

**Stormwater Control Plan
for a Regulated Project**

**The Cui Family Land Subdivision
in Point Reyes Station
Marin County, California**

Project ID P4403

Tentative Map Application

Prepared for:
Yan Cui
15906 Via Pato
Rancho Santa Fe
CA, 92067

Prepared by:
Xiaoqing Zeng, PhD, PE
Stetson Engineers Inc.
2171 E. Francisco Blvd, Suite K
San Rafael, CA 94901
(415)457-0701



December 2024

Table of Contents

1.0 Project Data	1
2.0 Setting	2
2.1 Project Location and Description	2
2.2 Existing Site Conditions and Drainage	3
2.3 Opportunities and Constraints for Stormwater Control	8
3.0 Low Impact Development Design Strategies	9
3.1 General Strategies	9
3.2 Stormwater Treatment and Hydromodification Management Facilities	9
4.0 Documentation of Post-Development Drainage Design	11
5.0 Source Control Measures	15
6.0 Stormwater Facility Maintenance	16
7.0 Construction Plan Checklist	17
8.0 Certifications	18

Figures

Appendices:

Appendix A: Pollutant Sources/Source Control Checklist

Appendix B: Bioretention Construction Inspection Checklist

Appendix C: Bioretention Facility Plant Matrix

This Stormwater Control Plan was prepared using the template provided in the BASMAA Post-Construction Manual (January 2019).

1.0 Project Data

Table 1 below is a summary of the Project data. This Project is considered a “Regulated Project” since it will create a total of approximately 312,482 square-feet (sf) impervious areas, exceeding the impervious area criterion of 5,000 sf for the Regulated Project.

Table 1 Project Data

Project Name/Number	Cui Family Land Subdivision; Project ID P4403
Application Submittal Date	XXX
Project Location	Near 11798 State Route 1, Point Reyes Station in Marin County
Project Phase No.	NA
Project Type and Description	<p>The Project proposes to subdivide an existing vacant 82.32-acre land into 37 parcels for future single-family residential development. Of the 37 parcels, 5 parcels are designated as affordable housing. This subdivision considered a density bonus of 35% after meeting the 20% affordable housing requirement.</p> <p>The land subdivision proposal includes conceptual plans for new driveways to access all the new parcels and driveway tie-in aprons at State Route 1 and Point Reyes-Petaluma Road, roadway improvements to Point Reyes-Petaluma Road at the southeast corner, utility installation and maintenance areas, onsite wastewater treatment systems, limited tree removal, and general grading to accommodate site improvements such as new driveways.</p> <p>As this is a Planning Submittal and not a site improvement plan, no grading or land disturbance will occur at this time.</p>
Total Project Site Area (acres)	82.32 acres
Total New and Replaced Impervious Surface Area	312,482 SF (New)
Total Pre-Project Impervious Surface Area	0 SF
Total Post-Project Impervious Surface Area	312,482 SF

2.0 Setting

2.1 Project Location and Description

The subject property (82.32 acres) is located near 11798 State Route 1, Point Reyes Station in the unincorporated area of Marin County (APN: 119-050-04, 119-050-09, 119-140-03, and 119-140-09). It is within the village limit boundaries of the community of Point Reyes Station and located within the Coastal Zone. Figure 1a shows the property location in Marin County and Figure 1b shows the project vicinity and the existing property parcels (4 parcels). The property is bounded by Point Reyes-Petaluma Road and Lagunitas Creek on the south, State Route 1 to the west, rural residential housing to the north, and open pastureland to the east. The project site is currently vacant and undeveloped.

The subject property consists of four (4) lots (69, 79, 80, and 81). Refer to Figure 2 for the Record of Survey prepared by Adobe Associates in 2022. Table 2 is a summary of the four lots.

Table 2 Summary of the Four Lots of the Subject Property

Lot ID	Document Number (DN)	Assessor's Parcel Number (APN)	Area (acre)
69	1999-0091165	119-140-03 119-140-09	8.01
79		119-050-04	25.78
79		119-050-09	14.89
80			14.89
81			18.75
Total			

Figure 3a shows the Coastal Zone land use zoning under the Marin County Local Coastal Program (LCP) Land Use Plan and property location. The property is within the zoning of C-ARP-3 -- Coastal, Agricultural, Residential Planned (1 unit per 3 acres). The C-ARP land use zoning is designed to preserve productive lands for agricultural use through the clustering of allowed residential development.

The project site is subject to the Marin Countywide Plan (CWP)'s C-AG3 (Coastal Agricultural 3; 1 unit per 1 – 9 acres) land use designation. The C-AG3 land use category was established for residential use within the context of small-scale agricultural and agriculturally related uses.

According to Map 19e Point Reyes Station Land Use Policy Map, the density associated with C-AG3 is 1 unit per every 1 to 9 acres (see Figure 3b).

The 82.32-acre subject property is proposed to be subdivided into 37 parcels for future single-family residential development (see Figure 4). Of the 37 parcels, 5 parcels are designated as affordable housing. The subdivision considered a density bonus of 35% after meeting the 20% affordable housing requirement. Preliminary plan indicates that individual lots will range between about 1.02- and 8.2-acres, meeting the density requirement for the C-AG3 land use designation (1 unit per 1 to 9 acres).

The land subdivision proposal includes conceptual plans for new driveways to access all the new parcels and driveway tie-in aprons at State Route 1 and Point Reyes-Petaluma Road, roadway improvements to Point Reyes-Petaluma Road at the southeast corner, utility installation and maintenance areas, onsite wastewater treatment systems, limited tree removal, and general grading to accommodate site improvements such as new driveways.

Access to the development will be provided via an eastward extension of the existing Water Tank Road, via a new access driveway from State Route 1 a few hundred yards north of the existing Water Tank Road, and a new driveway extending from Point Reyes-Petaluma Road in the southeast corner of the site.

2.2 Existing Site Conditions and Drainage

The site is positioned in a topographically steep section of Point Reyes Station surrounded by rural residential development, pastureland, and light commercial development. The majority of the project site is undeveloped and consists of pastureland with several seasonal drainages, stock ponds, and wetland seeps based on the Huffman & Associates' reconnaissance of the site in 2023 (see Figure 5). A small parcel near the southwestern end consists of a farmhouse with attendant features. Current land use is limited to cattle and horse grazing.

Figure 6a shows the topographical contours based on the 2023 topographic survey using the Real-Time Kinematic (RTK) Observations method. The site elevation ranges from about 40 ft NAVD88 near Point Reyes-Petaluma Road in the south to about 400 ft NAVD88 in the northeast. Below is a summary of site slopes based on a preliminary slope analysis (see also Figure 6b). The site has an average slope of approximately 28.5%.

Slope Range	Acres	% of Site
< 15%	13.09	15.9
15% - 25%	22.10	26.9
25% - 45%	39.24	47.7
>45%	7.75	9.5
Total	82.18	100

Existing drainage patterns and drainage facilities at/near the project site are shown in Figure 7. In general, the southeast portion of the site drains to Lagunitas Creek and the northwest portion of the site drains to Tomasini Canyon (refer to Figure 1b for Tomasini Canyon). Both creeks eventually discharge into Tomales Bay. The Lagunitas Creek watershed is the largest drainage into Tomales Bay and Tomasini Canyon is one of the small tributaries draining the east side of Tomales Bay (Tomales Bay's eastshore).

There are eight (8) existing culverts along the Point Reyes-Petaluma Road that drain the southeast portion of the site into Lagunitas Creek. The roadside ditch along the Point Reyes-Petaluma Road on the west side helps convey the stormwater runoff from the site into the 8 culverts. Culvert #8 is located offsite and drains a small portion from the site (Sub-Basin 3-1 in Figure 8).

There is a twin culvert along State Route 1 (CA-1) at the entrance of the site. This twin culvert along with the roadside ditch conveys the stormwater from the northwest portion of the site to Tomasini Canyon.

Field survey was performed to inspect and locate the existing culverts, survey the culverts invert and top elevations, measure the culvert sizes, and measure the dimensions of the roadside ditches. These surveyed data are summarized in Table 3.

The site generally consists of narrow ridgelines, typically inclined between about 5:1 (horizontal: vertical), flanked by steep slopes. Incised drainage channels at the base of the slopes are typically bounded by channel banks inclined between about 2:1 and near vertical.

Vegetation in the ridgeline and upper slopes is typically limited to native grasses and ground cover, while the lower slopes and many of the channel areas are vegetated with mature oak, bay and laurel trees along with dense poison oak, broom, and other shrubs.

Table 3 Surveyed Data of Existing Culverts and Roadside Ditches

ID	PM Sign	Existing Culvert	Diameter/Size (in)	Length (ft)	Inlet Area (ft ²)	Allowable Inlet Water Level without Overtopping (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Slope
1	PM 13.97	Inlet Portion 18" RCP and Outlet Portion 24" CMP	18"	37	1.77	89.38	87.71	84.85	7.7%
2	PM 13.87	Inlet Portion 18" RCP and Outlet Portion 24" HDPE	18"	45	1.77	50.05	47.30	45.54	3.9%
3	PM 13.78	18" CMP	18"	49	1.77	40.14	35.68	NV	10.0%
4	PM 13.71	18" RCP	18"	40	1.77	33.97	28.13	23.42	11.8%
5	PM 13.70	18" RCP	18"	40	1.77	33.74	29.51	26.39	7.8%
6	PM 13.67	12" CMP	12"	42	0.79	32.86	29.17	26.34	6.7%
7	PM 13.63	20" RCP	20"	54	2.18	32.00	28.97	NV	10.0%
8	PM 13.51	20" RCP	20"	73	2.18	28.00	19.50	NV	10.0%
		CA-1: Two 14" CMP	14"×2	24	1.07				2.7%
		CA-1 Ditch	Bottom width: 1 ft Depth: 2.5 ft Side slope: 1:1		8.8				2.7%
		Point Reyes–Petaluma Rd Ditch	Bottom width: 1 ft Depth: 1 ft Side slope = 1:1.5		2.5				0.6%

PM: Post Mile; NV: Not Visible. The slopes in red are assumed slopes based on judgement in the field.

Figure 8 shows the delineated drainage sub-basins under existing conditions based on the site topography (or flow directions) and the locations of the existing culverts. The sub-basins inside the property are numbered with a postfix of 1 (e.g., Sub-Basin 1-1, Sub-Basin 2-1) and the sub-basins outside of the property are numbered with a postfix greater than 1 (e.g., Sub-Basin 1-2, Sub-Basin 2-2, Sub-Basin 2-3). The 100-year peak flow calculations based on this drainage sub-basin delineation are intended to evaluate the hydraulic adequacy of the existing drainage culverts.

Note that the total site area shown in the table insert in Figure 8 is about 81.51 acres, which is a little smaller than the total property area of 82.32 acres (see Table 2) from the boundary survey. The reason for this is that the boundary line shown in Figure 8 is not exactly the same as the surveyed property boundary which includes a portion of the Point Reyes-Petaluma Road at the southeast corner of the property. There is no need to include the portion of the Point Reyes-Petaluma Road in the drainage analysis and stormwater control plan.

As shown in Figure 8, Sub-basins 1-1 and 2-1 inside the property drain to Tomasini Canyon with a total drainage area of about 41.40 acres ($5.68 + 35.72 = 41.40$; see the table insert in Figure 8). All other sub-basins inside the property drain to Lagunitas Creek.

Table 4 summarizes the existing condition drainage sub-basins and hydrologic characteristics. Under existing conditions, the entire property site has no impervious areas. There are about 3.12-acre impervious areas adjacent to the property site. These impervious areas include residential buildings, storage tanks, and paved areas (see Figure 9).

Table 4 Existing Condition Drainage Sub-Basins and Hydrologic Characteristics

Basin	Sub-Basin	Area (sf)	Area (ac)	Top Elev (ft NAVD88)	Bottom Elev (ft NAVD88)	Flow Length L (ft)	Average Slope S	Pervious Area (ac)	Impervious Area (ac)
1	1-1	247,393	5.68	404	234	578	29.4%	5.68	0.00
	1-2	2,788,512	64.02					64.02	0.00
2	2-1	1,556,051	35.72	404	68	2,103	16.0%	35.72	0.00
	2-2	34,613	0.79					0.79	0.00
	2-3	261,952	6.01					5.82	0.19
	2-4	156,287	3.59					3.49	0.10
3	3-1	78,057	1.79	368	304	168	38.1%	1.79	0.00
	3-2	1,064,736	24.44					24.44	0.00
4	4-1	17,359	0.40	276	256	266	7.5%	0.40	0.00
	4-2	794,932	18.25					15.64	2.61
5	5-1	551,671	12.66	368	32	1,434	23.4%	12.66	0.00
	5-2	39,982	0.92					0.92	0.00
6	6-1	355,619	8.16	308	34	1,068	25.7%	8.16	0.00
7	7-1	417,763	9.59	280	34	1,004	24.5%	9.59	0.00
	7-2	111,014	2.55					2.44	0.11
8	8-1	227,285	5.22	130	40	355	25.4%	5.22	0.00
	8-2	173,643	3.99					3.95	0.04
9	9-1	89,895	2.06	128	58	289	24.2%	2.06	0.00
	9-2	43,767	1.00					1.00	0.00
10	10-1	9,676	0.22	110	90	139	14.4%	0.22	0.00
	10-2	47,036	1.08					1.01	0.07
Total		9,067,242	208.16					205.04	3.12
Total Inside Property		3,550,769	81.51					81.51	0.00

Note: The sub-basins in red represent the sub-basins inside the property.

2.3 Opportunities and Constraints for Stormwater Control

Constraints

The site is on a hillslope with relatively steep slopes. This slope constraint would limit the site development.

The site surface soils typically consist of medium-dense, porous silty sand and sandy silt which typically exhibit little cohesion and will be prone to erosion. Sandy soils on moderately steep slopes or clayey soils on steep slopes are susceptible to erosion when exposed to concentrated surface water flow. The potential for erosion is increased when established vegetation is disturbed or removed during normal construction activity.

Disposal of runoff to deep infiltration is not feasible on this site due to shallow soils and low permeability.

The site has a significant amount of environmentally sensitive habitat areas (ESHA). This constraint would greatly limit the site development.

The preliminary geotechnical evaluation mapped several landslides around the site. Most slides appear to consist of relatively shallow earth flows occupying the upper reaches of the incised drainages around the site. The margins of these slides are typically marked by near-vertical scarps ranging from about 1- to 3-feet high. The site development plan will need to consider this constraint.

Opportunities

The site is relatively large and the proposed density is relatively low, there are many locations onsite between the proposed building envelopes, sewage disposal locations, and proposed access driveways to create a drainage system that will mimic natural processes. By creating a network of stormwater collection and conveyance system (culverts and street gutters) and bioretention facilities (BF), it will be possible to create natural drainage elements for the low intensity design storms to mitigate the runoff created by the proposed improvements to the required standards for both stormwater treatment and hydromodification management¹. Additional storage will be provided at the top of the selected BFs for attenuation/detention of the 100-year flood flow so that the Project will not increase the 100-year peak flow magnitude of stormwater leaving the site, compared to existing conditions.

¹ Hydromodification management is an additional requirement for Regulated Projects (It is not required for non-Regulated Projects). The purpose of hydromodification management is to minimize the potential of storm water discharges from causing altered flow regimes (in terms of flow rate and duration) and excessive downstream erosion in receiving waters, i.e., mimic existing condition hydrographs. The required design storm for hydromodification management is 2-year, 24-hour storm.

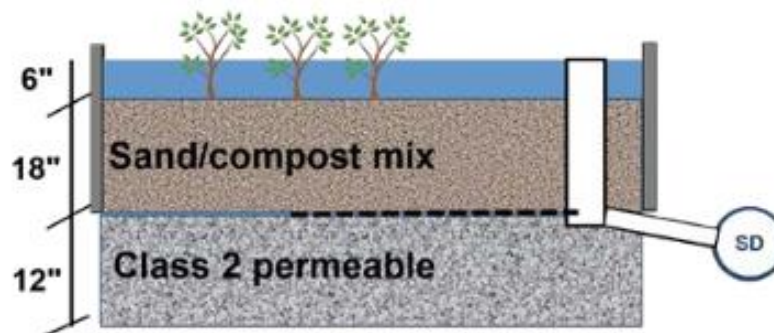
3.0 Low Impact Development Design Strategies

3.1 General Strategies

- Limit development envelopes.
- Limit clearing, grading, and soil compaction.
- Minimize impervious surfaces.
- Conserve natural areas and natural drainage features of the site as much as possible.
- Comply with stream setback ordinances/requirements to protect creeks, wetlands, and riparian habitats.
- Protect slopes and channels against erosion.

3.2 Stormwater Treatment and Hydromodification Management Facilities

Stormwater generated from all and only the impervious areas is collected and conveyed by culverts/pipes and street gutters into 11 bioretention facilities (BF) that are strategically located/designed for stormwater treatment and hydromodification management. See the schematic below for the bioretention facility.



Bioretention Facility Cross Section (Schematic)

The bioretention facilities will be designed to the criteria in the BASMAA *Post-Construction Manual* (January 2019), and will include the following features:

- Surrounded by a concrete curb.
- Each layer built flat, level, and to the elevations specified in the plans:
 - Bottom of Gravel Layer (BGL)
 - Top of Gravel Layer (TGL)
 - Top of Soil Layer (TSL)
 - Overflow Grate
 - Facility Rim
- 12 inches of Class 2 permeable, Caltrans specification 68-2.02F(3)
- 18 inches sand/compost mix meeting the recommended BASMAA specifications

- 4 in. dia. PVC SDR 35 perforated pipe underdrain, installed with the invert at the top of the Class 2 permeable layer with holes facing down, and connected to the overflow structure at that same elevation
- 6-inch-deep reservoir between top of soil elevation and overflow grate elevation
- Plantings selected for water conservation, and consistent with the plant matrix in Appendix F of the BASMAA Post-Construction Manual (see also Appendix C in this Stormwater Control Plan).
- Irrigation system on a separate zone, with drip emitters and “smart” irrigation controllers
- Ripraps at the bioretention facility inflow and outflow locations for erosion control.
- Sign identifying the facility as a stormwater treatment facility.

The construction checklist in Appendix B (from the BASMAA Post-Construction Manual) will be adapted and used to guide inspections during construction of the bioretention facilities.

4.0 Documentation of Post-Development Drainage Design

The Project proposes to subdivide the land into 37 parcels for future single-family residential development. Of the 37 parcels, 5 parcels are designated as affordable housing. This subdivision considered a density bonus of 35% after meeting the 20% affordable housing requirement.

Figure 10 shows the post-development drainage conditions. The post-development conditions will preserve all the existing environmentally sensitive habitat areas (ESHA) with 100 ft buffers. No structures and construction activities will encroach into the ESHA 100 ft buffer areas. Most of the existing hydrologic features will be maintained except the paved driveways and the buildings that have a building footprint of about 4,000 sf each based on the County code. All driveways are designed to have slopes not more than 18% and meet the following width requirements specified in the Marin Coastal Zoning Code section 20.65.030.A.

- The minimum improved width of a driveway serving a single dwelling unit is 12 feet.
- The minimum improved width of a driveway serving two to six dwelling units is 16 feet.
- A driveway which serves more than six dwelling units shall be considered equivalent to a private road and designed accordingly. The minimum width is 20 ft.

Figure 11 shows the drainage sub-basins under project conditions. Stormwater generated from all and only the impervious areas is collected and conveyed by culverts/pipes and street gutters into 11 bioretention facilities (BF) that are strategically located/designed. For a pervious area where stormwater flows toward a street gutter segment due to the natural topography, the designed street curb along the gutter segment would prevent the stormwater from flowing into the gutter. The BFs will serve conjunctive use purposes to satisfy both the stormwater management (water quality pollutant control) and hydromodification management. Additional storage volume at the top of selected BFs will be provided for attenuation/detention of the 100-year flood flow so that the Project will not increase the 100-year peak flow magnitude of stormwater leaving the site, compared to existing conditions. This way the Project design will meet the following typical hydrology-related requirements:

- a) not increasing the 100-year peak flow magnitude of stormwater leaving the site, compared to existing conditions;
- b) not reducing the water quality of stormwater leaving the site, compared to existing conditions; and
- c) not increasing erosion potential of stormwater leaving the site for relatively frequent storm events by hydromodification management.

In locating the BFs, the following factors were considered:

- High-visibility, well-trafficked places
- Common, publicly accessible areas for inspection and maintenance
- Dispersed throughout the site
- Drain only impervious building roofs and pavement
- Use surface drainage; keep runs short
- Make facilities flat and level
- Make top of soil elevation high as possible

Table 5 summarizes the project condition drainage sub-basins and hydrologic characteristics. The project condition will create about 7.17 acres of new impervious areas.

Table 5 Project Condition Drainage Sub-Basins and Hydrologic Characteristics

Basin	Sub-Basin	Area (sf)	Area (ac)	Top Elev (ft NAVD88)	Bottom Elev (ft NAVD88)	Flow Length L (ft)	Average Slope S	Pervious Area (ac)	Impervious Area (ac)
1	1-1	247,393	5.68	404	234	578	29.4%	5.68	0.00
	1-2	2,788,512	64.02					64.02	0.00
2	2-1	1,556,051	35.72	404	68	2,103	16.0%	32.68	3.04
	2-2	34,613	0.79					0.79	0.00
	2-3	261,952	6.01					5.82	0.19
	2-4	156,287	3.59					3.49	0.10
3	3-1	78,057	1.79	368	304	168	38.1%	1.18	0.61
	3-2	1,064,736	24.44					24.44	0.00
4	4-1	17,359	0.40	276	256	266	7.5%	0.40	0.00
	4-2	794,932	18.25					15.64	2.61
5	5-1	551,671	12.66	368	32	1,434	23.4%	11.38	1.29
	5-2	39,982	0.92					0.92	0.00
6	6-1	355,619	8.16	308	34	1,068	25.7%	7.29	0.87
7	7-1	417,763	9.59	280	34	1,004	24.5%	9.05	0.55
	7-2	111,014	2.55					2.44	0.11
8	8-1	227,285	5.22	130	40	355	25.4%	4.66	0.55
	8-2	173,643	3.99					3.95	0.04
9	9-1	89,895	2.06	128	58	289	24.2%	1.80	0.26
	9-2	43,767	1.00					1.00	0.00
10	10-1	9,676	0.22	110	90	139	14.4%	0.22	0.00
	10-2	47,036	1.08					1.01	0.07
Total		9,067,242	208.16					197.86	10.29
Total Inside Property		3,550,769	81.51					74.34	7.17

Note: The sub-basins in red represent the sub-basins inside the property.

The eleven (11) bioretention facilities (BF) were sized to meet the following two objectives based on the BASMAA Post-Construction Manual (January 2019):

- Provide the required stormwater quality management; and
- Provide the required hydromodification management.

The BASMAA Post-Construction Manual categorizes the drainage management areas (DMA) into the following four types:

- Self-treating areas
- Self-retaining areas
- Areas draining to self-retaining areas
- Areas draining to a bioretention facility

Self-treating areas are landscaped or turf areas that do not drain to bioretention facilities, but rather drain directly off site or to the existing storm drain system. In general, self-treating areas include no impervious areas.

Self-retaining areas are used where, because of site layout or topography, it is not possible to drain entirely pervious areas off-site separately. To create self-retaining turf and landscape areas in flat areas or on terraced slopes, berm the area or depress the grade into a concave cross-section so that these areas will retain the first inch of rainfall.

Areas draining to self-retaining areas. Runoff from impervious areas, such as roofs, can be managed by routing it to self-retaining pervious areas. The maximum ratio is 2 parts impervious area for every 1 part pervious area.

Areas draining to a bioretention facility. Where possible, design site drainage so only impervious roofs and pavement drain to bioretention facilities. When only impervious areas are drained to a bioretention facility, the required minimum area of the bioretention facility is 4% of the total impervious area draining to the bioretention facility.

Only the third and fourth methods above are applicable methods for managing stormwater from impervious areas. For a given size of impervious area, the third method requires a minimum self-retaining area to be 50% of the impervious area, while the fourth method requires a minimum bioretention facility area to be 4% of the impervious area. The bioretention facility method has been verified by hydrologic routing modeling for its effectiveness in meeting the hydromodification management requirements (Dubin Environmental Consulting, 2014). It is unclear if the third method is able to meet the hydromodification management requirements.

The bioretention facility method is selected in this subdivision for managing stormwater from the impervious areas to meet the requirements for both stormwater quality control and hydromodification management. No stormwater from any pervious areas will be directed to the bioretention facilities. The project site is in a natural state with all areas pervious. The land subdivision will not affect the existing pervious areas except that the Project will create a total of 312,482 sf or 7.17 acres impervious areas that include 37 buildings (4,000 sf each) and paved driveways. This total impervious area is approximately 8.7 percent of the total land area (82.32 acres).

The drainage design strategically located 11 bioretention facilities (BF) by collecting and conveying stormwater from all the impervious areas into these BFs via stormdrain culverts/pipes and street gutters. These 11 BFs are shown in Figures 9 and 10.

Table 6 shows the sizing of these BFs. The total required minimum surface area of the 11 BFs is estimated to be about 12,499 sf, ranging from 453 sf for BF11 to 1,601 sf for BF2.

It is worth noting that this drainage plan considered stormwater from all the buildings will be directed to the BFs by stormdrain culverts/pipes and street gutters. When the future site-specific plans are developed for the individual buildings, additional bioretention facilities may be designed and installed at the individual lots by future property owners, beyond those proposed in this drainage plan, which will further manage stormwater onsite. Therefore, the sizing of the proposed BFs in this drainage plan would be conservative (oversized), providing some level of reliability and redundancy.

Table 6 Bioretention Facilities Sizing

Bioretention Facility (BF) ID	Road Area (sf)	Buildings	Number of Buildings	Building Area (sf)	Total Impervious Area (sf)	Required BF Minimum Surface Area (sf)
BF1	17,087	4, 5, 6, 7, 9	5	20,000	37,087	1,483
BF2	20,022	1, 2, 3 ,8,10	5	20,000	40,022	1,601
BF3	10,713	11, 12, 13, 14	4	16,000	26,713	1,069
BF4	10,600	21	1	4,000	14,600	584
BF5	25,529	15, 16, 17, 18	4	16,000	41,529	1,661
BF6	7,683	22, 23	2	8,000	15,683	627
BF7	22,097	19, 20, 24, 25	4	16,000	38,097	1,524
BF8	7,755	28, 29, 30, 31	4	16,000	23,755	950
BF9	23,562	26, 27, 32, 33	4	16,000	39,562	1,582
BF10	12,097	34, 35, 36	3	12,000	24,097	964
BF11	7,337	37	1	4,000	11,337	453
Total	164,482			148,000	312,482	12,499

5.0 Source Control Measures

On-site activities that could potentially produce stormwater pollutants include:

- Indoor and structural pest control
- Landscape maintenance
- Construction activities
- Vehicle operations
- Garbage and waste
- Agriculture development

Table 7 below is a summary of pollutant sources and source control measures. Refer to Appendix A for more detailed information.

Table 7 Pollutant Sources and Source Control Measures

Potential Source of Runoff Pollutants	Permanent/Structural Source Control BMPs	Operational Source Control BMPs
Indoor and structural pest control	New construction minimizes potential for pest entry.	Integrated Pest Management (IPM) information will be provided to new homeowners.
Landscape maintenance	Developer-installed landscaping will minimize irrigation and runoff and be selected for pest resistance, and will minimize the need for fertilizers and pesticides. Plants will be selected appropriately to site soils, slopes, climate, sun, wind rain, land use, air movement, ecological consistency, and plant interactions.	IPM information will be provided to new homeowners. Landscaping will be maintainable using minimum or no pesticides. Use of native plants and mulches and native compost for Revegetation. Limit use of fertilizers.
Construction - dust	Dust control - water paving and subgrade compaction, mulches, filter fabrics	Limit of grading activities during high wind events, Daily sweeping and site cleanup.
Construction - sediment	Sediment traps; Bioretention facilities	Grading limits, filter fabric fencing, rock aprons, staging areas for equipment, construction access plan. construction schedule May 1 - Oct 15.
Construction – materials, paints and solvents	Designated materials staging areas. Dust free sanding and collection systems, Low VOC coatings. Approved coatings. Approved construction materials. Designated stockpiling and staging areas.	Licensed contractors in area of construction associated with waste, i.e. a painting contractor trained in containment and coatings management.
Vehicle operations	Bioretention facilities	Construction vehicle maintenance program
Garbage and waste	Designated trash enclosures and solid waste management plan. Stockpiling and reuse of materials from the site	Daily site cleanup or more frequently during construction as needed to contain construction waste generated onsite.
Agriculture development	Minimize the need for fertilizers and pesticides. Plants will be selected appropriately to site soils, slopes, climate, sun, wind rain, land use, air movement, ecological consistency, and plant interactions.	IPM information will be provided to new homeowners. Agriculture will be maintainable using minimum or no pesticides. Limit use of fertilizers.

6.0 Stormwater Facility Maintenance

As a part of the Final Map and associated construction documents and improvement plans for this Project, a Final Stormwater Facility Maintenance will be developed in consultation with Marin County Staff.

In general, since this Project is single-family residential in nature with agriculture development in the future, all of the facilities will be maintained by the owner of the individual parcels where the stormwater improvements are specific to an individual site.

In the case where the stormwater systems benefit the use of multiple land owners, a cost sharing program will be determined, outlined and made as part of the Final Map and deed restrictions or CCR's as appropriate for the Project.

In the interim, while the established parcels are held by a common owner - the applicant accepts responsibility for interim operation and maintenance of stormwater treatment and flow-control facilities until such time as this responsibility is formally transferred to a subsequent owner.

7.0 Construction Plan Checklist

This Stormwater Control Plan is prepared for the Tentative Map application, the first phase of a land subdivision for more than four parcels. The next phase is the Final Map application².

Construction plans will be provided at the next phase of the subdivision plan, Final Map application.

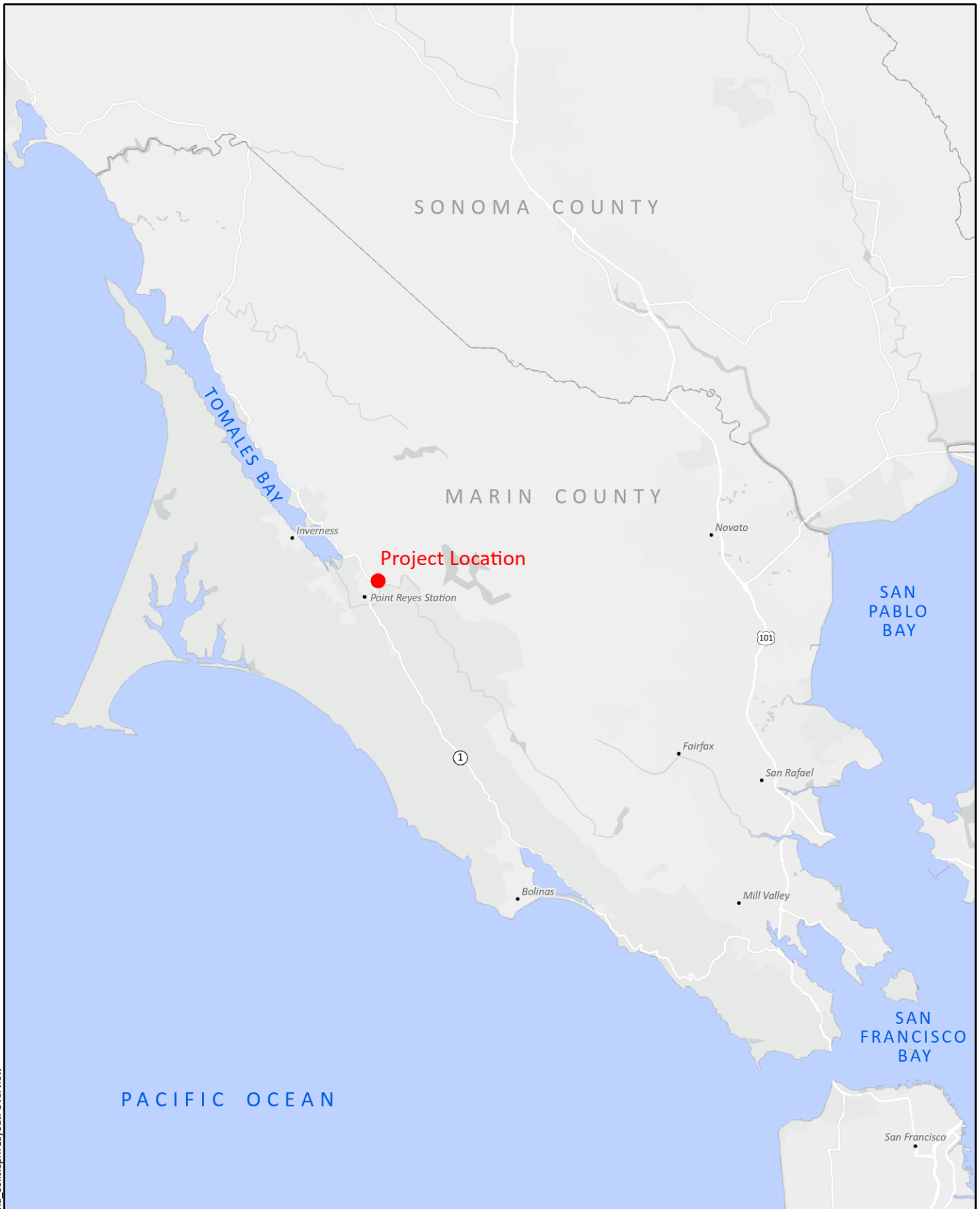
² The County Development Code (Title 22) specifies that a land subdivision for 4 or fewer parcels will have two phases: (1) Tentative Map and (2) Parcel Map. The two phases for a land subdivision for more than 4 parcels are specified as: (1) Tentative Map and (2) Final Map.

8.0 Certifications

The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this Stormwater Control Plan are in accordance with the current edition of the BASMAA Post-Construction Manual (January 2019).

Note: Additional Certifications will be determined by the Marin County Department of Public Works and other departments during the review of this project.

Figure 1a



Path: J:\n2904\Stormwater_and_Soils.aprx Layout: Overview



Note:

**PROJECT LOCATION
POINT REYES STATION, CA**

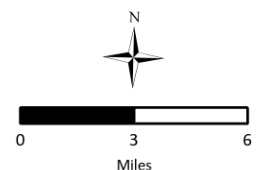
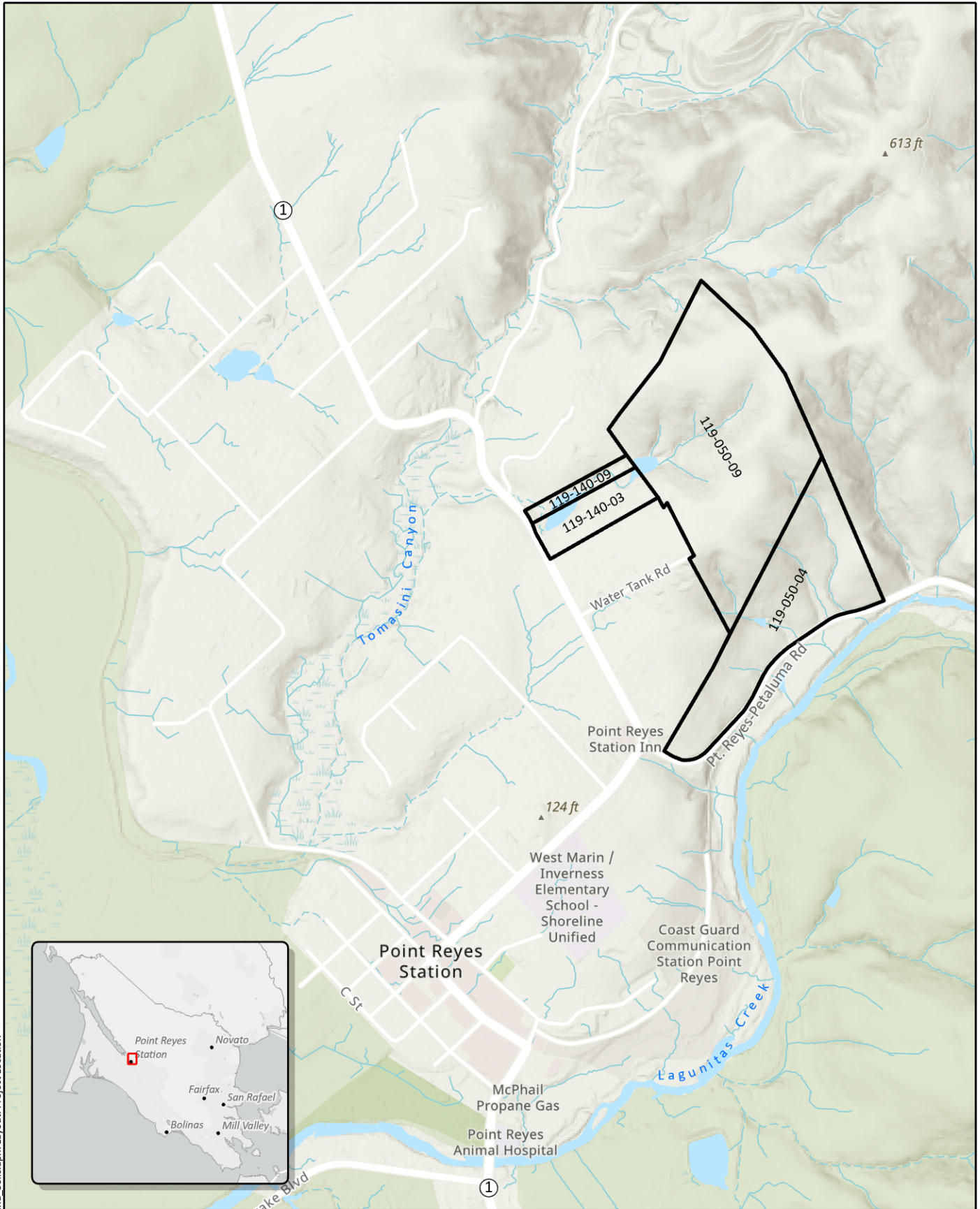


Figure 1b

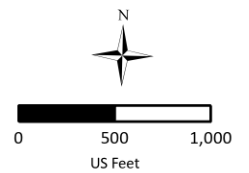


Path: J:\n2904\Stormwater_and_Solls.aprx Layout: Project Location

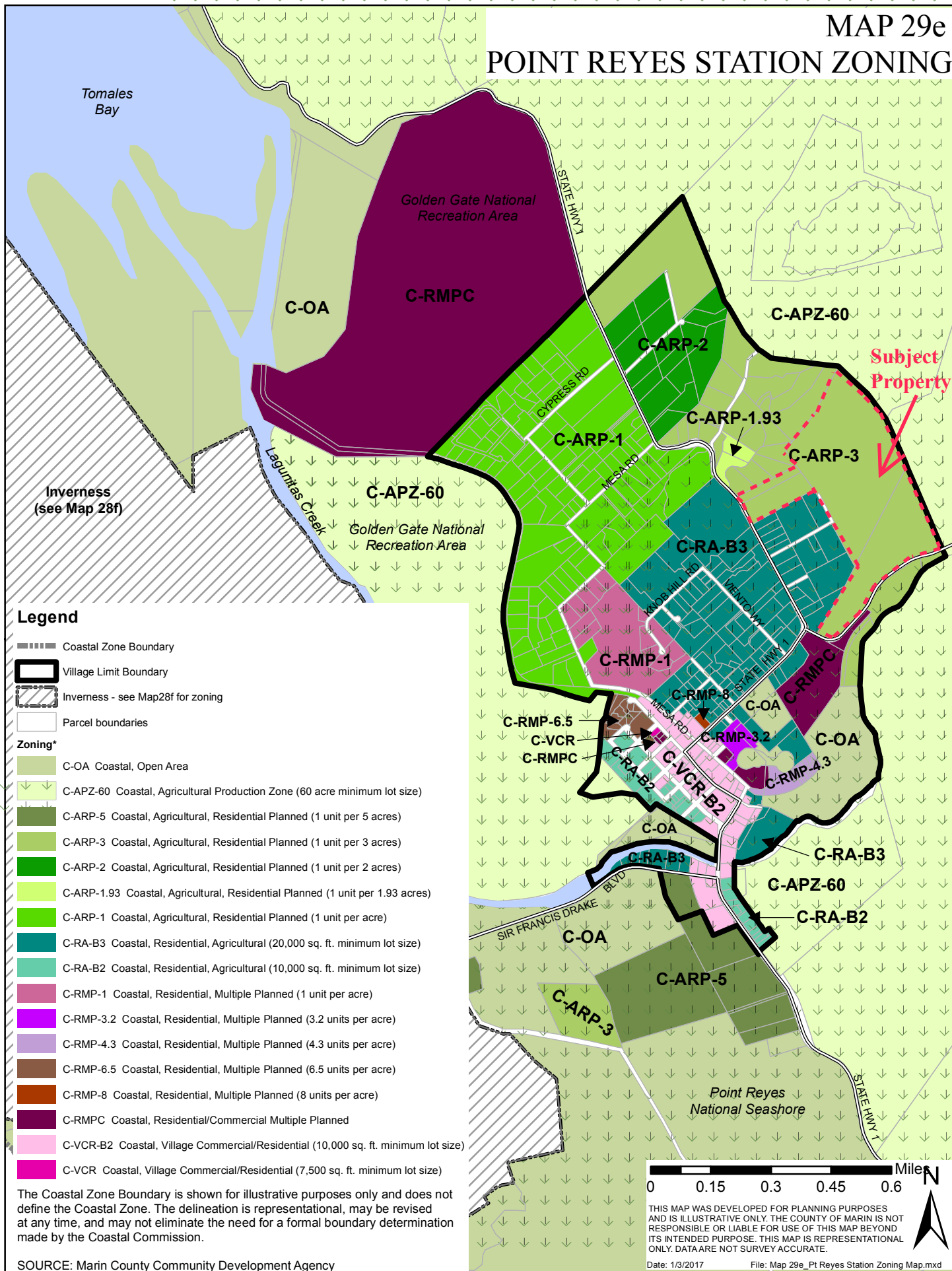


**PROJECT VICINITY AND EXISTING PROPERTY PARCELS
POINT REYES STATION, CA**

Note: Parcel Boundaries from Marin County.



MAP 29e POINT REYES STATION ZONING



0 0.15 0.3 0.45 0.6 Miles

THIS MAP WAS DEVELOPED FOR PLANNING PURPOSES AND IS ILLUSTRATIVE ONLY. THE COUNTY OF MARIN IS NOT RESPONSIBLE OR LIABLE FOR USE OF THIS MAP BEYOND ITS INTENDED PURPOSE. THIS MAP IS REPRESENTATIONAL ONLY. DATA ARE NOT SURVEY ACCURATE.

MAP 19e

POINT REYES STATION LAND USE POLICY MAP

The Coastal Zone Boundary is shown for illustrative purposes only and does not define the Coastal Zone. The delineation is representational, may be revised at any time in the future, is not binding on the Coastal Commission, and may not eliminate the need for a formal boundary determination made by the Coastal Commission.

Legend

- Coastal Single Family
 - C-SF5 2-4 units/acre
 - C-SF4 1-2 units/acre
- Coastal Multi Family
 - C-MF3 5-10 units/acre
 - C-MF2 1-4 units/acre
- Coastal Planned Residential
 - C-PR 1 unit/1-10 acres
- Coastal Neighborhood Commercial / Mixed Use
 - C-NC 1-20 units/acre
F.A.R. = 0.30 TO 0.50
- C-OS Coastal Open Space
- Coastal Agricultural
 - C-AG3 1 unit/1-9 acres
 - C-AG1 1 unit/31-60 acres
- Village Limit Boundary

F.A.R. = Floor Area Ratio

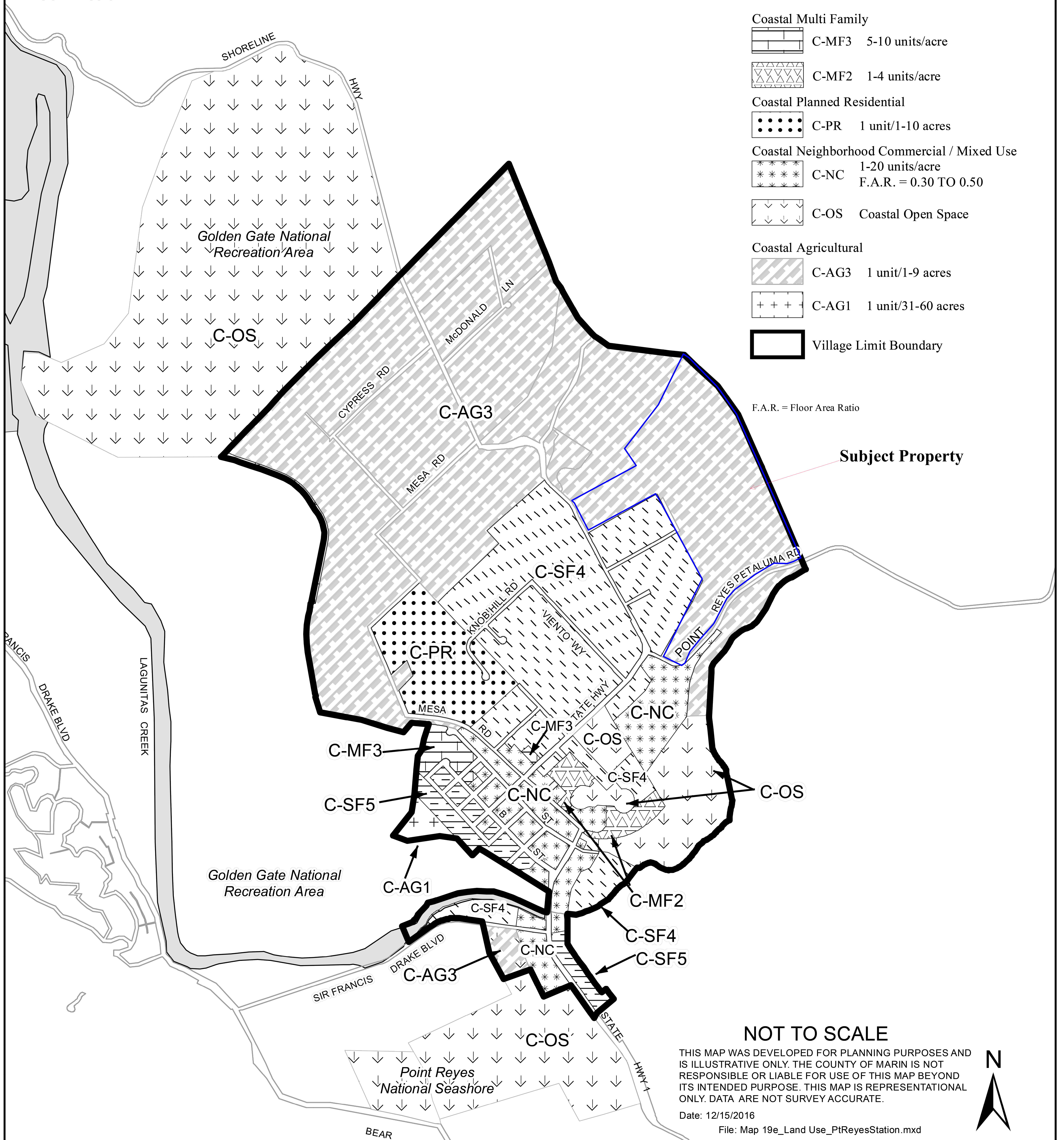
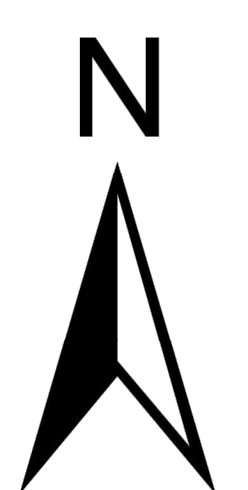
Subject Property

NOT TO SCALE

THIS MAP WAS DEVELOPED FOR PLANNING PURPOSES AND IS ILLUSTRATIVE ONLY. THE COUNTY OF MARIN IS NOT RESPONSIBLE OR LIABLE FOR USE OF THIS MAP BEYOND ITS INTENDED PURPOSE. THIS MAP IS REPRESENTATIONAL ONLY. DATA ARE NOT SURVEY ACCURATE.

Date: 12/15/2016

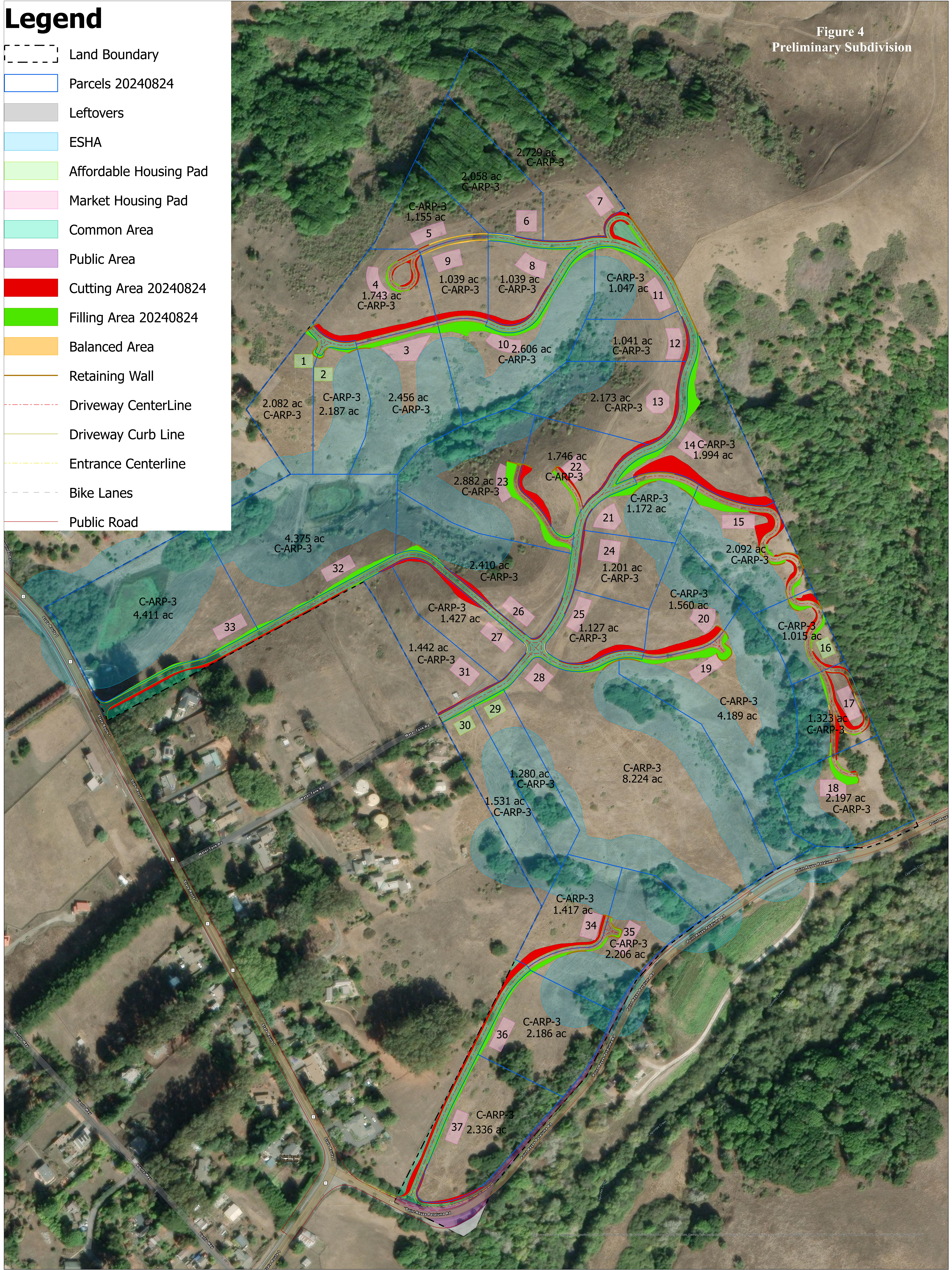
File: Map 19e_Land Use_PtReyesStation.mxd



Legend

-  Land Boundary
-  Parcels 20240824
-  Leftovers
-  ESHA
-  Affordable Housing Pad
-  Market Housing Pad
-  Common Area
-  Public Area
-  Cutting Area 20240824
-  Filling Area 20240824
-  Balanced Area
-  Retaining Wall
-  Driveway CenterLine
-  Driveway Curb Line
-  Entrance Centerline
-  Bike Lanes
-  Public Road

Figure 4
Preliminary Subdivision



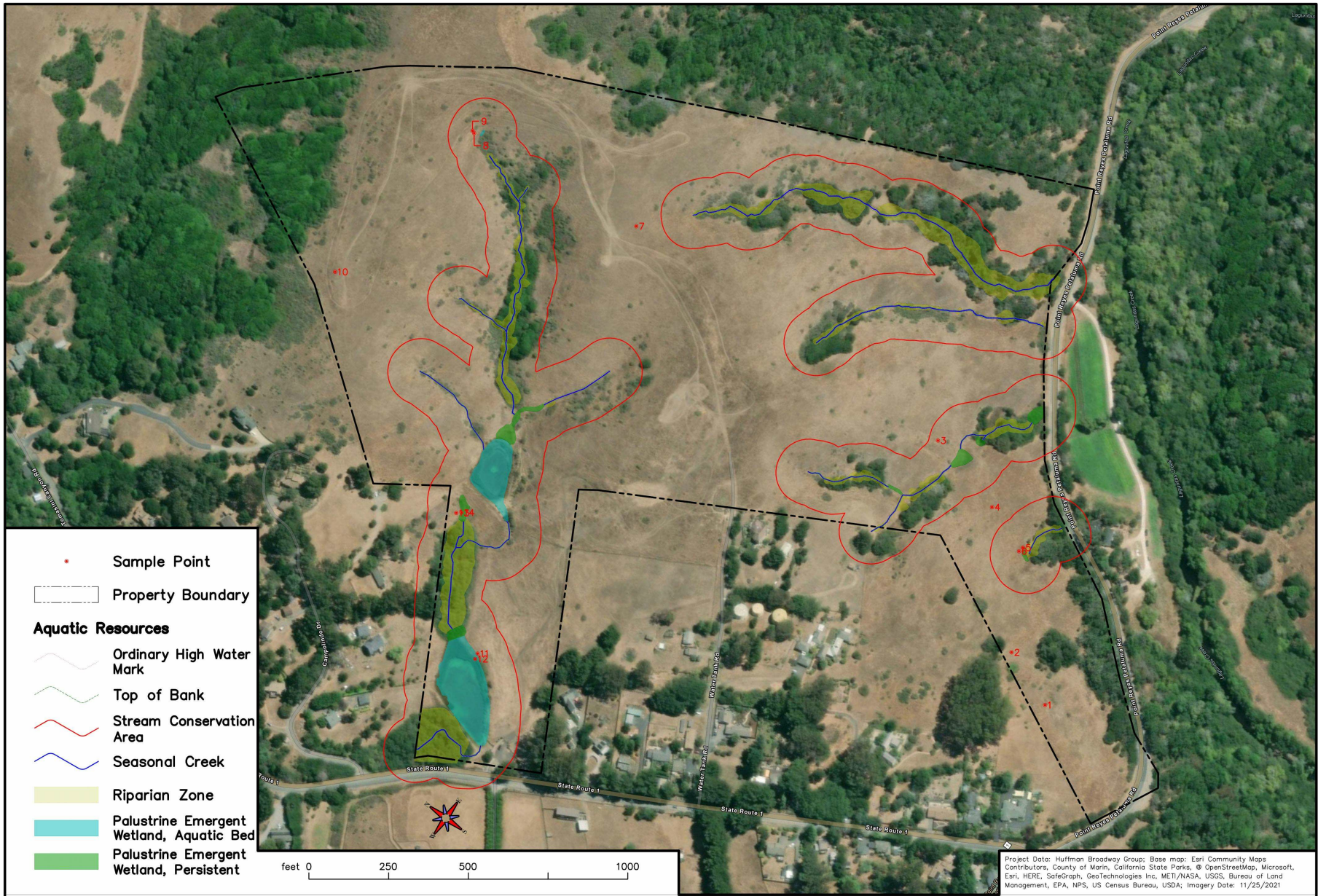
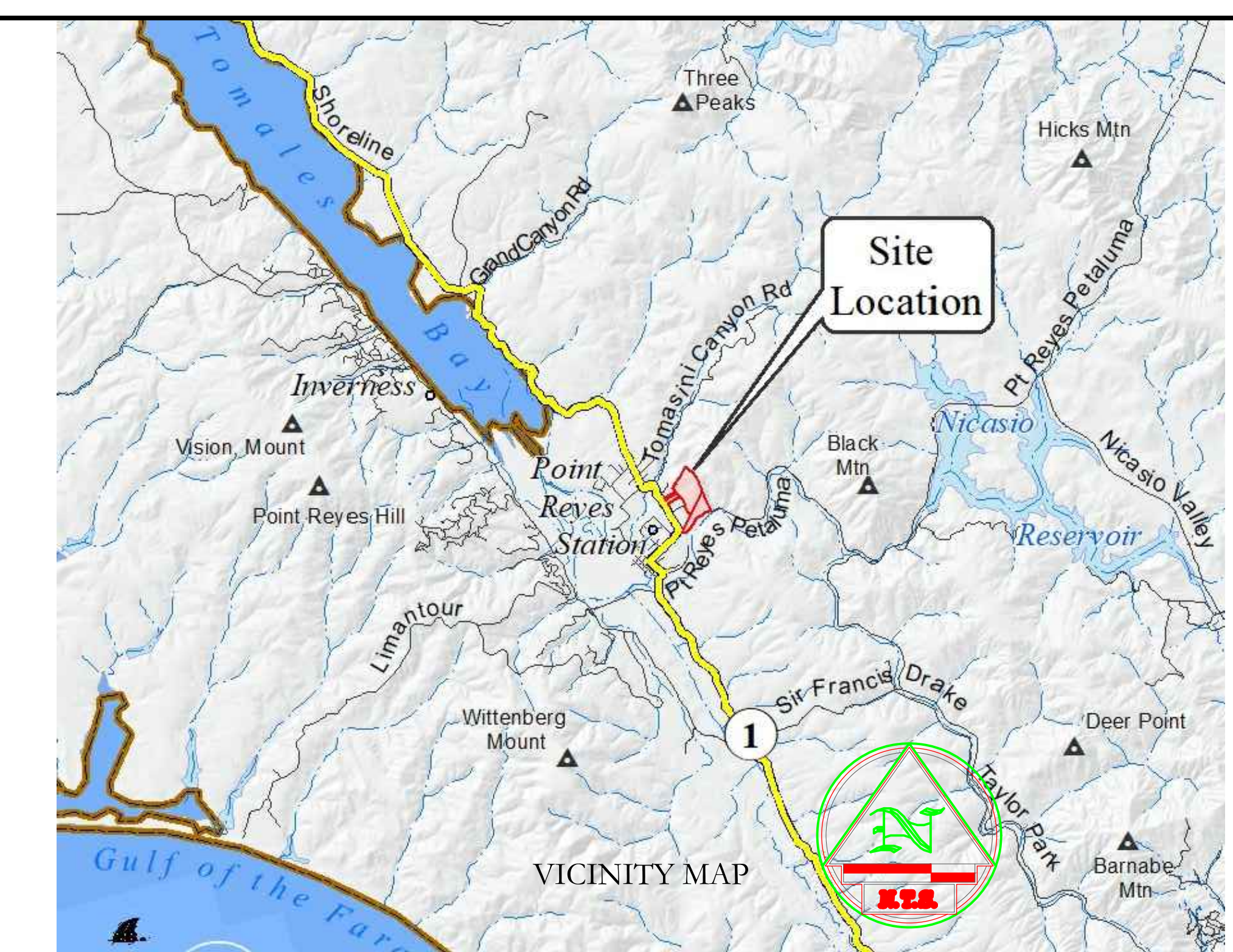
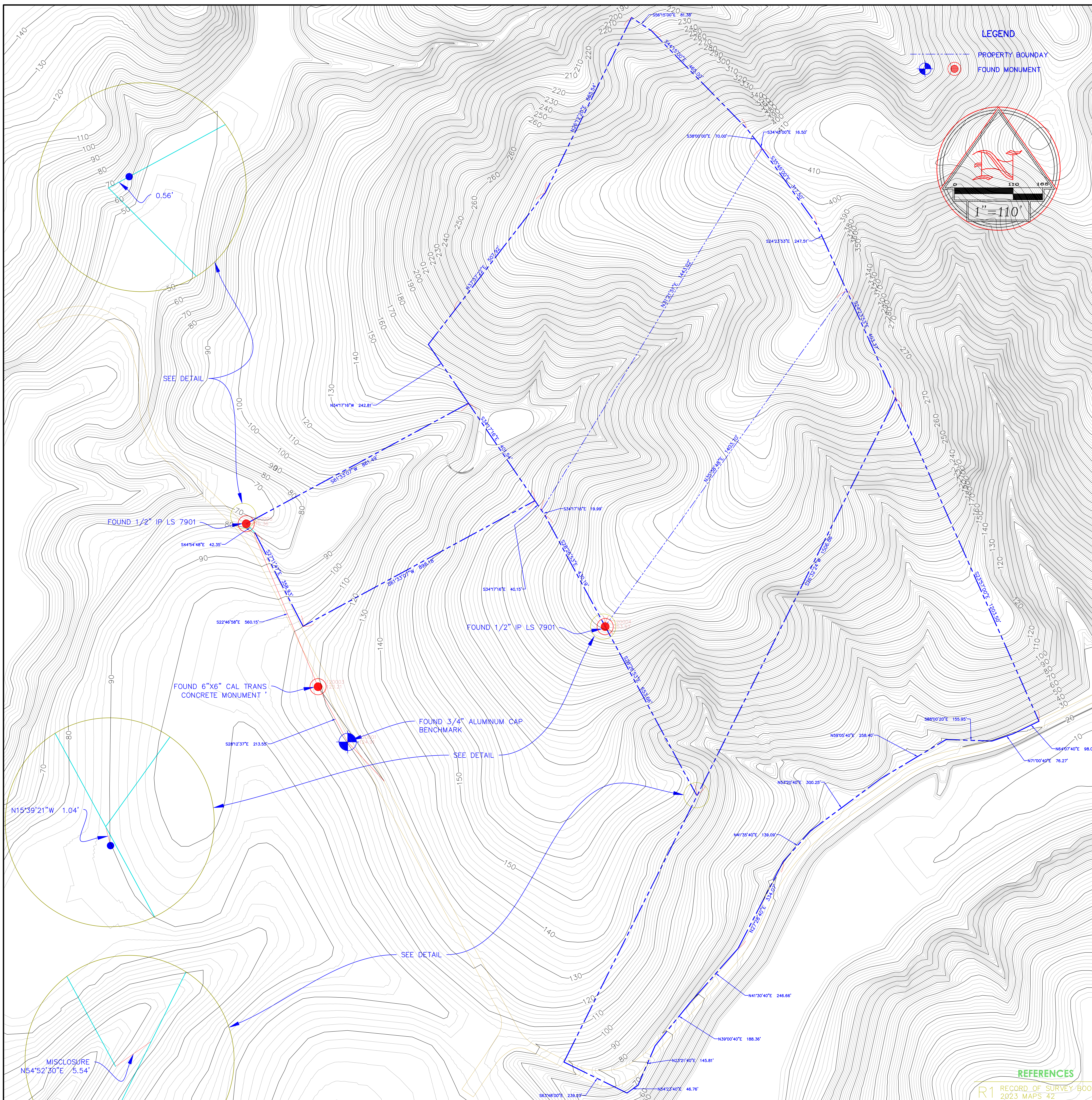


Figure 5 Aquatic Resources and 100-Foot Buffers

Huffman-Broadway Group, Inc.
 ENVIRONMENTAL REGULATORY CONSULTANTS



MAPPING NOTES

THE LOCATION OF UNDERGROUND STRUCTURES AND UTILITIES SHOWN HEREON HAS BEEN DETERMINED FROM SURFACE EVIDENCE OF THEIR EXISTENCE AND/OR FROM INFORMATION OBTAINED FROM PUBLIC AND/OR UTILITY AGENCIES. THE SURVEYOR ACCEPTS NO LIABILITY FOR THE LOCATION, EXISTENCE OR NON-EXISTENCE OF THOSE UNDERGROUND STRUCTURES, UTILITY LINES AND RELATED APPURTENANCES. ANY INDIVIDUAL, COMPANY OR AGENCY USING THIS MAP MUST CONFIRM THE LOCATION OF ALL UNDERGROUND LINES OR STRUCTURES PRIOR TO COMMENCING ANY EXCAVATION.

THE CONTENT OF THIS MAP WAS DEFINED BY CONTRACT AT THE SPECIFIC REQUEST OF THE CLIENT(S) AND/OR THEIR CONSULTANT(S). THE SURVEYOR ACCEPTS NO LIABILITY FOR USE OF THIS MAP BY ANY ONE OTHER THAN THE CLIENT(S) AND/OR CONSULTANTS FOR WHOM IT WAS PREPARED.

ANY BOUNDARY INFORMATION SHOWN HEREON IS RECORD DATA PER RS IN BOOK 2023 OF MAPS AT PAGE 42 MARIN COUNTY RECORDS AND DOES NOT REPRESENT A BOUNDARY SURVEY BY THE SURVEYOR.

ATTENTION

INFORMATION SHOWN HEREON HAS BEEN DERIVED FROM COLLECTED DATA AND PROCESSED IN ELECTRONIC FILE Boundary and Topograph with Yan Large Surface.dwg DATED 12/18/23. ALL AVAILABLE DATA MAY OR MAY NOT HAVE BEEN USED TO COMPILE THIS FINISHED PRODUCT. AN ELECTRONIC FORMAT OF THIS MAP WHICH CAN BE REFERRED TO FOR ADDITIONAL INFORMATION, HAS BEEN PROVIDED AS A COURTESY TO BC ENGINEERING AND SHALL BE CONSIDERED SUPPLEMENTAL TO THIS SIGNED AND SEALED PAPER ORIGINAL. A COPY OF THE SIGNED ORIGINAL HAS BEEN DELIVERED WITH THE ELECTRONIC DRAWING FILE AND CONSTITUTES THE DELIVERY PRODUCT OF PROFESSIONAL SERVICES AS PER OUR CONTRACT.

SURVEYOR'S STATEMENT

I, RAY C. CARLSON, A LICENSED LAND SURVEYOR IN AND FOR THE STATE OF CALIFORNIA, DO HEREBY STATE THAT THIS MAP WAS PREPARED BY ME, OR UNDER MY DIRECTION, AS REQUESTED BY YAN CUI IN SEPTEMBER 2023.

DATED: 12/14/2023

RAY C. CARLSON PLS 3890



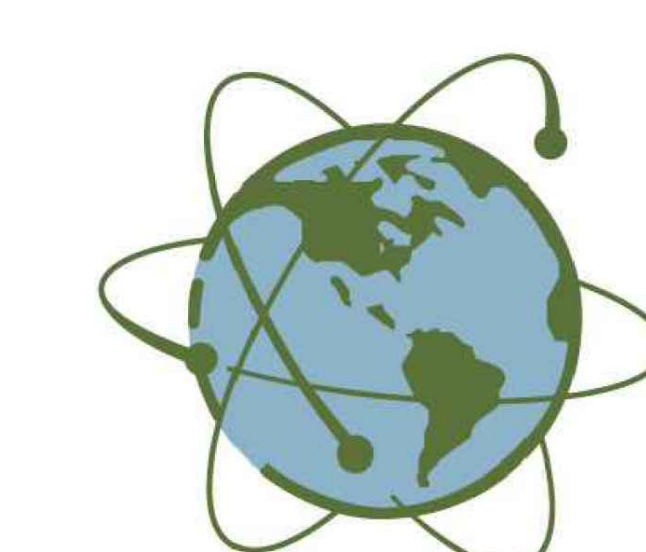
BENCHMARK NOTE

DESCRIPTION OF BENCHMARK:
ELEVATION: 124.9 FEET VRS NAD83/NAVDB8 CALIFORNIA ZONE III; EPOCH 2010.00, 18 GEOID, DECEMBER, 2023
CONTOUR INTERVAL = 2 FEET

**(BOUNDARY AND)
TOPOGRAPHIC MAP**

OF THE LANDS OF CUI AS DESCRIBED IN THAT DEED RECORDED IN OFFICIAL RECORDS AS DOCUMENT NUMBER 2023-0005225, MARIN COUNTY RECORDS.

COUNTY OF MARIN POINT REYES STATION STATE OF CALIFORNIA



RAY CARLSON
AND ASSOCIATES, INC.
Mapping for a Better World™
SURVEYING • MAPPING • GIS • CONSULTING
411 RUSSELL AVENUE SANTA ROSA, CALIFORNIA 95403
(707) 528-7649 • RCMAPS.COM
©2022, Ray Carlson and Associates, Inc.

REFERENCES
R1 RECORD OF SURVEY BOOK
2023 MAPS 42

Figure 6a Site Topography

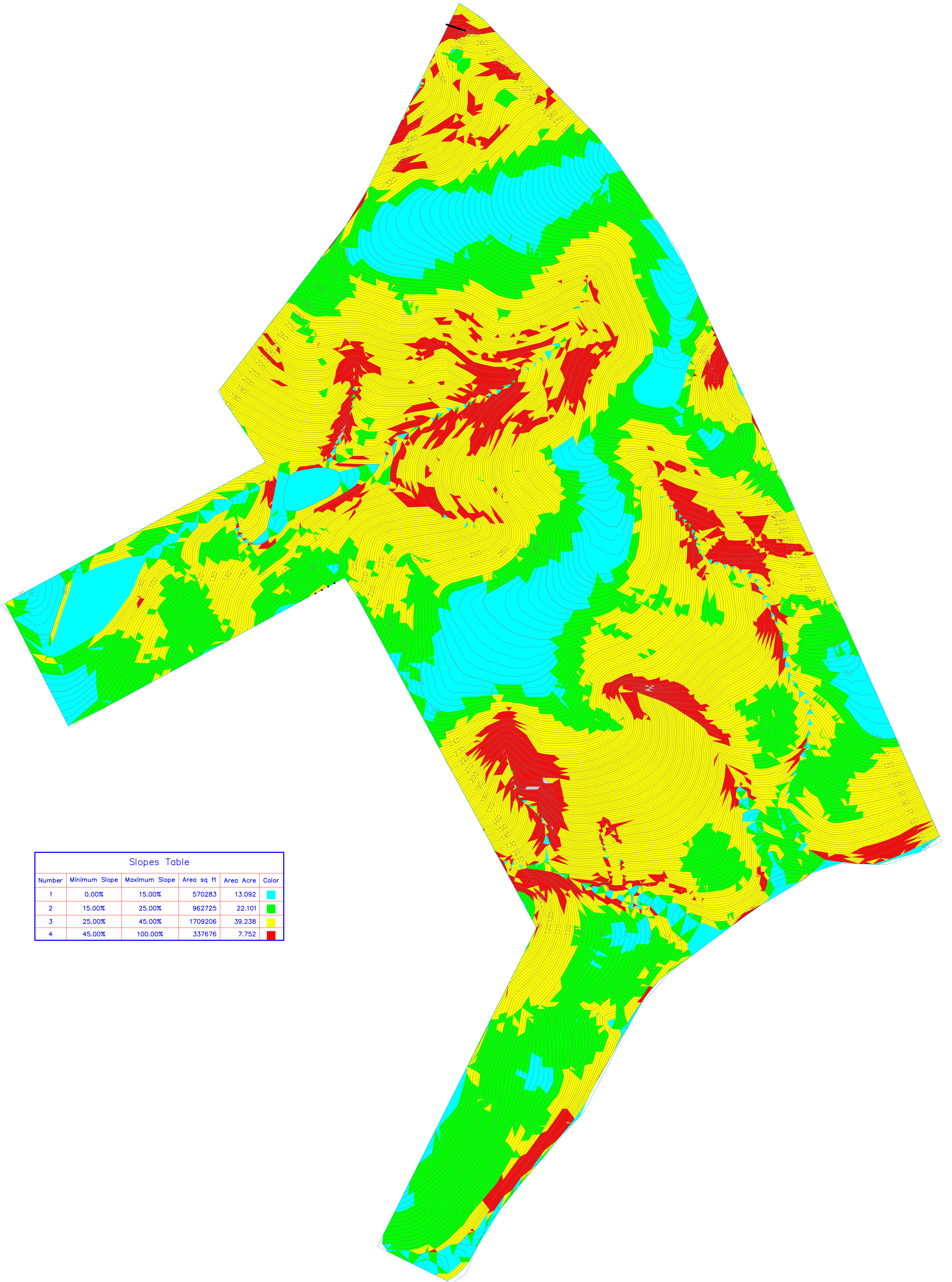
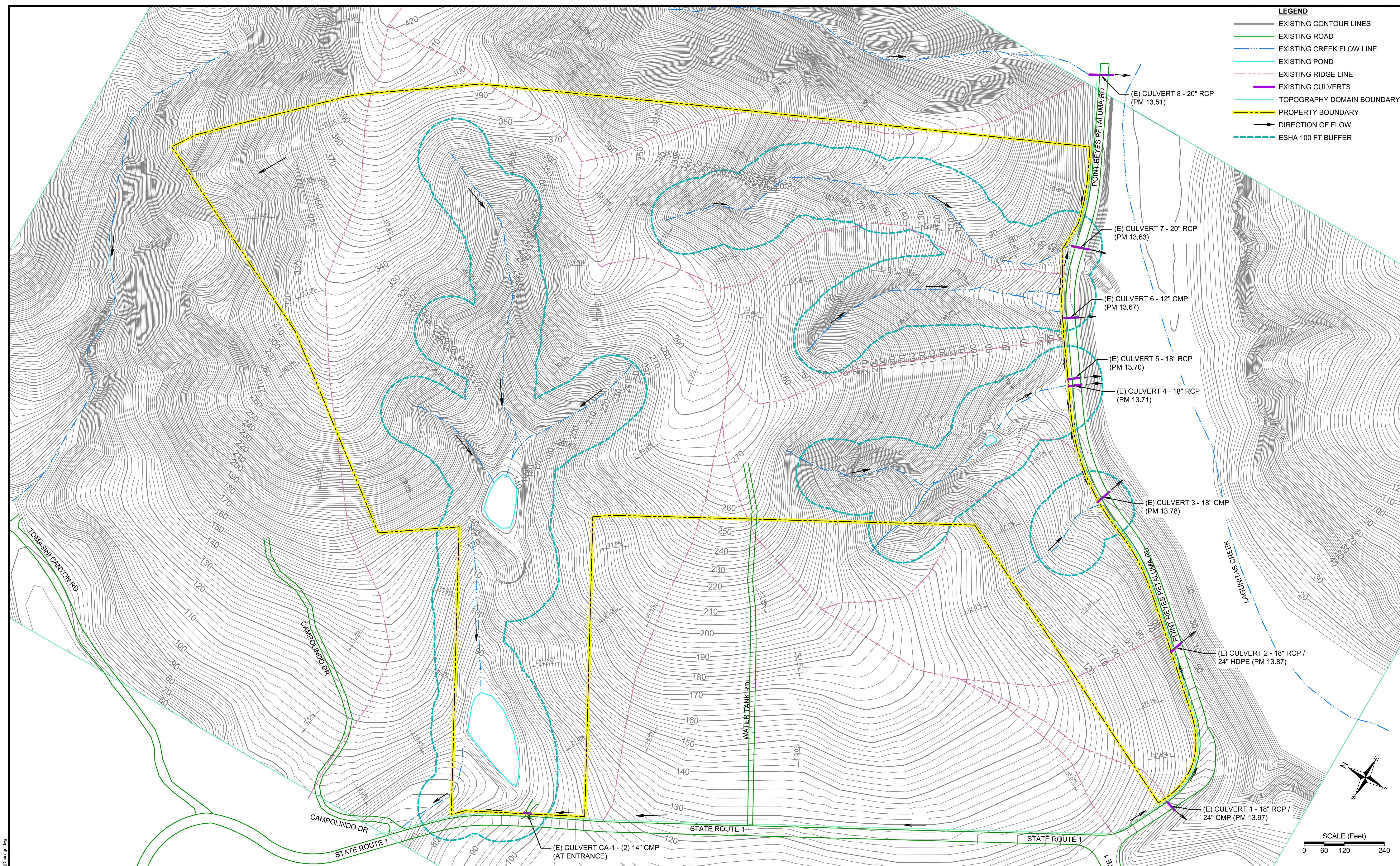
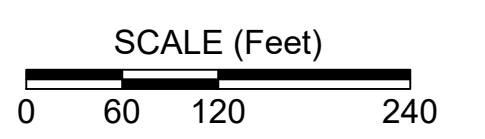


Figure 6b Site Slope Analysis



- LEGEND**
- EXISTING CONTOUR LINES
 - EXISTING ROAD
 - EXISTING CREEK FLOW LINE
 - EXISTING POND
 - - - EXISTING RIDGE LINE
 - EXISTING CULVERTS
 - TOPOGRAPHY DOMAIN BOUNDARY
 - - - PROPERTY BOUNDARY
 - DIRECTION OF FLOW
 - - - ESHA 100 FT BUFFER



DESIGNED:	No.	DATE	REVISION	BY	APPR
GT. / XZ.					
DRAFTED:					
GT.					
CHECKED:					
XZ.					

Stetson Engineers Inc.
 2171 E. Francisco Blvd., Suite K
 San Rafael, CA. 94901
 (415) 457-0701

THIS BAR IS 1-INCH LONG
 AT FULL SCALE

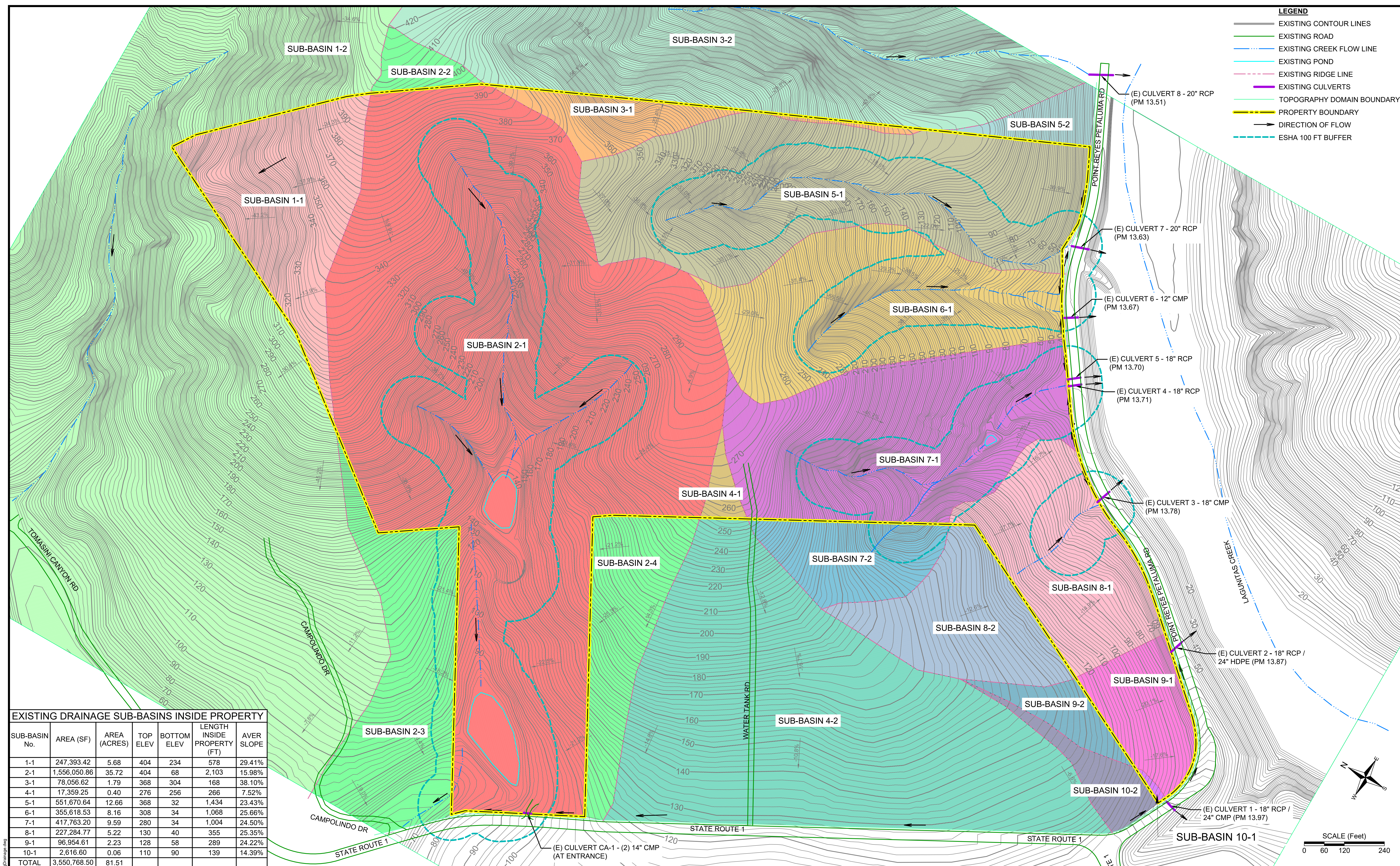
DRAFT

CUI FAMILY LAND SUBDIVISION
 OWNER: YAN CUI
 ADDRESS: _____

EXISTING DRAINAGE FACILITIES

DATE: SEPTEMBER 25, 2024
 SCALE: AS INDICATED
 PROJECT No.: 2904

Figure 7



- LEGEND**
- EXISTING CONTOUR LINES
 - EXISTING ROAD
 - EXISTING CREEK FLOW LINE
 - EXISTING POND
 - - - EXISTING RIDGE LINE
 - EXISTING CULVERTS
 - TOPOGRAPHY DOMAIN BOUNDARY
 - PROPERTY BOUNDARY
 - DIRECTION OF FLOW
 - - - ESHA 100 FT BUFFER

EXISTING DRAINAGE SUB-BASINS INSIDE PROPERTY						
SUB-BASIN No.	AREA (SF)	AREA (ACRES)	TOP ELEV	BOTTOM ELEV	LENGTH INSIDE PROPERTY (FT)	AVER SLOPE
1-1	247,393.42	5.68	404	234	578	29.41%
2-1	1,556,050.86	35.72	404	68	2,103	15.98%
3-1	78,056.62	1.79	368	304	168	38.10%
4-1	17,359.25	0.40	276	256	266	7.52%
5-1	551,670.64	12.66	368	32	1,434	23.43%
6-1	355,618.53	8.16	308	34	1,068	25.66%
7-1	417,763.20	9.59	280	34	1,004	24.50%
8-1	227,284.77	5.22	130	40	355	25.35%
9-1	96,954.61	2.23	128	58	289	24.22%
10-1	2,616.60	0.06	110	90	139	14.39%
TOTAL	3,550,768.50	81.51				

DESIGNED:	No.	DATE	REVISION	BY	APPR
GT. / XZ.					
DRAFTED:					
GT.					
CHECKED:					
XZ.					

STETSON ENGINEERS INC.
 2171 E. Francisco Blvd., Suite K
 San Rafael, CA. 94901
 (415) 457-0701

THIS BAR IS 1-INCH LONG AT FULL SCALE

DRAFT

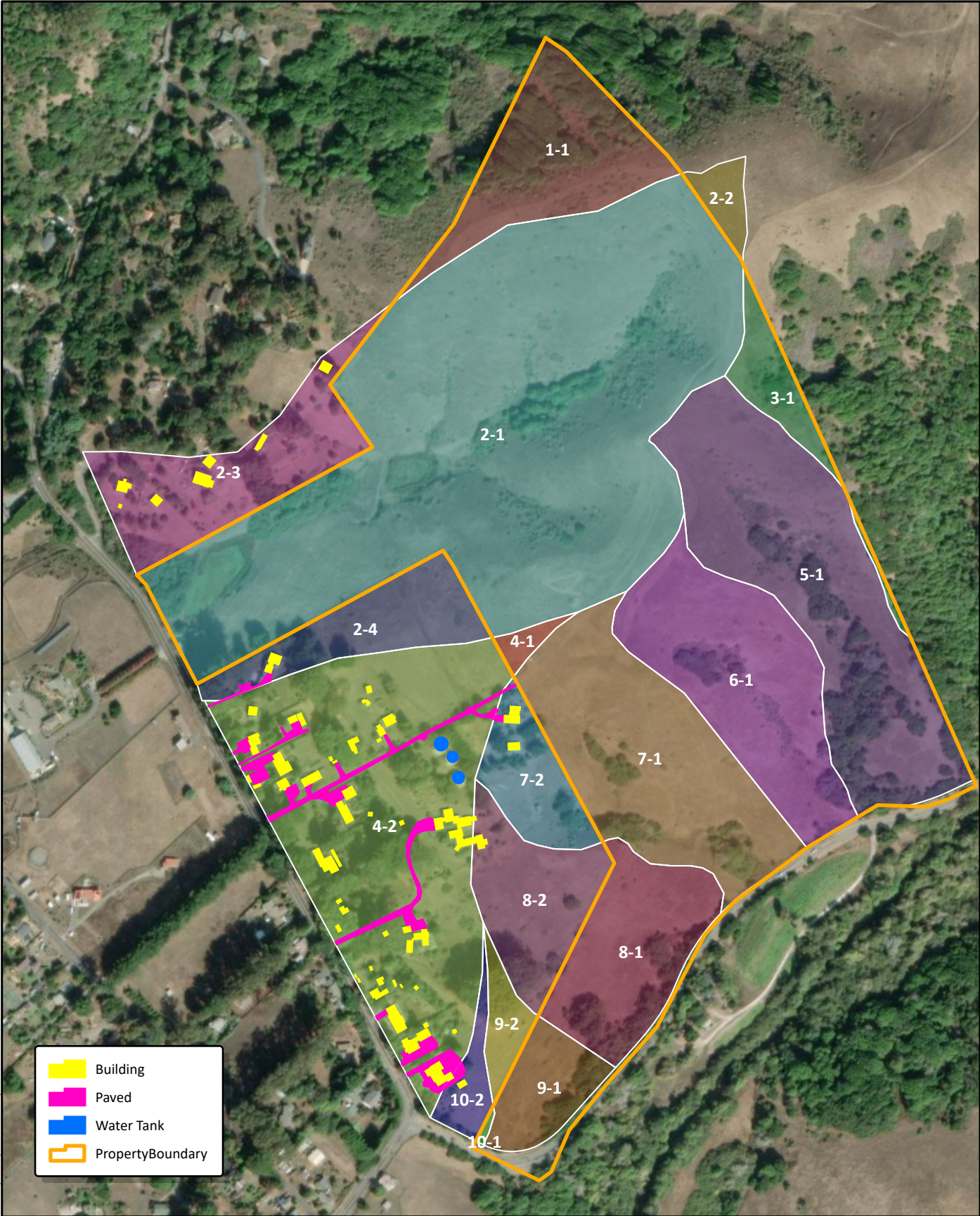
CUI FAMILY LAND SUBDIVISION
 OWNER: YAN CUI
 ADDRESS: _____

EXISTING DRAINAGE SUB-BASINS MAP

DATE: SEPTEMBER 25, 2024
 SCALE: AS INDICATED
 PROJECT No.: 2904

Figure 8

Figure 9

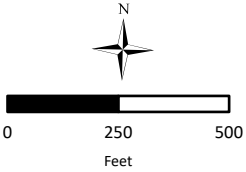


- Building
- Paved
- Water Tank
- Property Boundary

J:\jnr2904\SubdivisionAnalysis2024.aprx:ImperviousAnalysis

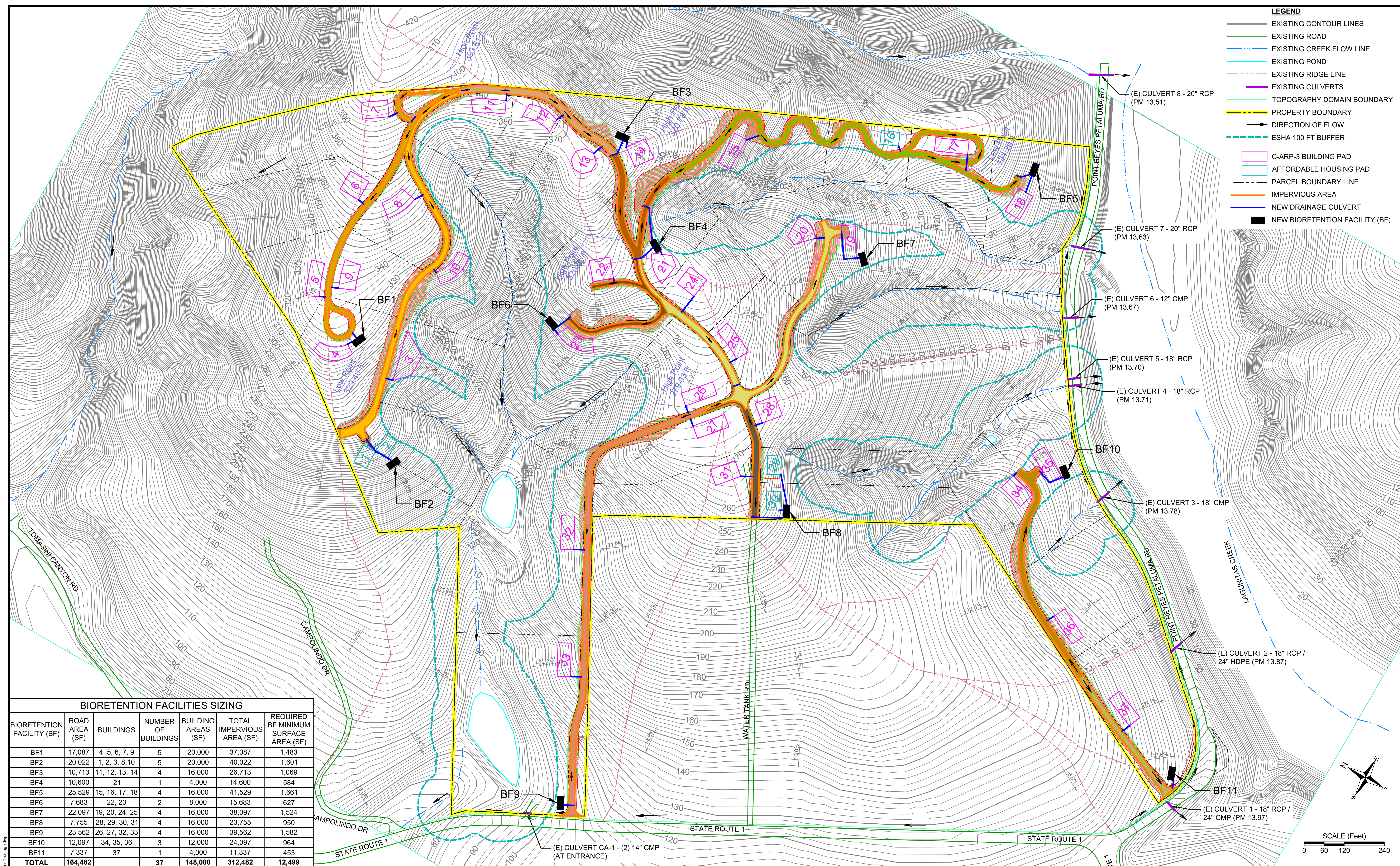


CUI FAMILY LAND SUBDIVISION
Drainage Basins/Subbasins and Existing Condition Impervious Areas



LEGEND

- EXISTING CONTOUR LINES
- EXISTING ROAD
- EXISTING CREEK FLOW LINE
- EXISTING POND
- EXISTING RIDGE LINE
- EXISTING CULVERTS
- TOPOGRAPHY DOMAIN BOUNDARY
- PROPERTY BOUNDARY
- DIRECTION OF FLOW
- ESHA 100 FT BUFFER
- C-ARP-3 BUILDING PAD
- AFFORDABLE HOUSING PAD
- PARCEL BOUNDARY LINE
- IMPERVIOUS AREA
- NEW DRAINAGE CULVERT
- NEW BIORETENTION FACILITY (BF)



BIORETENTION FACILITIES SIZING

BIORETENTION FACILITY (BF)	ROAD AREA (SF)	BUILDINGS	NUMBER OF BUILDINGS	BUILDING AREAS (SF)	TOTAL IMPERVIOUS AREA (SF)	REQUIRED BF MINIMUM SURFACE AREA (SF)
BF1	17,087	4, 5, 6, 7, 9	5	20,000	37,087	1,483
BF2	20,022	1, 2, 3, 8, 10	5	20,000	40,022	1,601
BF3	10,713	11, 12, 13, 14	4	16,000	26,713	1,069
BF4	10,600	21	1	4,000	14,600	584
BF5	25,529	15, 16, 17, 18	4	16,000	41,529	1,661
BF6	7,683	22, 23	2	8,000	15,683	627
BF7	22,097	19, 20, 24, 25	4	16,000	38,097	1,524
BF8	7,755	28, 29, 30, 31	4	16,000	23,755	950
BF9	23,562	26, 27, 32, 33	4	16,000	39,562	1,582
BF10	12,097	34, 35, 36	3	12,000	24,097	964
BF11	7,337	37	1	4,000	11,337	453
TOTAL	164,482		37	148,000	312,482	12,499

DESIGNED:	GT. / XZ.	No.	DATE	REVISION	BY	APPR
DRAFTED:	GT.					
CHECKED:	XZ.					

STETSON ENGINEERS INC.
 2171 E. Francisco Blvd., Suite K
 San Rafael, CA. 94901
 (415) 457-0701

THIS BAR IS 1-INCH LONG AT FULL SCALE

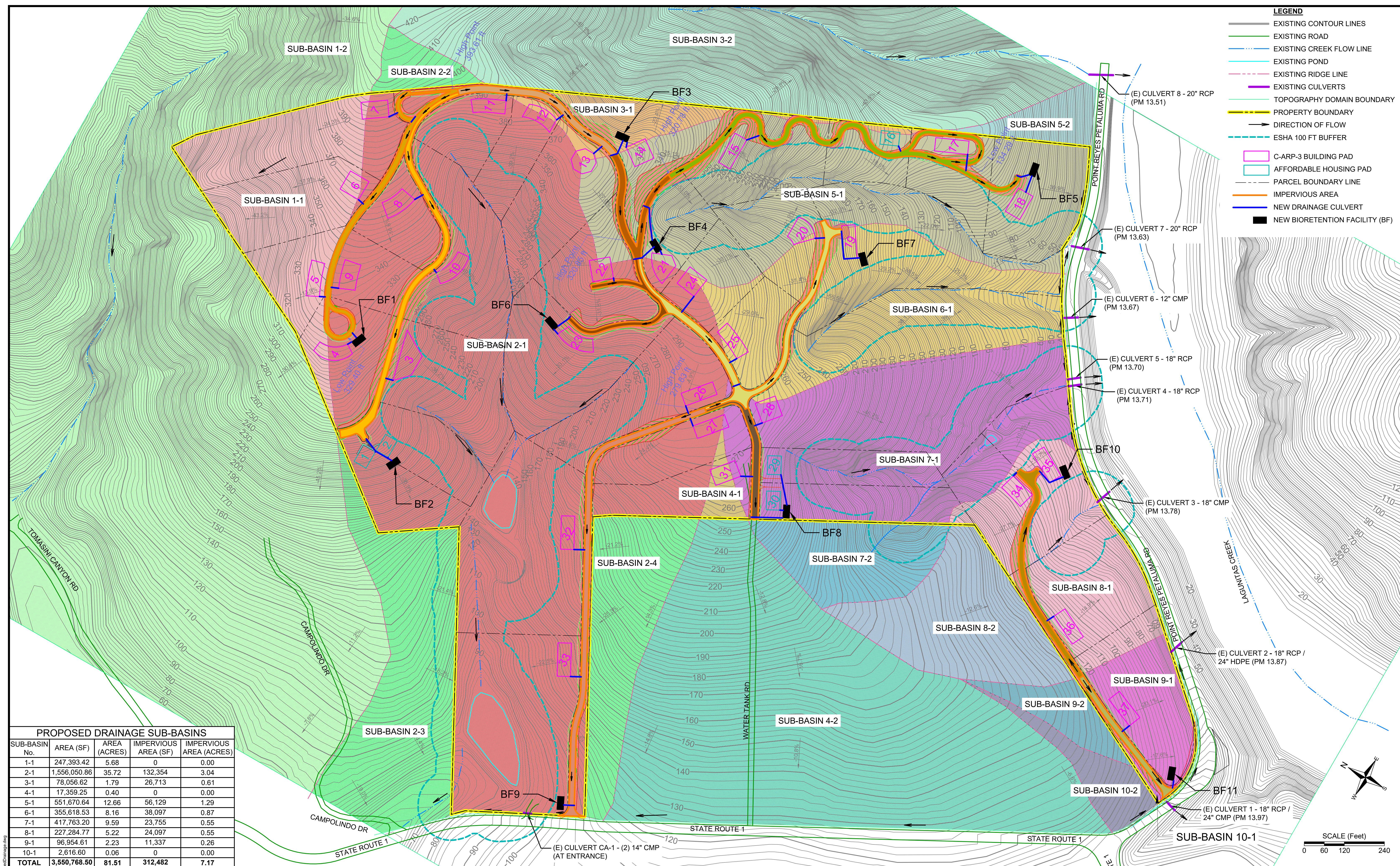
DRAFT

CUI FAMILY LAND SUBDIVISION
 OWNER: YAN CUI
 ADDRESS: _____

PROPOSED DRAINAGE FACILITIES

DATE: SEPTEMBER 25, 2024
 SCALE: AS INDICATED
 PROJECT No.: 2904

Figure 10



- LEGEND**
- EXISTING CONTOUR LINES
 - EXISTING ROAD
 - EXISTING CREEK FLOW LINE
 - EXISTING POND
 - EXISTING RIDGE LINE
 - EXISTING CULVERTS
 - TOPOGRAPHY DOMAIN BOUNDARY
 - PROPERTY BOUNDARY
 - DIRECTION OF FLOW
 - ESHA 100 FT BUFFER
 - C-ARP-3 BUILDING PAD
 - AFFORDABLE HOUSING PAD
 - PARCEL BOUNDARY LINE
 - IMPERVIOUS AREA
 - NEW DRAINAGE CULVERT
 - NEW BIORETENTION FACILITY (BF)

PROPOSED DRAINAGE SUB-BASINS				
SUB-BASIN No.	AREA (SF)	AREA (ACRES)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (ACRES)
1-1	247,393.42	5.68	0	0.00
2-1	1,556,050.86	35.72	132,354	3.04
3-1	78,056.62	1.79	26,713	0.61
4-1	17,359.25	0.40	0	0.00
5-1	551,670.64	12.66	56,129	1.29
6-1	355,618.53	8.16	38,097	0.87
7-1	417,763.20	9.59	23,755	0.55
8-1	227,284.77	5.22	24,097	0.55
9-1	96,954.61	2.23	11,337	0.26
10-1	2,616.60	0.06	0	0.00
TOTAL	3,550,768.50	81.51	312,482	7.17

DESIGNED:	GT. / XZ.	No.	DATE	REVISION	BY	APPR
DRAFTED:	GT.					
CHECKED:	XZ.					

STETSON ENGINEERS INC.
 2171 E. Francisco Blvd., Suite K
 San Rafael, CA. 94901
 (415) 457-0701

THIS BAR IS 1-INCH LONG AT FULL SCALE

DRAFT

CUI FAMILY LAND SUBDIVISION
 OWNER: YAN CUI
 ADDRESS: _____

PROPOSED DRAINAGE SUB-BASINS MAP

DATE: SEPTEMBER 25, 2024
 SCALE: AS INDICATED
 PROJECT No.: 2904

Figure 11

APPENDIX A

Pollutant Sources/Source Control Checklist

Appendix A. Stormwater Pollutant Sources/Source Controls Checklist

How to use this worksheet (also see instructions on page 3-7 of the *BASMAA Post-Construction Manual*):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding Structural Source Control BMPs in your Stormwater Control Plan drawings.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable Structural Source Control BMPs and Operational Source Control BMPs in a table in your Stormwater Control Plan. Use the format shown in Table 3-1 on page 3-7 of the *BASMAA Post-Construction Manual*. Describe your specific BMPs in an accompanying narrative and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs.

IF THESE SOURCES WILL BE ON THE PROJECT SITE THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
<input type="checkbox"/> A. On-site storm drain inlets (unauthorized non-stormwater discharges and accidental spills or leaks)	<input type="checkbox"/> Locations of inlets.	<input type="checkbox"/> Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	<input type="checkbox"/> Maintain and periodically repaint or replace inlet markings. <input type="checkbox"/> Provide stormwater pollution prevention information to new site owners, lessees, or operators. <input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks <input type="checkbox"/> Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
<input type="checkbox"/> B. Interior floor drains and elevator shaft sump pumps	<input type="checkbox"/> Show drains and pump locations	<input type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	<input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.
<input checked="" type="checkbox"/> C. Interior parking garages	<input checked="" type="checkbox"/> Show drain locations	<input checked="" type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.	<input checked="" type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.

IF THESE SOURCES WILL BE ON THE PROJECT SITE THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
<input checked="" type="checkbox"/> D1. Need for future indoor & structural pest control		<input checked="" type="checkbox"/> Note building design features that discourage entry of pests.	<input checked="" type="checkbox"/> Provide Integrated Pest Management information to owners, lessees, and operators.
<input checked="" type="checkbox"/> D2. Landscape/ Outdoor Pesticide Use/Building and Grounds Maintenance	<input checked="" type="checkbox"/> Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. <input checked="" type="checkbox"/> Show self-retaining landscape areas, if any. <input checked="" type="checkbox"/> Show bioretention facilities. (See instructions in Chapter 4.)	<p>State that final landscape plans will accomplish all of the following.</p> <input checked="" type="checkbox"/> Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. <input checked="" type="checkbox"/> Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. <input checked="" type="checkbox"/> Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. <input checked="" type="checkbox"/> Consider using pest-resistant plants, especially adjacent to hardscape. <input checked="" type="checkbox"/> To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	<input checked="" type="checkbox"/> Maintain landscaping using minimum or no pesticides. <input checked="" type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks <input checked="" type="checkbox"/> Provide IPM information to new owners, lessees and operators.
<input type="checkbox"/> E. Pools, spas, ponds, decorative fountains, and other water features.	<input type="checkbox"/> Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	<input type="checkbox"/> If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	<input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks <input type="checkbox"/> The sanitary sewer operator must be notified and a clean out identified when pools are to be drained to the sanitary sewer.

IF THESE SOURCES WILL BE ON THE PROJECT SITE THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
<input type="checkbox"/> F. Food service	<input type="checkbox"/> For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. <input type="checkbox"/> On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	<input type="checkbox"/> Describe the location and features of the designated cleaning area. <input type="checkbox"/> Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	<input type="checkbox"/> State maintenance schedule for grease interceptor
G. Refuse areas	<input type="checkbox"/> Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. <input type="checkbox"/> If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. <input type="checkbox"/> Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	<input type="checkbox"/> State how site refuse will be handled and provide supporting detail to what is shown on plans. <input type="checkbox"/> State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	State how the following will be implemented: <ul style="list-style-type: none"> <input type="checkbox"/> Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks
<input type="checkbox"/> H. Industrial processes.	<input type="checkbox"/> Show process area.	<input type="checkbox"/> If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	<input type="checkbox"/> See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

IF THESE SOURCES WILL BE ON THE PROJECT SITE THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
<input type="checkbox"/> 1. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	<input type="checkbox"/> Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. <input type="checkbox"/> Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. <input type="checkbox"/> Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	<input type="checkbox"/> Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. <input type="checkbox"/> Where appropriate, reference documentation of compliance with the requirements of programs for: <ul style="list-style-type: none"> ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank 	<input type="checkbox"/> See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

IF THESE SOURCES WILL BE ON THE PROJECT SITE THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
<input type="checkbox"/> J. Vehicle and Equipment Cleaning	<input type="checkbox"/> Show on drawings as appropriate: <p>(1) Commercial/industrial facilities having vehicle/ equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.</p> <p>(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).</p> <p>(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.</p> <p>(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.</p>	<input type="checkbox"/> If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): <ul style="list-style-type: none"> <input type="checkbox"/> Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. <input type="checkbox"/> Car dealerships and similar may rinse cars with water only. <input type="checkbox"/> See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

IF THESE SOURCES WILL BE ON THE PROJECT SITE THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
<input type="checkbox"/> K. Vehicle/Equipment Repair and Maintenance	<input type="checkbox"/> Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. <input type="checkbox"/> Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. <input type="checkbox"/> Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	<input type="checkbox"/> State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. <input type="checkbox"/> State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. <input type="checkbox"/> State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	<p>In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:</p> <input type="checkbox"/> No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. <input type="checkbox"/> No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. <input type="checkbox"/> No person shall leave unattended parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.
<input type="checkbox"/> L. Fuel Dispensing Areas	<input type="checkbox"/> Fueling areas shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. <input type="checkbox"/> Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area ¹ .] The canopy [or cover] shall not drain onto the fueling area.		<input type="checkbox"/> The property owner shall dry sweep the fueling area routinely. <input type="checkbox"/> See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

IF THESE SOURCES WILL BE ON THE PROJECT SITE THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
<input type="checkbox"/> M. Loading Docks	<input type="checkbox"/> Show the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected in a tank for ultimate discharge to the sanitary sewer. <input type="checkbox"/> Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. <input type="checkbox"/> Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		<input type="checkbox"/> Move loaded and unloaded items indoors as soon as possible. <input type="checkbox"/> See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks
<input checked="" type="checkbox"/> N. Fire Sprinkler Test Water		<input checked="" type="checkbox"/> Provide a means to drain fire sprinkler test water to the sanitary sewer.	<input checked="" type="checkbox"/> See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

IF THESE SOURCES WILL BE ON THE PROJECT SITE THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
<ul style="list-style-type: none"> <input type="radio"/> Miscellaneous Drain or Wash Water or Other Sources <input type="checkbox"/> Boiler drain lines <input type="checkbox"/> Condensate drain lines <input type="checkbox"/> Rooftop equipment <input type="checkbox"/> Drainage sumps <input checked="" type="checkbox"/> Roofing, gutters, and trim. <input checked="" type="checkbox"/> Other sources 	<ul style="list-style-type: none"> <input type="checkbox"/> Show drain lines and drainage sumps 	<ul style="list-style-type: none"> <input type="checkbox"/> Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. <input type="checkbox"/> Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. <input type="checkbox"/> Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. <input type="checkbox"/> Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. <input checked="" type="checkbox"/> Include controls for other sources as specified by local reviewer. 	<p>If architectural copper is used, implement the following BMPs for management of rinsewater during installation:</p> <ul style="list-style-type: none"> <input type="checkbox"/> If possible, purchase copper materials that have been pre-patinated at the factory. <input type="checkbox"/> If patination is done on-site, prevent rinse water from entering storm drains by discharging to landscaping or by collecting in a tank and hauling off-site. <input type="checkbox"/> Consider coating the copper materials with an impervious coating that prevents further corrosion and runoff. <p>Implement the following BMPs during routine maintenance:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Prevent rinse water from entering storm drains by discharging to landscaping or by collecting in a tank and hauling off-site.
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> P. Plazas, sidewalks, and parking lots. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Show extent of permeable paving materials 		<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

APPENDIX B

Bioretention Construction Inspection Checklist

Appendix B. Bioretention Facility Construction Inspection Checklist

Layout (to be confirmed prior to beginning excavation)

- Square footage of the facility meets or exceeds minimum shown in Stormwater Control Plan
- Site grading and grade breaks are consistent with the boundaries of the tributary Drainage Management Area(s) (DMAs) shown in the Stormwater Control Plan
- Inlet elevation of the facility is low enough to receive drainage from the entire tributary DMA
- Locations and elevations of overland flow or piping, including roof leaders, from impervious areas to the facility have been laid out and any conflicts resolved
- Rim elevation of the facility is laid out to be level all the way around, or elevations are consistent with a detailed cross-section showing location and height of interior dams
- Locations for vaults, utility boxes, and light standards have been identified so that they will not conflict with the facility
- Facility is protected as needed from construction-phase runoff and sediment

Excavation (to be confirmed prior to backfilling or pipe installation)

- Excavation conducted with materials and techniques to minimize compaction of soils within the facility area
- Excavation is to accurate area and depth
- Slopes or side walls protect from sloughing of native soils into the facility
- Moisture barrier, if specified, has been added to protect adjacent pavement or structures.
- Native soils at bottom of excavation are ripped or loosened to promote infiltration

Overflow or Surface Connection to Storm Drainage

(to be confirmed prior to backfilling with any materials)

- Overflow is at specified elevation
- No knockouts or side inlets are in overflow riser
- Overflow location selected to minimize surface flow velocity (near, but offset from, inlet recommended)
- Grating excludes mulch and litter (beehive or atrium-style grates with ¼" openings recommended)
- Overflow is connected to storm drain via appropriately sized piping

Underground connection to storm drain/outlet orifice

(to be confirmed prior to backfilling with any materials)

- Perforated pipe underdrain (PVC SDR 35 or approved equivalent) is installed with holes facing down
- Perforated pipe is connected to storm drain at specified elevation (typ. bottom of soil elevation)
- Cleanouts are in accessible locations and connected via sweep bends

Drain Rock/Subdrain (to be confirmed prior to installation of soil mix)

- Rock is installed as specified, 12" min. depth. Class 2 permeable, Caltrans specification 68-2.02F(3) recommended
- Rock is smoothed to a consistent top elevation. Depth and top elevation are as shown in plans
- Slopes or side walls protect from sloughing of native soils into the facility
- No filter fabric is placed between the subdrain and soil mix layers

Soil Mix

- Soil mix is as specified.
- Mix installed in lifts not exceeding 12"
- Mix is not compacted during installation but may be thoroughly wetted to encourage consolidation
- Mix is smoothed to a consistent top elevation. Depth of mix (18" min.) and top elevation are as shown in plans, accounting for depth of mulch to follow and required reservoir depth

Irrigation

- Irrigation system is installed so it can be controlled separately from other landscaped areas. Smart irrigation controllers and drip emitters recommended and may be required by code or ordinance.
- Spray heads, if any, are positioned to avoid direct spray into outlet structures

Planting

- Plants are installed consistent with approved planting plan, consistent with site water allowance
- Any trees and large shrubs are staked securely
- No fertilizer is added; compost tea may be used
- No native soil or clayey material are imported into the facility with plantings
- 1"-2" mulch may be applied following planting; mulch selected to avoid floating
- Final elevation of soil mix maintained following planting
- Curb openings are free of obstructions

Final Engineering Inspection

- Drainage Management Area(s) are free of construction sediment; landscaped areas are stabilized
- Inlets are installed to provide smooth entry of runoff from adjoining pavement, have sufficient reveal (drop from the adjoining pavement to the top of the mulch or soil mix, and are not blocked)
- Inflows from roof leaders and pipes are connected and operable
- Temporary flow diversions are removed
- Rock or other energy dissipation at piped or surface inlets is adequate
- Overflow outlets are configured to allow the facility to flood and fill to near rim before overflow
- Plantings are healthy and becoming established
- Irrigation is operable
- Facility drains rapidly; no surface ponding is evident
- Any accumulated construction debris, trash, or sediment is removed from facility
- Permanent signage is installed and is visible to site users and maintenance personnel

APPENDIX C

Bioretention Facility Plant Matrix

Scientific name	Common name	Plant Categories	Light Preference			Size (feet)		Watering				Tolerances					High Performers		CA Native	Notes
			Sun	Part	Shade	Ht.	Width	L	M	H	Summer	Heat	Coast	Wind	Zone 1	Zone 2	Best for irrigated sites	Best for non-irrigated sites		
<i>Agrostis exarata</i>	Spike bentgrass	Grasses and Grass-like Plants	✓	✓		1	1.25		✓	✓	✓			✓	✓					Moist sand dunes ;adapts to shady woodlands from San Diego to Sonoma County
<i>Bouteloua gracilis</i>	blue grama	Grasses and Grass-like Plants	✓			1.5	1	✓						✓						Tolerates no summer water, good for non-irrigated remote sites. AKA= Mosquito Grass
<i>Bromus carinatus</i>	California brome	Grasses and Grass-like Plants	✓			2	1	✓			ok			✓				✓		Good for erosion control ; not a good meadow grass
<i>Carex barbarea</i>	Santa Barbara sedge	Grasses and Grass-like Plants	✓	✓		3	2	✓	✓		✓	✓	✓	✓	✓	✓		✓		Stays green w/ summer H2O, moist to drought tolerant, spreading large statured sedge
<i>Carex divulsa</i>	grassland sedge	Grasses and Grass-like Plants	✓	✓	✓	1	1		✓		ok			✓	✓	✓				Widely sold in CA as Carex tumulicola (Berkeley sedge). Native to Eurasia. Full sun along coast. Tolerates drought once established. Needs regular water in sun.
<i>Carex nudata</i>	California black sedge	Grasses and Grass-like Plants	✓	✓		2	2	✓	✓		✓	✓		✓	✓			✓		Turns orange in frost, showy black flower spikes
<i>Carex obnupta</i>	slough sedge	Grasses and Grass-like Plants	✓	✓		2	1		✓	✓	✓			✓	✓			✓		Some salt tolerance, drought tolerant once established. Thick, graceful, bright green stands in wetlands.
<i>Carex pansa</i>	dune sedge	Grasses and Grass-like Plants	✓	✓		2	2		✓		✓	✓	✓	✓	✓	✓		✓		Native to Asilomar; Plug not seed planting; mow end of summer if desired.
<i>Carex praegracilis</i>	clustered field sedge	Grasses and Grass-like Plants	✓	✓		1.5	1.5		✓	✓	✓	✓	✓	✓	✓			✓		Lawn alternative, tolerates some foot traffic; summer dormant in warmer areas
<i>Chondropetalum tectorum</i>	small cape rush	Grasses and Grass-like Plants	✓	✓		4	3			✓	✓	✓		✓	✓					Native to S. Africa, drought tolerant
<i>Danthonia californica</i>	California oat grass	Grasses and Grass-like Plants	✓	✓		1.5	1.5		✓		✓			✓	✓			✓		Bunch grass, recommend plugs not seed to start, tolerates some foot traffic
<i>Distichlis spicata</i>	salt grass	Grasses and Grass-like Plants	✓			0.3	3		✓	✓	✓	✓	✓	✓	✓			✓		Looks like bermuda grass, withstands foot traffic, for soils with high salt
<i>Festuca californica</i>	California fescue	Grasses and Grass-like Plants	✓	✓	✓	2	2				ok	✓	✓	✓				✓		Use only in driest areas of basin
<i>Festuca idahoensis</i>	Idaho fescue	Grasses and Grass-like Plants	✓	✓		1	1	✓	✓		ok	✓	✓	✓				✓		Can mow. Needs light summer water at hot sites
<i>Festuca rubra</i>	red fescue	Grasses and Grass-like Plants	✓	✓		1	1.5		✓	✓	ok	✓	✓	✓				✓		Can mow. Lawn alternative; Water conservation LDS; Bio Strips; Infiltration basins
<i>Festuca rubra 'molate'</i>	molate fescue	Grasses and Grass-like Plants	✓	✓		1	1.5		✓	✓	ok	✓	✓	✓				✓		Can mow. Lawn alternative
<i>Juncus effusus</i>	common rush	Grasses and Grass-like Plants	✓	✓		2.5	2.5		✓		ok		✓	✓	✓	✓		✓		Forms dense clumps
<i>Juncus pallidus</i>	giant rush	Grasses and Grass-like Plants	✓			4	2	✓			ok	✓	✓	✓	✓	✓				Evergreen, heat and drought tolerant.
<i>Juncus patens</i>	blue rush	Grasses and Grass-like Plants	✓			2	1		✓	✓	✓	✓		✓	✓	✓		✓		Plant from plugs; Irrigate occasionally summer
<i>Leymus triticoides</i>	creeping wildrye	Grasses and Grass-like Plants	✓	✓		3	1	✓	✓		ok	✓	✓	✓	✓			✓		Can mow 4 x yr.. Sub-surface H2O best. Can be aggressive in moist areas.
<i>Muhlenbergia rigens</i>	deergrass	Grasses and Grass-like Plants	✓			3	3	✓	✓		ok	✓			✓			✓		Evergreen, forms mounds.
<i>Sisyrinchium bellum</i>	blue eyed grass	Grasses and Grass-like Plants	✓	✓		1	1		✓		ok		✓		✓	✓		✓		Needs occasional summer water, tolerates some foot traffic
<i>Achillea millefolium</i>	common yarrow	Herbaceous Perennials and Groundcovers	✓			1.5	1	✓			ok	✓			✓	✓		✓		Good for hot sites. Tolerates mowing, and can be used in a lawn replacement mix.
<i>Artemisia douglasiana</i>	mugwort	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	3	✓	✓		ok	✓	✓	✓	✓	✓		✓		Rhizomatous
<i>Artemisia ludoviciana</i>	white sagebrush	Herbaceous Perennials and Groundcovers	✓	✓	✓	1.5	2	✓	✓		✓	✓	✓	✓	✓	✓		✓		Aromatic. Tolerates foot traffic and wide range of conditions
<i>Asclepias fascicularis</i>	narrowleaf milkweed	Herbaceous Perennials and Groundcovers	✓			3	2	✓	✓		ok	✓	✓		✓	✓		✓		Monarch butterfly host plant, deciduous
<i>Darmera peltata</i>	Indian rhubarb	Herbaceous Perennials and Groundcovers		✓	✓	3	5			✓	✓				✓			✓		Prefers cool summers. Native to N CA, S OR; found on stream banks and in woodlands.
<i>Epilobium canum</i>	California fuchsia	Herbaceous Perennials and Groundcovers	✓	✓		1	4	✓			ok	✓			✓			✓		dormant in winter, best with winter mowing
<i>Epipactis gigantea</i>	stream orchid	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	1.5		✓	✓			✓	✓				✓		Goes dormant with drought, salt tolerant
<i>Fragaria chiloensis</i>	beach strawberry	Herbaceous Perennials and Groundcovers	✓	✓	✓	0.3	2	✓	✓		ok		✓	✓				✓		Evergreen groundcover, performs well as filler at the upper edges of facility.
<i>Heuchera micrantha</i>	alum root	Herbaceous Perennials and Groundcovers		✓	✓	2	1.5	✓	✓		✓			✓	✓			✓		Dainty white flowers
<i>Heuchera pilosissima</i>	hairy alum root	Herbaceous Perennials and Groundcovers		✓	✓	1.5	1.5	✓	✓		✓		✓		✓			✓		Tolerates sand, best at basin edges
<i>Iris douglasiana</i>	Douglas iris	Herbaceous Perennials and Groundcovers	✓	✓		1.5	2	✓	✓		ok	✓	✓	✓		✓		✓		Also, Iris hybrids
<i>Lilium pardalinum</i>	leopard lily	Herbaceous Perennials and Groundcovers	✓	✓		6	4	✓	✓				✓	✓				✓		Native to dry summer areas, deciduous
<i>Lobelia cardinalis</i>	cardinal flower	Herbaceous Perennials and Groundcovers		✓	✓	2	2		✓				✓	✓				✓		Not drought tolerant, requires regular water
<i>Lotus scoparius</i>	deerweed	Herbaceous Perennials and Groundcovers	✓			4	3	✓				✓		✓				✓		Short-lived, nitrogen fixer
<i>Mimulus aurantiacus</i>	common monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓		3	3	✓			ok	✓			✓			✓		Drought tolerant, stress deciduous
<i>Mimulus cardinalis</i>	scarlet monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	3		✓	✓	✓	✓			✓			✓		Aggressive seeder, needs summer water
<i>Mimulus guttatus</i>	seep monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓		3	3		✓	✓	✓	✓			✓			✓		Attracts Bees, stress deciduous, needs summer water
<i>Mirabilis multiflora</i>	Giant four o'clock	Herbaceous Perennials and Groundcovers		✓	✓	2	4	✓			✓	✓			✓			✓		Best for hot sites, native to Southern California
<i>Oenothera hookeri</i>	Hooker's evening primrose	Herbaceous Perennials and Groundcovers	✓	✓		3	2	✓			ok	✓			✓	✓		✓		Easy to establish biennial, self seeds
<i>Polypodium californicum</i>	California Polypody fern	Herbaceous Perennials and Groundcovers		✓	✓	2	2	✓			✓		✓					✓		Summer dormant except at coast, spreads slowly by rhizomes, frost tender
<i>Prunella vulgaris</i>	self heal	Herbaceous Perennials and Groundcovers	✓	✓		0.5	2'	✓	✓		ok		✓		✓			✓		Somewhat drought tolerant, long flowering
<i>Rudebeckia californica</i>	California coneflower	Herbaceous Perennials and Groundcovers	✓			3	2	✓	✓		ok	✓			✓	✓		✓		Native to dry summer areas, deciduous
<i>Scaevola 'mauve clusters'</i>	fan flower	Herbaceous Perennials and Groundcovers	✓	✓		1	4	✓				✓			✓			✓		Native to Australia, sensitive to frost
<i>Scutellaria austinae</i>	skullcap	Herbaceous Perennials and Groundcovers	✓			1	2	✓	✓		✓	✓			✓			✓		Dies back in drought
<i>Sisyrinchium californicum</i>	yellow eyed grass	Herbaceous Perennials and Groundcovers	✓	✓		1	1		✓		✓		✓	✓				✓		Can be drought tolerant
<i>Verbena lasiostachys</i>	Western vervain	Herbaceous Perennials and Groundcovers	✓	✓		2	2	✓			ok	✓			✓	✓		✓		Attracts butterflies, can be weedy pioneer species
<i>Verbena lilacina</i>	Cedros Island verbena	Herbaceous Perennials and Groundcovers	✓	✓		2	4	✓			ok	✓	✓		✓			✓		Drought tolerant, best with minimal irrigation, native to Baja CA
<i>Alyogyne huegelii</i>	blue hibiscus	Shrubs	✓			8	7	✓				✓			✓			✓		Very low water after second year, Sunset zones 15-17 & 20-24, prune to encourage flowering
<i>Baccharis pilularis consanguinea</i>	bush baccharis	Shrubs	✓			6	6	✓	✓		ok	✓	✓	✓	✓	✓		✓		Fast-growing, somewhat short-lived; deer proof
<i>Calycanthus occidentalis</i>	western spicebush	Shrubs	✓	✓		8	8	✓			✓		✓		✓			✓		Deer resistant, deciduous. Bright green leaves, good for hedgerow/screen. Riparian areas.
<i>Carpenteria californica</i>	bush anemone	Shrubs	✓	✓		6	4	✓	✓		ü	✓			✓			ü		Interior climate with occasional water otherwise low water needs
<i>Cornus sericera</i>	redtwig dogwood	Shrubs	✓	✓		5	4	✓			✓	✓			✓			✓		Deciduous, red stems for winter color, best with afternoon shade. Can cut to ground to maintain small size and red stems.
<i>Erigeron glaucus</i>	seaside daisy	Shrubs	✓			1	1.5				ok		✓	✓				✓		Not good for dusty sites
<i>Lonicera hispidula</i>	California honeysuckle	Shrubs	✓	✓	✓	4	2		✓	✓	✓				✓			✓		Climbing vine-like. Best in part shade. Attracts birds
<i>Lonicera involucrata</i>	twinberry honeysuckle	Shrubs	✓	✓	✓	6	3		✓	✓	✓				✓			✓		Needs good drainage, Best in part shade. Attracts birds
<i>Mahonia pinnata</i>	California holly grape	Shrubs	✓	✓	✓	4	4	✓	✓		✓		✓	✓				✓		Slow but easy to grow
<i>Physocarpus capitatus</i>	pacific ninebark	Shrubs	✓	✓		8	8	✓	✓	✓	✓	✓			✓			✓		Part shade and summer water required in hot locations

Scientific name	Common name	Plant Categories	Light Preference			Size (feet)		Watering				Tolerances					High Performers		CA Native	Notes
			Sun	Part	Shade	Ht.	Width	L	M	H	Summer	Heat	Coast	Wind	Zone 1	Zone 2	Best for irrigated sites	Best for non-irrigated sites		
<i>Rhamnus californica</i>	California coffeeberry	Shrubs	✓	✓		12	8	✓			✓	✓		✓		✓	✓	✓	✓	'Eve Case' is compact with broad foliage. Syn. <i>Frangula californica</i>
<i>Rhamnus crocea</i>	redberry	Shrubs	✓	✓	✓	5	5	✓			✓	✓	✓		✓				✓	Pea sized fruits attract birds, stain concrete
<i>Rhododendron occidentale</i>	western azalea	Shrubs	✓	✓	✓	8	8		✓	✓	✓			✓	✓				✓	Summer deciduous
<i>Ribes aureum gracillimum</i>	golden current	Shrubs	✓	✓		4	3	✓	✓	✓	ok	✓		✓		✓			✓	Easy, fall color, deciduous
<i>Ribes divericatum</i>	coast black gooseberry	Shrubs		✓	✓	5	5	✓	✓		ok		✓		✓				✓	Thorny, good for discouraging entry, deciduous
<i>Ribes sanguineum</i>	red flowering currant	Shrubs		✓	✓	5	5	✓	✓		✓	✓		✓	✓	✓			✓	Needs good air movement to avoid white fly, more drought tolerant at coast
<i>Ribes speciosum</i>	fuchsia-flowered gooseberry	Shrubs	✓	✓	✓	4	4	✓	✓			✓	✓		✓				✓	Prefers only light summer water after 2nd year, stress deciduous
<i>Rosa californica</i>	California wild rose	Shrubs	✓	✓		3	6		✓	✓	ok	✓	✓	✓	✓	✓			✓	Hooked thorns, good for discouraging entry. Shade in interior, sun at coast
<i>Rosa gymnocarpa</i>	wood rose	Shrubs	✓	✓	✓	2	3		✓		ok	✓	✓		✓	✓			✓	Easy to grow, thorny
<i>Rubus parviflorus</i>	thimbleberry	Shrubs	✓	✓		8	5			✓	✓			✓	✓				✓	Spreads readily in wet areas, prefers regular water
<i>Rubus spectabilis</i>	salmonberry	Shrubs		✓	✓	8	5		✓	✓	✓		✓	✓	✓				✓	deciduous, soft spiny stems
<i>Rubus ursinus</i>	California blackberry	Shrubs		✓	✓	3	5		✓	✓	ok	✓	✓	✓	✓				✓	Thorny, good for discouraging entry. Harbors beneficial insects
<i>Symphoricarpos albus</i>	common snowberry	Shrubs	✓	✓	✓	4	4	✓	✓	✓	ok	✓			✓	✓			✓	Adaptable to many conditions, try <i>Symphoricarpos mollis</i> at coast
<i>Whipplea modesta</i>	whipplevine	Shrubs		✓	✓	0.5	3		✓	✓	✓				✓				✓	Best for moist shady spots near coast
<i>Acer circinatum</i>	vine maple	Small Trees		✓	✓	20	10		✓	✓	✓				✓				✓	In wide riparian areas; top of slope. Avoid hot inland climates and coastal conditions/salt spray.
<i>Baccharis viminea</i>	seep-willow	Small Trees	✓			8	5	✓	✓	✓	✓	✓	✓	✓	✓				✓	Important plant for butterflies and beneficial insects.
<i>Chilopsis linearis</i>	desert-willow	Small Trees	✓			15	15		✓		✓	✓		✓	✓	✓			✓	Does best inland
<i>Corylus cornuta v. californica</i>	California hazel	Small Trees		✓	✓	10	10		✓					✓	✓				✓	Deciduous, edible nut
<i>Fraxinus dipetala</i>	California ash	Small Trees	✓	✓		20	20				ok	✓		✓	✓	✓			✓	drought tolerant, slow to establish, then fast
<i>Garrya elliptica</i>	coast silktassel	Small Trees	✓	✓		12	12	✓	✓		ok	✓	✓	✓	✓	✓			✓	Winter blooms. 'Evie' is compact variety. Best at coast. Afternoon shade inland, deer resistant
<i>Heteromeles arbutifolia</i>	toyon	Small Trees	✓	✓	✓	8	5	✓	✓		✓	✓	✓		✓				✓	Doesn't respond well to pruning low branches, no summer water at coast
<i>Laurus nobilis 'Saratoga'</i>	Grecian bay	Small Trees	✓	✓		20	20	✓				✓		✓	✓				✓	Specify 'standard' and prune for tree form, easy
<i>Myrica californica</i>	Pacific wax myrtle	Small Trees	✓	✓	✓	25	12	✓	✓					✓	✓				✓	Best at coast
<i>Sambucus mexicana</i>	elderberry	Small Trees	✓	✓		20	15	✓	✓					✓	✓	✓			✓	Deciduous, edible fruit, attracts bees and birds, unripe fruits are poisonous but useful and common landscape plant
<i>Acer negundo</i>	box elder	Trees	✓	✓	✓	35	35	✓	✓		ok	✓	✓	✓	✓	✓			✓	Tough shade tree, deciduous
<i>Fraxinus latifolia</i>	Oregon ash	Trees	✓	✓	✓	70	40			✓	✓	✓		✓	✓				✓	Plant in moist areas with rich soil.
<i>Fraxinus velutina</i>	velvet ash	Trees	✓			30	45	✓	✓		ok	✓		✓	✓	✓			✓	Withstands poor drainage and drought
<i>Pittosporum eugenioides</i>	tarata	Trees	✓	✓		40	15	✓	✓		✓	✓		✓	✓				✓	Shear to control height
<i>Platanus acerifolia</i>	London plane tree	Trees	✓	✓		80	30		✓		✓	✓		✓	✓				✓	Large tree, aggressive roots will lift pavement
<i>Platanus racemosa</i>	California sycamore	Trees	✓	✓		80	30		✓	✓	ok	✓		✓	✓				✓	Asymmetrical shape and wide trunk when mature. Give lots of room.
<i>Populus fremontii</i>	cottonwood	Trees	✓	✓		80	30		✓			✓		✓	✓				✓	Riparian species with limited drought tolerance. Aggressive roots will lift pavement. Give lots of room.
<i>Quercus agrifolia</i>	coast live oak	Trees	✓	✓		60	60	✓				✓	✓	✓	✓				✓	Large evergreen tree, tolerant and widespread, important for wildlife, no summer water
<i>Vitis californica</i>	California grape	Vine	✓	✓		10	1-3	✓	✓		✓	✓	✓	✓	✓				✓	Climbing vine. Best in full sun. Can be aggressive in moist area.

Plant Categories	
Grasses and Grass-like Plants	Grass refer to those species that are monocotyledonous plants with slender-leaved herbage.
Herbaceous Perennials and Groundcovers	Herbaceous refers to those species with soft upper growth rather than woody growth. Some species will die back to the roots at the end of the growing season and grow again at the start of the next season. This list only includes those that are perennial, i.e. live for several years.
Shrubs	Shrub is a horticultural distinction that refers to those species of woody plants which are distinguished from trees by their multiple stems and lower height. A large number of plants can be either shrubs or trees, depending on the growing conditions they experience.
Small Tree	Small trees refers to those species of woody plants with one main trunk and a distinct and elevated head with a maximum size of 25' tall and wide.
Tree	Tree refers to those species of woody plants with one main trunk and a rather distinct and elevated head with a size greater than 25' tall or wide.
Water Preference	
Water Preference-Low/Moderate/High	We have provided recommendations for irrigation. All plants should be watered with more frequency during the first two years after planting. After this establishment period, Low water use plants will only need supplemental irrigation at the hottest and driest sites. Plants with Moderate irrigation needs will be best with occasional supplemental water (once per week to once per month) and plants with High irrigation needs will be best with more frequent watering especially during periods of drought in the cooler seasons.
Water Preference-Summer Irrigation	Plants with a check in this column will not withstand a long period of summer drought without irrigation. Plants with an 'ok' in this column are tolerant of, but do not require, frequent summer irrigation. Plants with nothing in this column may not tolerate summer irrigation after establishment.
Stress Tolerance	
Tolerates Heat	A check in the heat column indicates that the plant will tolerate hot sites. It should not be confused with a plants preference for sun. Absence of the check indicates it should only be used in areas close to the Bay or other cool sites.
Tolerates Coast	The coast column indicates plants that perform well within 1,000 feet of the ocean or bay. Most of these plants tolerate some amount of salt air, fog, and wind.
Tolerates Wind	A check in the wind column means that the plant will tolerate winds of ten miles per hour or more.
Zone 1	Plants that tolerate Zone 1 are common riparian, wetland and bog plants capable of surviving in saturated soils for long durations throughout the year. Most of these plants are not drought tolerant and require some water throughout the growing season.
Zone 2	Plants that tolerate Zone 2 are common in riparian/upland transition areas, moist woodlands, and seasonal wetlands. They are capable of surviving in saturated soils for shorter durations especially in the winter or spring. Many of these plants tolerate summer drought but could benefit from some year-round moisture.
High Performers	
Best for irrigated sites	These plants have been used successfully in irrigated bioretention areas in the Bay Area.
Best for non-irrigated sites	These plants have been used successfully in non-irrigated bioretention areas in the Bay Area. Temporary irrigation for establishment is highly recommended.
Origin	
CA Native	Indicates native or cultivar of California native. Cultivars offer habitat benefits to native wildlife and are adapted to the local climate but have reduced genetic diversity.