



Memo: ARPA Green Stormwater Infrastructure

Site Selection Methodology and Top Sites Summary

Introduction

This memo provides information on the methodology utilized to identify and prioritize sites for the green stormwater infrastructure (GSI) pilot project funded through the American Rescue Plan Act (ARPA). In addition to managing stormwater runoff and improving water quality, the pilot project aims to provide multiple co-benefits, including testing new technologies, providing educational opportunities, and improving cross-sector collaboration.

To identify locations for a pilot project, we developed a robust set of criteria based on quantitative information from Geographic Information System (GIS) datasets and qualitative information collected through site visits and research. The prioritization criteria allowed us to identify census tracts where GSI pilot projects could meaningfully address stormwater runoff by improving water quality and reducing runoff volumes. This memo describes how we used these criteria to identify sites, the top six sites identified and visited, and a list of the thirty sites we evaluated.

Throughout this process, our team engaged with several organizations and professionals with expertise in green stormwater infrastructure to seek input and consensus on our methods, to identify potential sites, and gauge organizational interest and capacity. Stakeholders included:

- San Diego Green Infrastructure Consortium, with member expertise in the fields of Landscape Architecture, Natural Resources, Academic, Business Management, and Data Science
- Greenprint Partners
- Landscape Architecture and Civil Engineering Professionals
- Potential Site Operation Managers/Directors from The Water Conservation Garden; Lakeside River Park Conservancy; San Diego Youth Services; San Diego County YMCA
- Broadview Collaborative
- Corvias Infrastructure Solutions
- Brookings Institution

The feedback and input received from these stakeholders was invaluable in refining the methods and recommendations for site selection described in this memo.



Acronyms

AoI – Area of Interest
APN – Assessor’s Parcel Number
DAC – Disadvantaged Community
DOE – Department of Energy
FEMA – Federal Emergency Management Agency
GIS – Geographic Information Systems
GSI – Green Stormwater Infrastructure
NLCD – National Land Coverage Database
SANDAG – San Diego Association of Governments

Definitions

Definitions adapted from the County of San Diego’s Green Streets Clean Water Plan and FEMA Flood Zone definitions.

100-year flood zone – According to FEMA, these areas are designated as Special Flood Hazard Areas on the Flood Insurance Rate Maps and indicate that the area will be inundated by the flood event, having a 1-percent chance of being equaled or exceeded in any given year. The 100-year flood zone is also referred to as the base flood zone or 1-percent annual chance flood.¹

500-year flood zone – According to FEMA, these areas are designated as a moderate flood hazard area and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood.²

Disadvantaged Communities (DAC) - Refers to the areas that most suffer from a combination of economic, health, and environmental burdens. These burdens include poverty, high unemployment, air and water pollution, the presence of hazardous wastes, and high incidence of asthma and heart disease.

Flood Risk – The likelihood of flood multiplied by the value of the assets at risk of flooding.

¹ <https://www.fema.gov/glossary/flood-zones>

² <https://www.fema.gov/glossary/flood-zones>



Geographic Information System (GIS) – A system that integrates data creation, management, and analysis with the location of that data on maps.

Green Stormwater Infrastructure (GSI)– An approach to stormwater and flood management that protects, restores and mimics the natural water cycle using vegetation, mulch, soils, and natural processes while creating healthier environments.

Green Street – A natural system approach to reduce stormwater flow, improve water quality, reduce urban heating, enhance pedestrian safety, reduce carbon footprints, and beautify neighborhoods. Green Streets integrate Green Infrastructure strategies into roads and rights-of-way.

Infiltration – The percolation of water into the ground.

Justice40 – A White House directive that requires 40% of the overall benefits of certain Federal investments – including investments in clean energy and energy efficiency; clean transit; affordable and sustainable housing; training and workforce development; the remediation and reduction of legacy pollution; and the development of clean water infrastructure – to flow to disadvantaged communities (DACs).

Median Household Income –The income amount which divides a group evenly, with half having higher incomes and half having lower incomes. In 2021, the median household income in the United States was \$70,784 and the median household income in San Diego County was \$84,457. Because the median measures the middle value instead of the mean, which measures an average of all values, median household income can vary more widely depending on the size of the group.

Priority Land Uses – Are defined by the State Water Board as the types of land uses or locations where control of trash discharges are required to address water quality concerns. “Priority Land Uses” (PLUs) include industrial, commercial, high-density residential (10 or more dwelling units/acre), mixed urban; and public transportation stations, including bus stations and stops.

Surface Permeability – A measure of the ability of a surface (for example, a concrete sidewalk or an asphalt parking lot) to absorb water. Impermeable surfaces do not allow water to pass through them to the earth below, causing the water to accumulate and runoff.

Site Selection Methodology

This section of the report includes detailed site selection methodology, and the steps taken to determine prioritization criteria and to rank census tracts. This six-step process included local, state, federal, and proprietary datasets, as well as other proprietary information.

Step 1) Data collection

PIC collected data across San Diego County that would be used in analysis and site selection.³ The following indicators were included:

- 100-year and 500-year flood plains – Federal Emergency Management Agency (FEMA)
- Watersheds – San Diego Association of Governments (SANDAG)
- Surface permeability – US Geological Survey: National Land Coverage Database (NLCD)
- Property and building location within flood plain – First Street Data⁴
- Median household income – US Census Bureau
- Disadvantaged community – Department of Energy (DOE): Justice40⁵
- Flood risk for buildings – Department of Energy (DOE): Justice40

Step 2) Identification of waterways that are most prone to flooding.

PIC accessed and analyzed data published by FEMA. It visually represented one-in-100-year flood plains and one-in-500-year flood plains (Figure 1, Map B). Flood plain data helped identify areas of critical need.

Step 3) Identification of watersheds where flood plains are prevalent.

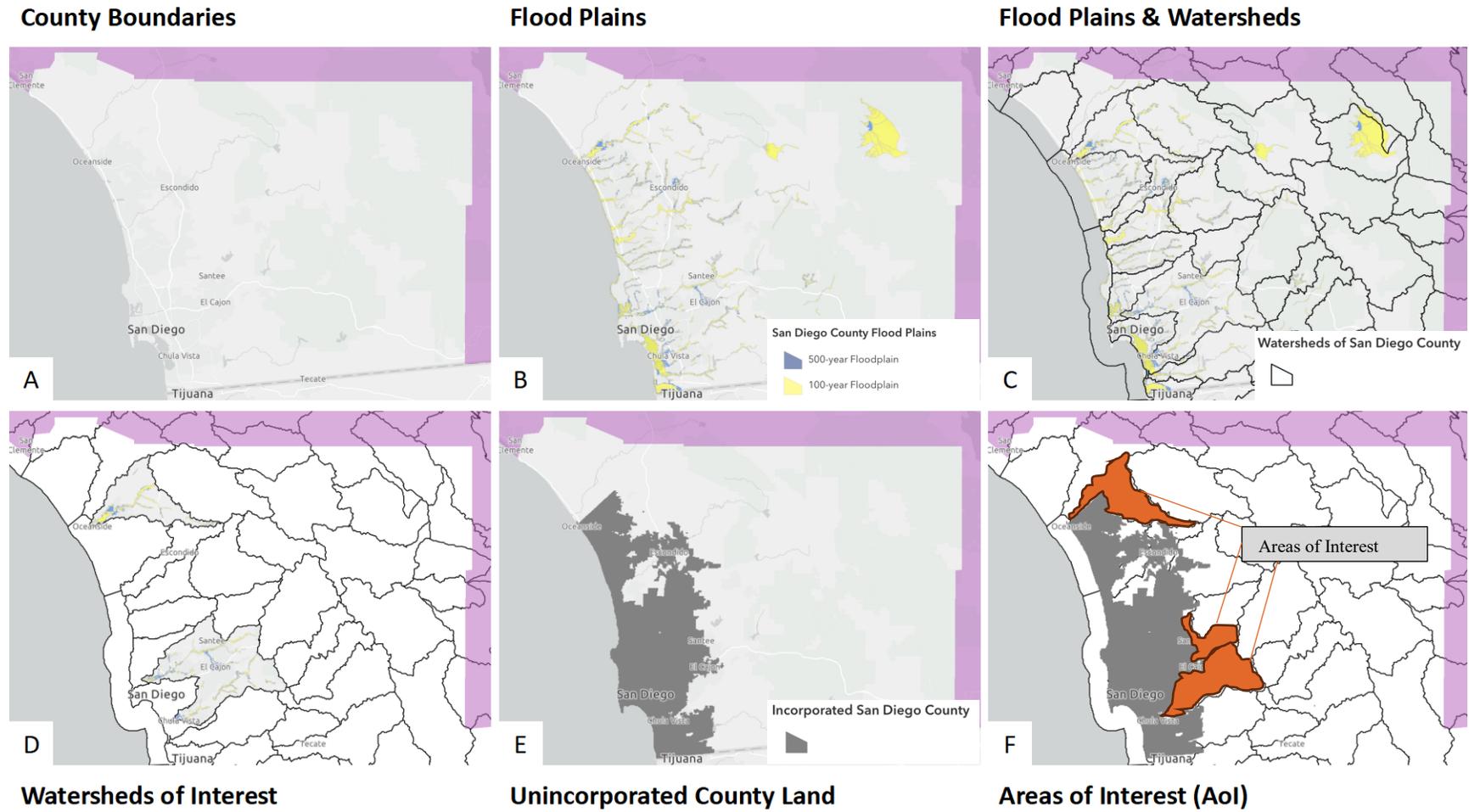
Since runoff from across the watershed contributes to flooding and water quality around the waterways themselves, PIC expanded its analysis to watersheds, including areas and buildings outside of flood plains, in its census tract prioritization effort using data from SANDAG. After identifying the watersheds that were most prone to flooding but still densely populated (Figure 1, Map C and D), we then filtered out areas that were not within unincorporated areas of the county (Figure 1, Map E). Those waterways that were outside of 1) unincorporated areas, 2) non-urban, and/or 3) did not flood were excluded. The watersheds that met the criteria in this analysis include the San Diego River, Sweetwater, and San Luis Rey watersheds, which are classified as the Areas of Interest (Aoi).

³ It should be noted that while those variables that factored most into the site selection methodology are listed above, more than twenty total variables were analyzed. A full list of variables that were analyzed is available in the appendix.

⁴ First Street Data combines data sets to show property-specific data on flood, fire, and other climate risks. The First Street Foundation Flood Model (FSF-FM) system is a framework of hazard layer development that assesses flood risks in the United States. <https://firststreet.org/data-access/paid-access/>

⁵ CalEnviroScreen 4.0 data (<https://oehha.ca.gov/calenviroscreen/sb535>) from California Senate Bill 535 was also assessed. Census tracts identified as disadvantaged communities were the same in both methodologies. As such, only one dataset was used for analysis. Justice40 was selected for use as it is a federal screening standard for project funding.

Figure 1: Identifying Area of Interest for Potential GSI Pilot



Step 4) Creation of criteria for prioritization

Once we collected data and identified AoI, PIC geospatially represented the following criteria across all census tracts:

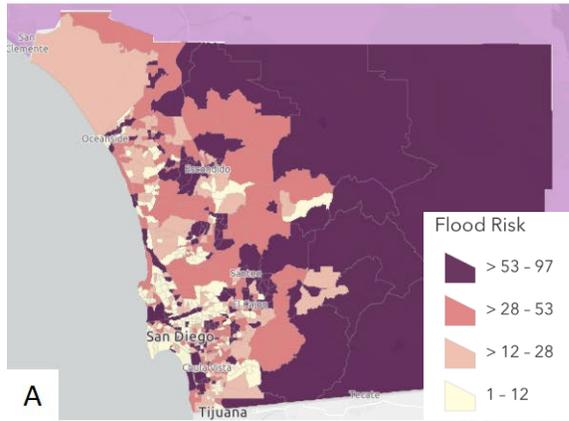
1. **Flood risk across the census tract, classified as the percentage of buildings at risk of flooding within 30 years** (an example shown in Figure 2, Map A–C).
2. **The presence of floodplains within the census tract.** This metric exposes those census tracts that are more likely to experience flooding.
3. **Percentage of surface within a census tract that is non-permeable** (an example shown in Figure 2, Map D–F). Areas with higher percentages of surfaces that cannot absorb stormwater (non-permeable surfaces) which can impact water quality and are more likely to include Priority Land Uses which may generate higher rates of trash and debris that impacts water quality.
4. **Median household income** (an example shown in Figure 3, Map A–C). This measures the household income for the median home across the income distribution within the census tract. It helps to display the difference between census tracts and the county at large.
5. **Considered a Justice40 census tract** (an example shown in Figure 3, Map D–F). A nationally recognized definition of disadvantaged community (DAC), Justice40 allows for improved comparison across census tracts and incorporates numerous socioeconomic factors.
6. **Adjacent to a Justice40 census tract** (an example shown in Figure 3, Map D–F). Spillover effects from census tracts that are adjacent to DAC census tracts may occur, allowing for increased return on investments.

The Lower San Luis Rey watershed had moderate to high flood risk to buildings, but very few non-permeable surfaces. The Lower Sweetwater and Lower San Diego River watersheds had moderate to high flood risk to buildings, but a greater percentage of non-permeable surfaces. As such, most of the census tracts that were identified as a priority utilizing this methodology are located within the Sweetwater watershed.

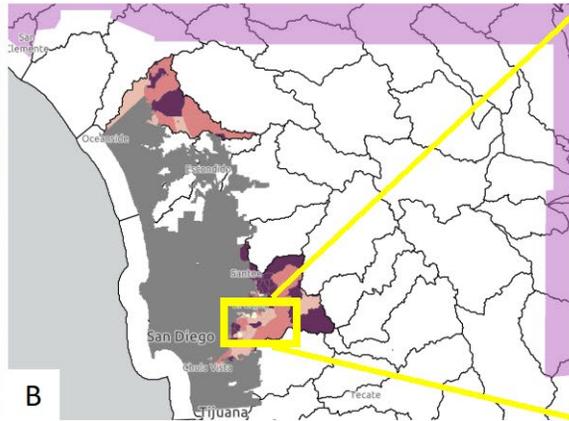
Based on this geospatial analysis, 30 census tracts of interest were identified in the unincorporated communities of Lakeside, Spring Valley, Rancho San Diego, La Presa, Jamul, Bonsall, and Valley Center, as well as unincorporated areas adjacent to the City of El Cajon. These areas of interest overlap with, but are more expansive than, the County of San Diego’s designated Environmental Justice communities (as shown in Figure 4). A few potential sites were identified in North El Cajon and Spring Valley, but these communities are primarily heavy industrial areas ill-suited for the type of GSI interventions proposed in this project. No potential sites were identified in Sweetwater, as the area is primarily residential, with the exception of some County facilities.

Figure 2: Identifying Census Tracts of Interest – Flood Risk

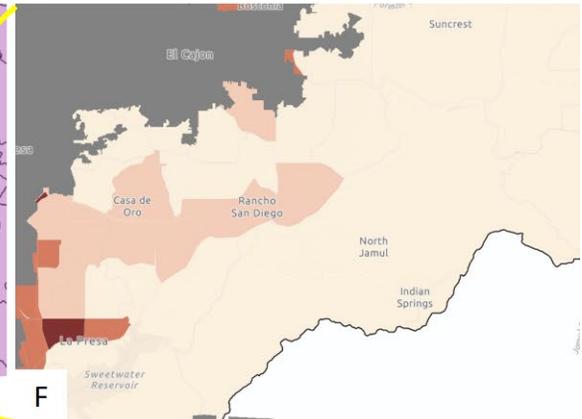
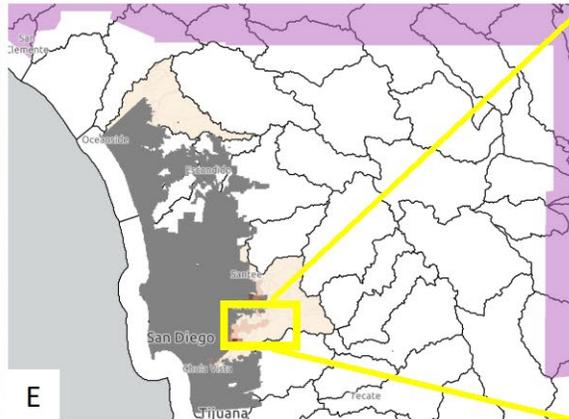
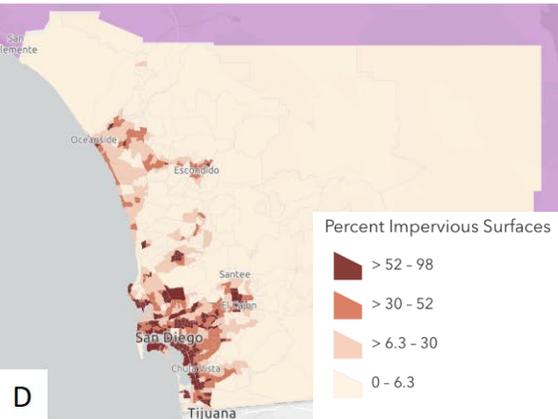
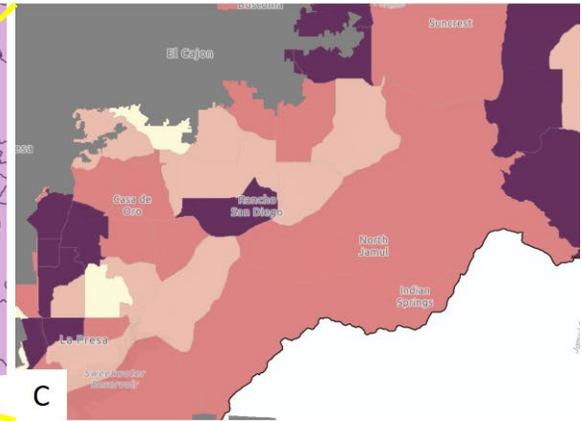
Flood Risk to Buildings



Flood Risk to Buildings – AoI



Flood Risk to Buildings – AoI



% Non-Permeable Surface

% Non-Permeable Surface – AoI

% Non-Permeable Surface – AoI

Figure 3: Identifying Census Tracts of Interest – Socioeconomic Factors

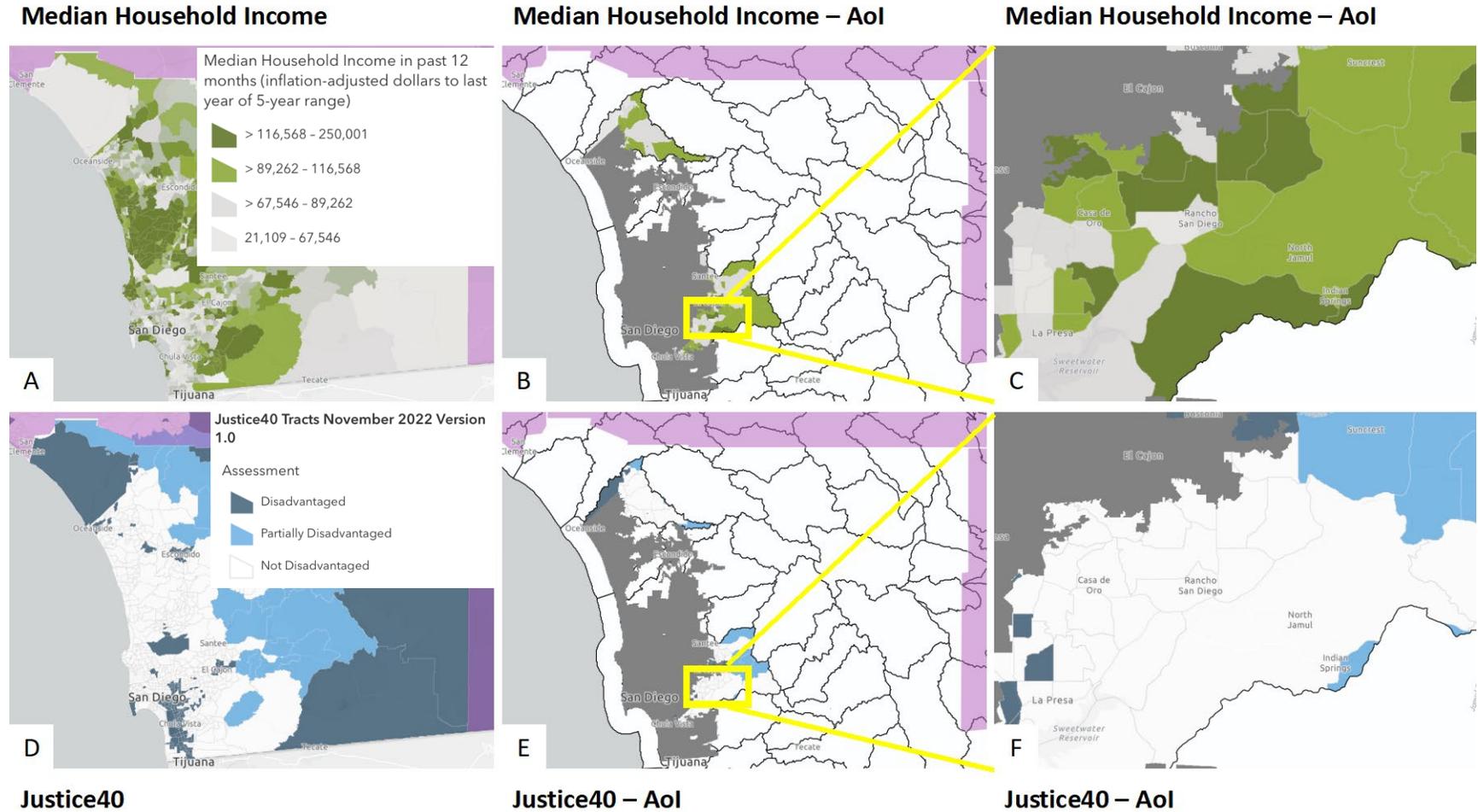
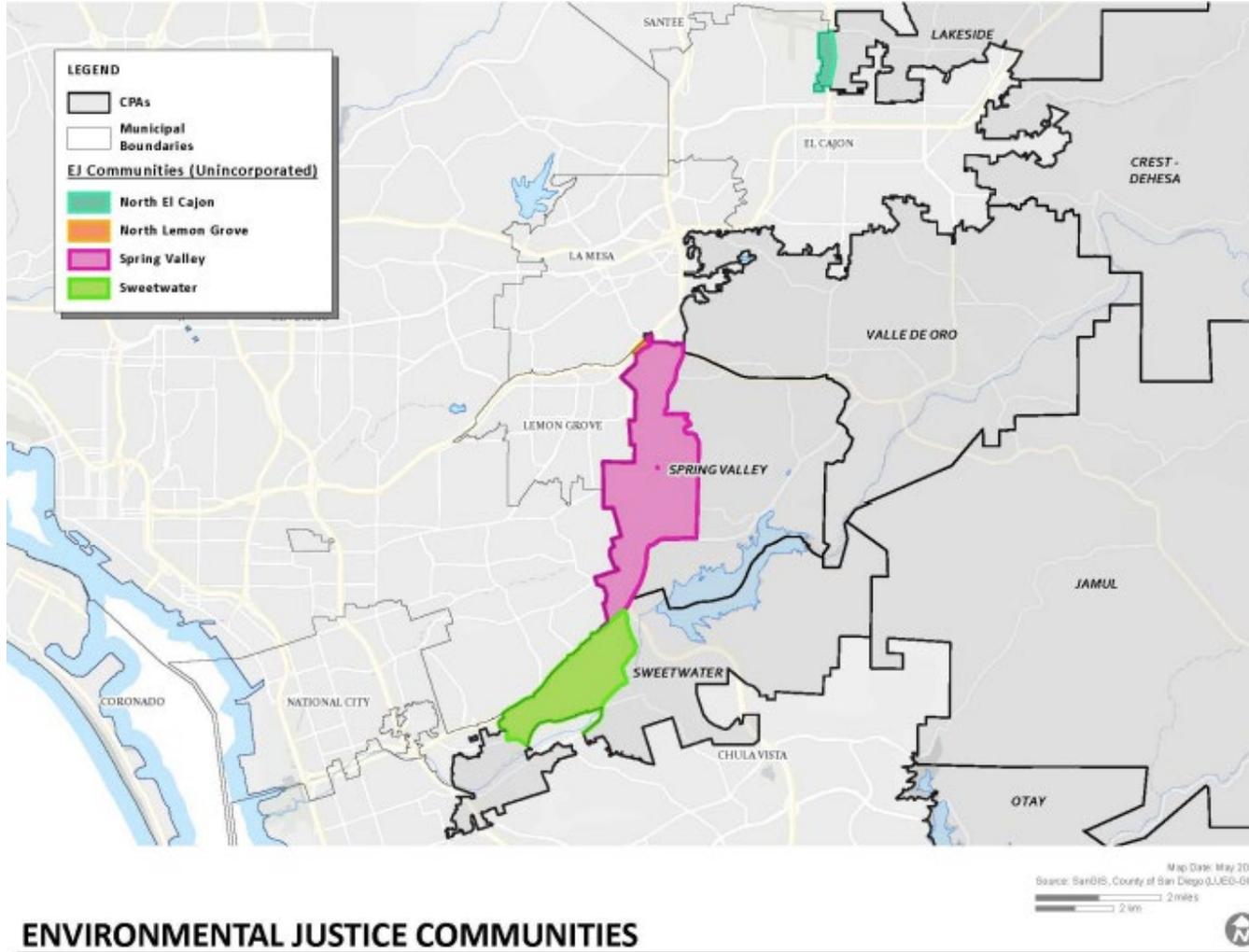


Figure 4: County of San Diego Environmental Justice Communities



ENVIRONMENTAL JUSTICE COMMUNITIES

San Diego County General Plan

Figure EJ-1

Step 5) Ranking of indexed census tracts.

PIC created a series of binary criteria to compare each census tract to one another (Figure 5). We then prioritized census tracts for hosting a potential pilot by focusing on the highest-scoring census tracts. Census tracts did not need to meet all criteria to be considered a high priority. PIC focused on census tracts with at least three of the six criteria listed in the previous step being present:

1. Greater than the national median flood risk
2. The presence of a floodplain within the census tract
3. Greater than the county median level of non-permeable surfaces
4. Median household income is lower than the county median
5. Designated as a DAC
6. Adjacent to a census tract that is designated as a DAC

Criteria 1, 3, and 4 were all evaluated both at the national and the county level. We then selected the more restrictive of the two metrics as the threshold from which to consider the criteria to be met. We focused on this more restrictive approach because we wanted to prioritize those census tracts that are most impacted by stormwater and socioeconomic factors. Of the 30 census tracts that were assessed in detail, there are 23 such census tracts that met three or more criteria, and these tracts were primarily located in unincorporated areas adjacent to El Cajon and the communities of Lakeside, Spring Valley, La Presa, Rancho San Diego, and Bonsall.

Figure 5: Census Tract Prioritization Ranking Matrix

COMMUNITY AREA	CENSUS TRACT	WATERSHED	GREATER THAN THE NATIONAL MEDIAN FLOOD RISK ⁶	CENSUS TRACT CONTAINS FLOOD PLAIN	GREATER THAN THE COUNTY MEDIAN LEVEL OF NON-PERMEABLE SURFACE ⁷	MEDIAN HOUSEHOLD INCOME IS LOWER THAN THE COUNTY MEDIAN ⁸	DESIGNATED AS DAC	ADJACENT TO DESIGNATED DAC	PRIORITY SCORE
Unincorporated El Cajon	165.04	Lower San Diego River	Yes	Yes	Yes	Yes	Yes	Yes	6
La Presa	31.08	Lower Sweetwater	Yes	No	Yes	Yes	Yes	Yes	5
Spring Valley	138.02	Lower Sweetwater	Yes	Yes	Yes	Yes	Yes	No	5
City of El Cajon	162.02	Lower San Diego River	Yes	Yes	Yes	Yes	No	Yes	5
Unincorporated El Cajon	164.03	Lower San Diego River	Yes	Yes	No	Yes	Yes	Yes	5
Unincorporated El Cajon	165.02	Lower San Diego River	No	Yes	Yes	Yes	Yes	Yes	5
La Presa	32.14	Lower Sweetwater	No	No	Yes	Yes	Yes	Yes	4
Spring Valley	137.02	Lower San Diego River	Yes	Yes	No	Yes	No	Yes	4
Spring Valley	138.01	Lower Sweetwater	Yes	Yes	No	Yes	No	Yes	4
La Presa	139.08	Lower Sweetwater	Yes	No	Yes	Yes	No	Yes	4
Lakeside	168.04	Lower San Diego River	Yes	Yes	No	Yes	No	Yes	4
Lakeside	168.09	Lower San Diego River	Yes	Yes	No	Yes	No	Yes	4
Lakeside	169.02	Lower San Diego River	Yes	Yes	No	No	Yes	Yes	4
Crest/Harbison Canyon	155.01	Lower San Diego River	No	Yes	Yes	No	Yes	Yes	4
Skyline	31.07	Lower Sweetwater	No	No	Yes	Yes	No	Yes	3
Rancho San Diego	136.07	Lower Sweetwater	Yes	Yes	No	Yes	No	No	3
Rancho San Diego	136.08	Lower Sweetwater	Yes	Yes	No	Yes	No	No	3
La Presa	139.03	Lower Sweetwater	No	Yes	No	Yes	No	Yes	3

⁶ The national median for the percent of properties within a census tract being at risk of flooding is 7%. The county median for the percent of properties within a census tract being at risk of flooding is 4%. PIC used the national median because it is more restrictive.

⁷ The national median for the percent of surface within a census tract that is considered non-permeable is 40%. The county median for the percent of surface within a census tract that is considered non-permeable is 54%. PIC used the county median because it is more restrictive.

⁸ The national median household income by census tract \$93,274. The county median household income by census tract \$103,542. PIC used the county median because it is more restrictive.



COMMUNITY AREA	CENSUS TRACT	WATERSHED	GREATER THAN THE NATIONAL MEDIAN FLOOD RISK ⁶	CENSUS TRACT CONTAINS FLOOD PLAIN	GREATER THAN THE COUNTY MEDIAN LEVEL OF NON-PERMEABLE SURFACE ⁷	MEDIAN HOUSEHOLD INCOME IS LOWER THAN THE COUNTY MEDIAN ⁸	DESIGNATED AS DAC	ADJACENT TO DESIGNATED DAC	PRIORITY SCORE
Lakeside	168.07	Lower San Diego River	Yes	Yes	Yes	No	No	No	3
Lakeside	168.12	Lower San Diego River	No	Yes	No	Yes	No	Yes	3
Bonsall	188.03	Lower San Luis Rey	Yes	Yes	No	Yes	No	No	3
Jamul	213.05	Lower Sweetwater	No	Yes	Yes	No	No	Yes	3
Jamul	213.06	Lower Sweetwater	No	Yes	Yes	No	No	Yes	3
Bonita	32.07	Lower Sweetwater	No	Yes	No	No	No	Yes	2
Spring Valley	135.06	Lower Sweetwater	No	Yes	No	Yes	No	No	2
Lakeside	168.10	Lower San Diego River	Yes	Yes	No	No	No	No	2
Lakeside	168.11	Lower San Diego River	Yes	Yes	No	No	No	No	2
Lakeside	169.01	Lower San Diego River	Yes	Yes	No	No	No	No	2
Bonsall	188.04	Lower San Luis Rey	No	Yes	No	No	No	No	1
Valley Center	191.05	Lower San Luis Rey	No	Yes	No	No	No	No	1

Step 6) Identification of potential site locations.

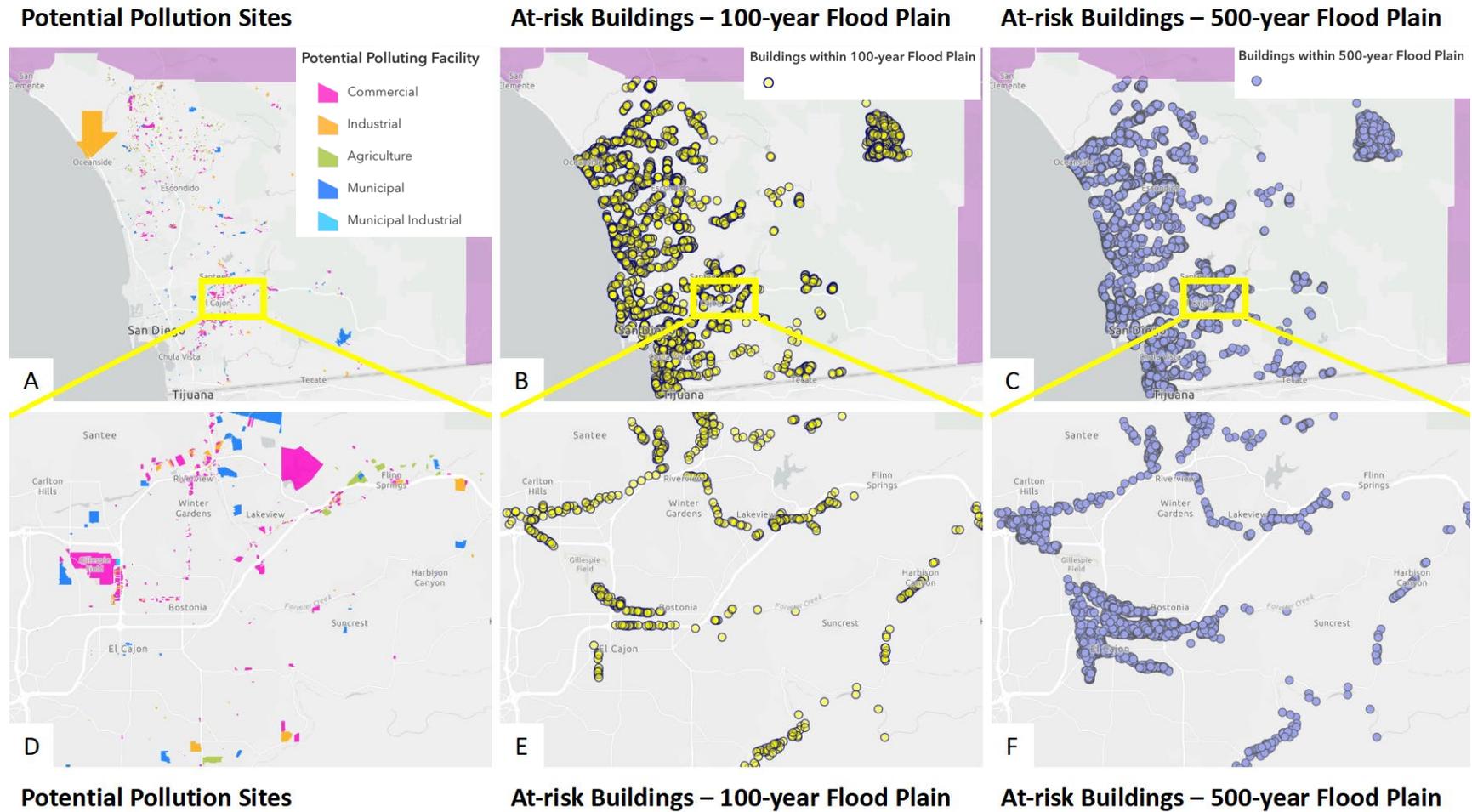
After PIC identified high-priority census tracts, we identified suitable sites for a GSI pilot. To identify sites, we found properties within priority census tracts, with attention paid to those properties within a 100-year or 500-year flood zone (Figure 6, Map B, C, E, and F). PIC also looked for sites that were considered potential pollution sites or were adjacent to potential pollution sites (Figure 6, Map A and D). PIC collected address information, the assessor’s parcel numbers (APN), existing and planned land uses, and the size of the site for future research and outreach.

The goal was to collect data on ten sites; however, we identified more than thirty potential site locations within our 23 census tracts of interest in the unincorporated area of San Diego County. Properties identified are listed in an appendix to this memo and include a mix of educational, commercial, religious, and community-based organizations. As described in the next section, we further narrowed this initial list to six top potential locations based on sites that were at least one acre in size, included areas of open space, fields, or parking lots that were not covered by buildings, and had some level of public accessibility or visibility on the site.



The census tracts with the highest priority, scores of 5 and 6, were evaluated to identify potential sites for a green infrastructure demonstration project. After reviewing, sites within these top census tracts appear to have limited opportunities or suitable land area for a demonstration project as the sites were primarily industrial or exclusively residential uses or had sites smaller than one acre.

Figure 6: Site Specific Factors



Top Sites for Consideration

Based on the site selection criteria, thirty sites within or adjacent to the 23 census tracts of interest were identified for further evaluation as candidates for the installation of green stormwater infrastructure interventions. The full list of potential sites, included as an appendix, was then narrowed down to six top locations based on sites that were at least one acre in size; included areas of open space, fields, or parking lots that were not covered by buildings; and had some level of public accessibility or visibility on the site (See Figure 7).

It should be noted that this list is not exhaustive; there may be additional properties that would also meet the above criteria but have additional constraints on the site that would limit opportunities for a successful GSI project. Some of the constraints that may limit site potential for a GSI project include the level of public use, visibility, or access to a site; the existing or planned general plan land use designation; existing infrastructure on-site to address stormwater runoff; and site ownership or program operations on site.

Overview of Potential Locations

The top six sites identified are in the communities of Lakeside, Spring Valley, Rancho San Diego, and Bonsall, as shown in Figures 8 and 9.

Lakeside candidate sites are in the **San Diego River watershed** and include Lakeside River Park Conservancy and El Capitan High School.

In the **Sweetwater watershed**, the San Diego Youth Services site in Spring Valley, the Water Conservation Garden on the Cuyamaca College campus in Rancho San Diego, and the McGrath Family YMCA in Rancho San Diego were identified.

The potential site identified in Bonsall, which is in the **San Luis Rey watershed**, was the Bonsall Elementary School, which shares property with Bonsall Unified District offices and the Bonsall Community Center.

In addition to visiting the sites, some preliminary research and assessment were completed for each of the top sites. During these site visits and assessment, our team identified that the Lakeside River Park Conservancy, San Diego Youth Services, and McGrath Family YMCA likely have the potential need and capacity for the implementation of green stormwater infrastructure. The El Capitan High School and Water Conservation Garden sites have additional constraints or considerations, described in the site notes, are not recommended for further consideration at this time.

Figure 7: Potential Site Evaluation Criteria

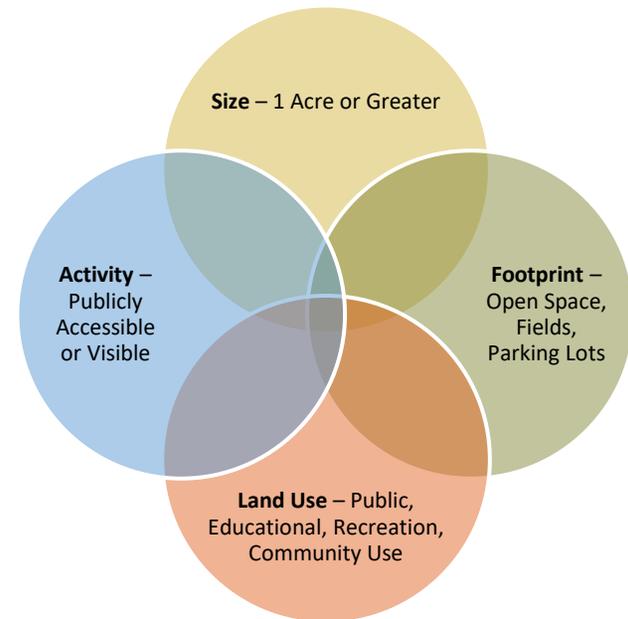
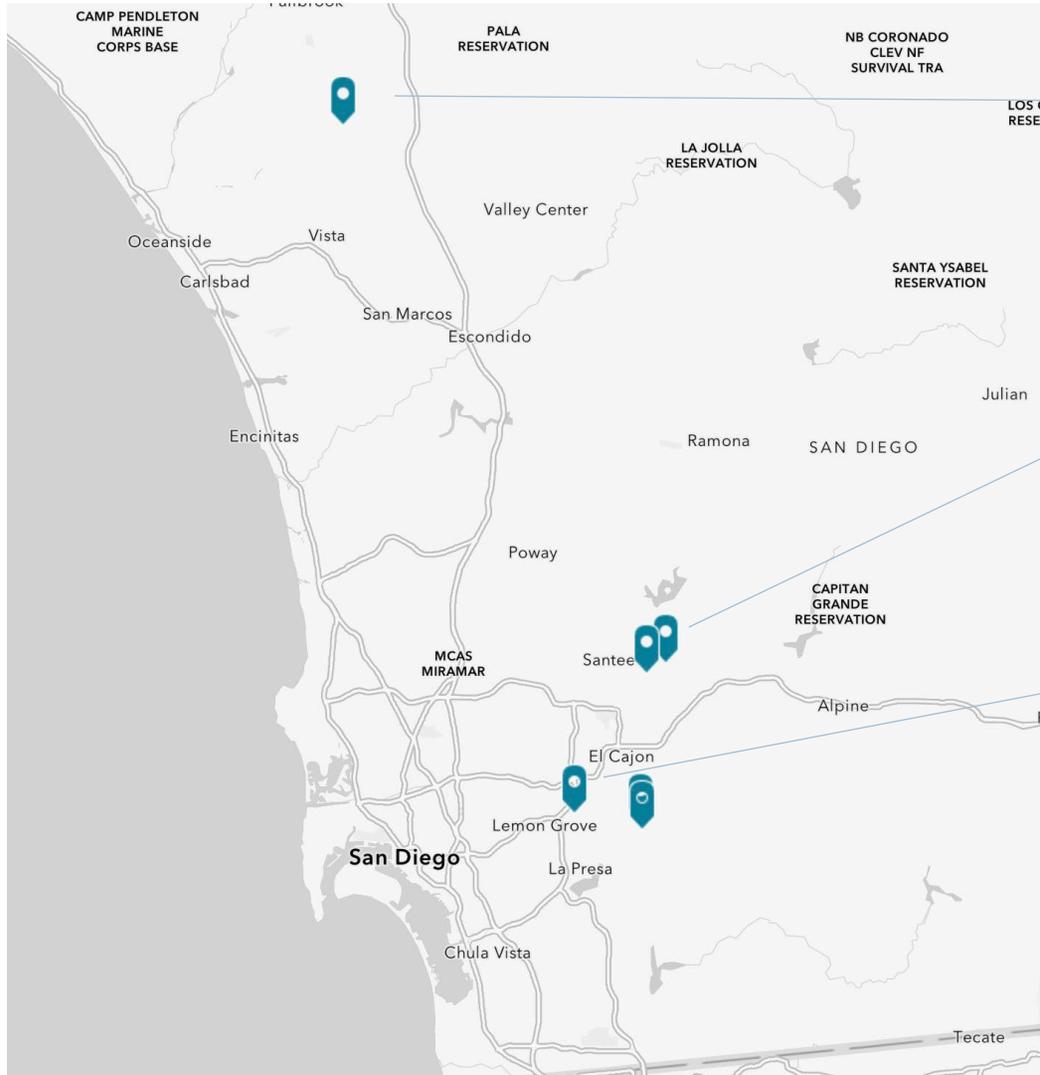


Figure 8: Potential Site Locations – Countywide

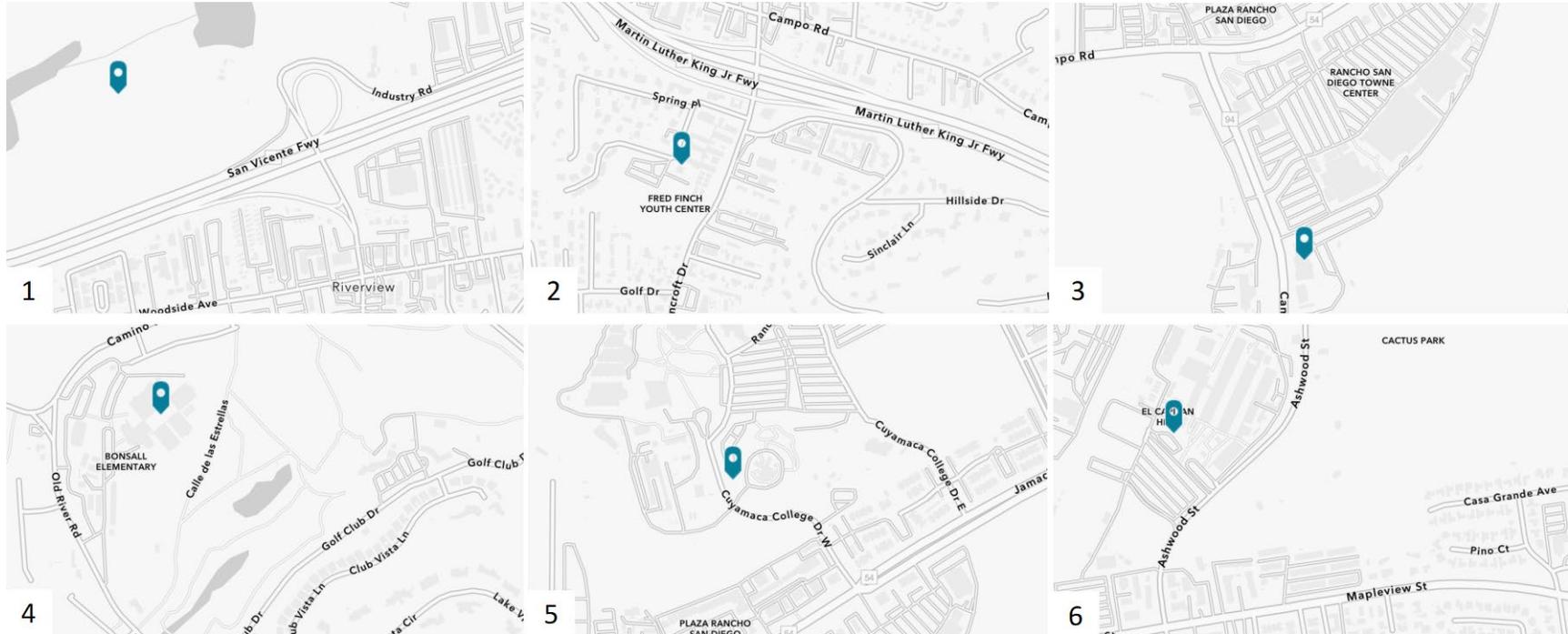


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The Lakeside candidate sites are in **the San Diego River watershed** and include the Lakeside River Park Conservancy and El Capitan High School.

In the **Sweetwater watershed**, the San Diego Youth Services site in Spring Valley, the Water Conservation Garden on the Cuyamaca College campus in Rancho San Diego, and the McGrath Family YMCA in Rancho San Diego were identified.

Figure 9: Potential Site Locations

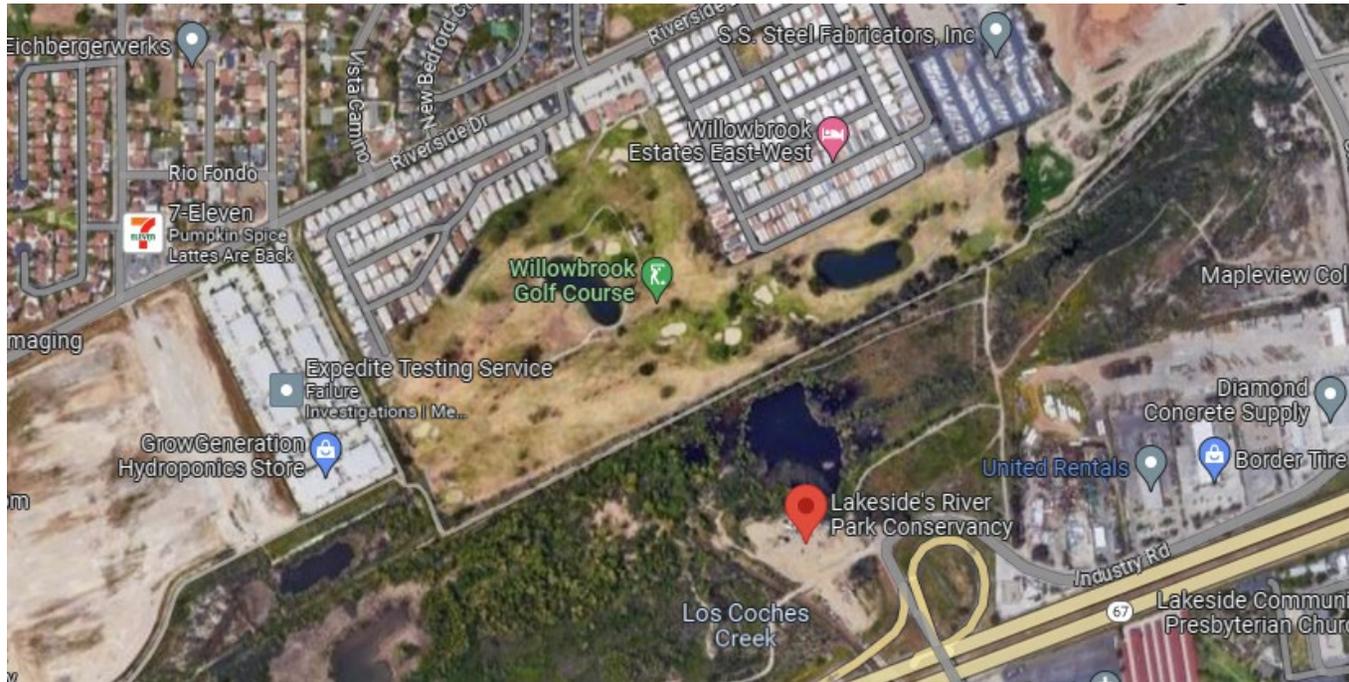


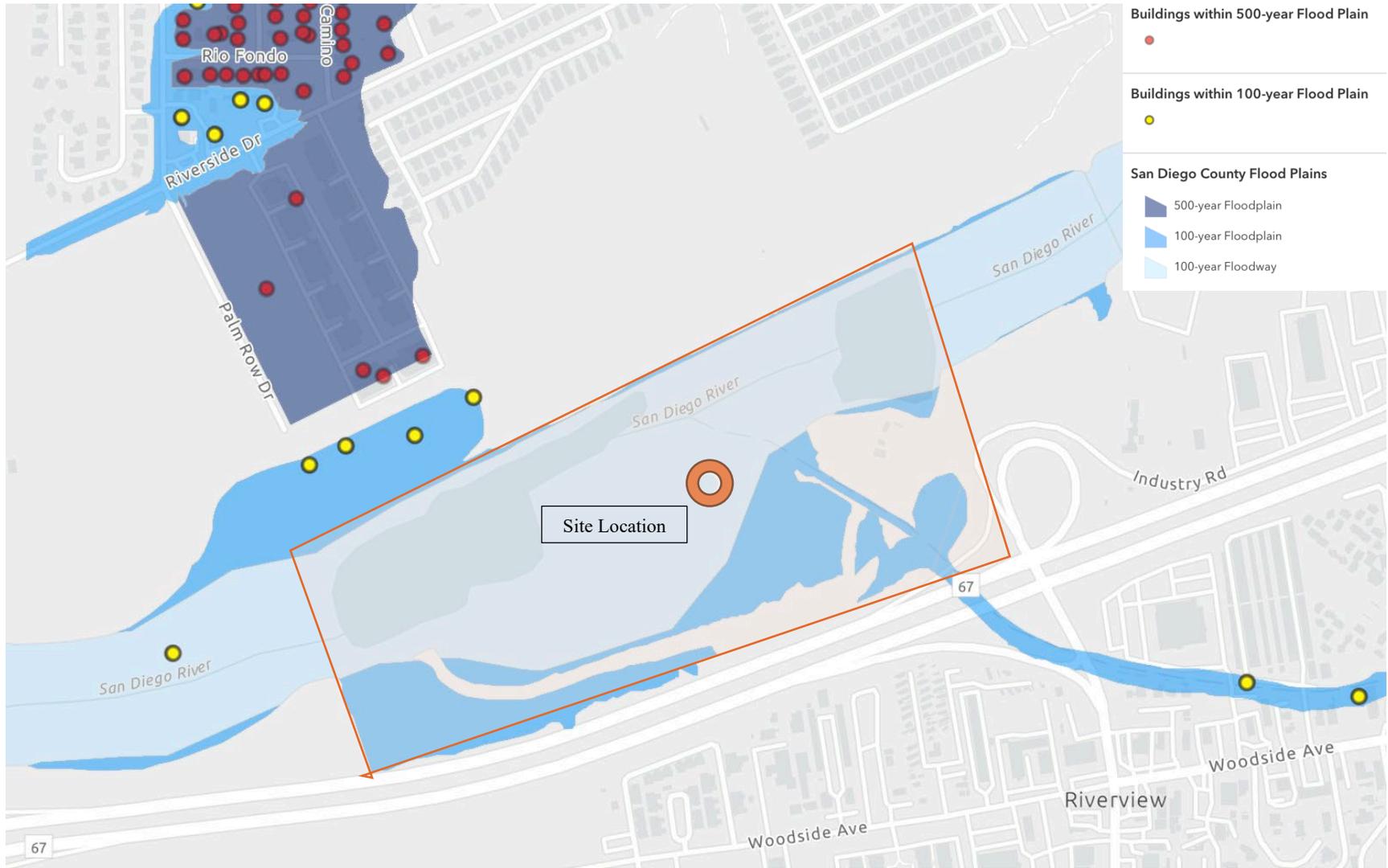
1. Lakeside River Park Conservancy
2. San Diego Youth Services East Communities Campus
3. McGrath Family YMCA
4. Bonsall Elementary School
5. Cuyamaca College/ The Water Conservation Garden
6. El Capitan High School

Potential Site 1 – Lakeside River Park Conservancy

<i>Website:</i> https://www.lakesideriverpark.org/		
<i>Address:</i> 12108 Industry Rd, Lakeside CA 92040		
<i>Current/Planned Land Uses:</i> Open Space Park or Preserve		<i>Flood Plain:</i> FP 100/FW 100
<i>Census Tract:</i> 169.01	<i>Watershed:</i> Lower San Diego River	<i>Size:</i> 100+ Acres
<i>APN(s):</i> 3822503300, 3940113500		
<i>Parcel Report:</i> https://gissd.sandag.org/plt/ParcelRpt.aspx?APN=3822503300		

Map: (Source: Google Maps, 2023)





Site Visit Photos:

1. *San Diego River Pond and Wetland*
2. *Field Station Construction Area*
3. *Lakeside Segment of the High Trail*

(Sources: PIC site visit on 8/18/23 and Lakeside River Park Conservancy)



Site Description:

This site consists of multiple properties along the Los Coches Creek and San Diego River in Lakeside. The site is located north of SR-67 freeway and to the south of a golf course and other industrial and formerly industrial uses. The San Vicente Creek also connects to the San Diego River just east of this site. In addition to the High Trail, the Lakeside River Conservancy site is actively under construction to develop the San Diego River Science Field Station, including classrooms, office space, parking, bus drop-off space, and an amphitheater. The Science Field Station project has been over ten years in the making, and the Conservancy has been successful in obtaining funding for different elements of this project over that time, including funding from the State Prop 68 Funding for the San Diego River Conservancy.

Potential Impact and Outcomes:

Located at the intersection of multiple reaches of the San Diego River, PIC could likely deploy a suite of innovations that serve to educate the public, improve stormwater filtration, and support research efforts in the region. The site includes both developed areas and natural or reconstructed ponds, which could expand the types of suitable improvements to pilot. As part of the eastern reach of the San Diego River watershed, stormwater improvements that reduce flooding and improve water quality at this site would have positive downstream effects as water flows downstream to Ocean Beach, including through Mission Trails Regional Park. While the immediate visibility and number of visitors are likely lower than the other sites analyzed, the completion of the river science field station and additional educational and research programming will open the site up to more visibility and public use.



Site Considerations:

Active construction of educational center - On a site visit from the PIC team on 8/18/23, PIC met with the Conservancy's Executive Director and learned more about the recent upgrades and projects underway at this site. Because of upcoming developments at this location, there will be a great deal of public attention paid to the site and opportunities for educational engagement and research. Due to the construction activity underway, PIC may be able to coordinate with the project team leading the new development to integrate GSI pilot project work into the current project and apply 'dig once' principles.

Single owner and operator - The Lakeside River Park Conservancy is the site's owner and operator, which will simplify coordination with only one primary agency.

Research and demonstration potential - Because of the educational center that is under construction at this site and the Conservancy's objectives to develop educational and research partnerships, there may be additional opportunities for further research and demonstration within this site.

Potential Site 2 – San Diego Youth Services East Communities Campus

Website: https://sdyouthservices.org/		
Address: 3845 Spring Drive - Spring Valley, CA 91977		
Current/Planned Land Uses: School District Office		Flood Plain: FP100
Census Tract: 138.01	Watershed: Lower Sweetwater	Size: 6.78 Acres
APN(s): 4995320100, 4993731200, 4993731300, 4993731400, 4993731500		
Parcel Report: https://gis.sandag.org/pl/ParcelRpt.aspx?APN=4995320100		

Map: (Source: Google Maps, 2023)



Buildings within 500-year Flood Plain



Buildings within 100-year Flood Plain

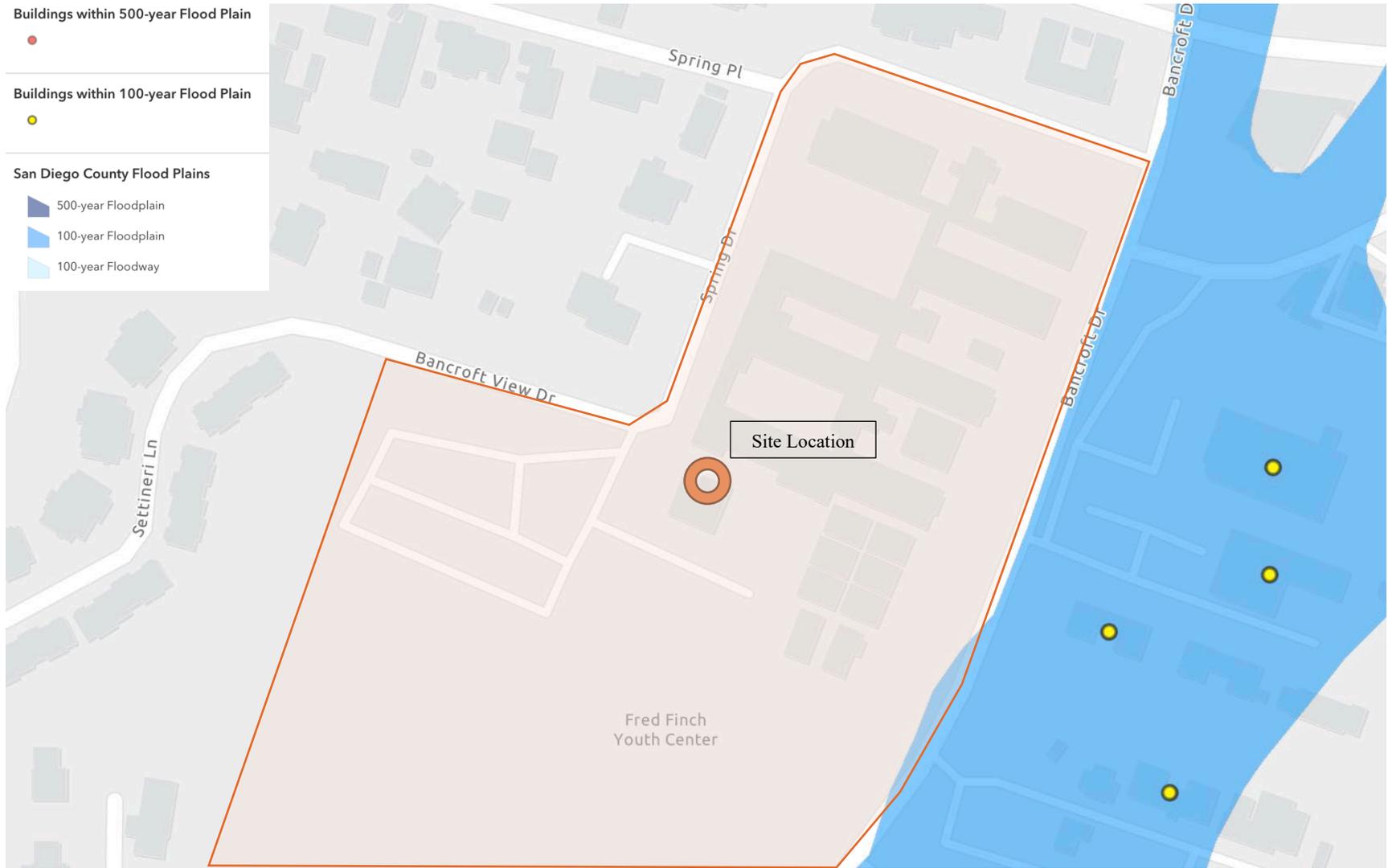


San Diego County Flood Plains

500-year Floodplain

100-year Floodplain

100-year Floodway



Site Photos: School parking lot and retaining wall at the west end of the school site; Storm drain catch basin between parking lot and school playground/fields (Source: PIC site visit on 8/17/23)

Site Description:

This site consists of five parcels in total. Formerly the Spring Valley Elementary School, this site is now referred to as the Spring Valley and East Communities Campus and has multiple educational programs operating at the site. Because it is an educational setting, there are opportunities for learning about stormwater among the site's users and the public, which has access to the playground, track, and community garden. This site is located within the Spring Valley Environmental Justice community, as designated by the County.



Potential Impact and Outcomes:

In this location, PIC could likely deploy a suite of innovations that educate students, enhance the site, capture water on-site, and improve runoff and water quality. This location has the potential to contribute to a distributed network of green stormwater solutions. Potential opportunities for interventions could be located near the parking lot/ entry to the field, where there are large impervious surfaces and ongoing work to improve drainage.

Site Considerations:

Existing channelized infrastructure indicates flood potential - The site has two large grass fields and an asphalt playground and parking lot. During a site visit by the PIC team on 8/17/23, we observed storm drain grates and catch basins, as well as some drainage paths to direct water through the site, indicating that water does run through the site.

Creation of distributed network of interventions - This location is about a half mile from another County green stormwater infrastructure project at the Spring Valley Community Church. That project includes a rain garden and storm management features. With multiple small-scale green infrastructure solutions along a watershed corridor, a distributed systems effect to managing stormwater may be created.

Site users and owners – This site is owned by San Diego Youth Services, which operates some programming on-site and leases the property to nonprofit operators, including Fred Finch and the All Kids Academy Headstart program. The owners are implementing a variety of sustainability and community projects, are excited about additional rain capture, and allow the public to access their track and playground.

Potential Site 3 – McGrath Family YMCA

Website: ymcasd.org/locations/mcgrath-family-ymca		
Address: 12006 Campo Road Spring Valley, CA 91978		
Current/Planned Land Uses: Other Recreation		Flood Plain: FP 500/ FP 100
Census Tract: 213.05	Watershed: Lower Sweetwater	Size: 11.03 Acres
APN(s): 5061310500, 5061310300		
Parcel Report: https://gis.sandag.org/pl/ParcelRpt.aspx?APN=5061310500		

Map: (Source: Google Maps, 2023)



Buildings within 500-year Flood Plain

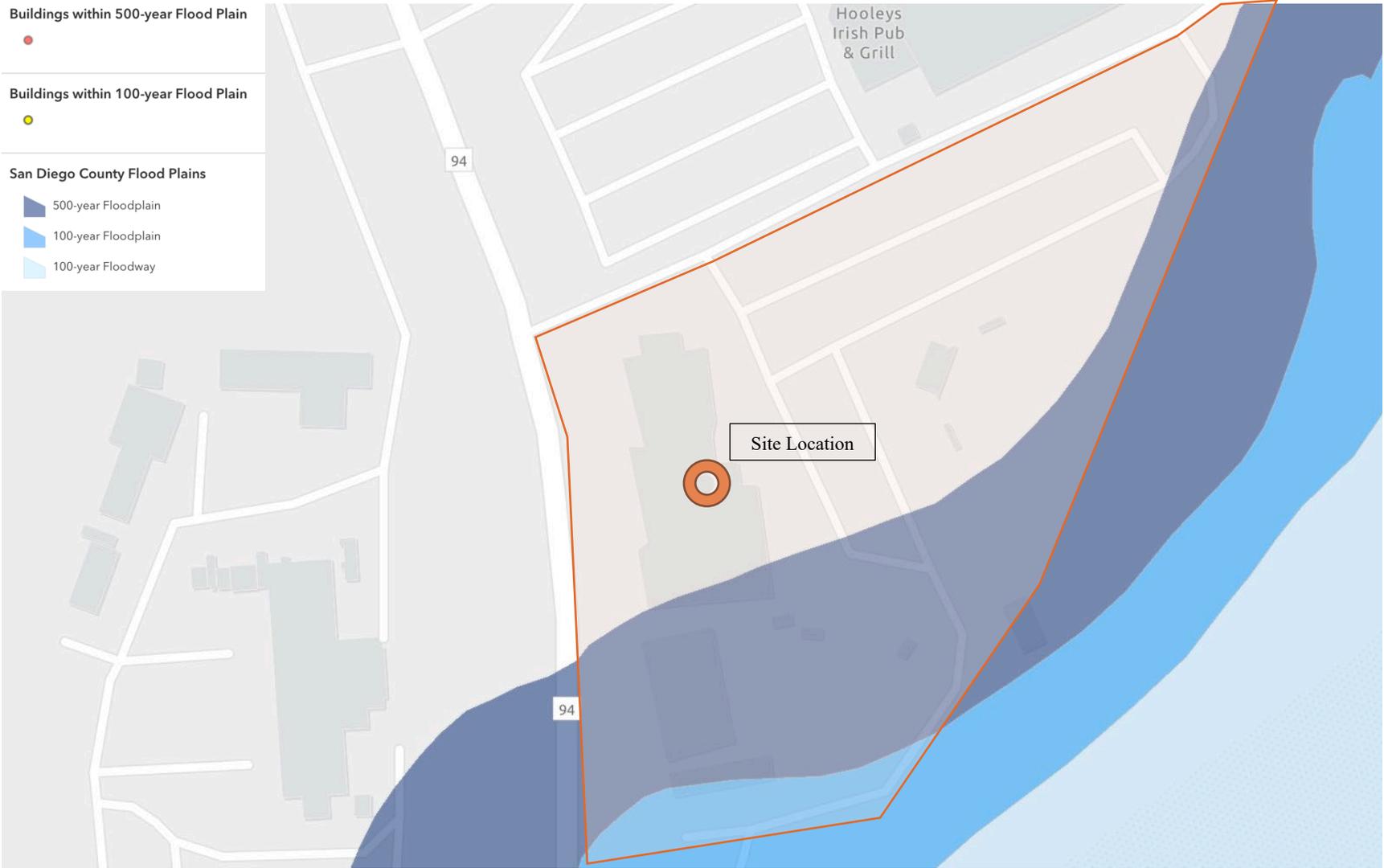


Buildings within 100-year Flood Plain



San Diego County Flood Plains

- 500-year Floodplain
- 100-year Floodplain
- 100-year Floodway



Site Photos:

1. *Overview of McGrath YMCA Site and parking lot*
2. *Permeable pavement and curb cuts*
3. *Concrete drainage area between site and river trail*

(Source: PIC site visit on 8/17/23 and Google Earth)



Site Description:

The McGrath Family YMCA, located in Rancho San Diego along the Sweetwater River, consists of two parcels totaling approximately 11 acres and includes a two-story recreational facility, indoor and outdoor pools, a parking lot, playground/summer camp areas, as well as baseball/soccer fields. The site is located between the Rancho San Diego Town Center to the north and the Sweetwater River to the south.

Potential Impact and Outcomes:

Although this organization's mission is more focused on health and wellness, the range of facilities and activities on site are frequently used by the community, indicating better visibility for GSI interventions.



Site Considerations:

Adjacent to public river path – While the site is tucked away behind a commercial shopping center, it is located adjacent to the Sweetwater River walking and bike path. Access to the path is provided through the YMCA site, although access points could be enhanced, the elevation change between the YMCA site and path would mean most interventions would not be visible from the river path.

Evidence of runoff/flooding/erosion – Upon visiting the site, the PIC team observed evidence of erosion/potential runoff and some stormwater features such as permeable pavement along the west side of the site that drains to the river path below. Some standing water was also visible in the parking lot on a sunny day, indicating potential drainage challenges.

Newer construction – This site was largely constructed in 2009, with the camp/recreational area constructed in 2015, so the YMCA may not be interested in a major construction project.

Potential Site 4 – Bonsall Elementary School

Website: https://be.bonsallusd.com/		
Address: 31555 Old River Rd, Bonsall CA 92003		
Current/Planned Land Uses: Elementary School		Flood Plain: FP 500
Census Tract: 188.03	Watershed: Lower San Luis Rey	Size: 22 Acres
APN(s): 1260702600, 1263005300, 1260702300		
Parcel Report: https://gissd.sandag.org/plt/ParcelRpt.aspx?APN=1260702600		

Map: (Source: Google Maps, 2023)



Buildings within 500-year Flood Plain



Buildings within 100-year Flood Plain

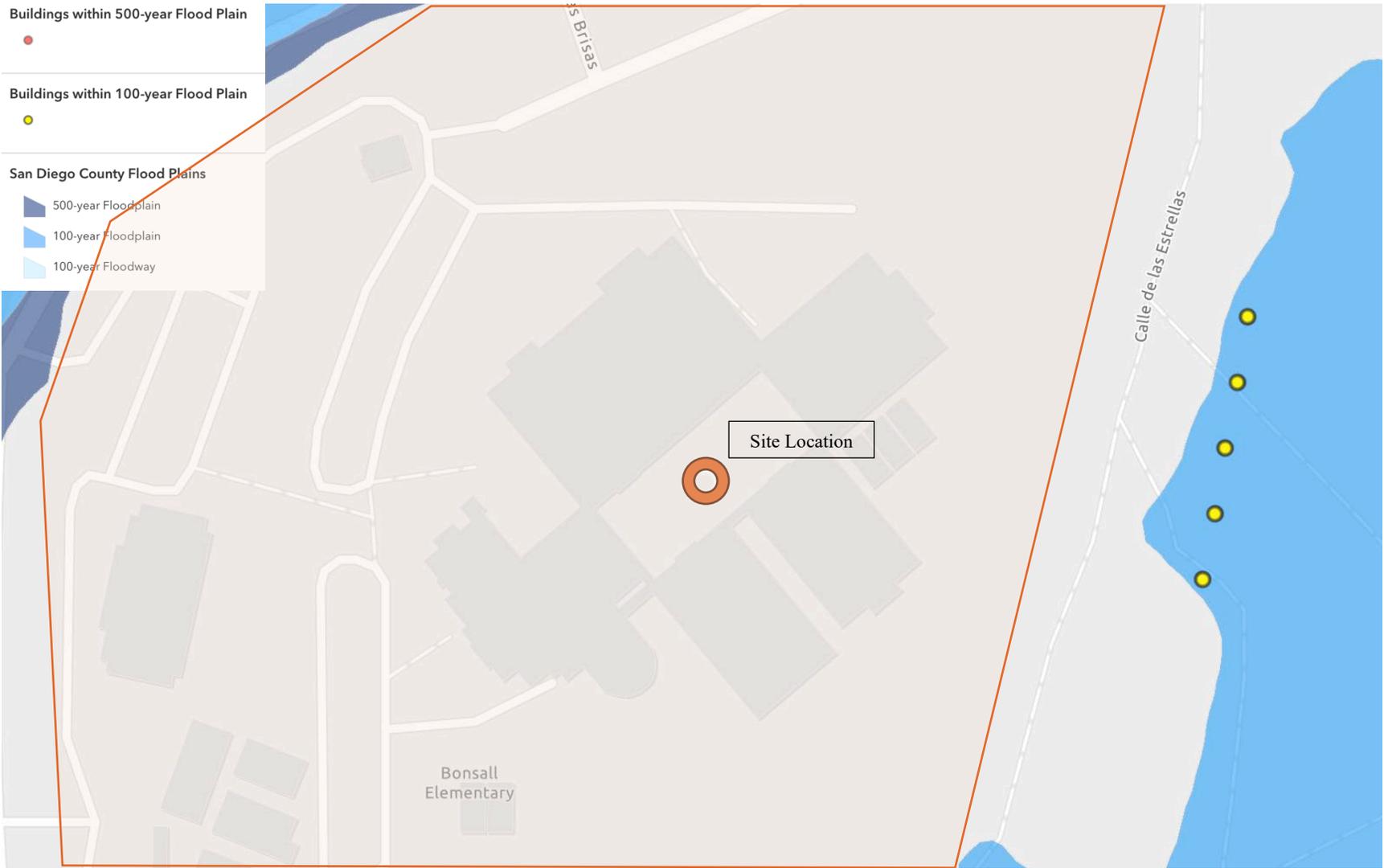


San Diego County Flood Plains

500-year Floodplain

100-year Floodplain

100-year Floodway





Site Photos:

1. *Street view image of standing water to the east of the site.*

(Source: Google Earth, 2023)

Site Description:

This site includes three properties that encompass the Elementary school, School District Offices, and Bonsall Community Center. The site is surrounded by residential uses, with the San Luis Rey River located to the north and west of the site. This site appears to have some slopes/elevated area above the surrounding roads and have some runoff/drainage issues on the site based on photos.

Potential Impact and Outcomes:

In this location, PIC could likely deploy a suite of innovations that educate the public, enhance the site, and improve runoff and water quality. Potential opportunities for interventions could be located on impervious surfaces or slopes with drainage issues.

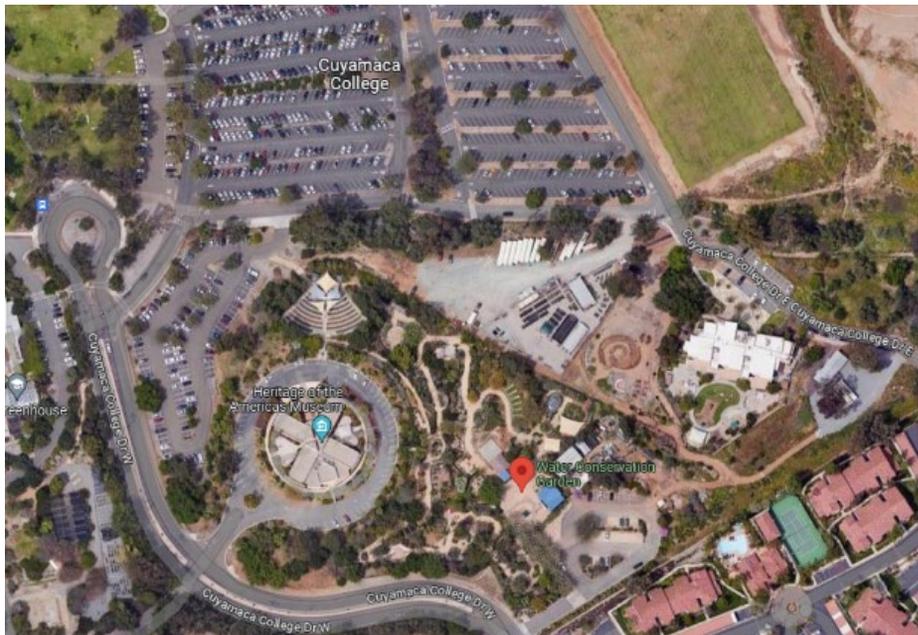
Site Considerations:

This is a large lot with a variety of educational users, which provides great opportunities for educational co-benefits and challenges with construction time cycles.

Evaluated Site 5 – Cuyamaca College/ The Water Conservation Garden

Website: https://thegarden.org/		
Address: 12122 Cuyamaca College Dr West, El Cajon, CA 92019		
Current/Planned Land Uses: Community College		Flood Plain: Zone X
Census Tract: 136.07	Watershed: Lower Sweetwater	Size: Garden (6 acres)
APN(s): 7601285000		
Parcel Report: https://gis.sandag.org/plr/ParcelRpt.aspx?APN=7601284600		

Map: (Source: Google Maps, 2023)



Buildings within 500-year Flood Plain

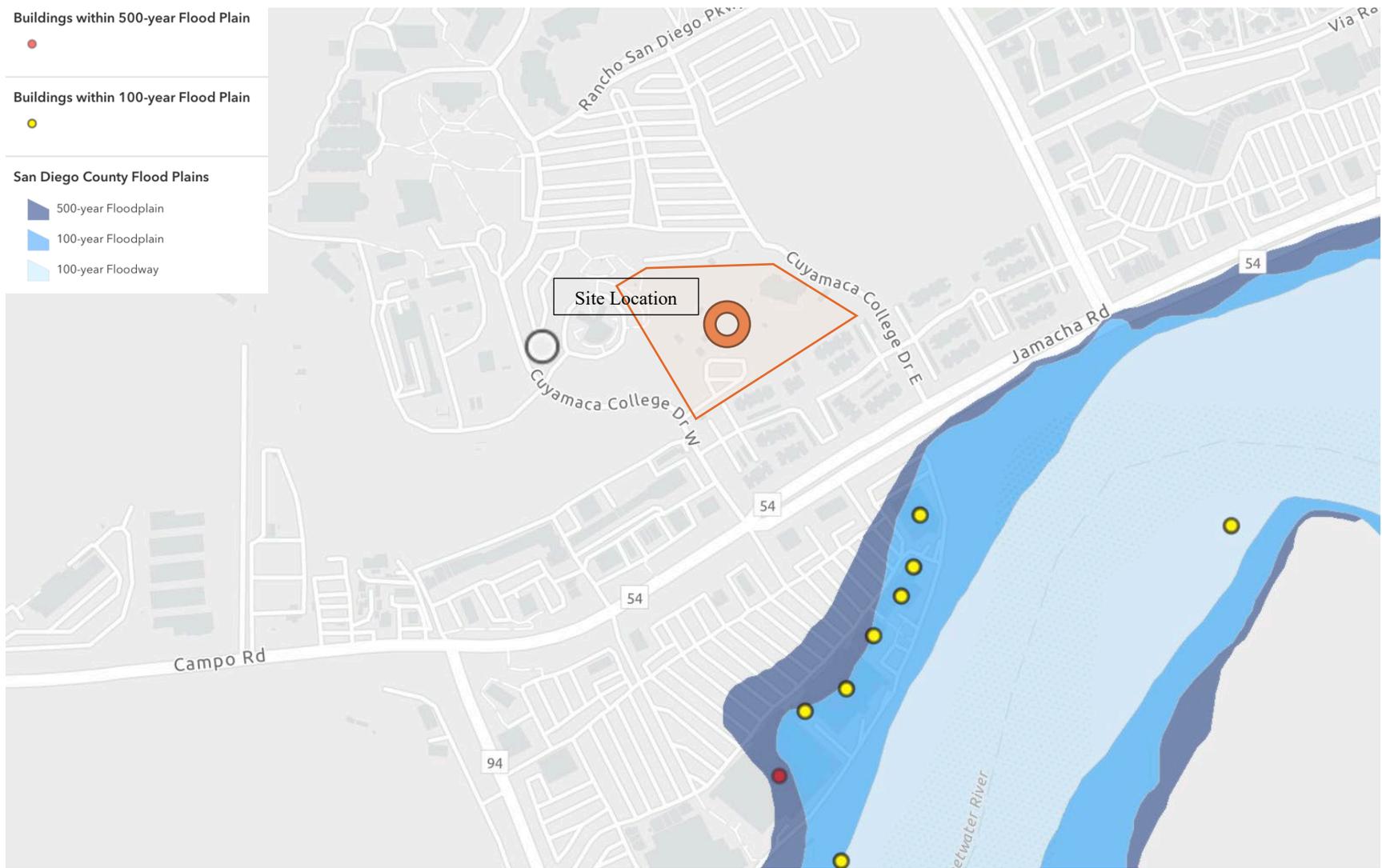


Buildings within 100-year Flood Plain



San Diego County Flood Plains

-  500-year Floodplain
-  100-year Floodplain
-  100-year Floodway





already implemented at this location, our team noted the potential for a role for additional signage around GSI, but not around additional stormwater infrastructure.

Aligned conservation mission – While touring the facility, one is greeted by inspiring examples of water collection and reuse as well as thoughtful arrangements of native plants that require far less maintenance than traditional lawns and landscaping, as well as instructional demonstrations of everything from composting to erosion management. In addition to general admission, the garden also hosts group classes, large events, and community engagement opportunities.

Wide public visibility – This location would offer a lot of visibility. Thousands of visitors enter the conservation garden every year. Each visitor represents an opportunity to develop stronger alliances with our communities and share important and actionable lessons learned on our stormwater needs and opportunities.

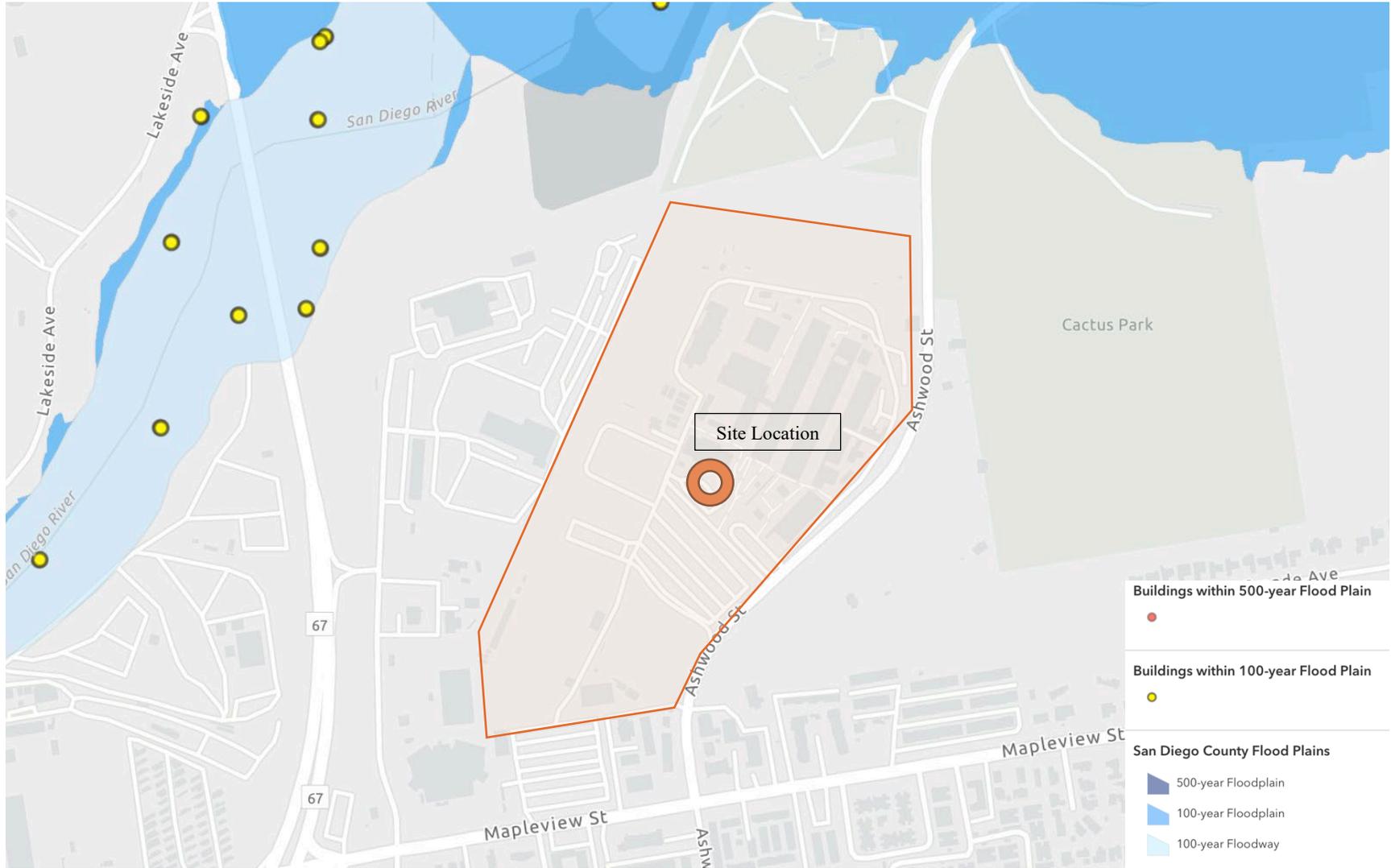
Well-developed site and demonstration projects –One challenge with this location is that the full extent of the site is currently in use, and the organization has a relatively firm long-term strategic plan in place. The project timelines for the GSI pilot may not overlap with the Water Conservation Garden.

Evaluated Site 6 – El Capitan High School

Website: https://elcapitan.guhsd.net/		
Address: 10410 Ashwood St., Lakeside CA 92040		
Current/Planned Land Uses: Senior High School		Flood Plain: Zone X
Census Tract: 168.04	Watershed: Lower San Diego River	Size: 52.13 Acres
APN(s): 3921203700		
Parcel Report: https://gissd.sandag.org/plr/ParcelRpt.aspx?APN=7739212001		

Map: (Source: Google Maps, 2023)





Site Photos: Images of the school parking lot and the County's Mapleview Green Streets project under construction adjacent to the school site (Source: PIC site visit on 8/18/23)



Site Notes:

As an educational facility, El Capitan High School has a high potential impact as a partner in implementing and educating students on GSI, but it will also require a proportionally high level of effort and coordination.

In this location, PIC has the opportunity to make a large impact that will be readily visible to all visitors to the school and even many just driving by. If we are able to successfully engage all partners, a pilot project at this site could leave a lasting impression on the region. Thousands of people would be able to interact with and learn from the project for years to come. More significantly, it will be directly available to students at El Capitan High School.

High visibility site – There is no apparent conscious plan for stormwater management in the landscaping at the entrance to the school. There is an opportunity to deploy passive landscaping designs that would improve water quality, reduce erosion, and sustainably beautify the property, all while providing ample opportunities for community engagement and education.



School district coordination and scheduling – Partnering with El Capitan High School could be challenging. Not only would the partnership require the support of the local administration, but it would likely require the approval of the district and other agencies. In addition, there could be many challenges with scheduling and feasibility. The school is a high-traffic area, and any non-essential construction will likely take a back seat to the daily needs of the students, teachers, and administration.

Adjacent to County Green Streets Project – The County of San Diego’s Maplevue Green Streets project is currently under construction directly to the south of El Capitan High School. Since most of the high school site drainage is likely captured by the Green Streets project, it is unclear whether this is duplicative or if there is a further need to install additional stormwater infrastructure on the school site.



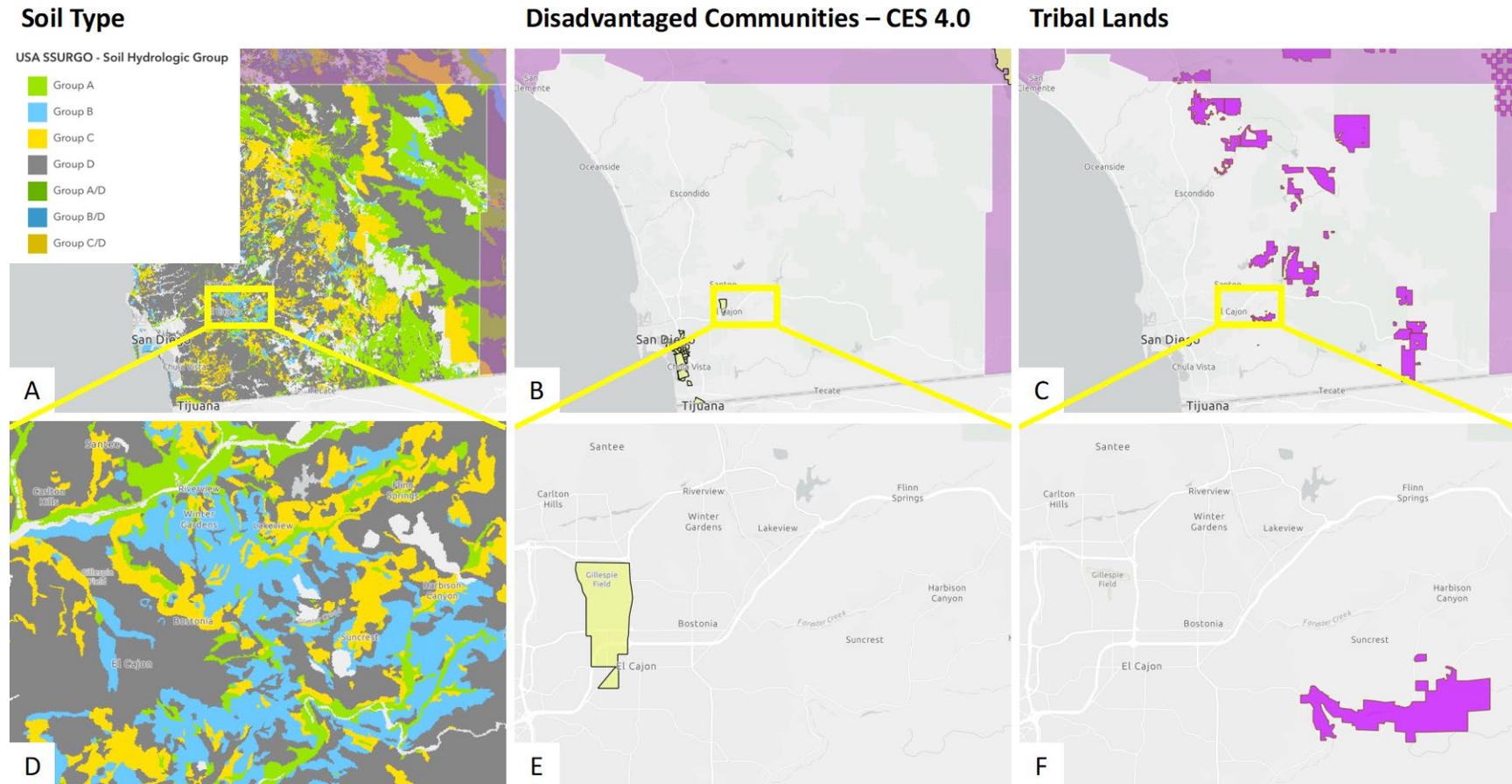
APPENDIX

The table below contains the exhaustive list of variables considered in PIC’s potential GSI site selection methodology.

Figure A.1: Complete Variable List for Analysis

VARIABLE NAME	SOURCE
100-year Flood Plain	Federal Emergency Management Agency (FEMA)
500-year Flood Plain	Federal Emergency Management Agency (FEMA)
San Diego Watersheds	San Diego Association of Governments (SANDAG)
Permeable Surfaces	US Geological Survey: National Land Coverage Database (NLCD)
Building Location and Characteristics	First Street Data
Median Household Income	UC Census Bureau
Disadvantaged Community	Department of Energy (DOE): Justice40
Disadvantaged Community	CalEnviroScreen 4.0
Environmental Justice	County of San Diego Designation
Flood Risk for Buildings	Department of Energy (DOE): Justice40
Tribal Land	US Department of the Interior
Potential Pollution Site	Environmental Protection Agency (EPA)
Soil Type	Natural Resources Conservation Services (NRCS): Soil Survey Geographic Database
Flood Frequency	Natural Resources Conservation Services (NRCS): Soil Survey Geographic Database
Tree Canopy Coverage	National Land Cover Database (NLCD)
Public Parks	ESRI
County Boundaries	US Census Bureau 2020 TIGER FGDB (National Sub-State)
Census Tract Boundaries	US Census Bureau 2020 TIGER FGDB (National Sub-State)
Freeways, Highways, and Roads	Open Roads
MTS Trolley Lines	San Diego Metropolitan Transit System
Public School Location	National Center for Education Statistics
Publicly Owned Land	PIC’s Land Locator Map

Figure A.2: Other Factors Considered during Census Tract Prioritization



The seven classes of hydrologic soil group followed by definitions: Group A - Group A soils consist of deep, well drained sands or gravelly sands with high infiltration and low runoff rates.; Group B - Group B soils consist of deep well drained soils with a moderately fine to moderately coarse texture and a moderate rate of infiltration and runoff; Group C - Group C consists of soils with a layer that impedes the downward movement of water or fine textured soils and a slow rate of infiltration; Group D - Group D consists of soils with a very slow infiltration rate and high runoff potential. This group is composed of clays that have a high shrink-swell potential, soils with a high water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material; Group A/D - Group A/D soils naturally have a very slow infiltration rate due to a high water table but will have high infiltration and low runoff rates if drained; Group B/D - Group B/D soils naturally have a very slow infiltration rate due to a high water table but will have a moderate rate of infiltration and runoff if drained; Group C/D - Group C/D soils naturally have a very slow infiltration rate due to a high water table but will have a slow rate of infiltration if drained.

Additional Sites Considered

A table of all sites considered by PIC is provided below. This table includes notes about the location, including priority of the census tract from the site selection methodology, and notes about the property that assisted in determining whether the sites may be suitable for further consideration for green stormwater infrastructure interventions. The rows highlighted in green were those that were determined for further consideration and are described in this report. If the top sites are determined not to be feasible for implementation of a GSI project, the sites noted with a maybe and highlighted in yellow will be evaluated. While the sites highlighted in red may meet some of the criteria, due to their size, location, or land use, they are considered not likely to be feasible for a GSI pilot project at this time.

Figure A.3: Additional Site Consideration Matrix

NAME	ADDRESS	CITY	ZIP CODE	CENSUS TRACT	CENSUS TRACT RATING	WATERSHED	GP EXISTING LAND USE	GP PLANNED LAND USE	FLOOD PLAIN	SIZE	ADDL EVAL	NOTES	PARCEL REPORT
San Diego Youth Services	3845 Spring Drive	Spring Valley	91977	138.01	4	Lower Sweetwater	School District Office	School District Office	FP 100	6.78 Acres	Yes	5 parcels in total. Also site of Spring Valley and East Communities Campus, Spring Valley Elementary School	https://gis.sd.gov/planning/Pages/ParcelReport.aspx?APN=4995320100
El Capitan High School	10410 Ashwood St	Lakeside	92040	168.04	4	Lower San Diego River	Senior High School	Senior High School	X	52.13 Acres	Yes	Adjacent to Lakeside Rodeo and Water District Properties. County has a green streets project for Maplevue St in front of the high school under construction.	https://gis.sd.gov/planning/Pages/ParcelReport.aspx?APN=7739212001
Cuyamaca College /The Water Conservation Garden	12112 Cuyamaca College Dr W	Valle de Oro	92019	136.07	3	Lower Sweetwater	Junior College	Junior College	X	6.0 Acres	Yes	Located in unincorporated county in Rancho San Diego. College has courses on stormwater and water/wastewater management.	https://gis.sd.gov/planning/Pages/ParcelReport.aspx?APN=7601284600
Bonsall Elementary School	31555 Old River Rd	Bonsall	92003	188.03	3	Lower San Luis Rey	Elementary School	Elementary School	FP 500	22 Acres	Yes	Property includes the Elementary School, School District Offices and Bonsall Community Center.	https://gis.sd.gov/planning/Pages/ParcelReport.aspx?APN=1260702600 https://gis.sd.gov/planning/Pages/ParcelReport.aspx?APN=1263005300
McGrath Family YMCA	12006 Campo Rd	Spring Valley	91978	213.05	2	Lower Sweetwater	Other Recreation	Other Recreation	FP 100/FP 500	11.03 Acres	Yes	Adjacent to river, bike path, commercial shopping center, and county public works facility, but this is a newly developed site, so may not be interested in a major construction project.	https://gis.sd.gov/planning/Pages/ParcelReport.aspx?APN=5061310500
Lakeside's River Park Conservancy	12108 Industry Rd	Lakeside	92040	169.01	2	Lower San Diego River	Open Space Park or Preserve	Open Space Park or Preserve	FW 100/FP 100	100 Acres	Yes	Open space property with multiple creeks and field science station construction in progress	https://gis.sd.gov/planning/Pages/ParcelReport.aspx?APN=3822503300

NAME	ADDRESS	CITY	ZIP CODE	CENSUS TRACT	CENSUS TRACT RATING	WATERSHED	GP EXISTING LAND USE	GP PLANNED LAND USE	FLOOD PLAIN	SIZE	ADDL EVAL	NOTES	PARCEL REPORT
El Cajon SDA - Food Distribution Center	1640 E Madison Ave	El Cajon	92019	164.03	5	Lower San Diego River	Elementary School	Spaced Rural Residential	X	5.98 Acres	Maybe	Property is gated, may not be accessible to the public. Planned land use designation is residential though it is not currently operating as a residential use.	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=5111010800
Rapture's Horse Rescue Foundation	12620 Willow Rd	Lakeside	92040	169.02	4	Lower San Diego River	Spaced Rural Residential	Spaced Rural Residential	FP 500	3.93 Acres	Maybe	Gated, public access issues	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=3920302200
Friends Chapel	8955 Kenwood Drive	Spring Valley	91977	138.01	4	Lower Sweetwater	Religious Facility	Religious Facility	FP 100	1.30 Acres	Maybe	Size of open space on property too small	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=5030902700
Lakeside Water District	10435 Vine St	Lakeside	92040	168.04	4	Lower San Diego River	Communications and Utilities	Communications and Utilities	X	2.33 Acres	Maybe	Next to El Capitan High, and a water agency property.	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=7601410300
Spring Valley Swap Meet	6377 Quarry Rd	Spring Valley	91977	139.03	3	Lower Sweetwater	Wholesale Trade	Light Industry - General	FP 100	15.35 Acres	Maybe	Project already considered by county, pooling water	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=5841600600
Quarry Self Storage	6260 Quarry Rd	Spring Valley	91977	139.03	3	Lower Sweetwater	Public Storage	Public Storage	FP 100	5.02 Acres	Maybe	Should evaluate property ownership, adjacent to quarry trail recently constructed	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=5861802100
Riverview Evangelical Free Church	4980 Sweetgrass Ln	Bonsall	92003	188.03	3	Lower San Luis Rey	Religious Facility	Spaced Rural Residential	FP 500	4.18 Acres	Maybe	Adjacent to large privately gated community and Hwy 76 which may require Caltrans permitting	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=1233804100
Bonsall Preserve	5505 W Lilac Rd	Bonsall	92003	188.03	3	Lower San Luis Rey	Open Space Park or Preserve	Spaced Rural Residential	FP 500	27.36 Acres	Maybe	Mostly natural space/surfaces and not really any buildings or improved surfaces in need of stormwater infrastructure	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=1262300100
Bonsall Community Church	31552 Old River Rd	Bonsall	92003	188.03	3	Lower San Luis Rey	Religious Facility	Religious Facility	FP 500	0.6 Acres	Maybe	Some impervious surfaces/parking lot adjacent to a more natural preserve area	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=1260702100
Rancho San Diego Town Center	2911 Jamacha Rd	Rancho San Diego	92019	213.05	2	Lower Sweetwater	Community Shopping Center	Community Shopping Center	FW 100/FP 100	10 Acres	Maybe	Various commercial tenants, complexity, lots of parking lot	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=5061301600
US Tire Supply	1742 E Madison Ave	El Cajon	92019	164.03	5	Lower San Diego River	Single Family Residential	Spaced Rural Residential	X	< 0.5 Acres	No	Residential property, less than 1 acre, and limited green space	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=5111121000
Greenfield Estates	501 Greenfield Dr	El Cajon	92021	165.04	5	Lower San Diego River	Multi-family Residential	Multi-family Residential	FP 100/FP 500	< 0.5 Acres	No	Residential property, less than 1 acre, and limited green space	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=4831012800
Cabo Verde Apartments	340 Hart Dr # 1	El Cajon	92021	165.04	5	Lower San Diego River	Multi-family Residential	Multi-family Residential	FW 100/FP 100	.99 Acres	No	Limited green space on this property	https://gisssd.sandag.org/plt/ParcelRpt.aspx?APN=4831012800

NAME	ADDRESS	CITY	ZIP CODE	CENSUS TRACT	CENSUS TRACT RATING	WATERSHED	GP EXISTING LAND USE	GP PLANNED LAND USE	FLOOD PLAIN	SIZE	ADDL EVAL	NOTES	PARCEL REPORT
													rrelRpt.aspx?APN=4830812000
Spring Valley Community Church	3310 Bancroft Dr	Spring Valley	91977	138.01	4	Lower Sweetwater	Religious Facility	Religious Facility	FP 100	2.11 Acres	No	Recently completed a GSI project at location	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=5031912100
Valley Tireshop #2	3701 Bancroft Dr	Spring Valley	91977	137.02	4	Lower Sweetwater	Other Retail Trade and Strip Commercia	Light Industry - General	FP 100	.71 Acres	No	Industrial site on less than 1 acre.	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=5043020100
Superior Metal Finish	3617 Bancroft Dr	Spring Valley	91977	137.02	4	Lower Sweetwater	Other Retail Trade and Strip Commercia	Light Industry - General	FP 100	.60 Acres	No	Industrial site on less than 1 acre.	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=5043025400
Greenstone Landcare INC.	9014 Kenwood Dr	Spring Valley	91977	137.02	4	Lower Sweetwater	Other Retail Trade and Strip Commercia	Light Industry - General	FP 100	.56 Acres	No	Industrial site on less than 1 acre.	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=5043025600
American Asphalt and Concrete, Inc.	9011 Memory Lane	Spring Valley	91977	137.02	4	Lower Sweetwater	Other Retail Trade and Strip Commercia	Light Industry - General	FP 100	< 0.5 Acres	No	Industrial site on less than 1 acre. Property is fenced off.	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=5043025300
Homestead Sheetmetal	9031 Memory Lane	Spring Valley	91977	137.02	4	Lower Sweetwater	Other Retail Trade and Strip Commercia	Light Industry - General	FP 100	< 0.5 Acres	No	Industrial site on less than 1 acre.	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=5043025200
Buchmann Bakery & Restaurant Supply Distributor	11106 Moreno Ave	Lakeside	92040	169.02	4	Lower San Diego River	Intensive Agriculture	Spaced Rural Residential	FW 100/FP 100	2.76 Acres	No	Parking lot, already some landscaping	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=3772714500
Scripps Mesa RV Storage	12238 Vigilante Rd	Lakeside	92040	169.02	4	Lower San Diego River	Extractive Industry	Light Industry - General	FP 100	2.45 Acres	No	Fenced off- public access issues	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=3750403600
Vista Paint El Cajon	1220 N Magnolia Ave	El Cajon	92020	162.02	4	Lower San Diego River	Industrial Park	Industrial Park	FP 100	2.36 Acres	No	Broadway Creek Channel as part of their property	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=4830226400
JB Construction & Renovations	204 Greenfield Dr Suite B	El Cajon	92020	162.02	4	Lower San Diego River	Industrial Park	Industrial Park	FP 100	6.29 Acres	No	Broadway Creek Channel as part of this property	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=4830226800
DS Waters of America	11811 CA-67	Lakeside	92040	169.01	2	Lower San Diego River	Intensive Agriculture	Spaced Rural Residential	FW 100/FP 100	67.94 Acres	No	Somewhat remote area on private property	https://gis.sd.gov/pl/Pa rcelRpt.aspx?APN=3751800200