

## Appendix 4.A

### Structural Control Measure Fact Sheets

BMP Fact Sheets were developed for each subcategory of structural BMPs. Each BMP Fact Sheet further details BMP functions, design variations, and typical design components. A relative performance gauge is used to display the BMP performance functions for each subcategory.

### 4.A.1 BMP Fact Sheets for Regional BMPs

Regional BMPs are constructed structural practices intended to treat runoff from a contributing area of multiple parcels (normally on the order of 10s or 100s of acres or larger). Regional practices include *infiltration facilities* that promote groundwater recharge and *detention facilities* that encourage settling. Infiltration and detention regional BMPs can be either constructed as open-surface basins or subsurface galleries. Regional practices also include *constructed wetlands*, which use engineered wetland environments to encourage pollutant removal, and *treatment facilities*, which use either conventional or innovative treatment processes to target pollutants of concern or divert flows to sanitary sewer.

## Infiltration Facilities (Regional BMP)

Infiltration facilities are designed to decrease runoff volume through groundwater recharge and improve water quality through filtration and sorption. Facilities can incorporate engineered medias to improve percolation into native soils. Infiltration facilities can be open-surface basins or subsurface galleries.

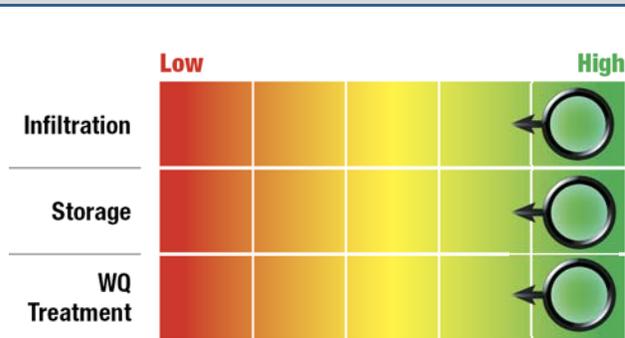


Surface Infiltration Basin



Subsurface Infiltration Gallery

### BMP Performance Functions



### Design Variations

Several design variations include:

- **Surface Infiltration Basins:** depressions designed to infiltrate stormwater into the subgrade soils. Facilities can be vegetated to encourage evapotranspiration and aesthetics. Also known as spreading grounds.
- **Subsurface Infiltration Galleries:** underground storage systems designed to infiltrate stormwater into subgrade soils. Subsurface systems are used when limited area is available for BMP implementation.

### Typical Design Components

Figure 4.A-1 presents a typical design and highlights potential design variations:

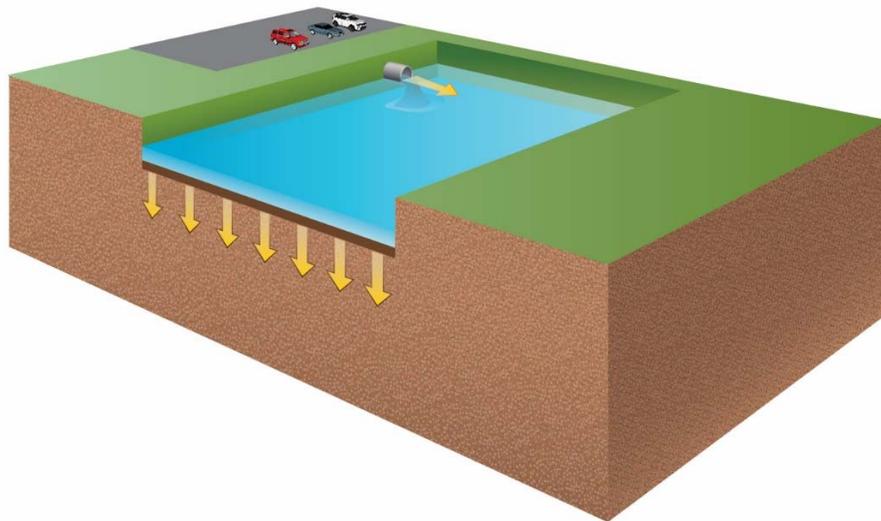


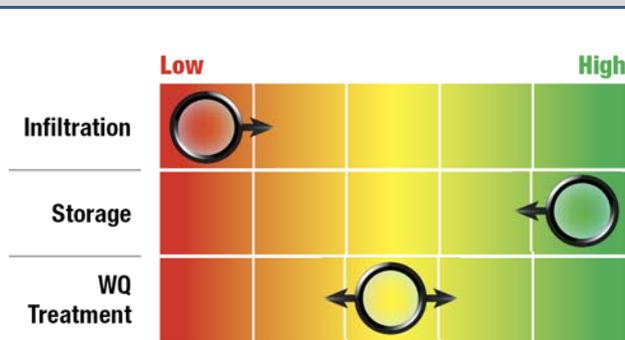
Figure 4.A-1. Typical regional infiltration facility schematic (arrows indicate water pathways).

## Detention Facilities (Regional BMP)

Detention facilities are designed to detain runoff and improve water quality through pollutant settling. Facilities encourage settling by decreasing runoff flow rates and allowing ponding to occur. Detention facilities can be open-surface practices or subsurface galleries and can be dry during non-rainy seasons or wet year-round.



### BMP Performance Functions



### Design Variations

Several design variations include:

- **Surface Detention Basins:** basins designed to detain stormwater runoff for a specified time to allow sedimentation of particle-bound pollutants. Surface systems can have permanent pools or fully drain between storms.
- **Subsurface Detention Galleries:** underground storage systems designed to detain stormwater. Subsurface systems are used when limited area is available for BMP implementation.

### Typical Design Components

Figure 4.A-2 presents a typical design and highlights potential design variations:

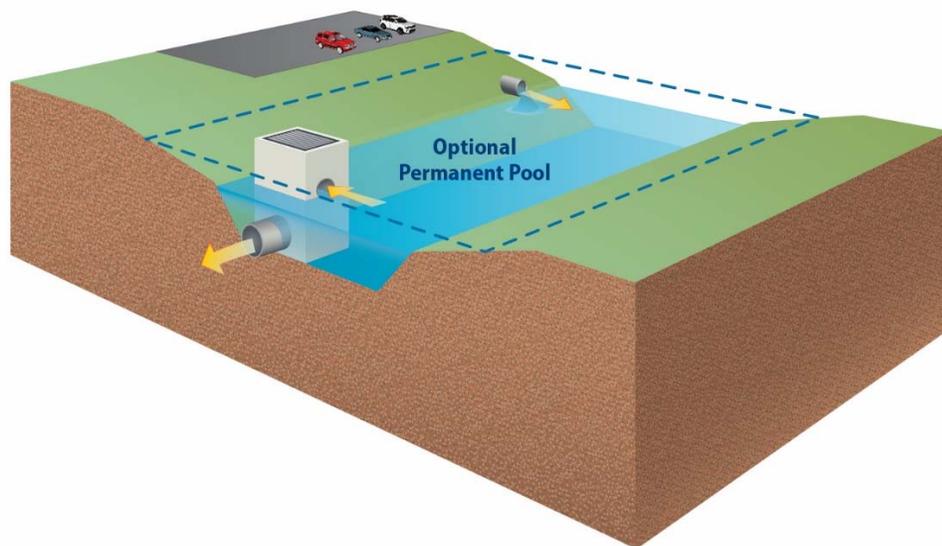


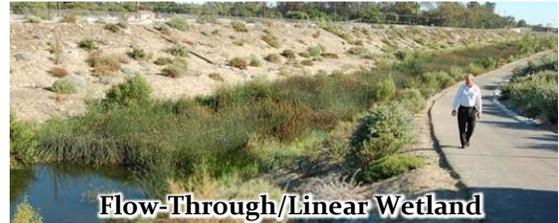
Figure 4.A-2. Typical regional detention facility schematic (arrows indicate water pathways).

## Constructed Wetlands (Regional BMP)

Constructed wetlands are engineered, shallow-marsh systems designed to control and treat stormwater runoff. Particle-bound pollutants are removed through settling, and other pollutants are removed through biogeochemical activity. Constructed wetlands must always maintain a baseflow into the system, which can come from an intersected groundwater or an associated low-flow diversion utilizing dry-weather flows.

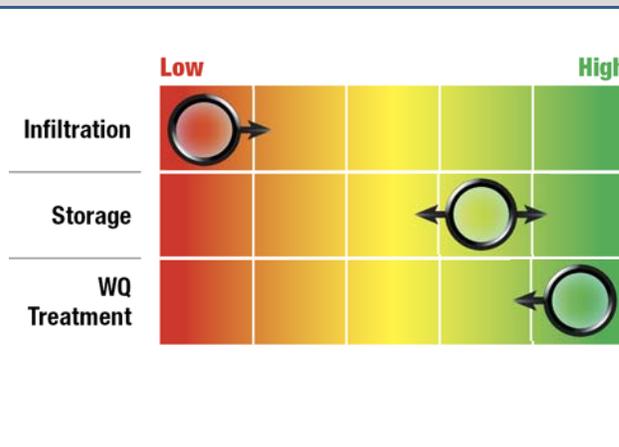


Wetland Basin



Flow-Through/Linear Wetland

### BMP Performance Functions



### Design Variations

Several design variations include:

- **Wetland Basins:** basins with shallow permanent pools and a temporary shallow ponding zone. An outlet control structure typically regulates dewatering of the temporary storage volume.
- **Flow-through/Linear Wetlands:** wetlands that provide treatment as water passes through a long flow path. These wetlands are typically constructed parallel to existing channels such that water can be easily diverted.

### Typical Design Components

Figure 4.A-3 presents a typical design and highlights potential design variations:

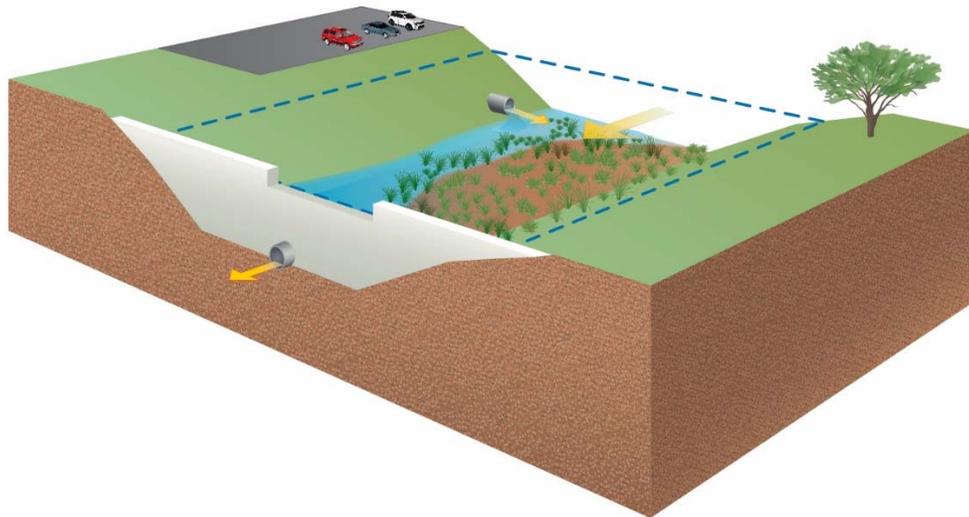


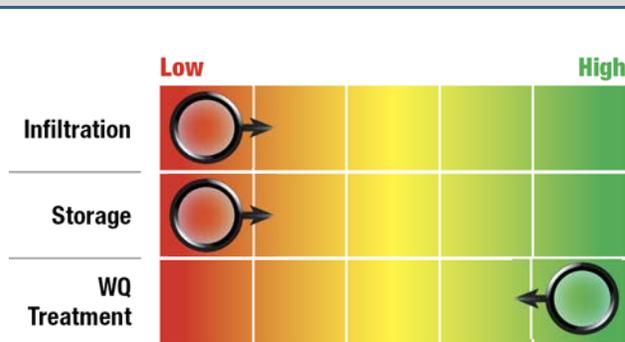
Figure 4.A-3. Typical regional constructed wetland schematic (arrows indicate water pathways).

## Treatment Facilities (Regional BMP)

Other regional water quality technology falls into the *treatment facilities* subcategory. These systems typically divert flow from engineered channels to a treatment facility. Water is treated using physical, chemical, or radiological processes and is then used to offset potable water supply, returned to the original channel, or discharged to the treatment plant outfall.



### BMP Performance Functions



### Design Variations

Treatment facilities design variations include:

- **Low Flow Diversion:** a design flow rate (typically dry weather flow) is diverted from the storm drain to a sanitary sewer for treatment.
- **Treatment and Return:** water is pumped or conveyed by gravity from a channel to a small-scale wastewater treatment facility where it is treated and discharged back into the original channel. Sometimes a portion of treated water can be diverted for reuse.

### Typical Design Components

Figure 4.A-4 presents a typical design and highlights potential design variations:

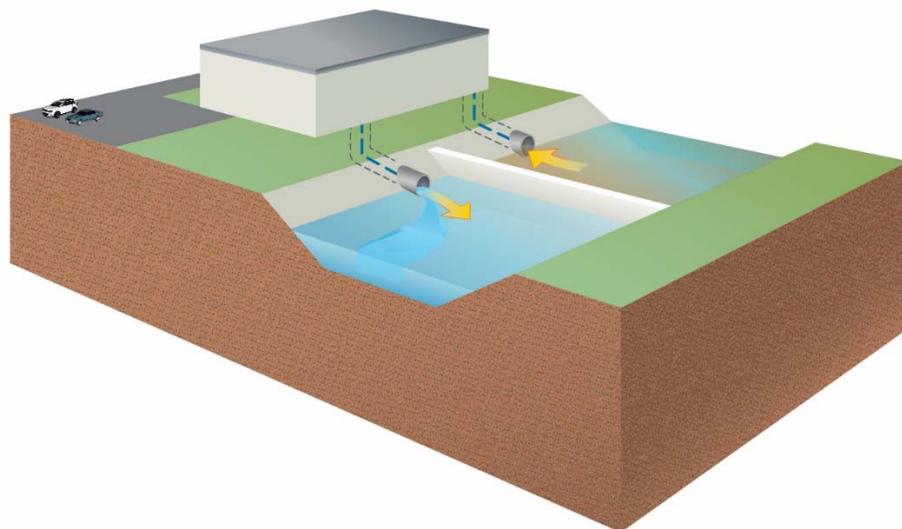


Figure 4.A-4. Typical regional treatment facility schematic (arrows indicate water pathways; a low flow diversion would direct flow to the nearby sanitary sewer).

## 4.A.2 BMP Fact Sheets for Distributed BMPs

Distributed BMPs are constructed structural practices intended to treat runoff relatively close to the source and typically implemented at a single- or few-parcel level (normally less than one acre). As described in the following BMP Fact Sheets, distributed BMPs include the following subcategories:

- Site-scale detention facilities
- Green infrastructure
- Flow-through treatment BMPs
- Source control structural BMPs

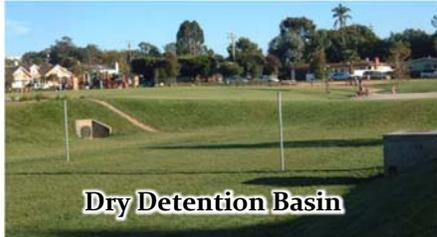
A major subcategory of distributed BMPs is *green infrastructure*. The Permit specifies that EWMPs should “incorporate effective technologies, approaches and practices, including green infrastructure.” The primary goal of distributed green infrastructure BMPs is to intercept and treat runoff near its source using resilient natural systems. As opposed to traditional *gray infrastructure*, green infrastructure relies on contact between runoff, soils, and vegetation to accomplish volume and pollutant reduction. Green infrastructure has been shown to cost-effectively reduce the impacts of wet-weather flows while also reducing BMP maintenance requirements (Kloss et al. 2006). In addition, green infrastructure can provide multiple benefits to the surrounding community, including increased property values, increased enjoyment of surroundings and sense of well-being, increased safety, and reduced crime rate (Ward et al. 2008; Shultz and Schmitz 2008; Wolf 2008; Northeastern Illinois Planning Commission 2004; Hastie 2003; Kuo 2003; Kuo et al. 2001a; Kuo et al. 2001b; Wolf 1998).

Structural BMPs incorporated into the green infrastructure subcategory include the following, as described in the BMP Fact Sheets below:

- Bioretention and biofiltration
- Permeable pavement
- Green streets
- Bioswales
- Infiltration BMPs
- Rainfall harvest (green roofs, cisterns and rain barrels)

## Site-Scale Detention (Distributed BMP)

Site-scale detention facilities are designed to detain runoff from an individual parcel and improve water quality through pollutant settling. Site-scale detention facilities can reduce peak flows and improve water quality by storing water in a basin before slowly draining the water through an orifice to the downstream waterway. Settling of sediment and sediment-bound pollutants is the primary pollutant removal mechanism.

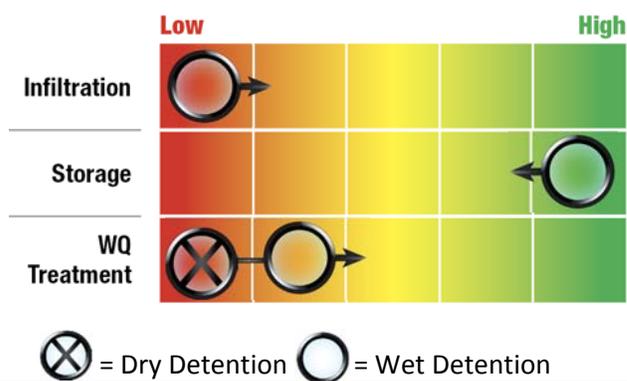


Dry Detention Basin



Wet Detention Pond

### BMP Performance Functions



### Design Variations

Several design variations include:

- **Dry Detention Basins:** Runoff ponds on the basin surface and fully drains between storm events. The drawdown orifice is located at the bottom of the basin.
- **Wet Detention Pond:** Runoff is captured in a temporary storage zone above a permanent pool. The drawdown orifice sets the depth of the permanent pool.
- **Detention Chambers:** Subsurface chambers or vaults designed to detain captured runoff.

### Typical Design Components

Figure 4.A-5 presents a typical design and highlights potential design variations:

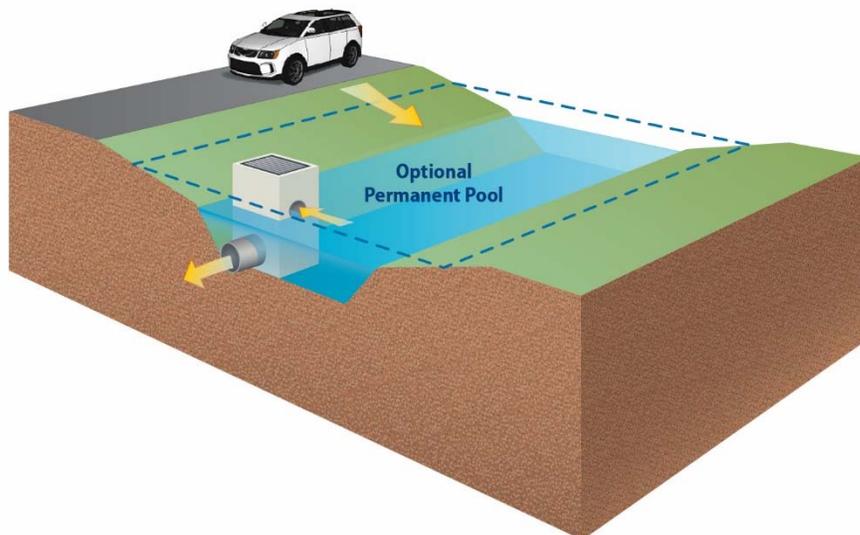


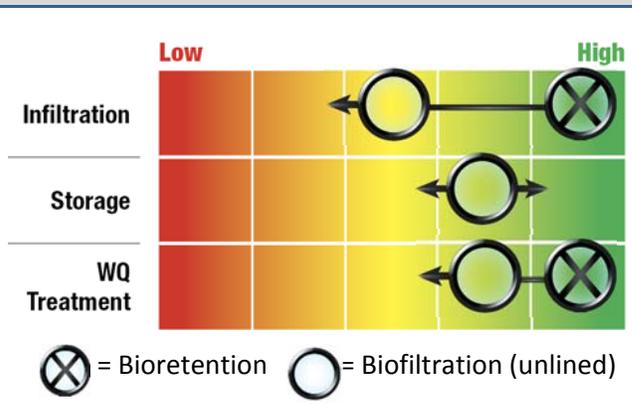
Figure 4.A-5. Typical distributed site-scale detention schematic (arrows indicate water pathways).

## Bioretention and Biofiltration (Green Infrastructure BMP)

Bioretention and biofiltration are vegetated BMPs designed to capture and filter stormwater runoff through a soil layer. Following filtration, treated runoff infiltrates underlying soils (bioretention), or, if the subgrade has poor permeability, exits through an underdrain to the downstream conveyance network (biofiltration). Vegetation can enhance biological treatment processes.



### BMP Performance Functions



### Design Variations

- Several design variations include:
- **Bioretention:** shallow, depressed, vegetated basins with permeable soil media. Runoff temporarily ponds on the surface before filtering through the soil. Bioretention does not include underdrains.
  - **Biofiltration:** bioretention areas with underdrains. Infiltration is considered incidental, although substantial infiltration can occur in some unlined systems.

### Typical Design Components

Figure 4.A-6 presents a typical design and highlights potential design variations:

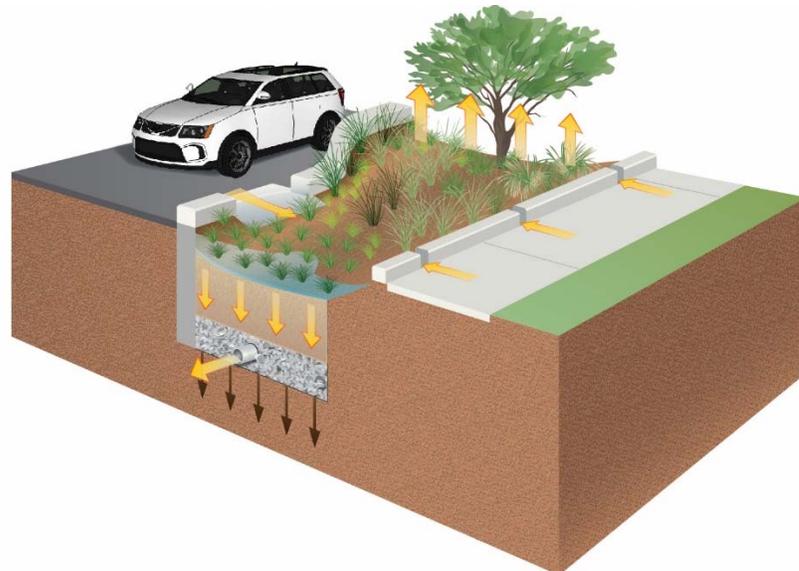
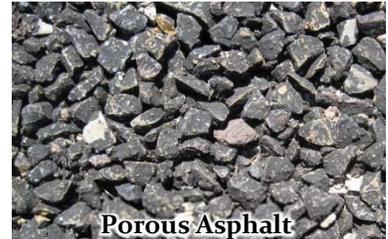


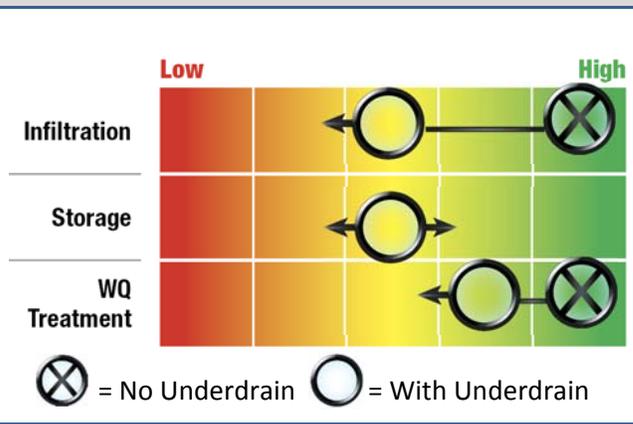
Figure 4.A-6. Typical distributed bioretention and biofiltration schematic showing underdrain option (arrows indicate water pathways).

## Permeable Pavement (Green Infrastructure BMP)

Permeable pavement is a stable load-bearing surface that allows for stormwater infiltration. Beneath the permeable surface is a crushed-rock reservoir that provides structural support while allowing runoff to percolate to the underlying soils. Permeable pavement can be fully infiltrating or can have an underdrain like bioretention and biofiltration practices, respectively?



### BMP Performance Functions



### Design Variations

Several design variations include:

- **Pervious Concrete:** fines are excluded from typical concrete aggregate to create permeable void space within the section.
- **Porous Asphalt:** fines are excluded from typical hot-mix asphalt to create pores within the section.
- **Permeable Interlocking Concrete Pavers:** Pavers that allow infiltration of rainwater through joints between the blocks.

### Typical Design Components

Figure 4.A-7 presents a typical design and highlights potential design variations:

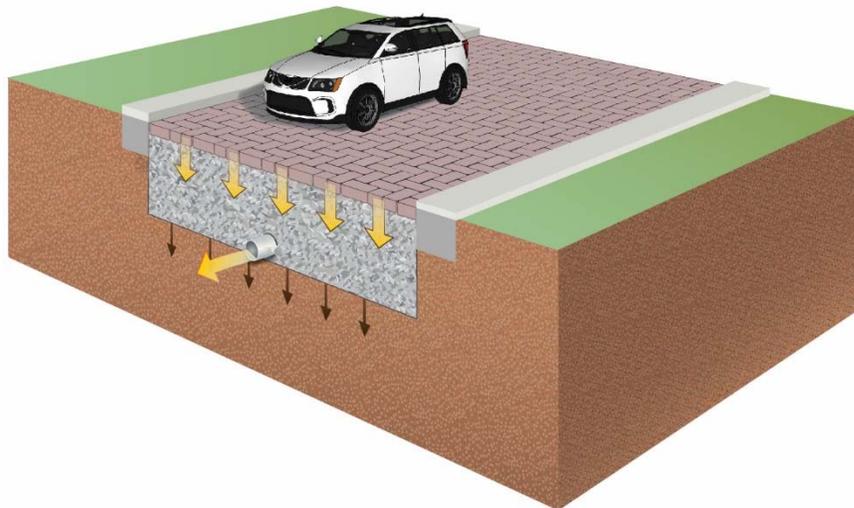


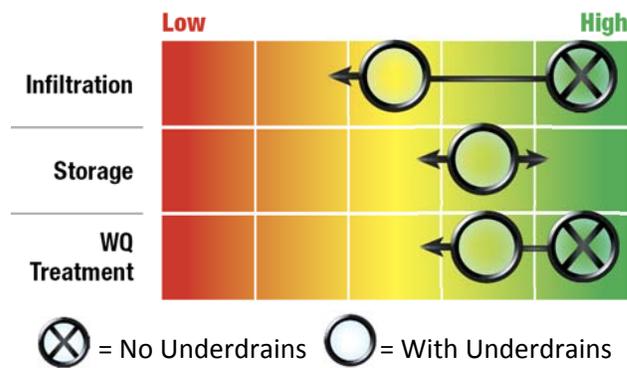
Figure 4.A-7. Typical distributed permeable pavement schematic showing underdrain option (arrows indicate water pathways).

## Green Streets (Green Infrastructure BMP)

Green streets are systems of multiple BMPs arranged in a linear fashion within the street right-of-way (as opposed to a parcel-based implementation). Green streets are designed to reduce runoff and improve water quality for the runoff from the roadway and adjacent parcels. Bioretention, biofiltration, and permeable pavement BMPs are commonly used in conjunction and can be hydraulically connected using subsurface stone reservoirs.



### BMP Performance Functions



### Design Variations

Green streets can feature several design variations. Some common features include:

- **Linear Bioretention/Biofiltration:** BMPs can be incorporated as linear systems between the road and parcel to intercept runoff from both roadways and properties.
- **Curb Extensions:** bioretention/biofiltration BMPs “bumpouts” can intercept gutter flow.
- **Permeable Parking Lanes:** street parking can be designed with permeable pavement to intercept roadway runoff.

### Typical Design Components

Figure 4.A-8 presents a typical design and highlights potential design variations:



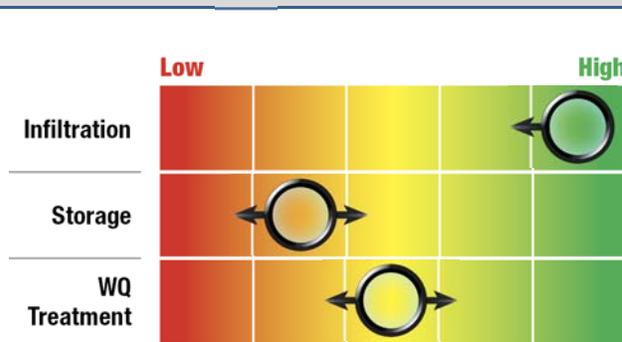
Figure 4.A-8. Typical distributed green street schematic (arrows indicate water pathways).

## Infiltration BMPs (Green Infrastructure BMP)

Infiltration BMPs capture and infiltrate runoff into underlying soils. Runoff is typically stored in subsurface trenches or pits filled with engineered soil media, gravel, or concrete chambers. Some infiltration BMPs that inject water into subsurface reservoirs are considered class V injection wells and must be registered as such. Infiltration BMPs are unvegetated (see Bioretention for vegetated practices).



### BMP Performance Functions



### Design Variations

Several design variations include:

- **Infiltration Trench:** a media-filled trench that captures runoff in the pore space of gravel or soil prior to infiltration.
- **Dry/Wet Well:** a gravel-surrounded vault with perforated walls that receives runoff from a pipe and allows direct infiltration into the ground.
- **Rock Well:** a gravel-filled pit that receives runoff from a pipe. This BMP is essentially a dry well without a concrete vault.

### Typical Design Components

Figure 4.A-9 below presents a typical design and highlights potential design variations:



Figure 4.A-9. Typical distributed infiltration BMP schematic showing perforated concrete dry well variation (arrows indicate water pathways; for infiltration trenches, see Figure 4.A-6 and omit vegetation).

## Bioswales (Green Infrastructure BMP)

Bioswales are practices that convey uniform sheet flow through vegetated, shallow depressions to remove sediment-associated pollutants by settling and straining. Infiltration and filtration through soil media are not key components of bioswales; rather, bioswales are typically implemented to act as pretreatment and used to transport runoff to an associated structural BMP.

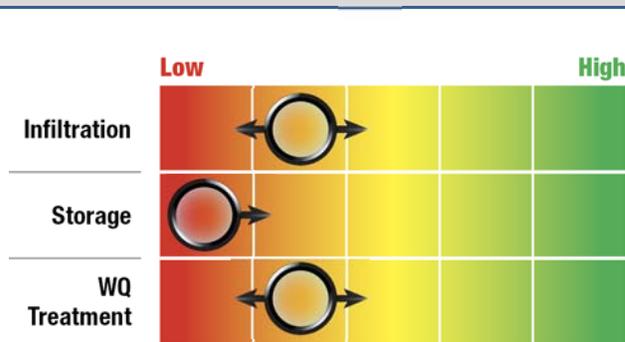


Vegetated Swale



Vegetative Filter Strip

### BMP Performance Functions



### Design Variations

Several design variations include:

- **Vegetated Swale:** linear, vegetated channels used to convey concentrated flow from the contributing area to a structural BMP. Check dams can be added in areas of steep slopes or to further decrease the flow rates and spread the runoff over a larger area.
- **Vegetative Filter Strip:** broad-sloped, vegetated areas used to convey sheet flow from the contributing area to a structural BMP or other conveyance channel.

### Typical Design Components

Figure 4.A-10 presents a typical design and highlights potential design variations:

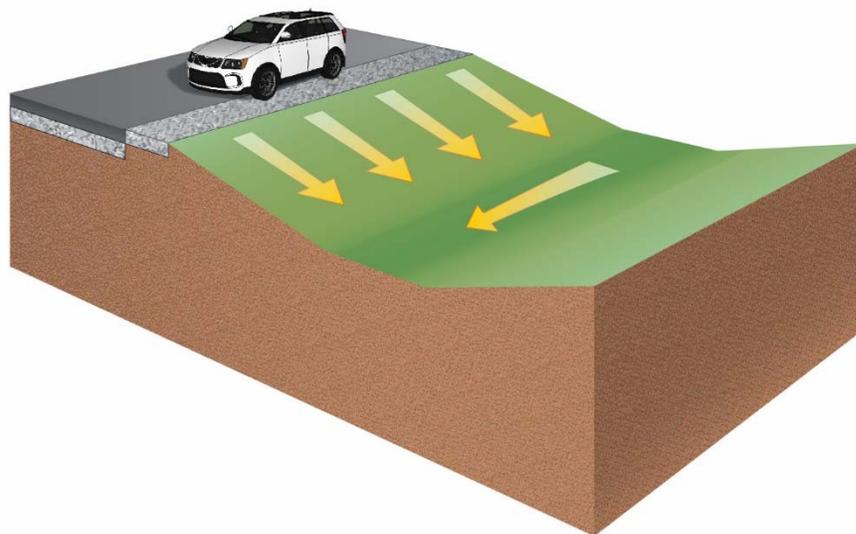


Figure 4.A-10. Typical distributed bioswale schematic (arrows indicate water pathways).

## Rainfall Harvest (Green Infrastructure BMP)

The primary goal for rainfall harvest is improving water quality by intercepting rooftop runoff and lowering the overall impervious impact of a developed site. Runoff can be reduced through interception and evapotranspiration on green roofs or used for alternative uses with a cistern or rain barrel.

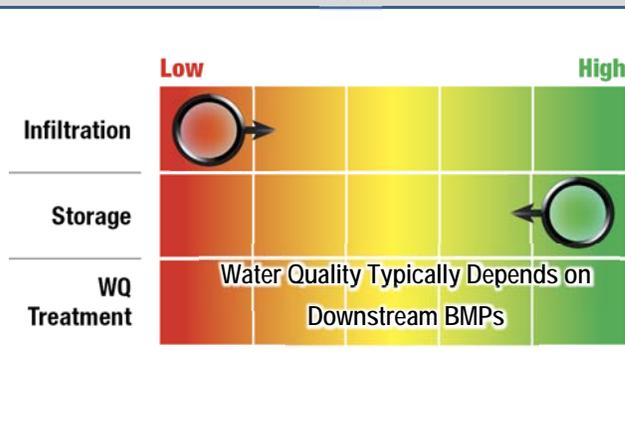


Green Roof



Cistern

### BMP Performance Functions



### Design Variations

Several design variations include:

- **Green Roof:** engineered, vegetated roof structures intended to intercept rainfall in a growing medium. Rooftop detention can be incorporated if structures allow.
- **Cisterns and Rain Barrels:** storage tanks used to intercept and store rooftop runoff. Captured runoff can be reused to offset non-potable water uses such as irrigation and toilet flushing. Alternatively, stored water can be slowly released to a pervious surface.

### Typical Design Components

Figure 4.A-11 presents a typical design and highlights potential design variations:

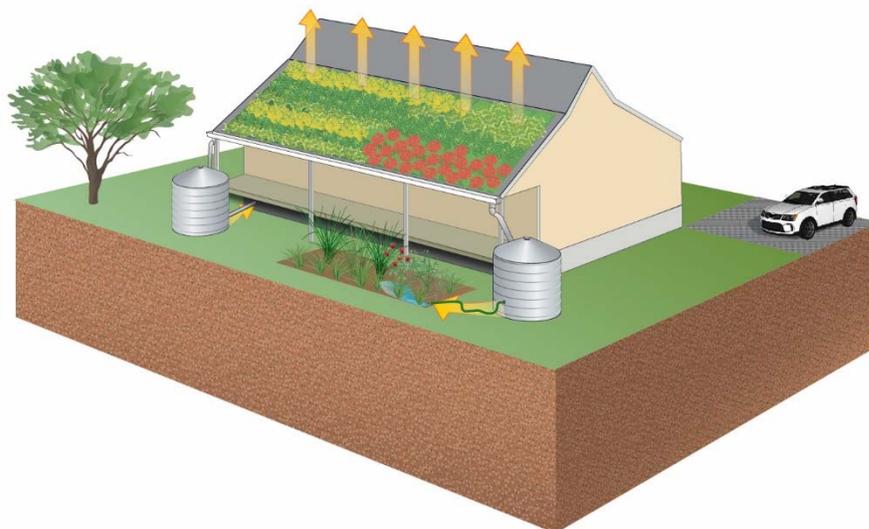


Figure 4.A-11. Typical distributed rainfall harvest schematic (arrows indicate water pathways).

## Flow-Through Treatment BMP (Distributed BMP)

Manufactured flow-through devices are commercial products that aim to provide stormwater treatment using patented, innovative technologies. Typical types of manufactured devices for stormwater management include cartridge filters, media filters, and high-flow biotreatment devices.



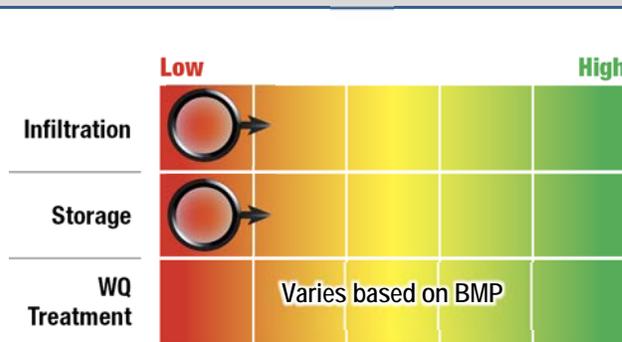
Media/Cartridge Filter



High-Flow Biotreatment

(photo source: Jonathan Page, NCSU-BAE)

### BMP Performance Functions



### Design Variations

Several design variations include:

- **Media/Cartridge Filters:** proprietary filtration devices used to remove pollutants.
- **High-Flow Biotreatment Device:** modular, vault-type practices containing high-flow media. Typically incorporate vegetation.

### Typical Design Components

Figure 4.A-12 presents a typical design and highlights potential design variations:

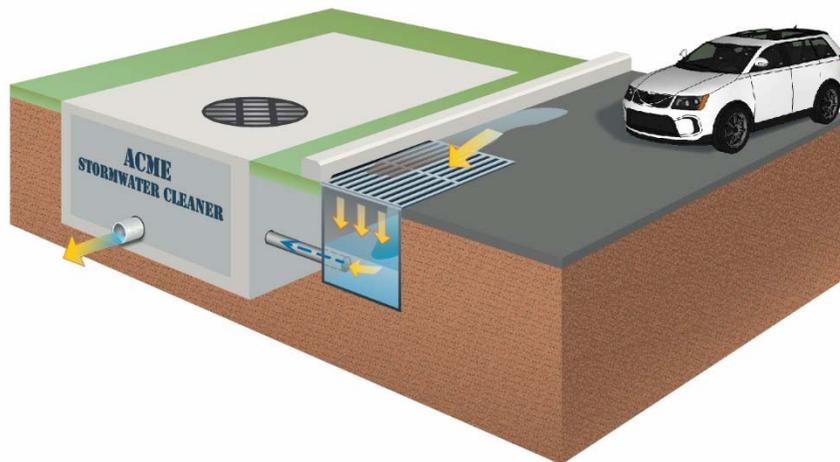


Figure 4.A-12. Typical distributed flow-through treatment BMP schematic (arrows indicate water pathways).

## Source Control Structural BMPs (Distributed BMP)

Source control structural BMPs are commercial products designed to treat runoff in highly urbanized environments. Mechanical separation, or more complex physicochemical processes, provides separation of gross solids and other pollutants. Many models feature media or materials designed to sequester hydrocarbons and other pollutants. Also includes trash full-capture devices.



Catch Basin Insert

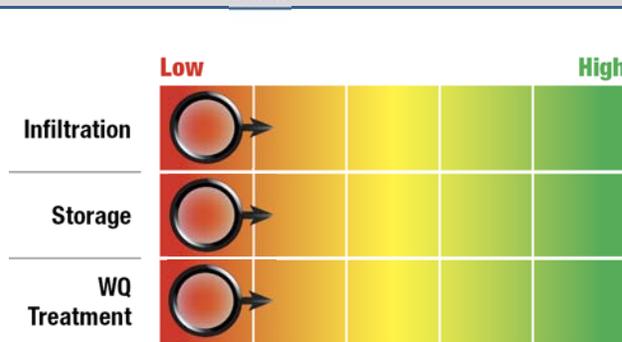


Hydrodynamic Separator



Catch Basin Insert

### BMP Performance Functions



### Design Variations

Several design variations include:

- **Hydrodynamic Separators:** mechanical devices that use screens, baffles, and/or vortical flow to separate sediment and gross solids.
- **Catch Basin Inserts:** inserts that use nets, screens, fabric, and/or filtration media to gross solids, fine sediments, oils, and/or grease from runoff entering a catch basin.

### Typical Design Components

Figure 4.A-13 presents a typical design and highlights potential design variations:



Figure 4.A-13. Typical distributed source control structural BMP (arrows indicate water pathways).

## Appendix 4.B

# Regional Project Site Selection Process



## Appendix 4.C

# Engineering and Feasibility for Signature Regional Projects



DRAFT TECHNICAL MEMORANDUM

# ENGINEERING AND ENVIRONMENTAL FEASIBILITY FOR SELECTED REGIONAL PROJECT SITES

PREPARED FOR

Upper Los Angeles River Watershed  
Management Group

FEBRUARY 2015



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Appendix B – Field Investigation Findings

Appendix C – Optimization Results by Tetra Tech

Appendix D – Project Site Maps with BMP Opportunity Area

Appendix E – Tributary Drainage Area Maps per Project

Appendix F – Cost Data (to be provided in Final Memo)

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## 1 Background

The purpose of this technical memorandum is to describe the findings of the additional engineering and environmental feasibility reviews of the eight regional project sites selected by the Upper Los Angeles River (ULAR) Watershed Management Group (WMG). The selection of these project sites is documented in *Regional Project Section Process and Preliminary List of Projects*, October 2014. The concepts developed for these project sites will be included in the Enhanced Watershed Management Plan (EWMP) to be submitted to the Regional Water Quality Control Board (Regional Board) in June 2015.

The following sections present the methodology employed to evaluate the eight regional project locations for engineering and environmental feasibility.

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## 2 Evaluation Methodology

The eight selected ULAR project sites underwent further evaluations to determine the engineering and environmental feasibility of constructing regional best management practice (BMP) projects at these locations. Evaluations included various desktop analyses, field investigations, hydrologic modeling, and discussions with project stakeholders. The evaluation methodology is summarized in the following sections.

### 2.1 COMPILE MAPPING, STORM DRAINAGE, AND WATERSHED INFORMATION

Initial evaluation efforts focused on compiling information on the surrounding storm drain system and contributing watershed area for each project site. Storm drain data was obtained from the City of Los Angeles's geographic information system (GIS) data, GIS data from Los Angeles County, as-built record drawings provided on NavigateLA, and other as-built record drawings provided by individual member agencies. NavigateLA is a web-based mapping application that delivers maps and reports based on data supplied by various City departments, Los Angeles County, and Thomas Brothers maps. Storm drain sizes and invert elevations were noted from the available data. This assessment of the surrounding storm drain network provided insight into the typical flow volumes experienced and the feasibility of intercepting the flows at the project locations. Storm drain connectivity upstream of the project sites was also reviewed in conjunction with available contour data. This analysis led to identifying the contributing watershed area, or drainage area, for each project site.

Detailed information compiled from this initial desktop evaluation, such as relevant storm drain depths and critical watershed divides, was plotted on maps suitable for review during the field investigations.

### 2.2 CONDUCT DESKTOP EVALUATION OF INFILTRATION POTENTIAL

A desktop evaluation of the infiltration potential of all of the sites was conducted utilizing Natural Resource Conservation Service (NRCS) soil data made available by the County of Los Angeles. The spatial dataset identified the soil class and soil type for all areas within Los Angeles County. NRCS-accepted infiltration rates were assumed for each soil type and used to calculate a single aggregate infiltration rate for each project site. This aggregate infiltration rate was calculated by multiplying the accepted infiltration rate for each soil type by the percent of total area of that soil type within the project site. The results of this soils analysis are summarized below in Table 2.2-1. Further details are provided in Appendix A.

**Table 2.2-1 Infiltration Analysis Summary**

<b>Project Site ID</b>	<b>Site Description</b>	<b>Aggregate Infiltration Rate (in/hr)</b>
AL01	Alhambra Golf Course	0.70
GL01	Freemont Park	0.30
LAC01	Roosevelt Park	0.30
MP01	Sierra Vista Park	0.30
SF01	San Fernando Regional Park	0.80
SM01	Lacy Park	0.39
SP01	Lower Arroyo Park	0.80
NHP	North Hollywood Park	0.80

### **2.3 CONDUCT FIELD INVESTIGATIONS TO ASSESS INITIAL OPPORTUNITY AREAS**

Field investigations for the eight selected ULAR project sites were conducted over two days on January 7 and January 8, 2015. All site visits were attended by City of Los Angeles staff and engineering consulting team members from Black & Veatch. The site visit schedule was shared with WMG members prior to the visiting days. WMG members were invited to and encouraged to attend any or all site visits.

The primary objective of the field investigations was to identify the most practical project opportunity areas given each project site's existing layout and facilities. Project opportunity areas refer to a sub-area(s) within the selected project site boundary that can best accommodate the construction or implementation of the proposed BMP. In general, project opportunity areas avoided spaces posing constructability issues; established facilities such as lighted, fenced tennis courts; or environmental issues such as disturbing mature heritage trees. Findings of these field investigations for each project site are presented in the project concepts, site maps, and calculations provided in Section 3.

The project team prepared several documents that describe the findings of the field investigations, including Field Investigation Notes, Initial Study/Environmental Constraints Evaluation, and a Summary of Environmental Constraints. These documents are provided in Appendix B.

### **2.4 COMPILE SITE DATA AND DEVELOP BASIC BMP PARAMETERS**

Findings from the field investigations were distributed to and discussed with WMG members. Follow-up discussions were conducted as necessary to continue to refine project concepts and define basic BMP parameters. These basic parameters included the type of BMP, available BMP capacity or volume, and the expected runoff volume.

The type of BMP proposed at each project site falls into one of the structural BMP subcategories based on its major function. The subcategories and example BMP types are listed below. BMP types for each project site were selected based on the findings from the desktop analyses and field

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investigations, and input from project stakeholders. The proposed BMP type for each site is described in Section 3.

- Infiltration BMP – surface infiltration basin, subsurface infiltration gallery
- Detention BMP – surface detention basin, subsurface detention gallery
- Constructed Wetland BMP – constructed wetlands, flow-through/linear wetland
- Treatment Facility BMP – facilities designed to treat runoff from and return it to the receiving water
- Low Flow Diversion BMP – facilities designed to divert dry weather flows to the sanitary sewer

The available BMP capacity or volume was calculated based on the estimated BMP depth and project opportunity area (or BMP footprint) at each project site. BMP depths were identified based on groundwater level and practical depth per BMP type. The City provided 10-foot groundwater contour data which was used to identify the approximate groundwater elevation within the BMP opportunity areas. A minimum of a 5-foot buffer was assumed between the groundwater elevation and bottom of BMP. The proposed opportunity area at each site was reviewed with project stakeholders and thus was carried forward in the available BMP volume calculations. The identified BMP depth was multiplied by the opportunity area to estimate a maximum practical BMP volume available for each project site. This volume will be used to retain, infiltrate, or treat stormwater runoff. BMP estimated depths, opportunity areas, and available volume calculations are presented for each project site in Section 3.

In order to determine if the available BMP volume at each project site is adequate to meet the Municipal Separate Storm Sewer System (MS4) Permit requirements, the 85<sup>th</sup> percentile runoff volume had to be determined for each project site and compared to the feasible BMP capacity. Runoff volumes were estimated using a hydrologic model and providing drainage area parameters for each site. Findings from previous desktop analyses and field investigations showed that most sites appeared to have a larger watershed area tributary to the site (by intercepting flow in a channel or larger pipe), as well as a somewhat smaller tributary watershed area (by intercepting flow in a smaller pipe). Thus, a maximum drainage area and an alternative (or minimum) drainage area were identified for all sites.

For four of the project sites, the identified maximum drainage area was situated on or near receiving waters in the ULAR watershed. Receiving waters in the ULAR watershed include Bell Creek, McCoy-Dry Canyon Creek, Brown's Canyon Wash, Los Angeles River Reach 6, Aliso Wash, Bull Creek, Tujunga Wash, Burbank Western Channel, Verdugo Wash, Arroyo Seco, Los Angeles River Reach 2, Rio Hondo, and Compton Creek. In accordance with the MS4 Permit, BMP projects should not divert receiving waters. The recommended projects in this technical memorandum avoid diverting flows from Alhambra Wash, Arcadia Wash, Eaton Wash, and Santa Anita Wash. As a result, the maximum drainage areas for the four sites situated on or near receiving waters were not considered for BMP sizing. These four project sites are: Freemont Park (GL01), San Fernando (SF01), Lower Arroyo Park (SP01), and North Hollywood Park (NHP).

The hydrologic model was run to estimate the 85<sup>th</sup> percentile runoff volume for each project site using both maximum and alternative drainage areas, if applicable. The maximum and alternative drainage areas, and associated 85<sup>th</sup> percentile runoff volumes, are presented for each site in Section

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3. In many cases, the entire design storm for the maximum watershed area could be accommodated with the proposed BMP size; however, in other cases, the smaller watershed area did not fully utilize the BMP size. These results were discussed with the team and a scheme was developed to determine the optimal BMP size for each project site. This optimization process is described in the next section.

## **2.5 REFINE AND OPTIMIZE BMP PARAMETERS**

The hydrologic modeling approach utilized in this engineering and environmental feasibility analysis to optimize BMP parameters was discussed and confirmed with the WMG members. Under this approach, the hydrologic model was used to determine the 85<sup>th</sup> percentile peak flow resulting from the maximum drainage area and alternative drainage area for each project site. The model also considered a range of diversion scenarios in an effort to optimize the proposed BMP volume at each site. The hydrologic model was used to simulate the following diversion scenarios for both maximum and alternative drainage areas for each project site:

- Routing all flow through the proposed BMP
- Routing only the 85<sup>th</sup> percentile 24-hour storm event through the proposed BMP
- Routing flows from a 20 cubic feet per second (cfs) diversion through the proposed BMP

Routing the various storm sizes through the model allows project stakeholders to make more informed decisions to optimize the benefits of the proposed BMPs. For instance, a BMP that can accommodate all of the flow from its drainage area may be larger than required by the MS4 Permit, but it may take advantage of economy of scale construction costs and provide greater watershed benefits. On the other hand, if sizing limitations prevent a proposed BMP from being able to receive the 85<sup>th</sup> percentile storm event as required by the MS4 Permit, it can still provide the benefits of a regional BMP project, but at a smaller scale. A 20 cfs diversion was assumed to define the lower limit of the diversion scenarios as it generally represents a maximum realistic pumped flow rate.

Based on the available volume of the proposed BMP and the runoff volume estimated for the three diversion scenarios (for both maximum and alternative drainage areas, if applicable), a maximum cost-effective BMP size was determined for each project site. Full graphical and tabular results of the optimization are presented in Appendix C. A summary of the optimization parameters and recommendations for each project site are presented in Section 3.

### 3 Project Concepts

Concepts for the eight regional project sites are presented in this section. The following items are included for each project site:

- A fact sheet with a summary description of the recommended BMP project; BMP parameters; and a description of potential benefits
- A figure showing a plan view of the project site, showing the identified BMP opportunity area(s) and surrounding storm drain infrastructure
- A figure showing a plan view of the maximum and alternative drainage areas delineated for the project site, if applicable

The fact sheet for each project site includes a table summarizing key design parameters for the BMP. The items presented in the summary tables are defined below.

<b>Project Site Parameters</b>	<b>Total (Maximum) Drainage Area</b>	The area in acres of the maximum drainage area delineated for each project site. This parameter was not considered for the four sites located on or near receiving waters. The drainage area delineation is described in Section 2.
	<b>Alternative (Minimum) Drainage Area</b>	The area in acres of the alternative drainage area delineated for each project site. The drainage area delineation is described in Section 2.
	<b>Maximum Required BMP Volume</b>	The BMP volume in acre-feet that is required to retain the 85 <sup>th</sup> percentile design storm volume generated from the maximum drainage area. This parameter was not considered for the four sites located on or near receiving waters.
	<b>Alternative Required BMP Volume</b>	The BMP volume in acre-feet that is required to retain the 85 <sup>th</sup> percentile design storm volume generated from the alternative drainage area.
	<b>Groundwater Depth</b>	The groundwater depth in feet from the ground surface. Groundwater depths were determined using groundwater contours and ground elevation GIS data provided by the City.
<b>BMP Design Parameters</b>	<b>BMP Opportunity Area</b>	The area in acres of the BMP opportunity area(s) identified during the field investigations and follow-up discussions. This process is described in Section 2.
	<b>Recommended Maximum BMP Depth</b>	The depth in feet of the recommended BMP project. This depth is based on groundwater depth and practical project design characteristics, as discussed in Section 2.
	<b>Available BMP Volume</b>	The BMP volume in acre-feet that is potentially available at the project site. This volume is based on the BMP opportunity area and recommended depth presented above, as discussed in Section 2.
	<b>Recommended Active BMP Volume</b>	The recommended BMP volume in acre-feet. This volume is recommended based on the hydrologic modeling and optimization results as discussed in Section 2.

### 3.1 ALHAMBRA GOLF COURSE

The Alhambra Golf Course and Almansor Park are located in the City of Alhambra in an area that drains to Alhambra Wash. The golf course is owned and operated by the City of Alhambra. Almansor Park consists of open grass fields, picnic tables with covered shelters, playgrounds, baseball fields, tennis courts, meeting/activity rooms, restrooms, and basketball court. During the site visit it was noted that the trail around the perimeter of Almansor Park is popular among residents. The potential BMP is proposed as a below-ground retention/infiltration basin situated beneath the baseball fields and open space in the southwest portions of the park.

The maximum drainage area for this project site is approximately 1,145 acres. After review of available site opportunities and surrounding infrastructure, a smaller (alternative) drainage area was delineated, encompassing approximately 51 acres.

After reviewing the hydrologic model results and estimated runoff volumes for the various diversion scenarios, it was determined that a retention/infiltration BMP sized to accommodate all inline flows contributed from the maximum drainage area is best suited for this project site. As a result, the recommended active volume of the BMP is 74.7 acre-feet.

Table 3.1-1 summarizes key conceptual design parameters of the BMP proposed at Alhambra Golf Course. A map of the project site including key infrastructure and highlighted BMP opportunity areas is provided in Appendix D. A map of the total (maximum) and alternative (minimum) tributary drainage areas can be found in Appendix E.

**Table 3.1-1 Summary of Alhambra Golf Course (AL01)**

<b>Table 3.1-1 Summary of Alhambra Golf Course (AL01)</b>		
<b>Project Site Parameters</b>	Total (Maximum) Drainage Area	1,145 ac
	Alternative (Minimum) Drainage Area	51 ac
	Maximum Required BMP Volume	49.0 ac-ft
	Alternative Required BMP Volume	0.515 ac-ft
	Groundwater Depth	165 ft
<b>BMP Design Parameters</b>	BMP Opportunity Area	10.2 ac
	Recommended Maximum BMP Depth	25 ft
	Available BMP Volume	255 ac-ft
	<b>Recommended Active BMP Volume</b>	<b>74.7 ac-ft</b>

In addition to the volumetric features summarized above, it is envisioned that this site would feature the following potential benefits:

- Drains an urbanized area
- Stormwater capture and some infiltration
- Stormwater quality improvement via pre-treatment, retention, and infiltration
- Water harvested can be utilized for a significant amount of on-site irrigation

## 3.2 FREEMONT PARK

Freemont Park is located in Glendale in an area that drains to Verdugo Wash. The park is approximately 8 acres and consists of basketball courts, horseshoe courts, tennis courts, volleyball courts, playground equipment, and a wading pool. The potential BMP is proposed as a below-ground retention/infiltration basin situated beneath the open field space in the southeast corner of the park site.

No maximum drainage area was identified for this site since it is located adjacent to a receiving waterbody, Verdugo Wash. After review of available site opportunities and surrounding infrastructure, a smaller (alternative) drainage area was delineated, encompassing approximately 206 acres. A considerable part of this alternative watershed area is comprised of CalTrans right-of-way for the CA-134 Freeway.

After reviewing the hydrologic model results and estimated runoff volumes for the various diversion scenarios, it was determined that this site is not suited for accommodating the 85<sup>th</sup> percentile design storm runoff volume contributed from the smaller drainage area. As a result, a BMP implemented at this site will provide important water quality benefits; however, it will not qualify as a regional project. As such, the recommended active volume of the BMP is 8.0 acre-feet.

Table 3.2-1 summarizes key conceptual design parameters of the BMP proposed at Freemont Park. A map of the project site including key infrastructure and highlighted BMP opportunity areas is provided in Appendix D. A map of the alternative (minimum) tributary drainage area can be found in Appendix E.

**Table 3.2-1 Summary of Freemont Park (GL01)**

<b>Table 3.2-1 Summary of Freemont Park (GL01)</b>		
<b>Project Site Parameters</b>	Total (Maximum) Drainage Area	N/A
	Alternative (Minimum) Drainage Area	206 ac
	Maximum Required BMP Volume	N/A
	Alternative Required BMP Volume	16.0 ac-ft
	Groundwater Depth	50 ft
<b>BMP Design Parameters</b>	BMP Opportunity Area	0.4 ac
	Recommended Maximum BMP Depth	20 ft
	Available BMP Volume	8 ac-ft
	<b>Recommended Active BMP Volume</b>	<b>8.0 ac-ft</b>

In addition to the volumetric features summarized above, it is envisioned that this site would feature the following potential benefits:

- Drains an urbanized area
- Stormwater capture and some infiltration
- Stormwater quality improvement via pre-treatment, retention, and infiltration
- Water harvested can be utilized on-site irrigation
- Collaboration and potential cost sharing with CalTrans

### 3.3 ROOSEVELT PARK

Roosevelt Park is located in unincorporated Los Angeles County. The park is a large facility that includes basketball courts, picnic facilities with barbecue grills, playground equipment, a senior center, community room, computer center, fitness zone, and gym. The County investigated several BMP options including an infiltration basin near the north end of the park and dry wells to the east and west of the park.

The maximum drainage area for this project site is approximately 2,250 acres. After review of the available site information and surrounding infrastructure, a smaller (alternative) drainage area was delineated, encompassing approximately 169 acres.

After reviewing the hydrologic model results and estimated runoff volumes for the various diversion scenarios, it was determined that this site is suitable for a BMP sized to accommodate more than the 85<sup>th</sup> percentile design storm runoff volume contributed from the maximum drainage area. As a result, the recommended active volume of the BMP is 138.2 acre feet.

Table 3.3-1 summarizes key conceptual design parameters of the BMP proposed at Roosevelt Park. A map of the project site including key infrastructure and highlighted BMP opportunity areas is provided in Appendix D. A map of the total (maximum) and alternative (minimum) tributary drainage areas can be found in Appendix E.

**Table 3.3-1 Summary of Roosevelt Park (LAC01)**

Table 3.3-1 Summary of Roosevelt Park (LAC01)		
Project Site Parameters	Total (Maximum) Drainage Area	2,250 ac
	Alternative (Minimum) Drainage Area	169 ac
	Maximum Required BMP Volume	82.4 ac-ft
	Alternative Required BMP Volume	2.2 ac-ft
	Groundwater Depth	80 ft
BMP Design Parameters	BMP Opportunity Area	10 ac
	Recommended Maximum BMP Depth	20 ft
	Available BMP Volume	200 ac-ft
	<b>Recommended Active BMP Volume</b>	<b>138.2 ac-ft</b>

In addition to the volumetric features summarized above, it is envisioned that this site would feature the following potential benefits:

- Drains an urbanized area
- Stormwater capture and some infiltration
- Stormwater quality improvement via pre-treatment, retention, and infiltration
- Surface water can be utilized for aesthetic and other community benefits
- Water harvested can be utilized for a significant amount of on-site irrigation

### 3.4 SIERRA VISTA PARK

Sierra Vista Park is located within the City of Monterey Park. The park includes a senior/community center, baseball diamond, basketball court, picnic shelters, tennis courts, restrooms, and playground equipment. The potential BMP type is proposed as a below-ground retention/infiltration basin situated beneath the baseball diamond in the southwest corner of the site.

The maximum drainage area for this project site is 2,928 acres. After review of available site information and surround infrastructure data, a smaller (alternative) drainage area was delineated, encompassing approximately 800 acres.

After reviewing the hydrologic model results and estimated runoff volumes for the various diversion scenarios, it was determined that this site cannot accommodate the 85<sup>th</sup> percentile design storm flows from the smaller drainage area. Thus, it is recommended that the BMP be sized for retention/infiltration of approximately 10 ac-ft of runoff, which will be conveyed to the BMP via a 20 cfs pumped diversion. 20 cfs is viewed as a maximum realistic peak pumped flowrate, as discussed in Section 2.

Table 3.4-1 summarizes key conceptual design parameters of the BMP proposed at Sierra Vista Park. A map of the project site including key infrastructure and highlighted BMP opportunity areas is provided in Appendix D. A map of the total (maximum) and alternative (minimum) tributary drainage areas can be found in Appendix E.

**Table 3.4-1 Summary of Sierra Vista Park (MP01)**

<b>Table 3.4-1 Summary of Sierra Vista Park (MP01)</b>		
<b>Project Site Parameters</b>	Total (Maximum) Drainage Area	2,928 ac
	Alternative (Minimum) Drainage Area	800 ac
	Maximum Required BMP Volume	178.6 ac-ft
	Alternative Required BMP Volume	48.6 ac-ft
	Groundwater Depth	80 ft
<b>BMP Design Parameters</b>	BMP Opportunity Area	0.7 ac
	Recommended Maximum BMP Depth	20 ft
	Available BMP Volume	14 ac-ft
	<b>Recommended Active BMP Volume</b>	<b>10.0 ac-ft</b>

In addition to the volumetric features summarized above, it is envisioned that this site would feature the following potential benefits:

- Drains an urbanized area
- Stormwater capture and some infiltration
- Stormwater quality improvement via pre-treatment, retention, and infiltration
- Surfaced water can be utilized for aesthetic and other community benefits
- Water harvested can be utilized for a significant amount of on-site irrigation

### 3.5 SAN FERNANDO REGIONAL PARK

The park representing the San Fernando Regional Park is located within the City of San Fernando. The park includes open field space, baseball diamonds, community center, and pool facilities. The potential BMP type is proposed as a below-ground retention/infiltration basin situated beneath the open fields and baseball diamond at the southwest end of the park.

No maximum drainage area was identified for this site since it is located adjacent to a receiving waterbody, Pacoima Wash. After review of available site opportunities and surrounding infrastructure, a smaller (alternative) drainage area was delineated, encompassing approximately 423 acres.

After reviewing the hydrologic model results and estimated runoff volumes for the various diversion scenarios, it was determined that this site is suitable for an underground retention/infiltration BMP sized to accommodate more than the 85<sup>th</sup> percentile design storm runoff volume contributed from the smaller drainage area. As a result, the recommended active volume of the BMP is 22.6 acre-feet.

Table 3.5-1 summarizes key conceptual design parameters of the BMP proposed at San Fernando Regional Park. A map of the project site including key infrastructure and highlighted BMP opportunity areas is provided in Appendix D. A map of the alternative (minimum) tributary drainage area can be found in Appendix E.

**Table 3.5-1 Summary of San Fernando Regional Park (SF01)**

Table 3.5-1 Summary of San Fernando Regional Park (SF01)		
<b>Project Site Parameters</b>	Total (Maximum) Drainage Area	N/A
	Alternative (Minimum) Drainage Area	423 ac
	Maximum Required BMP Volume	N/A
	Alternative Required BMP Volume	11.3 ac-ft
	Groundwater Depth	50 ft
<b>BMP Design Parameters</b>	BMP Opportunity Area	2.7 ac
	Recommended Maximum BMP Depth	20 ft
	Available BMP Volume	54 ac-ft
	<b>Recommended Active BMP Volume</b>	<b>22.6 ac-ft</b>

In addition to the volumetric features summarized above, it is envisioned that this site would feature the following potential benefits:

- Drains an urbanized area
- Stormwater capture and some infiltration
- Stormwater quality improvement via pre-treatment, retention, and infiltration
- Water harvested can be utilized for on-site irrigation

### 3.6 LACY PARK

Lacy Park is a public park located within the City of San Marino in an area that drains to the Upper Los Angeles River. Park features include a picnic area heavily used by residents, open green space, two walking trails, and tennis courts. The potential BMP type proposed is a below-ground retention/infiltration basin situated in the center of the park beneath a depressed area of land that used to be a natural lake.

The maximum drainage area for this project site is approximately 1,067 acres. After review of available site information and surrounding infrastructure, a smaller (alternative) drainage area was delineated, encompassing approximately 928 acres.

After reviewing the hydrologic model results and estimated runoff resulting from the various diversion scenarios, it was determined that this is suitable for an underground retention/infiltration BMP sized to accommodate the 85<sup>th</sup> percentile design storm runoff volume contributed from the maximum drainage area. As a result, the recommended active volume of the BMP is 46.4 acre-feet.

Table 3.6-1 summarizes key conceptual design parameters of the BMP proposed at the Lacy Park. A map of the project site including key infrastructure and highlighted BMP opportunity areas is provided in Appendix D. A map of the total (maximum) and alternative (minimum) tributary drainage areas can be found in Appendix E.

**Table 3.6-1 Summary of Lacy Park (SM01)**

Table 3.6-1 Summary of Lacy Park (SM01)		
Project Site Parameters	Total (Maximum) Drainage Area	928 ac
	Alternative (Minimum) Drainage Area	1,067 ac
	Maximum Required BMP Volume	46.6 ac-ft
	Alternative Required BMP Volume	40.0 ac-ft
	Groundwater Depth	145 ft
BMP Design Parameters	BMP Opportunity Area	2.4 ac
	Recommended Maximum BMP Depth	20 ft
	Available BMP Volume	48 ac-ft
	<b>Recommended Active BMP Volume</b>	<b>46.4 ac-ft</b>

In addition to the volumetric features summarized above, it is envisioned that this site would feature the following potential benefits:

- Drains an urbanized area
- Stormwater capture and some infiltration
- Stormwater quality improvement via pre-treatment, retention, and infiltration
- Water harvested can be utilized for a significant amount of on-site irrigation

### 3.7 LOWER ARROYO PARK

Lower Arroyo Park is located within the City of South Pasadena in an area that drains to Arroyo Seco. A channelized portion of Arroyo Seco runs through the center of the proposed site parcel. Park facilities include two baseball diamonds, open field space, and playground equipment. The potential BMP type is proposed as a below-ground retention/infiltration basin situated beneath the baseball diamonds and other open field space in the southwest corner and northern portions of the park.

No maximum drainage area was identified for this site since it is located adjacent to a receiving waterbody, Arroyo Seco. After review of available site opportunities and surrounding infrastructure, a smaller (alternative) drainage area was delineated, encompassing approximately 145 acres.

After reviewing the hydrologic model results and estimated runoff volume for the various diversion scenarios, it was determined that this project site was suitable for a retention/infiltration BMP sized to accommodate more than the 85<sup>th</sup> percentile design storm flows contributed from the smaller alternative drainage area. As a result, the recommended active volume of the BMP is 3.7 acre feet.

Table 3.7-1 summarizes key conceptual design parameters of the BMP proposed at Lower Arroyo Park. A map of the project site including key infrastructure and highlighted BMP opportunity areas is provided in Appendix D. A map of the alternative (minimum) tributary drainage area can be found in Appendix E.

**Table 3.7-1 Summary of Lower Arroyo Park (SP01)**

Table 3.7-1 Summary of Lower Arroyo Park (SP01)		
Project Site Parameters	Total (Maximum) Drainage Area	N/A
	Alternative (Minimum) Drainage Area	145 ac
	Maximum Required BMP Volume	N/A
	Alternative Required BMP Volume	0.06 ac-ft
	Groundwater Depth	25 ft
BMP Design Parameters	BMP Opportunity Area	10.6 ac
	Recommended Maximum BMP Depth	25 ft
	Available BMP Volume	265 ac-ft
	<b>Recommended Active BMP Volume</b>	<b>3.7 ac-ft</b>

In addition to the volumetric features summarized above, it is envisioned that this site would feature the following potential benefits:

- Drains an urbanized area
- Stormwater capture and some infiltration
- Stormwater quality improvement via pre-treatment, retention, and infiltration
- Water harvested can be utilized for a significant amount of on-site irrigation

### 3.8 NORTH HOLLYWOOD PARK

North Hollywood Park is located within the City of Los Angeles in an area that drains to Tujunga Wash. Park facilities include an auditorium, baseball diamonds, basketball courts, playground, indoor gym, picnic tables, seasonal pool, and tennis courts. The potential BMP type is proposed as a below-ground retention/infiltration basin situated beneath open field space in the south and central areas of the park.

No maximum drainage area was identified for this site since it is located adjacent to a receiving waterbody, Tujunga Wash. After review of available site opportunities and surrounding infrastructure, a smaller (alternative) drainage area was delineated, encompassing approximately 5,122 acres.

After reviewing the hydrologic model results and estimated runoff volume for the various diversion scenarios, it was determined that this project site was suitable for a retention/infiltration BMP sized to accommodate the 85<sup>th</sup> percentile design storm flows contributed from the smaller alternative drainage area. As a result, the recommended active volume of the BMP is 38 acre feet.

Table 3.8-1 summarizes key conceptual design parameters of the BMP proposed at North Hollywood Park. A map of the project site including key infrastructure and highlighted BMP opportunity areas is provided in Appendix D. A map of the alternative (minimum) tributary drainage area can be found in Appendix E.

**Table 3.8-1 Summary of North Hollywood Park (NHP)**

Table 3.8-1 Summary of North Hollywood Park (NHP)		
<b>Project Site Parameters</b>	Total (Maximum) Drainage Area	N/A
	Alternative (Minimum) Drainage Area	5,122 ac
	Maximum Required BMP Volume	N/A
	Alternative Required BMP Volume	38.0 ac-ft
	Groundwater Depth	65 ft
<b>BMP Design Parameters</b>	BMP Opportunity Area	7.8 ac
	Recommended Maximum BMP Depth	20 ft
	Available BMP Volume	156 ac-ft
	<b>Recommended Active BMP Volume</b>	<b>38.0 ac-ft</b>

In addition to the volumetric features summarized above, it is envisioned that this site would feature the following potential benefits:

- Drains an urbanized area
- Stormwater capture and some infiltration
- Stormwater quality improvement via pre-treatment, retention, and infiltration
- Water harvested can be utilized for a significant amount of on-site irrigation

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## 4 Estimated Costs

Comparative costs (derived from WMMS's comparative costs) are presented in Table 4-1. These comparative costs were developed based on unit costs for individual construction components including planning, design, and mobilization that were collected from the Los Angeles County Department of Public Works Bid History and local vendors that serve the Los Angeles area as part of the Phase II Report: Development of the Framework for Watershed-Scale Optimization Modeling, June 2011. These comparative costs include the estimated capital cost of the facility plus 20 years of estimated operation and maintenance costs. More detailed cost opinions (commensurate with a conceptual level of design completion) will be developed for each of the eight regional project sites, after feedback is received on this draft report.

**Table 4-1 Estimated Cost Summary**

<b>Cluster ID</b>	<b>Site Description</b>	<b>Active Volume (AF)</b>	<b>Comparative Cost (\$M)</b>
AL01	Alhambra Golf Course	74.7	27.9
GL01	Freemont Park	8.0	1.5
LAC01	Roosevelt Park	138.2	33.0
MP01	Sierra Vista Park	10.0	2.3
SF01	San Fernando	22.6	7.5
SM01	Lacy Park	46.4	9.3
SP01	Lower Arroyo Park	3.7	21.4
NHP	North Hollywood Park	38.0	19.6

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## 5 Next Steps

The following presents recommended next steps in the development of this memo:

- WMG Reviews Draft Memo and provides feedback on project type and size
- With this feedback the team will:
  - develop final cost opinions
  - incorporate feedback into final memo
  - and include projects in final RAA run, and the EWMP

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## 6 References

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**APPENDIX A**

**DESKTOP GEOTECHNICAL**

**ANALYSIS**



Cluster ID	Site Name	Total Area (ac)	Aggregate Infiltration Rate (in/hr)	Chino Silt Loam		Hanford Fine Sandy Loam		Hanford Gravelly Sandy Loam		Ramona Loam		Ramona Sandy Loam		Tujunga Fine Sandy Loam		Yolo Loam	
				Soil Area (ac)	% of Site Total	Soil Area (ac)	% of Site Total	Soil Area (ac)	% of Site Total	Soil Area (ac)	% of Site Total	Soil Area (ac)	% of Site Total	Soil Area (ac)	% of Site Total	Soil Area (ac)	% of Site Total
AL01	Alhambra Golf Course	133.6	0.70	0.0	0%	0.0	0%	0.0	0%	27.6	21%	92.8	69%	13.3	10%	0.0	0%
GL01	Fremont Park	9.4	0.30	0.0	0%	9.4	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
LAC01	Roosevelt Park	24.3	0.30	17.3	71%	7.1	29%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
MP01	Sierra Vista Park	2.5	0.30	0.0	0%	0.0	0%	0.0	0%	0.1	5%	0.0	0%	0.0	0%	2.3	95%
NHP	North Hollywood Park	22.5	0.80	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	22.5	100%	0.0	0%
SF01	San Fernando Regional Park	10.7	0.80	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	10.7	100%	0.0	0%
SM01	Lacy Park	26.7	0.39	0.0	0%	0.0	0%	0.0	0%	21.9	82%	4.8	18%	0.0	0%	0.0	0%
SP01	Lower Arroyo Park	25.5	0.80	0.0	0%	0.0	0%	25.5	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%



Hydrologic Soil Group	Infiltration Rate (in/hr)	Soil Textures	Corresponding Unified Soil Classification	
			Symbol	Description
A	1.63	gravel	GW	well-graded gravels, sandy gravels
	1.63	sandy gravel	GP	gap-graded or uniform gravels, sandy gravels
	1.63	silty gravels	GM	silty gravels, silty sandy gravels
	1.63		SW	well-graded gravelly sands
	0.8	sandy gravel	SP	gap-graded or uniform sands, gravelly sands
	0.8	loamy sand		
	0.8	sandy loam		
B	0.45		SM	silty sands, silty gravelly sands
	0.3	loam, silt loam	MH	micaceous silts, diatomaceous silts, volcanic ash
C	0.2	sandy clay loam	ML	silts, very fine sands, silty or clayey fine sands
D	0.06	clay loam	GC	clayey gravels, clayey sandy gravels
	0.06	silty clay loam	SC	clayey sands, clayey gravelly sands
	0.06	sandy clay	CL	low plasticity clays, sandy or silty clays
	0.06	silty clay	OL	organic silts and clays of low plasticity
	0.06	clay	CH	highly plastic clays and sandy clays
	0.06		OH	organic silts and clays of high plasticity



**APPENDIX B**

**FIELD INVESTIGATION**

**FINDINGS**



## ULAR Site Tour Summary by Black & Veatch

### SP01: Lower Arroyo Park

#### Day 1 Stop # 1, 8:30 AM

##### General:

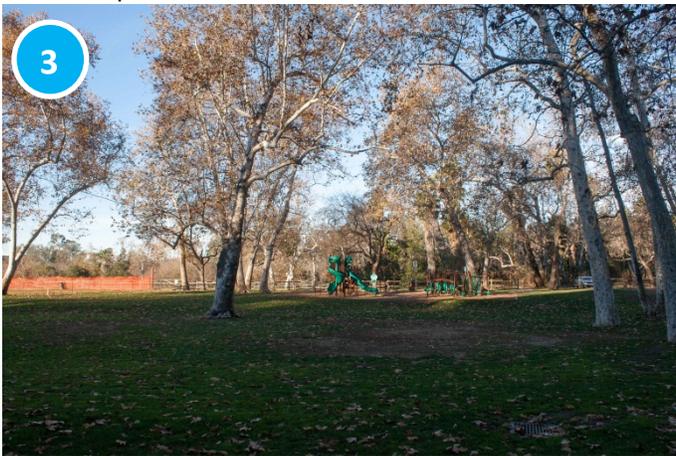
- Mikki Klee, a consultant representing the City of South Pasadena, met us onsite and attended the site walk.
- No underground network shows up on GIS or Navigate LA. Based on surface grates, there appears to be SD piping within the park site, South Pasadena will review.
- Park appears to be graded to generally slope to the east towards the open channel
- Soil data unknown but permeable soils are not likely present.
- Park contains two baseball fields and a playground. Construction phasing may take one baseball field out of commission at any given time to minimize disruptions.
- Natural vegetated swale west of San Ramon Drive drains to a pooled area that acts as a natural basin (may be able to repurpose in some way, possibly with small hydraulic modifications) <sup>9</sup>
- City is open to surface BMPs if necessary, but not in areas such as ball fields or parking lots.
- It appears that the residential area to the east drains towards the park .



Channelized portion of the Arroyo Seco running through center of parcel area



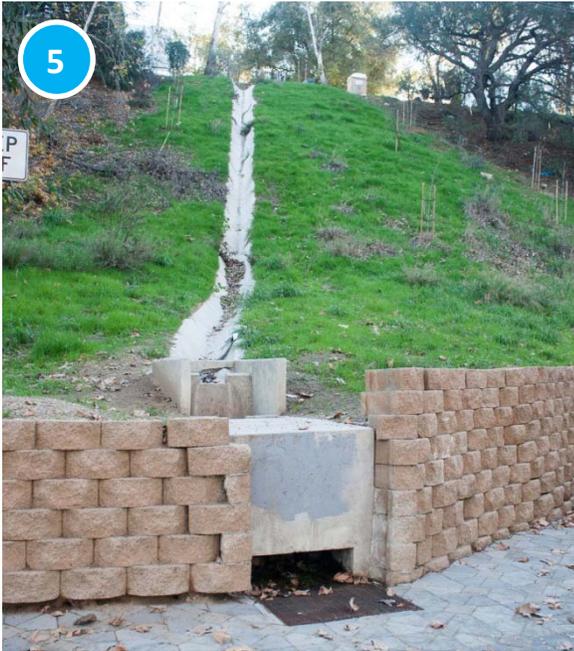
Parking lot south on San Ramon Drive



Playground in southeastern corner of parcel area



Baseball field in southwestern corner of parcel area



Drainage into open channel will need to be considered



Drainage grate and connecting system will need to be considered



San Pascual Ave & Comet St where SD enters park area



Catch basin on San Pascual Ave



Opportunity Areas (highlighted in green) would likely include subsurface BMPs.

- 9 This area may include an existing swale/biofilter.

## SM01: Lacy Park

### Day 1 Stop # 2, 10:00 AM

- Ron Serven with the City of San Marino met us onsite and attended the site walk.
- Large diameter storm drain runs through the center of the park (immediate drainage from park & surrounding areas including the Huntington Library and the Yard). This storm drain was installed to drain a natural lake used to exist in the center of the park. It was discussed that this location could be used for a buried tank at the low point with spread infiltration.
- Wooded areas will need to be avoided.
- A project that will allow for infiltration of drainage off of the road interloop is in the works.
- Men's pick up soccer league and other team utilize the field, must maintain surface use.



1  
Depression in center of park where natural lake used to exist



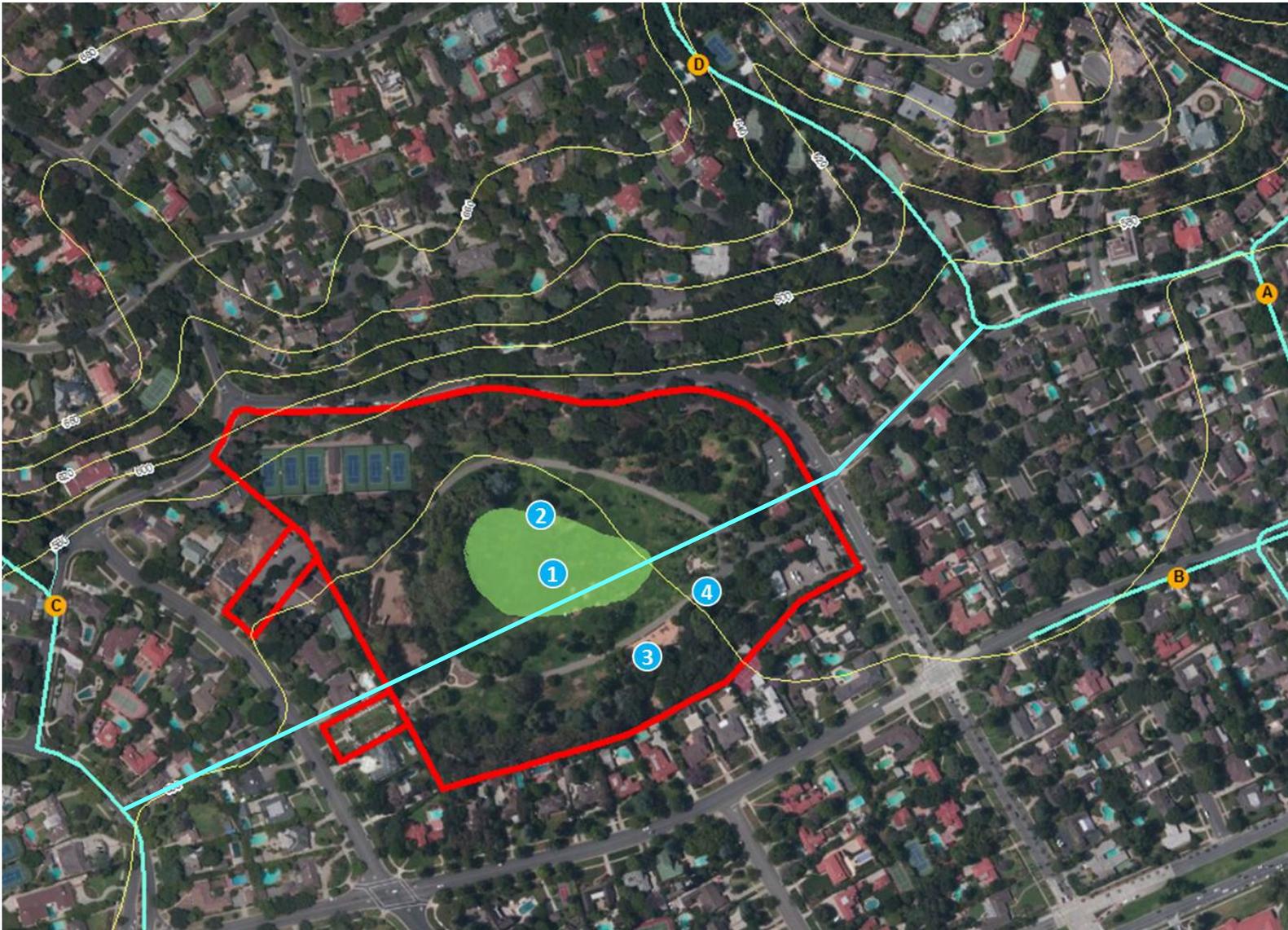
2  
Trees along north side



3  
Playground on western side of park



4  
Park heavily used by surrounding community for sports/walking/playing/gatherings



Opportunity Areas (highlighted in green) would likely include subsurface BMPs.

## AL01: Alhambra Golf Course

### Day 1 Stop # 3, 11:00 AM

- David Dolphin, with the City of Alhambra Public Works Department, met us onsite and attended the site walk.
- Generally, the City is amenable to use of Almansor Park for buried solutions. The Golf Course and Pond area are not considered opportunity areas.
- Catch basins and storm drain along Adams Ave are county-owned & feed into Alhambra Wash near intersection of Adams Ave and New Ave.
- May be able to divert drainage from Alhambra Wash if a large watershed is treatable here.
- Walking trail around Almansor park heavily used by local residents.



Alhambra Wash runs along the east side of the Golf Course



Dry-weather flow in Alhambra Wash



Adams Ave looking west towards Granada Ave



Lower parking lot appears to have deep storm drain below



Baseball field on west side of parcel area



Railroad tracks along northwestern side of parcel area



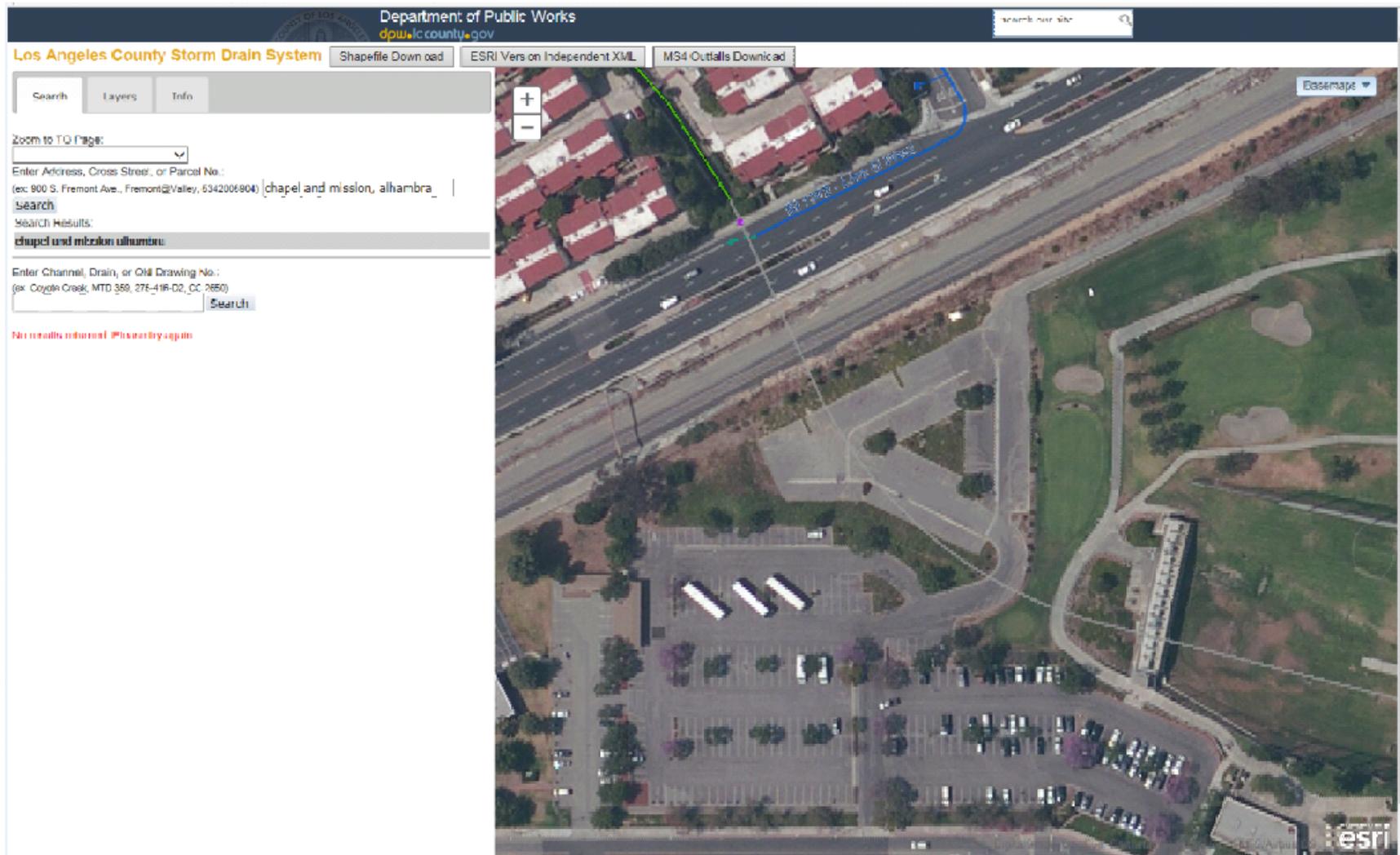
The Public works yard, although situated on the wash, is not viewed as an opportunity area by the City



Lake area is not viewed as an opportunity area by the City



Opportunity Areas (highlighted in green) would likely include subsurface BMPs.



Storm drain layout in lower parking lot area of Golf Course. Storm drain appears to discharge into 24-inch line connected to San Pasqual Wash, which runs underground through the Golf Course.

## MP01: Monterey Park

### Day 1 Stop # 4, 2:00 PM

- Mikki Klee, a consultant representing the City of Monterey Park, and Chris Arriola, with the City of Monterey Park met us onsite and attended the site walk.
- They City considers the baseball field to be the opportunity area for underground detention. Construction impacts may be a concern.
- Both the park itself and parking lot appears to be highly used by local residents.
- Park set a few feet above grade of surrounding streets.
- Storm drains on Atlantic & Garvey are likely very deep, but City will confirm or obtain drawings.



1  
Playground in northwestern corner of park



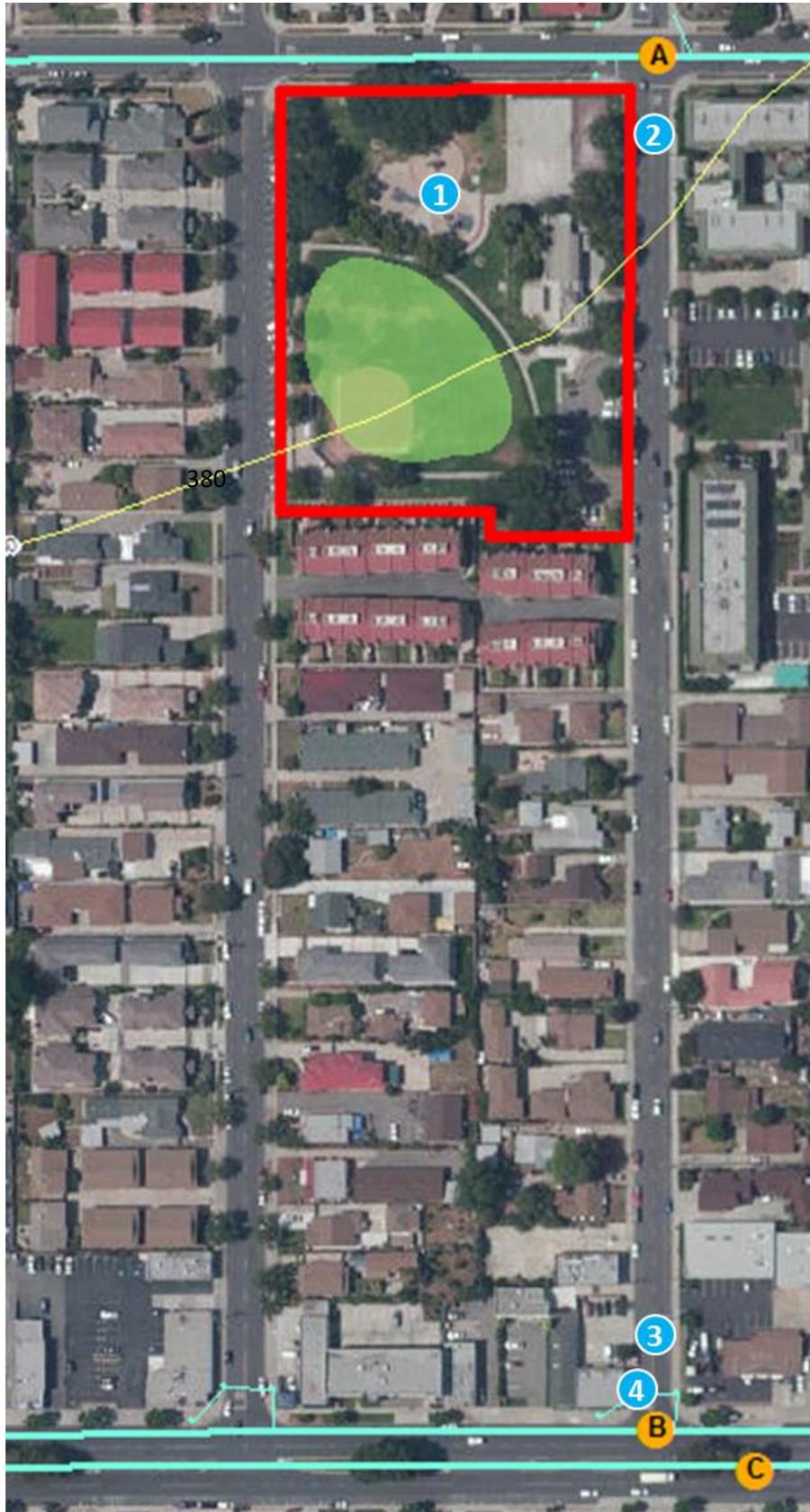
2  
Northeastern corner of park on Emerson Ave & Rural Dr



3  
Intersection of Rural Dr & Garvey Ave looking towards Sierra Vista Park (very flat from park to intersection where storm drain is located)



4  
Catch basin on Rural Dr near Garvey Ave



Opportunity Areas (highlighted in green) would likely include subsurface BMPs.

## LAC01: Roosevelt Park

### Day 1 Stop # 5, 3:30 PM

- Aaron Chiang, with the County of Los Angeles Department of Public Works, met us onsite and attended the site walk.
- County has already investigated multiple BMP options:
  - Infiltration basin on north end of park
  - Dry wells to the east and west of the park
- Aaron noted that they have found the upper 15' to be clay, layers below that have much higher infiltration rates.
- Entire park appears to be heavily utilized (typ.) for recreational activities including basketball courts, skate park, children's play area, and sitting area.
- Preliminary calculations done by County show 6 af for 85th percentile.



Open space on northeastern end of park



Open space on northeastern end of park



Park heavily used by local residents



Baseball field on southern end of park



Opportunity Areas (highlighted in green) would likely include subsurface BMPs.

**SF01: San Fernando**

**Day 2 Stop # 1, 9:00 AM**

- Joe Bellomo, a consultant representing the City of San Fernando, met us onsite and attended the site walk.
- According to Joe, approximately  $\frac{3}{4}$  of the City's drainage is captured in two parallel SDs surrounding the park. He added that the City has 8 outlets, SD near park captures  $\sim\frac{2}{3}$  of the City's drainage.
- Based on soils observed in nearby rail embankment/channel, reasonable infiltration rates may be found here.
- Joe mentioned new park was built last year off of 8<sup>th</sup> St to capture surface runoff.



Baseball field on southern end of park



Baseball field on southern end of park



1<sup>st</sup> St where major storm drain runs beside park



Railroad tracks on west side of 1<sup>st</sup> St



Opportunity Areas (highlighted in green) would likely include subsurface BMPs.

## NHP: North Hollywood Park

### Day 2 Stop # 2, 10:15 AM

- Jane Parathara and Bing Neris representing the City of Los Angeles attended this and all 8 site visits.
- Park is heavily used (walkers, people walking dogs)
- Great number of mature trees all over north end of park
- Middle and south end of park contains less mature trees
- Could potentially pipe storm drains from north end of park to center of park where less mature trees are located and could be removed
- Park does not include many large open spaces, but more smaller pockets dispersed throughout park between a large number of trees
- Jane acknowledged that the City may have a concept developed for this site. She will review with Deborah Deets who may know of the concept.



Channelized portion of the Central Branch of the Tunjunga Wash bordering west side of park



Dry-weather flow in open channel



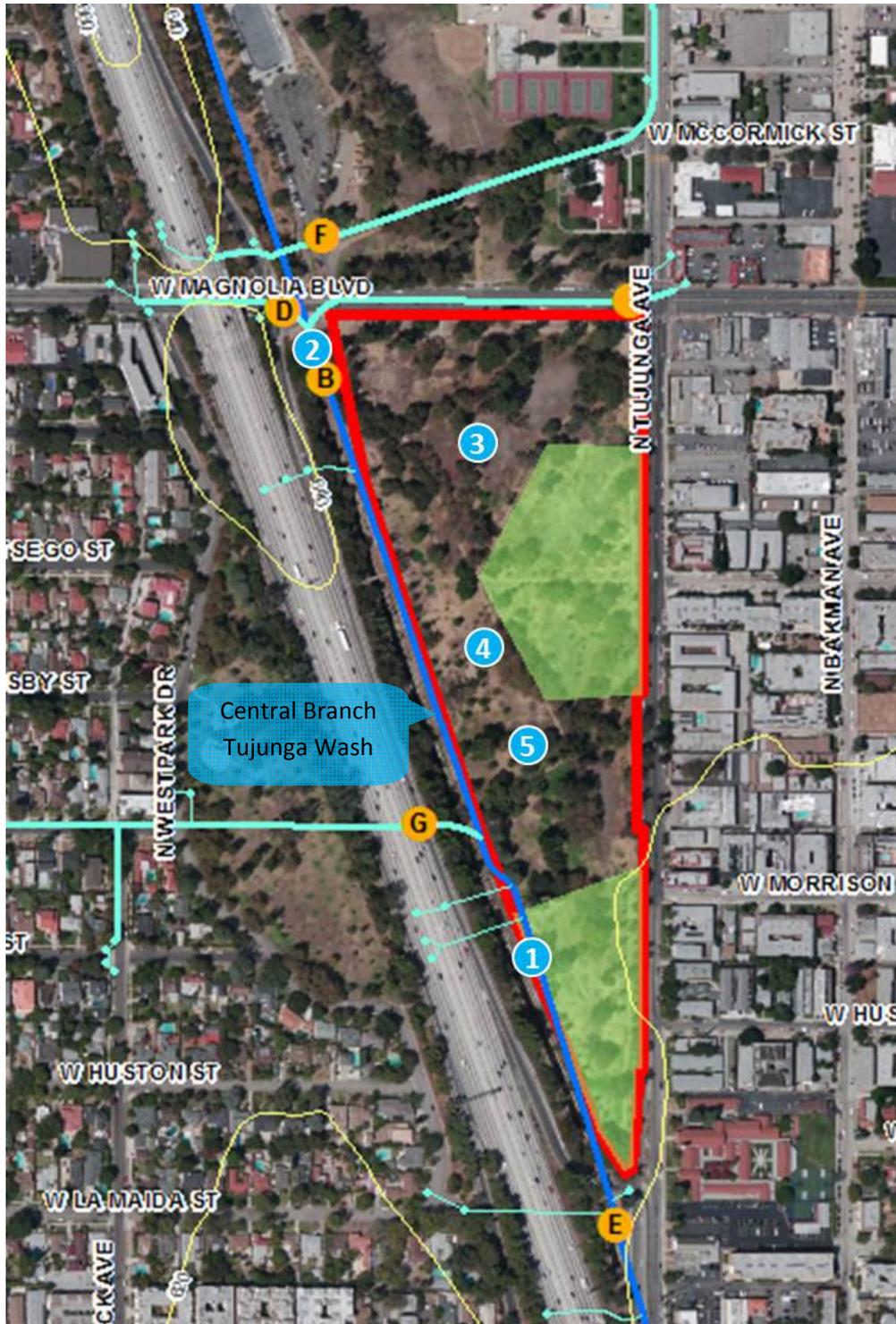
Mature trees on north end of park



Less mature trees in center of park area



9/11/2001 Memorial



Opportunity Areas (highlighted in green) would likely include subsurface BMPs.

## GL01: Freemont Park

### Day 2 Stop # 3, 11:30 AM

- Michael Lundsford from the City of Glendale and Mikki Klee, a consultant representing the City, met us onsite and attended the site walk.
- Could potentially capture drainage from piped storm drain on east side of park and pipe to open area on east side of park. Storm drain outlet into channel is approximately 30' deep, which could be challenging and may require pumping.
- Approximately half of the 200ac watershed in storm drain is in Caltrans right of way (drainage off of 134 freeway).



Channelized portion of Verdugo Wash on north side of park



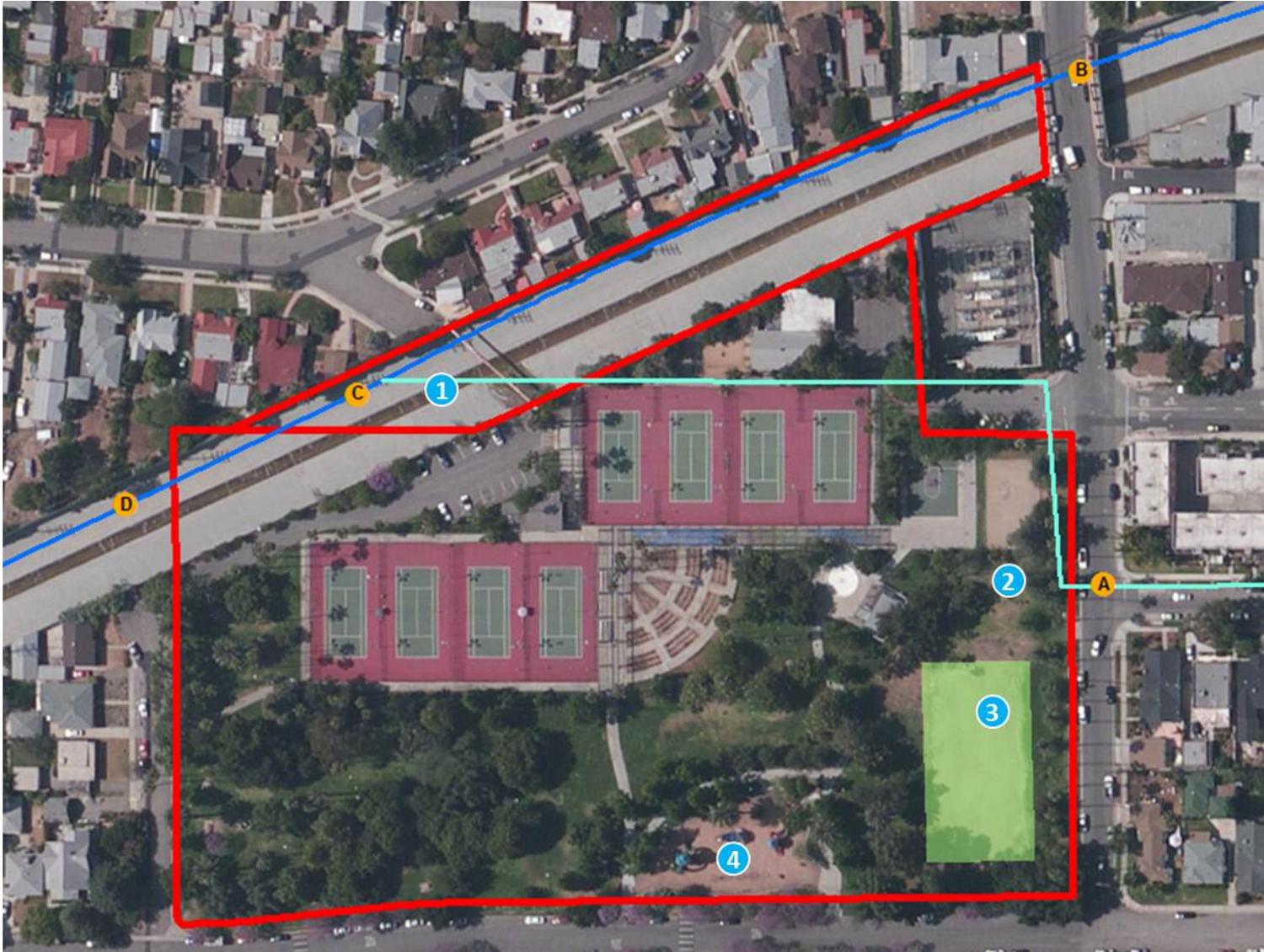
Heavily used tables on eastern side of park



Open area on east side of park. Currently utilized for parking periodically.



Playground in southwestern area of park



Opportunity Areas (highlighted in green) would likely include subsurface BMPs.

# Summary Environmental Constraints: Upper Los Angeles River Watershed Regional Projects

## SF01 – Recreation Park

- **AQ:** Construction emissions in excess of thresholds; may increase time for site-specific CEQA compliance.
- **AQ:** Cumulative AQ impacts may increase time for site-specific CEQA compliance.
- **AQ:** Air pollutant concentrations from construction may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could disturb active nests (violation of Migratory Bird Treaty Act); may increase time for site-specific CEQA compliance.
- **CUL:** Archeological resources may be present; should be addressed during site specific CEQA compliance.
- **CUL:** Paleontological resources may be present; should be addressed during site specific CEQA compliance.
- **HAZ:** Potential contamination (lead) site identified 350 feet east of Recreation Park. Additional due diligence may be required to determine is contamination has migrated; may increase time for site-specific CEQA compliance.
- **WQ:** Remote possibility that contamination has migrated to site, and for infiltration to occur in or above the contamination (if present); may increase time for project design and site-specific CEQA compliance.
- **NOI:** Potential for construction to generate noise in excess of City limit (at property line) of 70 dBA; may increase time for site-specific CEQA compliance.
- **REC:** Temporary loss of recreational areas of Recreation Park is likely to require close coordination between the City of San Fernando, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational uses. Increased site-specific CEQA compliance time.

## NHP – North Hollywood Park

- **AQ:** Construction emissions in excess of thresholds; may increase time for site-specific CEQA compliance.
- **AQ:** Cumulative AQ impacts may increase time for site-specific CEQA compliance.
- **AQ:** Air pollutant concentrations from construction may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could disturb active nests (violation of Migratory Bird Treaty Act); may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could destroy protected trees; may increase time for site-specific CEQA compliance.
- **CUL:** Archeological resources may be present; should be addressed during site specific CEQA compliance.
- **CUL:** Paleontological resources may be present; should be addressed during site specific CEQA compliance.
- **NOI:** City LA has construction noise thresholds that may increase the length of time required for individual project approvals and CEQA compliance.
- **REC:** Temporary closure of a large portion of North Hollywood Park during construction is likely to require close coordination between the City of Los Angeles, local residents, and community stakeholders to develop suitable mitigation options for addressing impacts to passive recreational uses of the park. Increased site-specific CEQA compliance time.

## GL01 – Fremont Park

- **AQ:** Construction emissions in excess of thresholds; may increase time for site-specific CEQA compliance.
- **AQ:** Cumulative AQ impacts may increase time for site-specific CEQA compliance.
- **AQ:** Air pollutant concentrations from construction may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could disturb active nests (violation of Migratory Bird Treaty Act); may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could destroy protected trees; may increase time for site-specific CEQA compliance.
- **CUL:** Archeological resources may be present; should be addressed during site specific CEQA compliance.
- **CUL:** Paleontological resources may be present; should be addressed during site specific CEQA compliance.
- **REC:** Temporary closure of a portion of Fremont Park during construction will likely to require close coordination between the City of Glendale, local residents, and community stakeholders to develop suitable mitigation options for addressing impacts to Fremont Park. Increased site-specific CEQA compliance time.

## SP01 – Arroyo Park

- **AQ:** Construction emissions in excess of thresholds; may increase time for site-specific CEQA compliance.
- **AQ:** Cumulative AQ impacts may increase time for site-specific CEQA compliance.
- **AQ:** Air pollutant concentrations from construction may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could disturb active nests (violation of Migratory Bird Treaty Act); may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could destroy protected trees; may increase time for site-specific CEQA compliance.
- **CUL:** Archeological resources may be present; should be addressed during site specific CEQA compliance.
- **CUL:** Paleontological resources may be present; should be addressed during site specific CEQA compliance.
- **REC:** Temporary closure of the recreational uses within Arroyo Park is likely to require close coordination between the City of South Pasadena, City of Los Angeles (a small section of the park west of the Arroyo Seco appears to be located within the City of Los Angeles), local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational uses. Increased site-specific CEQA compliance time.

## SM01 – Lacy Park

- **AQ:** Construction emissions in excess of thresholds; may increase time for site-specific CEQA compliance.
- **AQ:** Cumulative AQ impacts may increase time for site-specific CEQA compliance.
- **AQ:** Air pollutant concentrations from construction may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could disturb active nests (violation of Migratory Bird Treaty Act); may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal will require City approval; may increase time for site-specific CEQA compliance.
- **CUL:** Archeological resources may be present; should be addressed during site specific CEQA compliance.
- **CUL:** Paleontological resources may be present; should be addressed during site specific CEQA compliance.
- **REC:** Temporary closure of the central portion of Lacy Park is likely to require close coordination between the City of San Marino, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary closure. Increased site-specific CEQA compliance time.

## AL01 – Almansor Park

- **AQ:** Construction emissions in excess of thresholds; may increase time for site-specific CEQA compliance.
- **AQ:** Cumulative AQ impacts may increase time for site-specific CEQA compliance.
- **AQ:** Air pollutant concentrations from construction may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could disturb active nests (violation of Migratory Bird Treaty Act); may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal will require City approval.
- **CUL:** Archeological resources may be present; should be addressed during site specific CEQA compliance.
- **CUL:** Paleontological resources may be present; should be addressed during site specific CEQA compliance.
- **NOI:** Although construction at Almansor Park will not conflict with City noise regulations, several schools located nearby (Martha Baldwin Elementary School and Emmaus Lutheran Preschool), and implementation of noise reducing measures may be prudent during construction.
- **REC:** Temporary closure of the recreational uses within Almansor Park is likely to require close coordination between the City of Alhambra, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational uses. Increased site-specific CEQA compliance time.

## MP01 – Sierra Vista Park

- **AQ:** Construction emissions in excess of thresholds; may increase time for site-specific CEQA compliance.
- **AQ:** Cumulative AQ impacts may increase time for site-specific CEQA compliance.
- **AQ:** Air pollutant concentrations from construction may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could disturb active nests (violation of Migratory Bird Treaty Act); may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal will require city approval.
- **CUL:** Archeological resources may be present; should be addressed during site specific CEQA compliance.
- **CUL:** Paleontological resources may be present; should be addressed during site specific CEQA compliance.
- **REC:** Temporary closure of the recreational uses within Sierra Vista Park is likely to require close coordination between the City of Monterey Park, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational uses. Increased site-specific CEQA compliance time.

## LAC01 – Franklin D. Roosevelt Park

- **AQ:** Construction emissions in excess of thresholds; may increase time for site-specific CEQA compliance.
- **AQ:** Cumulative AQ impacts may increase time for site-specific CEQA compliance.
- **AQ:** Air pollutant concentrations from construction may increase time for site-specific CEQA compliance.
- **BIO:** Tree removal could disturb active nests (violation of Migratory Bird Treaty Act); may increase time for site-specific CEQA compliance.
- **CUL:** Archeological resources may be present; should be addressed during site specific CEQA compliance.
- **CUL:** Paleontological resources may be present; should be addressed during site specific CEQA compliance.
- **NOI:** Although construction at Franklin D. Roosevelt Park will not conflict with County noise regulations, a Head Start preschool is located onsite, and implementation of noise reducing measures may be prudent during construction.
- **REC:** Temporary closure of large portions of Franklin D. Roosevelt Park will require close coordination between the County of Los Angeles, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational areas. Increased site-specific CEQA compliance time.

**Initial Study/  
Environmental Constraints Evaluation**

**For**

**the Eight Recommended Regional Projects  
within the Upper Los Angeles River Watershed**

**February 2015**



**City of Los Angeles**



**Bureau of Engineering  
Watershed Protection  
Division**



# 1.0 INTRODUCTION

National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit (MS4 Permit) Order No. R4-2012-0175 establishes the waste discharge requirements for stormwater and non-stormwater discharges within the watersheds of Los Angeles County. This MS4 Permit was adopted by the California Regional Water Quality Control Board, Los Angeles Region (Regional Board), on November 8, 2012, and became effective on December 28, 2012.

The MS4 Permit includes provisions that allow permittees the flexibility to customize their stormwater programs to achieve compliance with certain receiving water limitations and water quality based effluent limits over time. Specifically, permittees may voluntarily choose to develop and implement an Enhanced Watershed Management Program (Program). The Program includes prioritization of water-quality issues, identification of implementation strategies, control measures, and Best Management Practices (BMPs) sufficient to meet pertinent standards, integrated water-quality monitoring, and opportunity for stakeholder input. Through the Program, permittees will implement projects to improve water quality, and also have incentives to evaluate and, where feasible, implement regional projects that retain all non-stormwater runoff and all stormwater runoff from the 85<sup>th</sup> percentile, 24-hour storm event for the drainage area tributary to those projects.

Municipalities, non-governmental organizations and community stakeholders throughout the County of Los Angeles are working collaboratively to develop Enhanced Watershed Management Plans for each of LA's five watersheds - Ballona Creek, Dominguez Channel, Marina Del Rey, Santa Monica Bay and Upper Los Angeles River. The objectives of the Enhanced Watershed Management Plans (or EWMPs) are to comply with water quality mandates, improve the quality of our rivers, creeks and beaches, and address current and future regional water supply issues.

Each of the five watersheds has a Watershed Management Group that meets on a regular basis. The goal of each Watershed Management Group is to develop an EWMP for their specific watershed. Each EWMP will identify current and future multi-benefit projects that will improve water quality, promote water conservation, enhance recreational opportunities, manage flood risk, improve local aesthetics, and support public education opportunities. Each EWMP will include water quality priorities, watershed control measures, reasonable assurance analysis, the scheduling of projects and the monitoring, assessment and adaptive management of projects. The Upper Los Angeles River Watershed Management Group has developed a list of eight very high priority Regional Projects for implementation, which has been submitted to the Regional Water Quality Control Board for approval.

The Los Angeles County Flood Control District is in the process of preparing a Program EIR (Program EIR) to address the environmental impacts associated with implementing EWMPs within 12 watersheds in the MS4 permit coverage area. One of these watersheds is the Upper Los Angeles River Watershed. The Program EIR will focus on potential effects that could result from implementation of the projects and management actions identified in each EWMP, and would assess the physical changes to the environment that would likely result from the construction and operation of EWMP projects, including direct, indirect, and cumulative impacts.

The purpose of this environmental constraints evaluation is to identify potential site-specific environmental constraints associated with each of the recommended eight structural Regional Projects within the Upper Los Angeles River Watershed, including increased time requirements to address issues, obtain project approvals (including CEQA compliance).

Environmental Constraints of Regional Projects within the Upper Los Angeles River Watershed	1	February, 2015
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## 2.0 PROJECT DESCRIPTION

### 2.1 Project Location

#### 2.1.1 Regional Setting

The Upper Los Angeles River Watershed is located on the Los Angeles Coastal Plain south of the San Gabriel Mountains. The watershed encompasses large portions of the San Fernando Valley; east into Pasadena, South Pasadena, San Marino, Alhambra, Monterey Park; south into Los Angeles and south Los Angeles (see Figure 1). The Upper Los Angeles River Watershed is largely urbanized.

#### 2.1.2 Project Setting

Eight structural Regional Projects are recommended for implementation, and the general settings at each location, are as follows:

- SF01 - Recreation Park in the City of San Fernando. The site includes a multi-purpose center, indoor gymnasium, an active recreational field (softball), outdoor basketball courts, playgrounds, fitness area, and picnic areas. The San Fernando Regional Pool facility is located on the northern portion of the site. Mature trees are located along the periphery and some interior areas around the active field. Surrounding land uses include single and multi-family residential units to the west, commercial/industrial uses to the east, the Pacoima Wash to the southeast, and railroad right-of-way to the southwest. The operating hours for the park are sunrise to 9 p.m. daily.
- NHP – North Hollywood Park in the City of Los Angeles. The southern part of North Hollywood Park (located south of Magnolia Boulevard) is a landscaped area that includes mature trees, and walking paths. The trees are interspersed throughout the open space. A September 11, 2001 memorial is located near the west border in approximately the middle of the park. Commercial and multi-family uses are located to the east across Tujunga Avenue, and the Tujunga Wash and Hollywood Freeway to the west.
- GL01 - Fremont Park in the City of Glendale. The site includes tennis courts, a basketball court, playgrounds, horseshoe pits, picnic areas with barbecues, and wading pool. A field is also located along the eastern portion of the park. Mature trees are present at the site and along the periphery. Surrounding land uses include single and multi-family residential units to the west, south and east of the park, and the Verdugo Wash to the north of the park. The operating hours for the park are sunrise to sunset daily.
- SP01 - Arroyo Park in the City of South Pasadena. Arroyo Park is bisected by the Arroyo Seco. The site east of the Arroyo Seco includes multiple lighted athletic fields (baseball, softball and soccer), playground equipment, picnic areas, small amphitheater, and hiking trails. The park located west of the Arroyo Seco includes a baseball field and open space. Both sites include mature trees. Surrounding land uses are primarily single family residences (in the vicinity of the west site). The San Pascual Stables are located to the north of the park and San Pascual Avenue. The park does not have designated operating hours. (South Pasadena, 2015c).
- SM01 – Lacy Park in the City of San Marino. The site includes a central landscaped green space with an inner and outer walkway around the perimeter. The perimeter of the green space has been planted with trees of varying species, and most are mature. Site uses include tennis courts, picnic areas, playground, and small field. Surrounding land uses are primarily single-family homes. The operating hours for the park is Monday - Friday: 6:30 a.m. to Sunset, and Saturday -

Sunday: 8:00 a.m. to 8:00 p.m. (March 13–November 5) or 8:00 a.m. to 6:00 p.m. (November 6–March 12).

- AL01 – Almansor Park in the City of Alhambra. The site includes open space areas, picnic tables with covered shelters, playground equipment, barbecues, restrooms, ball fields, tennis courts, horseshoe pits, exercise par course, meeting room, activity room, gymnasium, outdoor basketball court, a small lake, and a jogging course. Mature trees are located along the periphery. Surrounding land uses include single-family residences to the south and west, Alhambra Golf Course to the immediate east, and the Alhambra Fire Training Facility and Alhambra Wash farther to the east. In addition, the Martha Baldwin Elementary School, Emmaus Lutheran School, and Emmaus Lutheran Church are contiguous to the park. The operating hours for the park are 5:00 a.m. to 10:30 p.m. daily. .
- MP01 - Sierra Vista Park in the City of Monterey Park. The site includes a softball field, outdoor basketball and paddle tennis court, children's play area, picnic area, and community center. Mature trees are located along the periphery. Surrounding land uses include single- and multi-family residences. The operating hours for the park are 6:00a.m. - 10:00 p.m. daily.
- LAC01 – Franklin D. Roosevelt Park in the County of Los Angeles. The site includes basketball courts, children’s play areas, soccer fields, ball fields, a community center, computer center, fitness zone, gymnasium, skate park, picnic areas with barbecue grills, and senior center. In addition, a Head Start preschool operated by the Mexican American Opportunity Foundation is located at the park. The operating hours for the park are sunrise to sunset, daily. Surrounding land uses include single-family residences to the north and east of the park, commercial and residential to the south, and railroad right-of-way to the west.

## 2.2 Goals and Objectives

The purpose of the Regional Projects is to improve water quality and help the Cities and County comply with the MS4 permit discharge requirements for stormwater and non-stormwater discharges within the Upper Los Angeles River Watershed.

## 2.3 Description of Proposed Project

The Regional Projects are defined by the MS4 Permit as multi-benefit regional projects that, wherever feasible, retain all non-stormwater runoff and all stormwater runoff from the 85th percentile, 24-hour storm event for the contributing drainage area, while also achieving other benefits such as flood control and/or water supply. The proposed eight Regional Project sites within the Upper Los Angeles River Watershed would include one or more of the following at each site:

- Infiltration Projects, that could include surface infiltration devices (infiltration basins, infiltration trenches, infiltration galleries, and bio-retention approaches.
- Multi-Directional Infiltration Projects that could include devices such as dry wells, and/or hybrid bio-retention and dry wells.
- Detention Basins that promote settling out of larger particles.
- Capture and Use Projects such as underground cisterns, storage facilities to make captured water available for uses such as irrigation.

The Regional Projects would install and operate infiltrations structures, detention basins, and/or capture and use structures at eight locations (eight parks) within the Upper Los Angeles River Watershed, as described above. The infiltrations structures, detention basins, and/or capture and use structures would likely be located underground at each of the park sites, with possible bio-retention approaches in select areas.

Environmental Constraints of Regional Projects within the Upper Los Angeles River Watershed	3	February , 2015
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The water quality improvements proposed at each of the Regional Project sites within the Upper Los Angeles River Watershed are as follows:

- SF01-Recreation Park: Buried Infiltration structure, capture and use facility, or detention basin.
- NHP-North Hollywood Park: Buried Infiltration structure, capture and use facility, or detention basin.
- GL01-Fremont Park: Buried Infiltration structure, capture and use facility, or detention basin.
- SP01-Arroyo Park: Buried Infiltration structure, capture and use facility, or detention basin, with possible bio-retention in suitable areas.
- SM01-Lacy Park: Buried Infiltration structure, capture and use facility, or detention basin.
- AL01 – Almansor Park: Buried Infiltration structure, capture and use facility, or detention basin.
- MP01 – Sierra Vista Park: Buried Infiltration structure, capture and use facility, or detention basin.
- LAC01-Franklin D. Roosevelt Park: Buried Infiltration structure, capture and use facility, or detention basin.

In addition, accessory improvements would be required at each Regional Project site to make connections with nearby storm drains, as well as other improvement such as wells, pump stations, and electrical connections and controls.

## 2.4 Regional Project Construction

Construction of each of the Regional Projects is expected to take between 12-18 months, and would involve mobilization (of materials and equipment), excavation and shoring, haul away of soils, construction of the infiltration, detention, or capture and use structure (likely to be cast-in-place concrete), accessory improvements such as storm drain connections, equipment installation, backfilling, and surface restoration. Because the project sites are all park areas, the construction areas would have to be physically separated from the remaining park areas and screened. Due to the large quantities of runoff that would be infiltrated, detained, or captured, the subsurface structures would likely occupy substantial subsurface portions of the identified sites. Following construction of the facilities, surface features at each location would be restored to existing conditions or better.

## 2.5 Regional Project Operations

Once the Regional Projects are completed and commissioned, they would operate automatically, although their operation would be monitored and adjustments made on an as-needed basis, including during wet weather. The majority of the Regional Project would have subsurface components and their operation would not be detectible or apparent at the site surface. Small above-ground structures that house control equipment may be required.

Regional Projects that utilize approaches at the site surfaces (such as bio-retention) could periodically fill with retained runoff, and preclude other uses of those areas until percolation has been completed and the areas dry enough to support other uses.

## 2.6 Anticipated Permits and Approvals

Approvals or permits from the following agencies are expected to be required:

- City of Alhambra
- City of Glendale
- City of Los Angeles
- City of Monterey Park
- City of San Marino

- City of South Pasadena
- City of San Fernando
- County of Los Angeles
- State and Regional Water Quality Control Boards
- Others?

### 3.0 Initial Study Checklist

Potential environmental constraints associated with the Regional Projects are addressed in the Initial Study Checklist and detailed discussions are provided below.

#### Environmental Checklist Form

<b>1. Project Title:</b>	Upper Los Angeles River Regional Projects
<b>2. Lead Agency Name and Address:</b>	Varies depending on jurisdiction of each Regional Project (City of Alhambra, City of Glendale, City of Los Angeles, City of Monterey Park, City of San Marino, City of South Pasadena, City of San Fernando, and County of Los Angeles)
<b>3. Contact Person and Phone Number:</b>	Jim Rasmus, Black and Veatch (858) 945-8675
<b>4. Project Location:</b>	City of Alhambra, City of Glendale, City of Los Angeles, City of Monterey Park, City of San Marino, City of South Pasadena, City of San Fernando, and County of Los Angeles
<b>5. Project Sponsor's Name and Address:</b>	Bureau of Sanitation Watershed Protection Division 1149 S. Broadway, 10th Floor Los Angeles, CA 90015
<b>6. General Plan Designations:</b>	Varies (Open Space)
<b>7. Zoning:</b>	Varies (includes OS, OS-1XL, SR – special recreation)
<b>8. Description of Project:</b>	The proposed Project consists of installation and operation of runoff infiltration and/or capture and use facilities at eight (8) locations within the Upper Los Angeles River Watershed. Facility options include underground stormwater and runoff detention facilities, underground infiltration facilities, and surface treatment features. Ancillary improvements, including connector pipelines to nearby storm drains, and/or pump stations or wet wells would be included.

**Environmental Factors Potentially Affected:**

The environmental factors checked below would potentially be affected by the Regional Projects (i.e., the proposed Project would involve environmental constraints, as indicated by the checklist on the following pages).

	Aesthetics		Agriculture and Forest Resources	X	Air Quality
X	Biological Resources	X	Cultural Resources		Geology/Soils
	Greenhouse Gas Emissions	X	Hazards and Hazardous Materials	X	Hydrology/Water Quality
	Land Use/Planning		Mineral Resources	X	Noise
	Population/Housing		Public Services	X	Recreation
	Transportation/Traffic		Utilities/Service Systems	X	Mandatory Findings of Significance

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>I. AESTHETICS.</b>	Would the project:				
a.	Have a substantial adverse effect on a scenic vista?			X	
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?			X	
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
d.	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?			X	

Discussion:

**a. Would the project have a substantial adverse effect on a scenic vista?**

A scenic vista generally provides focal views of objects, settings, or features of visual interest; or panoramic views of large geographic areas of scenic quality, primarily from a given vantage point. Substantial constraints occur if the Regional Projects introduce incompatible visual elements within a field of view containing a scenic vista or substantially alters a view of a scenic vista.

**No Environmental Constraints.**

- SF01 - Recreation Park. Recreation Park is located in an urbanized portion of the City of San Fernando and is not located within a Scenic Vista. Further, the improvements at this site would likely be buried features with the park surface restored to the same or better condition than currently exists.
- NHP – North Hollywood Park. North Hollywood Park is located in the City of Los Angeles' North Hollywood Community in an urbanized area, and is not located within a Scenic Vista. The improvements at this site would occur underground, and the park surface restored to the same or better condition than currently exists.
- GL01 – Fremont Park. Fremont Park, located in the City of Glendale just north of SR134 and south of the Verdugo Wash, is not located within a Scenic Vista. The improvements would place subsurface structures at this site, with the park surface restored to the same or better condition than currently exists.

- SP01 – Arroyo Park. Arroyo Park is located in South Pasadena along the Arroyo Seco north of the Pasadena Freeway. Although a ridgeline is present along the east side of Arroyo Park, the future improvements at this site would likely be buried and surface features restored to the same or better condition than currently exists. A small area of surface bio-treatment features could be added between the wash and San Ramon Drive. None of the proposed improvements would block views of the surrounding hillside, and no scenic vistas would be adversely affected.
- SM01 – Lacy Park. Lacy Park is located within a residential neighborhood in the City of San Marino. There are no designated scenic vistas in Lacy Park. The improvements would place subsurface structures at this site, with the park surface restored to the same or better condition than currently exists.
- AL01 – Almansor Park. Almansor Park is located adjacent to a single-family residential area and the Alhambra Golf Course in the City of Alhambra. This park is not located within a Scenic Vista. The improvements at this site would likely be buried and surface features would be restored to the same or better condition than currently exists.
- MP01 – Sierra Vista Park. Sierra Vista Park is located in a mixed residential area in the City of Monterey Park. This park is not located within a Scenic Vista. The improvements at this site would likely be buried and surface features would be restored to the same or better condition than currently exists.
- LAC01 – Franklin D. Roosevelt Park. Franklin D. Roosevelt Park is located in a mixed residential and urbanized area in the southern portion of the County of Los Angeles. This park is not located within a Scenic Vista. The improvements at this site would likely be buried and surface features would be restored to the same or better condition than currently exists.

**b./c. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?**

**Would the project substantially degrade the existing visual character or quality of the site and its surroundings?**

**No Environmental Constraints.** The Regional Project improvements would not have the potential to damage scenic resources within a state scenic highway because none of the activities would be located near an eligible or designated state scenic highway. The California Department of Transportation (Caltrans) is responsible for the official nomination and designation of eligible scenic highways. The nearest officially designated state scenic highway (State Highway 2, from approximately three miles north of Interstate [I]-210 in La Cañada to the San Bernardino County Line) (California Department of Transportation, 2013) is located approximately 6 miles northeast of the nearest Regional Project (GL01 – Fremont Park).

The nearest eligible state scenic highway (State Highway 1, from State Highway 19 near Long Beach to I-5 south of San Juan Capistrano) (California Department of Transportation, 2013) is approximately 14 miles southeast of the nearest Regional Project (LAC01 – Franklin D. Roosevelt Park). None of the Regional Projects are visible

from either of these State Scenic Highways; therefore, the Regional Projects would not adversely affect the quality of the scenic views from these locations.

In addition, the following summarizes specific details regarding scenic resources at each Regional Project site:

- SF01 - Recreation Park. Recreation Park is located between industrial development to the east and residential structures along to the west. The buried water quality improvement structures Recreation Park would not be visible, and the surface would be restored to the same or better condition than currently exists following construction. As such, the improvements at Recreation Park are not expected to result in adverse effects to scenic resources or result in significant adverse impacts to visual character of the area.
- NHP – North Hollywood Park. The area of North Hollywood Park proposed for the water quality improvement facilities is a well-used landscaped open space with various mature and less mature trees. The water quality improvements at this site would likely be subsurface facilities that would not be visible. Further, the park surface would be restored to the same or better condition than currently exists following construction. As such, the improvements at North Hollywood Park are not expected to result in adverse effects to scenic resources or result in significant adverse impacts to visual character of the area.
- GL01 – Fremont Park. Fremont Park is landscaped and includes various active and passive recreational uses. There are no designated scenic highways in the City of Glendale. The Open Space and Conservation Element of the General Plan identify several “urban hikeways” in an effort to provide opportunities for citizens and visitors to discover Glendale’s unique urban form. Three self-guided routes cross through downtown Glendale, highlighting the Financial/Fremont Park District, the Brand Shopping District, and the Civic Center District. Although Fremont Park is located along one of the hikeways, the water quality improvements at this site would likely be subsurface facilities that would not be visible, once completed. Further, the park surface would be restored to the same or better condition than currently exists following construction. As such, the improvements at Fremont Park are not expected to result in adverse effects to scenic resources or result in significant adverse impacts to visual character of the area.
- SP01 – Arroyo Park. Arroyo Park is landscaped, and contains active and passive recreational uses. Trees are located throughout the park. This park is not located along a locally designated scenic highway; however, as stated in the City’s Open Space and Resource Conservation element of the General Plan, it is considered a valued resource by the City of South Pasadena. The subsurface water quality improvements at this site would not be visible. There is the potential for surface bio retention improvements to be added between the wash and Stoney Drive; however, these improvements are expected to be consistent with the open space setting of the park and would not introduce incompatible structures. Further, the park surfaces would be restored to the same or better condition than currently exists following construction. As such, the improvements at Arroyo Park are not expected to result in adverse effects to scenic resources or result in significant adverse impacts to visual character of the area.

- SM01 – Lacy Park. Lacy Park is located within a residential neighborhood in the City of San Marino. The center of Lacy Park serves as an open expanse which is highlighted as a resource in the City’s General Plan. The proposed improvements would be located beneath the ground surface in the central area of lacy park; however, because the improvements would be subsurface and the park surfaces restored to existing conditions or better, the improvements are not expected to adversely affect the central area as a scenic resource.
- AL01 – Almansor Park. Almansor Park is located adjacent to a single-family residential area and the Alhambra Golf Course in the City of Alhambra. The improvements at this site would likely be buried and surface features would be restored to the same or better condition than currently exists, and are not anticipated to result in significant impacts to scenic resources or the visual character of the project area.
- MP01 – Sierra Vista Park. Sierra Vista Park is located in a mixed residential area in the City of Monterey Park. Because the improvements at this site would likely be buried and surface features would be restored to the same or better condition than currently exists, significant impacts to scenic resources or visual character of the project area are not anticipated.
- LAC01 – Franklin D. Roosevelt Park. Franklin D. Roosevelt Park is located in a mixed residential and urbanized area in the southern portion of the County of Los Angeles. The improvements at this site would likely be buried and surface features would be restored to the same or better condition than currently exists, and are not anticipated to result in significant impacts to scenic resources or the visual character of the project area.

**d. affect day or nighttime views in the area?**

**No Environmental Constraints.** The Regional Projects would involve the placement of buried infiltration or storage structures, with surface features restored. Exterior lighting of such structures are not anticipated. Water quality improvements such as bio-retention of runoff and stormwater could be placed at ground level in one area of Arroyo Park in South Pasadena; however, lighting, if any, is not expected to be substantial. Some low intensity security lighting could be included; however, such lighting would not be intrusive and would not represent a substantial source of new lighting. As a consequence, adverse impacts related to new lighting sources are not anticipated.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>II. AGRICULTURE AND FOREST RESOURCES.</b>	In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in the Forest Protocols adopted by the California Air Resources Board. Would the project:				
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b.	Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?				X
c.	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC Section 12220(g)) or timberland (as defined in PRC Section 4526)?				X
d.	Result in the loss of forest land or conversion of forest land to non-forest use?				X

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e.	Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?				X

**Discussion:**

- a. **Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?**

**No Environmental Constraints.** The California Department of Conservation, as part of its Farmland Mapping and Monitoring Program (FMMP), develops maps and statistical data to be used for analyzing impacts on California’s agricultural resources. The FMMP categorizes agricultural land according to soil quality and irrigation status; the best quality agricultural land is identified as Prime Farmland. According to the FMMP, the proposed Regional Project sites are located in areas designated as Urban and Built-Up Land, which is described as land occupied by structures that has a variety of uses including industrial, commercial, institutional facilities, railroad or other transportation yards (California Department of Conservation, 2010 and 2011b). There is no Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Importance in the vicinity of the Regional Project sites. Therefore, there would be no impact to designated farmland.

- b. **Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?**

**No Environmental Constraints.** The Regional Project sites are zoned for open space or developed as existing parks, and there are no agricultural zoning designations or agricultural uses within the Project limits or adjacent areas. The Williamson Act applies to parcels consisting of at least 20 acres of Prime Farmland or at least 40 acres of land not designated as Prime Farmland. None of the Regional Project sites are located within a Prime Farmland designation, or on areas consisting of more than 40 acres of farmland (California Department of Conservation, 2010 and 2011b). No Williamson Act contracts apply to the Regional Project sites. Therefore, the Regional Projects would not have an impact on agricultural zoning or a Williamson Act contract.

- c. **Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC Section 12220(g)) or timberland (as defined in PRC Section 4526)?**

**No Environmental Constraints.** The Regional Project sites are zoned for open space or used for parks, and therefore would not conflict with existing zoning for, or require

rezoning of forest land or timberland. Therefore, the Regional Projects would have no impact on land zoned for forest land.

**d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?**

**No Environmental Constraints.** The Regional Projects would occur at existing park sites, which are not designated as forest lands. The Regional Projects would not result in the loss of forest land or conversion of forest land to non-forest use.

**e. Would the project involve other changes in the existing environment that, due to their location or nature, could individually or cumulatively result in loss of Farmland to non-agricultural use or conversion of forest land to non-forest use?**

**No Environmental Constraints.** As discussed above, no farmland or forest land is located on the Regional Project sites. Therefore, the Regional Projects would not involve the disruption or damage of the existing environment that would result in the loss of farmland to non-agricultural use or conversion of forest land to non-forest use.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>III. AIR QUALITY.</b>	When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a.	Conflict with or obstruct implementation of the applicable air quality plan?			X	
b.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	X			
c.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	X			
d.	Expose sensitive receptors to substantial pollutant concentrations?	X			
e.	Create objectionable odors affecting a substantial number of people?			X	

**Discussion:**

**a. Would the project conflict with or obstruct implementation of the applicable air quality plans?**

**No Environmental Constraints.** The Regional Project sites are located within the South Coast Air Basin (SCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD is responsible for administering the Air Quality Management Plan (AQMP) for the Basin, which is a comprehensive air pollution control program for attaining state and federal ambient air quality standards. The Cities in which the Regional Project sites would occur have each adopted an Air Quality Element as part of their General Plan. The Air Quality Elements contains policies and goals for attaining state and federal air quality standards, while continuing economic growth, and includes implementation strategies for local programs contained in the AQMP. A significant impact could occur if the proposed project is inconsistent with the AQMP or the applicable General Plan.

The Regional Projects would place water quality improvements below each of the sites or at their surface, and would not require permanent changes in uses of the parks (or median). Rather, the Regional projects are deemed to be consistent with the planned and existing uses at each site and with the applicable general plan. Therefore, the Regional Projects are not expected to conflict with or obstruct implementation of the applicable air quality plan and no impact is anticipated.

**b. Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?**

**Some Environmental Constraints.** Construction of the Regional Projects would require excavation of portions of each site for either the placement of subsurface storage and infiltration structures, or surface improvements. In addition, construction would be required to make connections with existing storm drains, and could require construction of accessory facilities such as subsurface pump stations or wet wells. The South Coast Air Quality Management District (SCAQMD) has established thresholds of significance for criteria pollutants generated during construction and operation, and a significant impact would occur if the Regional Projects result in construction or operational emissions that exceed the thresholds. Construction is likely to require heavy equipment such as loaders, and excavators, and substantial amounts of soil would require export from the sites. As a consequence, there is a possibility for construction emissions to exceed the SCAQMD significance thresholds, even with mitigation, depending on the construction phasing and schedule. Although such exceedances would not represent a substantial environmental constraint to the project, they would likely have the effect of increasing the length of time required for individual project approvals by requiring Mitigated Negative Declarations or Environmental Impact Reports for CEQA compliance. There is also the potential for the applicable decision-making body to determine that the benefits of an individual Regional Project do not override any associated significant impacts (including impacts to air quality), and therefore do not approve the project. However, this potential is considered to be minimal given the need for the Regional Projects in order to comply with the MS4 permit requirements.

Operation of the proposed Project would occur either passively, or if pumping is required, would not likely utilize a substantial amount of energy or require more than nominal operational activities, and therefore, are not likely to result in emission in excess of the SCAQMD significance thresholds for operation. Therefore, operation of the Regional Projects would not likely pose environmental constraints.

**c. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

**Some Environmental Constraints.** Construction of the Regional projects could result in emissions that exceed SCAQMD significance thresholds, and pose constraints related to individual Regional Project approval, as discussed above. Construction of the Regional Projects, in conjunction with construction of other water quality and related improvements, could result in cumulative air quality impacts. Cumulative impacts would be addressed as part of the County’s Program EIR or in site specific environmental compliance documentation (under the California Quality Act) and would pose the same environmental constraint as described above under Checklist Item III.b.

**d. Would the project expose sensitive receptors to substantial pollutant concentrations?**

**Some Environmental Constraints.** As discussed above, construction of the Regional projects could result in emissions that exceeds SCAQMD significance thresholds. Many of the Regional Projects are located in close proximity to residences, which are considered to be sensitive receptors. The SCAQMD has established localized significance thresholds (LST) to address the impacts that pollutant concentrations could have on nearby receptors. There is a potential for construction to result in emissions in excess of the applicable LSTs, which would have the effect of increasing the length of time required for individual project approvals for CEQA compliance.

**e. Would the project create objectionable odors affecting a substantial number of people?**

**No Environmental Constraints.** Construction of the Regional Projects would result in some odors associated with diesel emissions from construction equipment. Diesel odors are common in urbanized environments, and during project construction, would be temporary and localized, and not expected to result in substantial odor impacts.

Air emissions, including odors, during operation are anticipated to be absent or minimal, as surface water would not be stagnant, and storage and infiltration units would be located underground. Therefore, operation of the Regional Projects are not expected to result in substantial odors.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IV. BIOLOGICAL RESOURCES.</b>	Would the project:				
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			X	
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				X
c.	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?		X		
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?				X

**Discussion:**

- a. **Would the project have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?**

**No Environmental Constraints.** No candidate, sensitive, or special-status species are known to occur on the Regional Project sites. Sites SF01 is located within the USGS San Fernando quadrangle; NHP within the Van Nuys quadrangle; GL01 within the Burbank quadrangle; SP01 within the Los Angeles quadrangle; SM01, AL01, and MP01 within the El Monte quadrangle; and LAC01 within the South Gate quadrangle. Federal and state listed threatened and endangered species have been found in each of the quadrangles in the past (CNDDDB, 2015); however it is very unlikely that such habitat existing at any of the Regional Project sites, as those sites are all developed and actively used urban recreational areas. In addition, there are no Significant Ecological Areas (SEAs) in the vicinity of the Regional Project sites (LA County, 2014).

- b. **Would the project have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?**

**No Environmental Constraints.** There is no riparian habitat or wetlands located at any of the Regional Project sites or the immediate vicinity, as all of the sites are developed are recreational areas. Open drainage channels that are concrete lined are located adjacent to NHP (Tujunga Wash), GL01 (Verdugo Wash), and SP01 (Arroyo Seco); however, these drainages are devoid of riparian habitat and are not expected to be physically modified. Each Regional Project site is designated in its respective general plan as recreation, open space, or other public use. In addition, no SEAs are located in the vicinity of the Regional Project sites.

- c. **Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?**

**No Environmental Constraints.** There is no riparian habitat or wetlands located at any of the Regional Project sites or the immediate vicinity, as all of the sites are developed are recreational areas (see discussion above for Checklist Item IV.b.), and adjacent washes are lined with concrete.

- d. **Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?**

**Some Environmental Constraints.** There are no known terrestrial migration corridors within the vicinities of the Regional Project sites. The sites are located in urban areas, and are not connected with other open space areas via undeveloped or natural corridors. Although wildlife may visit the Regional Project sites, introduction of subsurface facilities at the Regional Project sites would not otherwise impede migration. None of the Regional Project sites have water courses that can be used by migratory fish. Therefore, the Regional Projects would not interfere with wildlife migration.

The Regional Project sites include landscaped open space areas, which include trees that could be used as nesting sites. Impacts to migratory birds and active nests are prohibited under the Federal Migratory Bird Treaty Act (MBTA), 50 C.F.R. Part 10, and Sections 3500 through 3705 of the California Fish and Game Code protect most migratory bird species and active nests from harm or destruction. Nearly all native North American bird species are on the MBTA list. The nesting season varies according to species, but is generally February 15th through August 15th for most birds and January 31st through September 1st for raptors. If tree and vegetation removal would occur during nesting months at any Regional Project site, a confirmation bird survey at each of the sites should be performed to prevent disturbance of active nests. Such surveys are standard mitigation applied during site specific environmental documentation. The requirements for bird surveys are not expected to result in substantial environmental constraints, but could result in additional time requirements for CEQA compliance.

**e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

**Some Environmental Constraints.** The Regional Projects would be located in the City of San Fernando (SF01), City of Los Angeles (NHP), City of Glendale (GL01), City of South Pasadena (SP01), City of San Marino (SM01), City of Alhambra (AL01), City of Monterey Park (MP01), and the County of Los Angeles LAC01).

The City of San Fernando does not currently have any locally-designated tree species, and existing vegetation is limited to introduced species used for landscaping (i.e. lawn area, bushes, and trees) (City of San Fernando, 2008).

The City of San Marino has established an Oak Tree Preservation Program that assists property owners on the proper care of oak trees. San Marino has established tree removal regulations for private property, which would not apply to Lacy Park. The City however does prohibit tree removal in Lacy Park unless authorized by the City Manager.

The City of Alhambra has established tree removal requirements and allows trees to be removed at city-owned facilities only after a review by the department head having jurisdiction. Any removed trees must be replaced as soon as practicable.

The City of Monterey Park allows the removal of trees from public property provided the owner of adjacent private property receives approval from the recreation and parks director. It is assumed that the director would also have to approve any tree removals from Sierra Vista Park or public areas, if required for the water quality improvements.

The County of Los Angeles protects oak trees and requires a permit prior to any oak tree removals.

Other municipalities have established various requirements for tree protection.

The City of Los Angeles protects the following trees within its jurisdiction:

- Oak tree including valley oak
- California Live Oak
- Any other oak genus indigenous to California but excluding the scrub oak,
- Southern California Black Walnut
- Western Sycamore
- California Bay

The City of Glendale protects the following trees, regardless of their location (public or private property):

- Coast Live Oak
- Mesa Oak
- Valley Oak
- Scrub Oak
- California Sycamore
- California Bay

The City of South Pasadena has established regulations governing tree removals within its jurisdiction. A permit is required for trimming or removing the following tree types:

- Oak trees of all varieties
- Coast Redwood
- Dawn Redwood
- Sycamore
- Blue Elderberry
- Heritage trees
- Giant Redwood
- California Walnut
- Christmas Berry
- Mexican Elderberry

There is a potential for the Regional Projects to result in some tree removal, depending on the specific locations and parameters of the water quality improvements, which would require permits or other approvals from the respective jurisdiction. The jurisdictions could apply conditions of approval, including tree replacements, or other measure that mitigate the removals. There tree removals would likely have the effect of increasing the length of time required for individual project approvals and CEQA compliance.

**f. Would the project conflict with the provisions of an adopted habitat conservation plan, natural communities conservation plan, or any other approved local, regional, or state habitat conservation plan?**

**No Environmental Constraint.** The Regional Project sites are located within urbanized areas and are developed as parks and recreational facilities. The sites are not located within an adopted Natural Communities Conservation Plan (NCCP) or Habitat Conservation Plan (HCP). In addition, the sites are not located in or near any SEA.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>V. CULTURAL RESOURCES.</b>	Would the project:				
a.	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?			X	
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X		
c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		
d.	Disturb any human remains, including those interred outside of formal cemeteries?			X	

**Discussion:**

**a. Would the project cause a substantial adverse change in the significance of a historical resource as defined in State CEQA Guidelines §15064.5?**

**No Environmental Constraints.** The Regional Projects would be located at community parks, or on a center median. None of the locations where water quality improvements would occur at the Regional Project sites are developed with structures over the age of 50-years that would be directly affected, and therefore, none of the Regional Projects would result in demolition or relocation of any historic structure. However, there is one historic resource north of GL01, Fremont Park, and one historic structure located at the east end of Lacy Park (SM01) in San Marino.

SM01 – Lacy Park. Lacy Park was originally Wilson Lake in 1875, and the land was purchased by the city in 1925 and dedicated as a park. Many of the tree species, planted nearly 100 years ago, are the result of the designer, Mr. William Hertrich and its first Park Superintendent, Mr. Armin Thurnher. The City considers the Thurnher house, located at the east end of the Park, to be a historic resource. In addition, the San Marino War Memorial is located at the east end of the Park. The water quality improvements would be subsurface and confined to center area of the Park and are not expected to not result in physical changes to the Thurnher house or the War memorial.

GL01 – Fremont Park. Fremont Park is bounded by Kenilworth Avenue on its east boundary. Approximately 200 feet to the north of the northern boundary of Fremont Park, the Kenilworth Avenue Bridge crosses over the Verdugo Wash. This bridge is listed as a historic resource in the City of Glendale’s Register of Historic Resources. The water quality improvements would be confined to Fremont Park and would not result in physical changes to the bridge, or its context.

**b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA Guidelines §15064.5?**

**Some Environmental Constraints.** The Regional Project site would be constructed within the boundaries of community parks and recreation sites. The surfaces of these sites are developed for active recreational uses (fields and courts) and passive recreational uses (picnic areas, etc.), and are not intensively developed. Because the development history of these sites is unknown and the onsite development is low intensity, there could be undisturbed soils below the sites which contain archaeological resources. Based on this, site-specific cultural resource investigations, including a cultural resources records search and field survey by a qualified archaeologist) should be conducted, either prior to or as part of the site-specific environmental documentation for each Regional Project. Mitigation that may be applied in the site-specific environmental document may include monitoring of excavation work by a qualified archaeologist with the authority to halt construction, and the subsequent evaluation and curation of any discovered resources. This potential constraint could have the effect of increasing the length of time required for individual project approvals and CEQA compliance.

**c. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?**

**Some Environmental Constraints.** Similar to the discussion under archaeological resources, the development history of the Regional Project sites is unknown and the onsite development is low intensity. There could be undisturbed subsurface geological units suitable for containing paleontological resources. A site-specific paleontological records search should be conducted by the County's Natural History Museum to determine whether paleontological resources can be present at the depths that would occur at each site, either prior to or as part of the site-specific environmental documentation for each Regional Project. Mitigation that may be applied in the site-specific environmental document may include monitoring of excavation work by a qualified paleontologist with the authority to halt construction, and the subsequent evaluation and curation of any discovered resources. This potential constraint could have the effect of increasing the length of time required for individual project approvals and CEQA compliance.

**d. Disturb any human remains, including those interred outside of formal cemeteries?**

**No Environmental Constraint.** No cemeteries or burial sites are known to have occurred at the Regional Project site; however, it is still possible that human remains exist in the subsurface. California Health and Safety Code Section 7050.5 requires that in the event of the discovery of human remains outside of a dedicated cemetery, all ground disturbances must cease and the county coroner must be notified. Section 7052 establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except by relatives. Sections 5097.94 and 5097.98 of the Public Resources Code specify a protocol to be followed when the Native American Heritage Commission receives notification of a discovery of Native American human remains from a county coroner. Compliance with existing laws regarding the handling of human remains discovered outside of formal cemeteries are expected to address any issues associated

with the unanticipated discovery of human remains during project construction, and no environmental constraints are anticipated.

Environmental Constraints of Regional Projects within the Upper Los Angeles River Watershed	23	February , 2015
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		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VI. GEOLOGY AND SOILS.</b>	Would the project:				
a.	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	i.) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the state geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			X	
	ii.) Strong seismic ground shaking?			X	
	iii.) Seismic-related ground failure, including liquefaction?			X	
	iv.) Landslides?				X
b.	Result in substantial soil erosion or the loss of topsoil?				X
c.	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?			X	
d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			X	
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?				X

**Discussion:**

**a. Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:**

**(i.) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the state geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.**

**No Environmental Constraints.** Southern California is one of the most seismically active areas in the U.S. Numerous active faults and fault zones are located within the general region, including the Whittier, Hollywood-Raymond, and Newport Inglewood faults. The Regional Projects would include subsurface storage basins and structures, and potentially some surface improvements. As a standard practice during the design process for any structure or facility, a geotechnical study is performed of each site that evaluates and identifies faults and fault zones that could affect the project, and that would make recommendations regarding project design based on the geotechnical considerations. Because geotechnical considerations are addressed during the design phase, the Regional Projects would not result in exposure of people or structures to substantial geotechnical hazards.

**(ii.) Strong seismic ground shaking?**

**No Environmental Constraints.** As discussed above, the Los Angeles Basin is an area of known seismic activity. The risk of seismic hazards such as ground shaking cannot be avoided. Similar to the earthquake fault hazards described above, geotechnical evaluations would be performed as a standard practice as part of the design phase, and the recommendations would be incorporated into project design to keep the Regional Projects from resulting in exposure of people or structures to substantial geotechnical hazards, including to ground shaking.

**(iii.) Seismic-related ground failure, including liquefaction?**

**No Environmental Constraints.** Similar to the earthquake hazards described above, a geotechnical study for each Regional Project would be prepared as a standard practice to address geotechnical considerations, including liquefaction, during the Project design phase, which would keep the Regional projects from resulting in exposure of people or structures to geotechnical hazards related to liquefaction.

**(iv.) Landslides?**

**No Environmental Constraints.** The Regional Projects would be constructed and operated on various community park sites and a center median. The project sites are relatively flat with no substantial natural or graded slopes. The Regional Projects are not located near any landslide hazard areas; therefore, there would be no environmental constraints.

**b. Would the project result in substantial soil erosion or the loss of topsoil?**

**No Environmental Constraints.** The majority of Regional Projects would involve storage structures beneath community recreation areas, and would not result in erosion.

The Regional Projects at Arroyo Park (SM01) could place bio-retention features at the ground surface; however, these improvements would be engineered and constructed in a manner that infiltrates captured stormwater, rather than conveys it offsite. These design features would limit the potential for erosion, and would not represent an environmental constraint.

- c. **Is the project located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse?**

**No Environmental Constraints.** Although no unstable geologic conditions are known to occur at the Regional Project sites, a geotechnical study for each Regional Project would be prepared as a standard practice to address geotechnical considerations during the Project design phase. Recommendations would be incorporated into the project design, which would keep the Regional Projects from resulting in substantive geotechnical hazards or risk exposure.

- d. **Is the project located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?**

**No Environmental Constraints** Expansive soils generally result from specific clay minerals that expand when saturated and shrink when dry. Expansive clay minerals are common in the geologic deposits throughout the Southern California region, and there is the potential that expansive soils could be present at the Regional Project sites. As discussed above, a geotechnical study for each Regional Project would be prepared to address geotechnical considerations (including expansive soils) as a standard practice during the Project design phase, and recommendations would be incorporated into Project designs to keep the Regional Projects from resulting in substantial risks to life or property.

- e. **Would the project have soils that are incapable of supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?**

**No Environmental Constraints.** The Regional Projects are water quality improvement projects that do not generate wastewater. Therefore, the Regional Projects would not result in environmental constraints related to alternative wastewater disposal methods.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VII. GREENHOUSE GAS EMISSIONS.</b>	Would the project:				
a.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b.	Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?			X	

**Discussion;**

- a. **Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

**No Environmental Constraints.** The Regional Projects would generate criteria pollutant emissions during construction, including CO2 and equivalents. Construction emissions are amortized over 30-years, and are not likely to result in substantive annual greenhouse gas emissions. In addition, operation of the Regional Projects would consist of the pumping of stormwater to the treatment devices, and are not expected to generate substantial levels of greenhouse gasses.

- b. **Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?**

**No Environmental Constraints.** The Regional Projects are water quality improvement projects that would not generate substantial greenhouse gas emissions. Because of this, the Regional Projects are not expected to not conflict with any applicable plans, policies, or regulations adopted by the state and local jurisdictions for the purposes of reducing GHG emissions.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VIII.</b>	<b>HAZARDS AND HAZARDOUS MATERIALS.</b> Would the project:				
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		X		
c.	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school?				X
d.	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e.	Be located within an airport land use plan area or, where such a plan has not been adopted, be within 2 miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?				X
f.	Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?				X
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
h.	Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

**Discussion:**

**a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

**No Environmental Constraint.** Construction activities associated with the Regional Projects are not likely to involve the use of substantial quantities of hazardous materials and the most likely source of hazardous materials would be from vehicles and construction equipment at the site. However, there could be small amounts of hazardous materials, including solvents and lubricants used to maintain construction equipment. These materials would be confined and located at the applicable staging areas. Federal and state regulations that govern the storage of hazardous materials in containers (i.e., the types of materials and the size of packages containing hazardous materials), secondary confinement requirements, and the separation of containers holding hazardous materials, would limit the potential adverse impacts of contamination to a relatively small area. In compliance with the State General Permit for Storm Water Discharges Associated with Construction Activity and a Project-specific SWPPP, standard BMPs would be used during construction activities to minimize runoff of contaminants and clean-up any spills. Applicable BMPs include, but are not limited to controls for: vehicle and equipment fueling and maintenance; material delivery, storage, and use; spill prevention and control; and waste management. Therefore, implementation of construction standards would minimize the potential for an accidental release of petroleum products, hazardous materials, and/or explosion during construction activities at the Project site. As a consequence, construction would not create an environmental constraint related to potential hazards to the public or the environmental through the routine transport, use, or disposal of hazardous materials.

Operation of the Regional Projects would be automated (with minimal electrical consumption for pumping) and would not require hazardous materials. The infiltration units would filter incoming stormwater to remove oil, grease, metals, and trash; however, the filters would be routinely replaced, and disposed of in accordance with applicable laws and regulations. Based on the above, the Regional projects are not expected to create a substantial hazard to the public or the environmental through the routine transport, use, or disposal of hazardous materials.

**b. Would the project create a significant hazard to the public or the environment through the reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?**

**Some Environmental Constraints.** The Regional Projects would be located on or beneath community parks within in residential or mixed commercial residential areas,

Various hazardous materials and contamination databases were reviewed (Geotracker and Envirostor), and several sites were identified near two Regional Project sites (SF01 and AL01) that have indications of past contamination.

None of the other Regional Project sites were documented to have been subject to past contamination, leaks, or remediation efforts. Based on this, Regional Projects NHP, GL01, SP01, SM01, MP01, and LAC01 are not expected to create a hazard to the public or environment during construction.

- SF01 – Recreation Park. The water quality improvement are within Recreation Park is located about 350 feet west of a site (located just east of Parkside Drive) potentially contaminated with lead. The Envirostor database identifies this site as “San Fernando Playground” and as in need of evaluation. Because this site is in need of evaluation, the extent of contamination present is unknown, and due to its proximity to SF01, further due diligence may be required during the Project planning and design phase. This potential constraint could also have the effect of increasing the length of time required for individual project approvals and CEQA compliance.

AL01 – Almansor Park. Geotracker identifies a leaking underground fuel tank located at 900 New Avenue that is owned by the City of Alhambra. Although Geotracker displayed the site location at the intersection of New Avenue and East Adams Avenue, the actual location of the tank may be at the City’s Fire Training Facility approximately 900 feet east of the area of Almansor Park where the water quality improvements would occur. Due to the distance of the leaking underground fuel tank from this Regional Project site and given that the tank location is at a lower elevation than Almansor Park, it is unlikely that leaked fuel has traveled to the Project site. In addition, Geotracker has identified several reported leaks from auto repair facilities (in 2000). Geotracker shows these sites located at the north end of Almansor Street (extended) and the railroad right-of-way; however, Geotracker appears to be displaying these locations incorrectly, and the actual locations of these facilities are north of the railroad right-of-way and west of the project site. Because of this, these facilities are not likely to have contaminated the project site or potential storm drain tie-in locations near the railroad right-of-way.

Based on the above, there appears to be a low potential for contaminated soils or groundwater to be present beneath the Project site, and no additional constraints related to hazardous materials are anticipated.

**c. Would the project emit hazardous emissions or handle hazardous materials or acutely hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school?**

**No Environmental Constraint.** None of the Regional Projects would utilize processes that could emit hazardous emissions or otherwise release hazardous substances or wastes. Infiltration devices would contain filtration systems designed to remove oils, metals, and other pollutants from storm water; however, the filters would be removed and disposed of in accordance with manufacturers’ recommendations and would not be released to the environment. Because of this, no environmental constraint associated with the Regional Projects are expected.

**d. Is the project located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?**

**No Environmental Constraint.** The provisions in Government Code Section 65962.5 are commonly referred to as the "Cortese List" (after the Legislator who authored the legislation that enacted it). Because this statute was enacted over twenty years ago, some of the provisions refer to agency activities that were conducted many years ago and are no longer being implemented and, in some cases, the information to be included in the Cortese List does not exist. While Government Code Section 65962.5 makes reference to the preparation of a "list," many changes have occurred related to web-based information access since 1992 and this information is now largely available on the Internet sites of the responsible organizations (CalEPA, 2015). The California Environmental Protection Agency (CalEPA) has identified the data resources that provide information regarding the facilities or sites identified as meeting the "Cortese List" requirements (Cal EPA, 2014b), which are as follows:

- List of Hazardous Waste and Substances sites from Department of Toxic Substances Control (DTSC) EnviroStor database,
- List of Leaking Underground Storage Tank Sites by County and Fiscal Year from State Water Board GeoTracker database,
- List of solid waste disposal sites identified by the State Water Board with waste constituents above hazardous waste levels outside the waste management unit,
- List of "active" Cease and Desist Orders (CDO) and Cleanup and Abatement Order (CAO) from the State Water Board<sup>1</sup>, and
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC.

The Hazardous Waste and Substance Site List maintained by the DTSC Information was downloaded from the DTSC EnviroStor website (DTSC, 2015), and reviewed. The Regional Project sites are not listed in the Hazardous Waste and Substance Site.

The Leaking Underground Storage Tank (LUST) Cleanup Sites contained in the State Water Resources Control Board (SWRCB) GeoTracker database was queried (February, 2015), and the Regional Project sites are not contained in the LUST Cleanup Site list.

The list of solid waste disposal sites identified by the SWRCB with waste constituents above hazardous waste levels outside the waste management unit (CalEPA, 2015c) was reviewed, and the Project site was not contained in the list.

The list of "active" CDOs and CAOs from the SWRCB (SWRCB, 2015b) was downloaded in February, 2015 and reviewed (sorted and searched). The Regional Project sites are not contained in the list of "active" CDO and CAO.

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<sup>1</sup> This list contains many CDOs and CAOs that do NOT concern the discharge of wastes that are hazardous materials. Many of the listed orders concern, as examples, discharges of domestic sewage, food processing wastes, or sediment that do not contain hazardous materials, but the State Water Boards' database does not distinguish between these types of orders.

The DTSC list of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code (DTSC, 2015b) was reviewed and the Regional Project sites are not included in this list.

Based on the reviews of the specific lists that currently comprise the Cortese List, none of the Regional Project sites are contained on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5.

- e. **For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?**

**No Environmental Constraints.** The Regional Project site that is closest to a public airport is SF01, which is located approximately 1.4 miles northwest of the Whiteman Airport runway. None of the other Regional Project are located within 2 miles of a public use airport. Although SF01 is located within 2 miles of an airport, neither it nor the other Regional Project sites are located within an airport land use plan; therefore, there would be no environmental constraints.

- f. **For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

**No Environmental Constraints.** There are numerous private airports throughout Los Angeles County, which include heliports. The proximity of the heliports to any of the Regional Projects would not result in a safety hazard for people working in the Project area, as the Regional Project would have no effect on air transport activities or their flight paths. The Regional Projects would therefore not result in any safety hazards for people in the vicinity of the sites.

- g. **Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

**No Environmental Constraint.** The Regional Project sites are currently used for recreational activities (active and passive). Although the Regional Projects would place water quality improvement infrastructure within the park and recreational sites, additional construction would be required at each site to connect with the existing storm drain system, which are located within the streets surrounding each site. The storm drain connections would involve excavations into the streets to make the tie-ins with the storm drains, and would require the temporary closure of one or more lanes while street work is occurring. However, street work would occur under permit from the applicable City or County, and appropriate notifications would be made to local emergency providers so that alternative routes can be planned for in the event of an emergency. As a standard practice, street work would be subject to the requirements of a Traffic Control Plan approved by the local transportation agency, or would comply with applicable work area traffic control requirements. In addition, contractors would have steel plating available in the event excavations need to be quickly spanned. Aside from the temporary street work, no other disruptions to the local transportation system would occur, and substantial interruptions to emergency access are not anticipated.

- h. **Would the project expose people or structures to the risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?**

**No Environmental Constraint.** The Regional Project sites are developed as community parks and recreations areas, or landscaped center median, and no wildlands are present at the Regional Project sites. The areas immediately surrounding the Regional Project sites are urbanized, and no increased wildland fire hazard is expected as a result of the water quality improvements at each site.

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		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IX.</b>	<b>HYDROLOGY AND WATER QUALITY.</b> Would the project:				
a.	Violate any water quality standards or waste discharge requirements?		X		
b.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?				X
c.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?				X
d.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?			X	
e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
f.	Otherwise substantially degrade water quality?				X
g.	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map or other flood hazard delineation map?				X

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
h.	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?				X
i.	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?			X	
j.	Contribute to inundation by seiche, tsunami, or mudflow?			X	

**Discussion:**

**a. Would the project violate any water quality standards or waste discharge requirements?**

**Some Environmental Constraints.** The Regional Projects would install and operate water quality improvement facilities at eight parks Upper Los Angeles River watershed, which would divert, treat, and infiltrate stormwater in order to meet the requirements of the MS4 permits. The Regional Projects would generally result in beneficial impacts to water quality.

However, for SF01, there is a remote potential for subsurface contamination to be present at portions of SF01 if contamination from the sites west of Parkside Drive (see Checklist Item VIII.b. above) has migrated westward. If such subsurface contamination is present and infiltration would occur in areas where the contamination is present, then there is a potential for adverse water quality impacts to groundwater. This potential environmental constraint is considered remote but could result in increased time for the planning and design of these three Regional Projects, and could also have the effect of increasing the length of time required for individual project approvals, design and CEQA compliance.

**b. Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?**

**No Environmental Constraints.** The Regional Projects would not be located in areas used for groundwater recharge and therefore would not interfere with groundwater recharge. The Regional Projects would divert runoff and stormwater from the storm drain system in the Upper Los Angeles River watershed, and treat and infiltrate some of the diverted stormwater. As a consequence, the Regional Projects are considered to provide beneficial effects to groundwater by increasing infiltration above baseline conditions.

- c. **Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?**

**No Environmental Constraints.** The Regional Projects would be located within community parks or a center median, and would not result in physical changes to a stream or river. All Regional Project sites would be restored following construction. Infiltration would occur subsurface and would not result in erosion. Bio-retention features would be designed to properly manage the diverted runoff and storm water, and would not result in erosion.

- d. **Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?**

**No Environmental Constraints.** The Regional Projects would divert and store or divert and treat/infiltrate a portion of the stormwater generated within the Upper Los Angeles River watershed, and would have the effect of decreasing the amount and slowing runoff generated in the watershed, which are considered to be beneficial effects. In addition, the stormwater diversions would decrease the potential for flooding downstream.

- e. **Would the project create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?**

**No Environmental Constraints.** The Regional Projects would divert and store or treat/infiltrate a portion of the stormwater generated within the Upper Los Angeles River watershed, and would have the effect of improving runoff quality and decreasing the potential for flooding downstream.

- f. **Would the project otherwise substantially degrade water quality?**

**No Environmental Constraints.** No constraints regarding water quality are anticipated beyond those discussed under Checklist Item IX.a. above.

- g. **Would the project place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map or other flood hazard delineation map?**

**No Environmental Constraints.** No housing is proposed under any of the Regional Projects.

- h. **Would the project place within a 100-year floodplain structures that would impede or redirect flood flows?**

**No Environmental Constraints.** The water quality improvements under the Regional Projects would be either buried infiltration or storage units, or surface bio-retention features, neither of which would impede site runoff or flood flows.

- i. **Would the project expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?**

**No Environmental Constraints.** Based on a review of the safety elements of the general plans of the Cities of Glendale, Los Angeles, Monterey Park, Pasadena, and South Pasadena, Regional Project sites SF01, NHP, SP01, and LAC01 appear to be within potential inundation or flood areas, including areas subject to flooding in the event of a dam failure. However, the Regional Projects would not house people or otherwise increase the risk of exposure to risks related to potential flooding. In addition, the Regional Projects are stormwater management projects that are expected to result in beneficial effects to downstream conveyance capacity in the event of a flood.

**j. Would the project contribute to inundation by seiche, tsunami, or mudflow?**

**No Environmental Constraints.** The Regional Project sites are not located within a tsunami hazard zone, or near inland water bodies that could be subject to a seiche. In addition, the sites are relatively flat and are not subject to mudflows.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>X.</b>	<b>LAND USE AND PLANNING.</b> Would the project:				
a.	Physically divide an established community?				X
b.	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c.	Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

**Discussion:**

**a. Would the project physically divide an established community?**

**No Environmental Constraints.** The Regional Projects would be located within existing community parks, and would not physically divide the surrounding communities.

**b. Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?**

**No Environmental Constraints.** The Regional Projects would be placed within community parks that are designated as open space or public facilities, and are considered to be consistent with planned and existing uses. It should be noted that for the water quality improvements under SP01, part of the site located west of Arroyo Seco appears to fall within the City of Los Angeles, and another portion within the City of South Pasadena. Regardless, the improvements at SP01 are not expected to conflict with either jurisdiction's applicable land use plan.

**c. Would the project conflict with any applicable habitat conservation plan or natural communities conservation plan?**

**No Environmental Constraints.** The Regional Project sites do not fall within or near an area covered by a habitat conservation plan or natural communities conservation plan. In addition, there are no Significant Ecological Areas in the vicinity of the Regional Projects.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XI. MINERAL RESOURCES.</b>	Would the project:				
a.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b.	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				X

**Discussion:**

- a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?**

**No Environmental Constraints.** The Regional Projects would be located within existing community parks or a center median, and none of the sites are designated as containing important mineral resources.

- b. Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?**

**No Environmental Constraints.** The Regional Project sites are designated in the applicable general plan as open space or parks. Therefore, the Regional Projects would not result in the loss of availability of mineral resources.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XII. NOISE.</b>	Would the project:				
a.	Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?		X		
b.	Expose persons to or generate excessive groundborne vibration or groundborne noise levels?			X	
c.	Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
d.	Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		X		
e.	Be located within an airport land use plan area, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?				X
f.	Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?				X

**Discussion:**

- a. **Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies?**

**No Environmental Constraints.** The Regional Projects would be located beneath the surface as the eight respective sites and the surface restored such that existing activities could resume following completion of construction. Operation of the water quality improvements would be automated and pump systems required to convey stormwater to the buried facilities would either be subsurface or placed in small housing units. Noise from operations is not expected to be noticeable, and would not result in elevations in ambient noise levels at the Regional Project sites or vicinities. The water quality improvements would require periodic maintenance; however, maintenance activities would not result in substantial elevation in ambient noise.

Construction of the water quality improvement facilities would result in noise associated with construction equipment and haul trip activities. Construction noise is typically governed by ordinance in each jurisdiction, and the following summarizes the construction noise regulations (the City of San Fernando construction noise regulations are discussed below).

- City of Los Angeles Noise Regulations. The City of Los Angeles (municipal Code, Chapter IV, Article 1, Section 41.40) allows construction Monday through Friday between 7:00 a.m. to 9:00 p.m., Saturdays and National Holidays between 8:00 a.m. to 6:00 p.m., and prohibits construction on Sundays (except for residents). The noise regulations also prohibit night construction if related noise can disturb persons occupying sleeping quarters in any dwelling, hotel, or residence. Major public works projects conducted by the City are exempt from this weekend and holiday restriction.
- City of Glendale Construction Noise Regulations. The City of Glendale (Municipal Code section 8.36.080) prohibits construction for projects within 500 feet of a residential zone between the hours of 7:00 p.m. one day and 7:00 a.m. the next day; 7:00 p.m. Saturday to 7:00 a.m. Monday; and from 7:00 p.m. preceding a holiday to 7:00 a.m. following such holiday.
- City of South Pasadena Noise Regulations. The City of South Pasadena (Municipal Code 19A.13) prohibits construction within or within 500 feet of a residential before 8:00 a.m. and after 7:00 p.m. on Monday through Friday, on Saturday before 9:00 a.m. and after 7:00 p.m., and Sunday before 10 a.m. and after 6:00 p.m.
- City of San Marino Noise Regulations. The City of San Marino (Municipal Code Section 25.01.02) prohibits construction between the hours of 6:00 p.m. and 7:00 a.m. Monday through Friday, on Saturdays, before 9:00 a.m. and after 4:00 p.m., and on Sunday and National holidays. City of Alhambra. The City of Alhambra regulates noise sources in its jurisdiction (Municipal Code Chapter 18.02), but exempts construction on public property or by public entities or their authorized representatives from the noise regulations.
- City of Monterey Park. The City of Monterey Park regulate noise sources in its jurisdiction (Municipal Code 9.53.010 - 9.53.070), but exempts construction conducted between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and the hours of 9:00 a.m. and 6:00 p.m. on Saturdays, Sundays and holidays.
- County of Los Angeles. The County of Los Angeles regulates noise within its jurisdiction (Code section 12.08.440) and prohibits construction activities between the hours of 7:00 p.m. and 7:00 a.m. and on Sundays and national holidays. The Code also establishes specific noise level limits at residential receptors for different categories of construction (mobile equipment operated for short durations, and stationary equipment operated for longer durations); however, the construction noise levels of the proposed project are exempt from the noise limits of the County Noise Control Ordinance as specified in the County Noise Control Ordinance Part 5 Exemptions, H: 5, which includes all transportation, flood control, and utility company maintenance and construction operations at any time on public right of way, and those situations, which may occur on private real property deemed necessary to serve the best interest of the public and to protect the public's health and well-being (County, 2012).

Construction of the Regional Projects would occur within the hours allowed for in the applicable noise regulations, or would be exempt from the noise regulations. It should be noted that several schools (Martha Baldwin Elementary School and Emmaus Lutheran Preschool) are located close to Almansor Park, and a Head Start preschool is located at the central portion of Franklin D. Roosevelt Park, and some noise reducing measures may be prudent during construction despite compliance with noise regulations.

**Some Environmental Constraints.** The City of San Fernando has established construction noise controls that set limits on when construction could occur, and the noise levels at the property line. Section 34-28 (a)(10) (Specific noises prohibited) and Section 34-31(5) (Exclusions) of the San Fernando Municipal Code provide the following provisions for construction noise:

*Noise sources associated with construction, repair, remodeling or grading of any real property are allowed up to 70 dB measured at the property line, provided such activities do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a federal holiday.*

Construction at Recreation Park would comply with the construction time restrictions (no construction between the hours of 6:00 p.m. to 7:00 a.m. Monday through Friday, or at any time on Saturdays and Sundays); however construction noise at the property line of the park could exceed the 70dBA restriction level established in the code. As such, construction of the water quality improvements at Recreation Park could conflict with the City's noise regulations. This potential environmental constraint could result in increased time required for CEQA compliance for SF01.

**b. Expose persons to or generate excessive groundborne vibration or groundborne noise?**

**No Environmental Constraints.** Construction activities of the Regional Projects would generate some level of vibration. Construction equipment such as excavators, loaders, and haul trucks would generate vibrations that could result in groundborne noise or vibration that could affect nearby structures or residences. Transient vibration levels greater than 0.5 inches per second (in/sec) and continuous/frequent intermittent vibration levels greater than 0.3 in/sec have the potential to damage older residential structure. Additionally, transient vibration levels greater than 2.0 in/sec or continuous sources greater than 0.4 in/sec would be severely noticeable to a human (Caltrans, 2013b). All phases of the construction involve multiple trucks and other vibration producing equipment resulting in vibration levels approximately up to 0.02 in/sec at the closest residences. Excessive groundborne vibration and/or groundborne noise are not anticipated. Therefore, substantial vibrations are not expected to occur during construction of the Regional Projects.

Operation of the Regional Project could include changing of filters in runoff treatment units and general inspections; however, these types of maintenance activities do not produce substantive vibrations. Therefore, operation of the proposed Project would not result in impacts related to groundborne vibration or noise.

**c. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?**

**No Environmental Constraints.** Operation of the Regional Projects would include pump stations or wet wells that transfer stormwater from storm drains to the water quality improvement structures, as well as general maintenance activities. Pump stations would be underground or housed in small structures, and are not expected to produce

audible noise. Because of this, operation of the Regional Projects are not expected to result in permanent increase in ambient noise levels.

**d. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?**

**Some Environmental Constraints.** Construction of the Regional Projects would occur within the hours allowed for in the applicable local noise regulations or would be exempt from noise regulations, and although construction would result in temporary increases in noise levels compared to ambient conditions without construction, the noise levels are presumably not considered to be substantial due to consistency with noise regulations.

However, for construction projects in the City of Los Angeles that last more than 10 days within a three-month period, the City recommends using the threshold of significance of 5 dBA or more increase in noise levels over existing ambient community noise equivalent level (CNEL), which is a type of 24-hour average noise level (City of Los Angeles, 2006). Given the extent of construction, the anticipated construction durations, and the surrounding noise receptors, it is likely that construction of the Regional Projects in the City of Los Angeles (NHP) would result in temporary elevations of the CNEL in excess of the 5dBA threshold, which would have the effect of increasing the length of time required for individual project approvals and CEQA compliance.

**e. For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?**

**No Environmental Constraints.** The Regional Project site that is closest to a public airport is SF01, which is located approximately 1.4 miles northwest of the Whiteman Airport runways. Although SF01 is located within 2 miles of an airport, the water quality improvements would be automated, and would not expose people to excessive noise related to proximity to an airport. None of the other Regional Project sites are located within an airport land use plan or within 2 miles of a public airport.

**f. For a project located within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?**

**No Environmental Constraints.** There are numerous private airports throughout Los Angeles County, which include heliports. The proximity of the heliports to any of the Regional Projects would not result in exposure of people to excessive noise levels, as the Regional Project would have no effect on air transport activities or their flight paths, and would not cause people to move closer to a private airport.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIII.</b>	<b>POPULATION AND HOUSING.</b> Would the project:				
a.	Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?				X
b.	Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?				X
c.	Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?				X

**Discussion:**

- a. **Would the project induce substantial population growth in an area, either directly (e.g., by proposing new homes and business) or indirectly (e.g., through extension of roads or other infrastructure)?**

**No Environmental Constraints.** The Regional Projects are water quality improvement projects that would not result in substantive employment demand and do not have a housing component that could induce population growth.

- b. **Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?**

**No Environmental Constraints.** No housing is located on any of the Regional Project sites, and no housing displacements would occur.

- c. **Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

**No Environmental Constraints.** There is no housing within the Regional Project site boundaries that would be displaced. The Regional Projects would not result in the displacement of any persons, or the need for replacement housing.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIV.</b>	<b>PUBLIC SERVICES.</b> Would the project:				
a.	Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
	i.) Fire protection?				X
	ii.) Police protection?				X
	iii.) Schools?				X
	iv.) Parks?				X
	v.) Other public facilities?				X

**Discussion:**

- a. **Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:**

**i.) Fire Protection**

**No Environmental Constraints.** The Regional Projects are water quality improvement projects that would not increase housing or induce population growth that could in turn increase the need for new fire protection services. Although the Regional Projects would involve some construction within the street system to connect to storm drains, the construction is not expected to substantively increase fire protection response times because prior notifications to emergency service providers occur as a standard permit condition for in-street construction.

**ii.) Police Protection**

**No Environmental Constraints.** The Regional Projects are water quality improvement projects that would not increase housing or induce population growth that could in turn increase the need for new police protection services. Although the Regional Projects would involve some construction within the street system to connect to storm drains, the construction is not expected to substantively increase police protection response times

because prior notifications to emergency service providers occur as a standard permit condition for in-street construction.

**iii) Schools**

**No Environmental Constraints.** The Regional Projects are water quality improvement projects that would not increase housing or induce population growth that could in turn increase the need for new schools.

**iv) Parks**

**No Environmental Constraints.** The Regional Projects are water quality improvement projects that would not increase housing or induce population growth that could in turn increase the need for new parks. Environmental constraints related to impacts on existing community parks are discussed under Checklist Item XV.b. below.

**v) Other Public Facilities**

**No Environmental Constraints.** The Regional Projects are water quality improvement projects that would not increase housing or induce population growth that could in turn increase the need for new public facilities.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XV. RECREATION.</b>	Would the project:				
a.	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b.	Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?		X		

**Discussion:**

- a. **Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

**No Environmental Constraints.** The Regional Projects would construct and operate water quality improvement facilities at specific community parks in the Cities of San Fernando, Los Angeles, Glendale, San Marino, Alhambra, and Monterey Park, and the County of Los Angeles. The water quality improvement facilities are considered to be infrastructure projects that do not increase the housing stock and do not result in the movement or relocation of people from one area to another. As a consequence, the Regional Projects would not result in increased demand for recreational facilities and would therefore not directly or indirectly result in physical deterioration of parks or other recreational facilities.

- b. **Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?**

**Some Environmental Constraints.** The Regional Projects would construct and operate water quality improvement facilities at specific community parks. Construction is estimated to take up to 18 months, and would result in the temporary disruption of park activities within the construction zone. The likely disruption to recreational uses at each Regional Project site are discussed below.

- **SF01 – Recreation Park.** The water quality improvement features at Recreation Park include buried storage basins and infiltration units within southern portion of the park. The improvements, depending on where they would be located, would require substantial excavation of the main park site, which could result in temporary closure of the softball field and other areas within the south end of the park. The closures would occur for the duration of construction (estimated to be 12-18 months) and the amount of time it would take to restore the fields, and other affect recreational features (estimated at 1-2 months). **The temporary loss**

of recreational areas of Recreation Park is likely to require close coordination between the City of San Fernando, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational uses. This represents an environmental constraint which would have the effect of increasing the length of time required for project approval and CEQA compliance.

- NHP – North Hollywood Park. The water quality improvements at North Hollywood Park would likely be subsurface infiltration and/or storage structures. Construction of these facilities would result in the temporary closure of some existing walking paths areas used for passive recreation. The temporary closure of a large portion of North Hollywood Park during construction is likely to require close coordination between the City of Los Angeles, local residents, and community stakeholders to develop suitable mitigation options for addressing impacts to passive recreational uses of the park. This represents an environmental constraint which would have the effect of increasing the length of time required for project approval and CEQA compliance.
- GL01 - Fremont Park. The water quality improvements proposed for the Fremont Park include a subsurface infiltration or storage facility within the southeastern portion of the park (beneath the active field). The improvements would require the temporary closure (up to approximately 18 months) of this portion of the park, including the active field and potentially relocation of other recreational facilities within the park. The temporary closure of a portion of Fremont Park during construction will likely to require close coordination between the City of Glendale, local residents, and community stakeholders to develop suitable mitigation options for addressing impacts to Fremont Park. This represents an environmental constraint which would have the effect of increasing the length of time required for project approval and CEQA compliance.
- SP01 – Arroyo Park. The water quality improvement facilities at Arroyo Park would include buried infiltration structures storage basins beneath the 3 baseball and softball fields in the northern part of the park, beneath the baseball field at the portion of the park west of the Arroyo Seco, and potential surface bio-retention improvements east of the Arroyo Seco to Stoney Drive. This latter area contains vegetation and does not appear to be used for active recreation. The improvements are likely to require substantial excavation within the park, which would result in temporary closure of multiple active areas (baseball and softball fields) and the periphery. Other park uses such as picnic areas and playgrounds may require relocation to elsewhere in the park. The closures would occur for the duration of construction (estimated to be up to 18 months) and the amount of time it would take to restore the fields and recreational areas. The temporary closure of the recreational uses within Arroyo Park is likely to require close coordination between the City of South Pasadena, City of Los Angeles (a small section of the park west of the Arroyo Seco is located within the City of Los Angeles), local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational uses. This represents an environmental constraint which would have the effect of increasing the length of time required for project approval and CEQA compliance.

- SM01 – Lacy Park. The water quality improvement facilities at Lacy Park would include buried infiltration and/or storage basins in approximately the center of the park. The improvements would require substantial excavation, which could result in temporary closure of the ball field and potentially several picnic areas around the periphery of the central green space. The temporary closure would occur for the duration of construction (estimated to up to 18 months) plus the amount of time it would take to restore the central green space area (estimated at 1-2 months). The temporary closure of the central portion of Lacy Park is likely to require close coordination between the City of San Marino, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary closure. This represents an environmental constraint which would have the effect of increasing the length of time required for project approval and CEQA compliance.
- AL01 – Almansor Park. The water quality improvement facilities proposed for Almansor Park include buried infiltration units and storage basins beneath the ball fields. The improvements would require substantial excavation, which would result in temporary closure of the ball fields for the duration of construction (estimated to be up to 18 months) plus the amount of time it would take to restore the fields, and other affect recreational features (estimated at 1-2 months). The temporary closure of the recreational uses within Almansor Park is likely to require close coordination between the City of Alhambra, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational uses. This represents an environmental constraint which would have the effect of increasing the length of time required for project approval and CEQA compliance.
- MP01 – Sierra Vista Park. The water quality improvement facilities proposed for Sierra Vista Park include buried infiltration units and/or storage basins at the southern end of the park, beneath the softball field. The improvements would require substantial excavation, which would result in temporary closure of the softball field and tennis courts. The closures would occur for the duration of construction (estimated to be up to 18 months) plus the amount of time it would take to restore the field, and other affect recreational features (estimated at approximately 1 month). The temporary closure of the recreational uses within Sierra Vista Park is likely to require close coordination between the City of Monterey Park, local residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational uses. This represents an environmental constraint which would have the effect of increasing the length of time required for project approval and CEQA compliance.
- LAC01 – Franklin D. Roosevelt Park. The water quality improvement facilities proposed for the Franklin D. Roosevelt Park would include buried infiltration units and/or storage basins beneath the northern, middle, and southern areas of the Park. The improvements are likely to require substantial excavation and result in temporary closure of these areas of the park, which include soccer fields, ball fields, basketball courts, and picnic areas. The closures would occur for the duration of construction (estimated to be up to 18 months) plus the amount of time it would take to restore the affected recreational areas (estimated at 1-2 months). The temporary closure of large portions of Franklin D. Roosevelt park will require close coordination between the County of Los Angeles, local

residents, and community stakeholders to develop suitable mitigation options for addressing the temporary loss of recreational areas. This represents an environmental constraint which would have the effect of increasing the length of time required for project approval and CEQA compliance.

Environmental Constraints of Regional Projects within the Upper Los Angeles River Watershed	50	February , 2015
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		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVI. TRANSPORTATION/TRAFFIC.</b>	Would the project:				
a.	Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	
b.	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				X
c.	Result in a change in marine vessel traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d.	Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e.	Result in inadequate emergency access?				
f.	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X

**Discussion:**

- a. **Would the project increase the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?**

**No Environmental Constraints.** The Regional Projects would involve water quality improvements at eight community parks within the Upper Los Angeles River watershed.

Although the Regional Projects would require some construction within the streets surrounding each site to make connections with storm drains, the construction would be temporary and subject to traffic control plans as required by the applicable city. Once the connections are made, the streets would be repaired and returned to service. Because the Regional projects would not make substantive changes to the circulation system or street capacities, they are not expected to pose environmental constraints in this area.

- b. Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?**

**No Environmental Constraints.** The Regional Projects are not located along a designated or interim CMP highway or arterial (Metro, 2010), and are not considered traffic generators. Therefore, the Regional Project would not conflict with the LA County Congestion Management Plan.

- c. Would the project result in a change in marine vessel traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?**

**No Environmental Constraints.** The Regional Projects are land based and are not generators of marine vessel traffic. Therefore, the Regional Project would not result in any environmental constraints related to marine vessel traffic.

- d. Would the project substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**

**No Environmental Constraints.** The Regional Projects would involve water quality improvements at seven community parks. Although the Regional Projects would require some construction within the streets surrounding each site to make connections with storm drains, the construction would be temporary and subject to traffic control plans as required by the applicable city. Once the connections are made, the streets would be repaired and returned to service. Because no substantive changes would be made to the street system, the Regional Projects would not increase roadway hazards.

- e. Would the project result in inadequate emergency access?**

**No Environmental Constraints.** As discussed under Checklist Item VIII.g. above, the Regional Projects would not result in substantial interruptions to emergency access.

- f. Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?**

**No Environmental Constraints.** The Regional Projects proposed for the community park sites would not result in permanent changes to the street systems that could affect alternative transportation routes, such as bike lanes or bike paths.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVII. UTILITIES AND SERVICE SYSTEMS.</b>	Would the project:				
a.	Exceed wastewater treatment requirements of the applicable regional water quality control board?				X
b.	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c.	Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?				X
e.	Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
g.	Comply with federal, state, and local statutes and regulations related to solid waste?				X

**Discussion:**

- a. Would the project exceed wastewater treatment requirements of the applicable regional water quality control board?**

**No Environmental Constraints.** The Regional Projects are water quality improvements projects that are not generators of wastewater. Therefore, the Regional Projects would not affect wastewater treatment requirements.

- b. Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**No Environmental Constraints.** The Regional Projects are water quality improvements projects would not consume or require potable water, and would not generate wastewater. Therefore, the Regional Projects would not increase require new potable water supplies or additional wastewater treatment capacity.

- c. Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**No Environmental Constraints.** The Regional Projects are water quality improvements projects that would divert a portion of the runoff generated in the Upper Los Angeles River watershed, and would store, treat, and infiltrate the diverted runoff. The Regional Projects would have beneficial effects on downstream storm drain capacity.

- d. Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

**No Environmental Constraints.** The Regional Projects are water quality improvements projects that would not consume water. Therefore, the Regional Projects would not require new water supplies.

- e. Has the wastewater treatment provider that serves or may serve the project determined that it has adequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments?**

**No Environmental Constraints.** The Regional Projects are water quality improvements projects that would not generate wastewater and would not have an effect on existing wastewater treatment capacity.

- f. Is the project served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs?**

**No Environmental Constraints.** The Regional Projects are water quality improvements projects would not generate substantial amounts of solid wastes. The Regional Projects would include a pre-treatment or filtration device that removes sediment, oils, particulates, and other contaminants from stormwater. The filters would periodically be removed and disposed of in accordance with applicable laws and regulations. Although some solid wastes would be generated by the Regional Projects, the amounts would be minimal and would not adversely affect landfill capacity. During construction, excavated soil would be hauled away and reused elsewhere in the area, or used as landfill cover, which does not contribute to reductions in landfill capacity.

- g. Would the project comply with federal, state, and local statutes and regulations related to solid waste?**

**No Environmental Constraints.** As discussed above, the Regional Projects would generate minimal solid wastes, but would comply with applicable solid waste regulations.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVIII. MANDATORY FINDINGS OF SIGNIFICANCE</b>					
a.	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?		X		
b.	Does the project have impacts that are individually limited but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)		X		
c.	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?		X		

**Discussion:**

- a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?**

Construction of the Regional Projects could affect nesting birds if tree removals are required during the nesting season. Construction of water quality improvements at the Regional Project sites has the potential to encounter archaeological and paleontological resources, which could require site-specific mitigation. These potential constraints have been identified above, and would be addressed during site-specific CEQA compliance.

- b. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past**

**projects, the effects of other current projects, and the effects of probable future projects.)**

Construction of the Regional Projects could contribute to cumulative air quality and potentially cumulative noise impacts, as well as other resource area cumulative impacts. However, cumulative impacts would be addressed in the County's Program EIR or in site-specific CEQA documentation.

**c. Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?**

The Regional Projects would result in impacts on human beings related to air quality, hazardous materials, water quality, noise, and recreation, as described above. These impacts would be addressed in future site-specific CEQA documentation.

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**APPENDIX C**  
**OPTIMIZATION RESULTS**  
**by TetraTech**



# Assumptions

- BMP area was fixed at the maximum footprint; depth was varied
- Maximum BMP depth was assumed based on the assumptions below
- Each curve is cut off at the maximum BMP size, per assumptions below

Cluster ID	Site Name	Max Drainage Area <sup>1</sup> (ac)	Min Drainage Area <sup>2</sup> (ac)	BMP Footprint (ac)	Max. BMP Depth <sup>3</sup> (ft)	Max. Practical Active Depth (ft)	Aggregate Infiltration Rate <sup>4</sup> (in/hr)	Comment on Max Drainage Area
AL01	Alhambra Golf Course	1145	51	10.205	165	25	0.70	Max updated to now include San Pascual Wash as max.
GL01	Freemont Park	<del>13375.7</del>	206.2264	0.3743	50	20	0.30	Max is not applicable as it is accepting the Verdugo Wash
LAC01	Roosevelt Park	2249.62	168.564	9.5979	80	20	0.30	Okay as is
MP01	Sierra Vista Park	2927.7265	799.4605	0.652	80	20	0.30	Okay as is
SF01	San Fernando	<del>4429.9353</del>	422.2799	2.7103	50	20	0.80	Max is not applicable as this is accepting the Pacoima Wash
SM01	Lacy Park	927.52563	1067.2045	2.3892	145	20	0.39	Okay as is
SP01	Lower Arroyo Park	<del>15380.546</del>	145.2086	10.588	25	25	0.80	Max is not applicable as it is accepting the Arroyo Seco
NHP	North Hollywood Park	<del>13909.873</del>	5122.0118	7.9579	65	20	0.80	Max is not applicable as it is accepting the Tujunga Wash

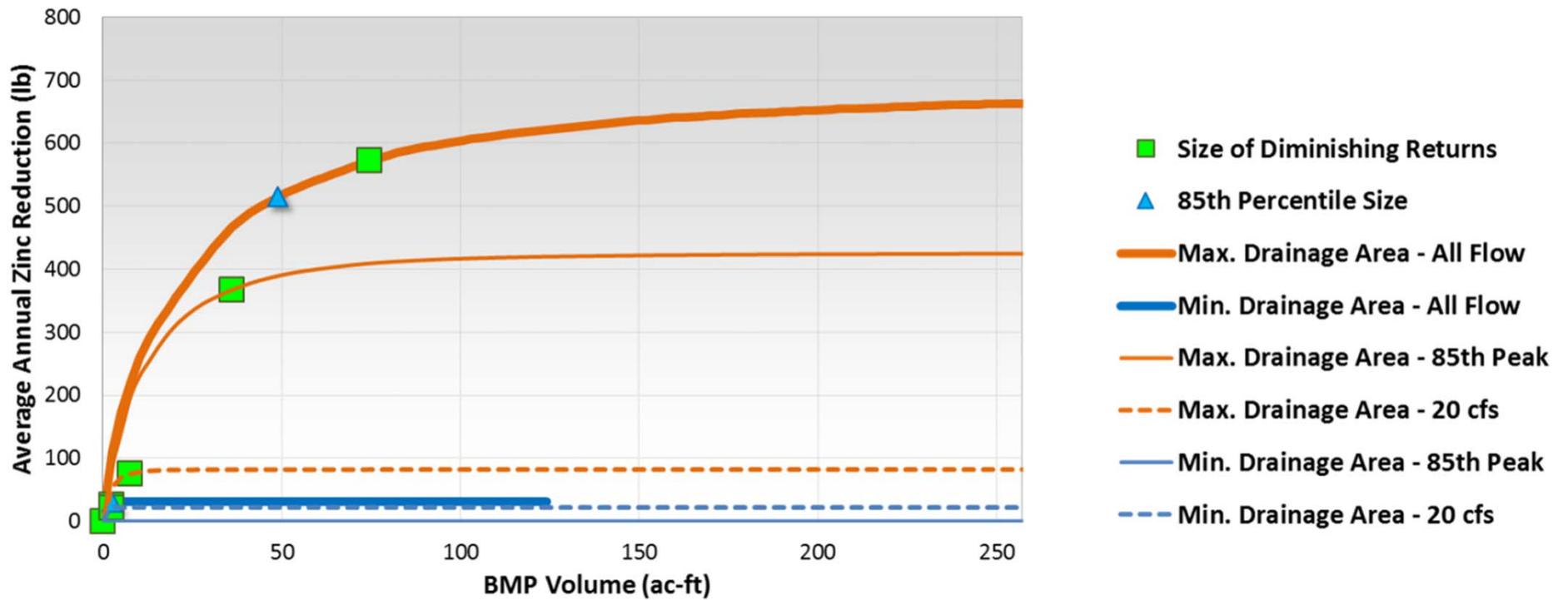
<sup>1</sup> Max Drainage Areas were delineated from subwatersheds from LA County GIS

<sup>2</sup> Min Drainage Areas were provided by Tetra Tech

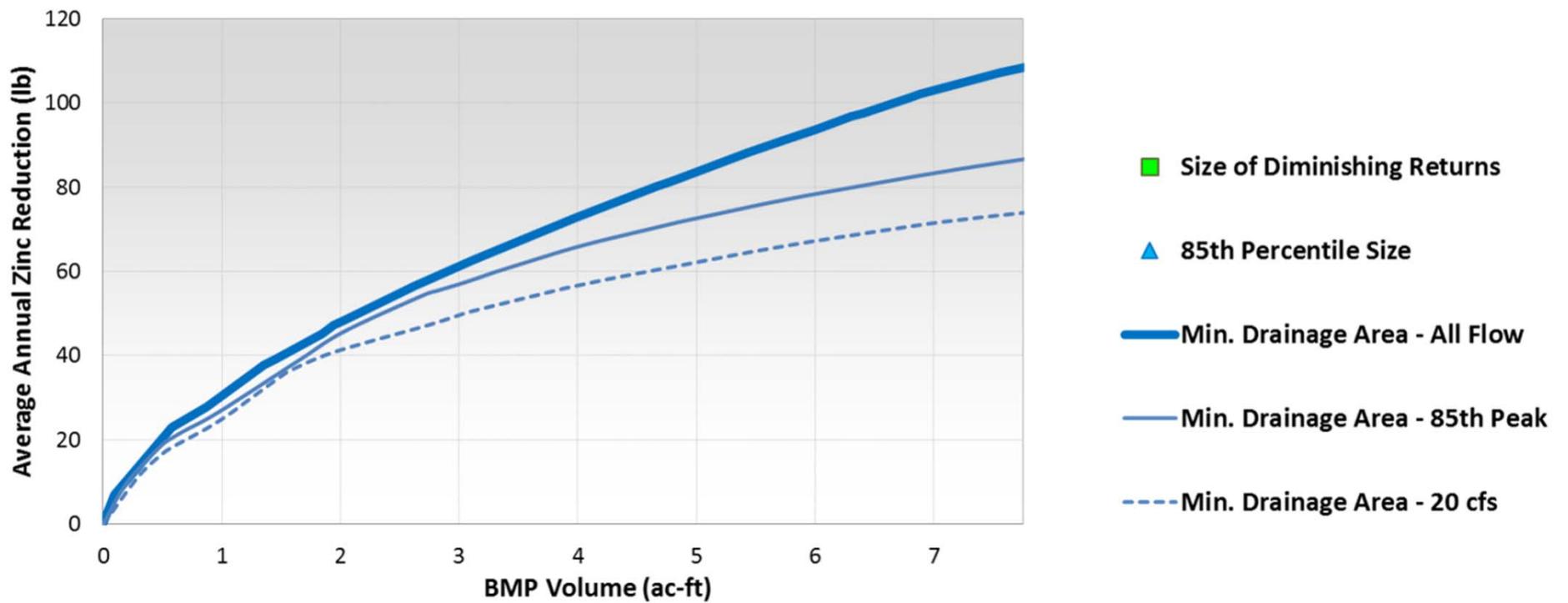
<sup>3</sup> BMP depth was determined using Groundwater Depth Contours provided by Tetra Tech. 10 feet of separation is in conformance with the County's LID ordinance.

<sup>4</sup> Soil data was taken from LA County GIS and associated infiltration rates were provided by Eliza Jane

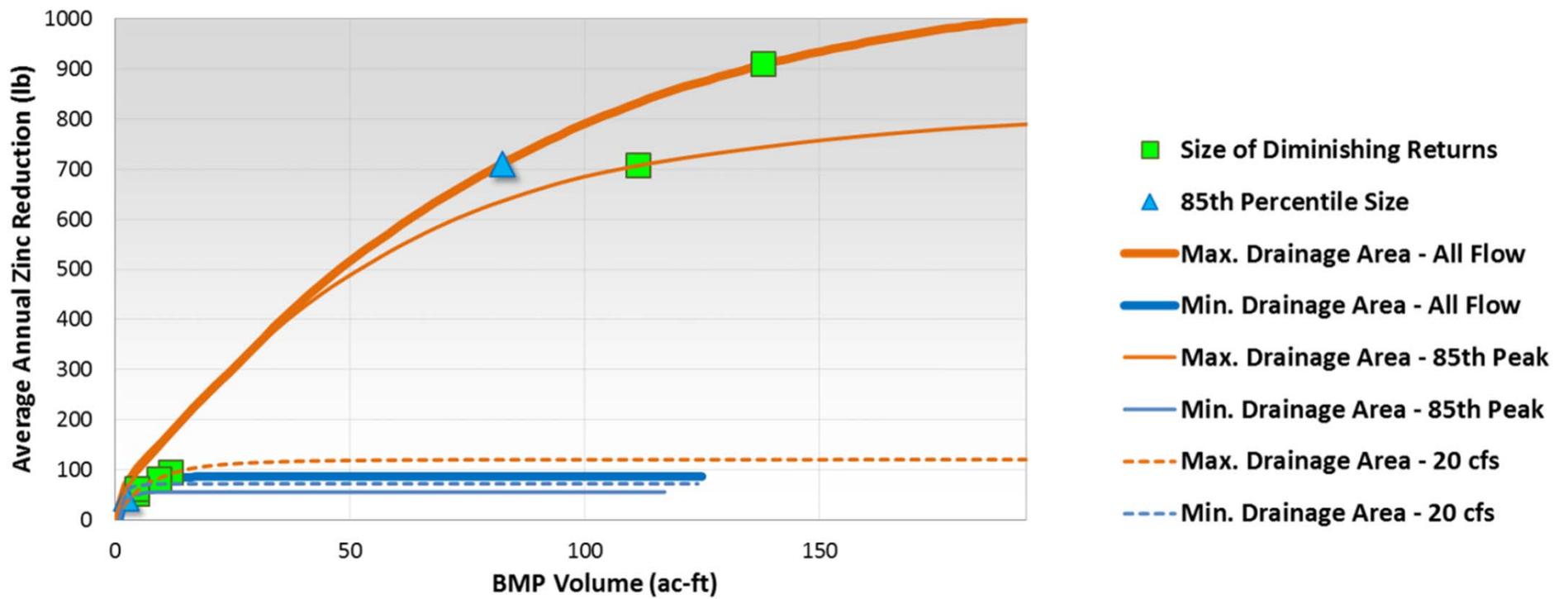
# AL01 – Alhambra Golf Course



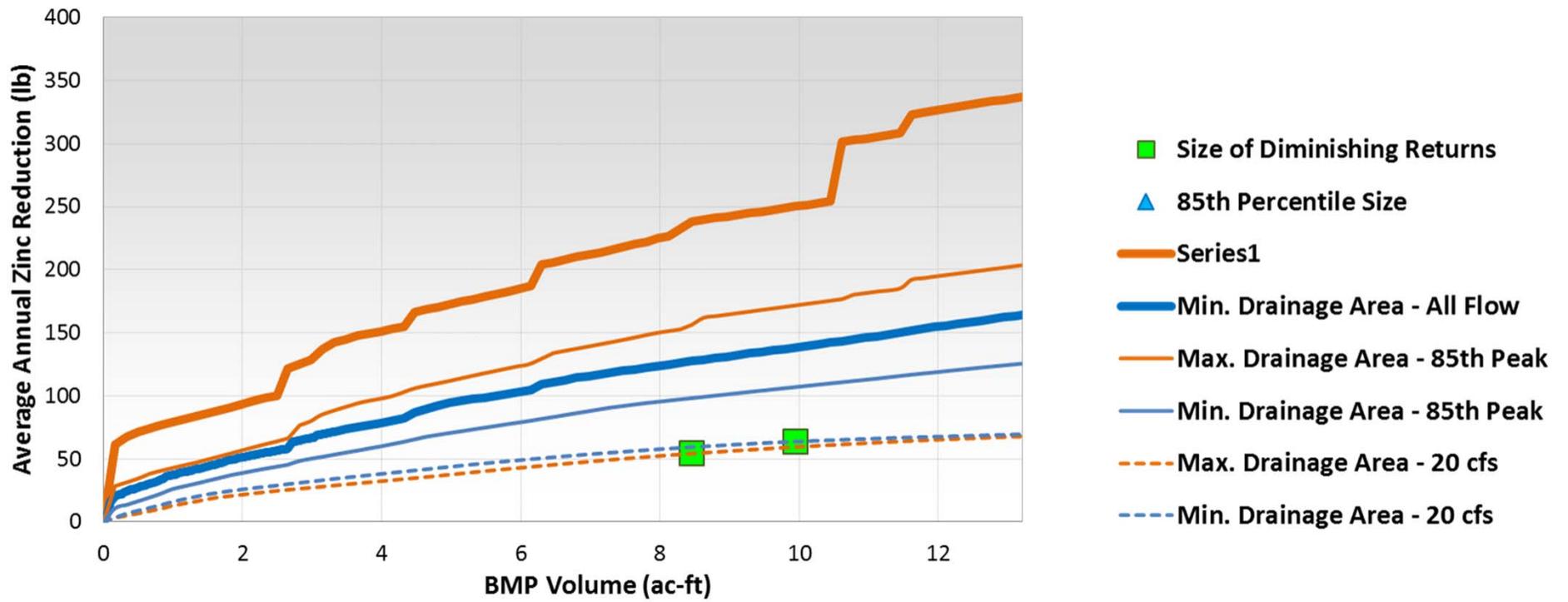
# GL01 – Freemont Park



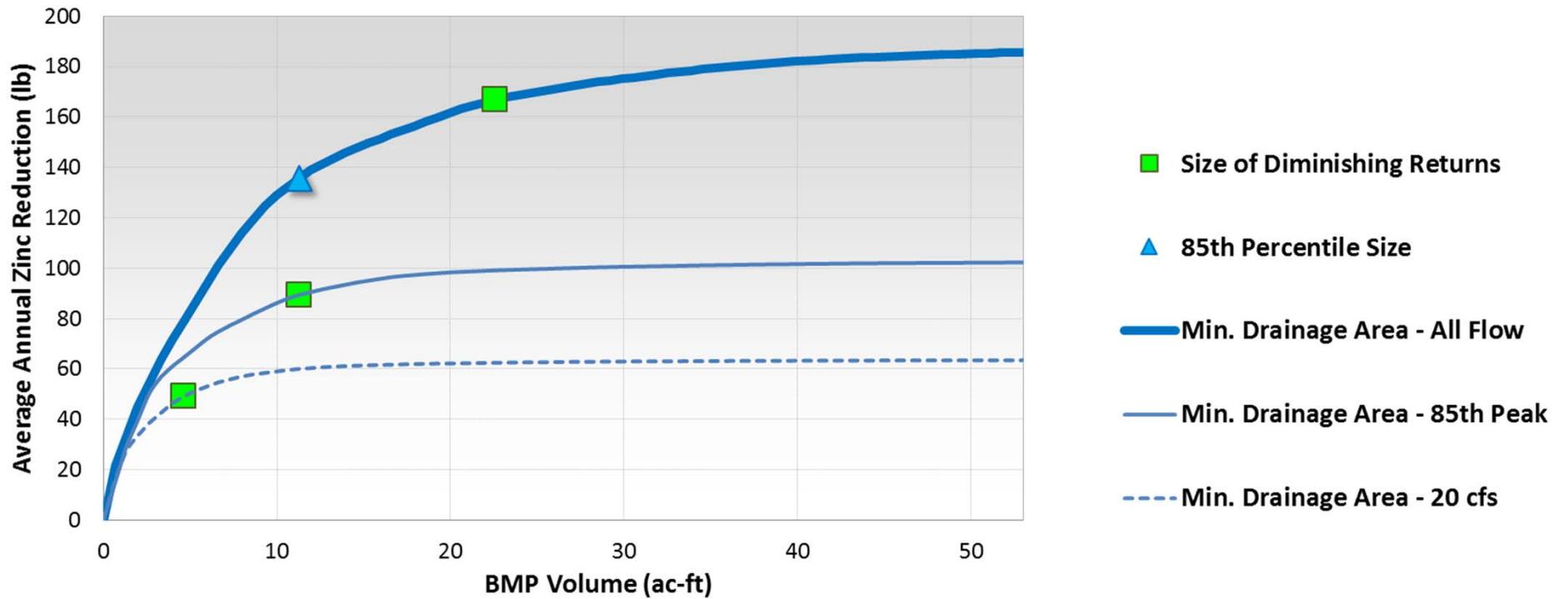
# LAC01 – Roosevelt Park



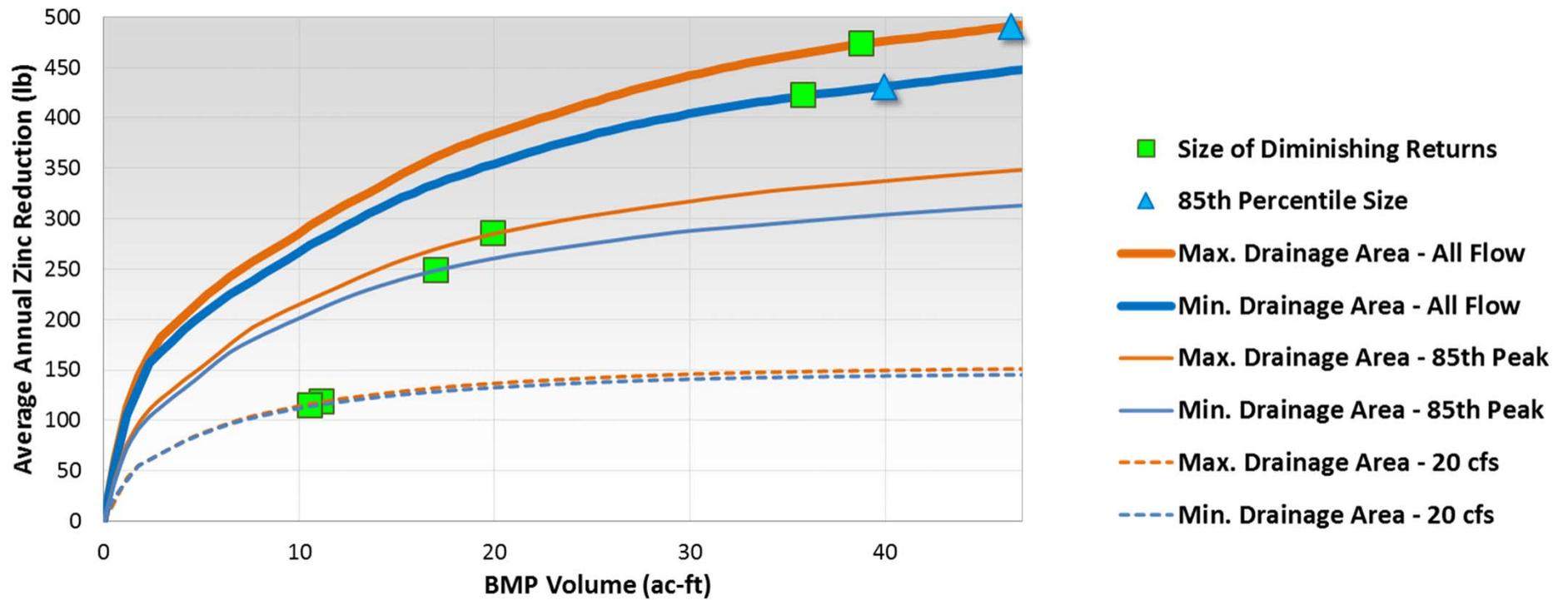
# MP01 – Sierra Vista Park



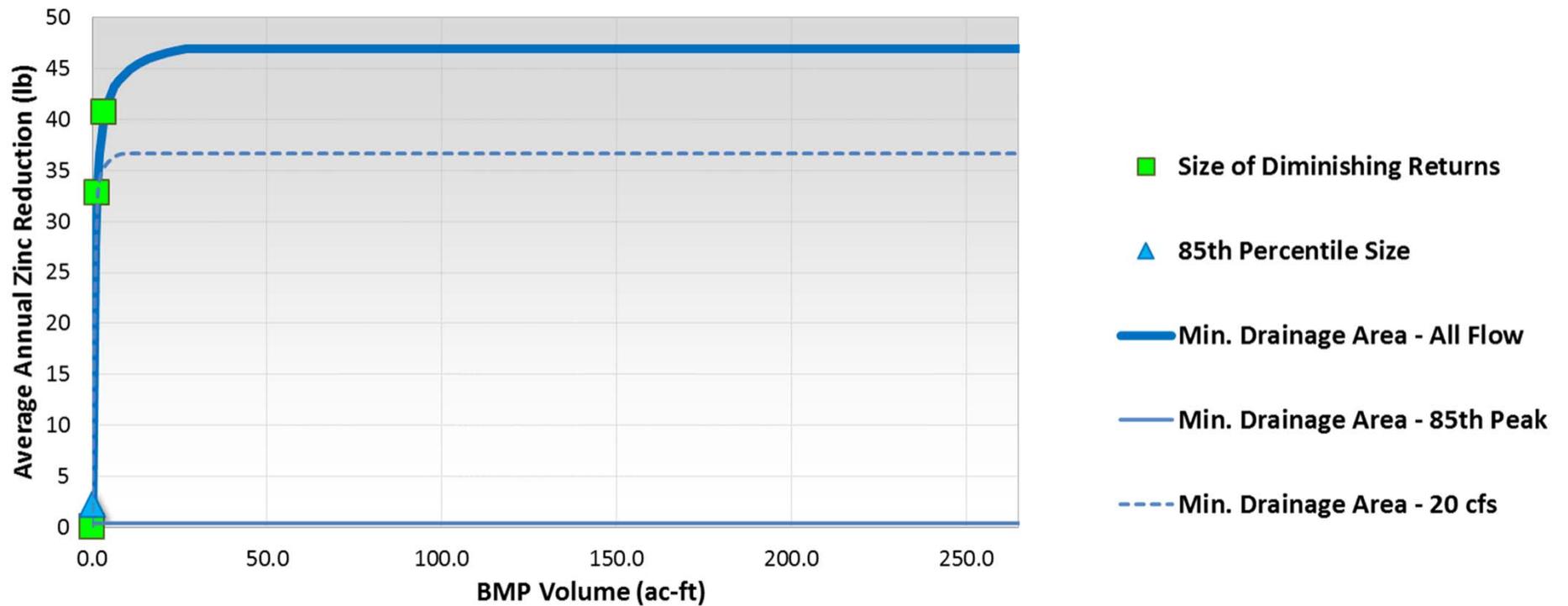
# SF01 – San Fernando



# SM01 – Lacy Park

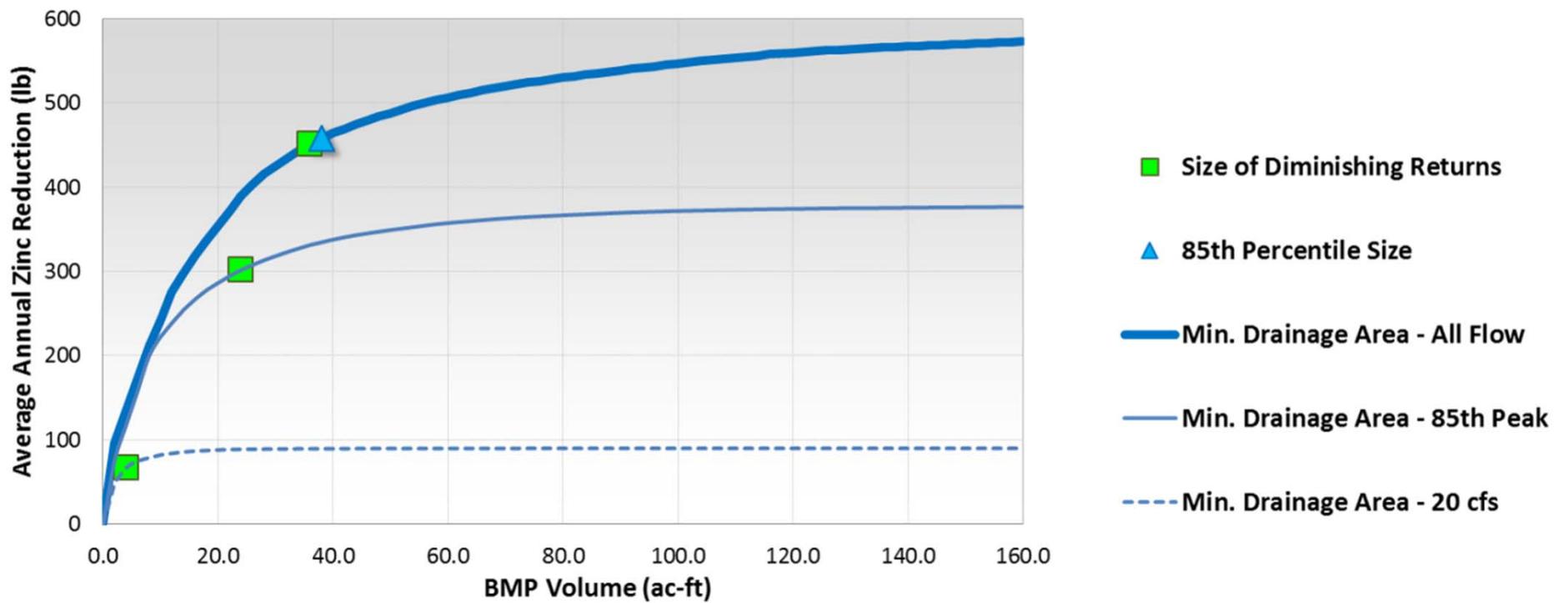


# SP01 – Lower Arroyo Park



*Small drainage area and large BMP footprint; small incremental increases in BMP size result in high pollutant load reduction*

# NHP – North Hollywood Park



# Summary of Recommended Solutions

Cluster ID	Site Description	Max BMP Footprint (ac)	Minimum Drainage Area (ac)	Maximum Drainage Area (ac)	Recommended Size					
					Minimum Drainage Area			Maximum Drainage Area		
					20 cfs Diversion	85th %-ile Peak Diversion	Online (All Flow)	20 cfs Diversion	85th %-ile Peak Diversion	Online (All Flow)
AL01	Alhambra Golf Course	10.2	51	1,145	85th	85th	85th	PDR	85th	PDR*
GL01	Freemont Park	0.4	206	--	MAX	MAX	MAX			
LAC01	Roosevelt Park	9.6	169	2,250	PDR*	PDR*	PDR*	PDR	PDR*	PDR*
MP01	Sierra Vista Park	0.7	799	2,928	PDR	MAX	MAX	PDR	MAX	MAX
SF01	San Fernando	2.7	422	--	PDR	85th	PDR*			
SM01	Lacy Park	2.4	1,067	928	PDR	85th	85th	PDR	85th	85th
SP01	Lower Arroyo Park	10.6	145	--	PDR*	PDR*	PDR*			
NHP	North Hollywood Park	8.0	5,122	--	PDR	85th	85th			

\*Solutions highlighted green also capture 85th percentile volume

Cluster ID	Site Description	Max BMP Footprint (ac)	Minimum Drainage Area (ac)	Maximum Drainage Area (ac)	Recommended Size (ac-ft)					
					Minimum Drainage Area			Maximum Drainage Area		
					20 cfs Diversion	85th %-ile Peak Diversion	Online (All Flow)	20 cfs Diversion	85th %-ile Peak Diversion	Online (All Flow)
AL01	Alhambra Golf Course	10.2	51	1,145	2.6	2.6	2.6	7.7	49.0	74.7*
GL01	Freemont Park	0.4	206	--	MAX	MAX	MAX			
LAC01	Roosevelt Park	9.6	169	2,250	4.8*	4.8*	9.7*	12.1	111.5*	138.2*
MP01	Sierra Vista Park	0.7	799	2,928	10.0	MAX	MAX	8.5	MAX	MAX
SF01	San Fernando	2.7	422	--	4.6	11.3	22.6*			
SM01	Lacy Park	2.4	1,067	928	10.6	40.0	40.0	11.2	46.4	46.4
SP01	Lower Arroyo Park	10.6	145	--	1.6*	0.4*	3.7*			
NHP	North Hollywood Park	8.0	5,122	--	4.0	38.0	38.0			

\*Solutions highlighted green also capture 85th percentile volume

# Summary of Recommended Solutions

Cluster ID	Site Description	Modeled Comparative Cost*					
		Minimum Drainage Area			Maximum Drainage Area		
		20 cfs Diversion	85th %-ile Peak Diversion	Online (All Flow)	20 cfs Diversion	85th %-ile Peak Diversion	Online (All Flow)
AL01	Alhambra Golf Course	\$ 20,646,707	\$ 20,646,707	\$ 20,646,707	\$ 21,162,044	\$ 25,284,741	\$ 27,861,427
GL01	Freemont Park	\$ 1,524,245	\$ 1,524,245	\$ 1,524,245			
LAC01	Roosevelt Park	\$ 19,674,980	\$ 19,674,980	\$ 20,160,010	\$ 20,402,525	\$ 30,345,640	\$ 33,013,305
MP01	Sierra Vista Park	\$ 2,307,954	\$ 2,639,726	\$ 2,639,726	\$ 2,158,657	\$ 2,639,726	\$ 2,639,726
SF01	San Fernando	\$ 5,715,033	\$ 6,378,577	\$ 7,506,602			
SM01	Lacy Park	\$ 5,709,005	\$ 8,647,885	\$ 8,647,885	\$ 5,767,782	\$ 9,294,438	\$ 9,294,438
SP01	Lower Arroyo Park	\$ 21,161,459	\$ 21,055,292	\$ 21,373,793			
NHP	North Hollywood Park	\$ 16,210,321	\$ 19,607,081	\$ 19,607,081			

\*Diversion and pumping costs held constant between scenarios



**APPENDIX D**

**PROJECT SITE MAPS WITH BMP**

**OPPORTUNITY AREAS**



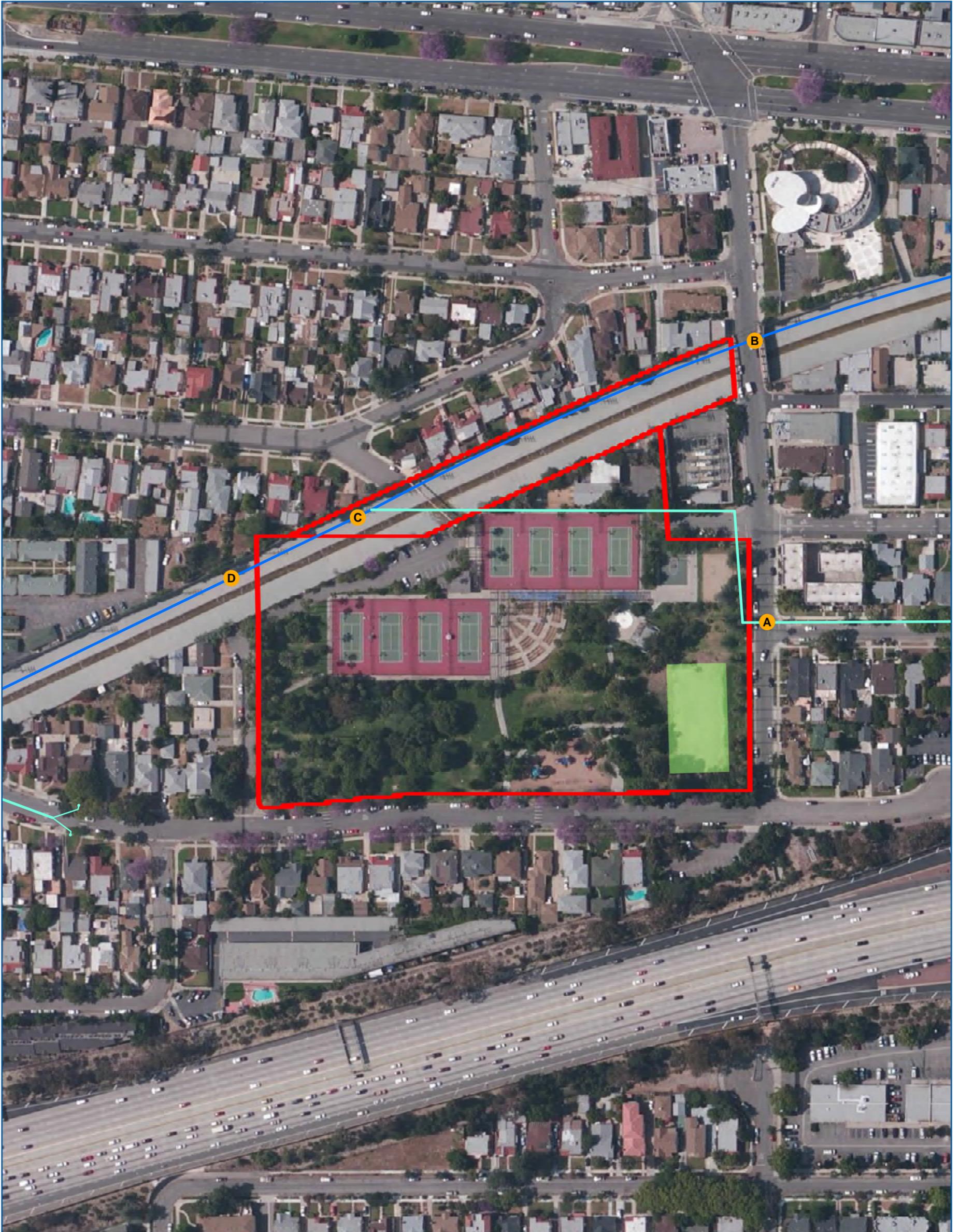


0 400 800  
Feet  
1 inch = 500 feet

- BMP Site Data Points
- Contour
- Catch Basin
- Storm Drain Network
- Open Channel
- ULAR\_BMPAreas
- Selected BMP Site

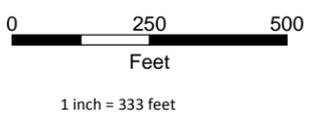
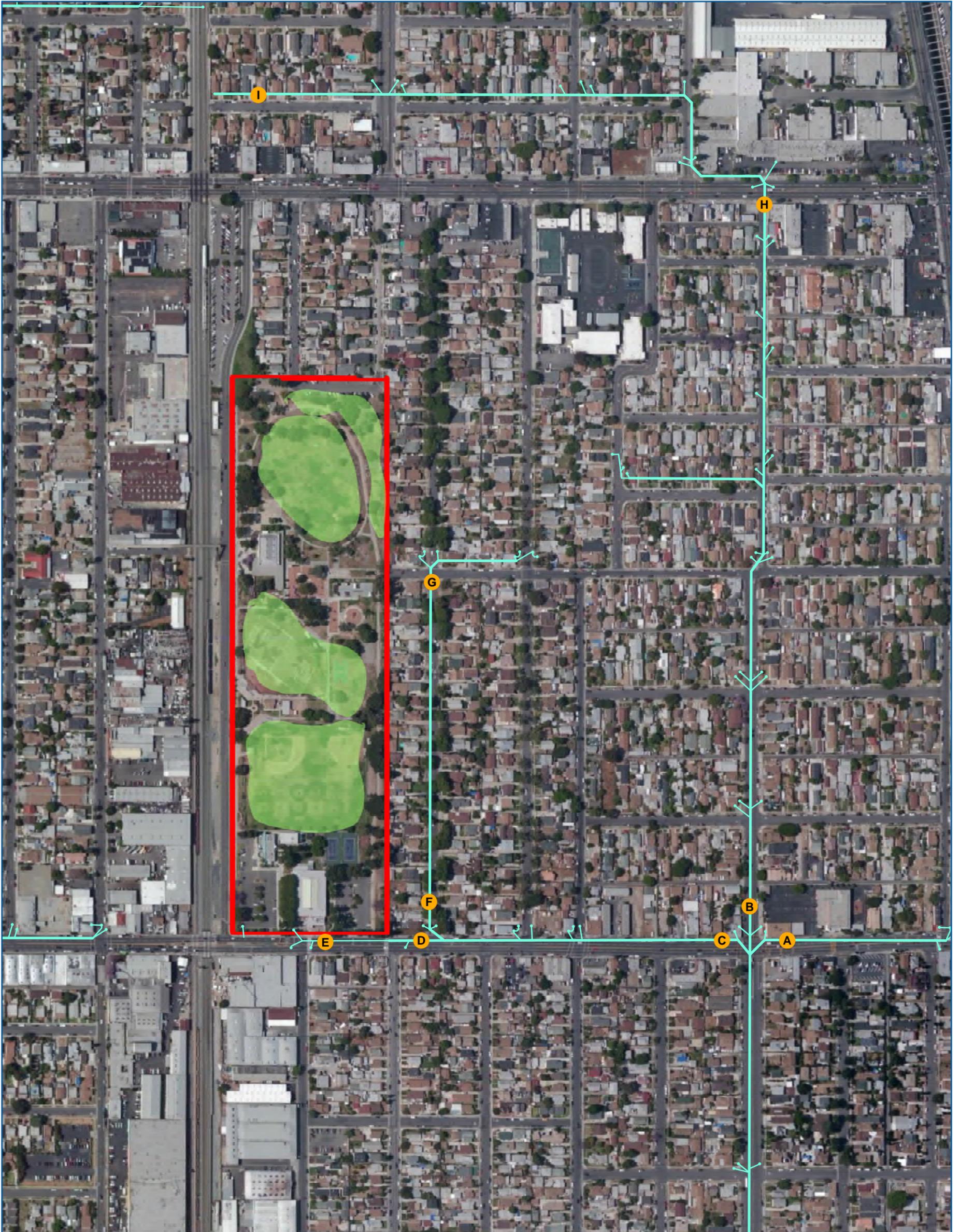
**Upper Los Angeles River  
Enhanced Watershed Plan  
BMP Site Investigation  
AL01: Alhambra Golf Course**  
PN 182198



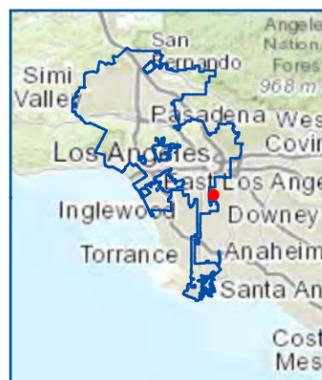


	<ul style="list-style-type: none"> <li><span style="color: yellow;">●</span> BMP Site Data Points</li> <li><span style="color: yellow;">—</span> Contour</li> <li><span style="color: cyan;">●</span> Catch Basin</li> <li><span style="color: cyan;">—</span> Storm Drain Network</li> <li><span style="color: blue;">—</span> Open Channel</li> <li><span style="background-color: lightgreen; border: 1px solid red; display: inline-block; width: 15px; height: 10px;"></span> ULAR_BMP Areas</li> <li><span style="border: 2px solid red; display: inline-block; width: 15px; height: 10px;"></span> Selected BMP Site</li> </ul>		<p><b>Upper Los Angeles River Enhanced Watershed Plan</b>  <b>BMP Site Investigation</b>  <b>GL01: Freemont Park</b>          PN 182198</p>
<p>0      100      200          Feet          1 inch = 150 feet</p>			





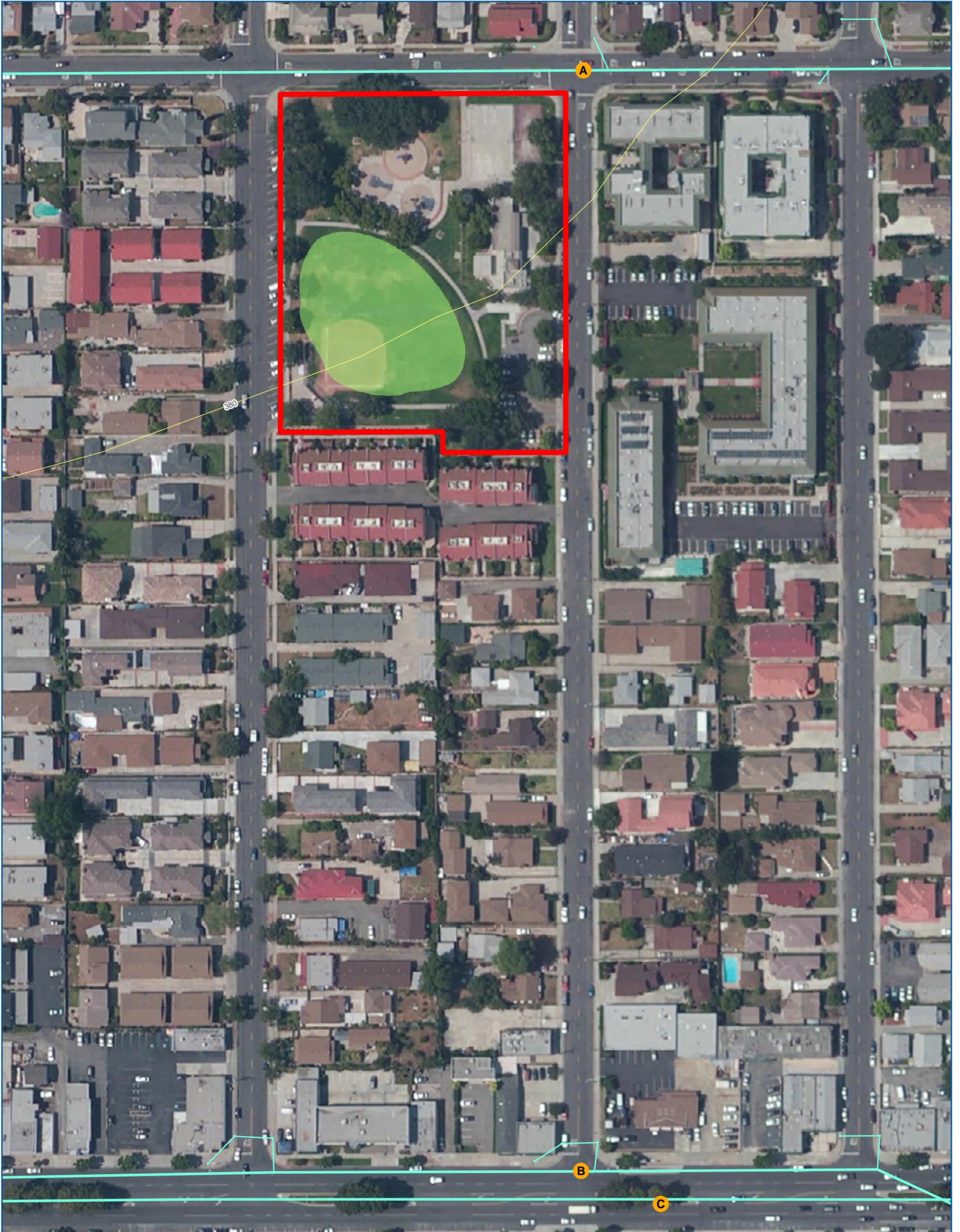
- BMP Site Data Points
- Contour
- Catch Basin
- Storm Drain Network
- Open Channel
- ULAR\_BMP Areas
- Selected BMP Site



**Upper Los Angeles River  
Enhanced Watershed Plan**  
**BMP Site Investigation**  
**LAC01: Roosevelt Park**  
 PN 182198

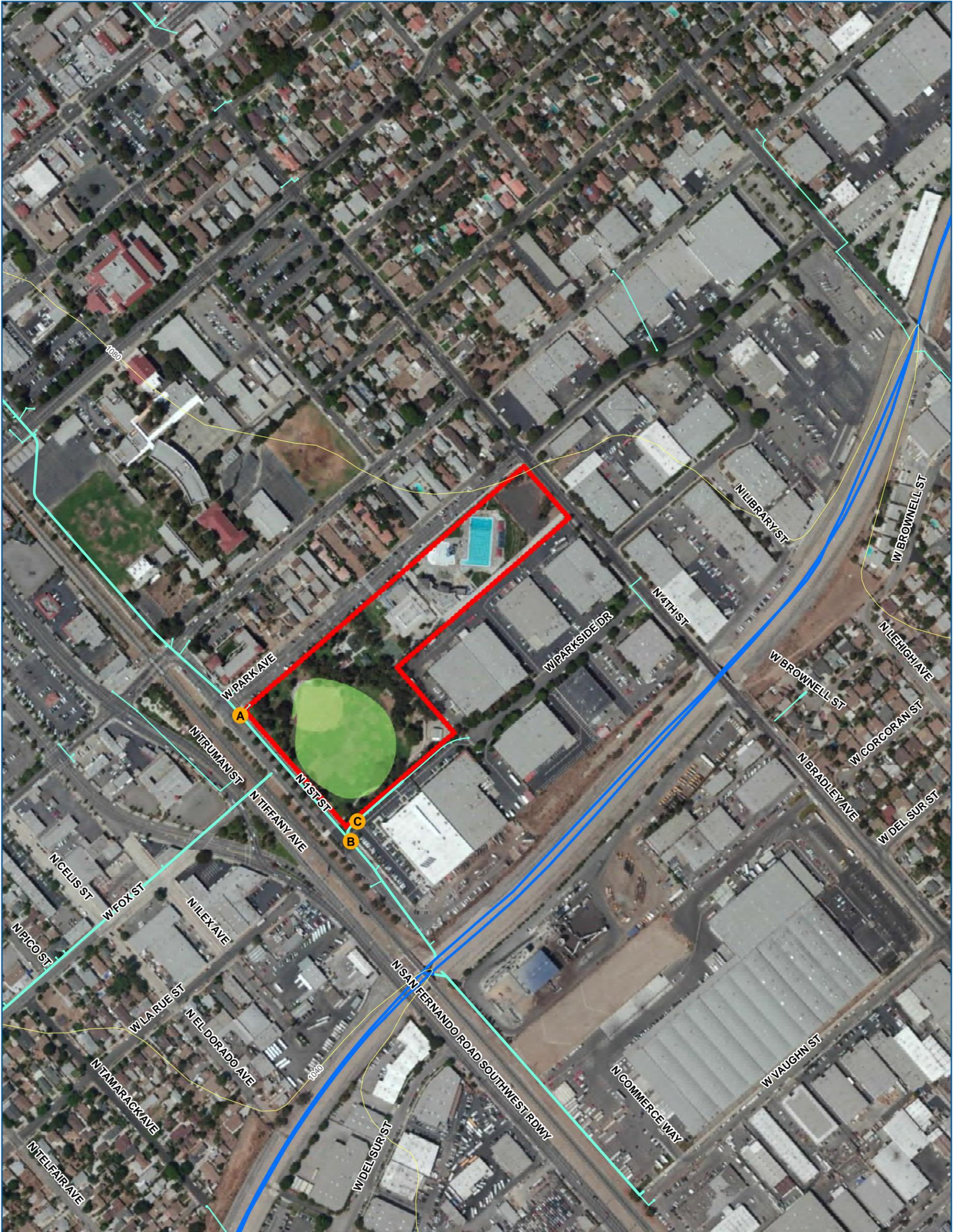






	<ul style="list-style-type: none"> <li><span style="color: yellow;">●</span> BMP Site Data Points</li> <li><span style="border: 2px solid red; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Selected BMP Site</li> <li><span style="border-bottom: 1px solid yellow; width: 20px; display: inline-block; margin-right: 5px;"></span> Contour</li> <li><span style="color: cyan;">●</span> CatchBasin</li> <li><span style="border-bottom: 1px solid cyan; width: 20px; display: inline-block; margin-right: 5px;"></span> GravityMain</li> <li><span style="border-bottom: 1px solid cyan; width: 20px; display: inline-block; margin-right: 5px;"></span> LateralLine</li> <li><span style="border-bottom: 1px solid blue; width: 20px; display: inline-block; margin-right: 5px;"></span> OpenChannel</li> <li><span style="background-color: lightgreen; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></span> ULAR_BMPAreas</li> </ul>		<p><b>Upper Los Angeles River Enhanced Watershed Plan</b>  <b>BMP Site Investigation</b>  <b>MP01: Sierra Vista Park</b>          PN 182198</p>





- BMP Site Data Points
- Contour
- CatchBasin
- GravityMain
- LateralLine
- OpenChannel
- ULAR\_BMPAreas
- Selected BMP Site

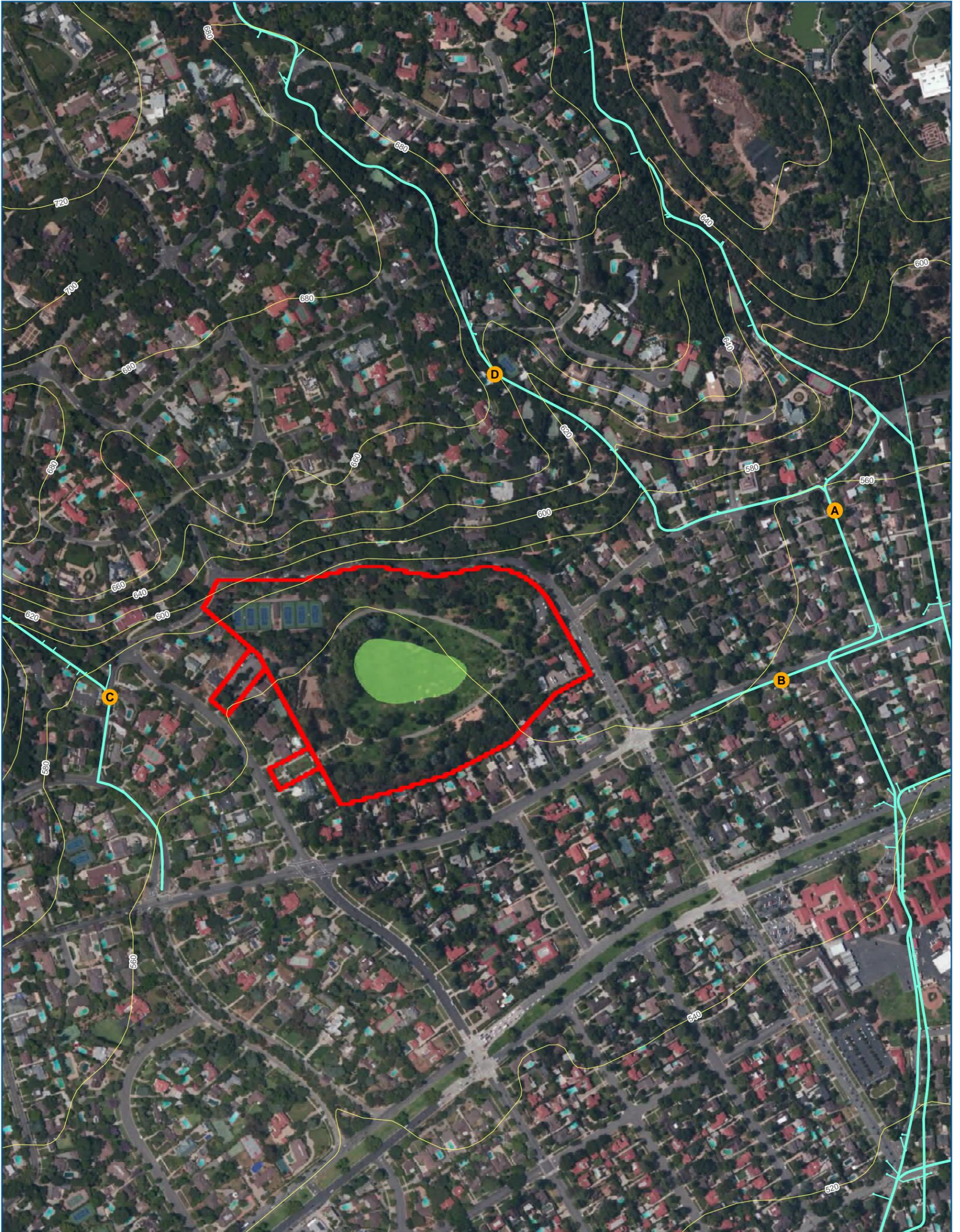
**Upper Los Angeles River  
Enhanced Watershed Plan**

**BMP Site Investigation**

**SF01: San Fernando**

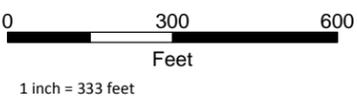
PN 182198



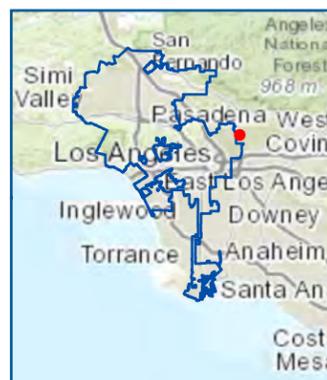


	<ul style="list-style-type: none"> <li><span style="color: orange;">●</span> BMP Site Data Points</li> <li><span style="color: yellow;">—</span> Contour</li> <li><span style="color: cyan;">—</span> CatchBasin</li> <li><span style="color: cyan;">—</span> GravityMain</li> <li><span style="color: cyan;">—</span> LateralLine</li> <li><span style="color: blue;">—</span> OpenChannel</li> <li><span style="color: green;">■</span> ULAR_BMPAreas</li> <li><span style="color: red;">□</span> Selected BMP Site</li> </ul>		<p><b>Upper Los Angeles River Enhanced Watershed Plan</b>  <b>BMP Site Investigation</b>  <b>SM01: Lacy Park</b>          PN 182198</p>





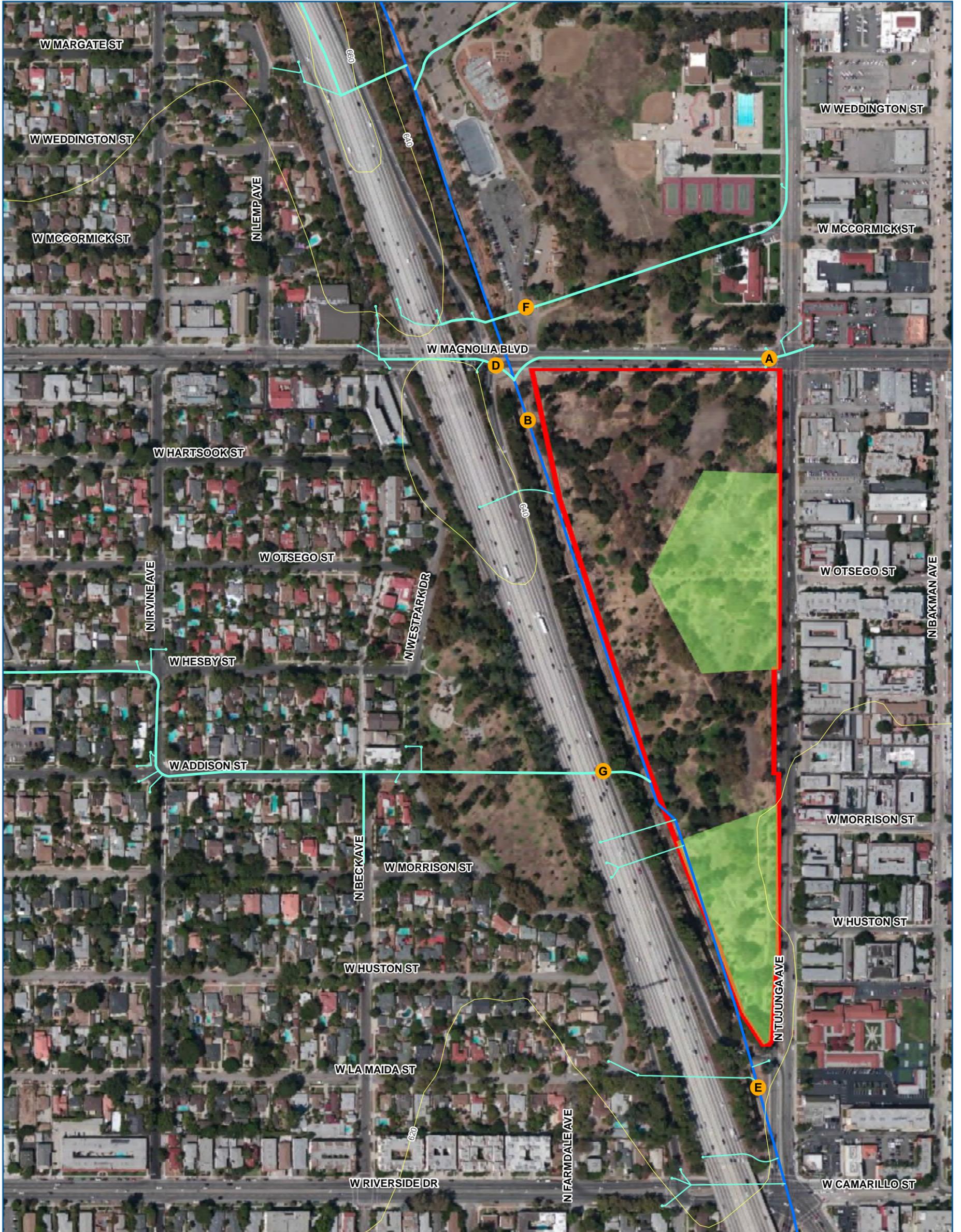
- BMP Site Data Points
- Contour
- Catch Basin
- Storm Drain Network
- Open Channel
- Opportunity Areas
- Selected BMP Site



**Upper Los Angeles River  
Enhanced Watershed Plan**  
**BMP Site Investigation**  
**SP01: Lower Arroyo Park**  
 PN 182198







- BMP Site Data Points
- Contour
- Catch Basin
- Storm Drain Network
- Open Channel
- ULAR\_BMPAreas
- Selected BMP Site

**Upper Los Angeles River  
Enhanced Watershed Plan  
BMP Site Investigation  
NHP: North Hollywood Park  
PN 182198**

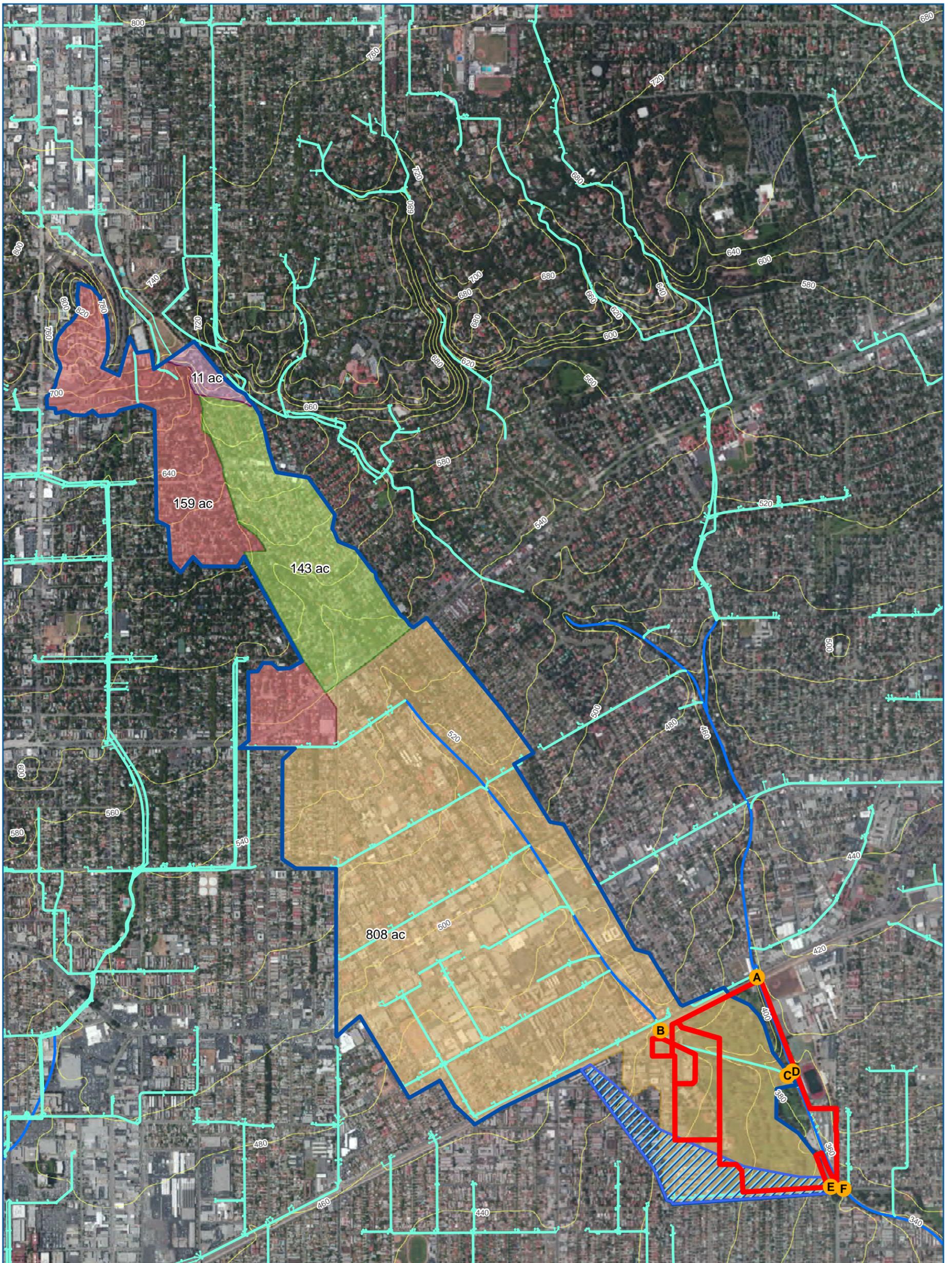


**APPENDIX E**

**TRIBUTARY DRAINAGE AREA**

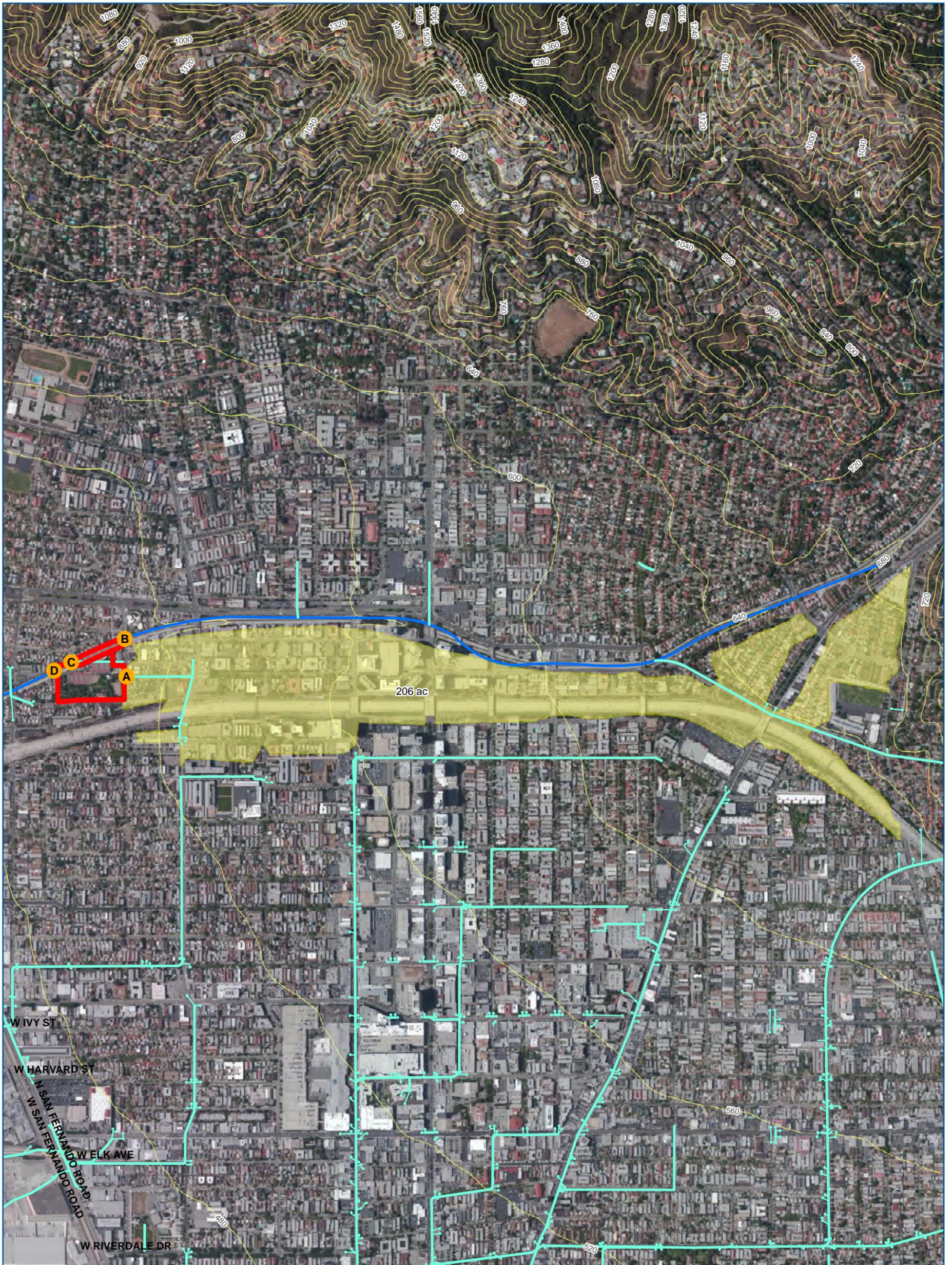
**MAPS PER PROJECT**





<p>0 900 1,800 Feet 1 inch = 1,500 feet</p>	BMP Site Data Points	<b>Drainage Area per City</b> Alhambra Pasadena San Marino South Pasadena		<b>Upper Los Angeles River Enhanced Watershed Plan BMP Site Investigation AL01: Alhambra Golf Course PN 182198</b>
	Selected BMP Site Contour Catch Basin Gravity Main Lateral Line Open Channel	<b>Drainage Area</b> Min Drainage Area Max Drainage Area		





	BMP Site Data Points	<b>Drainage Area per City</b>
	Selected BMP Site	Glendale
Contour	Catch Basin	Lateral Line
Gravity Main	Open Channel	

0      650      1,300

Feet

1 inch = 1,100 feet

**Upper Los Angeles River  
Enhanced Watershed Plan**

**BMP Site Investigation**

**GL01: Freemont Park**

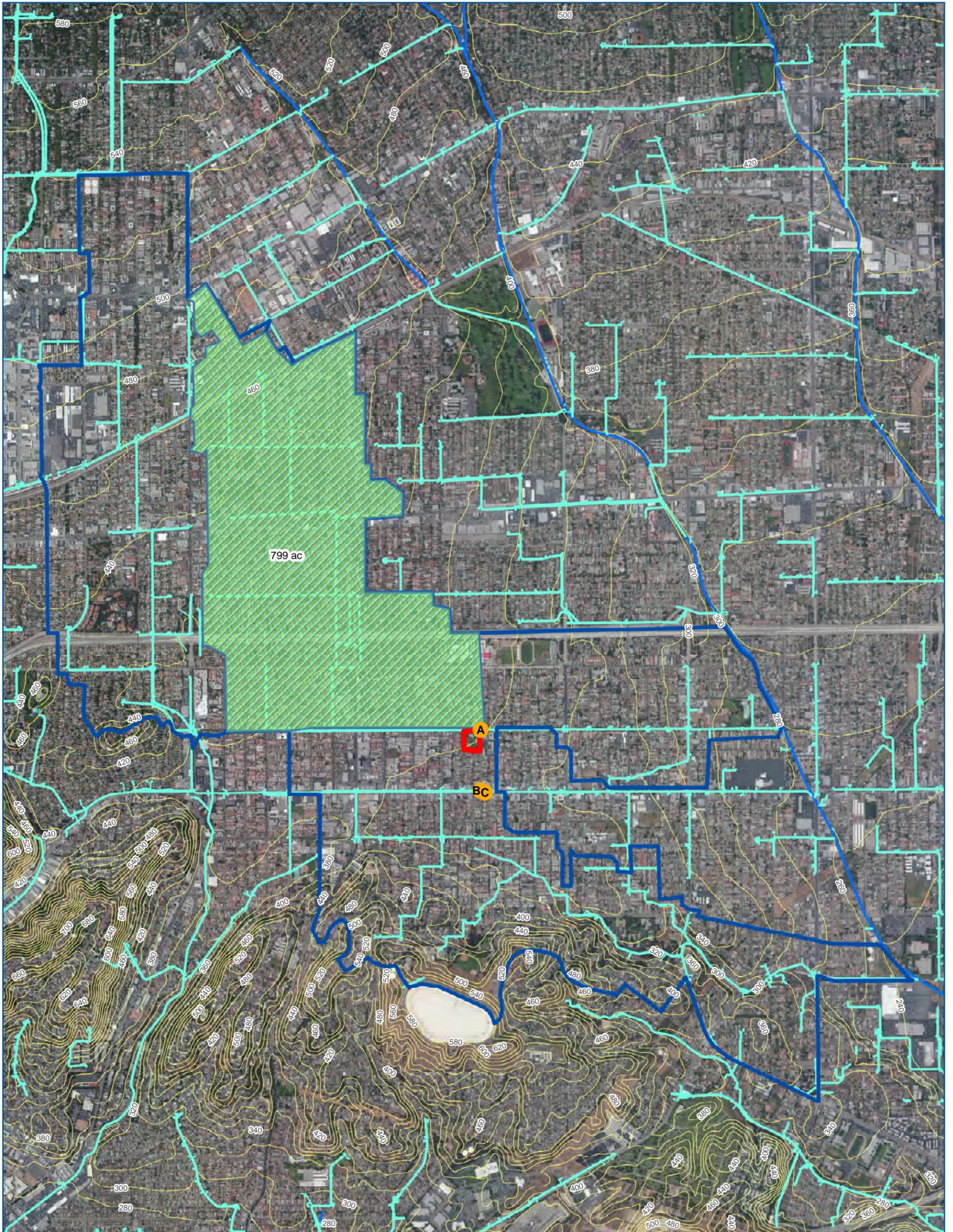
PN 182198

**BLACK & VEATCH**  
Building a world of difference.



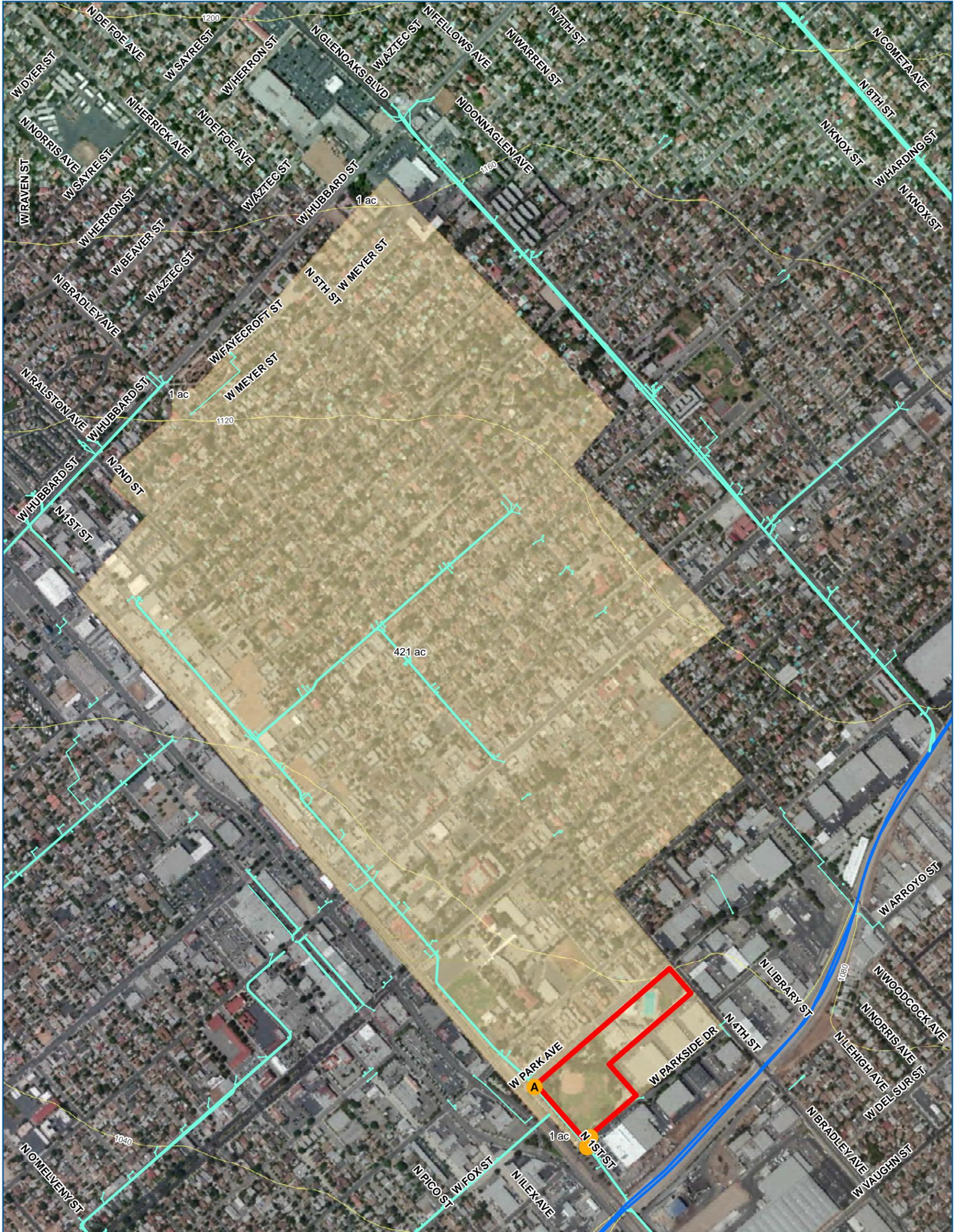






<p>0 1,200 2,400 Feet 1 inch = 2,000 feet</p>	BMP Site Data Points	<b>Drainage Area per City</b> MP01		<p><b>Upper Los Angeles River Enhanced Watershed Plan</b>  <b>BMP Site Investigation</b>  <b>MP01: Sierra Vista Park</b>          PN 182198</p> <p><b>BLACK &amp; VEATCH</b> Building a world of difference.</p>
	Selected BMP Site	<b>Drainage Area</b> Min Drainage Area Max Drainage Area		
	CatchBasin			
	GravityMain LateralLine OpenChannel Contour			





- BMP Site Data Points
- Selected BMP Site
- Contour
- Catch Basin
- Gravity Main
- Lateral Line
- Open Channel

**Drainage Area per City**

- San Fernando

**Upper Los Angeles River  
Enhanced Watershed Plan**

**BMP Site Investigation**

**SF01: San Fernando**

PN 182198

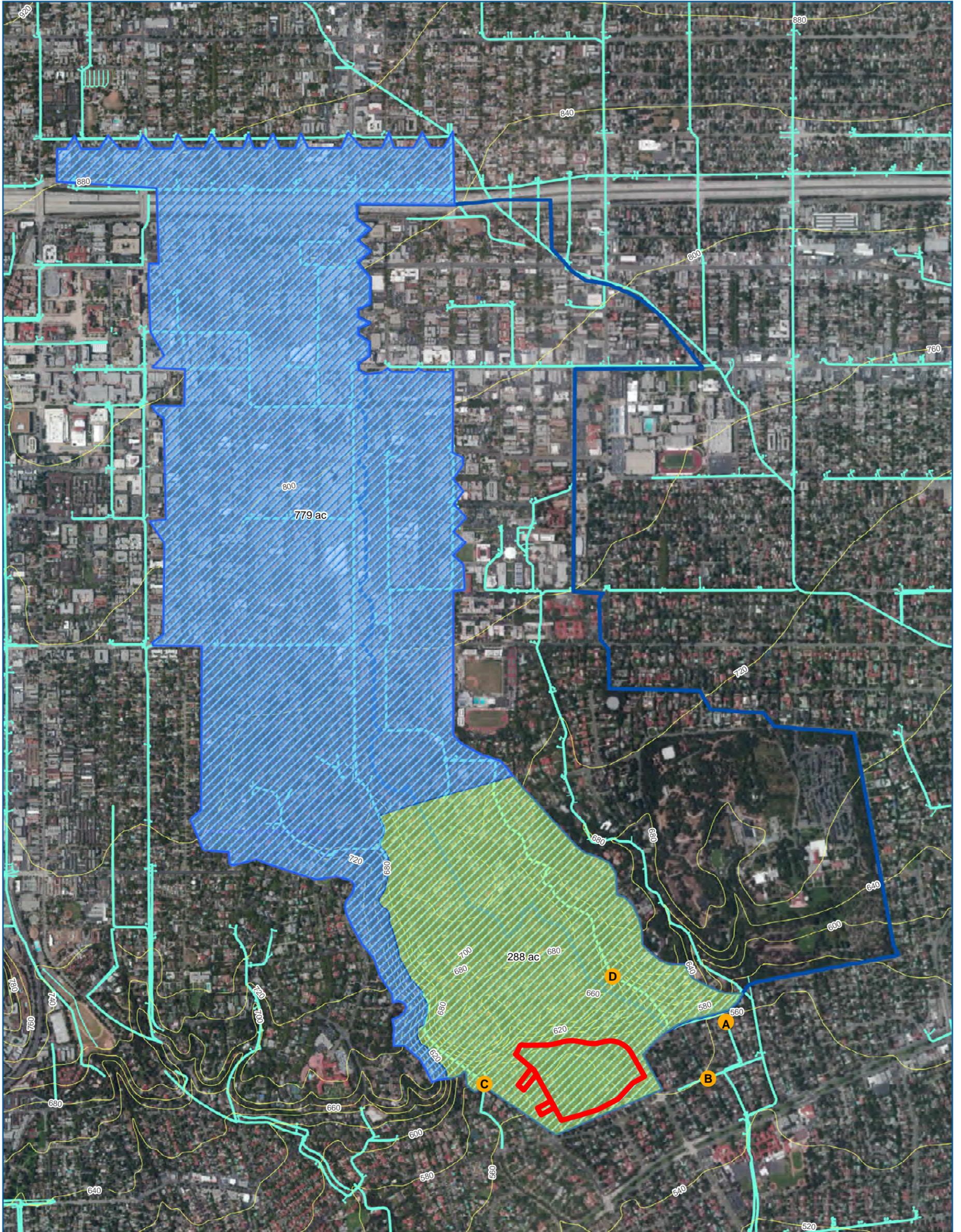
0 420 840

Feet

1 inch = 700 feet

**BLACK & VEATCH**  
Building a world of difference.

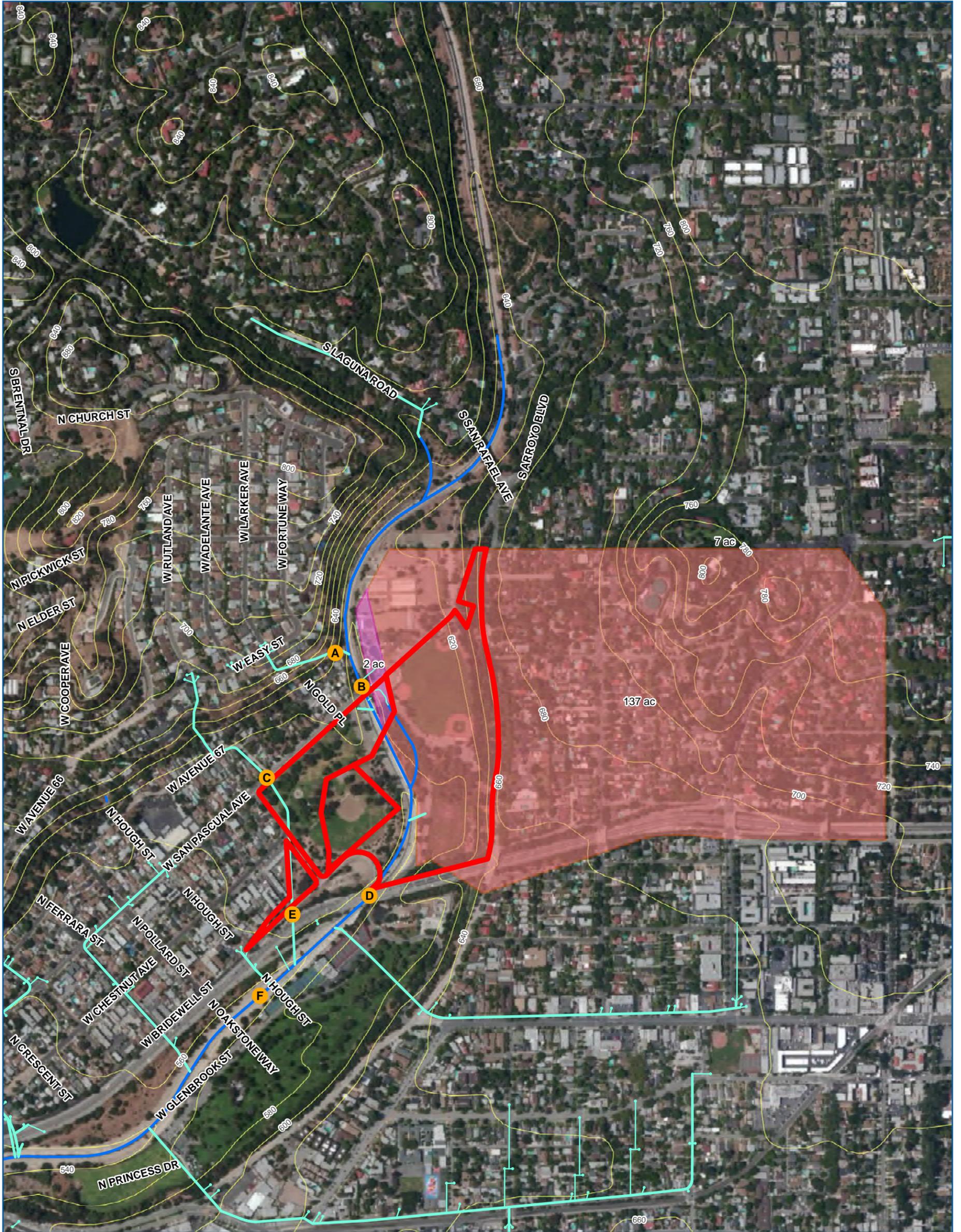




	BMP Site Data Points	<b>Drainage Area per City</b>
	Selected BMP Site	Pasadena San Marino
<p>1 inch = 1,250 feet</p>	Contour	<b>Drainage Area</b>
	CatchBasin GravityMain LateralLine	Min Drainage Area Max Drainage Area

**Upper Los Angeles River  
Enhanced Watershed Plan**  
**BMP Site Investigation**  
**SM01: Lacy Park**  
 PN 182198





0 385 770  
Feet  
1 inch = 600 feet

- BMP Site Data Points
- Selected BMP Site
- Catch Basin
- Gravity Main
- Lateral Line
- Open Channel
- Contour

**Drainage Area per City**

- Los Angeles
- South Pasadena

**Upper Los Angeles River  
Enhanced Watershed Plan**

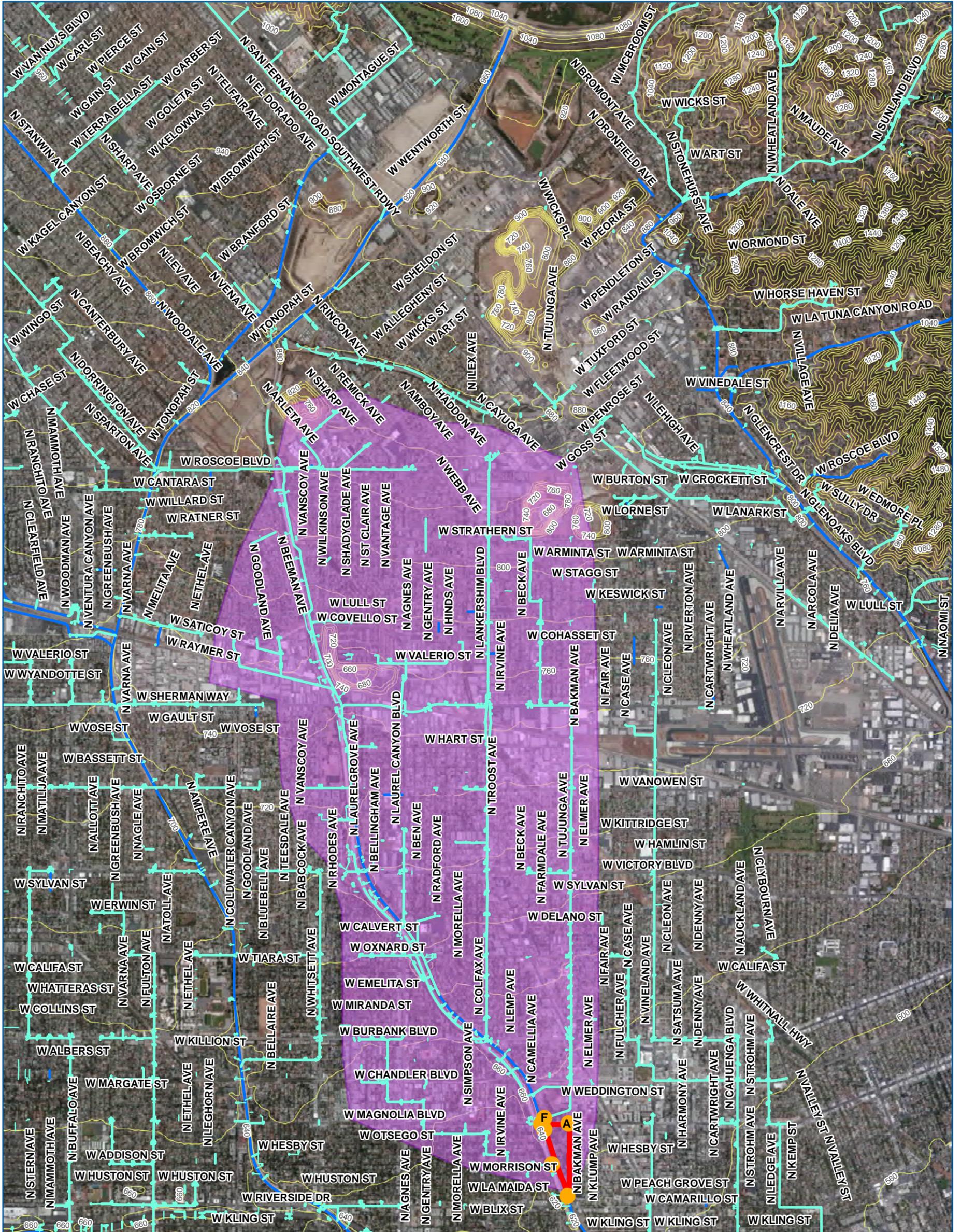
**BMP Site Investigation**

**SP01: Lower Arroyo Park**

PN 182198

**BLACK & VEATCH**  
Building a world of difference.





<p>0 1,800 3,600 Feet 1 inch = 3,000 feet</p>	BMP Site Data Points	<b>Drainage Area per City</b> Los Angeles
	Selected BMP Site	Contour Catch Basin Gravity Main Lateral Line Open Channel

**Upper Los Angeles River  
Enhanced Watershed Plan**  
**BMP Site Investigation**  
**NHP: North Hollywood Park**  
 PN 182198

