ATTACHMENT A: Project Modification Request (PMR) FORM

The purpose of this PMR form is to initiate the Project modification process and provide the District with information necessary to evaluate the Project modification request.

Regional Program	■Infrastructure Program Project ☐Scientific Studies Program ☐Technical Resources Program
Project/Study Name	Fairplex Stormwater Capture Project
Project/Study Lead	City of Pomona, Water Resources Department
Watershed Area(s)	Upper San Gabriel River
Current Project Phase	Design
Approved Stormwater Investment Plan Fiscal Year	FY2021-22
Transfer Agreement ID (e.g., 2020RPULAR52)	2021RPUSGR03

Has Transfer Agreement or most recent Addendum been executed (i.e., signed by the project lead and the District)? ■ Yes ☐ No

What type(s) of modification request?

☐ like-for-like modifications
■ functionally equivalent BMP modifications
☐ modifications to Project or Study components that were not material to the WASC, ROC, or Board's decision to include the Project or Study in the SIP
☐ minor modifications to the budget or schedule of intermediate tasks where the total Funded Activity amount and Funded Activity completion date is unchanged
☐ change in primary or secondary objective
■ change in Project benefits
■ change in methodology (e.g., infiltration instead of diversion to sanitary sewer)
■ decrease in BMP capacity
■ change in Project or Study location
☐ change in capture area where benefits claimed are diminished or where there is a change in the municipalities that are receiving benefits
■ updated engineering analysis resulting in a reduction of benefits claimed
☐ increase in Construction Cost or Life Cycle Cost greater than 10%
☐ increase or reallocation of annual funding distribution
☐ change in Funded Activity completion date
☐ other, please describe:

Impact on scope or benefits?

■ Improved
☐ Diminished
☐ Neither
☐ Not Sure

Description of the proposed modification(s) and the reason(s) why the modification(s) is/are being proposed.

The Fairplex Stormwater Capture Project, led by the City of Pomona, proposed to design a stormwater capture and runoff facility at the Pomona Fairplex. However, during the preliminary design phase of the project, new developments occurred that required the City to re-evaluate the original project concept developed in 2021. The primary issue was the development of the Fairplex Specific Plan in 2022 by the Fairplex Association. The Fairplex Association initially provided a support letter for this project as part of the original Feasibility Study in 2021. However, the Fairplex Association recently sent a letter to the City on 10/13/2023 stating that they can no longer support this project due to potential conflicts with the Fairplex Specific Plan.

The proposed project modifications are summarized and discussed in detail in the enclosed "Attachment B, Supplemental Information". The Concept Evaluation Memorandum (See Attachment C) is also provided which details the evaluation of the Project Options and a comparison of project benefits. Also, Attachment D includes support letters for the proposed project modification.

If applicable, list previously approved funding allocations/disbursements and revised funding request:

Note, if some or all of a previously Funded Activity cannot be completed as a result of the proposed modification, please include a description and indicate the amount of unused funds. Any unused funds should be reallocated and accounted for in your revised funding request.

Fiscal Year	Approved Funding Allocations	Revised Funding Request	Description/Phase *If applicable, include description of unused funds*
FY 21-22	$2,900,000		Design Phase
Future Funding			
TOTAL	$2,900,000		

A: SCWP Approved Total Funding Allocations	$2,900,000
B: Revised SCWP Anticipated Total Funding Request	
C: Difference between B and A	

If applicable, description of difference in SCWP Anticipated Total Funding Request. As a reminder, annual funding is at the discretion of the WASC, ROC, and ultimately the Board of Supervisors.

Brief description of Supporting Documentation provided.

Attachment B. Project Benefit Comparison: documents the changes Attachment C. Fairplex Stormwater Capture Project: Concept Evaluation Memorandum Attachment D. Fairplex Stormwater Capture Project: Project Modification Support Letters

I certify the information and supporting documentation provided is accurate and true.	■ YES
I understand this is a request and it is under the WASC's discretion to consider requested modifications.	■ YES

Name Jorge Anaya

Organization City of Pomona

Signature ______________

Date 11/29/2023

FOR DISTRICT USE ONLY

Proposed Modifications to Projects or Studies:

	Status	Date
Modified Project or Study is **consistent** with the Project or Study included in the current fiscal year's SIP and proposed modifications were **approved** by the District.	☐ YES	
Modified Project or Study is **NOT consistent** with the Project or Study included in the current fiscal year's SIP. **If yes, select all that apply**:	☐ YES	
PMR was received **after** October 31 of a fiscal year and the PMR will be considered for approval during the preparation of **subsequent** SIP for the fiscal year after the next	☐ YES	-
For Infrastructure Program Projects, modified Project was sent to **Scoring Committee**. If yes, revised score:	☐ YES	
Project or Study **abandoned** the proposed modifications	☐ YES	
Projector or Study was **withdrawn** from consideration by the WASC and shall issue repayment of unspent funds	☐ YES	
Proposed modifications were **recommended for approval** in the SIP	☐ YES ☐ NO	

Proposed Modifications to Project Concepts:

	Status	Date
Proposed modifications were deemed **consistent** with the Project concept that was approved by the WASC, ROC and Board for inclusion in the SIP and can be addressed within the existing budget. District will proceed to incorporate the proposed modification into the Feasibility Study immediately.	☐ YES	
Proposed modifications were deemed significant enough to result in a **significantly different** Project concept from the one approved by the WASC, ROC and Board for inclusion in the SIP. **If yes, select one:**	☐ YES	
District to **discontinue** work on the Feasibility Study, return unused funds to be programmed in the SIP for the next fiscal year, and advise the proponent to submit the modified Project concept during the Call for Projects for a future fiscal year.	☐ YES	-
District to **abandon** the proposed modifications and proceed with the Project concept included in the SIP.	☐ YES	-

Attachment B
Project Modification Request Form, Supplemental Information

This document is provided as a supplemental narrative to Attachment A: Project Modification Request Form. Attachment C. Fairplex Stormwater Capture Project: Concept Evaluation Memorandum provides details of the original Project Options and the recommended Project for the **Fairplex Stormwater Capture Project at Ganesha Park**. Attachment D. includes support letters for the proposed project modification.

The following describes the **types of modification requests** identified in Attachment A.

1. ***Functionally equivalent BMP modifications***
   - Drainage Area – **MODERATE INCREASE**. The original drainage area was 487.84 acres. The proposed option at Ganesha Park treats a larger drainage area of the Fairplex Drain at 625.0 acres.
   - Drainage Area Imperviousness – **MODERATE DECREASE**. The original analysis utilized the LADPW 2005 Land Use dataset to characterize imperviousness within the project drainage area. In accordance with the guidelines of the model that was selected for the revised analysis, WMMS 2.0 was used to characterize land use and imperviousness in the revised project drainage area. The WMMS 2.0 imperviousness value for this site is 41.3%.
   - 85^{th} Percentile Storm Volume – **MODERATE DECREASE**. Due to changes in drainage area and imperviousness, the WMMS 2.0 85^{th} percentile capture volume during the design storm will decrease from 31 ac-ft to 21 ac-ft.

2. ***Change in Methodology***
   - Change in Methodology – **CHANGED FROM INFILTRATION TO TREAT AND RETURN**. The original analysis did not utilize a site-specific infiltration rate, which is critical for the design of infiltration facilities. The proposed concept will achieve a similar level of pollutant removal of the primary pollutant (Copper) and secondary pollutant (Zinc) load reduction of greater than 80% for each. This will be accomplished with pretreatment, storage, and a manufactured filtration device that will treat captured stormwater and return it to the San Jose Creek Channel. The infiltration potential will be revisited later in the design project when a site-specific geotechnical investigation is conducted at Ganesha Park.

3. ***Change in BMP Capacity***
   - BMP Treatment Capacity – **SIGNIFICANT DECREASE**. The original concept calculated the 85^{th} percentile design storm event at 31 ac-ft using the Rational Method (HydroCalc 1.0.3), and the original design proposed to treat 100% of the 85^{th} percentile volume with a 28 ac-ft storage structure. An updated WMMS 2.0 analysis was conducted that resulted in the 85^{th} percentile storm volume of 21 acre-feet. The proposed project option at Ganesha Park would treat 100% of the 85^{th} percentile storm volume with a diversion rate of 35 cfs, subsurface storage of 7.7 ac-ft, and filtration discharge of 7.84 cfs. Therefore, the proposed project has the potential for a reduction in construction costs.

4. Change in Project Benefits

- Water Quality Benefits – **NO CHANGE ANTICIPATED**. The differences in project site and analysis explained above complicate the comparison of Water Quality Benefits between the original and proposed concepts. However, the original transfer agreement identifies >80% copper (primary pollutant) and >80% zinc (secondary pollutant) removal as a performance target, which will continue to be achieved in the new design.
- Water Supply Benefits – **TO BE DETERMINED.** The proposed project option will evaluate the potential for Water Supply Benefits based on the results of the geotechnical investigation at Ganesha Park. For this location, potential Water Supply Benefits will be coordinated with the Six Basins Watermaster.
- Community Investment Benefits – **SIGNIFICANT INCREASE**. The proposed modification significantly improves Community Investment Benefits associated with the project. In comparison to the original concept, which primarily featured below-grade improvements, the revised concept identifies many opportunities for above-ground improvements that will provide robust benefits for community members. Some of these features include new walking paths, a ball court and playing field, and picnic tables open all year round.
- Nature-Based Solutions – **MODERATE INCREASE**. Relocation of the project from the Fairplex facility to Ganesha Park will improve opportunities to utilize nature-based solutions. The proposed design concept will incorporate a garden and landscaped areas with drought-tolerant vegetation.
- Leveraging Funds – **NO CHANGE**.
- Community Support – **NO CHANGE**. The project has not had the opportunity to reach the public outreach phase, due to the complexity in land use (County Land, under lease with Fairplex Association) and the development of the Fairplex Specific Plan. The City is committed to delivering accurate information to the community with the proposed project location at Ganesha Park. Community outreach and engagement activities are programmed in accordance with the transfer agreement.

5. Updated Engineering Analysis

- Engineering Analysis – **REVISED MODEL**. A new hydrologic and water quality analysis was completed using Loading Simulation Program C++ (LSPC) to address these concerns.

6. Change in Project Location

- Project Location – **RELOCATED TO NEARBY PARCEL DIVERTING FROM SAME DRAIN**. The uncertainty added by the development of the Fairplex Specific Plan prompted the City of Pomona to explore alternative project sites. The project was originally located on the Fairplex campus. Furthermore, the Fairplex Association provided a letter in October 2023 indicating that they could not fully support the project at this time. In accordance with the recommendations of the revised analysis, the project was relocated to nearby Ganesha Park. Relocating the project site to a nearby parcel owned and maintained by the City of Pomona was done intentionally to further ensure support for the project will be secured throughout its useful life. A nearby site was selected to ensure that the overall design intent, including treating runoff from the Fairplex Drain, similar to the original approved concept was maintained to the maximum extent practicable.

MEMO

TO: City of Pomona

FROM: Craftwater Engineering, Inc.

SUBJECT: Fairplex Stormwater Capture Project
Concept Evaluation Memorandum

DATE: October 27, 2023 (Revised November 29, 2023)

In accordance with the 2020 Watershed Management Program (WMP) Plan established by the East San Gabriel Valley Watershed Management Group (ESGVWMG), a regional project has been identified and prioritized at Fairplex in the City of Pomona to meet the MS4 Permit requirements. The development of the Fairplex Stormwater Capture Project (Project) in the City of Pomona (City) represents another major opportunity to continue the regional scale progress to achieve pollutant load reductions for San Jose Creek – Thompson Wash.

The project is intended to divert the dry-weather flow and a sizable portion of the wet-weather flows from adjacent storm drains to a subsurface storage best management practice (BMP). A concept design was developed in 2021 to divert stormwater from three locations and store the water at Fairplex. During Meetings between the City and the Los Angeles County Fair Association (Fairplex), the Fairplex indicated that their preference for this project to be included within the Fairplex Specific Plan may have changed. The timeframe for the Specific Plan is on-going and unknown. Therefore, the City recommended a concept evaluation to explore alternatives that would align with the regional watershed goals.

This memo evaluates the benefits and costs of four design options, namely 1) the original concept design with three diversion lines, 2) the original site with only one diversion line, 3) new San Jose Creek diversion at Ganesha Park, and 4) new parking lot diversion at Auto Museum. For each design option, the project drainage area was delineated and analyzed to produce hydrographs which were used for BMP simulation and optimization. The optimization analysis identified the most cost-effective BMP configuration that meets the desired performance targets. The costs and performances of the optimal BMP configurations from all four options were evaluated. Concept plans were developed for the four design options.

This memo follows the order of the concept evaluation process. Section 1.0 introduces the original concept design and explains why it needs updates. Section 2.0 delineates the drainage area for all options and analyzes the characteristics of those drainage areas. Section 3.0 explains how the BMP optimization model was set up and how BMP performance should be evaluated and compared. Section 4.0 synthesizes the modeling results showing the water quality benefits different BMP configurations could attain. Cost estimates and concept plans are prepared for the optimal BMP configurations. Section 5.0 compares all aspects of the four design options and recommends a BMP configuration to fulfill all the project requirement while maintaining cost-effectiveness. Section 6.0 summarizes the concept evaluation results and discusses how the Fairplex project contributes to the ESGV WMP compliance goals.

1.0 BACKGROUND

1.1 Original Concept Design

A concept design was developed in 2021 to capture, treat and infiltrate local urban runoff at the Fairplex project site to address the regional BMPs that the City is responsible for in the ESGVWMG's WMP. The original design would capture 31 acre-feet (ac-ft) stormwater runoff from a 488-acre drainage area, mostly within Fairplex. The project received funding from the Safe Clean Water (SCW) Program for planning and design phases only; this project has not yet moved into construction phases. As conceived, the 24-hour, 85th percentile rainfall depth would be captured for added water supply and to decrease impact of non-point source pollutants, consistent with the SCW Program Goals.

The original design as approved and funded by SCW Program (see ***Figure 1-1***) proposed a 28 ac-ft subsurface storage structure that takes diverted stormwater from three diversion lines: 1) the north line diverts flows from LACFCD's RDD0086 – Thompson Creek Drain along W Arrow Hwy through gravity, 2) the east line diverts surface runoff from catch basins through gravity, and 3) the west line pumps flows from LACFCD's Fairplex Drain (North of W McKinley Ave). The overflow line connects the storage to Thompson Creek.

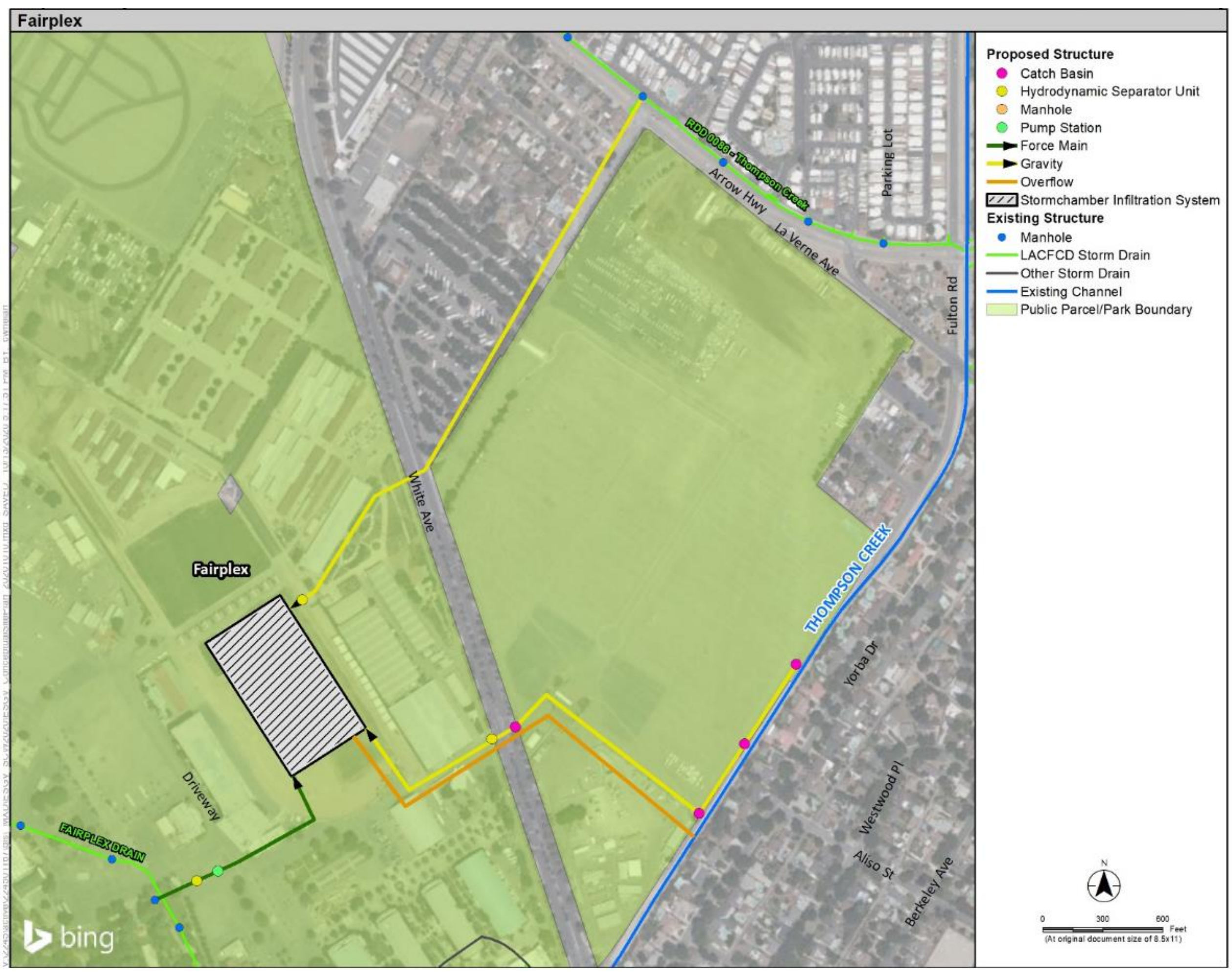

Figure 1-1. Original Fairplex Concept Design (*Safe, Clean Water Program Feasibility Study Report, 2021*)

1.2 Reasons to Update the Original Design

This section discusses different considerations to evaluate that might warrant a revision of the original Fairplex concept design as part of the full design process.

1.2.1 Drainage Area

The original drainage area delineation did not account for LACFCD Fairplex Drain Line B along Fairplex Dr (see black storm drains in ***Figure 1-2***). This line conveys flows generated by Mountain Meadows Golf Course and the residential area next to Fairplex Dr. Line B eventually joins Line A which is the drain the project diverts from. The original project drainage area needs to be extended to reflect this new information.

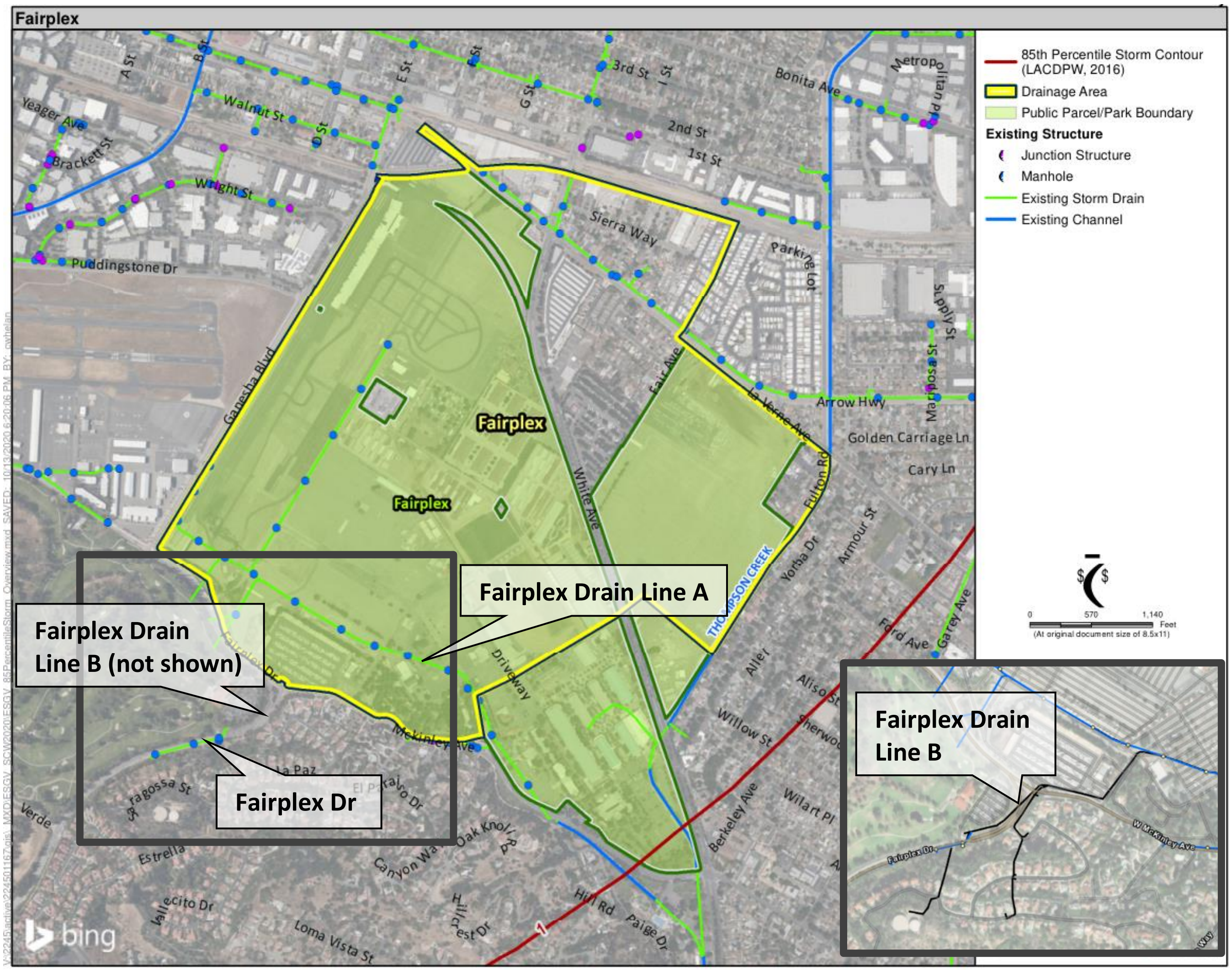

Figure 1-2. Original Fairplex Drainage Area (with Inset showing full stormdrain network)

1.2.2 Hydrology Model

The original Fairplex study used HydroCalc 1.0.3 to calculate the 85th percentile 24-hour storm flow for the 488-acre Fairplex drainage area. However, HydroCalc applies the rational method which does not model reaches and is only accurate when applied to subareas less than 40 acres per Section 7.2 and 12.1 of the [Los Angeles County](#)

Department of Public Works Hydrology Manual, 2006. To better represent the hydrology of this large drainage area, we used the Loading Simulation Program C++ (LSPC) software to model the 24-hr storm and the long-term runoff/pollutant load. LSPC model is a component of the updated Watershed Management Modeling System (WMMS 2.0) which is commonly used for the SCW Program and capable of evaluating cost-effective combinations of local and watershed-scale BMPs. Therefore, the subsurface BMP will need to be resized due to the hydrology updates.

1.2.3 Land Use/Hydrologic Response Unit

Land use and imperviousness of the drainage area are used in the 24-hr storm and the long-term modeling. The original study derived drainage area imperviousness from the LADPW 2005 Land Use dataset developed by Los Angeles County Department of Public Works as a support dataset for the Modified Rational Method (MODRAT) model. To be consistent with LSPC model, WMMS 2.0 complete Hydrologic Response Units (HRUs) should be used to classify the drainage area land use.

1.2.4 Infiltration Rate

The original concept design used a design infiltration rate of 0.44 in/hr measured at a well approximately 4300 ft from the proposed infiltration gallery. This infiltration test performed in December 2020 was likely following *GS200.2 Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration (2017)* which is replaced by *GS200.1 Guidelines For Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration (2021)*. The two versions calculate the total reduction factor differently which will cause the design infiltration rate to differ:

- The measured infiltration rate at 4300 ft from the site and 8 ft below ground is 0.88 in/hr.
- Per 2017 manual, reduction factors are multiplied. Total reduction factor = 2 x 1 x 1 = 2. Design infiltration rate = 0.88 / 2 = 0.44 in/hr.
- Per 2021 manual, reduction factors are summed. Total reduction factor = 2 + 1 + 1 = 4. Design infiltration rate = 0.88 / 4 = 0.22 in/hr, which is lower than the 0.3 in/hr minimum infiltration rate acceptable for subsurface infiltration (GS200.1, 2021).

The concept evaluation performed in this memo will not use this infiltration rate because of the large distance between the test well and site and the outdated infiltration test standard. Filtration is considered the main discharge method at the concept evaluation stage. Once a project site is selected and site-specific geotechnical investigation is completed, infiltration discharge at that project site can be evaluated.

1.3 Reasons to Explore Design Alternatives

Fairplex released a new Strategic Plan in 2018 and has decided to collaborate with the City of Pomona and the County of Los Angeles to develop a Specific Plan to take a thoughtful and comprehensive approach to land use planning for the campus. Proposed improvements across the entire Fairplex campus are currently in concept stage and may take up to 20 years to fully implement. The original concept design proposed subsurface storage under the current Fairplex grandstand field, and was supported by the Fairplex Association (see ***Attachment B1***). This required the stormwater capture project to be incorporated into the Fairplex Strategic Plan, whose implementation timeline remains uncertain as confirmed by recent correspondence from the Fairplex Association (see ***Attachment B2***). To account for the uncertainty of installing a regional BMP at Fairplex, the City has decided to explore other BMP design concepts that have equivalent or better water quality performance as the original concept. These alternatives as well as the updated original concept will be introduced in the next section.

Note: During the development of this document, the City received Fairplex's correspondence (***Attachment B2***) which states Fairplex is no longer able to provide continued support fort Project realization within their grounds due to the uncertainty in the proposed Fairplex Specific Plan.

2.0 EXISTING CONDITIONS

2.1 Drainage Area Delineation

Drainage area delineations were developed using geospatial data associated with the Loading Simulation Program C++ (LSPC) modeling subwatersheds and verified/corrected slightly using further GIS analysis where full subwatersheds did not coincide with project locations. High-resolution Light Detection and Ranging (LiDAR) elevation data and digital stormwater pipe inventories from the City of Pomona and Los Angeles County Flood Control District (LACFCD) were used to accomplish subwatershed splitting. ***Figure 2-1*** illustrates the geospatial data used in drainage area delineation. Developed drainage areas were used to model runoff and water quality baseline time series. These were then incorporated into BMP models to optimize the BMP decision variables.

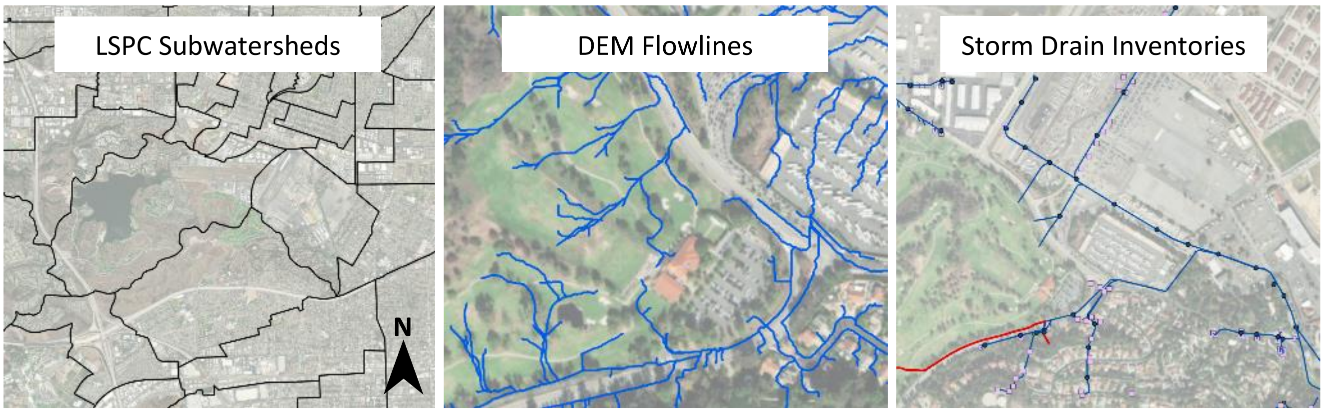

Figure 2-1. Geospatial Data Used in Drainage Area Delineation

The four design options evaluated in this memo are summarized in ***Table 2-1***. Their diversion locations are shown in ***Figure 2-2***. They will be referred to as Option 1-4 in this memo. Note that Option 1 is *not* the same as the original concept design developed in 2021 because they have different drainage areas and land uses.

Table 2-1. Summary of Design Options

Design	Diversion Point	BMP Location
Option 1 (Updated Original Concept)	1) North line: RDD0086 Thompson Creek Drain, W Arrow Hwy, 2) East line: surface runoff from catch basins, 3) West line: Fairplex Drain	Fairplex Grandstand
Option 2 (Updated Original Concept with Single Diversion)	Option 1 west line: Fairplex Drain	Fairplex Grandstand
Option 3 (Ganesha Park)	San Jose Creek downstream of Fairplex Drain	Ganesha Park
Option 4 (Motorsports Museum)	Fairplex Drain	Parking lot next to NHRA Motorsports Museum

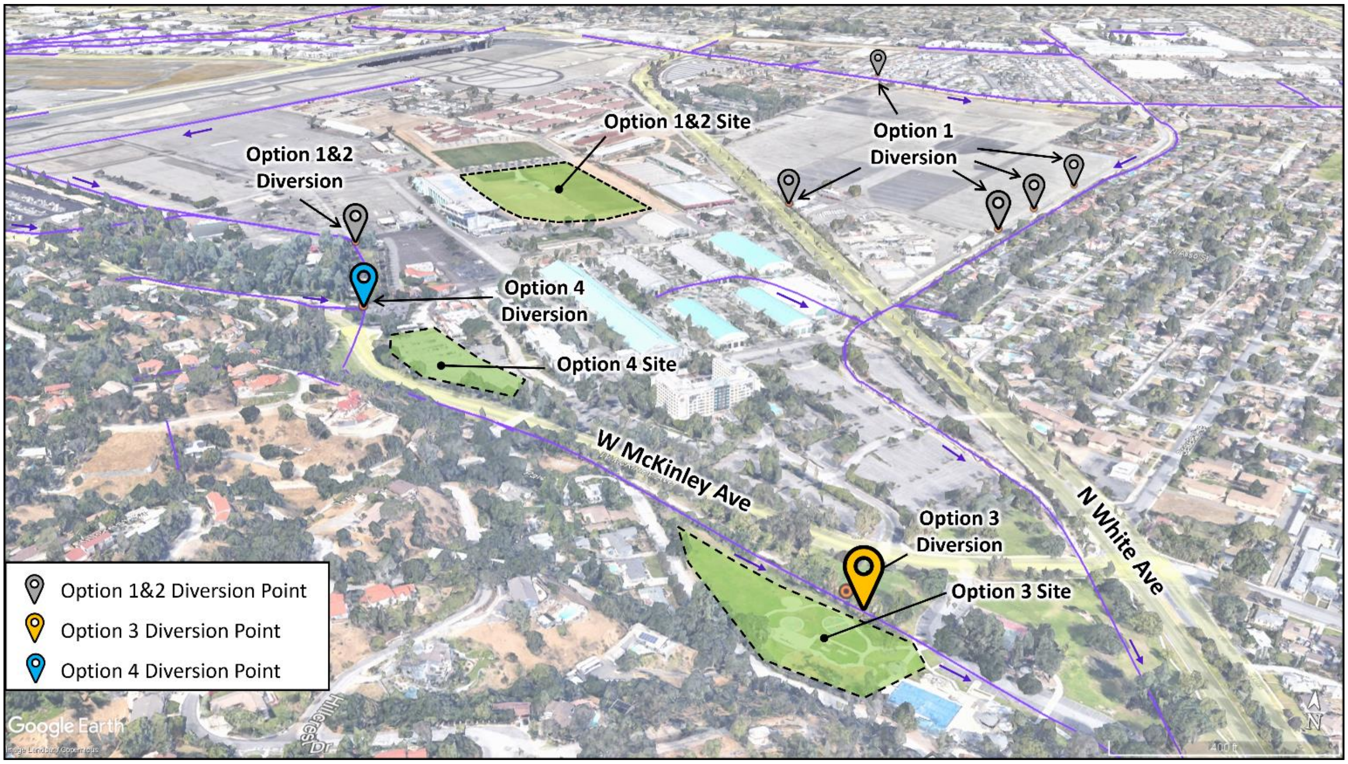

Figure 2-2. Option 1-4 Diversion Locations

Option 1 drainage areas are shown in ***Figure 2-3***. The largest drainage area on the west is the drainage area of Option 2. Option 3 drainage area is shown in ***Figure 2-4***. Option 4 drainage area is shown in ***Figure 2-5***.

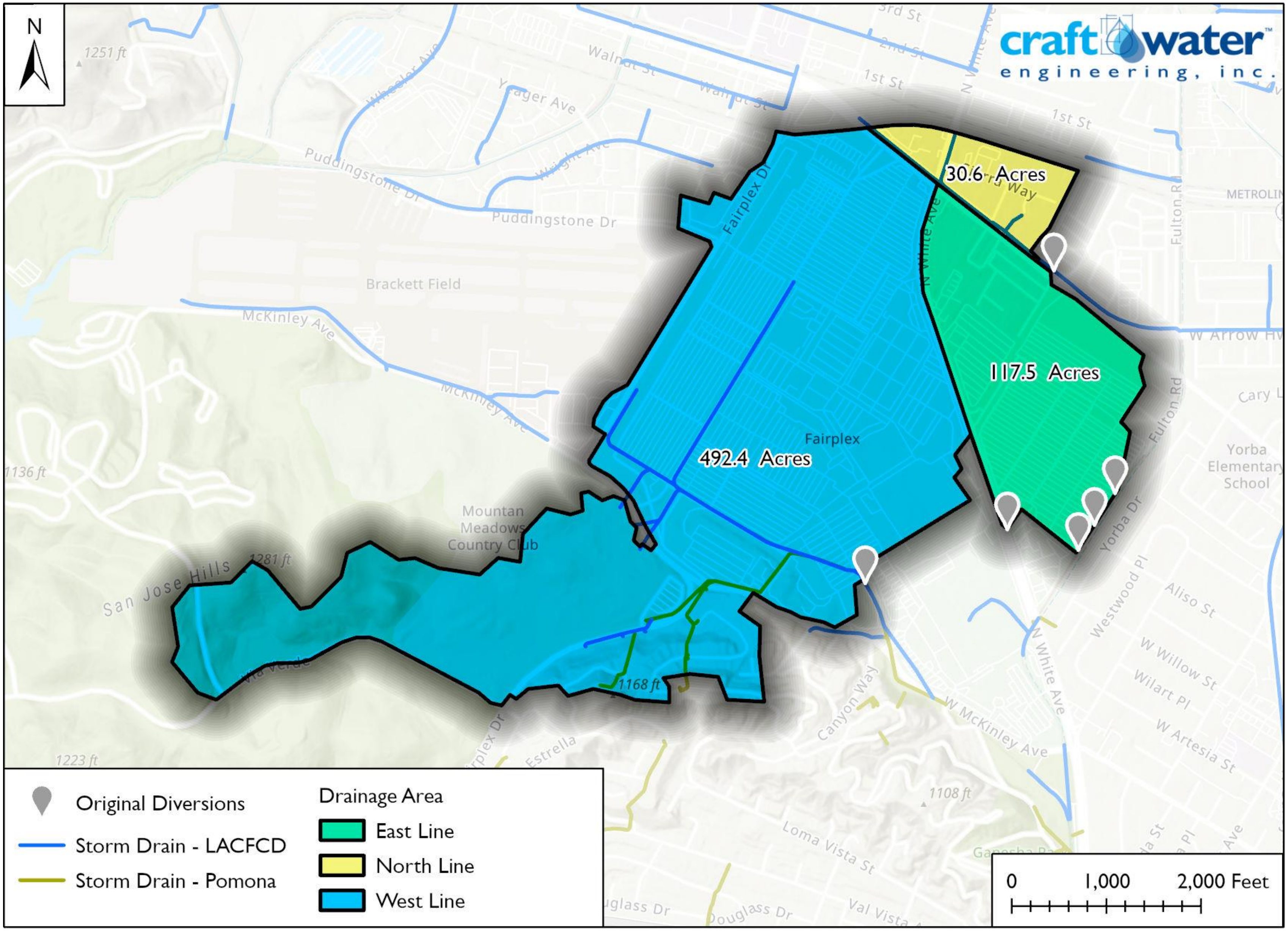

Figure 2-3. Option 1 and 2 Drainage Areas

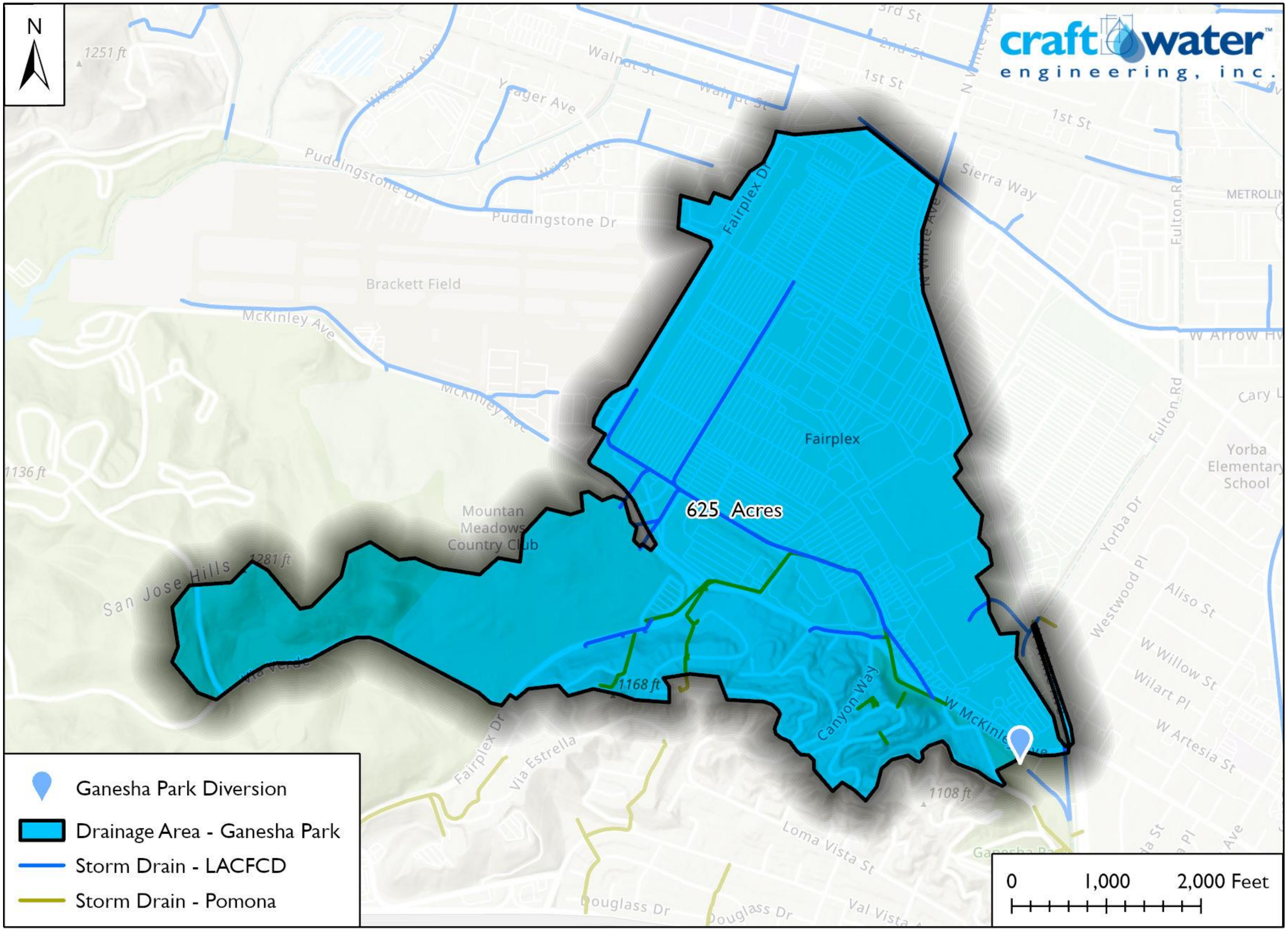

Figure 2-4. Option 3 Drainage Area

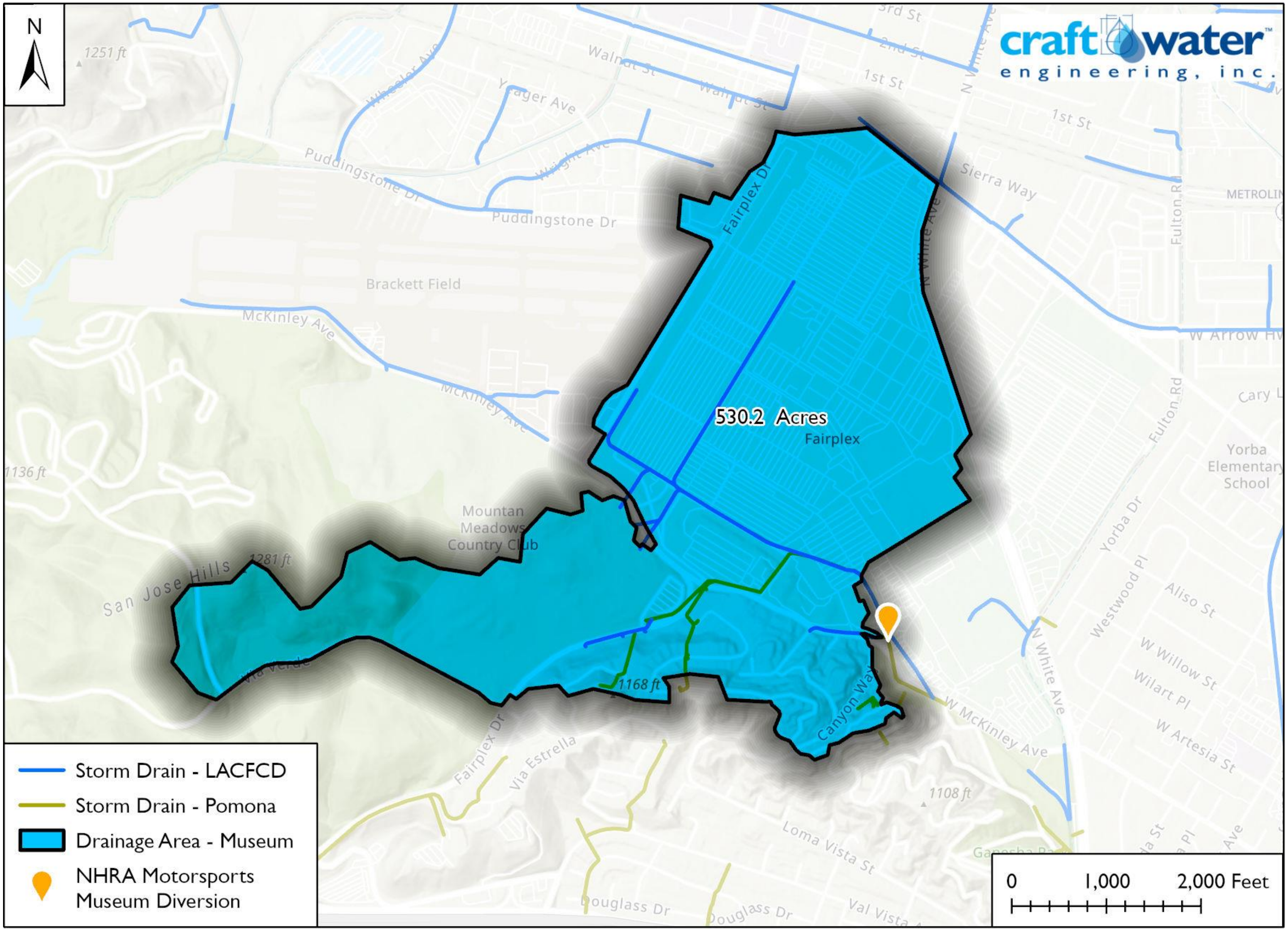

Figure 2-5. Option 4 Drainage Area

2.2 Drainage Area Characterization

For this study, the Loading Simulation Program C++ (LSPC) software was used to simulate 1) the contaminant loading, runoff volume, and flow rate associated with a long-term, 10-year continuous time series (Water Year 2009 to Water Year 2018), and 2) the hourly runoff volume and flow rate during an 85th percentile 24-hour design storm. A regionally calibrated LSPC model was used as this model was used in WMP development and is accepted by the Los Angeles Water Quality Control Board for compliance analyses.

Drainage area land uses categorized by WMMS 2.0 are summarized in ***Table 2-2***. The land use for Option 1-4 are mapped in ***Figure 2-6*** to ***Figure 2-8***. Developed using a *different drainage area* and a *different land use dataset*, the original concept design has an impervious area of 408 acres (84% of the 488-acre drainage area originally estimated).

Table 2-2. Option 1-4 Land Use Summary

Land Use	Option 1		Option 2		Option 3		Option 4	
	Area (ac)	Perc.	Area (ac)	Perc.	Area (ac)	Perc.	Area (ac)	Perc.
Commercial	2.7	0.4%	1.5	0.3%	1.6	0.3%	1.5	0.3%
Industrial	17.1	2.7%	7.7	1.5%	7.7	1.2%	7.6	1.4%
Institutional	169.9	26.5%	136.3	27.7%	153.2	24.5%	136.5	25.7%
Irrigated	99.9	15.6%	80.1	16.2%	95.7	15.3%	85.0	16.0%
Pervious	143.5	22.4%	117.1	23.8%	140.1	22.4%	124.4	23.5%
Residential	52.3	8.2%	31.8	6.5%	58.5	9.4%	40.2	7.6%
Road-Minor	8.4	1.3%	4.7	1.0%	7.3	1.2%	6.2	1.2%
Road-Primary	7.1	1.1%	2.3	0.5%	5.2	0.8%	3.1	0.6%
Roof	26.1	4.1%	17.0	3.5%	24.4	3.9%	18.0	3.4%
Vegetation	113.5	17.7%	93.9	19.0%	131.3	21.0%	107.7	20.3%
Sum	**640.5**	**100.0%**	**492.4**	**100.0%**	**625.0**	**100.0%**	**530.2**	**100.0%**
Impervious	**283.5**	**44.3%**	**201.3**	**40.9%**	**257.9**	**41.3%**	**213.1**	**40.2%**

Table 2-3 summarizes the jurisdictional areas within the project drainage areas. For reference, the 2021 original drainage area has 413 acres (84.7%) in Pomona and 75 acres (15.3%) in La Verne.

Table 2-3. Option 1-4 Jurisdictional Areas within Project Drainage Areas

City	Option 1		Option 2		Option 3		Option 4	
	Area (ac)	Perc.	Area (ac)	Perc.	Area (ac)	Perc.	Area (ac)	Perc.
Pomona	511.4	79.8%	411.5	83.6%	544.0	87.0%	449.3	84.7%
La Verne	74.7	11.7%	26.5	5.4%	26.6	4.3%	26.5	5.0%
San Dimas	54.4	8.5%	54.4	11.0%	54.4	8.7%	54.4	10.3%
Sum	**640.5**	**100.0%**	**492.4**	**100.0%**	**625.0**	**100.0%**	**530.2**	**100.0%**

Ten-year (Water Year 2009 to 2018, WMMS 2.0 calibration period) continuous runoff and pollutant time series and 85th percentile 24-hour runoff time series are developed with LSPC. Hydrologic characteristics summarized from those time series are presented in ***Table 2-4***. These baseline time series will serve as BMP model inputs in the next section for BMP simulation and optimization.

Table 2-4. Option 1-4 Drainage Area Hydrologic Characteristics

Characteristics	Option 1	Option 2	Option 3	Option 4
85th 24-hr Storm Peak Flow (cfs)	36.4 [1]	25.7	33.2	27.3
85th 24-hr Storm Volume (ac-ft)	22.9	16.4	21.0	17.3
Avg Annual Runoff (ac-ft/yr)	318.2	232.0	296.1	247.5
Avg Annual Zinc Load (lb/yr)	224.1	151.1	182.8	156.9
Avg Annual Copper Load (lb/yr)	51.5	34.9	42.3	36.2
Avg Annual Lead Load (lb/yr)	14.9	10.0	12.5	10.5

1. 25.7 cfs from the north line: RDD0086 Thompson Creek Drain along W Arrow Hwy; 7.8 cfs from the east line: surface runoff from inlets; 2.5 cfs from the west line: Fairplex Drain.

2.3 Preliminary Geotechnical Evaluation

Ninyo & Moore have performed a preliminary geotechnical evaluation of the four design options proposed for the Fairplex SW Capture project in Pomona, California. The evaluation included a site reconnaissance to observe and document the site conditions and review of readily available background documents, including geologic and groundwater maps and reports, geotechnical reports, historic aerial photographs, data available on the Geotracker website, topographic maps, and Seismic Hazards maps from the State of California. The following is a summary of the preliminary findings.

The four sites are located within Pomona Valley of the Transverse Ranges Geomorphic Province. Pomona Valley is an east-west trending structural trough bounded by the San Gabriel Mountains to the north and the San Jose Hills to the southwest. The valley has been infilled by relatively thick sequences of coarse-grained alluvial fan and stream deposits (cobbles, gravel, and sand) creating a relatively flat surface that gently slopes downward toward the south and southwest. The four sites are located just east and north of the San Jose Hills that are mapped as volcanic and igneous rocks in the project vicinity by Dibblee, T.W., Jr. (2002). The State of California (1998) has mapped an area of alluvium adjacent to the northeast side of the hills, which also includes the four sites, as clayey deposits. Thirteen boring logs drilled within these materials in 2001 for the Fairplex Storm Drain along the southern side of the Fairplex property generally encountered interbedded alluvial deposits of clayey sand, sandy clay, and silty sand with lesser amounts of poorly graded sand. It is anticipated that similar alluvial deposits will be encountered at the subject sites. However, granitic bedrock of the San Jose Hills could be encountered beneath the alluvium at Alternatives 3 and 4, which could present difficult excavation and/or oversize materials.

Based on the review of the historic groundwater maps, this area of clayey deposits was formerly mapped as an area of "artesian water" by Mendenhall in 1908, suggesting that groundwater was formerly at or near the ground surface in portions of the area. The State of California (1998) has mapped the historic high depth to groundwater (HHGW) beneath the stormwater storage areas of Alternatives 1 and 2 as approximately 20 feet. The HHGW is anticipated to be shallower at the locations of Alternatives 3 and 4. The review of the groundwater data available on the Geotracker website indicates that the depth to groundwater in the project area ranges from approximately 21 to 60 feet; however, groundwater was encountered along the Fairplex Storm Drain at depths as shallow as 7 feet. The depth to groundwater is anticipated to be more than 20 feet at the sites of Alternatives 1 and 2, but relatively shallow (less than 20 feet) at the sites of Alternatives 3 and 4. According to the State of California (1998), all four sites are underlain by deposits considered to be susceptible to liquefaction. There are no known active faults or landslides beneath the sites. A summary of the conditions anticipated at each site is presented in ***Table 2-5***.

Table 2-5. Preliminary Geotechnical Evaluation Summary

	Option 1	Option 2	Option 3	Option 4
Subsurface Materials	Alluvium	Alluvium	Alluvium/Granitic Bedrock (depth of contact unknown)	Alluvium/Granitic Bedrock (depth of contact unknown)
Estimated Depth to GW	More than 20 feet	More than 20 feet	Less than 20 feet	Less than 20 feet
Estimated HHGW	20 feet	20 feet	10 feet	10 feet
Liquefiable	Yes	Yes	Yes	Yes
Active Faulting	No	No	No	No
Landslides	No	No	No	No
Potential Site-Specific Risks			Potential for Shallow Bedrock; Wet soils due to shallow GW and landscape watering.	Potential for Shallow Bedrock; Wet soils due to shallow GW

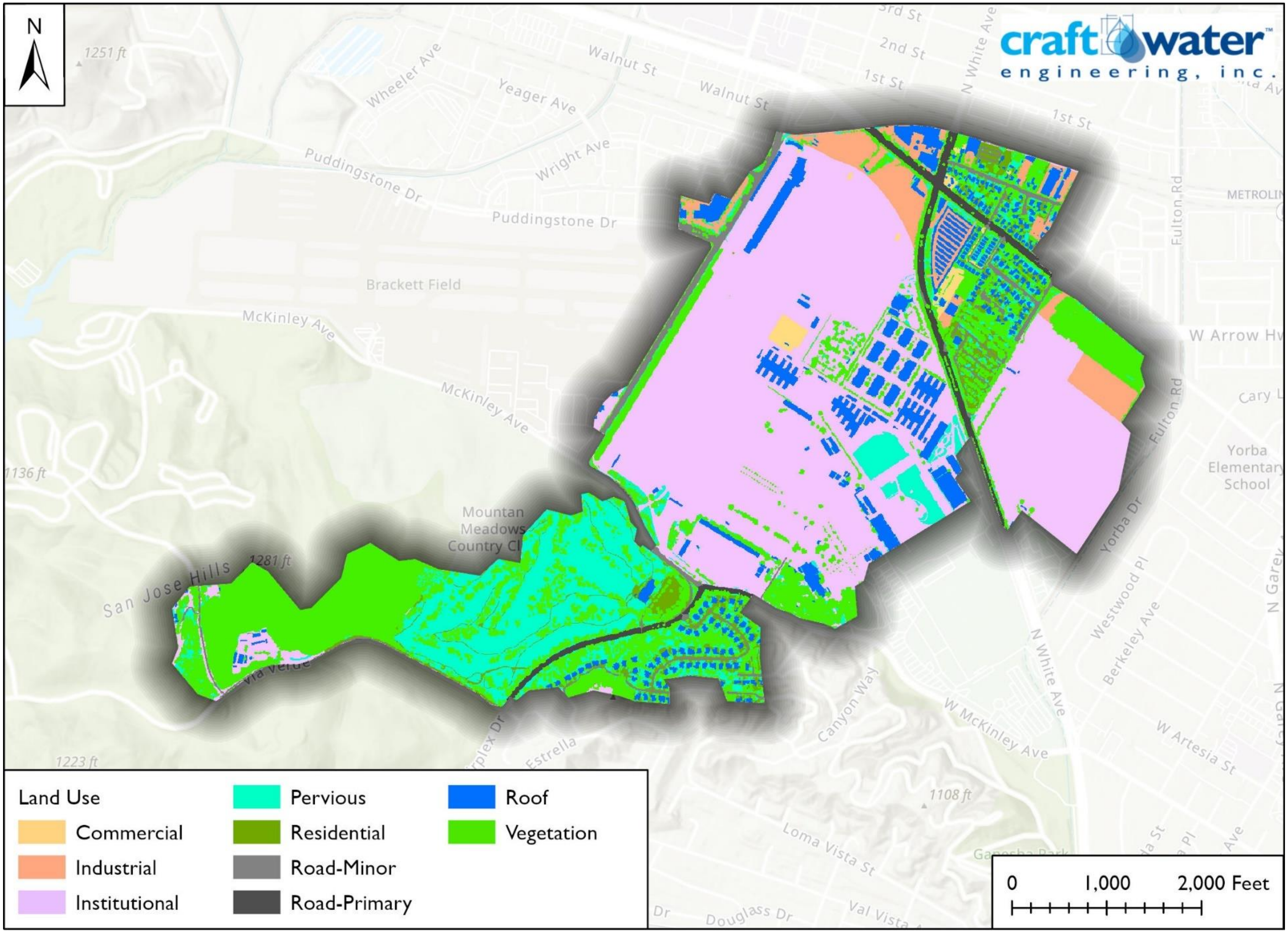

Figure 2-6. Option 1 and 2 Land Use

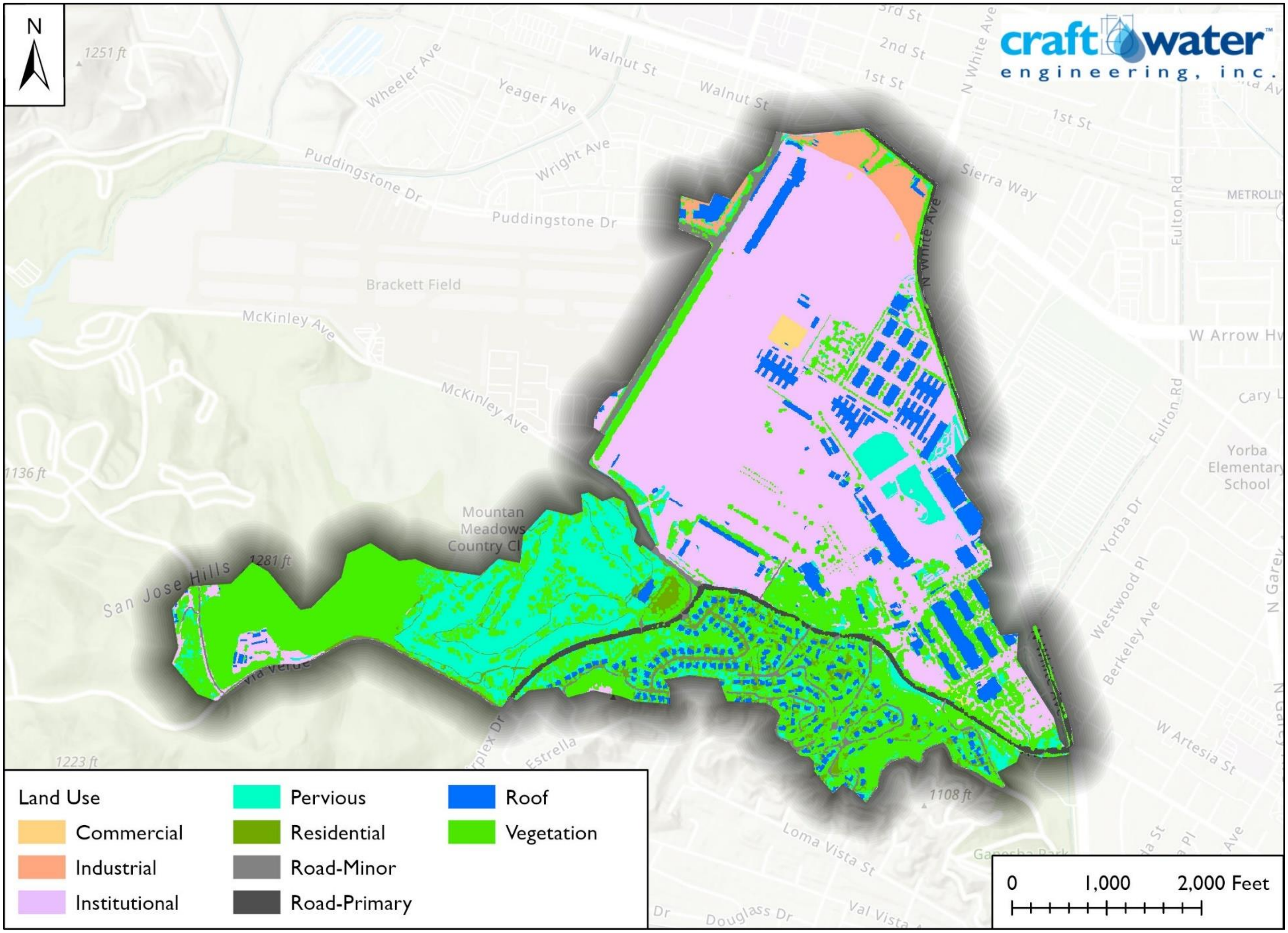

Figure 2-7. Option 3 Land Use

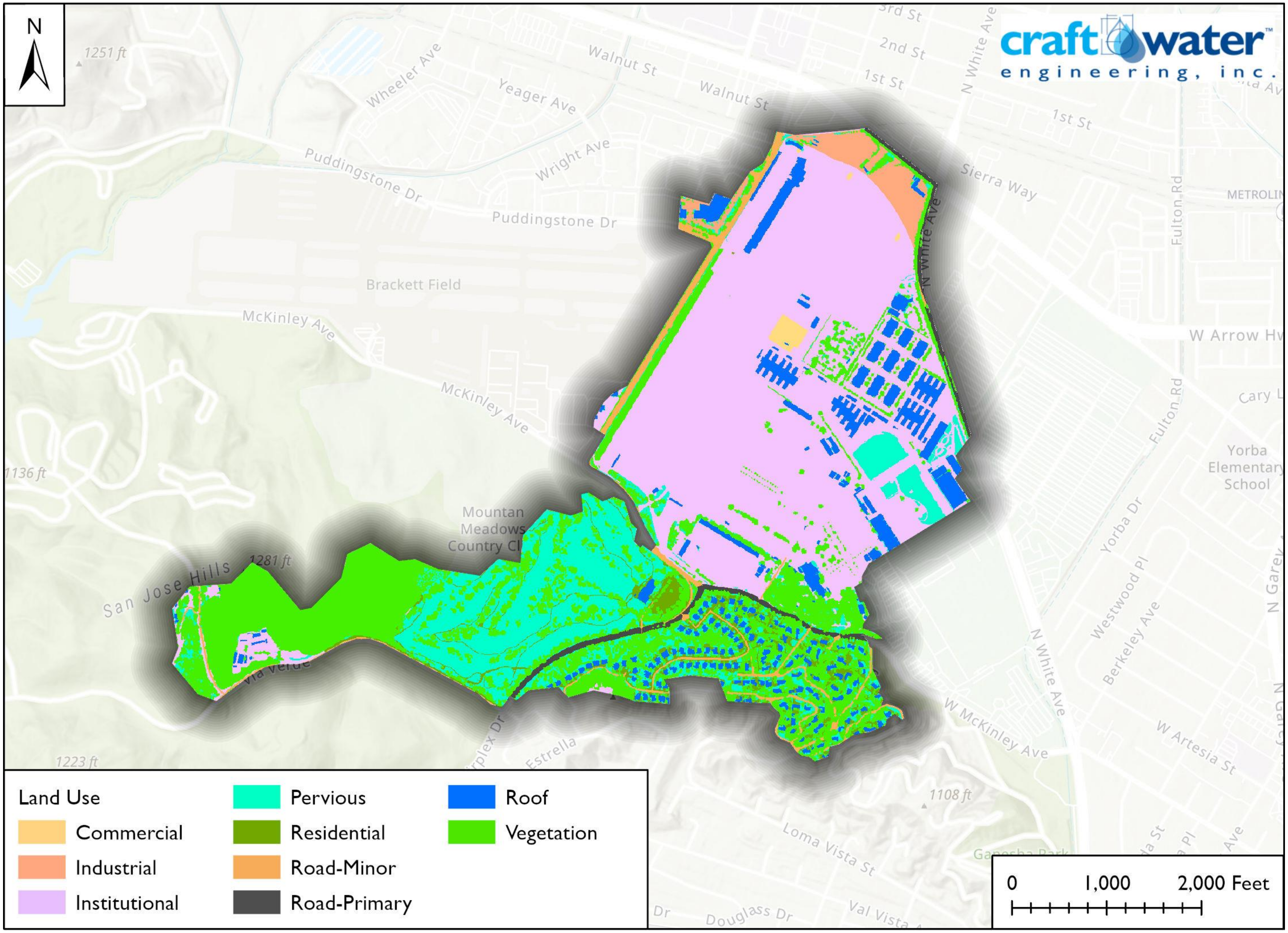

Figure 2-8. Option 4 Land Use

3.0 BMP SIMULATION AND OPTIMIZATION

3.1 Water Quality Optimization Strategy

The primary design goal of the Fairplex Project is to reduce long-term annual loading of pollutants to San Jose Creek Reach 2. Zinc was used as the limiting pollutant of interest following the methods used in the *Final Watershed Management Program Plan (Appendix A)* prepared by ESGVWMG. Copper and Lead are considered secondary pollutants for optimization. To ensure that the system will be sized to maximize load reductions in a cost-effective manner, optimization modeling was performed.

The purpose of optimization modeling is to support decision making by balancing design components (including BMP volume, inflow diversion rates, outflow treatment rates, etc.) such that performance objectives can be met in a cost-effective manner (see ***Figure 3-1*** at right).

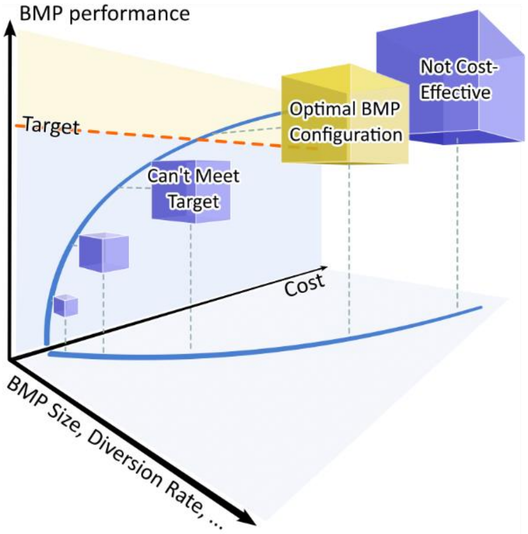

Figure 3-1. Illustration of optimization modeling balancing performance and cost

The model setup for water quality simulation and optimization is complex, involving several modeling systems and iterative feedback from design engineers. The general methodology is discussed in this section, and the results are presented thereafter.

3.2 BMP Performance Modeling and Optimization

The first step of the modeling was to predict BMP performance for a range of 1) diversion rates, 2) discharge alternatives, and 3) BMP sizes. Different combinations of these parameters will lead to different BMP performance statistics, including runoff capture and pollutant capture. These BMP model inputs and outputs are discussed in this section.

A custom BMP model was used to improve upon certain modeling limitations in EPA's System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN). This custom model is grounded in the physical BMP representations (stage-storage, stage-discharge) used in SUSTAIN, and it provides built-in optimization algorithms to more systematically automate the process of evaluating many different BMP configurations to select an effective solution related to project goals. The model was run using 10 years of runoff and pollutant loading time-series data (see Section 2.2). For each potential BMP configuration, the hourly inflow, storage, outflow of stormwater, and pollutants were simulated. The simulated performance statistics of all the BMP configurations are then evaluated against the objectives and considerations in Section 3.3 to develop the optimal project configuration alternatives.

The model inputs of all options are summarized in ***Table 3-1***.

Table 3-1. Option 1-4 BMP Model Inputs

Input	Option 1	Option 2	Option 3	Option 4
Diversion Rate	37 cfs pumping [1, 3]	5-30 cfs pumping [1]	10-45 cfs if gravity, 5-30 cfs if pumping	10-45 cfs if gravity, 5-30 cfs if pumping
Discharge Rate	2.88 cfs, 5.76 cfs, 7.84 cfs filter			
Storage Volume	0.2-86 ac-ft	0.2-86 ac-ft	0.1-25 ac-ft	0.1-25 ac-ft
Cover Depth	3' pumping	3' pumping	11.1' if gravity [2], 3' if pumping	10.1' if gravity [2], 3' if pumping
Diversion Pipe Length	4360'	830'	50'	250'

1. Has to be pumped because the site is higher than the diverted storm drain. Divert 26 cfs from the north line (RDD0086 Thompson Creek Drain, W Arrow Hwy), 8 cfs from the east line (surface runoff from inlets), 3 cfs from the west line (Fairplex Drain).
2. Estimated from as-built drawings.
3. 37 cfs is the sum of the 85th percentile storm peak flow rates of the three diversion lines.

3.2.1 Input - Diversion Rates

Model runs were limited to feasible diversion ranges for the proposed diversion point based on prior project knowledge related to the drainage area and potential project storage size. Two types of diversions are considered: gravity diversion where stormwater flows into the BMP through gravity, and pumped diversion where stormwater is pumped up to the BMP level. Gravity diversion requires the BMP to be lower than the existing storm drain invert, whereas pumped diversion allows the BMP to be placed at shallower depths to save earthwork costs. The practical pumping rate is limited to 30 cfs.

3.2.2 Input - Discharge Alternatives

Infiltration

BMP simulation assumes no infiltration discharge for all options. Once a project site is selected and site-specific geotechnical investigation is completed, infiltration discharge at that project site can be evaluated.

Filtration

Several commonly available stormwater filtration devices (at 2.88 cfs, 5.76 cfs, and 7.84 cfs discharge rates) were modeled. These values were chosen to cover a range of potential outflows common to off-the-shelf proprietary filter products such as the Kraken® Filter or the Jellyfish® Filter. If the desired outflow rate changes, rates can be revaluated in later stages of design. Water treated through filtration would be returned to the storm drain downstream of the diversion point.

The pollutant removal effectiveness of the filter was modeled using the effluent concentration limit data published by The Water Research Foundation in *International Stormwater BMP Database 2020 Summary Statistics*. The model assumes that any influent pollutant concentrations higher than the effluent concentration limit will be reduced to the limit, and any influent concentration lower than the limit will not be reduced.

3.2.3 Input - Storage Volume

Modeling assumes rectangular subsurface storage structures with a maximum storage depth of 10 ft. Footprints up to the maximum available footprint were modeled with a 0.01-acre interval.

3.2.4 Output – 85th Percentile 24-hour Design Storm Performance Statistics

A separate spreadsheet model was developed to verify whether a combination of diversion rate, treatment rate and storage volume can fully capture the peak flow and total runoff volume resulted from an 85th percentile 24-hour design storm.

3.2.5 Output – Long-term BMP Performance Statistics

Hourly inflow and outflow of runoff and pollutant loads can be generated by the custom model for each BMP configuration. This output time series data can be summarized into the following performance statistics that are relevant to the project objectives for BMP optimization:

- **Average Annual Runoff Reduction**: The average amount of stormwater removed from the storm drain system due to infiltration per year.
- **Average Annual Divertible Pollutant Load:** The average mass of pollutants (Total Zinc, Coper, and Lead) the diversion structure can theoretically divert to the BMP per year if the BMP has infinite storage volume.
- **Average Annual Pollutant Load Reduction:** The average mass of pollutants (Total Zinc, Coper, and Lead) the BMP can remove through treatment per year.

3.3 BMP Optimization Objectives and Considerations

This section discusses how the BMP performance statistics described in Section 3.2.5 are used for BMP optimization. Multiple aspects and stages of the project are considered when optimizing the BMP, including 1) how the BMP contributes to water quality and flood control, 2) how this project integrates with the Safe Clean Water Program, and 3) whether the BMP is optimized for construction and O&M.

3.3.1 General Project Objectives

From a watershed management perspective, BMP projects should be evaluated against these objectives:

- **Water Quality**: The amount of stormwater pollutants the BMP can remove, and the volume of stormwater the BMP can treat. This will be the primary objective of the Fairplex project.
- **Water Supply**: The volume of stormwater that can be accounted for water supply. This metric is not considered in the current optimization because the BMPs do not have a water supply component such as infiltration to groundwater basin, sewer discharge, or on-site irrigation reuse.
- **Flood Control**: The peak flow rate the BMP can capture and the runoff volume the BMP can store during a storm event to reduce flooding. The BMPs should be sized to capture the peak flow rate and runoff volume of at least the 85th percentile 24-hour design storm, if feasible.

3.3.2 Safe Clean Water Program (SCWP) Metrics

Benefits predicted for different BMP configuration options must also be weighed against Safe Clean Water Program (SCWP) scoring criteria to determine the optimal choice for a given site to ensure a Project meets the needs of this important regional program. The following SCWP scoring categories are primarily dependent on the proposed treatment type:

- **Wet Weather vs. Dry Weather BMP:** Does the proposed BMP capture the 85th percentile storm of the targeted drainage area? If so, it is historically defined as a wet weather project per the SCWP Scoring Committee. Otherwise, it is a dry weather BMP. Wet Weather and Dry Weather BMPs have different water quality scoring criteria, as detailed below. Both BMP types can still fulfill all other project related SCW scoring criteria (Water Supply, Community Investment, etc.). This concept is considered as a Wet Weather project based on this criterion.

- **Water Quality:**
  - Wet Weather BMP: Removal of at least 50% of the divertible primary and secondary pollutant, or at least 80% of the divertible primary and secondary pollutant.
  - Dry Weather BMP: Removal of 100% of all tributary dry weather flows.
- **Water Supply**: Utilizing captured stormwater to replenish local water supply (water reclamation and groundwater recharge).
  - Scoring thresholds for SCW occur at 25, 100, 200, and 300 ac-ft of water supply benefit.
- **Nature Based Solutions**: Implement or mimic natural processes to treat stormwater (infiltration).

3.3.3 Construction and O&M Considerations

Making the BMP size larger increases water quality and water supply benefits but also increases construction cost and maintenance efforts. **Therefore, when the key objectives described in Section 3.3.1 and 3.3.2 can be fulfilled, the lowest diversion rate, the smallest BMP storage size and the smallest filtration rate are recommended to ensure the project is cost-effective.** Concept-level cost estimates for Option 1-4 will be presented in Section 4.1.

4.0 OPTIMIZATION MODELING RESULTS

4.1 Concept Plan

The concept plans were created for the four options using the optimal configurations developed by BMP optimization. Section 4.2 and 4.3 will discuss the BMP optimization results.

Option 1 (***Figure 4-1***) has three diversion lines and one discharge line. The north line diverts stormwater from Thompson Creek Drain along Arrow Highway and conveys the flow through gravity. The east line collects runoff from the Fairplex parking lot north of N White Ave, pumps it up, and conveys it through gravity. The gravity portion of the east line also receives flows from an inlet along N White Ave. Flows from the north and east lines are pretreated before entering the subsurface storage. The west line pumps pre-treated stormwater from Fairplex drain to the subsurface storage. The 8.9 acre-feet subsurface storage will sit under the Fairplex grandstand. Three access openings will be provided in the grandstand area to provide maintenance access to the storage. Storage access outside of the grandstand could be provided if necessary. Stormwater exits the storage from the bottom through gravity and flows through a filter before returning to Fairplex drain downstream of the west line diversion point. No surface improvement is proposed for this Option.

Option 2 (***Figure 4-2***) pumps pre-treated stormwater from Fairplex drain to the 5.6 acre-feet subsurface storage under the Fairplex grandstand. Two access openings will be provided in the grandstand area to provide maintenance access to the storage. Storage access outside of the grandstand could be provided if necessary. Stormwater exits the storage from the bottom through gravity and flows through a filter before returning to Fairplex drain downstream of the west line diversion point. No surface improvement is proposed for this Option.

Option 3 (***Figure 4-3*** and ***Figure 4-4***) diverts stormwater from San Jose Creek through a pre-treatment unit into a 7.7 acre-feet subsurface storage system. Two underground storage chambers connected by equalization pipes are proposed in Ganesha Park on either side of an existing sewer line. Three access openings will be provided in the park to provide maintenance access to the storage. Stored stormwater is pumped through a filter and discharged back to San Jose Creek. Surface improvements above the subsurface storage include extended walk path, a U8 soccer field, a basketball court, an exercise area, two pavilions, and a bird and butterfly garden.

Option 4 (***Figure 4-5***) diverts stormwater from Fairplex Drain through a pre-treatment unit into a 5.9 acre-feet subsurface storage under the parking lot in front of the NHRA Motorsports Museum. Two access openings will be provided in the parking lot to provide maintenance access to the storage. Stored stormwater is pumped through a filter and discharged back to Fairplex Drain on the other side of Paige Dr. The parking lot will be restored after construction with new plantings.

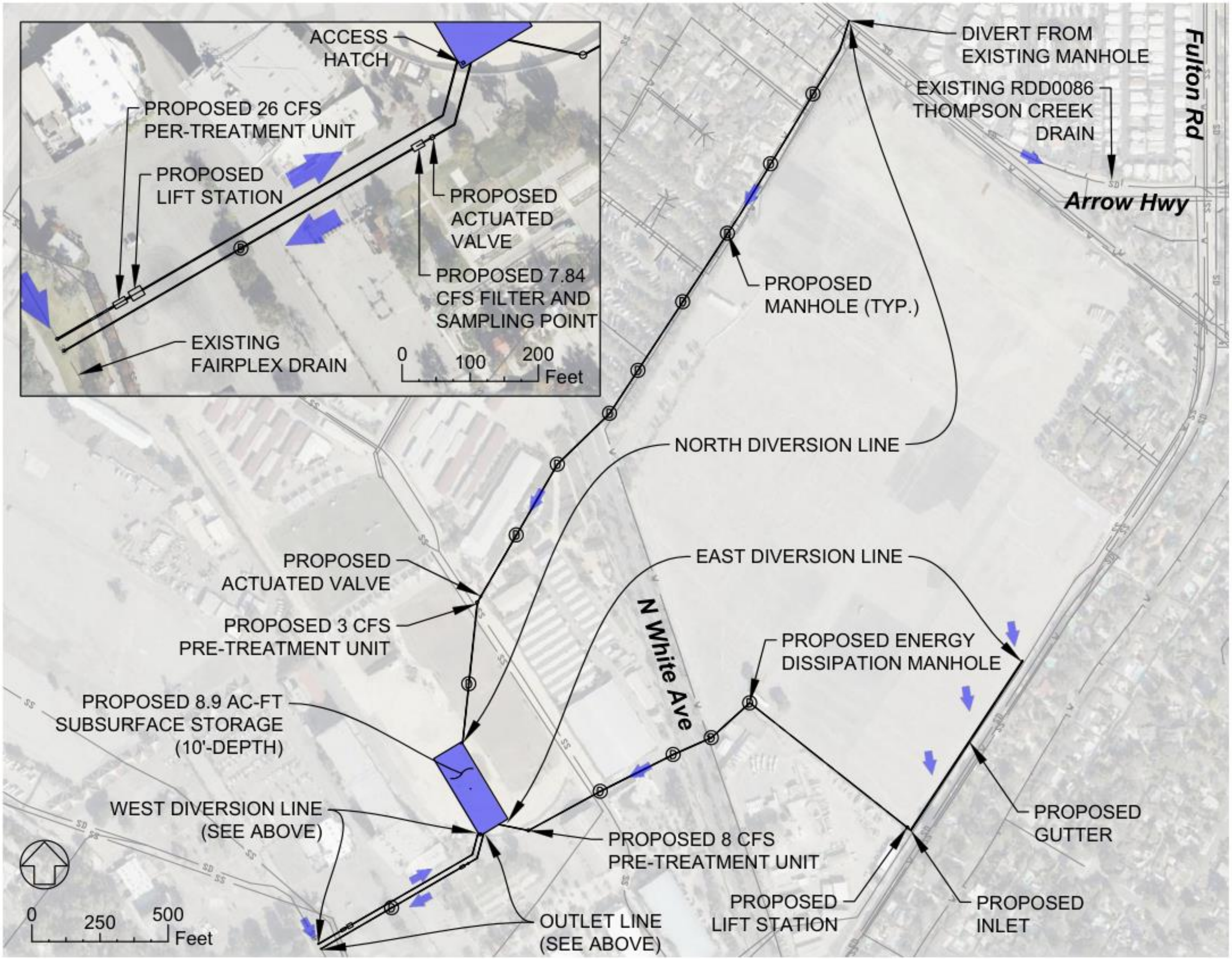

Figure 4-1. Option 1 Concept Plan

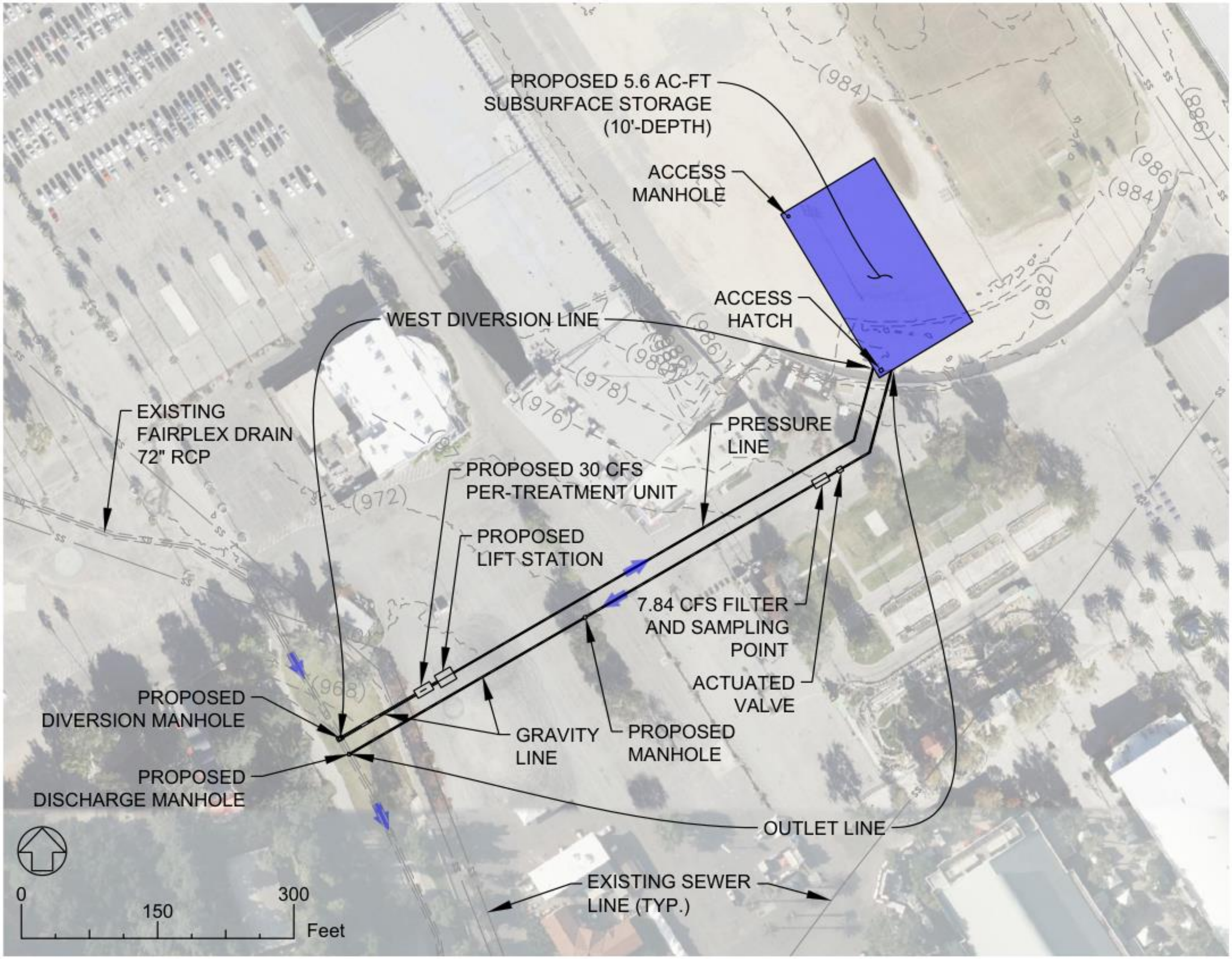

Figure 4-2. Option 2 Concept Plan

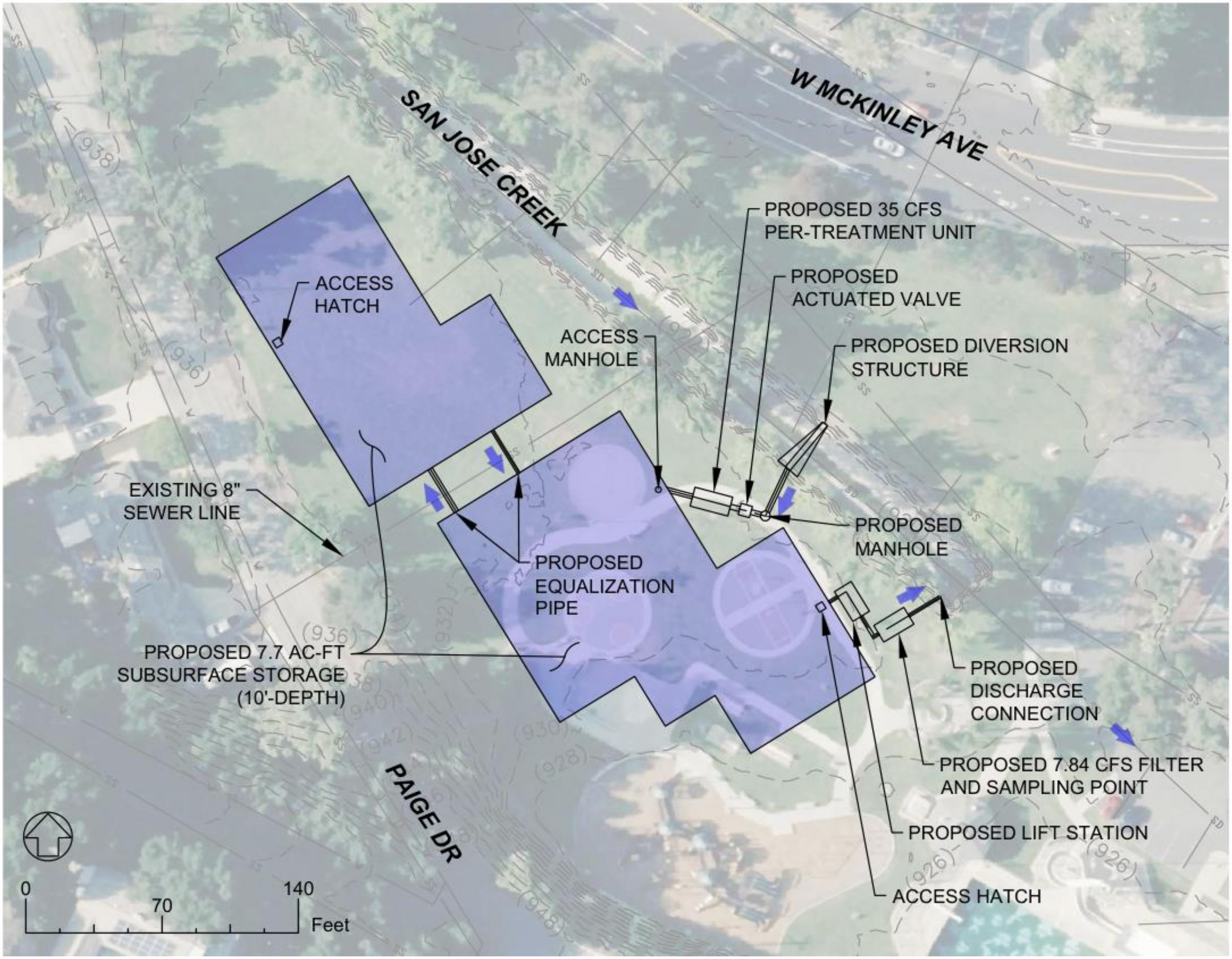

Figure 4-3. Option 3 Concept Plan – Utility

Figure 4-4. Option 3 Concept Plan – Surface Improvement

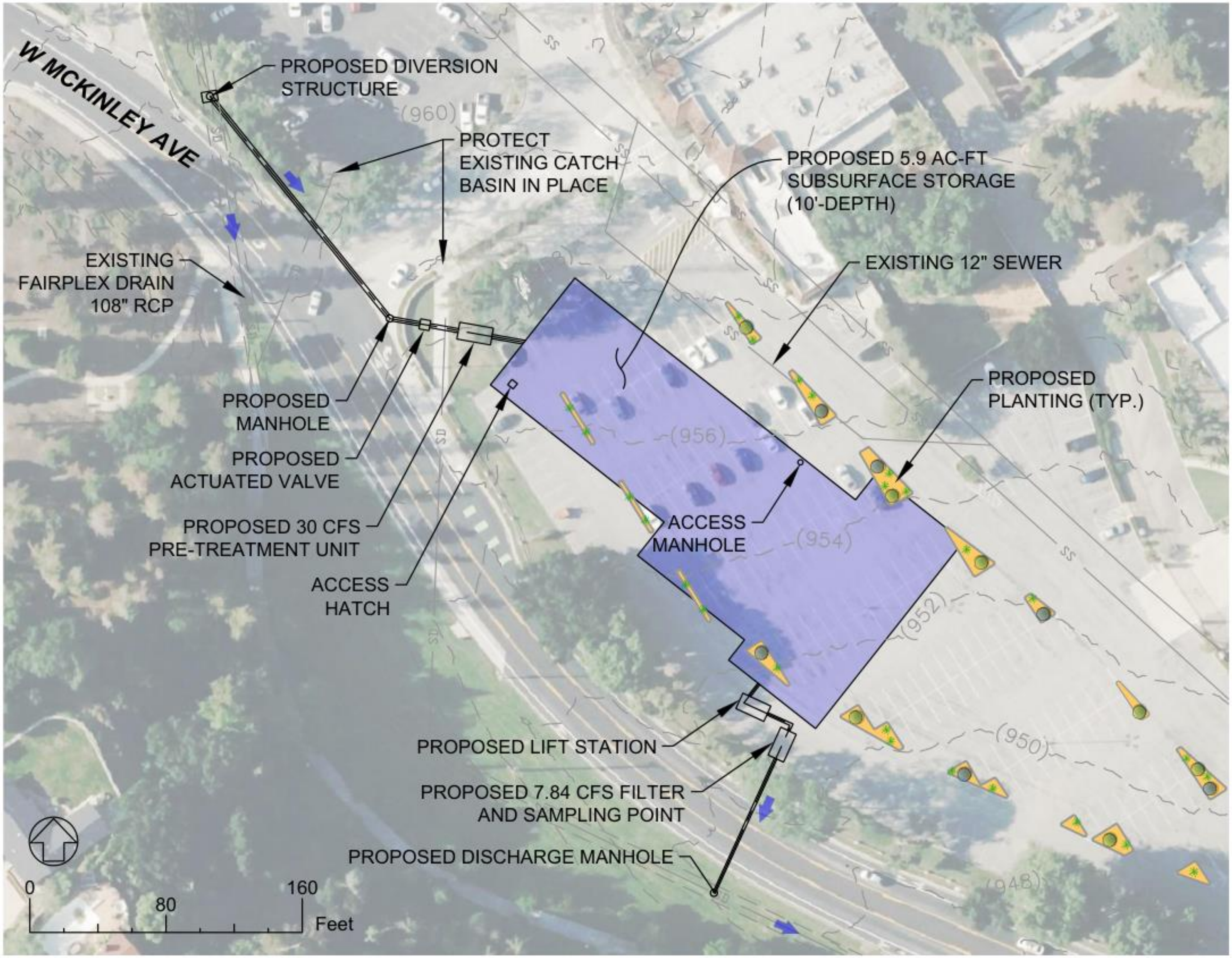

Figure 4-5. Option 4 Concept Plan

4.2 85th Percentile Design Storm Results

The minimum BMP storage sizes required to fully capture the 85th percentile 24-hour storm are summarized in ***Table 4-1***. To fully capture the 24-hour storm, the diversion capacity must be no smaller than the peak flow rate within the 24-hour storm. ***Figure 4-6*** illustrates the routing for 24-hour design storms using Option 2, 5.76 cfs configuration as an example.

Table 4-1. Storage Size Required to Fully Capture the 85th Percentile Storm

85th Percentile 24-hr Storm		Option 1	Option 2	Option 3	Option 4
Baseline Condition	Peak Flow (cfs)	36.4	25.7	33.2	27.3
	Runoff Volume (ac-ft)	22.9	16.4	21.0	17.3
Min. Size (ac-ft) Needed for Full Capture	2.88 cfs Filter Discharge	17.5	10.9	15.5	11.9
	5.76 cfs Filter Discharge	12.1	6.2	10.2	6.9
	7.84 cfs Filter Discharge	8.9	4.5	7.3	5.0

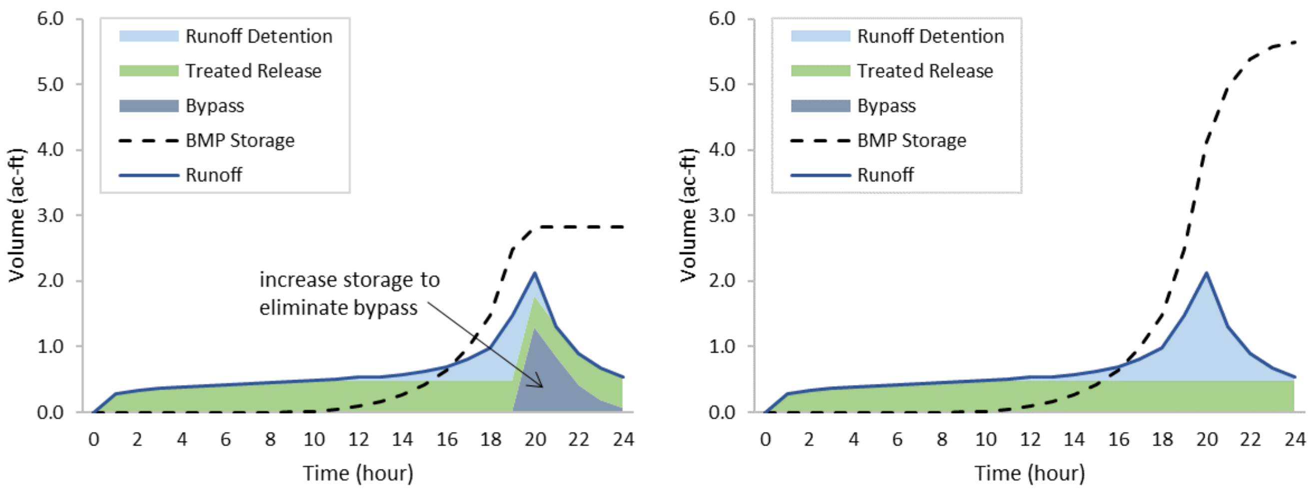

Figure 4-6. Routing Example for 24-Hour Design Storm

4.3 Long-Term Pollutant Reduction Results

Long-term simulation and optimization results are presented for all design options. One optimal configuration is recommended for each option. The ideal configuration should 1) fully capture the 85th percentile storm, 2) remove 80% of the divertible zinc load, 3) remove 80% of the divertible copper or lead load, and 4) be cost-effective. Diversion rates lower than the 85th percentile peak flow rate are not plotted because those configurations cannot fully capture the 85th percentile storm.

4.3.1 Option 1

Figure 4-7 compares the average annual zinc reduction of different BMP sizes and discharge rates. The zinc reduction provided by larger storage size diminishes as size exceeds 5.0-7.5 ac-ft. Increasing filter size benefits zinc reduction, but the advantage of large filters gradually diminishes as storage size increases. Copper and lead reductions were modeled and presented in the results summary (***Table 5-1***).

Figure 4-8 compares the marginal cost of zinc reduction for different BMP sizes and discharge rates. Larger filters are generally more cost-effective. The marginal cost increases (cost-efficiency decreases) monotonically as size exceeds 7.5 ac-ft.

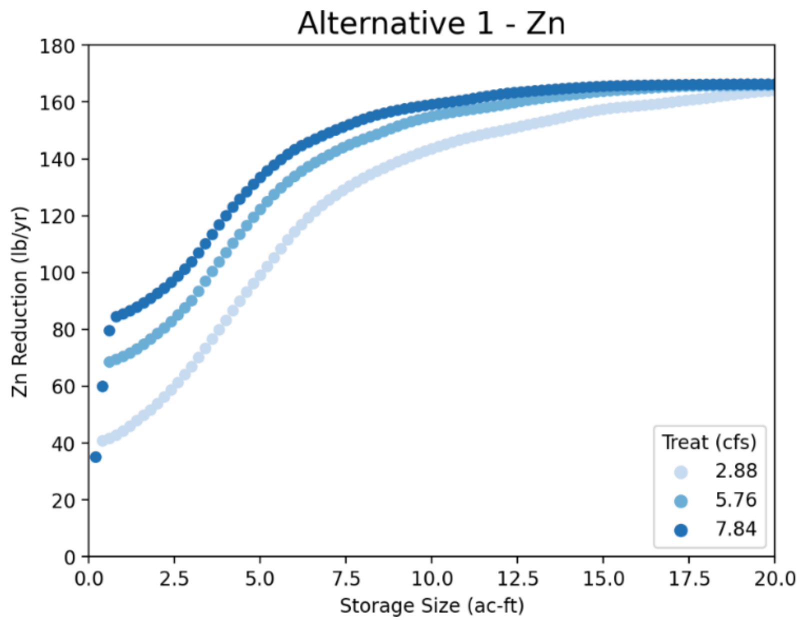

Figure 4-7. Option 1 Long-Term Zinc Reduction

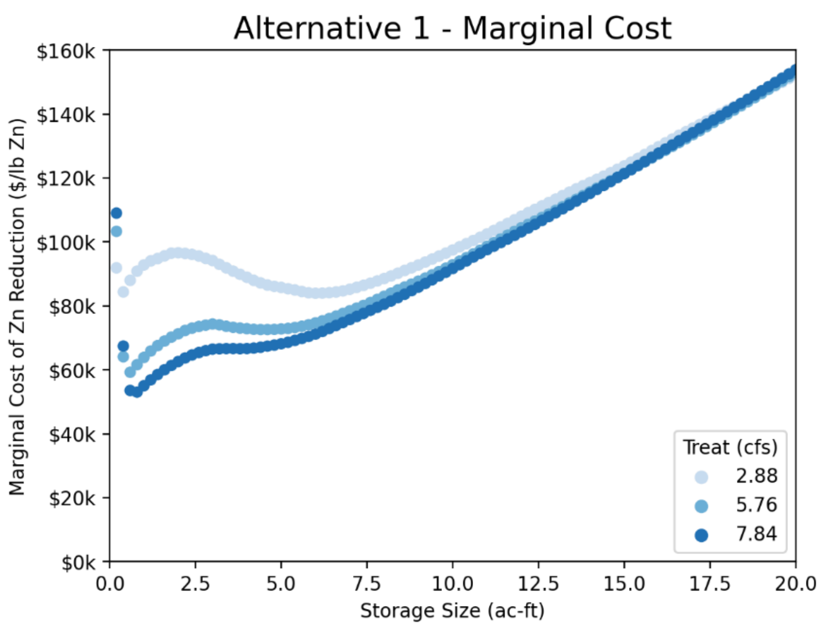

Figure 4-8. Option 1 Zinc Reduction Marginal Cost

The minimum storage sizes (ac-ft) required to meet different objectives are compared in ***Table 4-2***.

Table 4-2. Option 1 Minimum BMP Sizes Required by Each Objective

Objectives	2.88 cfs Filter	5.76 cfs Filter	7.84 cfs Filter
85th Percentile Storm Capture	17.5 ac-ft [1]	12.1 ac-ft [1]	8.9 ac-ft [1]
80% Divertible Zn Removal	14.0 ac-ft	10.0 ac-ft	8.4 ac-ft
80% Divertible Cu Removal	12.4 ac-ft	9.0 ac-ft	7.4 ac-ft

1. Minimum size required to meet all objectives.

The sizes that meet all objectives are compared in ***Table 4-3*** to select the optimal discharge rate.

Table 4-3. Option 1 Discharge Option Comparison

Metrics	2.88 cfs Filter	5.76 cfs Filter	7.84 cfs Filter
Storage Size	17.5 ac-ft	12.1 ac-ft	8.9 ac-ft
Planning Level Cost	$22M	$17M	$13M
Treated Runoff	201 ac-ft/yr	214 ac-ft/yr	218 ac-ft/yr
Zinc Load Removal	161 lb/yr	159 lb/yr	157 lb/yr
Cu Load Removal	38 lb/yr	38 lb/yr	38 lb/yr

The 7.84 cfs filter option is recommended because it costs significantly less than the other two discharge options. Increasing storage size from 8.9 ac-ft will decrease cost-effectiveness (see ***Figure 4-8***) without adding much water quality benefits (see ***Figure 4-7***).

The recommended BMP for Option 1 has **a total pumped diversion rate of 37 cfs, an 8.9 ac-ft subsurface storage unit, and a 7.84 cfs filtered discharge**.

4.3.2 Option 2

Figure 4-9 compares the average annual zinc reduction of different BMP sizes and discharge rates. The zinc reduction provided by larger storage size diminishes as size exceeds 3-5 ac-ft. Increasing filter size benefits zinc reduction, but the advantage of large filters gradually diminishes as storage size increases.

Figure 4-10 compares the marginal cost of zinc reduction for different BMP sizes and discharge rates. Larger filters are generally more cost-effective. The marginal cost increases (cost-efficiency decreases) monotonically as size exceeds 5 ac-ft.

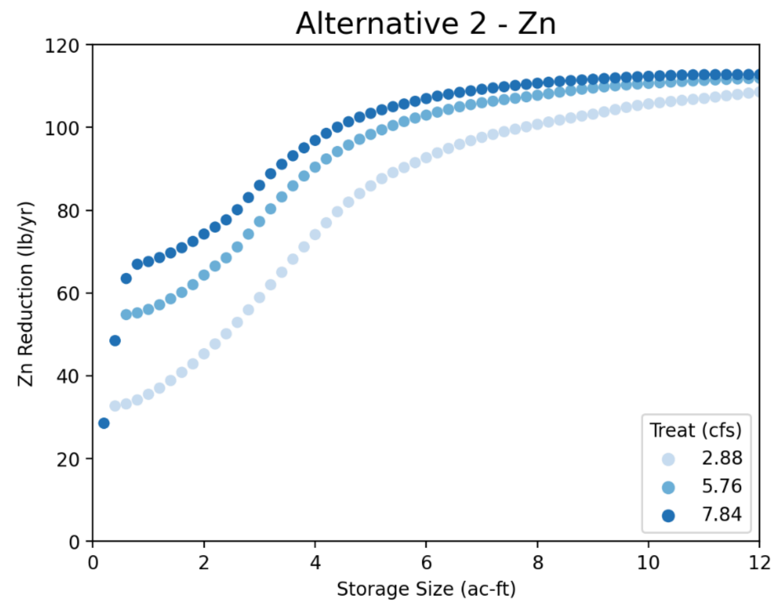

Figure 4-9. Option 2 Long-Term Zinc Reduction

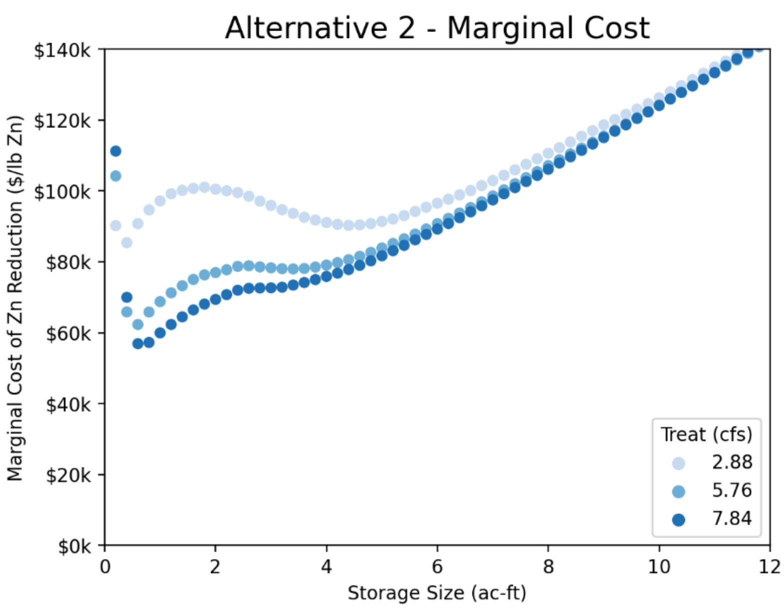

Figure 4-10. Option 2 Zinc Reduction Marginal Cost

The minimum storage sizes (ac-ft) required to meet different objectives are compared in ***Table 4-4***.

Table 4-4. Option 2 Minimum BMP Sizes Required by Each Objective

Objectives	2.88 cfs Filter	5.76 cfs Filter	7.84 cfs Filter
85th Percentile Storm Capture	10.9 ac-ft [1]	6.2 ac-ft	4.5 ac-ft
80% Divertible Zn Removal	10.0 ac-ft	6.8 ac-ft [1]	5.6 ac-ft [1]
80% Divertible Cu Removal	8.6 ac-ft	5.8 ac-ft	4.8 ac-ft

1. Minimum size required to meet all objectives.

The sizes that meet all objectives are compared in ***Table 4-5*** to select the optimal discharge rate.

Table 4-5. Option 2 Discharge Option Comparison

Metrics	2.88 cfs Filter	5.76 cfs Filter	7.84 cfs Filter
Storage Size	10.9 ac-ft	6.8 ac-ft	5.6 ac-ft
Planning Level Cost	$14M	$10M	$9M
Treated Runoff	150 ac-ft/yr	159 ac-ft/yr	166 ac-ft/yr
Zinc Load Removal	107 lb/yr	106 lb/yr	106 lb/yr
Cu Load Removal	26 lb/yr	25 lb/yr	25 lb/yr

The 7.84 cfs filter option is recommended because it costs less than the other two discharge options. To remove one pound of zinc load per year, the 7.84 cfs options costs $86k whereas the 5.76 cfs option costs $96k. Increasing storage size from 5.6 ac-ft will decrease cost-effectiveness (see ***Figure 4-10***) while receiving a diminishing increase in water quality benefits (see ***Figure 4-9***).

The recommended BMP for Option 2 has **a pumped diversion rate of 30 cfs, a 5.6 ac-ft subsurface storage unit, and a 7.84 cfs filtered discharge**.

4.3.3 Option 3

Figure 4-11 compares the average annual zinc reduction of different BMP sizes, diversion rates, and discharge rates. The zinc reduction provided by larger storage size diminishes as size exceeds 5-10 ac-ft. Increasing the diversion rate benefits zinc reduction especially for large storage sizes, because more stormwater and pollutants can enter the BMP and be treated. When smaller storage sizes (0-6 ac-ft) are used, larger diversion rates perform worse because they deplete the storage at the beginning of storms and prevent the BMP from treating more stormwater. When size and diversion rate are held constant, the larger filter treats more pollutants.

Figure 4-12 compares the marginal cost of zinc reduction of different BMP sizes, diversion rates, and discharge rates. Differences among diversion rates are relatively small. For 5.76 and 7.84 cfs filters, marginal cost increases with storage size monotonically after 1 ac-ft. Marginal cost of the 2.88 cfs filter option hardly changes in the 3-5 ac-ft range and increases after that. As explained previously, large diversion rates are not cost-effective for smaller units because they deplete the storage too soon. Large diversion rates become cost-effective after 6 ac-ft because those larger units can take advantage of the additional stormwater being diverted.

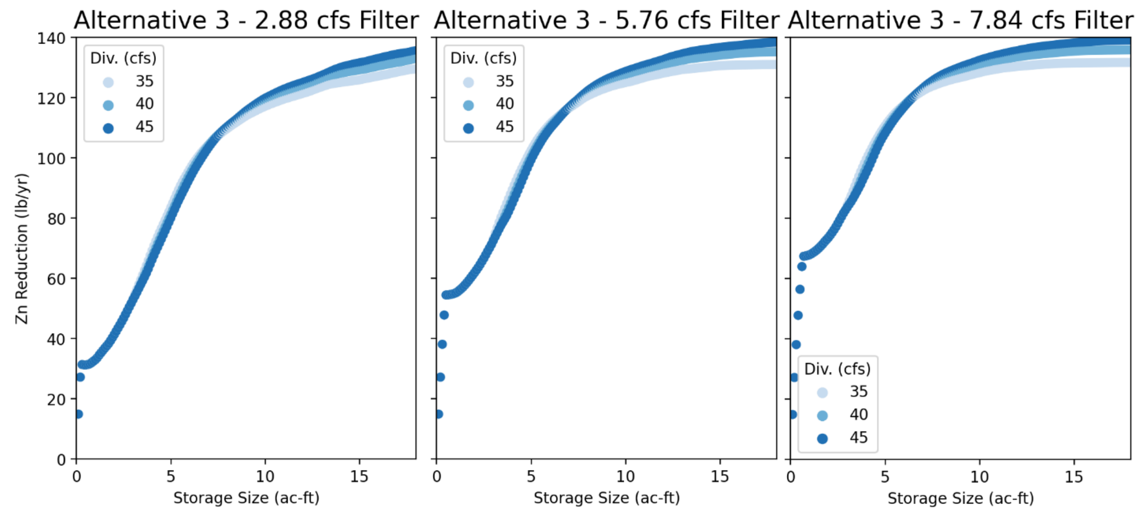

Figure 4-11. Option 3 Long-Term Zinc Reduction

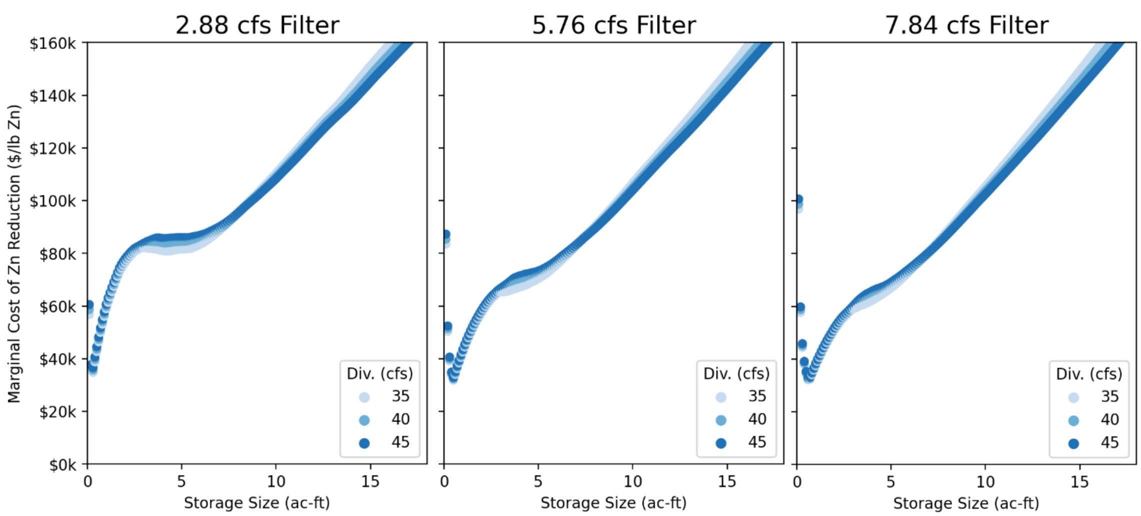

Figure 4-12. Option 3 Zinc Reduction Marginal Cost

The minimum storage sizes (ac-ft) required to meet different objectives are compared in ***Table 4-6***.

Table 4-6. Option 3 Minimum BMP Sizes Required by Each Objective

Objectives	2.88 cfs Filter			5.76 cfs Filter			7.84 cfs Filter		
	35 cfs Div.	40 cfs Div.	45 cfs Div.	35 cfs Div.	40 cfs Div.	45 cfs Div.	35 cfs Div.	40 cfs Div.	45 cfs Div.
85^{th} Perc. Storm Capture	15.5 [1]	15.5 [1]	15.5 [1]	10.2 [1]	10.2	10.2	7.3	7.3	7.3
80% Divertible Zn Removal	13.4	14.5	15.4	9.6	10.8 [1]	11.7 [1]	7.7 [1]	8.9 [1]	9.9 [1]
80% Divertible Cu Removal	11.5	12.5	13.1	8.0	8.8	9.6	6.6	7.4	8.1

1. Minimum size required to meet all objectives.
2. Unit: acre-foot.

The costs of the smallest BMPs meeting all objectives are compared ***Table 4-7***.

Table 4-7. Option 3 Discharge Option Cost Comparison

Diversion Rate	2.88 cfs Filter	5.76 cfs Filter	7.84 cfs Filter
35 cfs Diversion	$20M	$14M	$11M
40 cfs Diversion	$20M	$14M	$12M
45 cfs Diversion	$20M	$15M	$13M

The 7.84 cfs filter and 35 cfs diversion option is recommended because of its lowest cost. Increasing storage size from 7.7 ac-ft will decrease cost-effectiveness (see ***Figure 4-12***) while receiving a diminishing increase in water quality benefits (see ***Figure 4-11***).

The recommended BMP for Option 3 has **a gravity diversion rate of 35 cfs, a 7.7 ac-ft subsurface storage unit, and a 7.84 cfs filtered discharge**.

4.3.4 Option 4

Figure 4-13 compares the average annual zinc reduction of different BMP sizes, diversion rates, and discharge rates. The zinc reduction provided by larger storage size diminishes as size exceeds 5.0-7.5 ac-ft. Increasing the diversion rate benefits zinc reduction especially for large storage sizes, because more stormwater and pollutants can enter the BMP and be treated. When smaller storage sizes (0-7 ac-ft) are used, larger diversion rates perform worse because they deplete the storage at the beginning of storms and prevent the BMP from treating more stormwater. When size and diversion rate are held constant, the larger filter treats more pollutants.

Figure 4-14 compares the marginal cost of zinc reduction of different BMP sizes, diversion rates, and discharge rates. Gravity diversion is generally more cost-effective than pumped diversion. Differences among gravity diversion rates are not significant. The marginal cost changes slower around 2.5-5.0 ac-ft, and increases monotonically after 5 ac-ft. As explained previously, large diversion rates are not cost-effective for smaller units because they deplete the storage too soon. Large diversion rates become cost-effective after 7 ac-ft because those larger units can take advantage of the additional stormwater being diverted.

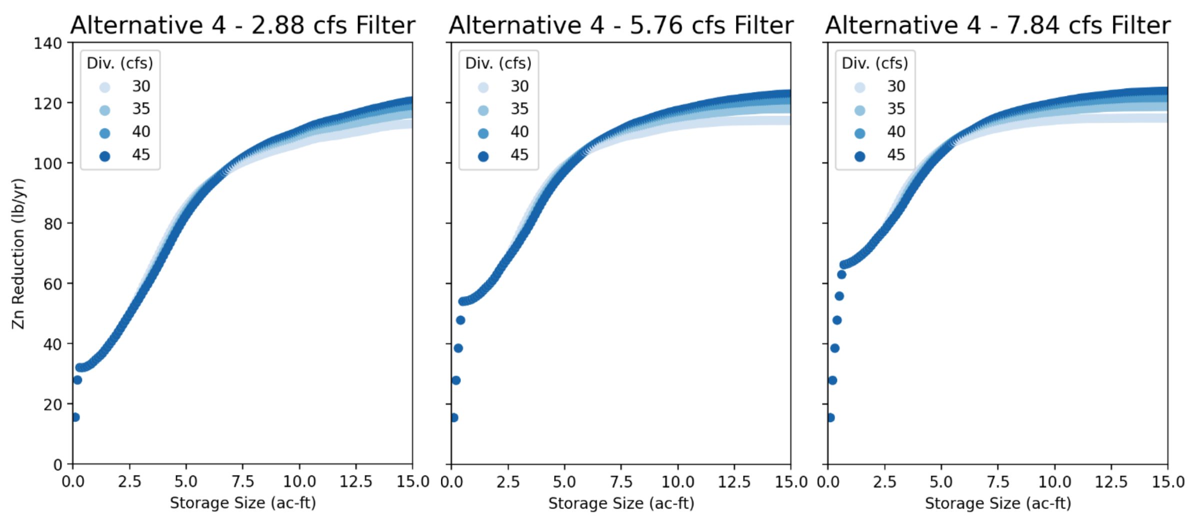

Figure 4-13. Option 4 Long-Term Zinc Reduction

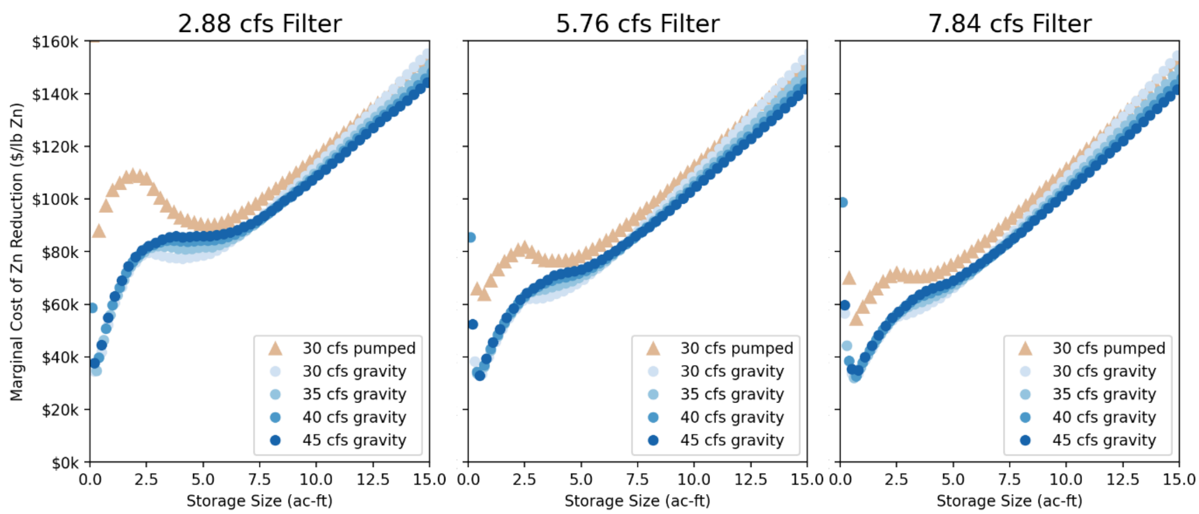

Figure 4-14. Option 4 Zinc Reduction Marginal Cost

The minimum storage sizes (ac-ft) required to meet different objectives are compared in ***Table 4-8***.

Table 4-8. Option 4 Minimum BMP Sizes Required by Each Objective

Objectives	2.88 cfs Filter				5.76 cfs Filter				7.84 cfs Filter			
	30 cfs Div.	35 cfs Div.	40 cfs Div.	45 cfs Div.	30 cfs Div.	35 cfs Div.	40 cfs Div.	45 cfs Div.	30 cfs Div.	35 cfs Div.	40 cfs Div.	45 cfs Div.
85^{th} Perc. Storm Capture	11.9 [1]	11.9 [1]	11.9	11.9	6.9	6.9	6.9	6.9	5.0	5.0	5.0	5.0
80% Divertible Zn Removal	10.6	11.6	12.4 [1]	13.0 [1]	7.2 [1]	8.3 [1]	9.2 [1]	9.9 [1]	5.9 [1]	6.8 [1]	7.6 [1]	8.4 [1]
80% Divertible Cu Removal	9.0	9.9	10.4	10.9	6.1	6.9	7.6	8.1	5.1	5.8	6.5	7.0

1. Minimum size required to meet all objectives.
2. Unit: acre-foot.

The costs of the smallest BMPs meeting all objectives are compared in ***Table 4-9***.

Table 4-9. Option 4 Discharge Option Cost Comparison

Diversion Rate	2.88 cfs Filter	5.76 cfs Filter	7.84 cfs Filter
30 cfs Pumped Diversion	$15M	$11M	$9M
30 cfs Gravity Diversion	$15M	$10M	$8M
35 cfs Gravity Diversion	$15M	$11M	$10M
40 cfs Gravity Diversion	$16M	$12M	$10M
45 cfs Gravity Diversion	$16M	$13M	$11M

The 7.84 cfs filter and 30 cfs gravity diversion option is recommended because of its lowest cost. Increasing storage size from 5.9 ac-ft will decrease cost-effectiveness (see ***Figure 4-14***) while receiving a diminishing increase in water quality benefits (see ***Figure 4-13***).

The recommended BMP for Option 4 has **a gravity diversion rate of 30 cfs, a 5.9 ac-ft subsurface storage unit, and a 7.84 cfs filtered discharge**.

4.4 Cost Estimates

Preliminary cost estimates of Option 1-4 are shown in ***Table 4-10*** to ***Table 4-13***. These planning-level cost estimates are intended for comparing different design options and may not represent the final project cost.

Table 4-10. Option 1 Cost Estimates

Client: **City of Pomona** | Prepared by: **YW**
Project: **Fairplex Stormwater Capture Project - Alternative 1** | Checked by:
Status: **Concept** | Date **10/3/2023**

Description	Qty	Unit	Unit Price	Total
Miscellaneous				**$999,433**
Mobilization / Demobilization (5% of Costs)	1	LS	$984,433.00	$984,433
Traffic Control	1	EA	$15,000.00	$15,000
Diversion and Pretreatment				**$5,386,773**
Temporary Diversion	2	EA	$15,000.00	$30,000
RCP Diversion Structure (includes excavation, installation, backfill, rebar)	3	EA	$56,000.00	$168,000
Manhole (includes excavation, installation, backfill)	13	EA	$15,000.00	$195,000
Actuated Valve (15") and Vault	1	EA	$50,000.00	$50,000
Pretreatment Unit (8 CFS) (includes excavation, installation, backfill), East Diversion	1	LS	$150,000.00	$150,000
Pretreatment Unit (3 CFS) (includes excavation, installation, backfill), North Diversion	1	LS	$100,000.00	$100,000
Pretreatment Unit (26 CFS) (includes excavation, installation, backfill), West Diversion	1	LS	$200,000.00	$200,000
Parking Lot Gutter, East Diversion	744	LF	$10.00	$7,440
Inlet, East Diversion, East Diversion	1	EA	$1,500.00	$1,500
Wet Well, East Diversion	1	LS	$500,000.00	$500,000
Piping (12-in DIP) (includes excavation, installation, backfill), East Diversion	750	LF	$204.00	$153,000
Piping (18-in RCP) (includes excavation, installation, backfill), East Diversion	1,052	LF	$153.00	$160,956
Piping (15-in RCP) (includes excavation, installation, backfill), North Diversion	3,064	LF	$141.00	$432,024
Lift Station, West Diversion	1	LS	$3,000,000.00	$3,000,000
Piping (30-in RCP) (includes excavation, installation, backfill), West Diversion	101	LF	$333.00	$33,633
Piping (24-in DIP) (includes excavation, installation, backfill), West Diversion	592	LF	$335.00	$198,320
Pipe Connection to Underground Infiltration Gallery	3	EA	$2,300.00	$6,900
Outlet Line				**$658,245**
Filter Unit (7.84cfs) (incl. excavation, installation, hauling, backfill, and shoring)	1	LS	$372,000.00	$372,000
Manhole (includes excavation & shoring)	1	EA	$25,000.00	$25,000
Piping (18-in RCP) (includes excavation, installation, backfill)	755	LF	$239.00	$180,445
Flap Gate	1	LS	$10,000.00	$10,000
Pipe Connection to Fairplex Drain	1	EA	$7,500.00	$7,500
45° RCP Bend	1	EA	$1,000.00	$1,000
Pipe Connection to Underground Infiltration Gallery	1	EA	$2,300.00	$2,300
Actuated Valve (18") and Vault	1	EA	$60,000.00	$60,000
Site Preparation and Demolition - Existing Area				**$94,912**
Overall Site Preparation (demo, clearing and grubbing, rough grading)	67,500	SF	$0.50	$33,750
AC Pavement Removal	29,346	SF	$2.00	$58,692
Fence Removal	247	LF	$10.00	$2,470
Subsurface Storage Reservoir				**$7,022,221**
Underground Infiltration Gallery Precast Structures	435,600	CF	$10.00	$4,356,000
Excavation	26,390	CY	$30.00	$791,700
Installation	1	LS	$871,200.00	$871,200
Backfill and Compaction	11,282	CY	$29.00	$327,188
Hauling	17,747	CY	$35.00	$621,133
Access Manhole	2	EA	$10,000.00	$20,000
Access Hatch	1	EA	$20,000.00	$20,000
Air Vents	3	EA	$5,000.00	$15,000
Electrical Service, Controls, Instrumentation				**$560,000**
Incoming Service Summary	1	LS	$110,000.00	$110,000
Switchboard Enclosure Summary	1	LS	$190,000.00	$190,000
Conduit and Wires and Trenching and Backfill Summary	1	LS	$190,000.00	$190,000
SCADA System Installation and Implementation	1	LS	$50,000.00	$50,000
Mobilization	1	LS	$20,000.00	$20,000
Landscape and Irrigation Modifications				**$64,640**
Turf/Sod Replacement	2,880	SF	$5.00	$14,400
Shrubs, Perennials, and Grasses	3,780	SF	$8.00	$30,240
90-Day Plant Establishment Period	1	LS	$20,000.00	$20,000
Site Amenities and Improvements				**$884,700**
AC Pavement	29,346	SF	$25.00	$733,650
Utilities Connections and Relocations	1	LS	$150,000.00	$150,000
6" Curb and Gutter	30	LF	$35.00	$1,050
Miscellaneous Construction Costs				**$95,000**
SWPPP Implementation	1	LS	$40,000.00	$40,000
O&M Manuals	1	LS	$5,000.00	$5,000
Record Drawings	1	LS	$5,000.00	$5,000
Start-up and Testing	1	LS	$45,000.00	$45,000
SUBTOTAL				**$15,765,924**
			25% Contingency	$3,941,481
			Total Construction Costs	**$19,707,405**
	GRAND TOTAL			**$19,707,405**

Table 4-11. Option 2 Cost Estimates

Client: **City of Pomona**			Prepared by: **YW**	
Project: **Fairplex Stormwater Capture Project - Alternative 2**			Checked by:	
Status: **Concept**			Date **10/3/2023**	
Description	**Qty**	**Unit**	**Unit Price**	**Total**
Miscellaneous				**$693,576**
Mobilization / Demobilization (5% of Costs)	1	LS	$678,576.00	$678,576
Traffic Control	1	EA	$15,000.00	$15,000
Diversion and Pretreatment				**$3,877,253**
Temporary Diversion	2	EA	$15,000.00	$30,000
RCP Diversion Structure (includes excavation, installation, backfill, rebar)	3	EA	$56,000.00	$168,000
Manhole (includes excavation, installation, backfill)	13	EA	$15,000.00	$195,000
Actuated Valve (15") and Vault	1	EA	$50,000.00	$50,000
Pretreatment Unit (30 CFS) (includes excavation, installation, backfill)	1	LS	$200,000.00	$200,000
Lift Station	1	LS	$3,000,000.00	$3,000,000
Piping (30-in RCP) (includes excavation, installation, backfill)	101	LF	$333.00	$33,633
Piping (24-in DIP) (includes excavation, installation, backfill)	592	LF	$335.00	$198,320
Pipe Connection to Underground Infiltration Gallery	1	EA	$2,300.00	$2,300
Outlet Line				**$658,245**
Filter Unit (7.84cfs) (incl. excavation, installation, hauling, backfill, and shoring)	1	LS	$372,000.00	$372,000
Manhole (includes excavation & shoring)	1	EA	$25,000.00	$25,000
Piping (18-in RCP) (includes excavation, installation, backfill)	755	LF	$239.00	$180,445
Flap Gate	1	LS	$10,000.00	$10,000
Pipe Connection to Fairplex Drain	1	EA	$7,500.00	$7,500
45° RCP Bend	1	EA	$1,000.00	$1,000
Pipe Connection to Underground Infiltration Gallery	1	EA	$2,300.00	$2,300
Actuated Valve (18") and Vault	1	EA	$60,000.00	$60,000
Site Preparation and Demolition - Existing Area				**$52,060**
Overall Site Preparation (demo, clearing and grubbing, rough grading)	46,700	SF	$0.50	$23,350
AC Pavement Removal	13,120	SF	$2.00	$26,240
Fence Removal	247	LF	$10.00	$2,470
Subsurface Storage Reservoir				**$4,497,650**
Underground Infiltration Gallery Precast Structures	277,200	CF	$10.00	$2,772,000
Excavation	17,100	CY	$30.00	$513,000
Installation	1	LS	$554,400.00	$554,400
Backfill and Compaction	7,517	CY	$29.00	$217,983
Hauling	11,293	CY	$35.00	$395,267
Access Manhole	1	EA	$10,000.00	$10,000
Access Hatch	1	EA	$20,000.00	$20,000
Air Vents	3	EA	$5,000.00	$15,000
Electrical Service, Controls, Instrumentation				**$560,000**
Incoming Service Summary	1	LS	$110,000.00	$110,000
Switchboard Enclosure Summary	1	LS	$190,000.00	$190,000
Conduit and Wires and Trenching and Backfill Summary	1	LS	$190,000.00	$190,000
SCADA System Installation and Implementation	1	LS	$50,000.00	$50,000
Mobilization	1	LS	$20,000.00	$20,000
Landscape and Irrigation Modifications				**$35,000**
Turf/Sod Replacement	3,000	SF	$5.00	$15,000
90-Day Plant Establishment Period	1	LS	$20,000.00	$20,000
Site Amenities and Improvements				**$403,420**
AC Pavement	13,120	SF	$25.00	$328,000
Utilities Connections and Relocations	1	LS	$75,000.00	$75,000
6" Curb and Gutter	12	LF	$35.00	$420
Miscellaneous Construction Costs				**$95,000**
SWPPP Implementation	1	LS	$40,000.00	$40,000
O&M Manuals	1	LS	$5,000.00	$5,000
Record Drawings	1	LS	$5,000.00	$5,000
Start-up and Testing	1	LS	$45,000.00	$45,000
SUBTOTAL				**$10,872,204**
			25% Contingency	$2,718,051
			Total Construction Costs	**$13,590,255**
	GRAND TOTAL			**$13,590,255**

Table 4-12. Option 3 Cost Estimates

Client: **City of Pomona**
Project: **Fairplex Stormwater Capture Project - Alternative 3**
Status: **Concept**
Prepared by: **YW**
Checked by:
Date **10/9/2023**

Description	Qty	Unit	Unit Price	Total
Miscellaneous				**$791,425**
Mobilization / Demobilization (5% of Costs)	1	LS	$746,425.00	$746,425
Traffic Control	1	EA	$45,000.00	$45,000
Diversion and Pretreatment				**$462,020**
Temporary Diversion	1	EA	$15,000.00	$15,000
Diversion Structure (includes excavation, installation, backfill, rebar)	1	EA	$56,000.00	$56,000
Manhole (includes excavation, installation, backfill)	1	EA	$15,000.00	$15,000
Actuated Valve (30") and Vault	1	EA	$75,000.00	$75,000
Pretreatment Unit (35 CFS) (includes excavation, installation, backfill)	1	LS	$280,000.00	$280,000
Piping (30-in RCP) (includes excavation, installation, backfill)	52	LF	$360.00	$18,720
Pipe Connection to Underground Infiltration Gallery	1	EA	$2,300.00	$2,300
Outlet Line				**$903,826**
Filter Unit (7.84cfs) (incl. excavation, installation, hauling, backfill, and shoring)	1	LS	$372,000.00	$372,000
Wet Well and Valve Vault	1	LS	$500,000.00	$500,000
Piping (18-in RCP) (includes excavation, installation, backfill)	25	LF	$303.00	$7,575
Piping (12-in DIP) (includes excavation, installation, backfill)	17	LF	$203.00	$3,451
Flap Gate	1	LS	$10,000.00	$10,000
Pipe Connection to San Jose Creek	1	EA	$7,500.00	$7,500
90° DIP Bend	1	EA	$1,000.00	$1,000
Pipe Connection to Underground Infiltration Gallery	1	EA	$2,300.00	$2,300
Site Preparation and Demolition - Existing Area				**$86,086**
Overall Site Preparation (demo, clearing and grubbing, rough grading)	79,411	SF	$0.50	$39,706
Concrete Path Removal	9,216	SF	$5.00	$46,080
Concrete Curb and Gutter Removal	30	LF	$10.00	$300
Subsurface Storage Reservoir				**$7,799,747**
Underground Infiltration Gallery Precast Structures	370,095	CF	$10.00	$3,700,950
Excavation	47,669	CY	$30.00	$1,430,070
Installation	1	LS	$740,190.00	$740,190
Backfill and Compaction	37,358	CY	$29.00	$1,083,381
Hauling	15,078	CY	$35.00	$527,728
Shoring	5,022	SF	$45.00	$225,990
Equalization Pipe (30-in RCP)	26	LF	$360.00	$9,360
Equalization Pipe (18-in RCP)	26	LF	$303.00	$7,878
Pipe Connection to Underground Infiltration Gallery	4	EA	$2,300.00	$9,200
Access Manhole	1	EA	$10,000.00	$10,000
Access Hatch	2	EA	$20,000.00	$40,000
Air Vents	3	EA	$5,000.00	$15,000
Electrical Service, Controls, Instrumentation				**$560,000**
Incoming Service Summary	1	LS	$110,000.00	$110,000
Switchboard Enclosure Summary	1	LS	$190,000.00	$190,000
Conduit and Wires and Trenching and Backfill Summary	1	LS	$190,000.00	$190,000
SCADA System Installation and Implementation	1	LS	$50,000.00	$50,000
Mobilization	1	LS	$20,000.00	$20,000
Landscape and Irrigation Modifications				**$403,364**
Turf/Sod Replacement	68,836	SF	$5.00	$344,180
Shrubs, Perennials, and Grasses - Landscape Island	4,898	SF	$8.00	$39,184
90-Day Plant Establishment Period	1	LS	$20,000.00	$20,000
Site Amenities and Improvements				**$886,322**
DG Path	6,569	SF	$8.50	$55,837
Concrete Path	3,279	SF	$15.00	$49,185
Basketball Court (Includes poles, mounts, backboards)	1	EA	$50,000.00	$50,000
Chainlink Fence	400	LF	$35.00	$14,000
20' High Backstop and Wings	240	LF	$200.00	$48,000
Removal Bollards	3	EA	$2,000.00	$6,000
Picnic Table	5	EA	$2,250.00	$11,250
Vehicular Concrete Approach	2	EA	$8,000.00	$16,000
Exercise Area	1	LS	$45,000.00	$45,000
Dog Park and Fencing	1	LS	$40,000.00	$40,000
Pavilion	2	EA	$200,000.00	$400,000
Utilities Connections and Relocations	1	LS	$150,000.00	$150,000
6" Curb and Gutter	30	LF	$35.00	$1,050
Miscellaneous Construction Costs				**$95,000**
SWPPP Implementation	1	LS	$40,000.00	$40,000
O&M Manuals	1	LS	$5,000.00	$5,000
Record Drawings	1	LS	$5,000.00	$5,000
Start-up and Testing	1	LS	$45,000.00	$45,000
SUBTOTAL				**$11,987,789**
			25% Contingency	$2,996,948
			Total Construction Costs	**$14,984,737**
	GRAND TOTAL			**$14,984,737**

Table 4-13. Option 4 Cost Estimates

Client: **City of Pomona**
Project: **Fairplex Stormwater Capture Project - Alternative 4**
Status: **Concept**
Prepared by: **YW**
Checked by:
Date **10/3/2023**

Description	Qty	Unit	Unit Price	Total
Miscellaneous				**$686,227**
Mobilization / Demobilization (5% of Costs)	1	LS	$641,227.00	$641,227
Traffic Control	1	EA	$45,000.00	$45,000
Diversion and Pretreatment				**$492,580**
Temporary Diversion	1	EA	$15,000.00	$15,000
RCP Diversion Structure (includes excavation, installation, backfill, rebar)	1	EA	$56,000.00	$56,000
Manhole (includes excavation, installation, backfill)	1	EA	$15,000.00	$15,000
Actuated Valve (30") and Vault	1	EA	$75,000.00	$75,000
Pretreatment Unit (30 CFS) (includes excavation, installation, backfill)	1	LS	$240,000.00	$240,000
Piping (30-in RCP) (includes excavation, installation, backfill)	248	LF	$360.00	$89,280
Pipe Connection to Underground Infiltration Gallery	1	EA	$2,300.00	$2,300
Outlet Line				**$937,362**
Filter Unit (7.84cfs) (incl. excavation, installation, hauling, backfill, and shoring)	1	LS	$372,000.00	$372,000
Wet Well and Valve Vault	1	LS	$500,000.00	$500,000
Piping (18-in RCP) (includes excavation, installation, backfill)	133	LF	$303.00	$40,299
Piping (12-in DIP) (includes excavation, installation, backfill)	21	LF	$203.00	$4,263
Flap Gate	1	LS	$10,000.00	$10,000
Pipe Connection to Fairplex Drain	1	EA	$7,500.00	$7,500
90° DIP Bend	1	EA	$1,000.00	$1,000
Pipe Connection to Underground Infiltration Gallery	1	EA	$2,300.00	$2,300
Site Preparation and Demolition - Existing Area				**$106,806**
Overall Site Preparation (demo, clearing and grubbing, rough grading)	3,400	SF	$0.50	$1,700
AC Pavement Removal	50,508	SF	$2.00	$101,016
Concrete Curb and Gutter Removal	409	LF	$10.00	$4,090
Subsurface Storage Reservoir				**$5,897,407**
Underground Infiltration Gallery Precast Structures	286,825	CF	$10.00	$2,868,250
Excavation	33,887	CY	$30.00	$1,016,595
Installation	1	LS	$573,650.00	$573,650
Backfill and Compaction	25,590	CY	$29.00	$742,101
Hauling	11,685	CY	$35.00	$408,991
Shoring	5,396	SF	$45.00	$242,820
Access Manhole	1	EA	$10,000.00	$10,000
Access Hatch	1	EA	$20,000.00	$20,000
Air Vents	3	EA	$5,000.00	$15,000
Electrical Service, Controls, Instrumentation				**$560,000**
Incoming Service Summary	1	LS	$110,000.00	$110,000
Switchboard Enclosure Summary	1	LS	$190,000.00	$190,000
Conduit and Wires and Trenching and Backfill Summary	1	LS	$190,000.00	$190,000
SCADA System Installation and Implementation	1	LS	$50,000.00	$50,000
Mobilization	1	LS	$20,000.00	$20,000
Landscape and Irrigation Modifications				**$58,512**
Turf/Sod Replacement	3,400	SF	$5.00	$17,000
Shrubs, Perennials, and Grasses - Landscape Island	2,689	SF	$8.00	$21,512
90-Day Plant Establishment Period	1	LS	$20,000.00	$20,000
Site Amenities and Improvements				**$1,470,730**
AC Pavement	50,508	SF	$25.00	$1,262,700
Utilities Connections and Relocations	1	LS	$150,000.00	$150,000
6" Curb - Landscape Island	1,249	LF	$35.00	$43,715
6" Curb and Gutter	409	LF	$35.00	$14,315
Miscellaneous Construction Costs				**$95,000**
SWPPP Implementation	1	LS	$40,000.00	$40,000
O&M Manuals	1	LS	$5,000.00	$5,000
Record Drawings	1	LS	$5,000.00	$5,000
Start-up and Testing	1	LS	$45,000.00	$45,000
SUBTOTAL				**$10,304,624**
			25% Contingency	$2,576,157
			Total Construction Costs	**$12,880,781**
	GRAND TOTAL			**$12,880,781**

5.0 OPTIONS COMPARISON

The optimal BMP configuration for Option 1-4 are summarized in ***Table 5-1***.

Table 5-1. Option 1-4 Configuration and Performance Comparison

		Option 1	Option 2	Option 3	Option 4
Drainage Area	Drainage Area (acre)	640.5	492.4	625.0	530.2
	Imperviousness	44.3%	40.9%	41.3%	40.2%
Hydrology & Water Quality	85^{th} Storm Peak Flow (cfs)	36.4	25.7	33.2	27.3
	85^{th} Storm Volume (ac-ft)	22.9	16.4	21.0	17.3
	Avg. Runoff (ac-ft/yr)	318.2	232.0	296.1	247.5
	Avg. Zn/Cu/Pb Load (lb/yr)	224/52/15	151/35/10	183/42/13	157/36/11
BMP Configuration	Diversion Rate (cfs)	37 [1]	30	35	30
	Storage Footprint (ac)	0.89	0.56	0.77	0.59
	Storage Volume (ac-ft)	8.9	5.6	7.7	5.9
	Filter Discharge Rate (cfs)	7.84	7.84	7.84	7.84
BMP Performance & Cost	85^{th} Storm Capture	Yes	Yes	Yes	Yes
	Runoff Treated (ac-ft/yr)	218	166	201	173
	Zn/Cu/Pb Reduction (lb/yr)	157/38/10	106/25/7	124/30/8	108/26/7
	Cost	$19.7M	$13.6M	$15.0M	$12.9M

1. Divert 26 cfs from the north line (RDD0086 Thompson Creek Drain, W Arrow Hwy), 8 cfs from the east line (surface runoff from inlets), 3 cfs from the west line (Fairplex Drain).

To compare all aspects of the four design options throughout their project life cycle, nine ranking criteria are proposed. Cost and Water Quality rankings were based on values in ***Table 5-1***. Other subjective rankings were based on the project team's experience and discussions with the City of Pomona.

- *Cost*: concept-level total construction cost.
- *Water Quality*: runoff volume retained during the 85th percentile, 24-hour design storm. This is what ESGV WMP Reasonable Assurance Analysis used to quantify compliance.
- *Constructability/Traffic Control*: technical challenges anticipated during design and construction; how much traffic control is required.
- *ROW/Easements*: whether the project is within the City's ROW.
- *O&M*: anticipated difficulty and cost of operation and maintenance.
- *Timeline for Implementation*: how soon will the project be implemented.
- *Permitting*: permitting effort required during design and construction.
- *Recreational Use*: recreational use of surface facilities.
- *Public Access*: public access to surface improvements.
- *Ecosystem Impacts*: creating ecosystems and mimicking natural processes.
- *Educational Opportunities*: opportunities to educate the public about water and environmental topics.

The ranks of the design options are presented in ***Table 5-2*** and ***Figure 5-1*** to assist decision making. A *lower* sum indicates the option is *more* favorable, and a *higher* sum indicates the option is *less* favorable. Please see the ranking details in ***Attachment A***.

Table 5-2. Option 1-4 Ranking

Consideration	Option 1	Option 2	Option 3	Option 4
Cost	4	2	3	1
Water Quality	1	4	2	3
Constructability/Traffic Control	4	2	1	3
ROW/Easements	4	3	1	2
O&M	4	3	1	2
Timeline for Implementation	4	3	1	2
Permitting	3	1	4	2
Recreational Use	3	4	1	2
Public Access	3	4	1	2
Ecosystem Impacts	4	3	1	2
Educational Opportunities	3	2	1	4
Sum	**37**	**31**	**17**	**25**

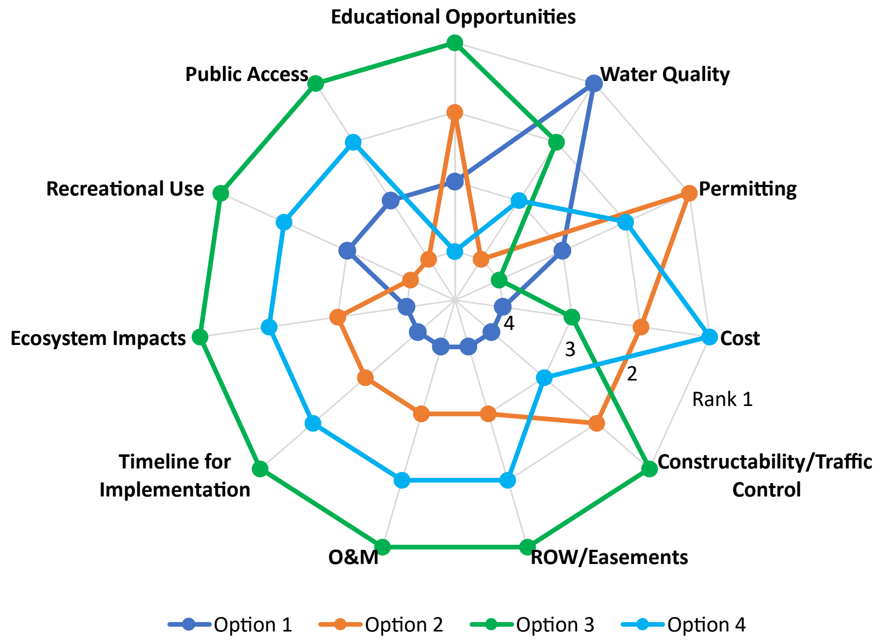

Figure 5-1. Option 1-4 Ranking Visualization

6.0 SUMMARY AND CONCLUSION

6.1 Concept Evaluation Summary

After evaluating multiple aspects of the four design options, **Option 3 at Ganesha Park is recommended**. The recommended BMP has a 35 cfs gravity diversion from San Jose Creek, a 7.7 ac-ft subsurface storage unit under Ganesha Park, and a 7.84 cfs filtered discharge back to San Jose Creek. Because Ganesha Park is within the City of Pomona's jurisdictional control, the recommended project will not be impacted by the Fairplex Strategic Plan, and site access during design, construction, and O&M will be easier. The proposed sports facilities and landscape features in Ganesha Park will enhance the recreation opportunities enjoyed by the community.

6.2 Contribution to Compliance

Section 5 of the East San Gabriel Valley *Final Watershed Management Program (WMP) Plan* uses a volume-based method to quantify the level of BMP implementation effort required in each jurisdiction. The runoff volume that should be retained during the 85th percentile, 24-hour design storm is shown in ***Table 6-1***.

Table 6-1. ESGV WMP Reasonable Assurance Analysis (RAA) – Overall Jurisdictional Requirements

Table 5-9
Overall Jurisdictional Requirements to Retain the Design Storm Volume

Jurisdiction	Required MS4 Treatment Capacity, acre-ft*	Potential Non-ROW BMP Capacity, acre-ft	Potential Capacity of Distributed ROW BMPs, acre-ft	Remaining Reduction assigned to Regional BMPs, acre-ft
Claremont	85.2	12.66 (15%)	32.5 (38%)	40.0 (47%)
La Verne	126.9	13.34 (11%)	39.2 (31%)	74.4 (59%)
Pomona	204.9	53.18 (26%)	55.9 (27%)	95.8 (47%)
San Dimas	126.9	14.72 (12%)	33.4 (26%)	78.7 (62%)
Total	**543.9**	**93.91 (17%)**	**161.0 (30%)**	**289.0 (53%)**

*Excludes design storm runoff from non-MS4 permitted facilities and California Department of Transportation (Caltrans) and County of Los Angeles islands

The City of Pomona is required to treat 204.9 ac-ft of design storm runoff, 149.0 ac-ft (53.18 + 95.8) of which needs to be treated by non-ROW BMPs. The recommended BMP will treat the 21.0 ac-ft runoff generated in an 85th percentile storm (see ***Table 5-1***), therefore contribute to 10.2% (21.0 / 204.9) of Pomona's total requirements and 14.1% (21.0 / 149.0) of the treatment volume by non-ROW BMPs.

ATTACHMENT A

Consideration	Option 1	Option 2	Option 3	Option 4
Cost (qualitative)	**Rank 4** Cost is $19.7M, highest.	**Rank 2** Cost is $13.6M, second lowest.	**Rank 3** Cost is $15.0M, second highest.	**Rank 1** Cost is $12.9M, lowest.
Water Quality (qualitative)	**Rank 1** Fully treats 22.9 ac-ft runoff during an 85th storm, highest.	**Rank 4** Fully treats 16.4 ac-ft runoff during an 85th storm, lowest.	**Rank 2** Fully treats 21.0 ac-ft runoff during an 85th storm, second highest.	**Rank 3** Fully treats 17.3 ac-ft runoff during an 85th storm, second lowest.
Constructability/Traffic Control (subjective)	**Rank 4** The longest diversion lines. Two pump stations. Construction in Arrow Hwy and two locations along White Ave.	**Rank 2** One 30 cfs pump station. No construction in the street.	**Rank 1** One 7.8 cfs pump station. No construction in the street.	**Rank 3** One 7.8 cfs pump station. Discharge line crossing McKinley Ave.
ROW/Easements (subjective)	**Rank 4** Within Fairplex property but requires more extensive easements than option 2&4.	**Rank 3** Within Fairplex property, more difficult access.	**Rank 1** Within City's property.	**Rank 2** Within Fairplex property, easier access.
O&M (subjective)	**Rank 4** Needs O&M for multiple diversion points, two pump stations, and three pre-treatment units. O&M within Fairplex property.	**Rank 3** O&M within Fairplex property. Needs O&M for a 30 cfs pump station.	**Rank 1** O&M within City property. O&M locations more concentrated.	**Rank 2** O&M within Fairplex property. Needs O&M for a 7.8 cfs pump station.
Timeline for Implementation (subjective)	**Rank 4** Uncertain because project site is within Fairplex Strategic Plan. If implemented, takes longer than option 2 to construct.	**Rank 3** Uncertain because project site is within Fairplex Strategic Plan.	**Rank 1** Within City property. Implementation is not limited by coordination with Fairplex.	**Rank 2** Need coordination with Fairplex. Not within the improvement area of the Fairplex Strategic Plan.
Permitting (subjective)	**Rank 3** Needs LACFCD permits for multiple storm drain connection locations.	**Rank 1** Needs LACFCD permits. Storm drain connection locations are close to each other.	**Rank 4** Needs LACFCD permits and a Lake and Streambed Alteration Permit.	**Rank 2** Needs LACFCD permits. Storm drain connection locations are further from each other.

Consideration	Option 1	Option 2	Option 3	Option 4
Recreational Use (subjective)	**Rank 3** The storage area is part of the Fairplex Strategic Plan. Opportunities to provide surface improvements along the diversion lines.	**Rank 4** Part of the Fairplex Strategic Plan. Not proposing new recreational use.	**Rank 1** Provides extended walk path, a new U8 soccer field, a new basketball court, a new exercise area, and two pavilions.	**Rank 2** New plantings in the parking lot islands.
Public Access (subjective)	**Rank 3** Partially in Fairplex; not currently accessible to the public. May provide improvements near the diversion lines outside of Fairplex.	**Rank 4** Within Fairplex; not currently accessible to the public.	**Rank 1** Ganesha Park is open to the public. Closer to residential areas and more accessible through walking.	**Rank 2** The parking lot is open to the public.
Ecosystem Impacts (subjective)	**Rank 4** Not proposing ecosystem improvement. Plantings along the north diversion line will be impacted.	**Rank 3** Not proposing ecosystem improvement.	**Rank 1** Proposed garden and landscape areas in Ganesha Park.	**Rank 2** New plantings in the parking lot islands.
Educational Opportunities (subjective)	**Rank 3** Can put educational signs in Fairplex.	**Rank 2** Can put educational signs in Fairplex.	**Rank 1** Can put educational signs in the park. The public have access to waterways.	**Rank 4** Educational signs are less effective in a parking lot.
Sum	**37**	**31**	**17**	**25**

ATTACHMENT B1

May 11, 2021

Julie Carver
Environmental Compliance Officer
City of Pomona
On behalf of the East San Gabriel Valley Watershed Management Group
148 N. Huntington Street
Pomona, CA 91768
Via email: Julie_Carver@ci.pomona.ca.us

Ms. Carver,

On behalf of the Los Angeles County Fair Association, a 501(c)(5) nonprofit, this letter acknowledges the planned project entitled the "Fairplex Regional Stormwater Project" that, once funded, would be constructed at Fairplex. Fairplex's 487-acre campus hosts the annual Fair and nearly 500 year-round events. Between 1941 and 1952, a total of 421 acres of the land belonging to the Association was deeded to Los Angeles County as a gift and in return, the Association received a long-term ground lease. The remaining acreage is still owned in fee by the Association.

We appreciate the efforts of your team to engage with us as this project was planned, and again as it moves towards implementation. The proposed project aligns with the guiding principles we included in our 2018 Strategic Plan, including **Public Benefit**: committed to doing good in everything we do; **Partnership:** we are at our best when we partner with others; and **Sustainability:** committed to being financially healthy and environmentally friendly.

When the time comes, we are prepared to work with your team to provide access to the site in a way that minimizes impacts on events at Fairplex and also achieves the timelines of the proposed project. As you know the local and county-wide communities depend on Fairplex for hosting events with large numbers of visitors, providing jobs and economic activity for the region. As a nonprofit, we reinvest profits in our facilities, people, programs, and community.

We understand that the siting of the project is key for the multiple benefits of improved water quality and enhanced water supply, and see synergies with the goals of the ESGV Watershed Management Group and our strategic plan for enhancing the sustainability of the Fairplex facility. We are hopeful and supportive of the project and desire several important outcomes. First, educating the nearly 3 million people that visit Fairplex about the innovative and sustainable infrastructure being installed. Second, we desire as responsible corporate citizens to become water neutral, based on our standard usage and recharge as a result of the project. Finally, in lieu of any compensation for the utilization of our land, we desire credits for water retained by the project against our annual water bill.

We are eager to support this effort in the appropriate ways and concur that this properly scheduled and collaborative effort can move forward when ready. When the project is being considered by potential funders, we would welcome the opportunity to further express our support and interest in the project moving forward.

If you have any questions, please don't hesitate to ask.

Sincerely,

Walter M. Marquez
Interim CEO, Fairplex

ATTACHMENT B2

FAIRPLEX

October 13, 2023

Via EMAIL

Jorge Anaya
Senior Water Resources Engineer
City of Pomona
148 N. Huntington Street
Pomona, CA 91768

Mr. Anaya,

Thank you for contacting us regarding a funding opportunity through the Safe Clean Water Program, managed by LA County Public Works. Unfortunately, we cannot provide our continuing support for the Fairplex Regional Stormwater Project as originally contemplated; the project no longer aligns with the planned use of Fairplex property in the proposed Fairplex Specific Plan.

As you know, we previously provided our support for the proposed stormwater project in May 2021. Since that time, the Los Angeles County Fair Association, a 501(c)(5) nonprofit, has made substantial progress in planning for the redevelopment of our 487-acre campus, home of the LA County Fair, and nearly 500 year-round events. Our Specific Plan is designed to accommodate an expanded breadth of uses for the fairgrounds, including but not limited to housing and residential developments, mixed-use spaces, commercial and retail spaces, a tech campus or similar job-generating campus, and green, open spaces, including landscaped footpaths for pedestrians and cyclists. Our Specific Plan is a product of years of community feedback, engagement, and collaboration with multiple government agencies and stakeholders.

Sustainable development is a key component of our Specific Plan, which includes elements like stormwater capture, walkable neighborhoods, and connectivity with existing and projected transit options. The proposed Specific Plan features a naturalization effort for Thompson Creek that aims to capture and filter stormwater runoff through the use of seasonal wetlands along with walking paths.

Although we cannot support the Fairplex Regional Stormwater Project at this time, we look forward to collaborating to provide enhanced stormwater management at Fairplex. Thank you again for your understanding.

Sincerely,

Walter Marquez
President & CEO

cc: Anita Guiterrez, Director of Development Services

day one

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p 626.229.9750 f
626.765.6239
www.goDayOne.org

November 27, 2023

Subject: Letter of Support for Fairplex Stormwater Capture Project with
Los Angeles County's Safe, Clean Water Program

To the SCWP Upper San Gabriel River Watershed Steering Committee:

Day One would like to express its continued support for the Fairplex Stormwater Capture Project. We understand that there is a need to find an alternative location for the subsurface storage best management practice (BMP) and after carefully considering several alternatives, we believe Ganesha Park not only to be the best option but a more beneficial option compared to the original plan. The location at Ganesha Park will provide significant benefits to the local community while helping accomplish the water goals of the Safe, Clean Water Program (SCWP). Equally important, the project aligns with Day One's goals of nurturing healthy and resilient communities.

One of the primary goals of the SCWP is to capture, clean, and store stormwater. Ganesha park's geographic location makes it strong location to pursue these goals and help LA County decrease its reliance on outside water. Specifically, the project will divert the dry-weather flow as well as wet-weather flows from adjacent storm drains to a subsurface storage BMP. In addition to these water quality benefits, the SCWP seeks to benefit disadvantaged communities—a goal that the new location clearly accomplishes. After reviewing the project proposal, all the key water benefits of the original plan remain in place. More importantly, the new location will allow Ganesha park to undergo a facelift by including a host or recreation opportunities in a park that experiences high use.

As we continue to support this project, the inclusion of Ganesha Park opens opportunities to conduct community outreach and engagement. These activities can ensure that the community receives benefits but also that the community have a say in deciding the recreational amenities to be included at Ganesha Park. We also see an opportunity to increase tree canopy where needed, thus helping reduce the heat island effect. These are benefits that help make communities more resilient and that allow residents to be more active, thereby improving not only the park but also the health of the residents who visit.

Overall, we are confident that this project will benefit the surrounding community and help improve groundwater quality in the USGR watershed. Recognizing the benefits this project will provide, Day One is in support this project. More information on Day One's efforts to create healthy and resilient communities can be found on our website at godayone.org. We are looking forward to continuing our support for this project as well as the goals of the Safe, Clean Water Program.

Please reach out to me with any questions.

Sincerely,

Christy Zamani
Executive Director, Day One
Cell: 626-229-9750

CITY OF LA VERNE
CITY HALL
3660 "D" Street, La Verne, California 91750-3599
www.cityoflaverne.org

November 27, 2023

Upper San Gabriel River Watershed Steering Committee
900 S. Fremont Avenue
Alhambra, CA 91803

Subject: Letter of Support for Fairplex Stormwater Capture Project

Upper San Gabriel River Watershed Steering Committee,

On behalf of the City of La Verne, we appreciate this opportunity to share our support for the modification of the Fairplex Stormwater Capture Project for design funding.

The City of Pomona is leading the development of the Fairplex Stormwater Capture Project, which was funded by the Safe, Clean Water Program for design. The Fairplex Stormwater Capture project was pursued by the East San Gabriel Valley Watershed Management Group (ESGVWMG) after rising as a prime regional project. Initially, this project received a support letter from the Fairplex Association. However, the Fairplex Association sent a letter to the City on 10/13/2023 stating that they no longer support the project, since it conflicts with the Fairplex Specific Plan, which was edited since our original correspondence with them.

The City of Pomona's consultant, Craftwater analyzed project alternatives and the City opted to continue to pursue an alternative location at Ganesha Park, which is across the street from the Fairplex. This location continues to be ideal for the same watershed, as did the first concept. The City of Pomona and Craftwater hosted a presentation detailing options, which City of La Verne staff attended.

Although the City of La Verne and the ESGVWMG supported the original concept of the project, the chosen alternative proposes no anticipated change in cost, continues to provide community benefits and is still vital in the compliance portfolio of our region. Therefore, the City of La Verne supports the proposed modification in location.

Thank you for your consideration.

Sincerely,

Meg McWade
Director of Public Works
City of La Verne