SAFE, CLEAN WATER PROGRAM

FEASIBILITY STUDY REPORT

Regional Program Projects Module

PROJECT NAME	Hermosillo Park
PROJECT LEAD(S)	City of Norwalk
SCW WATERSHED AREA	Lower San Gabriel River
PRELIMINARY SCORE	94
TOTAL FUNDING REQUESTED	$ 20,110,000.00
PROJECT CAPITAL COST	$ 20,100,000.00

Created On: Friday, December 13, 2019

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OVERVIEW

The objective of the Regional Infrastructure Program under the Safe, Clean Water (SCW) Program is to plan, build, and maintain multi-benefit watershed-based projects that improve water quality and increase water supply and/or enhance communities. A Feasibility Study is required before a project can be submitted for consideration and scoring for funding through the Los Angeles Region Safe, Clean Water (SCW) Program's Regional Infrastructure Program. Each Feasibility Study should provide enough information about a potential project to allow the Watershed Area Steering Committee members to make an informed decision for as to which projects should move forward for consideration for funding. The Minimum Feasibility Study Requirements for the Scoring and Consideration of Regional Infrastructure Program Projects is available at: https://portal.safecleanwaterla.org/projects-module/.

This document is based upon an output from the web-based tool called the 'SCW Regional Projects Module' (https://portal.safecleanwaterla.org/projects-module/). This output summarizes the information and data provided to Regional Projects Module, and also provides an initial estimate of project scoring per the SCW Infrastructure Program Project Scoring Criteria.

IMPORTANT: *ALL SCORING ESTIMATES GENERATED BY THE PROJECTS MODULE ARE PRELIMINARY AND SUBJECT TO REVIEW AND REVISION BY THE SCORING COMMITTEE.*

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1 GENERAL INFORMATION

This section provides general information on the project including location and project description.

1.1 Overview

The following table provides an overview of the project and the Project Developer(s):

Project Name:	Hermosillo Park
Project Description:	Hermosillo Park is a city-owned and operated community park located in the City of Norwalk. The park is well situated to intercept runoff from two large Flood Control District storm drains. One storm drain flows through center of the Park, and a second storm drain is under an adjacent street. The timing of this proposed project is ideal as the City has imminent plans for a complete rehabilitation of the surface features of this park. The scope of the proposed project will entail the installation of a sub-surface 11.8-acre foot infiltration gallery with water reclaim abilities. New soccer fields will be constructed over the surface of the treatment system, replacing the existing deteriorated grass areas. The City has applied for $8.5 million in Proposition 68 funding for a complete upgrade of the whole park. Upon completion, the proposed project will provide numerous community benefits and will serve to improve water quality in Coyote Creek and the San Gabriel River. The project is requesting SCWF funding for: 20-21 $ 4 million for final design and permitting and initial construction 21-22 $ 6 million construction of infiltration gallery and diversion structures 22-23 $ 6 million construction of infiltration gallery and diversion structures 23-24 $ 4.1 million complete infiltration gallery filtration system and overlying soccer fields 24-25 $ 0.1 million first full year of O&M costs
SCW Watershed Area:	Lower San Gabriel River
Call for Projects year:	FY20-21

Total Funding Requested:	$ 20,110,000.00
Project Weather Type:	Wet
Project Lead(s):	City of Norwalk
Additional Project Collaborators:	City of Santa Fe Springs
Additional Project Collaborators:	Unincorporated areas of Los Angeles County
Additional Project Collaborators:	N/A
Is this a non-municipal project?	No

1.2 Project Location

The following table summarizes the project location:

Latitude:	33.8032
Longitude:	-118.0875
Street Address:	11959 162nd street
City:	Norwalk
State:	CA
Zip Code:	90650

Please see the following attachment(s) for a project location map.

Attachments for this Section	
Attachment Name	Description
Hermosillo Park Jurisdiction and ROW Maps.pdf	

Is the project located within or providing a benefit to a Disadvantaged Community (DAC)?

Yes

Provide a summary of how the project will benefit its DAC with a discussion of measures on displacement avoidance.

DACs are interspersed throughout the proposed project's drainage area (map attached). This project will enhance the existing park and provide multi-benefits, including greater recreational opportunities and reduced heat island effect, to the surrounding communities. The design will follow LA County anti-displacement avoidance measures to ensure local community development.

1.3 Project Description

Provide a detailed description and historical background of the project. Please also state which regional water management plan includes the proposed project (SWRP, E/WMP, IRWMP, or other [must identify and justify as equivalent per 18.07.B.1.c.3]):

The Lower San Gabriel River Watershed Management Program (LSGR WMP), approved in 2015, included a preliminary assessment to determine potential locations for regional projects designed to address water quality objectives within the watershed. Sites were assessed based on an array of factors including land use, area, tributary area, and maximum design capture volume.

The LSGR Watershed Management Group (WMG) also identified four major storm water treatment corridors, which are associated with large storm drain systems and large drainage areas. The initial work to identify top tier sites for future stormwater capture and treatment systems concentrated on these corridors. Hermosillo Park was identified as a top tier project located within what the LSGR WMG refers to as the Cerritos/Norwalk corridor, which eventually discharges into Coyote Creek, a major tributary of the San Gabriel River.

In 2016, the LSGR WMG allocated funding to conduct percolation tests (attached). The study at Hermosillo Park found the water table height and soil percolation rates to be suitable for infiltration. As a result of this successful work, in early 2019, the LSGR WMG allocated additional funds for a 10% design which has been completed (attached). Simultaneously, the City was developing plans to significantly renovate the park. The proposed project objectives will include:

- Improve the water quality within Coyote Creek and the San Gabriel River
- Return water to the aquifers
- Offset the potable water demand at the park
- Maintain a public play space
- Restore/rehabilitate park facilities
- Educate the public on the local water supply and demands

These objectives will be achieved primarily through runoff/pollutant capture, infiltration, and use. The subsurface nature of the design allows for continued use of the open recreational space above the stormwater capture facility; the existing deteriorated grass areas will be enhanced, and new soccer fields will be installed for the community.

Additionally, the LSGR WMG listed Hermosillo Park in the OPTI database for inclusion in the Greater Los Angeles County IRWMP.

2 DESIGN ELEMENTS

This section provides an overview of the project design details.

2.1 Configuration

The following table is a summary of the project configuration:

Project Configuration Summary	
BMP Type:	Infiltration Facility
Infiltration Footprint Area:	2.15 ac
Ponding Depth:	5.5 ft
Media Layer Depth:	15 ft
Media Layer Porosity:	0.4 ft
Underdrain Layer Depth:	0 ft
Underdrain Layer Porosity:	0 ft

Calculated Storage Volume	
Module-generated Storage Volume:	24.7250 ac-ft

Please upload a description and detailed schematic of the project layout including its anticipated footprint and key components such as, but not limited to: inlets, outlets, diversion point, recreational components, nature-based components, pumps, treatment facilities, underdrains, conveyance, above ground improvements, and other project components.

Attachments for this Section	
Attachment Name	Description
Hermosillo Park 10% Design Plans.pdf	
Hermosillo Park Concept Plan	

2.2 Capture Area

The size and land uses of the capture area upstream of a project plays an important role in its water quality and water supply benefits. The capture area information here is used by the Module for scoring:

Capture Area Summary	
Capture Area:	2580 ac
Impervious Area:	1628 ac
Pervious Area:	952 ac

The following table is a summary of the land use breakdown for the area that drains to the project:

Breakdown of Impervious Acreage in Capture Area		
Land Use Type	Percent Impervious	Acres
Single Family Residential	17.3 %	281.64
Multi Family Residential	6.75 %	109.89
Commercial	13.41 %	218.31
Institutional	16.76 %	272.85
Industrial	25.16 %	409.6
Highways and Interstates	2.2 %	35.82
Secondary Roads and Alleys	18.42 %	299.88

Attachments for this Section	
Attachment Name	Description
Hermosillo Park Jurisdiction and Land Use Maps.pdf	

2.3 Diversion

Diversion Structures generally apply to 'off-line' regional projects where stormwater is diverted from a major water conveyance (e.g., gravity main) and directed to the project at a predetermined maximum rate. Smaller distributed projects, like bioretention, do not normally utilize these devices.

Does the project have a diversion structure?

Yes

The following table provides details on the diversion type and maximum diversion rate:

Diversion Details	
Type of Diversion	Typical Max Diversion Rate (cfs)
Pumping	50 cfs

Estimated Average Inflow Captured by Project:

50 cfs

Description of Diversion:

A drop-inlet structure and manhole are proposed along the BI0021 box culvert and BI9001 reinforced concrete pipe to divert stormwater during low-flow and storm events to the two pretreatment devices and eventually the subsurface storage.

BI0021 Box Culvert Diversion
At the proposed flow rate of 50 cfs, the structure on the 10-foot by 10-foot reinforced concrete box culvert will require a 4.0-foot drop below the existing invert and a 36-inch diameter diversion pipe at a 0.07% slope. The drop inlet will have dimensions of approximately 10-feet wide and 4.5-feet long.

BI9001 Pipe Diversion
At the proposed flow rate of 50 cfs, the structure on the 108-inch reinforced concrete pipe will require a 1.75-foot drop below the existing invert and a 36-inch diameter diversion pipe at a 0.5% slope. The drop

inlet structure will have dimensions of approximately 12-feet wide and 4-feet long.

2.4 Site Conditions & Constraints

Please provide an upload for each of the attachments below that describes the methods, outcomes and how the information will be incorporated into the project design.:

Geotechnical Investigation
A review of the Geotechnical Investigation Report dated December 1, 2018 ("Soil Infiltration Study – Hermosillo Park at 11959 162nd Street, in the City of Norwalk, California") was conducted prior to project concept development. It was determined that the existing minimum groundwater level is at 26.5 feet below existing ground surface. The infiltration testing identified typical rates averaging 14.0 inches per hour at a depth of 15 feet below the existing ground surface. The groundwater elevation can constrain the exfiltration from the facility and allow for only lateral infiltration during large events. While this information is sufficient to develop preliminary design concepts, it is recommended that additional geotechnical investigation be conducted given the results of this report to further develop geotechnical design recommendations in support of final design documents.

Historic park as-builts indicate that contaminated soils possibly exist within the park limits and a full Phase I Environmental Site Assessment should be performed to verify that they were removed during park construction.

The infiltration data and borehole logs indicate that this site is suitable for infiltration and an infiltration practice is recommended.

Hydrology, Hydraulics, and Water Quality
For this project, the Los Angeles County Watershed Management Modeling System (WMMS) was used within the Loading Simulation Program C++ (LSPC) to simulate the contaminant loading, runoff volume, and flow rates associated with a long-term, 10-year continuous time series (Water Year 2002 to Water Year 2011). The Modified Rational method was used to estimate runoff volume and peak flow for the 85th percentile storm to each diversion point.

Utility Data Review
To locate the existing utilities in the Hermosillo Park area, various sources were utilized. The following utilities were identified to be near the project area.

Utilities Near BI0021 Diversion
Existing utilities running near the channel and into the park area include site electrical lines, irrigation lines, and drain lines. The nearby utility mains will be avoided as the diversion and channel work will occur within the park limits and not impact the right-of-way utilities. Coordination for this effort with the Parks department will be required during the detailed design and construction phase of this project.

Utilities Near BI9001 Diversion
Existing utilities running down Horst Avenue and Algardi Street near Hermosillo Park include: street and park lighting owned by the City of Norwalk, an 8-inch VCP sanitary sewer owned by the City of Norwalk, an 8-inch and 4-inch cast iron water line owned by Liberty Utilities, and a 2-inch oil/gas line owned by Southern California Gas. Coordination with the various utilities will be required during the detailed design and construction phase of this project to minimize conflicts or facilitate realignments.

Site Access & Right-of-Way

The project requires access to the park, the existing 10-foot by 10-foot box culvert, and the existing 108-inch pipe. Access to the park will be done through the existing driveway on 162nd Street and will travel through the existing parking lot to the open field space. The box culvert passes through the middle of the park and will be accessed through surface manhole entry. The 108-inch pipe will be done through surface manhole entry and will require traffic control on Algardi Street and Horst Avenue. Entry will require close coordination with the LA County Flood Control District. Confined space requirements will apply and must be adhered to.

Does the project involve LACFCD infrastructure, facilities, or right-of-way?

Yes

Please see the following attachments for additional details on geotechnical, hydrology, right-of-way and/or LACFCD, and utility conditions.

Attachments for this Section	
Attachment Name	Description
Hermosillo Park Soil Infiltration Study.pdf	

Attachments for this Section	
Attachment Name	Description
Hermosillo LACFCD concpt approval.pdf	LACFCD Concept approval

2.5 Cost

The following tables provide details on the project's capital and annualized costs:

Capital Cost Breakdown	
Construction Cost:	$ 16,000,000.00
Planning and Design Cost*	$ 4,100,000.00

*Includes early concept design, pre-project monitoring, feasibility study development, site investigations, formal project design, intermediate and project completion audits, CEQA and other environmental impact studies and permitting.

Annual Cost Breakdown	
Annual Maintenance Cost:	$ 41,000.00
Annual Operation Cost:	$ 20,000.00
Annual Monitoring Cost:	$ 18,000.00
Project Life Span:	50 years

The following table provide details on calculated life-cycle costs for the project (either calculated the Module, or estimated by the Project Developer)**.**

Note: these life-cycle costs are used in Section 4.3 of this output for Water Supply Benefit scoring.

Module-generated Life-Cycle Cost for Project*	$ 21,995,518.16
Module-generated Annualized Cost for Project*	$ 916,712.89
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate Life Cycle costs, and attach supplemental information with details of the methodology, assumptions and calculations:	N/A
Supporting PDF	See attachment if applicable.

*Applies an annual discount rate as a static rate equal to 3.375%. The only costs not included in total life-cycle cost are the dismantling and replacement costs at the end of life.

2.6 Schedule

Provide a preliminary schedule required to design, permit, construct, operate, and maintain the

Project:

Schedule	
Milestone Name	Completion Date
Assumed Notice-to-Proceed	09/01/2020
30% Draft Design & Review	12/04/2020
60% Draft Design & Review	03/12/2021
90% Draft Design & Review	06/18/2021
100% Final Design	09/24/2021
LACFCD Permit	09/24/2021
Environmental Documentation	09/24/2021
Construction	09/30/2023
Start of Operation & Maintenance	10/01/2023

2.7 Monitoring

This section provides an overview of monitoring data related to the project.

Has any monitoring data been compiled related to the project?

No

Please provide an overview of the monitoring performed to date:

N/A

Please upload a monitoring plan to measure the effectiveness of the proposed project once completed, including metrics specific to the identified benefits. Also attach supplemental information on monitoring conducted to date, if applicable.

Attachments for this Section	
Attachment Name	Description
Hermosillo monitoring.pdf	Hermosillo Monitoring

2.8 O & M

Provide an overview of the plan for how operations and maintenance of the Project will be carried out. Identify the responsible party and describe any technical expertise required for O&M.

Long-term maintenance of the system is vital to its continued operation. The responsible party for the operation and maintenance of the completed project will be the City of Norwalk. A letter of commitment as well as preliminary operations and maintenance costs and requirements are attached.

A full draft maintenance plan will be developed as a part of the 100% final design. The maintenance plan will include details on equipment needed and standard practices and procedures. The final maintenance plan will be completed at the end of construction when actual brands and part information is made available.

Attachments for this Section	
Attachment Name	Description
Hermosillo Park O&M Requirements and Costs.pdf	

Hermosillo Park Letter of Commitment	

3 WATER QUALITY BENEFITS

This section provides an overview of project elements related to water quality benefits, including calculations used for Section A (Water Quality Benefits) of SCW Project Scoring Criteria.

3.1 24-hour Storm Capacity

Please enter information below regarding key parameters of the project's capacity. The Module will use those values to estimate the 24-hour capacity:

24-hour Storm Capacity Breakdown	
Effective Draw Down Rate:	14 in/hr
Stormwater Use During 24-hr Design Event:	0 gal

Calculated 24-hour Storm Capacity	
Module-generated 24-hr Capacity:	84.9250 ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate 24-hour capacity, and attach supplemental information with details of the methodology, assumptions and calculations.	N/A

3.2 Event-based Design Details

n this section, details regarding the project inlets and outlets are provided, along with estimates generated for the project design event. The event-based information is envisioned as basic estimates that would be generated during the project design, and will support review of the project details.

Estimated Total Inflow Volume during Design Event:

42.04 ac-ft

Describe the event used for project design. Describe the portion of the peak inflow that would be retained by the project through infiltration, capture, diversion, use, or other means. Tooltip for 'Treatment Description' under outlets:

A 0.91 inch 85th percentile LA County hyetograph was modeled to determine flows to the site through the WMMS model. Flows were developed for this rain event to the points of diversion for the project. As currently designed, one gravity-fed diversion and one pumped diversion would catch as much of the event as possible given maximum diversion rates and the capacity and throughflow of the regional project. Real-time controls could be added for better peak management given the limited size of diversions and large drainage area producing an event that is impractical to capture by a single practice. Inflows could be delayed until flows were high enough to target the peak of the storm event to accomplish this.

Describe whether and how the 85th percentile is being captured/diverted. If not, is there opportunity to do so? If feasible but not incorporated, explain why. If not feasible, explain why.

A portion of 85th percentile storm is being captured by the unit though the entire event cannot be managed due to feasible/practical diversion size limitations. This could be overcome by the addition of real-time controls if desired and/or if no other stormwater capture practices are added within the drainage area that would work in conjunction with the one proposed herein to enable its full capture.

Project inlet flows are based on a water budget calculation for the unit taking into account hourly flows to each diversion point on an hourly basis and subject to storage capacity.

The following tables detail inflow and outflow from the project during the design event:

Inlets	
Estimated Max Inflow Rate (cfs)	Total Inflow (ac-ft)
50 cfs	24.7 ac-ft
50 cfs	17.4 ac-ft

Outlets			
Estimated Max Outflow Rate (cfs)	Treated?	Treatment Description	Percent of Volume Treated (%)
0 cfs	Yes	Infiltration unit	100 %

Describe the methods used to generate estimates:

The WMMS modeled 85th percentile storm was routed through proposed diversions and subject to

proposed storage and outlet filtration capacities. See the attached PDR

3.3 Long-term Performance

This section present details of the calculation of long term (10-year) water quality benefit for Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria. These estimates were either generated by the Module using a 10-year hourly simulation with the Watershed Management Modeling System (WMMS), or generated by the Project Developer.

The following tables present selected primary and secondary pollutants and calculated reductions for water quality benefit per Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria.

Note: these estimates are based on the hourly 10-year WMMS simulation performed by the Module, or as estimated by the Project Developer.

Primary Pollutant	
Primary Pollutant	Total Zinc
Reduction Method used for Scoring	Method 2 (% Load Reduction)
Justification for selecting Primary Pollutant	The LSGR WMP identifies zinc as the limiting pollutant. LSGR has a metals TMDL
Calculated 10-year Pollutant Reduction	N/A
Use Project Developer estimate instead?	Yes
Own Value	100 %

Justification for using own value	See Table 3.5 "Long Term BMP Performance Reduction" in the attached Preliminary Design Report. The LA County WMMS model was run using 10 years of runoff and pollutant loading time-series data . An optimization analysis was performed and aimed to maximize the long-term pollutant load reduction and 85th percentile design storm volume capture by simultaneously varying the diversion rate, BMP size, and discharge rates. Each of the design considerations of the proposed project has an associated range of options that were modeled to assess alternatives against long-term water quality benefits. Pollutant loads diverted to the project based on diversion limitations are treated by both pretreatment devices and residence time in the treatment BMP train. Treatment efficiencies were developed for these devices from proprietary pretreatment performance data and the International BMP Database, respectively. Reported pollutant load reductions take into account the timing of pollutant loading to the diversion point, the portion able to be diverted, and the treatment efficiencies of the treatment components for the BMP. These values are calculated based on influent and effluent pollutant loads to the BMP itself.

Secondary Pollutant	
Secondary Pollutant	Bacteria
Reduction Method used for Scoring	Method 2 (% Load Reduction)
Justification for selecting Secondary Pollutant	The LSGR WMP identifies bacteria as a pollutant of concern. LSGR has a Bacteria TMDL
Calculated 10-year Pollutant Reduction	N/A

Use Project Developer estimate instead?	Yes
Own Value	100 %
Justification for using own value	Same method. The LA County WMMS model was run using 10 years of runoff and pollutant loading time-series data

The following table presents calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.

Note: this output includes all pollutants and methods, including those not selected as Primary or Secondary for scoring.

Pollutant Name	Method 1 (% Concentration Reduction)	Method 2 (% Load Reduction)	Method 3 (% Exceedance Reduction)
Total Zinc	28.2 %	66.9 %	N/A
Total Copper	25.9 %	65.8 %	N/A
Total Lead	26.7 %	66.2 %	N/A
Total Nitrogen	26.6 %	66.1 %	N/A
Total Phosphorous	24.7 %	65.2 %	N/A
E.coli	21.6 %	63.8 %	N/A
Toxics	N/A	N/A	N/A
Chloride	N/A	N/A	N/A
Trash	N/A	N/A	N/A
N/A = Modeling results not available from Projects Module, must be manually generated by user			

The following table presents inflow and outflow details for calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.

Note: this output includes pollutants not selected as Primary or Secondary for scoring, and reduction methods not selected for scoring.

Metric	Runoff from Capture Area	Minimally Treated Outflow from Project	Inflow into Project Inlet	Outflow from Project Outlet	Reduction by Project	% Reduction by Project
Runoff Volume (ac-ft)	1032.575	373.265	809.178	373.265	435.913	53.871 %
Total Zinc (ug/L)	376.800	264.830	369.010	264.830	104.180	28.232 %
Total Zinc (lbs)	1058.022	268.814	811.981	268.814	543.166	66.894 %
Total Copper (ug/L)	89.280	65.070	87.850	65.070	22.780	25.931 %
Total Copper (lbs)	250.681	66.052	193.315	66.052	127.263	65.832 %
Total Lead (ug/L)	64.980	46.570	63.510	46.570	16.940	26.673 %
Total Lead (lbs)	182.461	47.270	139.760	47.270	92.490	66.177 %
Total Nitrogen (mg/L)	3.584	2.648	3.606	2.648	0.959	26.588 %
Total Nitrogen (lbs)	10062.970	2687.358	7935.736	2687.358	5248.378	66.136 %
Total Phosphorous (mg/L)	0.554	0.417	0.554	0.417	0.137	24.667 %
Total Phosphorous (lbs)	1554.707	423.519	1218.750	423.519	795.230	65.250 %
E.coli (#/100mL)	9.826E+004	7.617E+004	9.715E+004	7.617E+004	2.098E+004	21.598 %
E.coli (#)	1.251E+015	3.506E+014	9.695E+014	3.506E+014	6.189E+014	63.834 %
Toxics	N/A	N/A	N/A	N/A	N/A	N/A
Chloride	N/A	N/A	N/A	N/A	N/A	N/A
Trash	N/A	N/A	N/A	N/A	N/A	N/A
N/A Modeling results not available from Projects Module, must be manually generated by user						

4 WATER SUPPLY BENEFITS

This section provides an overview of project elements related to water supply benefits, including calculations used for Section B (Significant Water Supply Benefits) of SCW Project Scoring Criteria.

4.1 Water Supply Nexus

Please describe and clearly justify the nexus between water supply and the stormwater and/or urban runoff that is captured/infiltrated/diverted by the Project:

There is some potential for this project to provide multiple benefits at the nexus of water supply and stormwater. The following describes how this has been considered in development of this project.

Onsite Irrigation Use
This project will utilize captured flows to offset onsite irrigation needs. Dry weather flows are appreciable and should offset most of the park's irrigation needs. Pumping and filtration will occur to redirect captured stormwater to the irrigation system and sanitize it to acceptable standards for this type of use.

Water Recycling
This project does not currently involve any water recycling by a wastewater treatment facility. There are sanitary sewer lines in the vicinity of the project, but further capacity study would be required to determine if discharges to these would be possible.

Aquifer Recharge
This project is connected to a managed water supply aquifer (Central Basin of the Coastal Plain, Los Angeles aquifer). Infiltration rates are high and will augment groundwater supply by approximately 1,079 ac-ft on an average annual basis.

Does this project capture water for onsite irrigation use?

Yes

Description of onsite use by the project:

Stormwater harvesting unit, see PDR for additional details

Does this project capture water used for water recycling by a wastewater treatment facility?

No

Description of water recycling by the project:

N/A

Is the project connected to a managed water supply aquifer?

Yes

If Yes, managed Aquifer Name:

Central Basin of the Coastal Plain, Los Angeles aquifer

If this project is augmenting groundwater supply, please provide confirmation that the agency managing the groundwater basin concurs with the added benefit.

Attachments for this Section	
Attachment Name	Description
WRD_Letter of Support.pdf	Water Replenishment District

4.2 Benefit Magnitude

Project Scoring Criteria Section B is based upon estimates of annual average water supply benefit. Water supply benefit can include, but is not limited to, water diverted to a separate groundwater recharge facility, into a water treatment plant, to a sanitary sewer to be converted into recycled water, etc. This section provides documentation of estimates of annual average water supply benefit.

Average dry weather inflow to project:

0.05 cfs

Describe the methods used to estimate average dry weather inflow to the project:

Flows from the WMMS model were average during dry weather. Wet weather was defined as any time period where rainfall was at least 0.1 in/hr and 24-hours after such timesteps.

The following tables present calculated annual inflow the project.

Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.

Module-generated annual average inflow to project:	809.178 ac-ft
Use Project Developer estimate instead?	Yes
Custom Value specified by User:	1959 ac-ft
Please provide a description of methods used to calculate water supply inflow values	This is the baseline runoff to the project from WMMS for water years 2002 – 2011.
Supporting PDF	See attached PDF if applicable.

The following tables present calculated annual average capture by the project, which is used for the Section B2 scoring calculation (Benefit Magnitude of SCW Scoring Criteria).

Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.

Module-generated annual average capture for water supply:	435.913 ac-ft
Use Project Developer estimate instead?	Yes
Custom Value specified by User:	1079 ac-ft

Please provide a description of methods used to calculate water supply benefit	These are the calculated annual dry weather flows from WMMS to be utilized for onsite irrigation and the average annual discharge to the groundwater from modeling.
Supporting PDF	See attached PDF if applicable.

4.3 Cost Effectiveness

Project Scoring Criteria Section B2 incorporates life-cycle costs. The cost-effectiveness for water supply benefit is calculated from other sections in the Module. The calculation for B2 scoring is based on a numerator of life-cycle cost (from Design Elements > Cost) and a denominator of annual average benefit magnitude (from Water Supply > Benefit Magnitude).

Module-generated water supply cost-effectiveness:	$ 849.59 per ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	$ N/A
Justification	N/A
Supporting PDF	See attached PDF if applicable.

5 COMMUNITY INVESTMENT BENEFITS

This section provides an overview of project elements related to community investment benefits, which are used in calculations for Section C (Community Investment Benefits) of SCW Project Scoring Criteria.

The following table details the project's community investment benefits:

Community Investment		
Investment Type	Applicable?	Detailed Description
Does this project improve flood management, flood conveyance, or flood risk mitigation?	Yes	The system has detention capabilities that can contribute towards enhanced flood retention capabilities of the whole storm drain system.
Does this project create, enhance, or restore park space, habitat, or wetland space?	Yes	The installation of the underground structure will require the removal and replacement of the current open playing space. The project proposes to create two new multi-sport fields including freshly installed natural turf grass. The Parks Department has solicited significant input from the community and have created surface improvements that the residents will embrace and enjoy.
Does this project improve public access to waterways?	No	N/A
Does this project create or enhance new recreational opportunities?	Yes	The multi-sports fields will provide significant new recreational opportunities for the community.
Does this project create or enhance green spaces at school?	No	N/A
Does this project reduce heat local island effect and increase shade?	Yes	Landscape plans post construction include additional native trees, shrubs, and grasses to be installed at select spots impacted by the construction throughout the park. This vegetation and the addition of zero impervious surfaces for this project will contribute to reductions in the heat island effect.
Does this project increase shade or the number of trees or other vegetation at the site location?	Yes	Native trees that are part of the post-construction landscape plan will contribute to increased tree count and shade for the park.

6 NATURE-BASED SOLUTIONS

This section provides an overview of project elements that leverage nature-based solutions, which are used in calculations for Section D (Nature-Based Solutions) of SCW Project Scoring Criteria.

Does this project implement natural processes?

Yes

Natural Processes Description:

Permeable pavement or equivalent LID design elements will be installed within the parking lot to promote on-site infiltration. The pavements are sized to convey flows from the parking lot within Hermosillo Park.

Does this project utilize natural materials?

Yes

Natural Materials Description:

Landscape plans post construction include natural turf, additional native trees, shrubs, and grasses to be installed at select spots impacted by the construction throughout the park.

Description of how nature-based solutions are utilized to the maximum extent feasible. If nature-based solutions are not used, include a description of what options where considered and why they were not included.

The City desires to continue use of the property as an active park with multi-sport fields available in the open space. To accommodate playing fields, open spaces of turf are required limiting the amount and types of vegetation. To incorporate nature-based solutions, the City is redesigning and reconstructing the existing parking lot and plan to install permeable pavements to promote infiltration into the groundwater. The permeable pavement swale will treat flows from the parking lot.

The following table details the impermeable area removed by the project:

Removed Impermeable Area by Project	
Pre-Project Impervious Area:	Post-Project Impervious Area:
1.5 ac	1.25 ac

7 LEVERAGING FUNDS & LOCAL SUPPORT

This section provides an overview of the project's funding and community support, which are used in calculations for Section E (Leverage Funds and Community Support) of SCW Project Scoring Criteria.

7.1 Cost Share

Is additional funding being provided as a Cost Share for this project?

No

The following is a summary of what other sources of funding were explored and/or why funding could not be secured through these other sources:

The City of Norwalk hereby acknowledges that eligible expenditures are only those incurred after November 7, 2018.

The following table details the additional funding attained for the project:

Additional Funding			
Funding Type	Description	Funding Amount	PDF
None provided	N/A	N/A	N/A

7.2 Local Support

Please describe the Outreach Plan conducted for this project:

The project, along with the Prop 68 grant application for park renovation, was part of an overall community outreach effort in the City for the past several months. Six community meetings were held with a variety of organizations, including the Norwalk La Mirada School District for the adjacent elementary school, the Social Services Center, and various youth groups and residents. The City reached out to several hundred people to identify the projects and get their feedback. In September 2019, a concept design for the park was presented to the community with overwhelmingly positive comments.

Does this demonstrate strong local, community-based support?

Yes

The following table details the support by local, community-based organizations for the project (also see attachments)**:**

Local Support		
Organization Name	Description	PDF
including the Norwalk La Mirada School District for the adjacent elementary school, the Social Services Center, and various youth groups and residents	a concept design for the park was presented to the community with overwhelmingly positive comments.	N/A
Norwalk Community Coordinating Council.	Community Based Support letter	Hermosillo letter of support.pdf

8 ADDITIONAL FEASIBILITY INFORMATION

This section presents additional information regarding project feasibility and technical details gathered during project design and feasibility assessment.

8.1 Environmental Documents and Permits

Discuss what potential environmental documentations (e.g. CEQA, NEPA, etc.) will be required or has been completed for the Project. Describe potential permitting challenges and associated time requirements and costs.

Notice of Categorical Exemption has been recorded 9/17/19 (attached). This will be reviewed as the final design documents are prepared and supplemental actions will be undertaken as necessary.

Attachments for this Section	
Attachment Name	Description
Hermosillo Park CEQA.pdf	

8.2 Vector Minimization

This following provides details on vector minimization strategies.

Does the project have vector minimization plan?

Yes

Please see an attachment with proposed vector minimization plan.

Attachments for this Section	
Attachment Name	Description
Hermosillo Park Vector Minimization.pdf	

8.3 Alternatives Studied

Describe alternatives that were considered and evaluated as part of the Project development:

Multiple fates for the discharge of captures stormwater have been considered to make the most well-informed choice given the initial project options. These include:

- Infiltration
- Onsite irrigation
- Filtration/return to storm drain

Please see the preliminary design report for additional details.

8.4 Effectiveness

Describe the effectiveness of similar types of projects already constructed if applicable:

Projects similar to the Hermosillo Park Stormwater Capture project are being designed and constructed throughout Los Angeles County. A couple (including Bolivar Park Stormwater Capture Project and Santa Monica Clean Beaches Project at the Pier) have recently been completed and are now beginning the monitoring phase. Numerous others are currently under construction (Caruthers Park in Bellflower, Mayfair Park in Lakewood, Carriage Crest Park in Carson, and Culver Boulevard in Culver City). In the future, it is anticipated that the project effectiveness will be obtained through monitoring efforts but at this time, there is no comparable completed and monitored project.

8.5 Legal Requirements and Obligations

Describe any legal requirements or obligations that may arise as a result of constructing the Project and how these requirements will be satisfied:

The proposed project is located on City-owned land, and no legal requirements or obligations are anticipated. However, construction requires accessing the LACFCD storm drain as a key component of this project. The LACFCD requires that the hydraulics of the existing infrastructure not be negatively impacted, and that access is maintained. The City of Norwalk will require an operation and maintenance memorandum of understanding (MOU) with the LACFCD for continued access. All required permits and agreements will be in place through the construction of the project.

As stated in the project description, compliance with the water quality targets set forth in the Lower San Gabriel River Watershed Management Program (LSGR WMP) is a key driver for the project. The City will be required to demonstrate project performance to the Los Angeles Regional Water Quality Control Board for acceptance towards the water quality objectives. The project will be monitored and reported on as required.

8.6 Technical Reports

Please upload additional technical reports related to this project not provided above.

8.7 Other

Provide any additional information related to the Project as necessary:

DAC Map attached
Preliminary Design Report attached

Attachments for this Section	
Attachment Name	Description
Hermosillo Park DAC Map.pdf	
Hermosillo Park Preliminary Design Report.pdf	

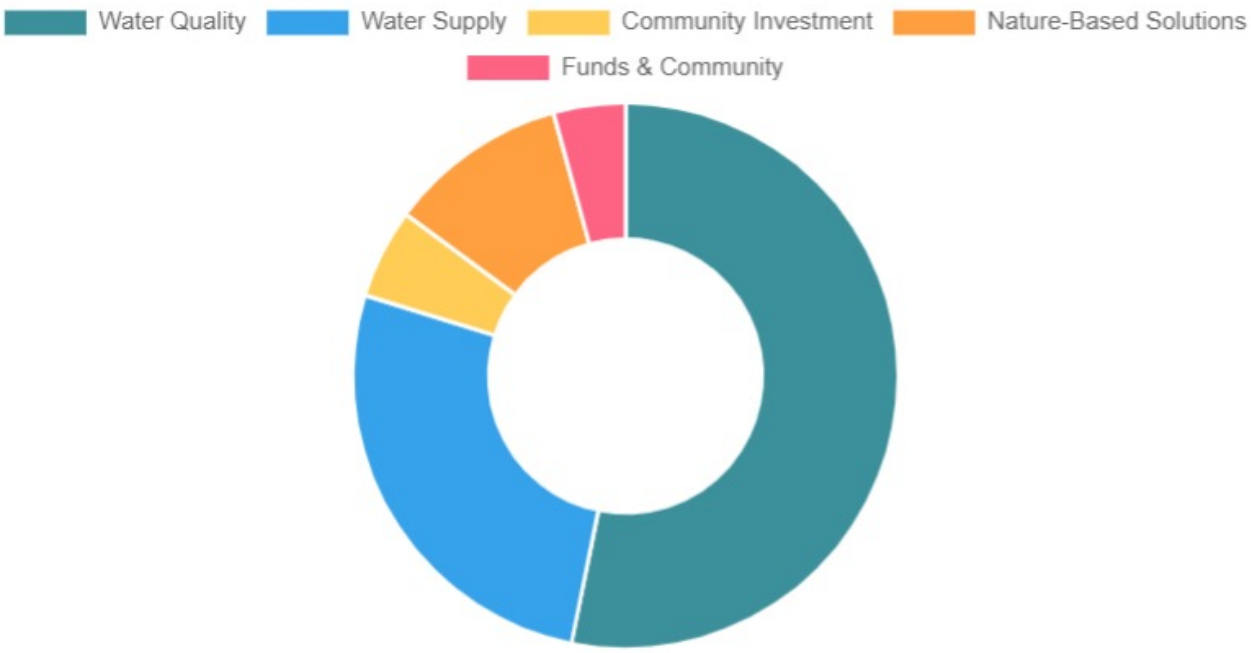
9 SCORING

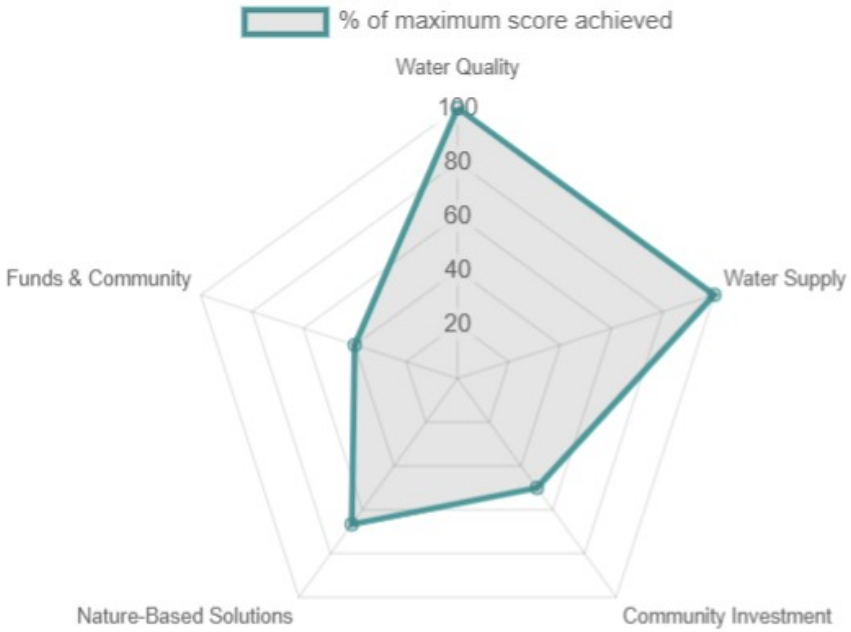
This section summarizes scoring calculations generated by the Module. All Regional Program Projects must meet the Threshold Score of 60 points or more using the following Project Scoring Criteria to be eligible for consideration.

Note: all scoring estimates are considered preliminary and subject to review and revision by the Scoring Committee.

Preliminary Estimated Project Score:
94 points

The following graphics summarize the project scoring. The first graphic shows the components of the project score, based on the different scoring sections. The second graphic shows the percent of maximum score achieved by the project within each scoring section.


Water Quality
Water Supply
Community Investment
Nature-Based Solutions
Funds & Community


% of maximum score achieved
Water Quality
100
80
60
40
20
Water Supply
Community Investment
Nature-Based Solutions
Funds & Community

The following table details the scoring calculated for the project, along with the scoring thresholds from the SCW Project Scoring Criteria:

Scoring Section	Project Score	Max Score	Scoring Criteria Thresholds
Water Quality Wet + Dry Weather **Part 1**	20	20	Cost Effectiveness = (24-hour BMP Capacity) / (Construction Cost in $Millions) • <0.4 = 0 points • 0.4-0.6 = 7 points • 0.6-0.8) = 11 points • 0.8-1.0 = 14 points • >1.0 = 20 points
Water Quality Wet + Dry Weather **Part 2**	30	30	Primary Pollutant Reduction: • >50% = 15 points • >80% = 20 points Secondary Pollutant Reduction: • >50% = 5 points • >80% = 10 points
Water Supply Part 1	13	13	• >$2500/ac-ft = 0 points • $2,000–2,500/ac-ft = 3 points • $1500-2,000/ac-ft = 6 points • $1000–1500/ac-ft = 10 points • <$1000/ac-ft = 13 points
Water Supply Part 2	12	12	• <25 ac-ft/year = 0 points • 25 - 100 ac-ft/year = 2 points • 100 - 200 ac-ft/year = 5 points • 200 - 300 ac-ft/year = 9 points • >300 ac-ft/year = 12 points
Community Investment	5	10	• One Benefit = 2 points • Three Benefits = 5 points • Six Benefits = 10 points
Nature Based Solutions	10	15	• Implements natural processes or mimics natural processes to slow, detain, capture, and absorb/infiltrate water in a manner that protects, enhances and/or restores habitat, green space and/or usable open space = 5 points • Utilizes natural materials such as soils and vegetation with a preference for native vegetation = 5 points • Removes Impermeable Area from Project (1 point per 20% paved area removed) = 5 points
Leveraging Funds Part 1	N/A	6	• >25% Funding Matched = 3 points • >50% Funding Matched = 6 points

Leveraging Funds Part 2	4	4	The Project demonstrates strong local, community-based support and/or has been developed as part of a partnership with local NGOs/CBOs.
Total	**94**	110	

10 ATTACHMENTS

Attachments are bundled and organized in the following pages, with cover pages between each subsection.

Please note – at a minimum, a feasibility study must attach the following:

- A Location Map
- A Schematic with Proposed Footprint and Key Components
- A Map of the Capture Area (Tributary Map)
- Technical Reports (e.g. soil report, hydrology report, hydraulic study, utility search, survey, PEIR, EIR, monitoring data, etc.)



ATTACHMENTS FOR SECTION 1.1:

OVERVIEW



ATTACHMENTS FOR SECTION 1.2:

PROJECT LOCATION

ATTACHMENT A: LOCATION MAP & LAND USE MAP



Figure 6. Map of parcels and ROW boundaries for Hermosillo Park project.

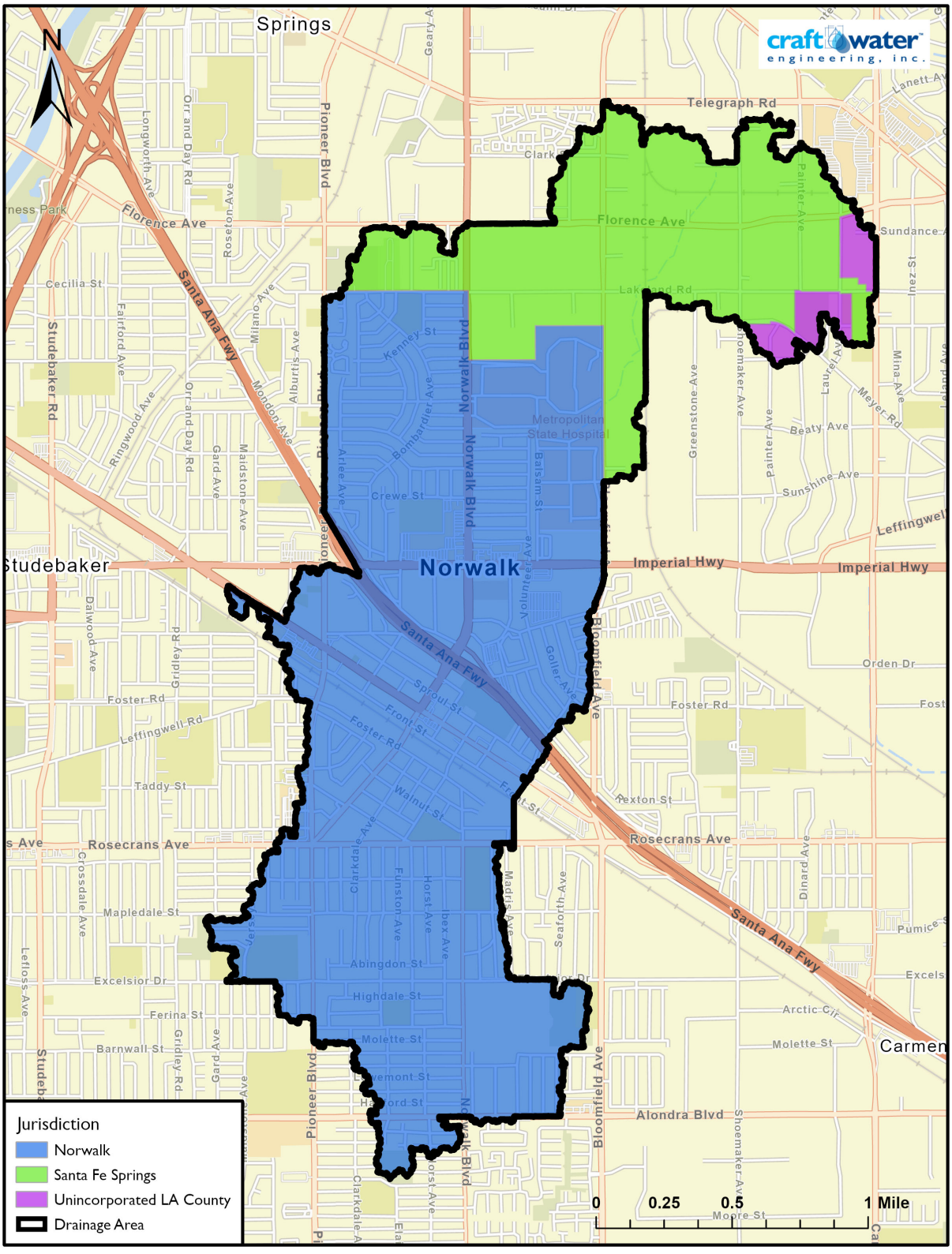
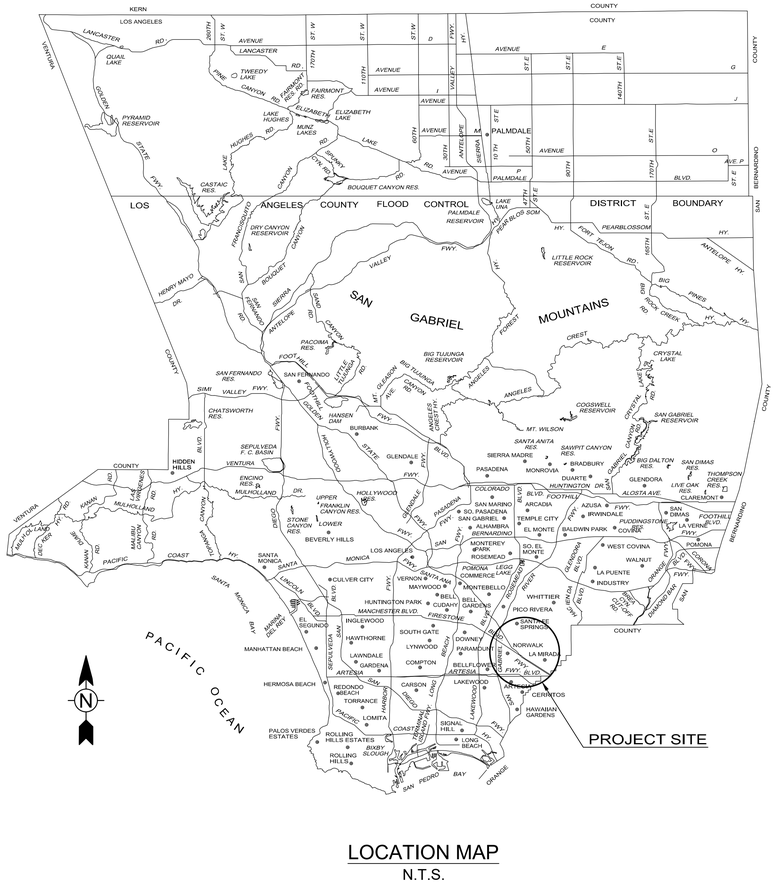


Figure 7. Drainage area jurisdiction boundaries for Hermosillo Park project

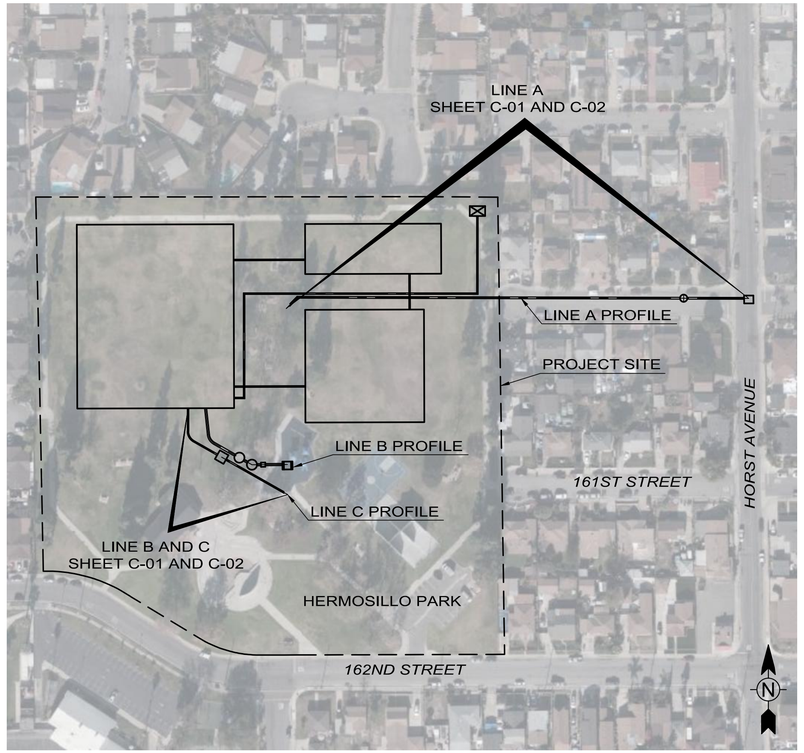


ATTACHMENTS FOR SECTION 2.1:

CONFIGURATION



LOCATION MAP
N.T.S.



VICINITY MAP
N.T.S.

INDEX TO PROJECT PLANS

SHT. NO.	DRAWING NO.	SHEET TITLE
1	G-01	TITLE SHEET
2	G-02	GENERAL NOTES
3	C-01	SITE PLAN
4	C-02	LINE A, B, AND C PROFILES
5	C-03	DETAILS

ABBREVIATIONS

E	EXISTING
H	HORIZONTAL
P	PROPOSED
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMIT
PVC	POLY VINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
TYP	TYPICAL
V	VERITCAL

UTILITIES

Utility	Company
Sewer	City of Norwalk
Oil/Gas	Southern California Gas - Downey
Water	Liberty Utilities
	Norwalk Municipal Water Systems
Electric	Southern California Edison District - Whittier
Telecommunications	Charter Communications - Irwindale

REFERENCES

DRAWING NUMBERS:

craftwater engineering, inc.
www.craftwaterinc.com
10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

COVER SHEET

PROJ:	19002 - Hermosillo
DESN:	M. Taylor
DRWN:	R. Martinez
CHKD:	C. Helmle

G-01
SHEET XX OF XX

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GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE PROJECT TECHNICAL SPECIFICATIONS. WORK NOT COVERED BY THE PROJECT SPECIFICATIONS SHALL CONFORM TO THE STANDARD PLANS OF LOS ANGELES COUNTY, THE CITY OF NORWALK, AMERICAN PUBLIC WORKS ASSOCIATION AND CALTRANS STANDARD PLANS AND SPECIFICATIONS. (ALL LATEST EDITIONS).
2. NOTIFICATION: AT LEAST TEN (10) DAYS BEFORE THE START OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY, IN WRITING, ALL HOMES LOCATED WITHIN 500 FEET OF THE WORK AREA, OF THE PROPOSED CONSTRUCTION START DATE. A COPY OF SAID WRITTEN NOTIFICATION SHALL BE PROVIDED TO THE INSPECTOR FOR WRITTEN APPROVAL BEFORE THEY ARE DISTRIBUTED TO THE OCCUPANTS OF THE ABUTTING PROPERTY.
3. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER TWO (2) WORKING DAYS IN ADVANCE FOR INSPECTION PRIOR TO STARTING WORK AT (XXX) XXX-XXXX.
4. THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES 48 HOURS IN ADVANCE PRIOR TO WORKING AROUND THEIR FACILITIES.
5. THE CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT AT 811 48 HOURS PRIOR TO ANY EXCAVATION.
6. THE CONTRACTOR SHALL VISIT THE SITE AND BE KNOWLEDGEABLE OF CONDITIONS THEREON. THE CONTRACTOR SHALL INVESTIGATE, VERIFY AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT. THE CONTRACTOR SHALL NOTIFY THE CITY OF ANY CONDITIONS REQUIRING CORRECTION OR MODIFICATION PRIOR TO PROCEEDING WITH THE WORK.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURATE PLACEMENT OF ALL WORK ON THE SITE.
8. EXISTING ELEVATIONS AND LOCATIONS TO BE JOINED BY THE WORK SHALL BE VERIFIED BY THE CONTRACTOR BEFORE COMMENCING THE WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE DRAWINGS.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL DRAWINGS WITH ITS SUBCONTRACTORS. ALL SUBCONTRACTORS SHALL BE FURNISHED WITH COMPLETE SETS OF PLANS AND SPECIFICATIONS BY THE CONTRACTOR.
10. WHERE SPECIFIC DIMENSIONS, DETAILS, OR DESIGN INTENT CANNOT BE DETERMINED, CONSULT THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
11. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES AND PROTECT THEM FROM DAMAGE AS REQUIRED. ALL EXISTING UTILITY CROSSINGS SHALL BE POTHOLED AND FIELD LOCATED. IN ANY INSTANCES WHERE THE CLEARANCE BETWEEN THE TOP OF THE EXISTING PIPE AND THE BOTTOM OF THE CROSSING PIPE OR CONDUIT IS LESS THAN 18", CONTRACTOR SHALL INSTALL BLANKET PROTECTION IN ACCORDANCE WITH THE STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION NO. 224-2.

EXISTING FACILITY NOTE

THESE PLANS HAVE BEEN PREPARED FROM LiDAR DEM AND RECORDED DOCUMENTS FURNISHED BY THE CITY OF NORWALK. A SITE SURVEY WAS NOT PERFORMED AND IS REQUIRED PRIOR TO FINAL DESIGN. ALL EXISTING INFORMATION SHOWN ON THE PLANS PREPARED BY CRAFTWATER HAS BEEN TRANSFERRED FROM DOCUMENTS PROVIDED BY THE CITY OF NORWALK. CRAFTWATER HAS PROVIDED DRAFTING SERVICES ONLY WITH REGARD TO DEPICTING EXISTING IMPROVEMENTS AND CONDITIONS. CRAFTWATER CANNOT GUARANTEE THE ACCURACY OR COMPLETENESS OF EXISTING INFORMATION SHOWN. IF CONTRACTOR NOTICES ANY DISCREPANCIES BETWEEN EXISTING INFORMATION SHOWN ON THESE PLANS AND ACTUAL CONDITIONS, THE CONTRACTOR SHALL GIVE NOTICE OF SUCH FACT TO THE CITY OR ITS REPRESENTATIVE WITHOUT DELAY.

JOB SITE RESPONSIBILITY

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; AND THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT GENERAL NOTES

1. A PERMIT SHALL BE OBTAINED FOR ALL WORK WITHIN THE COUNTY RIGHT OF WAY AND A DEPOSIT PAID TO THE DEPARTMENT OF PUBLIC WORKS AT THE PERMIT COUNTER, 900 SOUTH FREMONT AVENUE 8TH FLOOR, ALHAMBRA AT LEAST 72 HOURS PRIOR TO STARTING WORK UNDER THIS CONTRACT. COPIES OF ALL OTHER REQUIRED PERMITS, SUCH AS FLOOD CONTROL DISTRICT AND ROAD EXCAVATION, MUST BE FILED WITH THE PERMIT APPLICATION.
2. WHEN WORK IS WITHIN A CONTRACT CITY, THE CONTRACTOR MUST CONTACT THE DIRECTOR OF PUBLIC WORKS OF THAT CITY TO DETERMINE THE LOCATION TO PAY THE INSPECTION DEPOSIT.
3. THE CONTRACTOR SHALL CONTACT THE DISTRICT OFFICE LISTED ON THE “APPLICATION FOR STORM DRAIN CONSTRUCTION INSPECTION FORM I” TO ARRANGE FOR AN ACCEPTABLE CONSTRUCTION START DATE.
4. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION, OR THE EXISTENCE OR NONEXISTENCE OF ANY UNDERGROUND UTILITY, PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL SHEETS.
5. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE “STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", INCLUDING SUPPLEMENTS AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE DIRECTOR OF PUBLIC WORKS.
6. THE CONTRACTOR'S ATTENTION IS DIRECTED IN SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION IN REGARD TO SAFETY ORDERS AND SHALL CONFORM TO THE “MINIMUM PUBLIC SAFETY REQUIREMENTS” AS SHOWN ON LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD PLAN 6008-1.

WORK AREA RESTRICTION NOTES

1. ONCE AUTHORIZED BY THE CITY TO COMMENCE WORK WITHIN THE LACFCD STORM DRAIN, THE CONTRACTOR SHALL NOTIFY THE FLOOD MAINTENANCE DIVISION (IMPERIAL YARD) AT TELEPHONE (562) 861-0316 (8:00am TO 4:00pm) AND WATER RESOURCES DIVISION (OPERATIONS SECTION) AT TELEPHONE (626) 458-6177 AND PROVIDE THEM WITH A SCHEDULE OF ACTIVITIES A MINIMUM OF 120 HOURS (5 WORKING DAYS) BEFORE STARTING ANY WORK UNDER THE PERMIT.
2. CONTRACTOR SHOULD BE AWARE THAT IMPROVEMENTS WITHIN THE LACFCD STORM DRAIN MAY OCCUR WHEN LARGE FLOWS ARE PRESENT WITHIN THE LACFCD STORM DRAIN. RAIN GAUGES THROUGHOUT THE WATERSHED SHOULD BE MONITORED DURING ALL WORK WITHIN THE LACFCD STORM DRAIN. CONTRACTOR IS RESPONSIBLE FOR SAFELY DIVERTING AND CONVEYING FLOW WITHIN THE WORK AREA THROUGHOUT THE DURATION OF CONSTRUCTION.
3. PRIOR TO ANY WORK WITHIN THE LACFCD STORM DRAIN, THE CONTRACTOR SHALL SUBMIT A WATER DIVERSION PLAN TO THE CITY AND THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT (LACFCD) TO PROVIDE BYPASS CAPACITY AS FOLLOWS:
   i. APRIL 16 TO MAY 31: xx.xx CFS (xx%)
   ii. JUNE 1 TO AUGUST 31: xx.xx CFS (xx%)
   iii. SEPTEMBER 1 TO OCTOBER 14: xx.xx CFS (xx%)
   iv. NO WORK WILL BE ALLOWED IN THE LACFCD STORM DRAIN DURING THE PERIOD OF OCTOBER 15 - APRIL 15

   PLEASE SEE PERMIT POLICY DURING THE STORM SEASON (http://www.ladpw.org/ldd/lib/fp/permits/permit%20policy%20during%20the%20storm20%season.pdf) FOR MORE DETAILS.
4. THE CONTRACTOR SHALL SUBMIT THE WATER DIVERSION PLAN A MINIMUM OF 60-DAYS PRIOR TO THE ANTICIPATED START DATE OF THE WORK TO OCCUR WITHIN THE STORM DRAIN. THE WATER DIVERSION PLAN IS REQUIRED TO BE REVIEWED AND APPROVED BY THE CITY AND LACFCD.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM NOTES

1. IN THE CASE OF EMERGENCY, CALL XXXXXXXX, CITY OF NORWALK CITY ENGINEER AT (XXX) XXX-XXXX.
2. SEDIMENT FROM AREAS DISTURBED BY CONSTRUCTION SHALL BE RETAINED ON SITE USING STRUCTURAL CONTROLS TO THE MAXIMUM EXTENT PRACTICABLE.
3. STOCKPILES OF SOIL SHALL BE PROPERLY CONTAINED TO MINIMIZE SEDIMENT TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES OR ADJACENT PROPERTIES VIA RUNOFF, VEHICLE TRACKING OR WIND.
4. ALL WORK SHALL BE IN ACCORDANCE WITH THE PROJECT APPROVED STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
5. THE CONTRACTOR IS REQUIRED TO PREPARE AND SUBMIT THE SWPPP FOR APPROVAL BY THE CITY.

craftwater engineering, inc.
www.craftwaterinc.com
10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

GENERAL NOTES

PROJ:	19002 - Hermosillo
DESN:	M. Taylor
DRWN:	R. Martinez
CHKD:	O. Galang

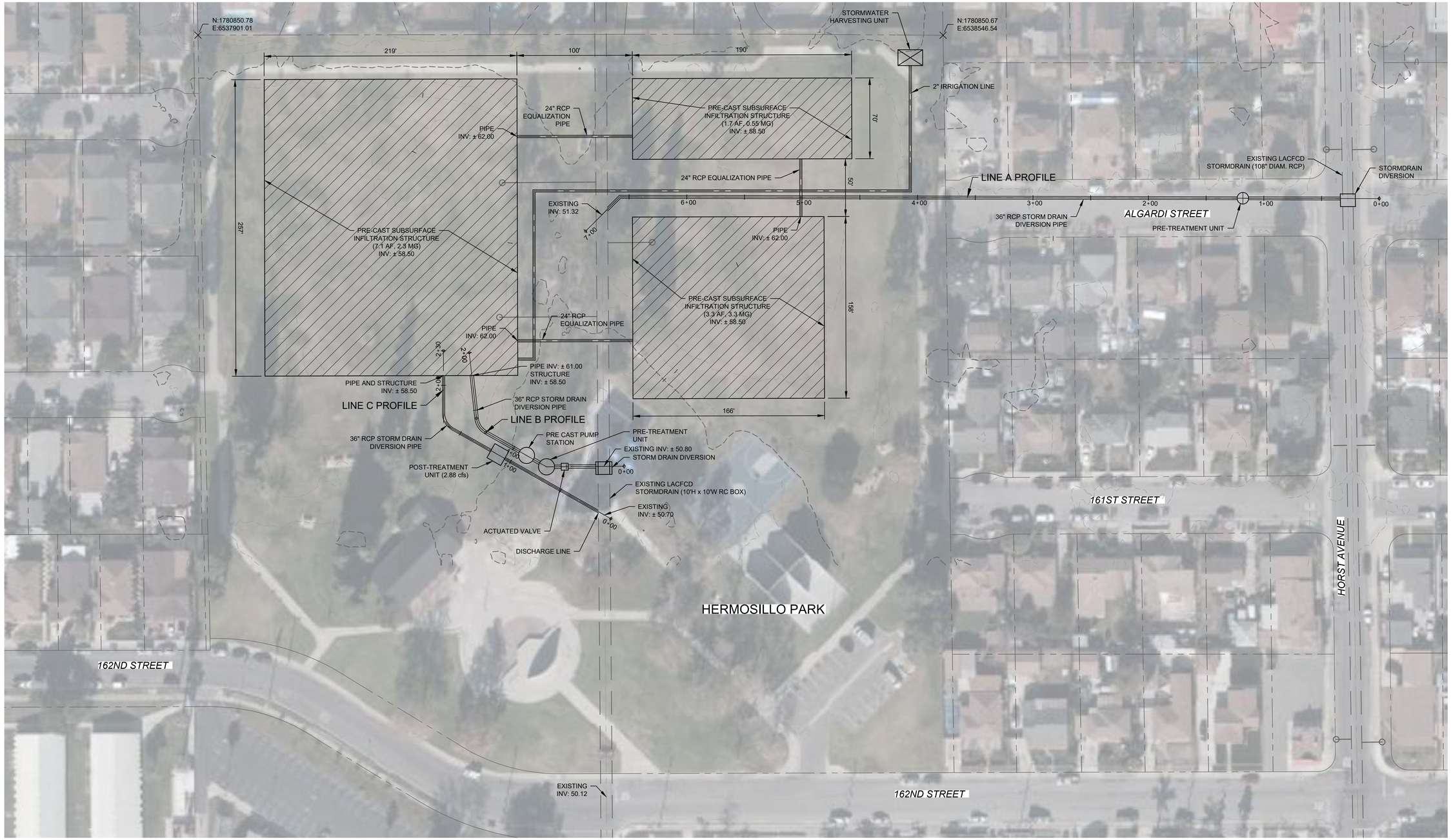
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SCALE: 1" = 40'

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10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

SITE PLAN

PROJ:	19002 - Hermosillo
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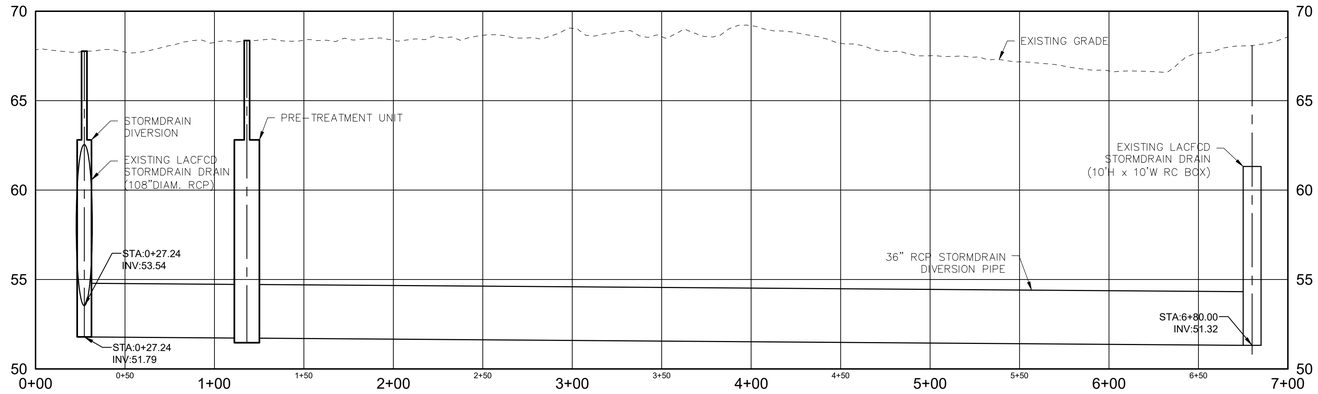
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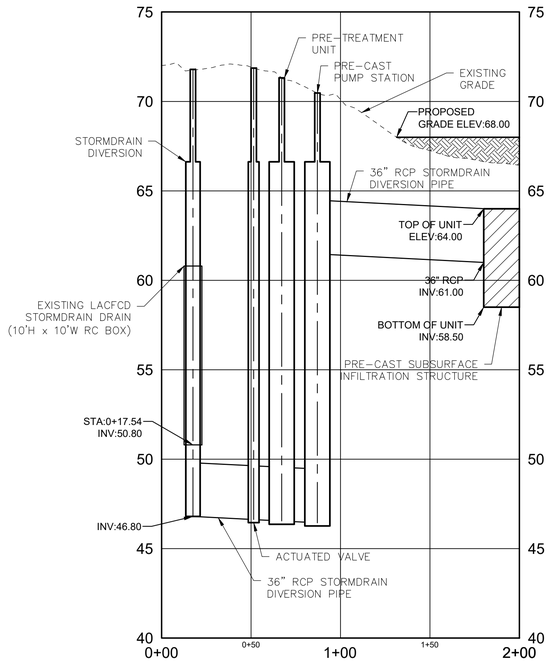
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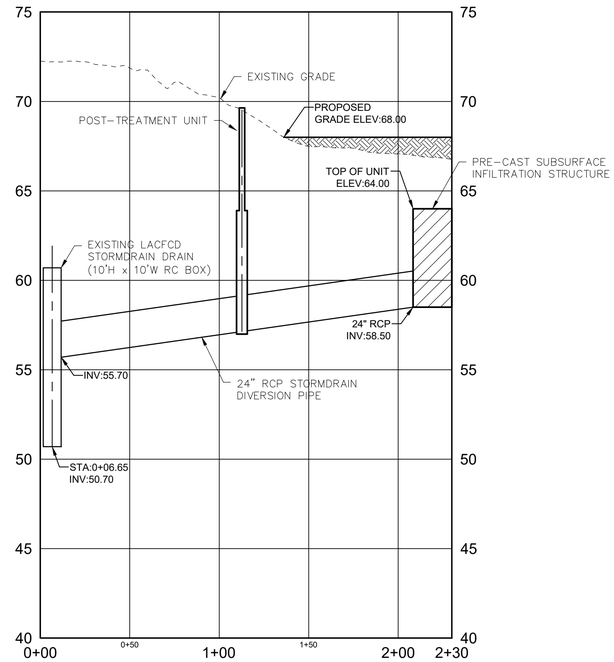
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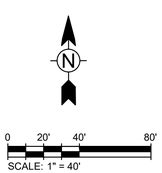
LINE A PROFILE
VERTICAL SCALE: 1"=4'



LINE B PROFILE
VERTICAL SCALE: 1"=4'



LINE C PROFILE
VERTICAL SCALE: 1"=4'



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(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

LINE A, B AND C PROFILES

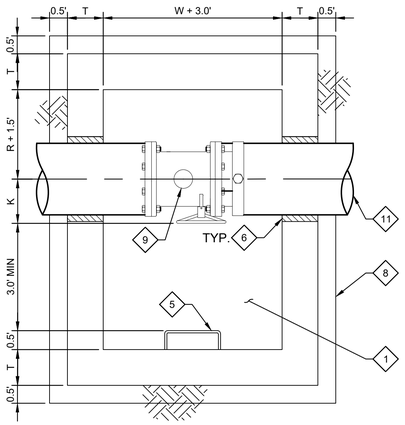
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C-02
SHEET 04 OF 05

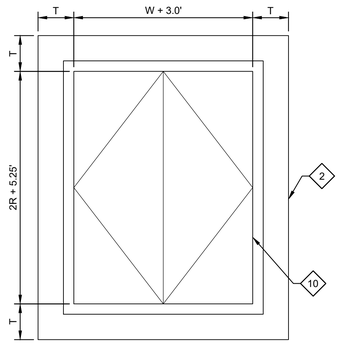
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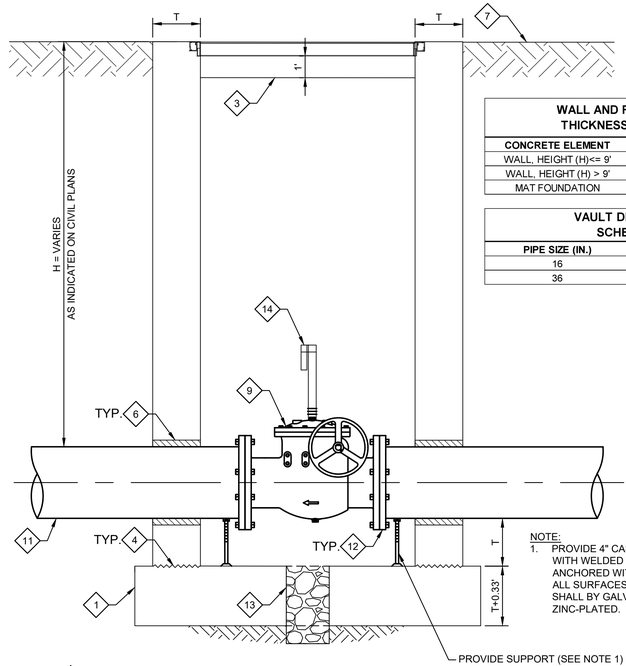
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FOUNDATION PLAN FOR
ACTUATED VALVE VAULT



ROOF PLAN FOR
ACTUATED VALVE VAULT



WALL AND FOUNDATION THICKNESS SCHEDULE	
CONCRETE ELEMENT	THICKNESS (IN.)
WALL, HEIGHT (H)<= 9'	T = 12
WALL, HEIGHT (H) > 9'	T = 16
MAT FOUNDATION	T + 4

VAULT DIMENSION SCHEDULE	
PIPE SIZE (IN.)	DIMENSION (IN.)
16	K = 13.0; R = 8; W = 17.75
36	K = 21.7; R = 18; W = 52

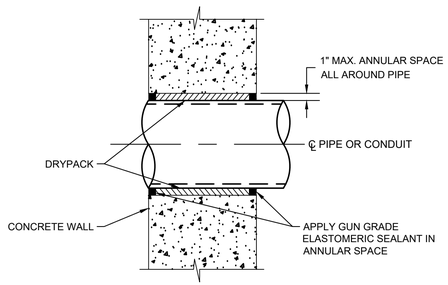
NOTE:
1. PROVIDE 4" CAST IRON PIPE SUPPORT WITH WELDED BASE PLATE ANCHORED WITH 3/4" DIA. X 5" BOLTS. ALL SURFACES OF PIPE SUPPORT SHALL BY GALVANIZED OR ZINC-PLATED.

VAULT VALVE SECTION

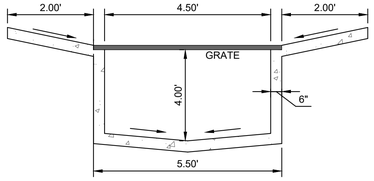
KEYNOTES:

1. CONCRETE MAT FOUNDATION
2. CONCRETE WALL
3. 1'-0" DEEP CONCRETE ROOF BEAM W/ 3 - #8 BOTTOM LONGITUDINAL BARS, 3 - #5 TOP LONGITUDINAL BARS & #4 STIRRUPS AT 1'-0" O.C.
4. ROUGHENED SURFACE
5. S.S. LADDER PER SPPWC STD. PLAN 635-3
6. PENETRATION SEAL - SEE DETAIL 2 HEREON
7. FINISHED GRADE
8. EDGE OF FOUNDATION
9. ELECTRIC ACTUATED PLUG VALVE
10. BILCO TYPE "JD-AL H20" ALUMINUM DOUBLE LEAF EQUIPMENT HATCH WITH LIFT ASSIST AND INTEGRATED FALL PROTECTION GRATING OR APPROVED EQUAL
11. PIPE SIZE AND MATERIAL - SEE CIVIL SHEETS FOR TYPE, SIZE, AND LOCATIONS
12. STEEL FLANGE ADAPTER FOR CONNECTION FROM REINFORCED CONCRETE PIPE TO ACTUATED PLUG VALVE
13. 1.0' DIA x 2.0' DEEP FRENCH DRAIN WITH 1.5" GRAVEL
14. ACTUATOR

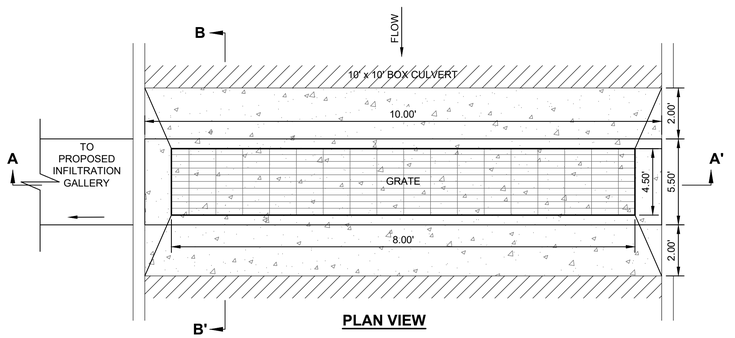
1 – ACTUATED VALVE STRUCTURE (>12" DIA. PIPE)
NTS



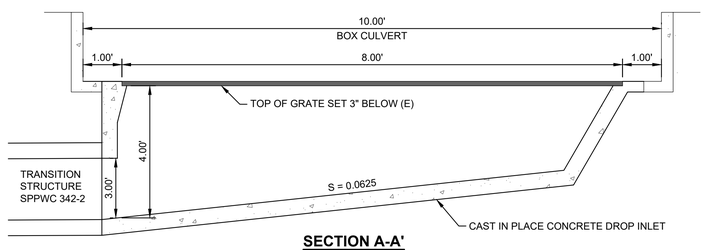
2 – PENETRATION SEAL AT WALL
NTS



SECTION B-B'

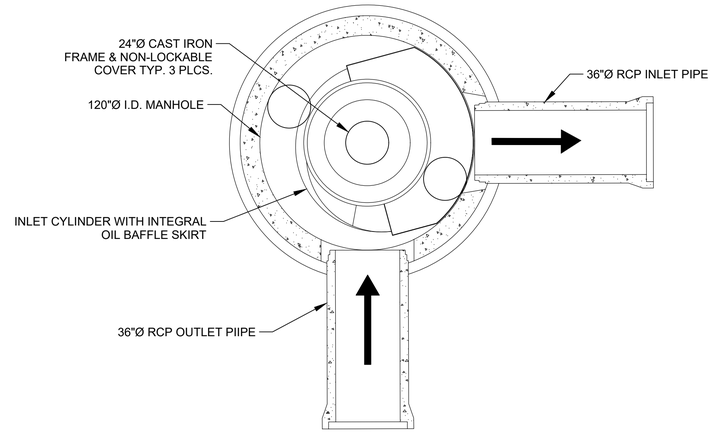


PLAN VIEW

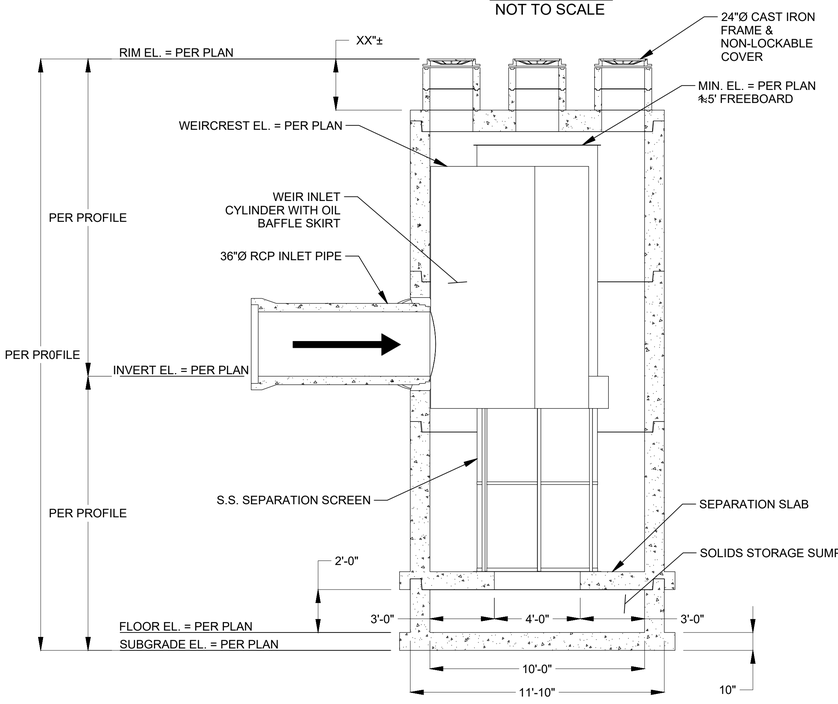


SECTION A-A'

3 – GRATED DROP INLET
NTS



PLAN VIEW
NOT TO SCALE



PROFILE VIEW
NOT TO SCALE

HYDRAULIC AND TREATMENT FLOW DESIGN :

STORMWATER QUALITY DESIGN FLOW (SQDF) - NO BYPASS	50 CFS

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS .

TREATMENT :

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE :
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

4 – HYDRODYNAMIC SEPARATOR (TYPICAL)
NTS

craftwater engineering, inc.
www.craftwaterinc.com
10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

DETAILS

PROJ:	19002 - Hermosillo
DESN:	M. Taylor
DRWN:	R. Martinez
CHKD:	O. Galang

C-03
SHEET 05 OF 05

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Bar Measures 1 inch, otherwise drawing not to scale

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LEGEND

KEY DESCRIPTION

1.0 PARK FEATURES

- 1.1 UPPER TERRACE FOR GROUP GATHERINGS & SPECTATORS
- 1.2 AMPHITHEATRE AND COMMUNITY EVENT SPACE
- 1.3 WALKING PATHS (LIGHTED)
- 1.4 SPLASH PAD
- 1.5 PICNIC TABLE
- 1.6 BIKE RACK
- 1.7 DRINKING FOUNTAIN
- 1.8 LITTER RECEPTACLE
- 1.9 ENTRY MONUMENT
- 1.10 TREE WELL
- 1.11 OUTDOOR PLAZA
- 1.12 GROUP BBQ FACILITIES

2.0 PLAYGROUND

- 2.1 EXISTING PLAY EQUIPMENT & PLAY SURFACING TO REMAIN
- 2.2 PORTION OF EXISTING PLAYGROUND TO ADJUSTED ACCOMMODATE SOCCER PITCH

3.0 FIELD SPORTS

- 3.1 SOCCER PITCH - 2 NATURAL TURF FIELDS (U19)
- 3.2 SOCCER PITCH (OVERLAY) - 4 FIELDS (U8)
- 3.3 30' HIGH SPORTS NETTING
- 3.4 SPORTS FIELD LIGHTING
- 3.5 CONCRETE BLEACHER SEATING

4.0 SPORT COURTS

- 4.1 BASKETBALL COURT (1 - FULL COURT & 1- 1/2 COURT)
- 4.2 HANDBALL COURTS (3- COURTS)

5.0 BUILDINGS & STRUCTURES

- 5.1 COMMUNITY CENTER (8500 SF)
  TOTAL ESTIMATED OCCUPANCY LOAD: 208 PEOPLE
  MULTI-PURPOSE ROOM: 3970 SF
  STAFF OFFICE SPACE: 280 SF
  POLICE SUB-STATION: 280 SF
  RESTROOM (MEN & WOMEN): 1225 SF
  STORAGE: 670 SF
- 5.2 SHADE CANOPY (3800 SF)
  (TENSILE FABRIC TYPE STRUCTURE)

6.0 PEDESTRIAN CIRCULATION

- 6.1 PAVED WALKWAYS (MINIMUM 8' WIDE)
- 6.2 EXERCISE PATH WITH TRAIL MARKERS - .4 MILE LOOP
- 6.3 EXISTING PERIMETER WALK TO REMAIN
- 6.4 PEDESTRIAN CROSSING

7.0 VEHICULAR CIRCULATION

- 7.1 EXPANDED PARKING LOT (NET GAIN: 135 SPACES)
- 7.2 EXISTING PARKING LOT ENTRY & EXIT TO REMAIN
- 7.3 NEW PARKING LOT ENTRY & EXIT

CONCEPT PLAN

HERMOSILLO PARK

CITY OF NORWALK

David Volz Design
Landscape Architects and Park Planners

APRIL 2019



ATTACHMENTS FOR SECTION 2.2:

CAPTURE AREA

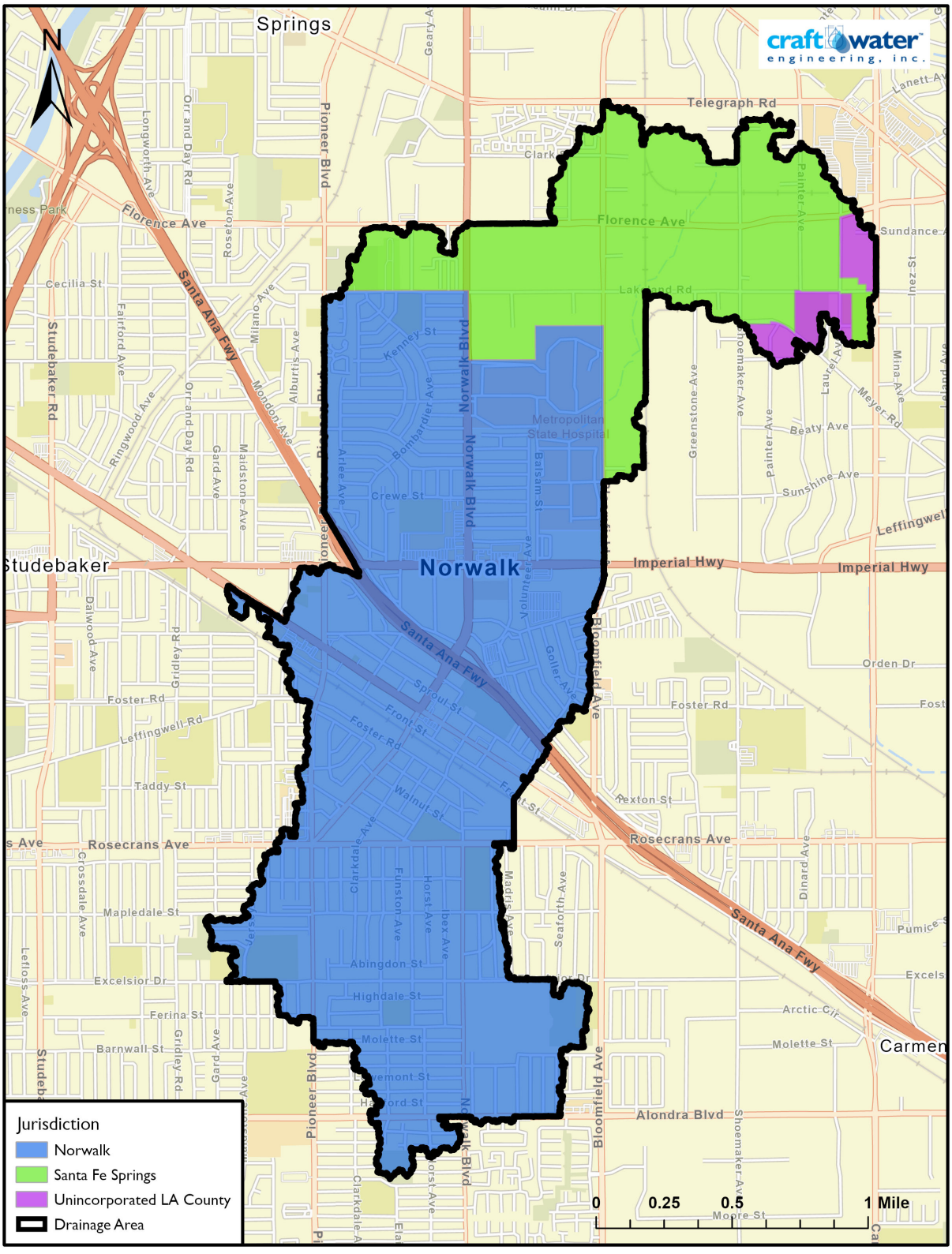


Figure 7. Drainage area jurisdiction boundaries for Hermosillo Park project

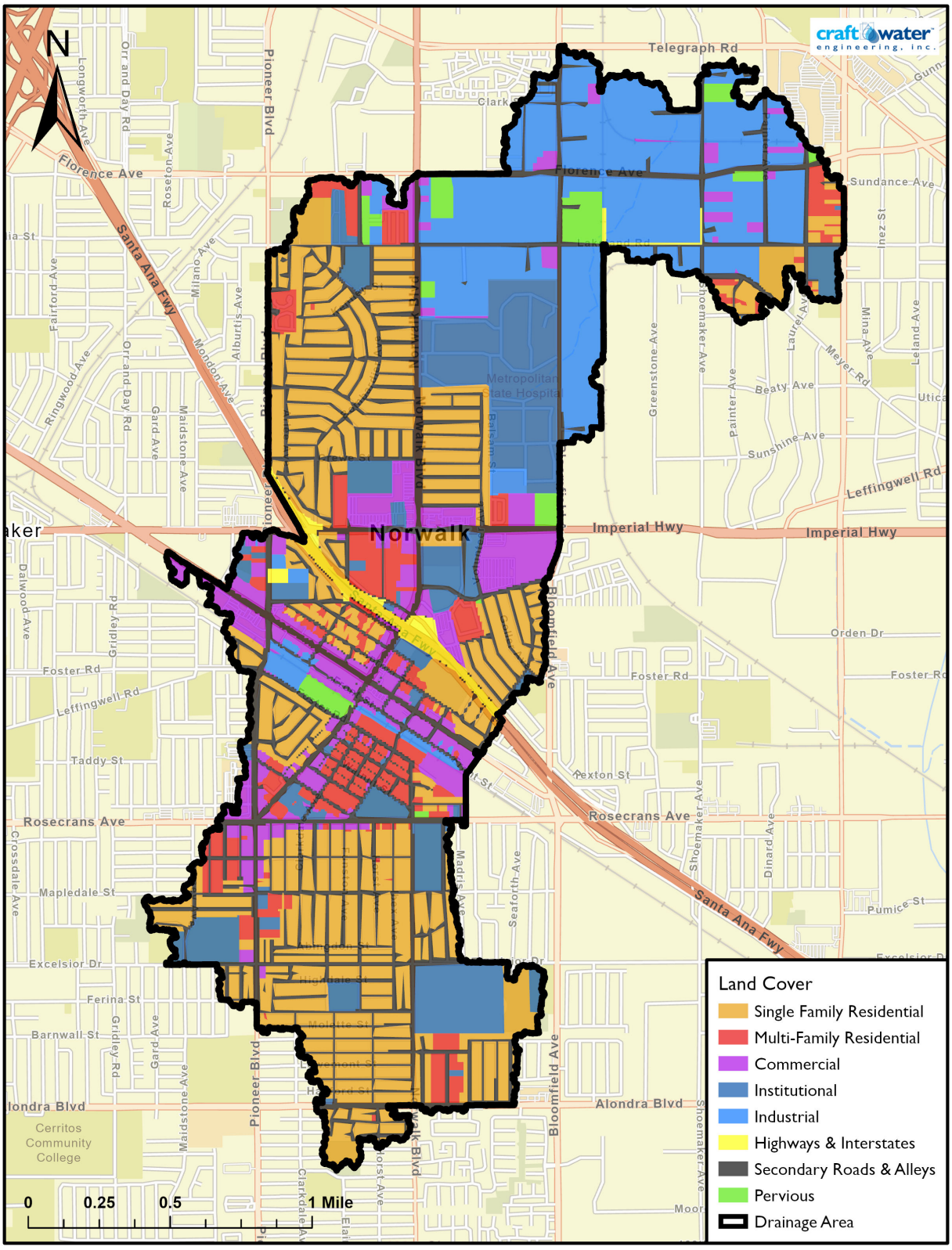


Figure 8. Drainage area land use for the Hermosillo Park project.



ATTACHMENTS FOR SECTION 2.4:

SITE CONDITIONS & CONSTRAINTS

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(562) 799-9469 Fax (562) 799-9459

December 1, 2016 Project Number 19267-16

John L. Hunter and Associates, Inc.
6131 Orangethorpe Avenue, Suite 300
Buena Park, California 90620

Attn: John L. Hunter, P.E.

RE: **Soil Infiltration Study** – Hermosillo Park at 11959 162nd Street, in the City of Norwalk, California

Dear Mr. Hunter:
Pursuant to your request, this firm has performed a Soil Infiltration Study for the above referenced project. The purpose of this study is to evaluate the feasibility of an on-site disposal system utilizing an infiltration vault. The scope of work included the following: 1) site reconnaissance; 2) subsurface geotechnical exploration; 3) infiltration testing; 4) engineering analysis of field data; and 5) preparation of this report.

Proposed Infiltration System

It is proposed to install an infiltration vault system in park area in order to retain and infiltrate water runoff into the subsurface soils. Depth of system is assumed to be within the upper 15 feet below grade. Depth of system will be limited by existing groundwater at approximately 26.5 feet below grade.

Site Description

The property is located north of 162nd Street at the intersection with Elaine Avenue, in the City of Norwalk, as shown on Figure 1. The site is a city park with community building, parking lots and sports courts and concrete walks. The area of the planned infiltration system is currently used as a soccer field. The land is relatively level and drainage appears to remain in the soccer field area.

Groundwater

Groundwater was encountered at a depth of 26.5 feet in our subsurface exploration B-1. Research of the *California Department of Conservation – Division of Mines and Geology Seismic Hazard Zone Report 037, Plate 1.2,* indicates a historic high groundwater level of 8 feet below ground surface in the vicinity.

Methodology and Procedures

A truck mounted hollow stem auger drilling rig was used to excavate the test borings. The locations of the tests are shown on the attached Figure 2.

Two infiltration test borings (B-2 and B-3) to depths of 10 and 15 feet, respectively, below ground surface (bgs) were performed in order to establish preliminary infiltration rates for the design of the system. The borings encountered less than 12 inches of fill soils, as measured from existing surface, overlying medium dense and damp native soils classifying as slightly silty SAND. Some gravel was also encountered below 9.5 feet.

Detailed descriptions of the subsurface soils are shown on the attached boring logs in Appendix B. The test borings were backfilled with the excavated soils and tamped at the completion of our field testing.

The test borings consisted of a 6-inch diameter hole. A 2-inch diameter perforated PVC casing with solid end cap was installed in the borings and then surrounded with gravel materials to prevent caving. The boreholes were then filled with water for pre-soaking purposes. Based upon the rapid drop in the water level in the initial pre-soak period, the holes were measured at 10-minute maximum intervals for eight additional readings.

The measurements were obtained by using an electronic tape measure with 1/16-inch divisions and timed with a stopwatch.

Discussion of Results

Based upon the results of our testing, the underlying soils exhibit various percolation rates based on the amount of fines in the soil layers. The field infiltration test data and our infiltration rate calculations are listed below and included in Appendix B.

Test No.	Depth (feet bgs)	Soil Type	Infiltration rate
B-2	10	slightly silty SAND	37.1 in/hr
B-3	15	slightly silty SAND	28.0 in/hr

The soils at 10 and 15 feet below grade are deemed suitable for infiltration.

a) The reduction factor - $R_f = CF_t$ and Rf = 2.63 to 3.0 for the field infiltration test.

b) CF_v = 1.0 based on silty sand soils encountered in the test borings at depths of 10 and 15 feet.

CF_s = 2.0 for long-term siltation, plugging and maintenance. The silty SAND soils are likely to have some plugging and regular maintenance of storm water discharge devices is required.

For design considerations, an infiltration rate of 14 in/hr may be used for soils at 10 to 15 feet below grade.

The potential of settlement of proposed or existing structures located at least 10 feet from any infiltration pit is low. In addition, the potential for hydro-consolidation and the susceptibility for any ground settlements are considered low. All systems shall meet the California Regional Water Quality Control Board (CRWQCB) requirements.

Closure

The use of an on-site disposal system appears to be geotechnically feasible for future development provided the low infiltration rates as give are used in the design. All systems must meet the California Regional Water Quality Control Board (CRWQCB) requirements. The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations.

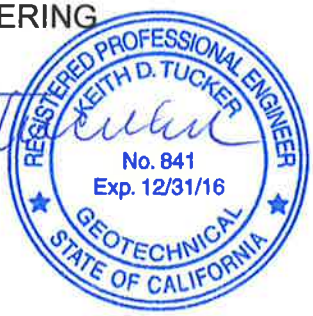
No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase.

This firm should have the opportunity to review the final plans to verify that all our recommendations are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

This study has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING



Keith D. Tucker
Project Engineer
R.G.E. 841

Mark A. Burkholder
Project Manager

List of Appendices
(in order of appearance)

Appendix A

- Vicinity Map and Site Plan

Appendix B

- Log of Groundwater Verification Boring B-1
- Logs of Test Borings B-2 and B-3
- Infiltration Field Test Data
- Infiltration Test Calculations

Appendix A



NorCal Engineering

SOILS AND GEOTECHNICAL CONSULTANTS

VICINITY MAP

PROJECT 19267-16 | DATE 11/2016

FIG. 1

Draft: Hermosillo Storm Water Treatment



N

NTS

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 19267–16 | DATE 11/2016

LOCATION OF FIELD EXPLORATIONS

FIG. 2

Appendix B

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL, SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINE (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

KEY:

- ■ Indicates 2.5-inch Inside Diameter. Ring Sample.
- ⊠ Indicates 2-inch OD Split Spoon Sample (SPT).
- ⧅ Indicates Shelby Tube Sample.
- ◫ Indicates No Recovery.
- ◧ Indicates SPT with 140# Hammer 30 in. Drop.
- ⊠ Indicates Bulk Sample.
- ◩ Indicates Small Bag Sample.
- ◨ Indicates Non-Standard
- ⊠ Indicates Core Run.

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1 - 5%
Few	5 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5mm) to No. 200 (0.074mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHESIONLESS SOILS		COHESIVE SOILS		
Density	N (blows/ft)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	Very Soft	0 to 2	< 250
Loose	4 to 10	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	Very Stiff	15 to 30	2000 - 4000
		Hard	over 30	> 4000

John L Hunter & Associates
19267-16

Log of Boring B-1

Boring Location: 11959 162nd St, Norwalk

Date of Drilling: 11/18/16 | Groundwater Depth: 26.5'

Drilling Method: Drill Rig

Hammer Weight: | Drop:

Surface Elevation: Not Measured

GROUNDWATER VERIFICATION BORING

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Relative Compaction
0		FILL SOILS Silty SAND with occasional gravel Brown, medium dense, damp					
		NATURAL SOILS Slightly silty SAND Light brown, medium dense, damp					
5							
		Some gravel below 9.5'					
10							
		Silty SAND Brown, medium dense, moist					
15							
20							
		Sandy SILT Grey, medium stiff, moist Wet to saturated with depth					
25							
		Boring completed at depth of 29'					
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\19267-16.log Date: 11/30/2016

NorCal Engineering

John L Hunter & Associates 19267-16	Log of Boring B-2
Boring Location: 11959 162nd St, Norwalk	
Date of Drilling: 11/18/16	Groundwater Depth: None Encountered
Drilling Method: Drill Rig	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Relative Compaction
0		FILL SOILS Silty SAND with occasional gravel Brown, medium dense, damp					
		GWT not encountered					
		NATURAL SOILS Slightly silty SAND Light brown, medium dense, damp; with some gravel below 9.5'					
5							
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\19267-16.log Date: 11/30/2016

John L Hunter & Associates
19267-16

Log of Boring B-3

Boring Location: 11959 162nd St, Norwalk

Date of Drilling: 11/18/16 | Groundwater Depth: None Encountered

Drilling Method: Drill Rig

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Relative Compaction
0		FILL SOILS Silty SAND with occasional gravel Brown, medium dense, damp					
		NATURAL SOILS Slightly silty SAND Light brown, medium dense, damp; with some gravel below 9.5'					
5		GWT not encountered					
10							
15		Silty SAND Brown, medium dense, moist Boring completed at depth of 15'					
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\19267-16.log Date: 11/30/2016

NorCal Engineering

NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA
FOR CITY OF LOS ANGELES, ONLY

Client:	**John Hunter – Hermosillo Park**		
Project No:	19267-16	**Tested By:**	M.B.
Test Hole:	B-2	**Date Tested:**	11/18/16
Depth of Test Hole:	10'	**Caving:**	
Diameter of Test Hole:	8"	**Notes:**	
Date Excavated:	11/18/16		

PRE-SOAK

TIME	PRE-SOAK NO.	TIME INTERVAL	TOTAL ELAPSED TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	CHANGE IN WATER LEVEL
7:33	1	3	3	107.0	120.0	13.0
7:36						
7:36	2	5	8	107.0	120.0	13.0
7:41						

PERCOLATION TEST

TIME	PRE-SOAK NO.	TIME INTERVAL	TOTAL ELAPSED TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	CHANGE IN WATER LEVEL
7:41	1	7	7	108.0	120.0	12.0
7:48						
7:48	2	7	14	108.0	120.0	12.0
7:55						
7:55	3	7	21	108.0	120.0	12.0
8:02						
8:02	4	7	28	107.0	120.0	13.0
8:09						
8:09	5	7	35	107.0	120.0	13.0
8:16						
8:16	6	8	43	107.0	120.0	13.0
8:24						
8:24	7	7	50	107.0	120.0	13.0
8:31						
8:31	8	6	56	107.0	120.0	13.0
8:37						

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NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA
FOR CITY OF LOS ANGELES, ONLY

Client:	John Hunter – Hermosillo Park		
Project No:	19267-16	**Tested By:**	M.B.
Test Hole:	B-3	**Date Tested:**	11/18/16
Depth of Test Hole:	15'	**Caving:**	
Diameter of Test Hole:	8"	**Notes:**	
Date Excavated:	11/18/16		

PRE-SOAK

TIME	PRE-SOAK NO.	TIME INTERVAL	TOTAL ELAPSED TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	CHANGE IN WATER LEVEL
9:11	1	5	5	167.0	180.0	13.0
9:16						
9:16	2	9	14	165.0	180.0	15.0
9:25						

PERCOLATION TEST

TIME	PRE-SOAK NO.	TIME INTERVAL	TOTAL ELAPSED TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	CHANGE IN WATER LEVEL
9:25	1	9	9	166.0	180.0	14.0
9:34						
9:34	2	10	19	166.0	180.0	14.0
9:44						
9:44	3	10	29	166.0	180.0	14.0
9:54						
9:54	4	10	39	165.5	180.0	14.5
10:04						
10:04	5	10	49	165.0	179.0	14.0
10:14						
10:14	6	10	59	165.0	179.0	14.0
10:24						
10:24	7	10	69	165.0	179.5	14.5
10:34						
10:34	8	10	79	165.0	179.0	14.0
10:44						

Copyright 2013 M. Barone

SOIL INFILTRATION RATE CALCS ⇒ Auger Boring

Location:	B-2	B-3
• Depth =	10.0'	15.0'
• Hole Dia. =	8"	8"
• Drop = Δd	13"	14"
• Time = Δt Interval	8 min.	10 min
• Preadjusted Perc. Rate	97.5 in/hr	84 in/hr
• Initial Water Depth = d_1	13"	15"
• Reduction Factor = R_f	2.63	3.0
• INFILTRATION RATE	37 in/hr	28 in/hr

$$\text{Infiltration Rate} = \frac{\text{Pre adjusted Perc. Rate}}{\text{Reduction Factor}}$$

$$\text{Reduction Factor} = R_f = \left[\frac{2 \cdot d_1 - \Delta d}{\text{Dia.}}\right] + 1$$

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

DATE

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

MARK PESTRELLA, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: SWP-3

December 12, 2019

Mr. John L. Hunter
City of Norwalk
12700 Norwalk Boulevard
Norwalk, CA 90650

NOTICE OF CONCEPTUAL APPROVAL FOR SAFE, CLEAN WATER PROGRAM CONSIDERATION OF INFRASTRUCTURE PROJECTS FUNDING

Los Angeles County Flood Control District has been engaged to review the following project and is hereby providing conceptual approval:

Hermosillo Park Stormwater Capture Project
City of Norwalk
Lower San Gabriel River

The Project is not currently inconsistent with any District plans, policies, or goals. Conceptual approval for this Project does not indicate the District's consent to support or even permit the Project. If funding is ultimately allocated to the Project, it is required that the developer remain closely engaged with District throughout each subsequent project phase and comply with any eventual applicable agreement and/or permit provisions. Please upload a copy of this letter in the Projects Module application when responding to the Regional Program Call for Projects.

Thank you for your interest in the Safe, Clean Water Program. Please be sure to continue to work with your District Watershed Manager from Los Angeles County Public Works, Julian Juarez. Mr. Juarez can be reached at (626) 458-7149 or jjuarez@pw.lacounty.gov. Ongoing collaboration is imperative. If the subject project is not funded within 2 years from the date of this letter, a new demonstration of conceptual approval will be required before the project can again be considered.

Very truly yours,

MARK PESTRELLA
Chief Engineer
Los Angeles County Flood Control District

KEITH A. LILLEY
Assistant Deputy Director
Stormwater Planning Division

CF:yg
P:\swppub\Secretarial\2019\Letters\District Conceptual Approval Hermosillo.docx

Enc.

Public Works
LOS ANGELES COUNTY

City of Norwalk, Hermosillo Park Stormwater Capture Project Fact Sheet

Project Scope

- Intercept both urban and stormwater flows that drain to LACFCD Drains BI9001 (108-inch RCP) and BI0021 (10-foot x 10-foot RCB) via drop-inlet structure.
- Divert captured flows to a series of three connected precast concrete subsurface infiltration galleries totaling 11.8 ac-ft.
- Install onsite treatment unit to treat captured stormwater for park irrigation.
- Reconstruct existing parking lot with permeable pavement.
- Construct two recreational fields and plant native vegetation and trees.
- Install overflow connection to pump water from storage tank back to existing BI0021 Drain.

Project Benefits

- Improve water quality by reducing polluted runoff entering Coyote Creek and the San Gabriel river through runoff/ pollutant capture and infiltration.
- Offset water demand at the park by reusing treated captured water for irrigation with average annual capture for water supply of 1,079 ac-ft.
- Provide heat island mitigation by planting native trees, shrubs, grasses and installing zero impervious surfaces.
- Improvements to aesthetic and recreational benefits of the park.

Project Location

Hermosillo Park, between 162nd Street and Horst Avenue in the City of Norwalk in Supervisorial District 4.

Preliminary Cost Estimate

- Construction Cost - $11,642,549 and Prop 68 Grant (Recreation) - $785,000

Tentative Milestone Schedule

- September 2020 — Notice to Proceed
- June 2021 — Preliminary Design
- September 2021 — Final Design, Permitting and Environmental
- September 2023 — Construction

Public Works
LOS ANGELES COUNTY





ATTACHMENTS FOR SECTION 2.5:

COST



ATTACHMENTS FOR SECTION 2.7:

MONITORING

Hermosillo Park Monitoring

The routine evaluation and monitoring of inflows and outflows (if any) for water quality is critical. During the 100% design phase, an extensive monitoring plan calling for samples to be collected and analyzed for (at a minimum) TMDL, other MS4 pollutants of concern and related constituents to measure the effectiveness of the treatment system.



ATTACHMENTS FOR SECTION 2.8:

O & M

2.7 MONITORING

This section provides an overview of monitoring data related to the project.

2.7.1 Historic Monitoring

Historic monitoring of the box culvert and pipe has not been performed to date. It is recommended that the dry-weather flows be measured during the design phase of the project to establish baseline conditions for water quality and flow rates.

2.7.2 Project Monitoring Plan

A monitoring plan will be developed as a part of the 100% final design documentation. The monitoring plan will include constituents of concern, monitoring locations including at the diversion point and inflows and outflows of the storage unit. The plan will demonstrate how the estimated benefits outlined in Section 3 and 4 of this report will be evaluated.

2.8 OPERATIONS & MAINTENANCE PLAN

Long-term maintenance of the system is vital to its continued operation. The responsible party for the operation and maintenance of the completed project will be the City of Norwalk.

Table 2-12: Operations & Maintenance Requirements and Costs

Description	No. of Times per Year	No. of Personnel & Hours per Visit	Personnel Expertise Level	Unit Price	Annual Total
Diversion Structure – Inspection & Cleaning	6 (x2)	2 @ 2 hr	Trash Removal crew	$500	$6,000
Pretreatment Device – Vacuum	2 (x2)	2 @ 2 hrs	Vactor Truck Operator	$1,000	$4,000
Wet Well – Dry Season Inspection & Cleaning	3	2 @ 2 hrs	Vactor Truck Operator	$1,000	$3,000
Wet Well – Wet Season Inspection & Cleaning	6	2 @ 2 hrs	Vactor Truck Operator	$1,000	$6,000
Valve Maintenance	1	1 @ 2 hrs	Mechanical Labor	$500	$500
Control Panel Maintenance	1	1 @ 2 hrs	Electrician	$500	$500
Storage – Dry Season Inspection & Cleaning	2	4 @ 5 hrs	Vactor Truck Operator	$4,000	$8,000
Storage – Wet Season Inspection & Cleaning	2	4 @ 5 hrs	Vactor Truck Operator	$4,000	$8,000

A full draft maintenance plan will be developed as a part of the 100% final design. The maintenance plan will include details on equipment needed and standard practices and procedures. The final maintenance plan will be completed at the end of construction when actual brands and part information is made available.

CITY OF NORWALK
A Connected Community

December 10, 2019

Los Angeles County Flood Control District
900 S. Fremont Ave
Alhambra, CA 91803

Letter of Commitment to Operate and Maintain The Hermosillo Park Stormwater Capture Project

Attention Safe Clean Water Program:

This letter was prepared for inclusion with the City's online application to the Safe Clean Water Program to construct a stormwater capture and infiltration regional project at Hermosillo Park. The purpose of this letter is to express the City's commitment to oversee the stormwater capture project including the responsibility for post-construction operations and maintenance.

The Public Services Department manages the city's storm drain infrastructure, sewer system, and streets, and has the capability to oversee the construction of the project as well as maintenance of the resulting stormwater capture facility. Public Services will be responsible for the maintenance of the public-facing aspects of the project, such as the sports fields, play equipment, splash pad, etc.

Collaboratively, the city will ensure that the project is constructed and maintained with integrity.

Sincerely,

Glen W.C. Kau, P.E.
Director of Public Services/City Engineer

cc: Christine Roberto, Public Services Manager
Noel Ford, Utilities Supervisor



ATTACHMENTS FOR SECTION 3.1:

24-HOUR STORM CAPACITY



ATTACHMENTS FOR SECTION 3.2:

EVENT-BASED DESIGN DETAILS



ATTACHMENTS FOR SECTION 3.3:

LONG-TERM PERFORMANCE



ATTACHMENTS FOR SECTION 4.1:

NEXUS

DIRECTORS
JOHN D. S. ALLEN, PRESIDENT
VERA ROBLES DEWITT, VICE PRESIDENT
WILLARD H. MURRAY, JR., SECRETARY
ROB KATHERMAN, TREASURER
SERGIO CALDERON, DIRECTOR

ROBB WHITAKER, P.E., GENERAL MANAGER

December 10, 2019

To: Applicants for Regional Projects
under the Safe Clean Water Fund

Regarding: Water Replenishment District Support for Infiltration Projects

The Water Replenishment District (WRD) is aware that many agencies will be applying for Regional Project funds under the Los Angeles County Flood Control District's Safe Clean Water Fund program. One of the provisions of that application process requires applicants to contact the groundwater management agency for concurrence in support of the proposed project.

The purpose of this letter is to advise those agencies within or overlapping the WRD's jurisdiction that the WRD is in general support of regional projects that infiltrate pre-treated captured runoff and provide a benefit to the overall health of the watershed. Prior to issuing individual support on specific projects, WRD will need additional information regarding the technical specifics of each project, which can be accomplished during your agency's development of the project's final engineering and design.

We look forward to working with our many agency partners on projects that promote healthy watersheds for our region.

Thank you,

Robb Whitaker, P.E.
General Manager



ATTACHMENTS FOR SECTION 4.2:

BENEFIT MAGNITUDE



ATTACHMENTS FOR SECTION 4.3:

COST EFFECTIVENESS



ATTACHMENTS FOR SECTION 5:

COMMUNITY INVESTMENT



ATTACHMENTS FOR SECTION 7.1:

COST SHARE



ATTACHMENTS FOR SECTION 7.2:

LOCAL SUPPORT

Norwalk Community Coordinating Council

Serving the Norwalk Community since 1936

We Believe in Norwalk!

2019-2020
Board of Directors

President
Gordon
Stefenhagen

VP Ways & Means
Lupe Flores

Communications
Vanessa Landin

Community Liaison
Bob Arthur

Historian
Marlene Hardy

Secretary
Richard LeGaspi

Programs
Espie Free

Treasurer
Gloria Rodriguez

Scholarships
Lori Altman

Email us at:
nccc@usa.com

Facebook:
NCCC1936

Instagram:
NCCC_CA

Non-Profit 501(c)3
Federal Tax I.D. #
95-4651463

December 12, 2019

City of Norwalk
12700 Norwalk Blvd.
Norwalk, CA 90650

To Whom it May Concern:

The Norwalk Community Coordinating Council is a local non-profit dedicated to serving the community of Norwalk for over 70 years. We partner with the City to provide resources and support to the residents of Norwalk and those of the surrounding communities.

We have learned of the City's efforts to seek grant funding to improve programs and infrastructure at Hermosillo Park, and are looking forward to the opportunity to once again partner with Norwalk on providing the constituents with improved amenities and a higher quality of life.

On behalf of the Board of Directors of the Norwalk Community Coordinating Council, we would like to formally give our support for any Hermosillo Park project brought forth through acquired grant funding. We are aware of the need for Hermosillo Park improvements and are anticipating great things to come from these potential funding opportunities.

Sincerely,

Gordon Stefenhagen

Gordon Stefenhagen, NCCC President

NCCC Mission Statement: The NCCC acts as an umbrella organization and communication tool for all non-profits in the City of Norwalk and also supports the community by assisting with a variety of social service projects.



ATTACHMENTS FOR SECTION 8.1:

ENVIRONMENTAL DOCUMENTS AND PERMITS

ORIGINAL FILED
SEP 17 2019
LOS ANGELES, COUNTY CLERK

CITY OF NORWALK
A Connected Community

12700 Norwalk Blvd.
Norwalk, CA 90650
Tel.: (562) 929-5744

NOTICE OF CATEGORICAL EXEMPTION

Project Title: Hermosillo Park – Upgrade/Improvement Project

Project Applicant: City of Norwalk

Project Location: 11959 162nd St, Norwalk, CA 90650

Project Description: The project includes the upgrade and improvement of facilities at an existing park known as Hermosillo Park. Upgrades and improvements to Hermosillo Park include, but are not limited to, replacement and construction of a community center, refurbishment of active and passive play areas/fields/courts and picnic areas. Also included is refurbishment or construction of accessory structures, such as restrooms, fitness stations, parking lot improvements, upgrades in lighting, and water efficient landscape and irrigation. The project also includes community visioning, engagement, and surveys for the proposed improvements.

Approving Project: City of Norwalk

Exempt Status: This project will not have a significant effect on the environment and is listed under the City of Norwalk Local CEQA Guidelines. The project is exempt based on the following Categorical Exemptions: Class 3, Subsections C and E, Class 4, Subsection B, and Class 11, Subsection B, Categorical Exemptions from the requirements of the California Environmental Quality Act.

Class 3, consists of construction or installation of small facilities or structures. Specifically, Subsection C includes buildings not exceeding 10,000 square feet in floor area on sites zoned for such use if not involving the use of significant amounts of hazardous substances where all necessary public services and facilities are available and the surrounding area is not environmentally sensitive. The proposed community center is approximately 8,300 square feet in size and replaces an existing 1,600 square foot building. Subsection E consists of accessory (appurtenant) structures which include play areas, sports fields and courts, picnic areas, shade structures, fitness stations, and lighting, which will be improved and upgraded as part of the project.

Class 4 consists of minor public or private alternations in the condition of land, water and or vegetation which do not involve the

removal of healthy mature, scenic trees. Specifically, Subsection B includes new gardening or landscaping, including the replacement of existing conventional landscaping with water efficient landscaping.

Class 11 consists of construction, or placement of minor structures accessory to (appurtenant to) existing commercial, industrial, or institutional facilities. Specifically, Subsection B applies to small parking lots, where the parking will be expanded to allow for more parking at the park site.

Date: September 4, 2019

Prepared by: Christine Roberto, Public Services Manager

9/16/19
Date

Michael L. Garcia
Michael L. Garcia
Director of Community Development

Dean C. Logan
Los Angeles County Registrar / Recorder
12400 Imperial Highway, Norwalk, CA
(800)201-8999

BUSINESS FILINGS REGISTRATION

NORWALK DEPARTMENT HEADQUARTER

Cashier: A. MOVSISYAN

20190917125001 1

Tuesday, September 17, 2019 10:18 AM

Item(s)

Fee	Qty	Total
NoE - County Posting Fee 2019250372	1	$75.00

Total **$75.00**

Total Documents: 1

Customer payment(s):

Credit Card $75.00

09/17/2019 10:19 AM PDT

LOS ANGELES CO Rev/CC NORWALK BUSINESS FILINGS
12400 IMPERIAL HIGHWAY
NORWALK, CA 90650

TERMINAL NAME: E3469303

ORDER #: 96346702

PAYMENT

BUSINESS FILINGS $75.00
201909171250011

AGENCY SUBTOTAL: $75.00
LEXISNEXIS SERVICE FEE: $1.75

TOTAL USD: $76.75

CARD #: 1681 VISA
PAYMENT: CREDIT CHIP READ-CONTACT
MODE: ISSUER
MID: x469x
TID: xxxxxxxxx160
AUTH CODE: 000075
APP LABEL: VISA CREDIT
CVM: NO SIG REQUIRED
AID: A0000000031010
TC: 7FB0894CB9E36FCF
AMOUNT: $76.75

xxx CARD APPROVED xxx

---

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

AMOUNT PAID:
$76.75

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

CUSTOMER COPY



ATTACHMENTS FOR SECTION 8.2:

VECTOR MINIMIZATION

EXCERPT: SECTION 8.2 OF THE PRELIMINARY DESIGN REPORT:

VECTOR MINIMIZATION

As a part of final design, the City will review the design documents with the Greater LA County Vector Control District to ensure that the system meets all requirements and minimizes the potential for vector increases.



ATTACHMENTS FOR SECTION 8.6:

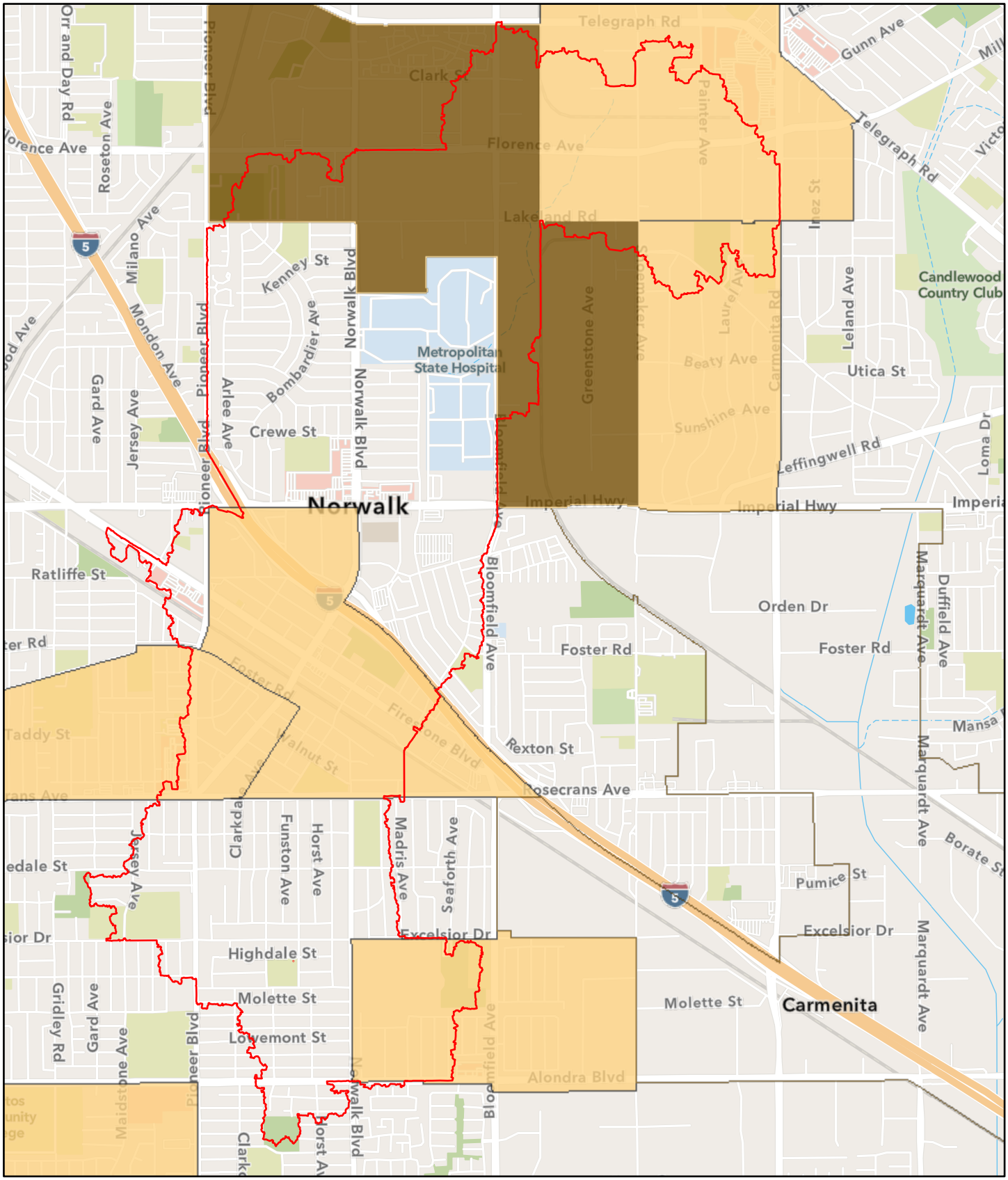
TECHNICAL REPORTS



ATTACHMENTS FOR SECTION 8.7:

OTHER

Hermosillo Park Disadvantaged Communities (DAC)



Disadvantaged Communities - Tract 2016

- Data Not Available
- Severely Disadvantaged Communities (MHI < $38,270)
- Disadvantaged Communities ($38,270 >MHI< $51,026)

0 0.25 0.5 1 mi
0 0.4 0.8 1.6 km

Hermosillo Park Drainage Area

- Drainage Outline

John L. Hunter AND ASSOCIATES, INC.

SCWF

HERMOSILLO PARK PROJECT

Preliminary Design Report – Hermosillo Park

Hermosillo Park

November 6, 2019





John L. Hunter and Associates, Inc.
6131 Orangethorpe Avenue, Suite 300
Buena Park, CA 90629

craft water engineering, inc.

HERMOSILLO PARK PROJECT

PRELIMINARY DESIGN REPORT

November 27, 2019

PRESENTED TO

John L. Hunter and Associates, Inc.
6131 Orangethorpe Avenue, Suite 300
Buena Park, CA 90629

PRESENTED BY

Craftwater Engineering, Inc.
San Diego | Los Angeles
Tel 805.729.0943
www.craftwaterinc.com

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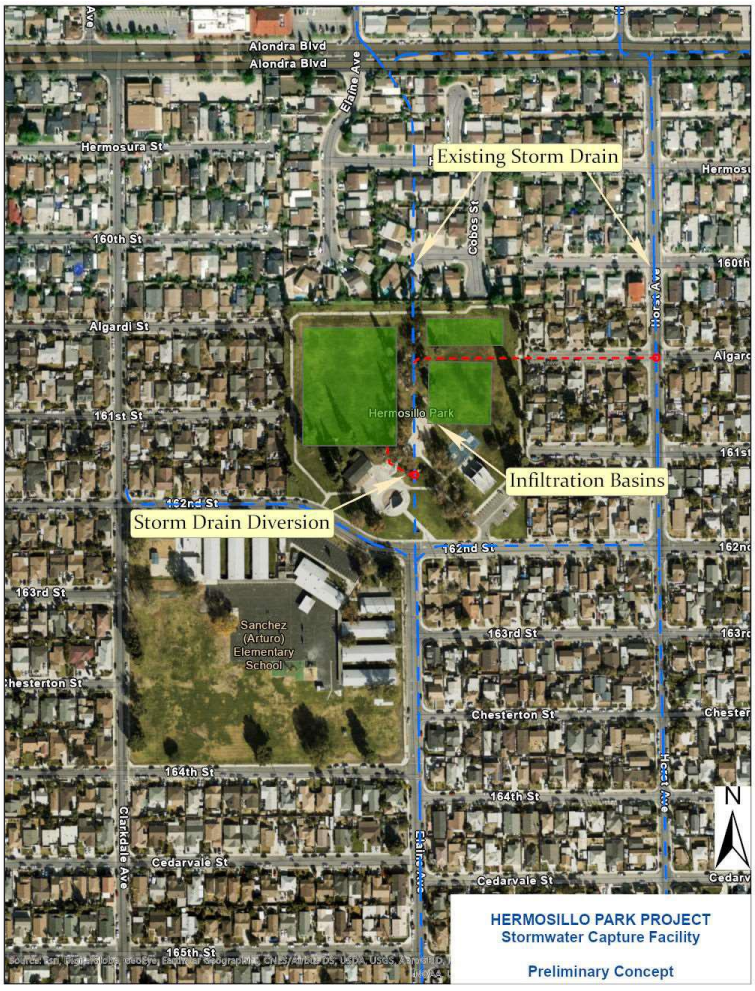
ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
ac-ft	acre-feet
BMP	Best Management Practice
cfs	cubic feet per second
EPA	Environmental Protection Agency
ft	feet
GIS	Geospatial Information System
hr	hour
in	inch
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LiDAR	Light Detection and Ranging
LSGR	Lower San Gabriel River
LSGR WMP	Lower San Gabriel River Watershed Management Program
LSPC	Loading Simulation Program C++
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
RAA	Reasonable Assurance Analysis
SUSTAIN	System for Urban Stormwater Treatment and Analysis Integration
TMDL	Total Maximum Daily Loads
WMMS	Watershed Management Modeling System
WMP	Watershed Management Program

1.0 GENERAL INFORMATION

The Lower San Gabriel River Watershed Management Program (LSGR WMP) Group, which includes the City of Norwalk, has been charged with achieving reductions of pollutants in the San Gabriel River, Coyote Creek, and San Jose Creek waterbodies. In accordance with the plans outlined in the LSGR WMP, a regional project has been identified at Hermosillo Park in the City of Norwalk. The project is intended to intercept the dry-weather flow and a sizeable portion of the stormwater flows from the BI9001 (Horst Avenue 108 inch reinforced concrete pipe [RCP]) and BI0021 (park bisecting 10 foot x 10 foot reinforced concrete box culvert [RCB]) drains prior to discharging into the Coyote Creek channel.

The objective of this report is to provide 10% design-level documents that will ultimately guide the development of the 100% detailed design documents and project implementation. The project concepts presented herein were optimized to meet the needs of the LSGR WMP Group, as demonstrated by supporting technical design, hydrologic, hydraulic, and water quality analytics. This document demonstrates full consideration of the technical challenges for this project as well as creative solutions that overcome these challenges by ensuring the technical feasibility of the project and positioning the design for future grant-funding with a clear demonstration of effectiveness and constructability.



While there are many options for the Hermosillo Park Project, the recommended option given the full range of identified outcomes and constraints for this project is an 11.8 ac-ft subsurface infiltration gallery that will provide stormwater capture and treatment while also adding to local natural amenities and plans for the park area. This stormwater infiltration gallery will feature the following key components:

- 50 cfs diversion at Horst Ave. with drop-inlet structure that routes by gravity to the BI0021 RCB line,
- 50 cfs diversion on BI0021 with drop-inlet structure that routes by pumping to the storage structure,
- Pretreatment at the BI9001 diversion and the BI0021 diversion to ensure effective pollutant reduction and minimized maintenance frequency,
- A series of up to 3 connected subsurface infiltration galleries totaling 11.8 ac-ft with equalizing pipes between where utility conflicts exist,
- Pumped emergency outflows with storage emptying into existing BI0021 RCB line.

This BMP will provide substantial pollutant reduction for runoff to Coyote Creek with an estimated 10-year total cost of $16,599,860 (including design, permitting, project management, construction, surface improvement and O&M but not including the planned soccer field).

1.1 OVERVIEW

Table 1-1 provides an overview of the project and the Project Developer(s):

Table 1-1: Project Overview

Project Name:	Hermosillo Park Stormwater Capture Project
Project Description:	Regional stormwater capture and infiltration facility located beneath the play surface of the existing park.
SCW Watershed Area:	Lower San Gabriel River
Estimated Treatment system Construction costs	$11,642,549
Estimated Treatment System Design, Permitting, Management costs	$4,094,891
Estimated 10-year O&M	$862,420
Replace playing (soccer) field	$785,000
Project Weather Type:	Wet
Project Lead(s):	City of Norwalk
Additional Project Collaborators:	Santa Fe Springs
Additional Project Collaborators:	Unincorporated areas of Los Angeles County
Is this a non-municipal project?	No

1.2 PROJECT LOCATION

Table 1-2 summarizes the project location. A site map and project location map can be found in Attachment A.

Table 1-2: Project Location

Latitude:	33.88500000
Longitude:	-118.07722222
Street Address:	11959 162nd Street
City:	Norwalk
State:	CA
Zip Code:	90650
Disadvantage Community (DAC)	Yes, DAC located within project tributary area

1.3 BACKGROUND

The following describes the historical background of the project.

1.3.1 Regulatory Context

The Lower San Gabriel River (LSGR) Watershed Management Program (WMP) Group identified a suite of watershed control measures and structural Best Management Practices (BMPs) to address the water quality objectives within the watershed. The Group is a collaborative effort of fourteen participating agencies with Municipal Separate Storm Sewer System (MS4) facilities within the subwatersheds of Coyote Creek, Reaches 1, 2 and 3 of the San Gabriel River and San Jose Creek. The WMP was developed to implement the requirements of Los Angeles Regional Water Quality Control Board Order Nos. R4-2012-0175 and R4-2014-0024 (National Pollutant Discharge Elimination System [NPDES] Permit Nos. CA004001, CA004003 respectively) on a watershed scale. In addition, elements of this WMP relating to Total Maximum Daily Loads (TMDLs) address requirements of California State Water Resources Control Board Order No. 2012-0011-DWQ (the Caltrans Stormwater Permit) for those TMDLs within the watershed area. Potential sites for targeted control measures were identified in the WMP and recommended by the LSGR WMP Group for further evaluation and potential implementation to meet compliance for the watershed.

Hermosillo Park is located within the Coyote Creek subwatershed. The site has the potential to provide significant water quality benefits for multiple jurisdictions due to the large drainage area, location of the adjacent storm drains, and available development space. The drainage area for the project (2,580 acres) covers the LSGR WMP Group jurisdictions of Norwalk and Santa Fe Springs, and also includes small portions of unincorporated LA County. This project has the potential to offer runoff storage and water quality benefits for these jurisdictions that can address the additional needs for stormwater management identified to achieve compliance in the WMP.

EXISTING SITE CONDITIONS

Hermosillo Park is a 9-acre park owned by the City of Norwalk. The parcel is mostly open with sparse vegetation concentrated in the middle of the park with a basketball court, racquetball courts, children play structures, and recreation center facility all located on the southern half of the park (immediately north of 162nd Street). This parcel is bisected by a 10-foot by 10-foot RCB that is underneath the field surface and has an additional underground 108-inch RCP drain on Horst Avenue directly to the east of the park facility. These drains eventually discharge to Coyote Creek within the San Gabriel River watershed.



1.3.2 Project Objectives

The Hermosillo Park Project objectives include:

- Primary
  - Improve the water quality within Coyote Creek and the San Gabriel River
  - Offset the potable water demand at the park
  - Maintain a public play space
- Secondary
  - Restore/rehabilitate park facilities with a new soccer field over the treatment system
  - Educate the public on the local water supply and demands

The primary mechanisms by which the Project will achieve the primary objectives are through runoff/pollutant capture, infiltration, and use. The subsurface nature of the design allows for continued use of the open recreational space above the storm water capture facility.

1.3.3 Watershed Characterization

The Hermosillo Park site sits at the bottom of a 2,580-acre drainage area consisting of residential, commercial, industrial, and transportation land uses. Stormwater runoff is conveyed through the storm drain network to the project site. The drainage area encompasses various jurisdictions providing benefit to multiple watershed partners. Table 1-3 provides a summary of the jurisdictional areas draining to the project site. The land use breakdown and impervious coverage information is contained in Section 2.2 of this report.

Table 1-3: Jurisdiction Summary

Jurisdiction	Area (acres)	% Watershed
Norwalk	1,872	72.6
Santa Fe Springs	653	25.3
Unincorporated LA County	55	2.1
TOTAL	2,580	100.0

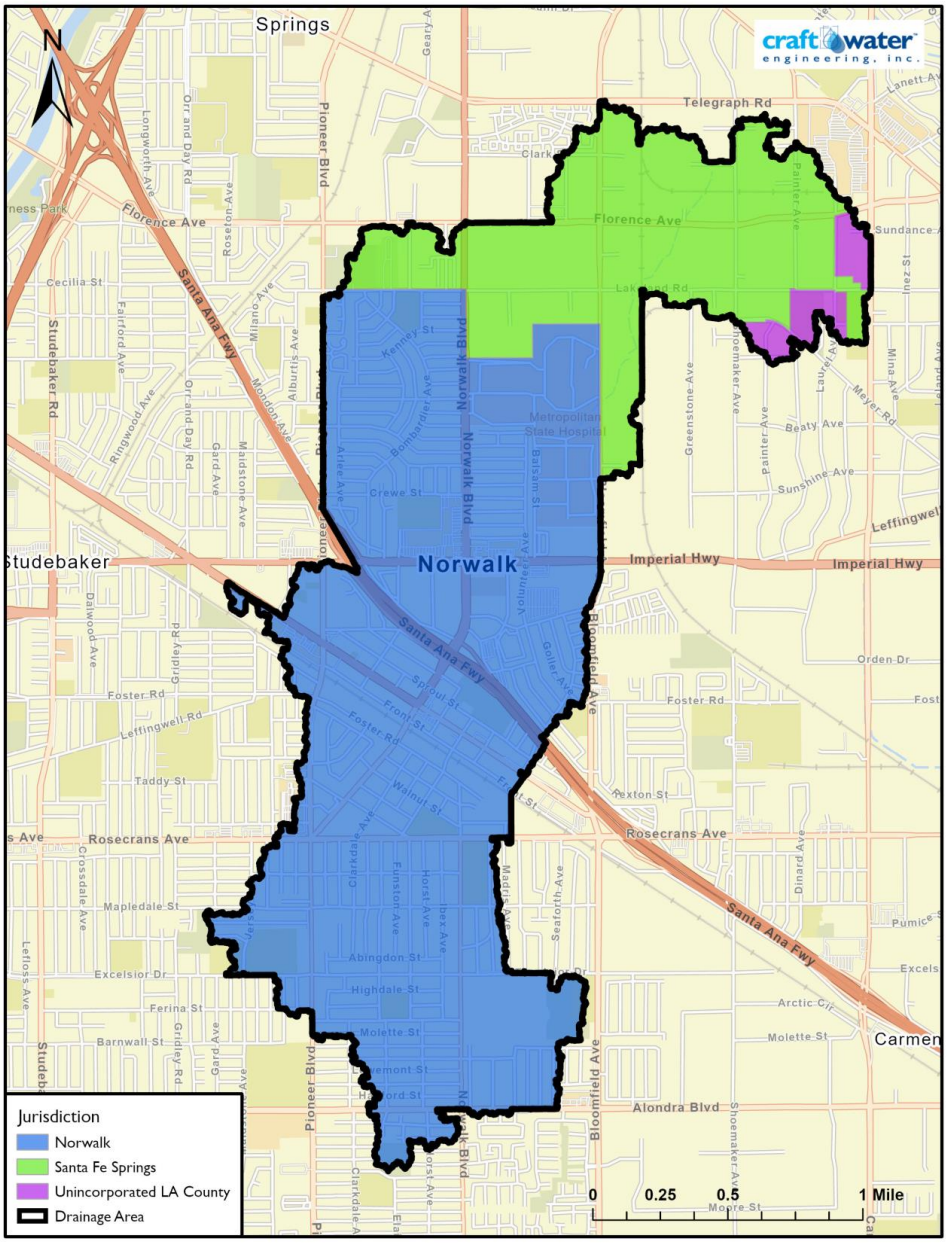


Figure 1. Drainage area jurisdiction boundaries for the Hermosillo Park project.

2.0 DESIGN ELEMENTS

This section provides an overview of the project design details.

2.1 CONFIGURATION

Table 2-1 is a summary of the project configuration. Attachment B and C contains the plan view and preliminary profile views of the project configuration.

Table 2-1: Project Configuration Summary

BMP Type:		Infiltration Facility
Ponding Depth:	Ft	5.5
Footprint Area	Ac	2.15

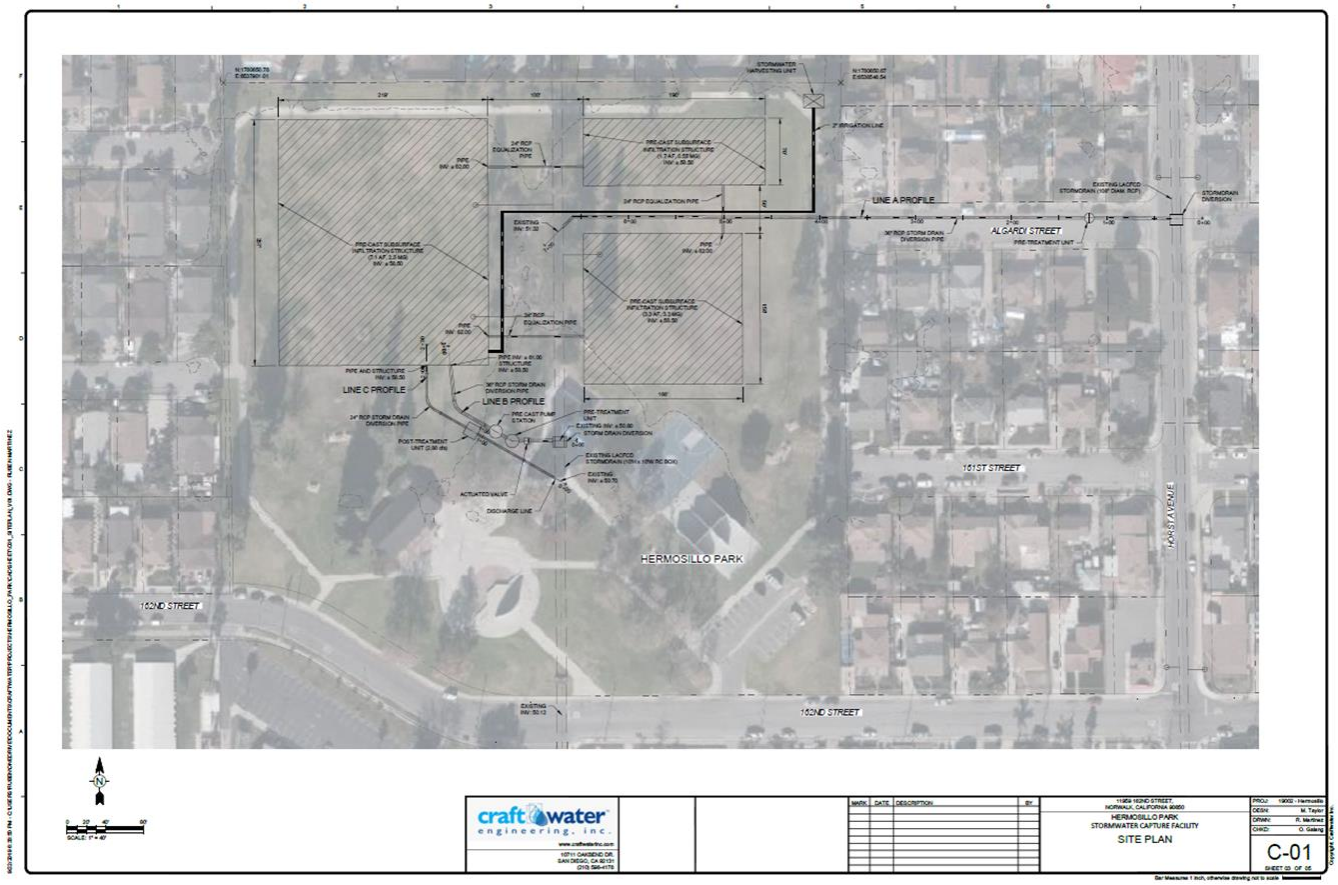


Figure 2. Conceptual layout configuration for Hermosillo Park project.

2.1.1 Diversion and Pretreatment

Information regarding the diversion and pretreatment system are discussed in Section 2.3 of this report.

2.1.2 Storage Component

Underground storage reservoirs provide stormwater detention and allow for implementation where surface space is limited or requires alternate uses. An 11.8 ac-ft storage reservoir consisting of three chambers hydraulically connected through 36-inch equalization pipes is proposed for Hermosillo Park with a storage depth of 5.5-feet, a freeboard depth of 1-foot, and a total footprint of 2.15 acres (between the three chambers).

The storage structure is proposed to be a precast concrete storage system made from durable, reinforced high-strength concrete. They are designed to withstand H-20 loading, allow for various depths of cover, and overcome any possible buoyant forces should groundwater be present.

2.1.3 Treatment and Discharge

The infiltration of water into the subsurface and eventual water table provide final pollutant removal. An emergency overflow connection serves as a redundant backup if the storage unit ever should require evacuation. A pump will lift the water from the storage tank and back to an elevation that matches the existing storm drain that passes through the middle of the park. The estimated treatment rate for Hermosillo Park is 30.1 cfs.

In conjunction with the infiltration gallery, the project proposed to install an on-site irrigation treatment unit that will allow for the use of captured stormwater for park irrigation. Typical treatment involves a four-step filtration and sanitation process: (1) a mechanical filter that removes sediment and particulates greater than 50 microns, (2) a bag filter that removes any remaining particulates down to 5 microns, (3) an activated carbon filter to remove undesirable odors, colors, and dissolved solids, and (4) an ultraviolet (UV) treatment to remove bacteria. The treated water is then distributed to the irrigation system via pumps. A pump and irrigation system containment structure is proposed to be installed on-site. Discussion on the water demand and use is found in Section 4.0 of this report. A 6-cfs pump will also serve as the emergency outlet pump that can drain the system if needed.

2.1.4 Nature-Based Components

The parking lot will be reconfigured and rebuilt and the parking stalls will be replaced with permeable pavement materials. This promotes infiltration of runoff into the subgrade and eventually to the groundwater table. The permeable pavement is sized to convey flow from the parking lot and roadways within the park.

2.1.5 Above Ground Improvements

As a separate effort to this storm water project, the City is currently pursuing Proposition 68 funding ($8.5 million) for designing surface improvements throughout the whole park to better serve the local community needs. The storm water improvements project is planned to be installed below the current conceptual configuration allowing for the installation of multi-use fields above the infiltration tanks. Additional native trees, shrubs, and grasses will be installed at select spots impacted by the construction throughout the park.

2.2 CAPTURE AREA

Table 2-2 is a summary of the area that drains to the project.

Table 2-2: Capture Area Summary

Capture Area:	Ac	2,580
Impervious Area:	Ac	1,628
Pervious Area:	Ac	952

2.2.1 Land Use

Table 2-3 is a summary of the land use breakdown for the area that drains to the project. A map showing the distribution of the land uses can be found in Attachment A.

Table 2-3: Land Use Summary

Land Use Type	Percent of Impervious	Acres
Single Family Residential	17.30	281.64
Multi Family Residential	6.75	109.89
Commercial	13.41	218.31
Institutional	16.76	272.85
Industrial	25.16	409.60
Highways & Interstates	2.20	35.82
Secondary Roads & Alleys	18.42	299.88

2.3 DIVERSION

This section provides details on the project's diversion structure and pretreatment system. Table 2-4 provides a summary of details on the diversion type and maximum diversion rate. Further descriptions of the diversion structures and pretreatment systems are included below.

Table 2-4: Diversion Details

Diverted Pipe ID	Type of Diversion	Typical Max Diversion Rate (cfs)
BI0021	Pump	50
BI9001	Gravity	50

The diversion structure is estimated to have an average inflow captured of 0.05 cfs.

2.3.1 Diversion Structure Description & Conditions

A drop-inlet structure and manhole are proposed along the BI0021 box culvert and BI9001 reinforced concrete pipe to divert stormwater during low-flow and storm events to the two pretreatment devices and eventually the subsurface storage.

2.3.1.1 BI0021 Box Culvert Diversion

At the proposed flow rate of 50 cfs, the structure on the 10-foot by 10-foot reinforced concrete box culvert will require a 4.0-foot drop below the existing invert and a 36-inch diameter diversion pipe at a 0.07% slope. The drop inlet will have dimensions of approximately 10-feet wide and 4.5-feet long. A schematic of the structure is shown in Attachment B.

2.3.1.2 BI9001 Pipe Diversion

At the proposed flow rate of 50 cfs, the structure on the 108-inch reinforced concrete pipe will require a 1.75-foot drop below the existing invert and a 36-inch diameter diversion pipe at a 0.5% slope. The drop inlet structure will have dimensions of approximately 12-feet wide and 4-feet long. A schematic of the structure is shown in Attachment B.



2.3.2 Pretreatment System

Stormwater runoff transports sediment, metals, nutrients, trash, and debris that can compromise the performance of the stormwater facility and pollute downstream receiving waters. Pretreatment will be an integral component of the treatment train strategy to extend the life of the system. It is prescribed to reduce the maintenance frequency of the Hermosillo Park facilities, focus maintenance efforts to a concentration and accessible area, and bolster watershed compliance.

For this project, a hydrodynamic separator is proposed to be installed at the two diversion points. One hundred percent of floatables and neutrally buoyant debris larger than the screen aperture (2400 microns or 2.4 mm) is collected and settle in the isolated sump of the system, eliminating scour potential. In addition to the screen aperture filtration, at least 80% of particles that are 130 microns or larger in size are removed for flows up to 50 cfs. With the chambered system, hydrocarbons float to the top of the water surface and are prevented from being

transported downstream. A target flow rate for each of the devices will be based on the final design of the diversion structure. Currently a total of 50 cfs from the pipe and 50 cfs from the box culvert are anticipated to be diverted to two separate pretreatment devices. Each will be designed to have the capacity to treat the maximum flow diverted to each unit. The size of the unit will also be based on the estimated sediment that will be collected in the sump to maximize sediment removal while balancing the routine maintenance required.

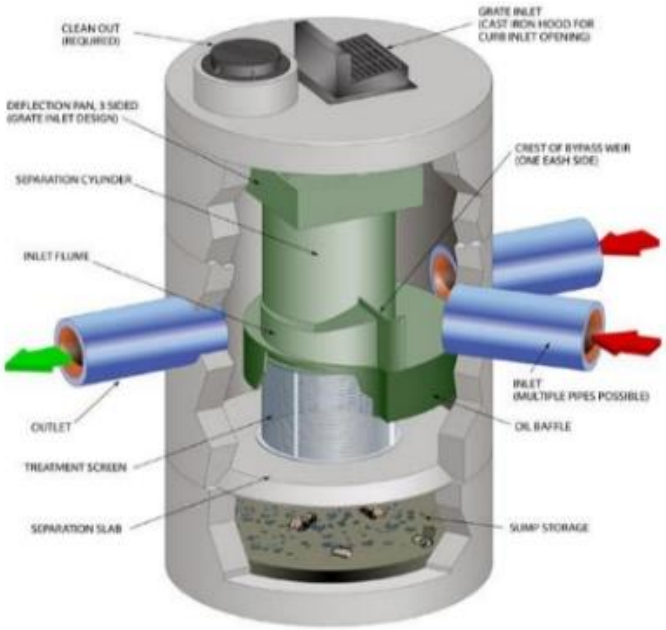


Figure 3. Typical Hydrodynamic Separator (Source: Contech Engineered Solutions)

2.4 SITE CONDITIONS & CONSTRAINTS

The following is a summary of the engineering analysis or estimates of existing site conditions, including existing and/or potential constraints or limitations due to existing conditions.

2.4.1 Site History

The site originally was a part of the agriculture and dairy farming common to the Norwalk area. The site was designed and constructed as a park in 1976. The site has continued to operate as a park and currently contains two open space fields, a recreation center, basketball courts, handball courts, a playground area, an amphitheater, and picnic tables.

2.4.2 Geotechnical Investigation

A review of the Geotechnical Investigation Report dated December 1, 2018 ("Soil Infiltration Study – Hermosillo Park at 11959 162nd Street, in the City of Norwalk, California") was conducted prior to project concept development. It was determined that the existing minimum groundwater level is at 26.5 feet below existing ground surface. The infiltration testing identified typical rates averaging 14.0 inches per hour at a depth of 15 feet below the existing ground surface. The groundwater elevation can constrain the exfiltration from the facility and allow for only lateral infiltration during large events. While this information is sufficient to develop preliminary design concepts, it is recommended that additional geotechnical investigation be conducted given the results of this report to further develop geotechnical design recommendations in support of final design documents.

Historic park as-builts indicate that contaminated soils possibly exist within the park limits and a full Phase I Environmental Site Assessment should be performed to verify that they were removed during park construction.

The infiltration data and borehole logs indicate that this site is suitable for infiltration and an infiltration practice is recommended. The geotechnical investigation report can be found in Attachment E.

2.4.3 Hydrology, Hydraulics, and Water Quality

For this project, the Los Angeles County Watershed Management Modeling System (WMMS) was used within the Loading Simulation Program C++ (LSPC) to simulate the contaminant loading, runoff volume, and flow rates associated with a long-term, 10-year continuous time series (Water Year 2002 to Water Year 2011). The Modified Rational method was used to estimate runoff volume and peak flow for the 85th percentile storm to each diversion point. Table 2-5 summarizes the existing baseline hydrology and water quality for the primary pollutant of concern. The full stormwater capture memorandum can be found in Attachment F.

Table 2-5: Summary of Hydrologic Conditions

Diverted Pipe ID	Average Annual Runoff (ac-ft)	Average Annual Zinc Loading (lbs)	85th Percentile Surface Runoff (ac-ft)	85th Percentile Peak Flow (cfs)
BI0021	560	395	32.2	48
BI9001	895	518	48.8	77

2.4.4 Utility Data Review

To locate the existing utilities in the Hermosillo Park area, various sources were utilized. The following utilities were identified to be near the project area.

2.4.4.1 Utilities Near BI0021 Diversion

Existing utilities running near the channel and into the park area include site electrical lines, irrigation lines, and drain lines. The nearby utility mains will be avoided as the diversion and channel work will occur within the park limits and not impact the right-of-way utilities. Coordination for this effort with the Parks department will be required during the detailed design and construction phase of this project.

Table 2-6: Utility Companies Adjacent to BI0021

Utility	Company
Sewer	City of Norwalk
Water	Norwalk Municipal Water Systems
Electric	Southern California Edison District - Whittier
Street & Park Lighting	City of Norwalk
Telecommunications	Charter Communications - Irwindale

2.4.4.2 Utilities Near BI9001 Diversion

Existing utilities running down Horst Avenue and Algardi Street near Hermosillo Park include: street and park lighting owned by the City of Norwalk, an 8-inch VCP sanitary sewer owned by the City of Norwalk, an 8-inch and 4-inch cast iron water line owned by Liberty Utilities, and a 2-inch oil/gas line owned by Southern California Gas. Coordination with the various utilities will be required during the detailed design and construction phase of this project to minimize conflicts or facilitate realignments.

Table 2-7: Utility Companies Adjacent to BI9001

Utility	Company
Sewer	City of Norwalk
Oil/Gas	Southern California Gas - Downey
Water	Liberty Utilities & Norwalk Municipal Water Systems
Electric	Southern California Edison District - Whittier
Street & Park Lighting	City of Norwalk
Telecommunications	Charter Communications - Irwindale

2.4.5 Site Access & Right-of-Way

The project requires access to the park, the existing 10-foot by 10-foot box culvert, and the existing 108-inch pipe. Access to the park will be done through the existing driveway on 162nd Street and will travel through the existing parking lot to the open field space. The box culvert passes through the middle of the park and will be accessed through surface manhole entry. The 108-inch pipe will be done through surface manhole entry and will require traffic control on Algardi Street and Horst Avenue. Entry will require close coordination with the LA County Flood Control District. Confined space requirements will apply and must be adhered to.

The LACFCD will be consulted following the completion of this feasibility report. An LACFCD Conceptual Review will be conducted and submitted through the LACFCD's EPICLA Permit application process. During Final Design of this project, a more rigorous hydraulic study and analysis will be performed to secure the necessary LACFCD permit to construct and maintain the stormwater diversions within the LACFCD system.

2.5 COST

Table 2-8 and Table 2-9 provide details on the Project's capital and annualized costs. A detailed cost breakdown can be found in Attachment D. Costs in this section do not include construction and O&M of the planned soccer field

Table 2-8: Capital Costs

Construction Cost:	$11,642,549
Planning and Design Cost*:	$4,094,891

Note:

*Includes early concept design, pre-project monitoring, feasibility study development, site investigations, formal project design, intermediate and project completion audits, CEQA and other environmental impact studies and permitting.

Table 2-9: Annual Costs

Maintenance Cost:	$36,000
Operation Cost:	$3,600
Monitoring Cost:	$15,000
Project Life Span:	50

Table 2-10: Life-Cycle Costs

Life-Cycle Cost for Project:	$17,047,508
Annualized Cost for Project:	$710,493

2.6 SCHEDULE

Table 2-11 is a schedule to design, permit, construct, operate, and maintain the project. Key milestones and their estimated completion dates are contained herein.

Table 2-11: Project Schedule

Milestone Name	Completion Date
Assumed Notice-to-Proceed	September 1, 2020
30% Draft Design & Review	December 4, 2020
60% Draft Design & Review	March 12, 2021
90% Draft Design & Review	June 18, 2021
100% Final Design	September 24, 2021
LACFCD Permit	September 24, 2021
Environmental Documentation	September 24, 2021
Construction	September 30, 2023
Start of Operation & Maintenance	October 1, 2023

2.7 MONITORING

This section provides an overview of monitoring data related to the project.

2.7.1 Historic Monitoring

Historic monitoring of the box culvert and pipe has not been performed to date. It is recommended that the dry-weather flows be measured during the design phase of the project to establish baseline conditions for water quality and flow rates.

2.7.2 Project Monitoring Plan

A monitoring plan will be developed as a part of the 100% final design documentation. The monitoring plan will include constituents of concern, monitoring locations including at the diversion point and inflows and outflows of the storage unit. The plan will demonstrate how the estimated benefits outlined in Section 3 and 4 of this report will be evaluated.

2.8 OPERATIONS & MAINTENANCE PLAN

Long-term maintenance of the system is vital to its continued operation. The responsible party for the operation and maintenance of the completed project will be the City of Norwalk.

Table 2-12: Operations & Maintenance Requirements and Costs

Description	No. of Times per Year	No. of Personnel & Hours per Visit	Personnel Expertise Level	Unit Price	Annual Total
Diversion Structure – Inspection & Cleaning	6 (x2)	2 @ 2 hr	Trash Removal crew	$500	$6,000
Pretreatment Device – Vacuum	2 (x2)	2 @ 2 hrs	Vactor Truck Operator	$1,000	$4,000
Wet Well – Dry Season Inspection & Cleaning	3	2 @ 2 hrs	Vactor Truck Operator	$1,000	$3,000
Wet Well – Wet Season Inspection & Cleaning	6	2 @ 2 hrs	Vactor Truck Operator	$1,000	$6,000
Valve Maintenance	1	1 @ 2 hrs	Mechanical Labor	$500	$500
Control Panel Maintenance	1	1 @ 2 hrs	Electrician	$500	$500
Storage – Dry Season Inspection & Cleaning	2	4 @ 5 hrs	Vactor Truck Operator	$4,000	$8,000
Storage – Wet Season Inspection & Cleaning	2	4 @ 5 hrs	Vactor Truck Operator	$4,000	$8,000

A full draft maintenance plan will be developed as a part of the 100% final design. The maintenance plan will include details on equipment needed and standard practices and procedures. The final maintenance plan will be completed at the end of construction when actual brands and part information is made available.

3.0 WATER QUALITY BENEFITS

This section provides an overview of project elements related to water quality benefits, including calculations used for Section A (Water Quality Benefits) of the SCW Project Scoring Criteria.

3.1 24-HOUR CAPACITY

The below tables contain information regarding key parameters of the project's capacity:

Table 3-1: 24-hour Storm Capacity Breakdown

24-hour Storm Capacity Breakdown	
Effective Draw Down Rate:	14.0 in/hr
Stormwater Use During 24-hr Design Event:	0 gal
SCW Module-Generated 24-hr Capacity:	72.03 ac-ft

3.2 EVENT BASED PERFORMANCE

This section details the event-based analysis for the capture system and how it performs:

Estimated Total Inflow Volume during Design Event: ***42.04 ac-ft***

Project design event:

A 0.91 inch 85th percentile LA County hyetograph was modeled to determine flows to the site through the WMMS model. Flows were developed for this rain event to the points of diversion for the project. As currently designed, one gravity-fed diversion and one pumped diversion would catch as much of the event as possible given maximum diversion rates and the capacity and throughflow of the regional project. Real-time controls could be added for better peak management given the limited size of diversions and large drainage area producing an event that is impractical to capture by a single practice. Inflows could be delayed until flows were high enough to target the peak of the storm event to accomplish this.

85th percentile Storm Capture:

A portion of 85th percentile storm is being captured by the unit though the entire event cannot be managed due to feasible/practical diversion size limitations. This could be overcome by the addition of real-time controls if desired and/or if no other stormwater capture practices are added within the drainage area that would work in conjunction with the one proposed herein to enable its full capture.

Project inlet flows are based on a water budget calculation for the unit taking into account hourly flows to each diversion point on an hourly basis and subject to storage capacity.

Table 3-2: Project Inlets 85th Percentile Flow Rates

Project Inlets		
Diversion Pipe ID	**Estimated Max Inflow rate (cfs)**	**Total Inflow (ac-ft)**
BI0021	50	24.7
BI9001	50	17.4

Table 3-3: Project Outlets 85th Percentile Outflow Volume

Project Outlets			
Event Outflow Volume	**Treated?**	**Treatment Description**	**Percent of Volume Treated**
0	Yes	Infiltration Unit	100%

Method Used for Estimates:

The WMMS modeled 85th percentile storm was routed through proposed diversions and subject to proposed storage and outlet filtration capacities.

3.3 LONG TERM PERFORMANCE

This section presents the results of modeling for the proposed facility and configuration as related to the primary and secondary pollutants. These annual average pollutant reduction estimates were developed using WMMS for the ten-year period over waters years 2002-2011 as is consistent with the LSGR WMP.

Table 3-4: Long Term BMP Performance Summary (10 Year Averages)

Long-Term BMP Performance Summary (10-Year Averages)			
Pollutant	**Baseline Load**	**Load Diverted To BMP**	**Load Discharged From BMP**
Zinc (lbs)	913.0	397.0	0
Bacteria (MPN)	2.80×10^{14}	2.69×10^{14}	0

Table 3-5: Long Term BMP Performance Reduction Summary (10 Year Averages)

Pollutant	Reduction Method Used	Justification for Use	Reduction (%)
Primary – Zinc	Percent Load Reduction	Limiting pollutant – LSGR WMP	100%
Secondary - Bacteria	Percent Load Reduction	Secondary limiting pollutant – LSGR WMP	100%

4.0 WATER SUPPLY

This section provides an overview of project elements related to water supply benefits, including calculations used for Section B (Significant Water Supply Benefits) of SCW Project Scoring Criteria.

4.1 NEXUS

There is some potential for this project to provide multiple benefits at the nexus of water supply and stormwater. The following describes how this has been considered in development of this project.

Onsite Irrigation Use

This project will utilize captured flows to offset onsite irrigation needs. Dry weather flows are appreciable and should offset most of the park's irrigation needs. Pumping and filtration will occur to redirect captured stormwater to the irrigation system and sanitize it to acceptable standards for this type of use.

Water Recycling

This project does not currently involve any water recycling by a wastewater treatment facility. There are sanitary sewer lines in the vicinity of the project, but further capacity study would be required to determine if discharges to these would be possible.

Aquifer Recharge

This project is connected to a managed water supply aquifer (Central Basin of the Coastal Plain, Los Angeles aquifer). Infiltration rates are high and will augment groundwater supply by approximately 1,079 ac-ft on an average annual basis.

4.1.1 Current Irrigation Demand

To better understand on-site irrigation demands, monthly estimates for irrigated areas of the Hermosillo Park were calculated based on 10 years of evapotranspiration data (coinciding with modeled water years; CIMIS 2019) using the SLIDE rule (Simplified Landscape Irrigation Demand Estimation; ANSI 2017). These results are displayed in ***Figure 4***, and they indicate that average monthly irrigation demand for the Park peaks at 2.14 ac-ft in July. Baseline modeling estimated average monthly dry weather flows of approximately 2.69 ac-ft for the two diverted storm drains, in excess of this irrigation demand estimate (0.03 cfs for BI9001 and 0.02 cfs for BI0021). However, modeling results are no substitute for actual monitoring, and it is advised that further study of the availability of dry-weather flows in these storm drains be conducted before any decision is made regarding the inclusion of filtration and irrigation systems. Should monitoring corroborate these results, there should be excess supply of dry-weather runoff to meet nearly all irrigation demands at Hermosillo Park if desired. Filtration equipment, irrigation system upgrades, and associated O&M activities and costs should be weighed throughout design processes to determine if this discharge option is desirable for the Hermosillo Park Project.

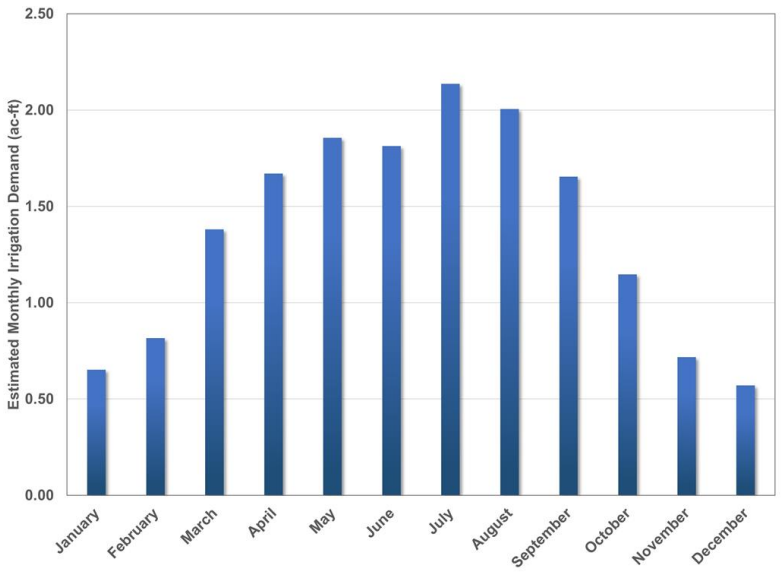


Figure 4. Irrigation demand estimates and potential supply via dry weather flows.

4.2 BENEFIT MAGNITUDE

Project Scoring Criteria Section B is based upon estimates of annual average water supply benefit. Water supply benefit can include, but is not limited to, water diverted to a separate groundwater recharge facility, into a water treatment plant, to a sanitary sewer to be converted into recycled water, etc. This section provides documentation of estimates of annual average water supply benefit.

Average dry weather inflow to the project: ***0.05 cfs***

Methods used to estimate average dry weather inflow to the project:

Flows from the WMMS model were average during dry weather. Wet weather was defined as any time period where rainfall was at least 0.1 in/hr and 24-hours after such timesteps.

Annual inflows (total) to the project for potential water supply: ***1,959 ac-ft***

Methods used to estimate annual inflows for potential water supply:

This is the baseline runoff to the project from WMMS for water years 2002 – 2011.

Annual average capture for water supply: ***1,079 ac-ft***

Methods used to calculate water supply benefits:

These are the calculated annual dry weather flows from WMMS to be utilized for onsite irrigation and the average annual discharge to the groundwater from modeling.

4.3 COST EFFECTIVENESS

Project Scoring Criteria Section B2 incorporates life-cycle costs. The cost-effectiveness for water supply benefit is calculated from other sections in the Module. The calculation for B2 scoring is based on a numerator of life-cycle cost (from Design Elements > Cost) and a denominator of annual average benefit magnitude (from Water Supply > Benefit Magnitude).

Cost Effectiveness: ***$658/ac-ft***

5.0 COMMUNITY INVESTMENT

This section provides an overview of project elements related to community investment benefits, which are used in calculations for the SCW Project Scoring Criteria.

Table 5-1: Community Investment Benefits

Investment Type	Applicable?
Does this project improve flood management, flood conveyance, or flood risk mitigation?	Yes
Does this project create, enhance, or restore park space, habitat, or wetland space?	Yes
Does this project improve public access to waterways?	No
Does this project create or enhance new recreational opportunities?	Yes
Does this project create or enhance green spaces at school?	No
Does this project reduce heat local island effect and increase shade?	Yes
Does this project increase shade or the number of trees or other vegetation at the site location?	Yes

Flood Management, Flood Conveyance, and Flood Risk Mitigation

The system has detention capabilities that can contribute towards enhanced flood retention capabilities of the whole storm drain system.

Parks, Habitat, or Wetland Creation

The installation of the underground structure will require the removal and replacement of the current open playing space. The project proposes to create two new multi-sport fields including freshly installed natural turf grass. The Parks Department has solicited significant input from the community to create surface improvements that the residents will embrace and enjoy.

Reducing Heat Island Effect

Landscape plans post construction include additional native trees, shrubs, and grasses to be installed at select spots impacted by the construction throughout the park. This vegetation and the addition of zero impervious surfaces for this project will contribute to reductions in the heat island effect.

Tree Count/Shade Increase

Native trees that are part of the post-construction landscape plane will contribute to increased tree count and shade for the park.

6.0 NATURE BASED SOLUTIONS

This section provides an overview of project elements that leverage nature-based solutions, which are used in the SCW Project Scoring Criteria.

Table 6-1: Nature Based Solutions

Nature Based Evaluation	Applicable?	Description
Does this project implement natural processes?	Yes	Permeable pavement or equivalent Low Impact Development (LID) designs will be installed within the parking lot to promote on-site infiltration. The pavements are sized to convey all flows from the parking lot within Hermosillo Park.
Does this project utilize natural materials?	Yes	Landscape plans post construction include additional native trees, shrubs, and grasses to be installed at select spots impacted by the construction throughout the park.

6.1 NATURE-BASED LIMITS

The City desires to continue use of the property as an active park with multi-sport fields available in the open space. To accommodate playing fields, open spaces of turf are required limiting the amount and types of vegetation. To incorporate nature-based solutions, the City is redesigning and reconstructing the existing parking lot and plan to install permeable pavement or LID designs to treat flows from the parking lot.

6.2 REMOVED IMPERMEABLE AREA

Table 6-2 details the impermeable area removed by the project.

Table 6-2: Removed Impermeable Area by Project

Project Impervious	Units	Value
Prior Impervious Area	Ac	1.25
Post Impervious Area	Ac	1.50

7.0 LEVERAGING FUNDS AND LOCAL SUPPORT

This section provides an overview of the project's funding and community support, which are used in calculations for the SCW Project Scoring Criteria.

7.1 COST SHARING

Nearly $8.5 million in Prop 68 grant funds has been applied for. The applicant is currently pending. Funds requested in the grant include:

DEVELOPMENT: List each **RECREATION FEATURE** and **MAJOR SUPPORT AMENITY**	**ESTIMATED COST**
Construct Community Recreation Building	$ 4,600,000.00
Construct Soccer/Multi-Use Sports Fields	$ 785,000.00
Construct Basketball Court	$ 300,000.00
Construct Playground Improvements and Fitness Stations	$ 75,000.00
Construct Plaza, Picnic Shelters, Restrooms, and Trail	$ 150,000.00
Construct Parking Lot Improvements	$ 1,100,000.00
Install Park Lighting	$ 340,000.00
Install Irrigation and Landscaping	$ 898,500.00
Total Estimated Cost for the RECREATION FEATURES and MAJOR SUPPORT AMENITIES (A)	$ 8,248,500.00
Total Estimated PRE-CONSTRUCTION COST (B)	$ 841,500.00
TOTAL PROJECT COST (A+B)	$ 9,090,000.00
Requested GRANT Amount	$ 8,500,000.00
Estimated amount of the GRANT to be charged to PRE-CONSTRUCTION COSTS (cannot exceed 25% of the GRANT)	$ 841,500.00

7.2 LOCAL SUPPORT OUTREACH PLAN

Copies of support letters needed.

8.0 ADDITIONAL FEASIBILITY INFORMATION

This section presents additional information regarding project feasibility and technical details gathered during project design and feasibility assessment.

8.1 ENVIRONMENTAL DOCUMENTS AND PERMITS

Consultation with regulatory agencies and acquisition of permits is required before the project components can be constructed. The following table summarizes the plan checks, regulatory permits and approvals relevant to the project.

Table 8-1: Listing of Anticipated Required Permits

Agency	Permit/Notification Name	Rationale	Initial Steps
City of Norwalk Recreation & Park Services	--	City of Norwalk Recreation & Parks is the property manager.	Contact Recreation and Park Services Department
United States Army Corps of Engineers	Section 404 Permit	Potential discharge of dredged or fill material into waters of the United States	File a permit with the Army Corps of Engineers
LA County Flood Control District	Major Modification Permit	A water diversion structure is considered a drainage facility modification.	Complete and submit application for review via EpicLA.
LA County Flood Control District	Discharge Permit	Non-storm water (treated water) will be discharged directly into an existing District facility.	Complete and submit application for review via EpicLA.
State Water Resources Control Board	Construction General Permit	One or more acres of soil will be disturbed during construction.	Develop a Storm Water Pollution Prevention Plan (SWPPP).
LA County Department of Public Health	Cross Connection and Water Pollution Control Program	Ensure that there is no hazard to the potable water system.	Undergo review and approval.
Greater LA County Vector Control District	Mosquito Abatement District	Potential mosquito concerns.	Provide Vector Control District conceptual project plans for review.
South Coast Air Quality Management District	Rule 403	Prevent, reduce, or mitigate fugitive dust emissions from construction activities.	Construction in the South Coast Air Basin must incorporate best available control measures included in Table 1 of Rule 403
CA Natural Resources Agency	CEQA Initial Study	State mandated environmental review	Prepare the Initial Study and associated anticipated Mitigated Negative Declaration

Past project experience has shown that the Initial Study most often identifies a Mitigated Negative Declaration for projects that are constructed within the existing park areas. The most significant impacts are temporary during the construction period and once construction is complete, will be gone entirely. Upon project completion, the project will ultimately provide a net benefit to the water quality and keep the park facilities unchanged.

On September 17, 2019, a Notice of Categorical Exemption was filed for Hermosillo upgrades and improvements. If necessary, an additional CEQA Initial Study and associated Mitigated Negative Declaration would be anticipated to take up to one year and will occur simultaneously with the design phase. It is expected to cost between $50,000 and $100,000 and is reflected in the life-cycle cost information.

The acquisition and securing of all the required permits and environmental documentation are anticipated to be around 5.0% of the total project costs for a grand total of $582,127. All permits are anticipated to be filed and acquired by the end of the 100% final design phase.

8.2 VECTOR MINIMIZATION

As a part of final design, the City will review the design documents with the Greater LA County Vector Control District to ensure that the system meets all requirements and minimizes the potential for vector increases.

8.3 ALTERNATIVES STUDIED

Alternatives evaluated included combinations of diverted storm drain lines, alternative footprints, and various outflow rates. The full discussion on alternatives studied can be found in Attachment F.

8.4 SIMILAR PROJECT EFFECTIVENESS

Projects similar to the Hermosillo Park Stormwater Capture project are being designed and constructed throughout Los Angeles County. A couple (including Bolivar Park Stormwater Capture Project and Santa Monica Clean Beaches Project at the Pier) have recently been completed and are now beginning the monitoring phase. Numerous others are currently under construction (Caruthers Park in Bellflower, Mayfair Park in Lakewood, Carriage Crest Park in Carson, and Culver Boulevard in Culver City). In the future, it is anticipated that the project effectiveness will be obtained through monitoring efforts but at this time, there is no comparable completed and monitored project.

8.5 LEGAL REQUIREMENTS AND OBLIGATIONS

There are two primary legal issues that require addressing through the course of the Hermosillo Park project; access and regulatory compliance.

The main project site is owned and maintained by the City of Norwalk. However, construction requires accessing the LACFCD box culvert and pipe as a key component of this project. The LACFCD requires that the hydraulics of the existing infrastructure not be negatively impacted, and that access is maintained. The City of Norwalk will require an operation and maintenance memorandum of understanding (MOU) with the LACFCD for continued access. All required permits and agreements will be in place through the construction of the project.

As stated in the project background, one of the key drivers for this project is the compliance with the water quality targets identified in the LSGR WMP. Design and construction of the project brings the LSGR WMP Group closer to watershed-wide compliance through water quality improvement. The City is required to demonstrate project performance to the Water Resource Control Board for acceptance towards the water quality objectives. The project will be monitored and reported on as required.

8.6 TECHNICAL REPORTS

The stormwater capture strategy including the basis, assumptions, and procedure of identifying the diversion location, rates, storage size, and outflow rates are contained within the attached Stormwater Capture Strategy Memorandum. The memo serves are the supporting modeling analysis for the basis of preliminary design. The memo is found in Attachment F.

8.7 OTHER

8.7.1 LSGR WMP Progress

Previous recommendations for structural BMP volumes and critical year runoff capture were made in the LSGR WMP at the jurisdictional scale based on modeling and assumptions from the Reasonable Assurance Analysis. Table 8-2 summarizes statistics for the recommended Hermosillo Park Project compared to the WMP compliance recommendations at the jurisdictional scale for greater context of how this project contributes to broader watershed goals. These recommended storage and capture volumes for the full jurisdictional area are shown in **Figure 5** compared to statistics for the cost-effective size for the Hermosillo Park Project. This plot demonstrates that both the storage size for the optimized BMP and the critical year runoff capture is in excess of the WMP recommendations for the City of Norwalk and City of Santa Fe Springs because of the high infiltration rates captured at this site and the cost-effective sizing. This excess protection provides multi-benefits for the WMP Group and can be used to account for other areas of the watershed where cost-effective projects may not be available.

Table 8-2: Placing the Hermosillo Park Project in the context of the LSGR WMP

	Recommended BMP Storage	Critical Year Runoff Capture
WMP Recommendation – Norwalk	4.7 ac-ft	153 ac-ft
WMP Recommendation – Santa Fe Springs	2.1 ac-ft	261 ac-ft
Project Contribution – Hermosillo Park	11.8 ac-ft	703 ac-ft

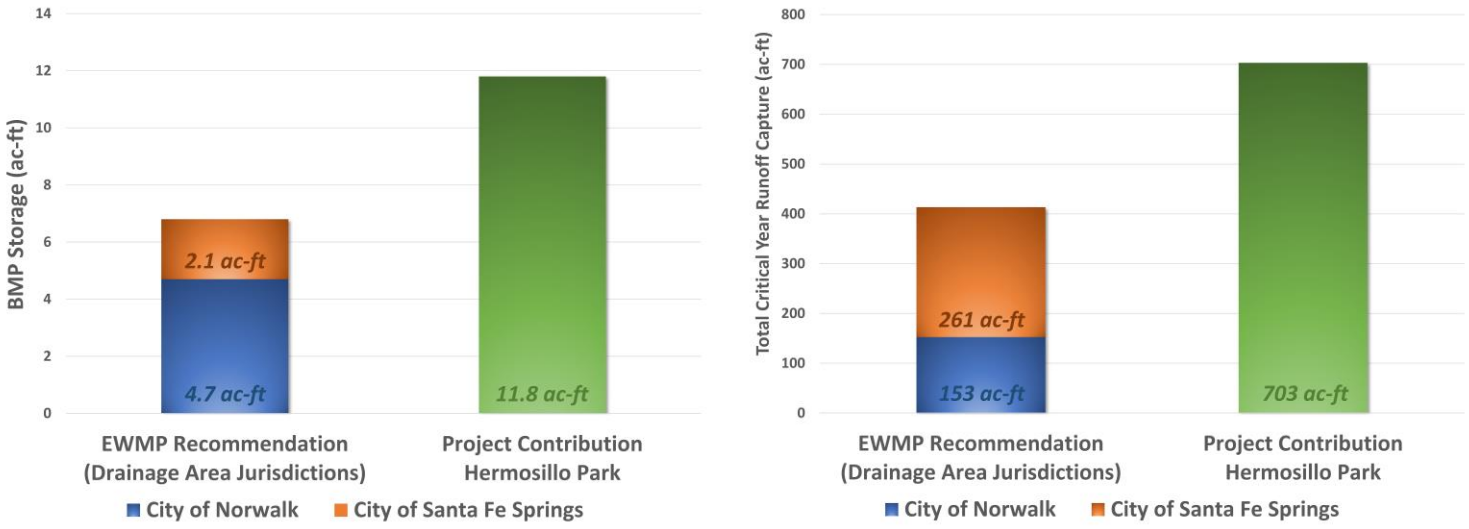


Figure 5. Placing cost-effective sizing of the Hermosillo Park Project in the context of the LSGR WMP.

9.0 SCORING

Section	Score Range	Scoring Standards	Scoring
A.1 Wet Weather Water Quality Benefits -OR-	**50 points max**	**The project provides water quality benefits**	**50 points**
	20 points max	A.1.1: For Wet Weather BMPs Only: Water Quality Cost Effectiveness Cost Effectiveness) = (24-hour BMP Capacity) / (Life-Cycle Cost in $Millions) - <0.4 (AF / $-Million) = 0 points - 0.4 - 0.6 (AF / $-Million) = 7 points - 0.6 - 0.8 (AF/ $-Million) = 11 points - 0.8 - 1.0 (AF / $-Million) = 14 points - >1.0 (AF/ $-Million) = 20 points	20
	30 points max	A.1.2: For Wet Weather BMPs Only: Water Quality Benefit Magnitude. Quantify the pollutant reduction (i.e. concentration, load, exceedance day, etc.) for a class of pollutants using the similar analysis as the E/WMP which use the Districts/Watershed Management Modeling System (WMMS). The analysis should be an average percent reduction comparing influent and effluent for the class of pollutant over a ten-year period showing the impact of the Project. Modeling should include the latest performance data to reflect the efficiency of the multi-pollutant BMP Type. **Primary Class of Pollutants** - >50% = 15 points - > 80% = 20 points *(20 points max)* **Second or More Classes of Pollutants** - >50% =5 points - > 80% = 10 points *(10 points max)*	30
A.2 Dry Weather Water Quality Benefits	20 points	A.2.1: For dry weather BMPs only, projects must be designed to capture, infiltrate, or divert 100% of all tributary dry weather flows.	NA
	20 points max	A.2.2: For Dry Weather BMPs only. Tributary size of the dry weather BMP - < 200 Acres = 10 points - > 200 Acres = 20 points	NA
B. Significant Water Supply Benefits	**25 points max**	**The project provides water supply benefits**	**Points Pending**
	13 points max	B1. Water Supply Cost Effectiveness. The total life-cycle cost per unit of acre foot of stormwater and/or urban runoff volume captured for water supply is: - > $2,500 / ac-ft = 0 points - $2,000 - $2,500 / ac-ft = 3 points - $1,500 - $2,000 / ac-ft = 6 points - $1,000 - $1,500 / ac-ft = 10 points - < $1,000 / ac-ft = 13 points	
	12 points max	B2. Water Supply Benefit Magnitude. The yearly additional water supply volume resulting from the project is: - < 25 ac-ft / year = 0 points - 25 - 100 ac-ft / year = 2 points - 100 - 200 ac-ft / year = 5 points - 200 - 300 ac-ft / year = 9 points - > 300 ac-ft / year = 12 points	

C. Community Investment Benefits	**10 points max**	**The project provides Community Investment Benefits**	**5 point**
	10 points	C1. Project includes: - One of the Community Investment Benefits defined below = 2 points - Three distinct Community Investment Benefits = 5 points - Six distinct Community Investment Benefit = 10 points Community Investment Benefits include: - Improved flood management, flood conveyance, or flood risk mitigation - Creation, enhancement, or restoration of parks, habitat, or wetlands - Improved public access to waterways - Enhanced or new recreational opportunities - Greening of schools - Reducing local heat island effect and increasing shade - Increasing the number of trees increase and/or other vegetation at the site location that will increase carbon reduction/sequestration and improve air quality	5
D. Nature-Based Solutions	**15 points max**	**The project implements Nature-Based Solutions**	**10 points**
	15 points	D.1. Project: - Implements natural processes or mimics natural processes to slow, detain, capture, and absorb/infiltrate water in a manner that protects, enhances and/or restores habitat, green space, and/or usable open space = 5 points - Utilizes natural materials such as soils and vegetation with a preference for native vegetation = 5 points - Removes Impermeable Area from Project (1 point per 20% paved area removed) = 5 points	10
D. Leveraging Funds and Community Support	**10 points max**	**The project achieves one or more of the following:**	**4 points**
	6 points max	E1. Cost-Share. Additional Funding has been awarded for the project. - > 25% Funding Matched = 3 points - > 50% Funding Matched = 6 points	0
	4 points	E2. The project demonstrates strong local, community-based support and/or has been developed as part of a partnership with local NGOs/CBOs.	4
Total	Total Points All Sections: 110		**Pending**

10.0 ATTACHMENTS

ATTACHMENT A: LOCATION MAP & LAND USE MAP

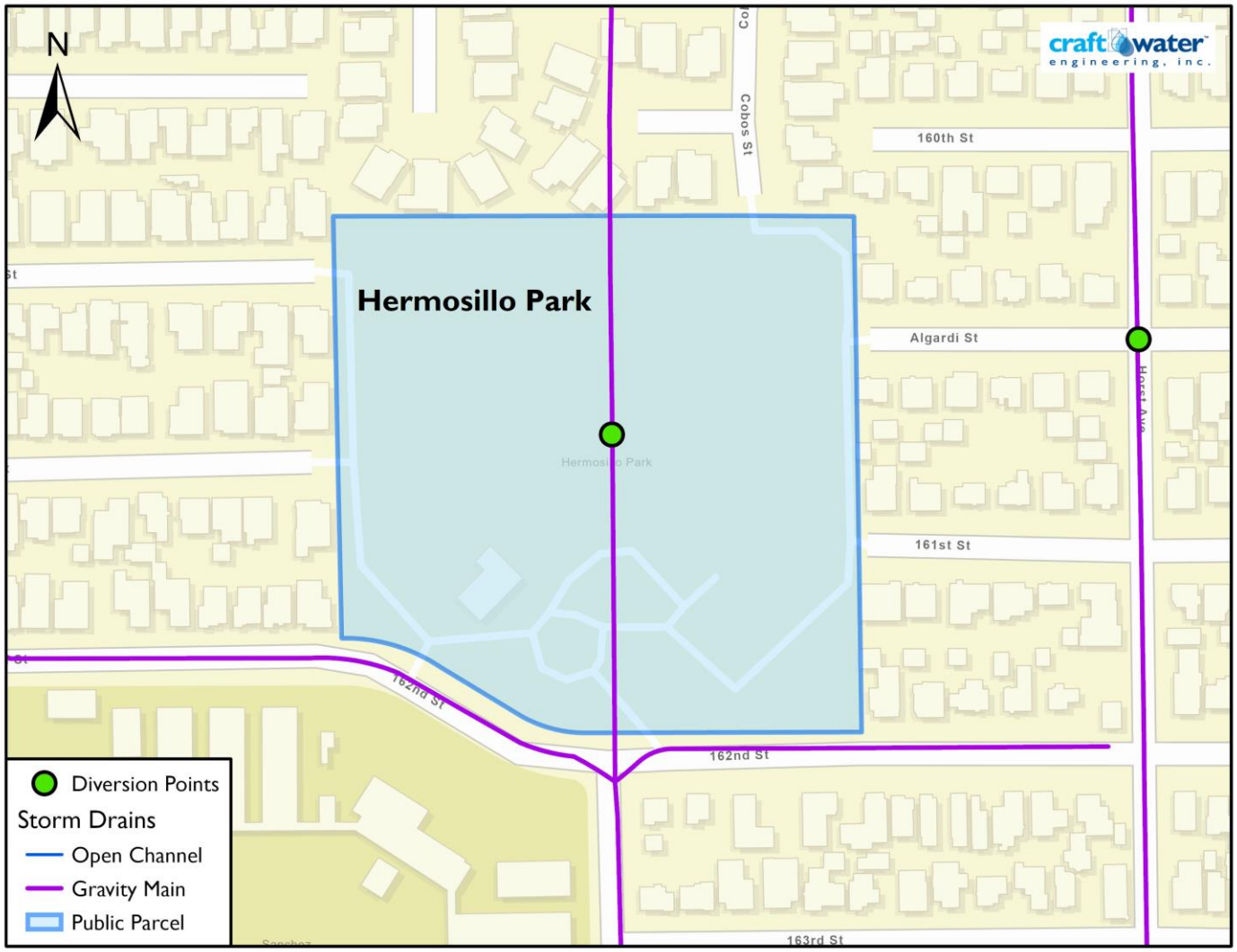


Figure 6. Map of parcels and ROW boundaries for Hermosillo Park project.

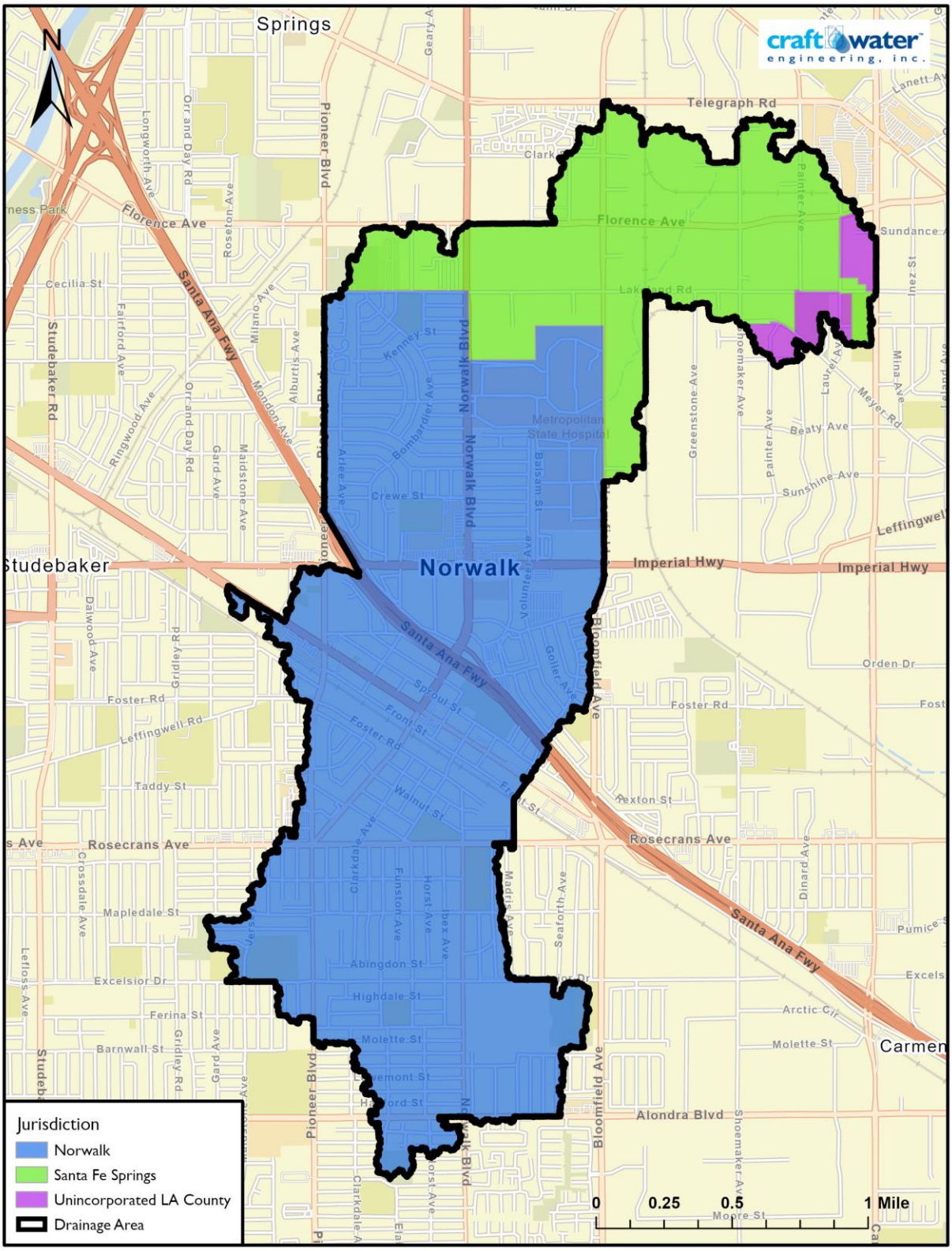


Figure 7. Drainage area jurisdiction boundaries for Hermosillo Park project

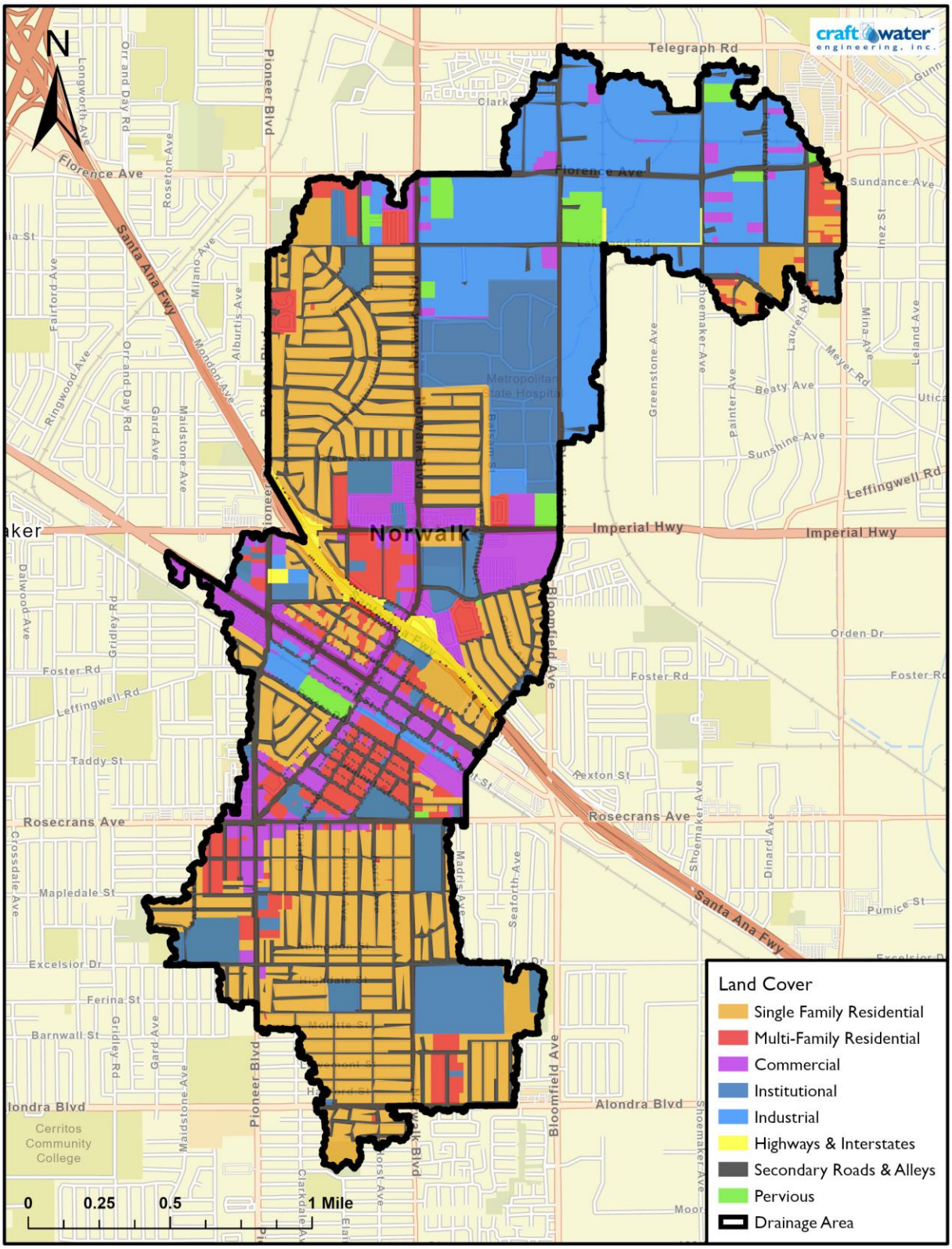
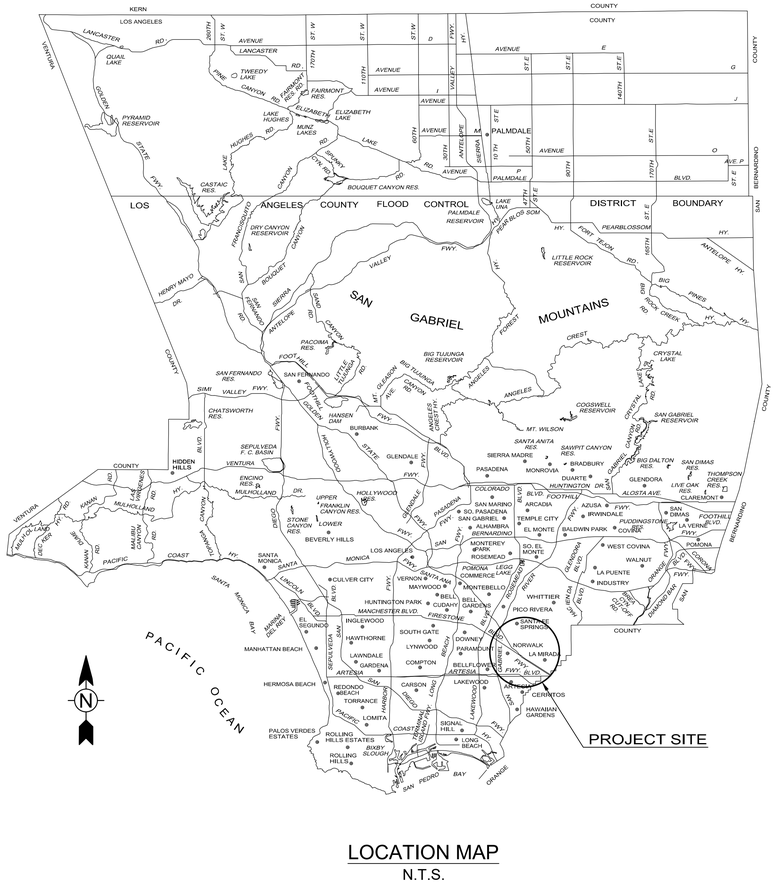


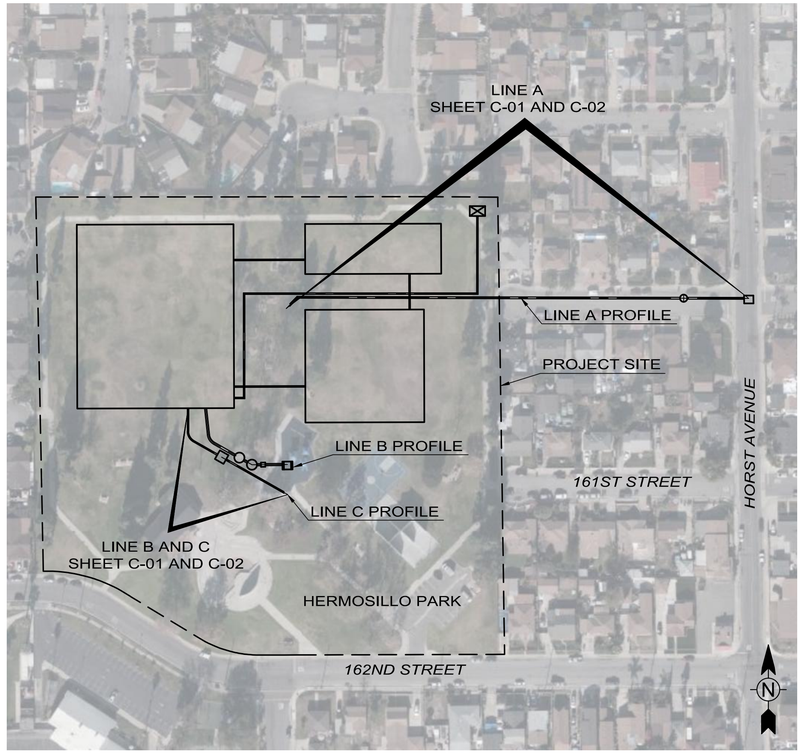
Figure 8. Drainage area land use for the Hermosillo Park project.

ATTACHMENT B: DETAILED DRAWINGS, SITE LAYOUTS, AND EXISTING UTILITY PLANS

Note: The site configuration may be modified during final design.



LOCATION MAP
N.T.S.



VICINITY MAP
N.T.S.

INDEX TO PROJECT PLANS

SHT. NO.	DRAWING NO.	SHEET TITLE
1	G-01	TITLE SHEET
2	G-02	GENERAL NOTES
3	C-01	SITE PLAN
4	C-02	LINE A, B, AND C PROFILES
5	C-03	DETAILS

ABBREVIATIONS

E	EXISTING
H	HORIZONTAL
P	PROPOSED
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMIT
PVC	POLY VINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
TYP	TYPICAL
V	VERITCAL

UTILITIES

Utility	Company
Sewer	City of Norwalk
Oil/Gas	Southern California Gas - Downey
Water	Liberty Utilities
	Norwalk Municipal Water Systems
Electric	Southern California Edison District - Whittier
Telecommunications	Charter Communications - Irwindale

REFERENCES

DRAWING NUMBERS:

craftwater engineering, inc.
www.craftwaterinc.com
10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

COVER SHEET

PROJ:	19002 - Hermosillo
DESN:	M. Taylor
DRWN:	R. Martinez
CHKD:	C. Helmle

G-01
SHEET XX OF XX

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GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE PROJECT TECHNICAL SPECIFICATIONS. WORK NOT COVERED BY THE PROJECT SPECIFICATIONS SHALL CONFORM TO THE STANDARD PLANS OF LOS ANGELES COUNTY, THE CITY OF NORWALK, AMERICAN PUBLIC WORKS ASSOCIATION AND CALTRANS STANDARD PLANS AND SPECIFICATIONS. (ALL LATEST EDITIONS).
2. NOTIFICATION: AT LEAST TEN (10) DAYS BEFORE THE START OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY, IN WRITING, ALL HOMES LOCATED WITHIN 500 FEET OF THE WORK AREA, OF THE PROPOSED CONSTRUCTION START DATE. A COPY OF SAID WRITTEN NOTIFICATION SHALL BE PROVIDED TO THE INSPECTOR FOR WRITTEN APPROVAL BEFORE THEY ARE DISTRIBUTED TO THE OCCUPANTS OF THE ABUTTING PROPERTY.
3. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER TWO (2) WORKING DAYS IN ADVANCE FOR INSPECTION PRIOR TO STARTING WORK AT (XXX) XXX-XXXX.
4. THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES 48 HOURS IN ADVANCE PRIOR TO WORKING AROUND THEIR FACILITIES.
5. THE CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT AT 811 48 HOURS PRIOR TO ANY EXCAVATION.
6. THE CONTRACTOR SHALL VISIT THE SITE AND BE KNOWLEDGEABLE OF CONDITIONS THEREON. THE CONTRACTOR SHALL INVESTIGATE, VERIFY AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT. THE CONTRACTOR SHALL NOTIFY THE CITY OF ANY CONDITIONS REQUIRING CORRECTION OR MODIFICATION PRIOR TO PROCEEDING WITH THE WORK.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURATE PLACEMENT OF ALL WORK ON THE SITE.
8. EXISTING ELEVATIONS AND LOCATIONS TO BE JOINED BY THE WORK SHALL BE VERIFIED BY THE CONTRACTOR BEFORE COMMENCING THE WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE DRAWINGS.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL DRAWINGS WITH ITS SUBCONTRACTORS. ALL SUBCONTRACTORS SHALL BE FURNISHED WITH COMPLETE SETS OF PLANS AND SPECIFICATIONS BY THE CONTRACTOR.
10. WHERE SPECIFIC DIMENSIONS, DETAILS, OR DESIGN INTENT CANNOT BE DETERMINED, CONSULT THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
11. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES AND PROTECT THEM FROM DAMAGE AS REQUIRED. ALL EXISTING UTILITY CROSSINGS SHALL BE POTHOLED AND FIELD LOCATED. IN ANY INSTANCES WHERE THE CLEARANCE BETWEEN THE TOP OF THE EXISTING PIPE AND THE BOTTOM OF THE CROSSING PIPE OR CONDUIT IS LESS THAN 18", CONTRACTOR SHALL INSTALL BLANKET PROTECTION IN ACCORDANCE WITH THE STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION NO. 224-2.

EXISTING FACILITY NOTE

THESE PLANS HAVE BEEN PREPARED FROM LiDAR DEM AND RECORDED DOCUMENTS FURNISHED BY THE CITY OF NORWALK. A SITE SURVEY WAS NOT PERFORMED AND IS REQUIRED PRIOR TO FINAL DESIGN. ALL EXISTING INFORMATION SHOWN ON THE PLANS PREPARED BY CRAFTWATER HAS BEEN TRANSFERRED FROM DOCUMENTS PROVIDED BY THE CITY OF NORWALK. CRAFTWATER HAS PROVIDED DRAFTING SERVICES ONLY WITH REGARD TO DEPICTING EXISTING IMPROVEMENTS AND CONDITIONS. CRAFTWATER CANNOT GUARANTEE THE ACCURACY OR COMPLETENESS OF EXISTING INFORMATION SHOWN. IF CONTRACTOR NOTICES ANY DISCREPANCIES BETWEEN EXISTING INFORMATION SHOWN ON THESE PLANS AND ACTUAL CONDITIONS, THE CONTRACTOR SHALL GIVE NOTICE OF SUCH FACT TO THE CITY OR ITS REPRESENTATIVE WITHOUT DELAY.

JOB SITE RESPONSIBILITY

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; AND THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT GENERAL NOTES

1. A PERMIT SHALL BE OBTAINED FOR ALL WORK WITHIN THE COUNTY RIGHT OF WAY AND A DEPOSIT PAID TO THE DEPARTMENT OF PUBLIC WORKS AT THE PERMIT COUNTER, 900 SOUTH FREMONT AVENUE 8TH FLOOR, ALHAMBRA AT LEAST 72 HOURS PRIOR TO STARTING WORK UNDER THIS CONTRACT. COPIES OF ALL OTHER REQUIRED PERMITS, SUCH AS FLOOD CONTROL DISTRICT AND ROAD EXCAVATION, MUST BE FILED WITH THE PERMIT APPLICATION.
2. WHEN WORK IS WITHIN A CONTRACT CITY, THE CONTRACTOR MUST CONTACT THE DIRECTOR OF PUBLIC WORKS OF THAT CITY TO DETERMINE THE LOCATION TO PAY THE INSPECTION DEPOSIT.
3. THE CONTRACTOR SHALL CONTACT THE DISTRICT OFFICE LISTED ON THE “APPLICATION FOR STORM DRAIN CONSTRUCTION INSPECTION FORM I” TO ARRANGE FOR AN ACCEPTABLE CONSTRUCTION START DATE.
4. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION, OR THE EXISTENCE OR NONEXISTENCE OF ANY UNDERGROUND UTILITY, PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL SHEETS.
5. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE “STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", INCLUDING SUPPLEMENTS AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE DIRECTOR OF PUBLIC WORKS.
6. THE CONTRACTOR'S ATTENTION IS DIRECTED IN SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION IN REGARD TO SAFETY ORDERS AND SHALL CONFORM TO THE “MINIMUM PUBLIC SAFETY REQUIREMENTS” AS SHOWN ON LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD PLAN 6008-1.

WORK AREA RESTRICTION NOTES

1. ONCE AUTHORIZED BY THE CITY TO COMMENCE WORK WITHIN THE LACFCD STORM DRAIN, THE CONTRACTOR SHALL NOTIFY THE FLOOD MAINTENANCE DIVISION (IMPERIAL YARD) AT TELEPHONE (562) 861-0316 (8:00am TO 4:00pm) AND WATER RESOURCES DIVISION (OPERATIONS SECTION) AT TELEPHONE (626) 458-6177 AND PROVIDE THEM WITH A SCHEDULE OF ACTIVITIES A MINIMUM OF 120 HOURS (5 WORKING DAYS) BEFORE STARTING ANY WORK UNDER THE PERMIT.
2. CONTRACTOR SHOULD BE AWARE THAT IMPROVEMENTS WITHIN THE LACFCD STORM DRAIN MAY OCCUR WHEN LARGE FLOWS ARE PRESENT WITHIN THE LACFCD STORM DRAIN. RAIN GAUGES THROUGHOUT THE WATERSHED SHOULD BE MONITORED DURING ALL WORK WITHIN THE LACFCD STORM DRAIN. CONTRACTOR IS RESPONSIBLE FOR SAFELY DIVERTING AND CONVEYING FLOW WITHIN THE WORK AREA THROUGHOUT THE DURATION OF CONSTRUCTION.
3. PRIOR TO ANY WORK WITHIN THE LACFCD STORM DRAIN, THE CONTRACTOR SHALL SUBMIT A WATER DIVERSION PLAN TO THE CITY AND THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT (LACFCD) TO PROVIDE BYPASS CAPACITY AS FOLLOWS:
   i. APRIL 16 TO MAY 31: xx.xx CFS (xx%)
   ii. JUNE 1 TO AUGUST 31: xx.xx CFS (xx%)
   iii. SEPTEMBER 1 TO OCTOBER 14: xx.xx CFS (xx%)
   iv. NO WORK WILL BE ALLOWED IN THE LACFCD STORM DRAIN DURING THE PERIOD OF OCTOBER 15 - APRIL 15

   PLEASE SEE PERMIT POLICY DURING THE STORM SEASON (http://www.ladpw.org/ldd/lib/fp/permits/permit%20policy%20during%20the%20storm20%season.pdf) FOR MORE DETAILS.
4. THE CONTRACTOR SHALL SUBMIT THE WATER DIVERSION PLAN A MINIMUM OF 60-DAYS PRIOR TO THE ANTICIPATED START DATE OF THE WORK TO OCCUR WITHIN THE STORM DRAIN. THE WATER DIVERSION PLAN IS REQUIRED TO BE REVIEWED AND APPROVED BY THE CITY AND LACFCD.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM NOTES

1. IN THE CASE OF EMERGENCY, CALL XXXXXXXX, CITY OF NORWALK CITY ENGINEER AT (XXX) XXX-XXXX.
2. SEDIMENT FROM AREAS DISTURBED BY CONSTRUCTION SHALL BE RETAINED ON SITE USING STRUCTURAL CONTROLS TO THE MAXIMUM EXTENT PRACTICABLE.
3. STOCKPILES OF SOIL SHALL BE PROPERLY CONTAINED TO MINIMIZE SEDIMENT TRANSPORT FROM THE SITE TO STREETS, DRAINAGE FACILITIES OR ADJACENT PROPERTIES VIA RUNOFF, VEHICLE TRACKING OR WIND.
4. ALL WORK SHALL BE IN ACCORDANCE WITH THE PROJECT APPROVED STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
5. THE CONTRACTOR IS REQUIRED TO PREPARE AND SUBMIT THE SWPPP FOR APPROVAL BY THE CITY.

craftwater engineering, inc.
www.craftwaterinc.com
10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

GENERAL NOTES

PROJ:	19002 - Hermosillo
DESN:	M. Taylor
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CHKD:	O. Galang

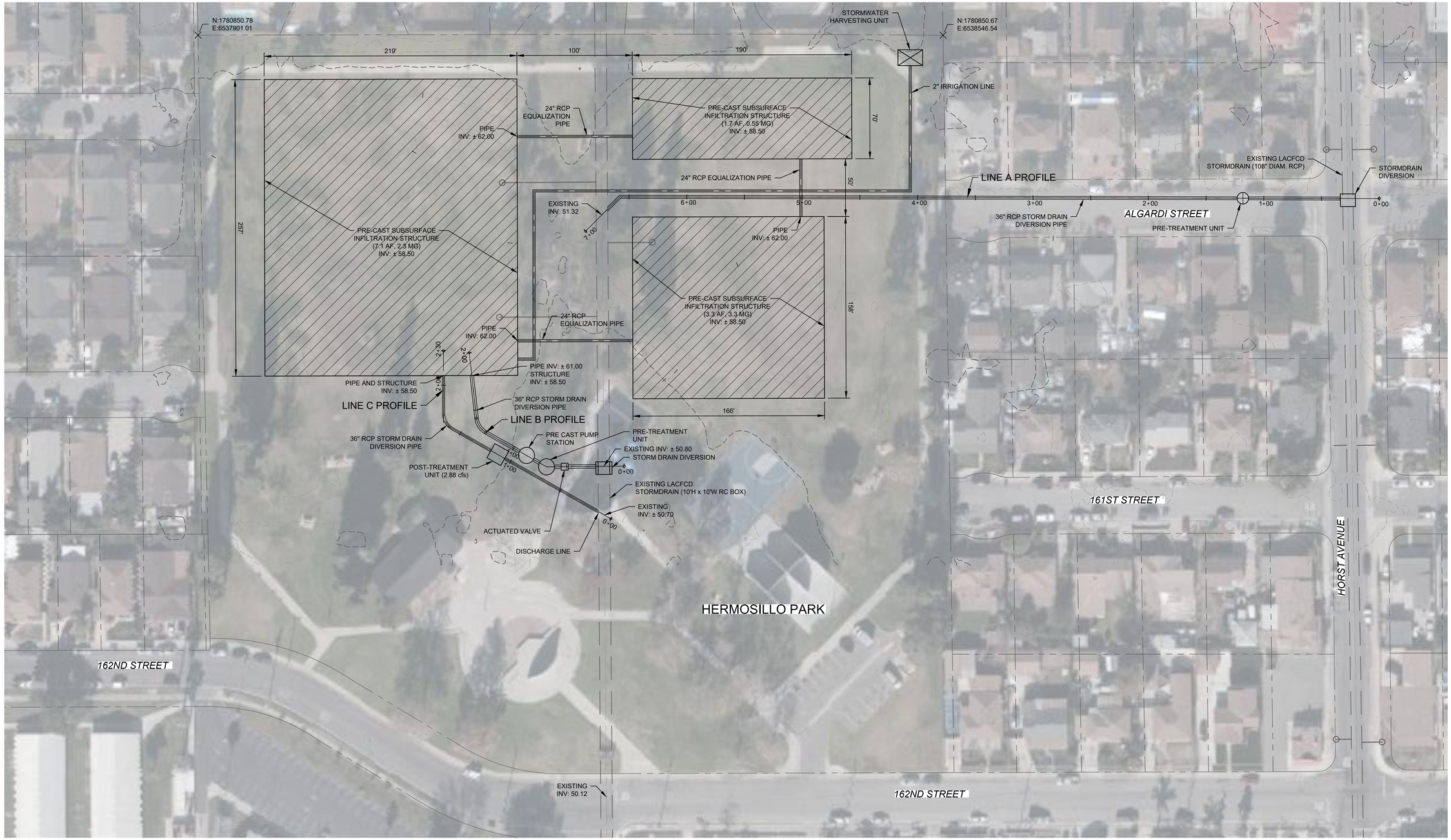
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SCALE: 1" = 40'

craftwater engineering, inc.

www.craftwaterinc.com

10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

SITE PLAN

PROJ:	19002 - Hermosillo
DESN:	M. Taylor
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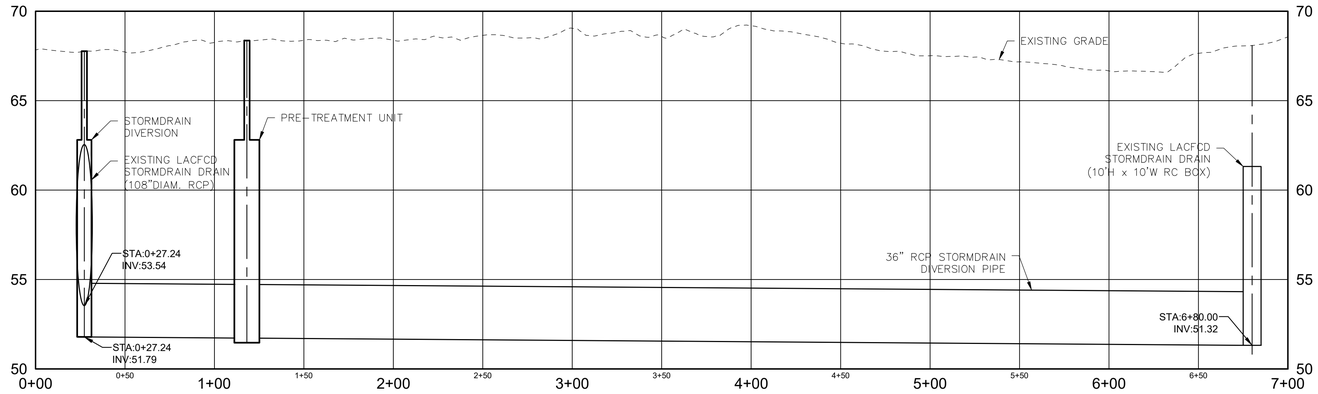
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SHEET 03 OF 05

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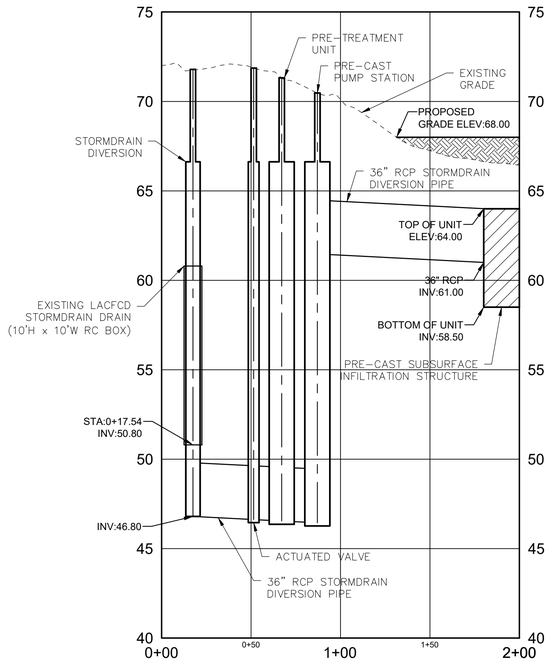
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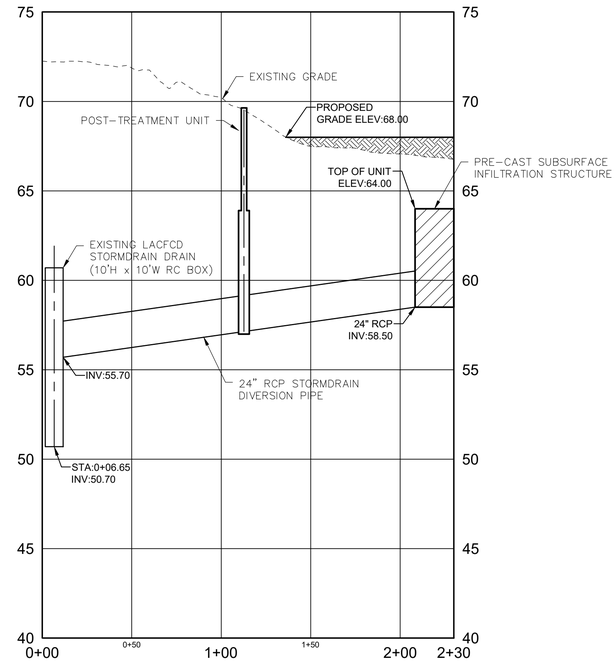
LINE A PROFILE

VERTICAL SCALE: 1"=4'



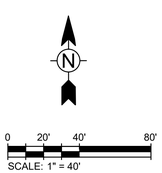
LINE B PROFILE

VERTICAL SCALE: 1"=4'



LINE C PROFILE

VERTICAL SCALE: 1"=4'



craftwater engineering, inc.
www.craftwaterinc.com
10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

LINE A, B AND C PROFILES

PROJ:	19002 - Hermosillo
DESN:	M. Taylor
DRWN:	R. Martinez
CHKD:	O. Galang

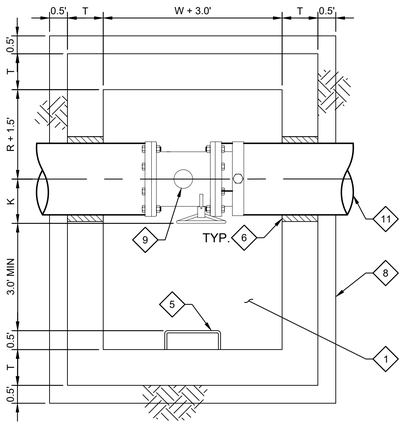
C-02

SHEET 04 OF 05

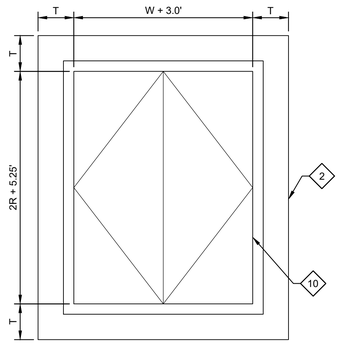
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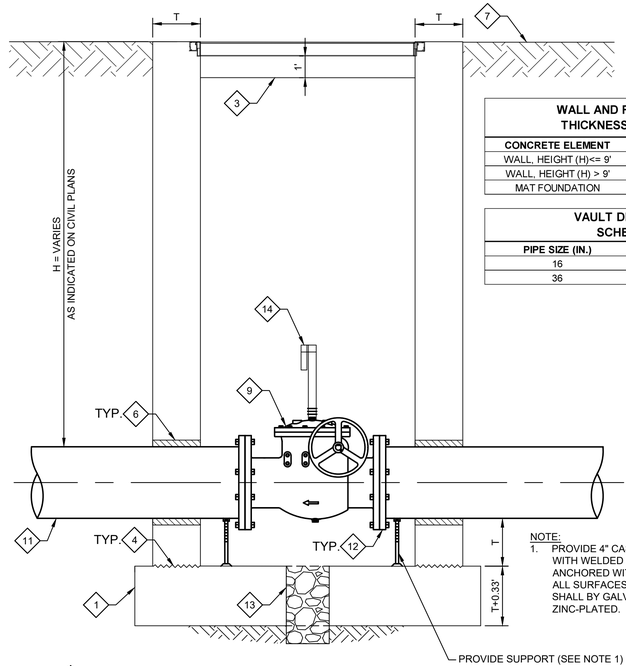
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FOUNDATION PLAN FOR
ACTUATED VALVE VAULT



ROOF PLAN FOR
ACTUATED VALVE VAULT



WALL AND FOUNDATION THICKNESS SCHEDULE	
CONCRETE ELEMENT	THICKNESS (IN.)
WALL, HEIGHT (H)<= 9'	T = 12
WALL, HEIGHT (H) > 9'	T = 16
MAT FOUNDATION	T + 4

VAULT DIMENSION SCHEDULE	
PIPE SIZE (IN.)	DIMENSION (IN.)
16	K = 13.0; R = 8; W = 17.75
36	K = 21.7; R = 18; W = 52

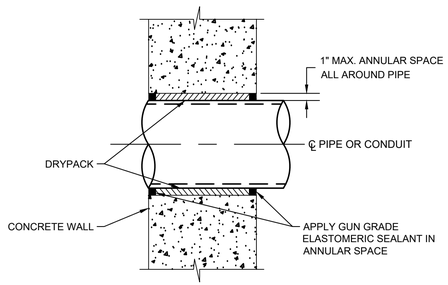
NOTE:
1. PROVIDE 4" CAST IRON PIPE SUPPORT WITH WELDED BASE PLATE ANCHORED WITH 3/4" DIA. X 5" BOLTS. ALL SURFACES OF PIPE SUPPORT SHALL BY GALVANIZED OR ZINC-PLATED.

VAULT VALVE SECTION

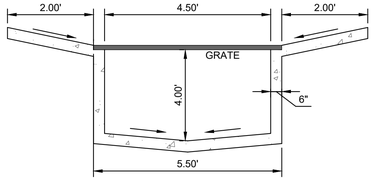
KEYNOTES:

1. CONCRETE MAT FOUNDATION
2. CONCRETE WALL
3. 1'-0" DEEP CONCRETE ROOF BEAM W/ 3 - #8 BOTTOM LONGITUDINAL BARS, 3 - #5 TOP LONGITUDINAL BARS & #4 STIRRUPS AT 1'-0" O.C.
4. ROUGHENED SURFACE
5. S.S. LADDER PER SPPWC STD. PLAN 635-3
6. PENETRATION SEAL - SEE DETAIL 2 HEREON
7. FINISHED GRADE
8. EDGE OF FOUNDATION
9. ELECTRIC ACTUATED PLUG VALVE
10. BILCO TYPE "JD-AL H20" ALUMINUM DOUBLE LEAF EQUIPMENT HATCH WITH LIFT ASSIST AND INTEGRATED FALL PROTECTION GRATING OR APPROVED EQUAL
11. PIPE SIZE AND MATERIAL - SEE CIVIL SHEETS FOR TYPE, SIZE, AND LOCATIONS
12. STEEL FLANGE ADAPTER FOR CONNECTION FROM REINFORCED CONCRETE PIPE TO ACTUATED PLUG VALVE
13. 1.0' DIA x 2.0' DEEP FRENCH DRAIN WITH 1.5" GRAVEL
14. ACTUATOR

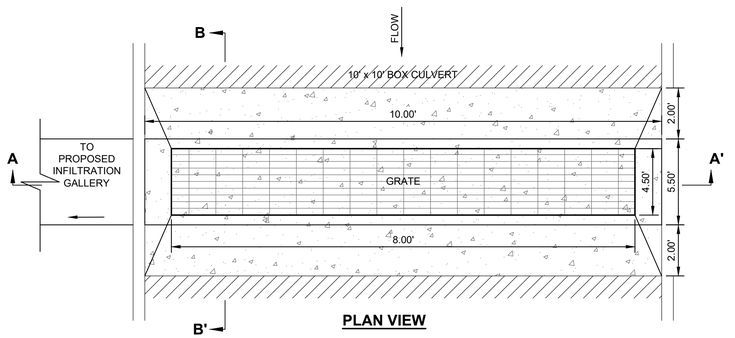
1 – ACTUATED VALVE STRUCTURE (>12" DIA. PIPE)
NTS



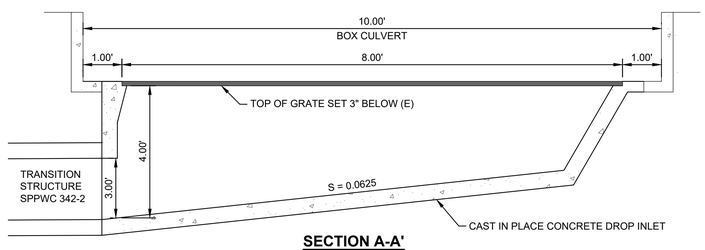
2 – PENETRATION SEAL AT WALL
NTS



SECTION B-B'

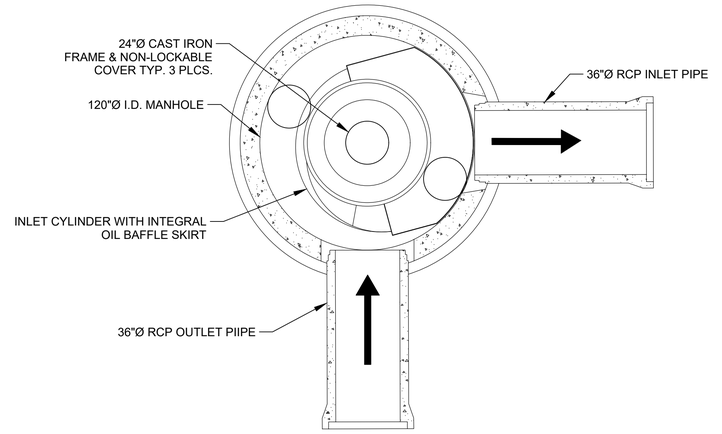


PLAN VIEW

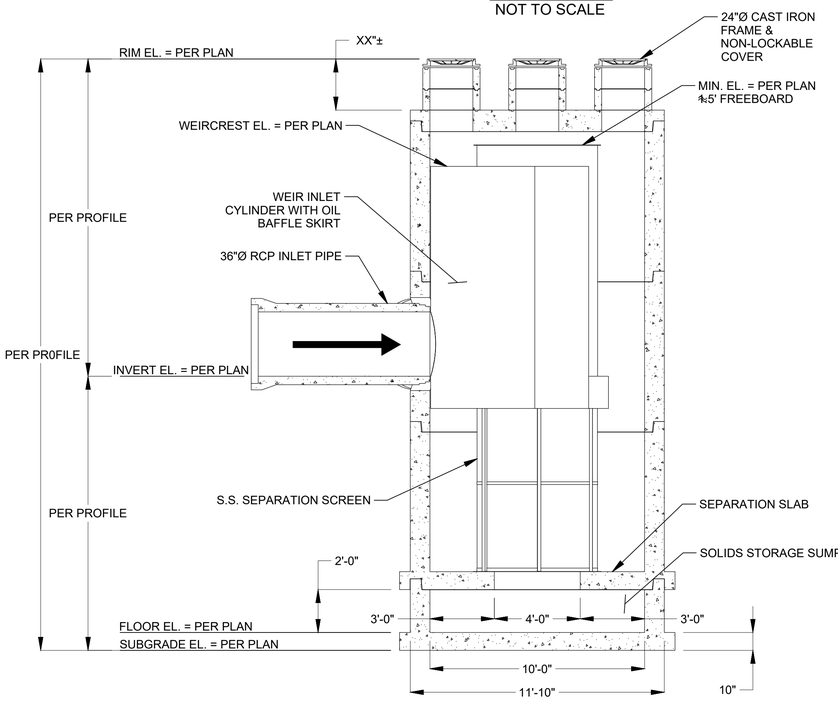


SECTION A-A'

3 – GRATED DROP INLET
NTS



PLAN VIEW
NOT TO SCALE



PROFILE VIEW
NOT TO SCALE

HYDRAULIC AND TREATMENT FLOW DESIGN :

STORMWATER QUALITY DESIGN FLOW (SQDF) - NO BYPASS	50 CFS

STORMWATER TREATMENT UNIT EMPLOYING THE CONTINUOUS DEFLECTIVE SEPARATION TREATMENT PROCESS TO PRODUCE A NON-BLOCKING SCREENING SYSTEM WITH SWIRL CONCENTRATION. THIS HYDRODYNAMIC SEPARATION TREATMENT IS EQUIPPED WITH AN INTERNAL BYPASS THAT PROVIDES COMPLETE BYPASS OF STORM DRAIN PIPELINE CONVEYANCE FLOW WITHOUT SCOUR OF CAPTURED GROSS SOLIDS .

TREATMENT :

1. 100% CAPTURE FOR TRASH & DEBRIS.
2. CAPTURE OF OTHER WATER QUALITY CONSTITUENTS INCLUDE :
   - TOTAL SUSPENDED SOLIDS (TSS)
   - HEAVY METALS
   - OIL & GREASE
   - NUTRIENTS
   - FECAL COLIFORM

4 – HYDRODYNAMIC SEPARATOR (TYPICAL)
NTS

craftwater engineering, inc.
www.craftwaterinc.com
10711 OAKBEND DR.
SAN DIEGO, CA 92131
(210) 598-4178

MARK	DATE	DESCRIPTION	BY

11959 162ND STREET,
NORWALK, CALIFORNIA 90650

HERMOSILLO PARK
STORMWATER CAPTURE FACILITY

DETAILS

PROJ:	19002 - Hermosillo
DESN:	M. Taylor
DRWN:	R. Martinez
CHKD:	O. Galang

C-03
SHEET 05 OF 05

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Bar Measures 1 inch, otherwise drawing not to scale

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ATTACHMENT C: LANDSCAPE PLAN



LEGEND

KEY DESCRIPTION

1.0 PARK FEATURES

- 1.1 UPPER TERRACE FOR GROUP GATHERINGS & SPECTATORS
- 1.2 AMPHITHEATRE AND COMMUNITY EVENT SPACE
- 1.3 WALKING PATHS (LIGHTED)
- 1.4 SPLASH PAD
- 1.5 PICNIC TABLE
- 1.6 BIKE RACK
- 1.7 DRINKING FOUNTAIN
- 1.8 LITTER RECEPTACLE
- 1.9 ENTRY MONUMENT
- 1.10 TREE WELL
- 1.11 OUTDOOR PLAZA
- 1.12 GROUP BBQ FACILITIES

2.0 PLAYGROUND

- 2.1 EXISTING PLAY EQUIPMENT & PLAY SURFACING TO REMAIN
- 2.2 PORTION OF EXISTING PLAYGROUND TO ADJUSTED ACCOMMODATE SOCCER PITCH

3.0 FIELD SPORTS

- 3.1 SOCCER PITCH - 2 NATURAL TURF FIELDS (U19)
- 3.2 SOCCER PITCH (OVERLAY) - 4 FIELDS (U8)
- 3.3 30' HIGH SPORTS NETTING
- 3.4 SPORTS FIELD LIGHTING
- 3.5 CONCRETE BLEACHER SEATING

4.0 SPORT COURTS

- 4.1 BASKETBALL COURT (1 - FULL COURT & 1- 1/2 COURT)
- 4.2 HANDBALL COURTS (3- COURTS)

5.0 BUILDINGS & STRUCTURES

- 5.1 COMMUNITY CENTER (8500 SF)
  TOTAL ESTIMATED OCCUPANCY LOAD: 208 PEOPLE
  MULTI-PURPOSE ROOM: 3970 SF
  STAFF OFFICE SPACE: 280 SF
  POLICE SUB-STATION: 280 SF
  RESTROOM (MEN & WOMEN): 1225 SF
  STORAGE: 670 SF
- 5.2 SHADE CANOPY (3800 SF)
  (TENSILE FABRIC TYPE STRUCTURE)

6.0 PEDESTRIAN CIRCULATION

- 6.1 PAVED WALKWAYS (MINIMUM 8' WIDE)
- 6.2 EXERCISE PATH WITH TRAIL MARKERS - .4 MILE LOOP
- 6.3 EXISTING PERIMETER WALK TO REMAIN
- 6.4 PEDESTRIAN CROSSING

7.0 VEHICULAR CIRCULATION

- 7.1 EXPANDED PARKING LOT (NET GAIN: 135 SPACES)
- 7.2 EXISTING PARKING LOT ENTRY & EXIT TO REMAIN
- 7.3 NEW PARKING LOT ENTRY & EXIT

CONCEPT PLAN

HERMOSILLO PARK

CITY OF NORWALK

David Volz Design
Landscape Architects and Park Planners

APRIL 2019

ATTACHMENT D: ENGINEER'S 10% COST ESTIMATE

HERMOSILLO PARK OPINION OF PROBABLE CONSTRUCTION COSTS

Client: **City of Norwalk (Hermosillo Park)**
Project: **Lower San Gabriel River EWP Feasibility Study - 11.8 AC-FT**
Status: **10% Cost Estimate**

Prepared by: **GK**
Checked by: **MMT**
Date: **9/23/2019**

Description	Qty	Unit	Unit Price	Total
Miscellaneous				**$607,128**
Mobilization / Demobilization (5% of Costs)	1	LS	$582,128.00	$582,128
Traffic Control	1	LS	$15,000.00	$15,000
Arborist Monitoring	1	LS	$10,000.00	$10,000
Channel Diversion and Pretreatment				**$816,822**
Diversion Structure	2	EA	$84,000.00	$168,000
Actuated Valve and Structure	1	EA	$25,000.00	$25,000
Pretreatment Device (50 CFS)	2	EA	$150,000.00	$300,000
Shoring for Pretreatment Device	3,594	SF	$10.00	$35,940
Excavation for Pretreatment Device	734	CY	$30.00	$22,020
Backfill and Compaction for Pretreatment Device	534	CY	$25.00	$13,350
Hauling for Pretreatment Device	260	CY	$28.00	$7,280
Manhole (4' I.D. x 16' Depth)	2	EA	$7,000.00	$14,000
Shoring for Manhole	2,016	SF	$5.00	$10,080
Excavation for Manhole	262	CY	$30.00	$7,860
Backfill and Compaction for Manhole	236	CY	$25.00	$5,900
Hauling for Manhole	34	CY	$28.00	$952
Piping (36" RCP)	758	LF	$70.00	$53,060
Excavation for Piping	1,684	CY	$8.00	$13,472
Shoring for Piping	22,740	SF	$5.00	$113,700
Backfill and Compaction for Piping	1,348	CY	$8.00	$10,784
Backfill and Compaction for Piping Base (crushed aggregate)	112	CY	$46.00	$5,152
Hauling for Piping	224	CY	$28.00	$6,272
Flap Gate	1	EA	$4,000.00	$4,000
Site Preparation and Demolition - Existing Park Area				**$35,560**
Concrete Sidewalk and Walkway Removal	1,700	SF	$3.50	$5,950
Concrete Curb and Gutter Removal	20	LF	$5.00	$100
AC Pavement Removal	200	SY	$22.00	$4,400
Turf Removal	12,500	SY	$2.00	$25,000
Infield Removal	0	SF	$1.25	$0
Fence Removal	25	LF	$4.40	$110
Storage				**$6,679,175**
Underground Infiltration Gallery Precast Structures	514,007	CF	$7.50	$3,855,053
Excavation	42,592	CY	$15.00	$638,880
Shoring (area that cannot be fully excavated at required slope)	23,600	SF	$50.00	$1,180,000
Installation	1	LS	$75,000.00	$75,000
Aggregate Backfill	873	CY	$30.00	$26,190
Subgrade (6" Stone Base with 2' Overhang Around Perimeter)	1,854	CY	$40.00	$74,160
Backfill and Compaction	10,648	CY	$25.00	$266,200
Hauling	18,989	CY	$28.00	$531,692
Maintenance Hole	2	EA	$16,000.00	$32,000

HERMOSILLO PARK OPINION OF PROBABLE CONSTRUCTION COSTS

Client: **City of Norwalk (Hermosillo Park)**
Project: **Lower San Gabriel River EWP Feasibility Study - 11.8 AC-FT**
Status: **10% Cost Estimate**

Prepared by: **GK**
Checked by: **MMT**
Date: **9/23/2019**

Description	Qty	Unit	Unit Price	Total
Wet Well and Conveyance				**$835,319**
Wet Well	1	EA	$20,200.00	$20,200
Wet Well Installation	1	LS	$31,000.00	$31,000
Submersible Pumps and Valves	1	LS	$350,000.00	$350,000
Irrigation Pump	1	LS	$165,000.00	$165,000
Excavation for Wet Well	381	CY	$30.00	$11,430
Shoring for Wet Well	2,496	SF	$30.00	$74,880
Backfill and Compaction for Wet Well	310	CY	$25.00	$7,750
Hauling for Wet Well	93	CY	$28.00	$2,604
36" DIP to Pump Station	75	LF	$180.00	$13,500
2" DIP to Irrigation	650	LF	$150.00	$97,500
Excavation for Piping	100	CY	$10.00	$1,000
Backfill and Compaction for Piping	91	CY	$8.00	$728
Backfill and Compaction for Piping Base (crushed aggregate)	6	CY	$46.00	$276
Hauling for Piping	12	CY	$28.00	$336
Actuated Valve and Structure	1	EA	$25,000.00	$25,000
Junction Manhole	1	EA	$15,000.00	$15,000
Shoring for Junction Manhole	1,088	SF	$5.00	$5,440
Excavation for Junction Manhole	162	CY	$30.00	$4,860
Backfill and Compaction for Junction Manhole	139	CY	$25.00	$3,475
Hauling for Junction Manhole	30	CY	$28.00	$840
Flap Gate	1	EA	$4,500.00	$4,500
Electrical Service, Controls, Instrumentation				**$322,000**
Electrical Service	1	LS	$60,000.00	$60,000
Control Panel and PLC Programming	1	LS	$80,000.00	$80,000
Conduit & Wiring	1	LS	$100,000.00	$100,000
NEMA 4 Junction Box, 6"x6"x6" (1 each for 480V and 120V conduits)	6	EA	$2,000.00	$12,000
Misc. Conduit Fittings, Elbows, Core Drilling and Sealing, etc.	1	LS	$25,000.00	$25,000
Instrumentation	1	LS	$45,000.00	$45,000
Landscape and Irrigation Modifications				**$277,375**
Re-Planting/Seeding Excavation Areas	112,500	SF	$0.50	$56,250
Irrigation System (including all components and mainline)	112,500	SF	$1.71	$192,375
Shrubs, Perennials, and Grasses	3,500	SF	$2.50	$8,750
90-Day Plant Establishment Period	1	LS	$20,000.00	$20,000
Site Amenities and Improvements				**$34,245**
Concrete Paving	1,700	SF	$10.00	$17,000
Concrete Curb and Gutter	20	LF	$26.00	$520
AC Paving	1,800	SF	$9.00	$16,200
Chain Link Fence (6' Height)	25	LF	$21.00	$525
Start-up, Testing, Prepare Operations & Maintenance Manuals, and Prepare Record Drawings				**$94,500**
SWPPP Implementation	1	LS	$40,000.00	$40,000
Start-up and Testing	1	LS	$46,500.00	$46,500
O&M Manuals	1	LS	$4,000.00	$4,000
Record Drawings	1	LS	$4,000.00	$4,000
SUBTOTAL				**$9,702,124**
			20% Contingency	$1,940,425
			Total Construction Costs	**$11,642,549**
		GRAND TOTAL		**$11,642,549**

craftwater engineering, inc.

HERMOSILLO PARK OPINION OF PROBABLE CONSTRUCTION COSTS

Client:	**City of Norwalk (Hermosillo Park)**	Prepared by:	**GK**
Project:	**Lower San Gabriel River EWP Feasibility Study - 11.8 AC-FT**	Checked by:	**MMT**
Status:	**10% Cost Estimate**	Date:	**9/23/2019**

Description	Qty	Unit	Unit Price	Total

Assumptions and Exclusions

1. This is a rough order of magnitude preliminary opinion of probable construction costs only. Actual costs may vary.
2. The unit cost data is derived from inhouse sources, recent bids on similar construction, and RSMeans current construction cost data.
3. This opinion of cost is based on the project program and plans made available at the time of preparation.
4. Material prices are based on current quotations and do not include escalation.
5. This opinion of cost assumes that all improvements will be constructed at one time.
6. Quantity take offs were performed when possible and parametric estimates and allowances are used for items that cannot be quantified at this stage of the design.
7. This opinion has been based on a competitive open bid situation with a recommended 5 - 7 bonafide reputable bids from general contractors and a minimum of 3 bidders for all items of subcontracted work.
8. All unit costs take into account sales tax, general conditions, bonding and insurance, and subcontractor and general contractor overhead and profit.
9. Where applicable, unit costs include the cost of freight.

The following are excluded:

1. Environmental clearances and permits
2. Hazardous spoil disposal, if encountered
3. Property and Right of Way acquisition or easements
4. Legal and accounting fees
5. Plan check, building permit fees
6. Utility Connection Fees
7. Testing and inspection
8. Fire and all risk insurance
9. Removal of unforeseen underground obstructions
10. Relocation of unforeseen subsurface utilities
11. Signage and wayfinding
12. Additional fill or import
13. Loose furniture and equipment
14. Utility connection fees
15. Tel/data system
16. Construction contingency
17. Work done after business hours
18. Design, engineering and consulting fees other than those specifically listed in the above estimate

Items that may affect the cost estimate:

1. Modifications to the scope of work included in this estimate
2. Unforeseen sub-surface conditions
3. Restrictive technical specifications or excessive contract conditions
4. Any other non-competitive bid situations
5. Bids delayed beyond the projected schedule

ATTACHMENT E: GEOTECHNICAL INVESTIGATION REPORT

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(562) 799-9469 Fax (562) 799-9459

December 1, 2016 Project Number 19267-16

John L. Hunter and Associates, Inc.
6131 Orangethorpe Avenue, Suite 300
Buena Park, California 90620

Attn: John L. Hunter, P.E.

RE: **Soil Infiltration Study** – Hermosillo Park at 11959 162nd Street, in the City of Norwalk, California

Dear Mr. Hunter:
Pursuant to your request, this firm has performed a Soil Infiltration Study for the above referenced project. The purpose of this study is to evaluate the feasibility of an on-site disposal system utilizing an infiltration vault. The scope of work included the following: 1) site reconnaissance; 2) subsurface geotechnical exploration; 3) infiltration testing; 4) engineering analysis of field data; and 5) preparation of this report.

Proposed Infiltration System

It is proposed to install an infiltration vault system in park area in order to retain and infiltrate water runoff into the subsurface soils. Depth of system is assumed to be within the upper 15 feet below grade. Depth of system will be limited by existing groundwater at approximately 26.5 feet below grade.

Site Description

The property is located north of 162nd Street at the intersection with Elaine Avenue, in the City of Norwalk, as shown on Figure 1. The site is a city park with community building, parking lots and sports courts and concrete walks. The area of the planned infiltration system is currently used as a soccer field. The land is relatively level and drainage appears to remain in the soccer field area.

Groundwater

Groundwater was encountered at a depth of 26.5 feet in our subsurface exploration B-1. Research of the *California Department of Conservation – Division of Mines and Geology Seismic Hazard Zone Report 037, Plate 1.2,* indicates a historic high groundwater level of 8 feet below ground surface in the vicinity.

Methodology and Procedures

A truck mounted hollow stem auger drilling rig was used to excavate the test borings. The locations of the tests are shown on the attached Figure 2.

Two infiltration test borings (B-2 and B-3) to depths of 10 and 15 feet, respectively, below ground surface (bgs) were performed in order to establish preliminary infiltration rates for the design of the system. The borings encountered less than 12 inches of fill soils, as measured from existing surface, overlying medium dense and damp native soils classifying as slightly silty SAND. Some gravel was also encountered below 9.5 feet.

Detailed descriptions of the subsurface soils are shown on the attached boring logs in Appendix B. The test borings were backfilled with the excavated soils and tamped at the completion of our field testing.

The test borings consisted of a 6-inch diameter hole. A 2-inch diameter perforated PVC casing with solid end cap was installed in the borings and then surrounded with gravel materials to prevent caving. The boreholes were then filled with water for pre-soaking purposes. Based upon the rapid drop in the water level in the initial pre-soak period, the holes were measured at 10-minute maximum intervals for eight additional readings.

The measurements were obtained by using an electronic tape measure with 1/16-inch divisions and timed with a stopwatch.

Discussion of Results

Based upon the results of our testing, the underlying soils exhibit various percolation rates based on the amount of fines in the soil layers. The field infiltration test data and our infiltration rate calculations are listed below and included in Appendix B.

Test No.	Depth (feet bgs)	Soil Type	Infiltration rate
B-2	10	slightly silty SAND	37.1 in/hr
B-3	15	slightly silty SAND	28.0 in/hr

The soils at 10 and 15 feet below grade are deemed suitable for infiltration.

a) The reduction factor - $R_f = CF_t$ and Rf = 2.63 to 3.0 for the field infiltration test.

b) CF_v = 1.0 based on silty sand soils encountered in the test borings at depths of 10 and 15 feet.

CF_s = 2.0 for long-term siltation, plugging and maintenance. The silty SAND soils are likely to have some plugging and regular maintenance of storm water discharge devices is required.

For design considerations, an infiltration rate of 14 in/hr may be used for soils at 10 to 15 feet below grade.

The potential of settlement of proposed or existing structures located at least 10 feet from any infiltration pit is low. In addition, the potential for hydro-consolidation and the susceptibility for any ground settlements are considered low. All systems shall meet the California Regional Water Quality Control Board (CRWQCB) requirements.

Closure

The use of an on-site disposal system appears to be geotechnically feasible for future development provided the low infiltration rates as give are used in the design. All systems must meet the California Regional Water Quality Control Board (CRWQCB) requirements. The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations.

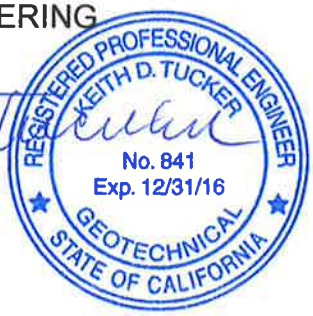
No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase.

This firm should have the opportunity to review the final plans to verify that all our recommendations are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

This study has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING



Keith D. Tucker
Project Engineer
R.G.E. 841

Mark A. Burkholder
Project Manager

List of Appendices
(in order of appearance)

Appendix A

- Vicinity Map and Site Plan

Appendix B

- Log of Groundwater Verification Boring B-1
- Logs of Test Borings B-2 and B-3
- Infiltration Field Test Data
- Infiltration Test Calculations

Appendix A



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VICINITY MAP

PROJECT 19267-16 | DATE 11/2016

FIG. 1

Draft: Hermosillo Storm Water Treatment



N

NTS

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PROJECT 19267–16 | DATE 11/2016

LOCATION OF FIELD EXPLORATIONS

FIG. 2

Appendix B

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL, SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINE (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

KEY:

- ■ Indicates 2.5-inch Inside Diameter. Ring Sample.
- ⊠ Indicates 2-inch OD Split Spoon Sample (SPT).
- ⧅ Indicates Shelby Tube Sample.
- ◫ Indicates No Recovery.
- ◧ Indicates SPT with 140# Hammer 30 in. Drop.
- ⊠ Indicates Bulk Sample.
- ◩ Indicates Small Bag Sample.
- ◨ Indicates Non-Standard
- ⊠ Indicates Core Run.

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1 - 5%
Few	5 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5mm) to No. 200 (0.074mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHESIONLESS SOILS		COHESIVE SOILS		
Density	N (blows/ft)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	Very Soft	0 to 2	< 250
Loose	4 to 10	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	Very Stiff	15 to 30	2000 - 4000
		Hard	over 30	> 4000

John L Hunter & Associates
19267-16

Log of Boring B-1

Boring Location: 11959 162nd St, Norwalk

Date of Drilling: 11/18/16 | Groundwater Depth: 26.5'

Drilling Method: Drill Rig

Hammer Weight: | Drop:

Surface Elevation: Not Measured

GROUNDWATER VERIFICATION BORING

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Relative Compaction
0		FILL SOILS Silty SAND with occasional gravel Brown, medium dense, damp					
		NATURAL SOILS Slightly silty SAND Light brown, medium dense, damp					
5							
		Some gravel below 9.5'					
10							
		Silty SAND Brown, medium dense, moist					
15							
20							
		Sandy SILT Grey, medium stiff, moist Wet to saturated with depth					
25							
		Boring completed at depth of 29'					
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\19267-16.log Date: 11/30/2016

NorCal Engineering

John L Hunter & Associates 19267-16	Log of Boring B-2
Boring Location: 11959 162nd St, Norwalk	
Date of Drilling: 11/18/16	Groundwater Depth: None Encountered
Drilling Method: Drill Rig	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Relative Compaction
0		FILL SOILS Silty SAND with occasional gravel Brown, medium dense, damp					
		GWT not encountered					
		NATURAL SOILS Slightly silty SAND Light brown, medium dense, damp; with some gravel below 9.5'					
5							
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\19267-16.log Date: 11/30/2016

John L Hunter & Associates
19267-16

Log of Boring B-3

Boring Location: 11959 162nd St, Norwalk

Date of Drilling: 11/18/16 | Groundwater Depth: None Encountered

Drilling Method: Drill Rig

Hammer Weight: | Drop:

Surface Elevation: Not Measured

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: Relative Compaction
0		FILL SOILS Silty SAND with occasional gravel Brown, medium dense, damp					
		NATURAL SOILS Slightly silty SAND Light brown, medium dense, damp; with some gravel below 9.5'					
5		GWT not encountered					
10							
15		Silty SAND Brown, medium dense, moist Boring completed at depth of 15'					
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\19267-16.log Date: 11/30/2016

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SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA
FOR CITY OF LOS ANGELES, ONLY

Client:	**John Hunter – Hermosillo Park**		
Project No:	19267-16	**Tested By:**	M.B.
Test Hole:	B-2	**Date Tested:**	11/18/16
Depth of Test Hole:	10'	**Caving:**	
Diameter of Test Hole:	8"	**Notes:**	
Date Excavated:	11/18/16		

PRE-SOAK

TIME	PRE-SOAK NO.	TIME INTERVAL	TOTAL ELAPSED TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	CHANGE IN WATER LEVEL
7:33	1	3	3	107.0	120.0	13.0
7:36						
7:36	2	5	8	107.0	120.0	13.0
7:41						

PERCOLATION TEST

TIME	PRE-SOAK NO.	TIME INTERVAL	TOTAL ELAPSED TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	CHANGE IN WATER LEVEL
7:41	1	7	7	108.0	120.0	12.0
7:48						
7:48	2	7	14	108.0	120.0	12.0
7:55						
7:55	3	7	21	108.0	120.0	12.0
8:02						
8:02	4	7	28	107.0	120.0	13.0
8:09						
8:09	5	7	35	107.0	120.0	13.0
8:16						
8:16	6	8	43	107.0	120.0	13.0
8:24						
8:24	7	7	50	107.0	120.0	13.0
8:31						
8:31	8	6	56	107.0	120.0	13.0
8:37						

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NORCAL ENGINEERING

SOILS AND GEOTECHNICAL CONSULTANTS

PERCOLATION TEST DATA
FOR CITY OF LOS ANGELES, ONLY

Client:	John Hunter – Hermosillo Park		
Project No:	19267-16	**Tested By:**	M.B.
Test Hole:	B-3	**Date Tested:**	11/18/16
Depth of Test Hole:	15'	**Caving:**	
Diameter of Test Hole:	8"	**Notes:**	
Date Excavated:	11/18/16		

PRE-SOAK

TIME	PRE-SOAK NO.	TIME INTERVAL	TOTAL ELAPSED TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	CHANGE IN WATER LEVEL
9:11	1	5	5	167.0	180.0	13.0
9:16						
9:16	2	9	14	165.0	180.0	15.0
9:25						

PERCOLATION TEST

TIME	PRE-SOAK NO.	TIME INTERVAL	TOTAL ELAPSED TIME	INITIAL WATER LEVEL	FINAL WATER LEVEL	CHANGE IN WATER LEVEL
9:25	1	9	9	166.0	180.0	14.0
9:34						
9:34	2	10	19	166.0	180.0	14.0
9:44						
9:44	3	10	29	166.0	180.0	14.0
9:54						
9:54	4	10	39	165.5	180.0	14.5
10:04						
10:04	5	10	49	165.0	179.0	14.0
10:14						
10:14	6	10	59	165.0	179.0	14.0
10:24						
10:24	7	10	69	165.0	179.5	14.5
10:34						
10:34	8	10	79	165.0	179.0	14.0
10:44						

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SOIL INFILTRATION RATE CALCS ⇒ Auger Boring

Location:	B-2	B-3
• Depth =	10.0'	15.0'
• Hole Dia. =	8"	8"
• Drop = Δd	13"	14"
• Time = Δt Interval	8 min.	10 min
• Preadjusted Perc. Rate	97.5 in/hr	84 in/hr
• Initial Water Depth = d_1	13"	15"
• Reduction Factor = R_f	2.63	3.0
• INFILTRATION RATE	37 in/hr	28 in/hr

$$\text{Infiltration Rate} = \frac{\text{Pre adjusted Perc. Rate}}{\text{Reduction Factor}}$$

$$\text{Reduction Factor} = R_f = \left[\frac{2 \cdot d_1 - \Delta d}{\text{Dia.}}\right] + 1$$

NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

DATE

ATTACHMENT F: STORMWATER CAPTURE ANALYSIS

Hermosillo Park Stormwater Capture Project

Stormwater Capture Capacity Options Technical Memorandum

June 11, 2019

PRESENTED TO

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OVERVIEW AND OBJECTIVES

The Lower San Gabriel River Watershed Management Program (LSGR WMP) Group has been charged with achieving reductions of pollutants in the San Gabriel River, Coyote Creek, and San Jose Creek waterbodies. In accordance to the plans outlined in the LSGR WMP, a regional project has been identified at Hermosillo Park in the City of Norwalk. The project is intended to intercept the dry-weather flow and a sizeable portion of the stormwater flows from two adjacent storm drains to the Park. Stormwater will be diverted from two drains running north to south near the Park; the drain running along Horst Ave. (108" reinforced concrete pipe [RCP]; BI9001 – U1 Line A) and the drain bisecting the Park (10' x 10' reinforced concrete box [RCB]; BI0021 – U2 Line A). See the proposed project concept in **Figure 1** for greater detail.

A series of subsurface pipe-connected storage basins is proposed at Hermosillo Park to capture stormwater from the two diversions. Project constraints and potential options will be detailed in this memo in detail to present an array of options that will contribute to both water quality goals as well as other important project considerations and desired outcomes. These options can then be considered and weighed before proceeding with the ultimate design of the project by identifying the project configuration that best meets the desired outcome and contributes to water quality benefits in a cost-effective manner.

OBJECTIVES

To identify the most effective stormwater capture configuration at the project site, decision support modeling has been conducted to identify the optimal BMP configuration using a balanced approach that incorporates design storm hydrologic targets as well as long-term water quality considerations. This optimal configuration addresses stormwater runoff that will be diverted to the project site from the BI9001 drain as well as runoff that will be diverted from the BI0021 drain bisecting the Park. BMP configuration recommendations will be made for the Hermosillo Park Project site for the following key design criteria:

Diversion Rates

Multiple diversion flowrates for both diversion points will be simulated to develop cost-effectiveness curves and to determine the optimal diversion rates that will provide the greatest water quality benefit without surpassing the point of declining returns. These will range in values grounded in construction feasibility and subject to other project constraints identified in the initial project concept development.

BMP Storage

The optimal BMP size will be determined subject to the allowable site footprint. Size recommendations will include the following highlighted endpoints:

- The BMP size that is most cost-effective for the project tributary area,
- The BMP size that will capture the 85th percentile, 24-hour storm runoff volume, and
- The BMP size that will achieve multi-benefits, including, but not limited to, addressing stormwater quality and water supply.

Discharge

Different routes exist for the outflows from the BMP, and each entail differing requirements, infrastructure, and constraints that impact the overall performance of the stormwater capture system and project cost. The following represent potential options for the Hermosillo Park Project site that will be investigated in this analysis and included in the BMP configuration optimization if deemed feasible:

- Infiltration
- On-site irrigation potential
- Filtration/return to storm drain

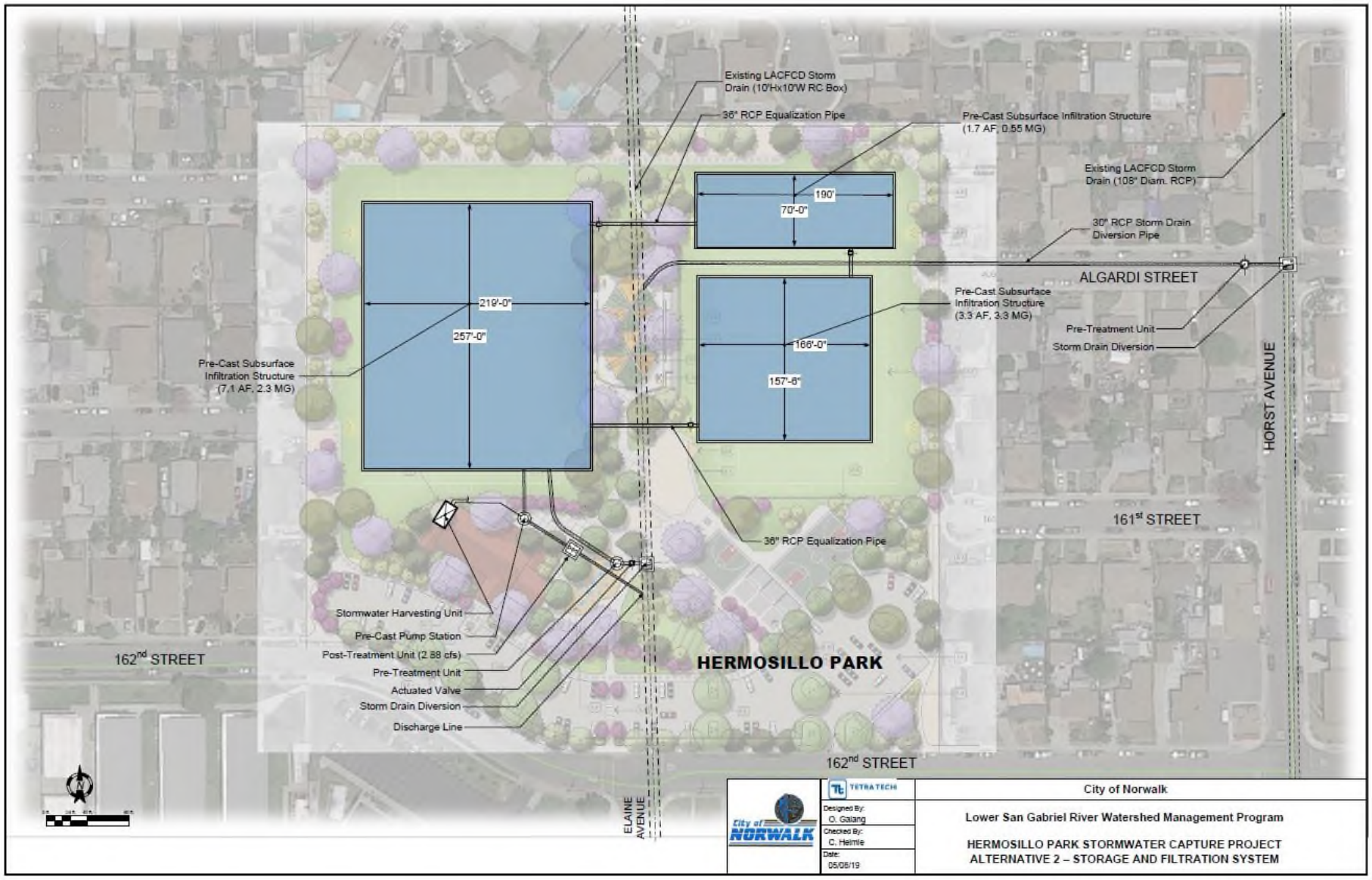


Figure 1. Hermosillo Park project concept.

BASELINE SITE CONDITIONS AND CONSTRAINTS

The following subsections summarize the baseline watershed, hydrologic, and on-site conditions and constraints that will be accounted for in BMP configuration and optimization analysis for the Hermosillo Park Project.

WATERSHED CHARACTERIZATION

For this study, the Los Angeles County Watershed Management Modeling System (WMMS) was used within the Loading Simulation Program C++ (LSPC) to simulate the contaminant loading, runoff volume, and flow rate associated with a long-term, 10-year continuous time series (Water Year 2002 to Water Year 2011) as well as for the 85th percentile storm. The WMMS is accepted by the Los Angeles Water Quality Control Board for performance of compliance analyses in the context of EWMP/WMP development.

The drainage area delineations for the project site (**Figure 2**) were developed using geospatial data associated with the WMMS modeling subwatersheds and verified/corrected slightly using further GIS analysis where full subwatersheds did not coincide with project locations and where subsurface storm drains overlapped. Digital stormwater pipe inventories and high-resolution Light Detection and Ranging (LiDAR) elevation data were used to accomplish subwatershed splitting. Developed drainage areas were used to model runoff and water quality baseline timeseries'. These were then incorporated into BMP models to optimize the BMP decision variables. The overall area and impervious fraction are summarized in the **Table 1**.

Table 1. Summary of watershed and hydrologic conditions for Hermosillo Park Project drainage areas.

Drainage Area	Total Tributary Area (ac)	Impervious Tributary Area (ac)	Average Annual Runoff (ac-ft)	Average Annual Zn Loading (lbs)	85th Percentile Surface Runoff (ac-ft)	85th Percentile Peak Flow (cfs)
BI9001 (Horst Ave.)	1,482	988 (67%)	895	518	48.8	77
BI0021 (Park Bisect)	1,098	641 (58%)	560	395	32.2	48
Total	**2,580**	**1,629 (63%)**	**1,455**	**913**	**81.0**	**NA**

HYDROLOGIC CONSIDERATIONS

Long-term baseline flows and pollutant loads to the site are also summarized in **Table 1**. The total loadings presented in this table represent the maximum possible reductions that could be achieved by control measures at the Hermosillo Park site. However, pragmatic diversion limitations, space constraints, and subsequent treatment mechanisms will ultimately limit how much runoff and pollutant mass can potentially be diverted into the BMP.

Peak flow rate and total runoff for the 85th percentile design storm (0.91 in., taken from isohyetal data for the centroid of the drainage areas) was determined from WMMS. The large drainage area produces runoff that would probably be infeasible to fully capture for this diversion based on other site constraints, but diverting flows from the two storm drains should result in substantial water quality benefits for the drainage areas upstream.

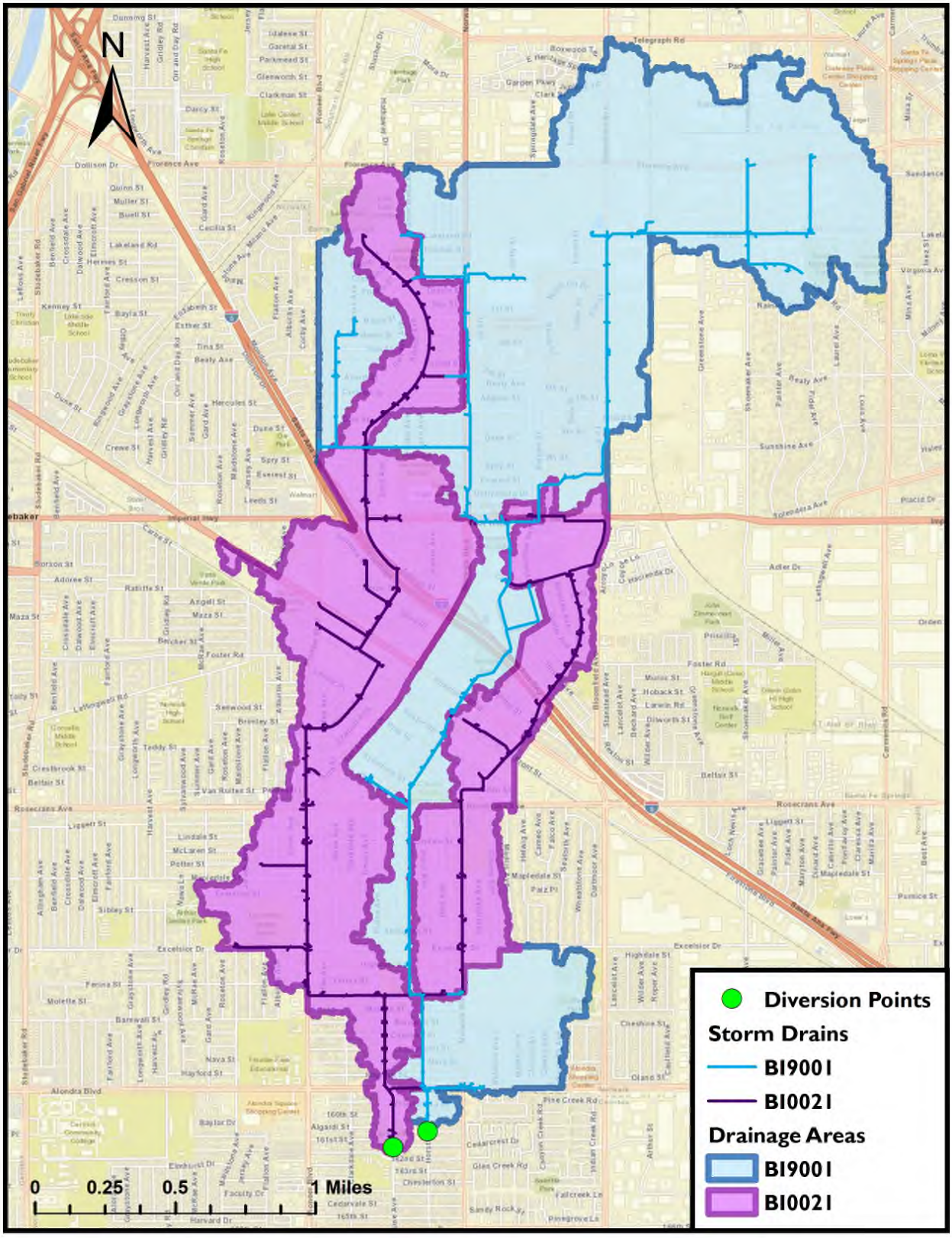


Figure 2. Map of drainage areas to the project site used to establish baseline hydrology and water quality models.

BMP DISCHARGE ALTERNATIVES

Multiple fates for the discharge of captured stormwater have been considered for the Hermosillo Park Project. They will be detailed here with acknowledgement of specific constraints and parameters that have been used in BMP modeling to accurately simulate the differences between the alternatives.

Infiltration

For the Hermosillo Park Project, the geotechnical report (NorCal Engineering 2016) indicates that this site has existing groundwater at approximately 26.5 feet below ground surface (bgs). A historic high groundwater level of 8 feet bgs was identified in the report, though local well data from Los Angeles County's Department of Public Works does not indicate groundwater levels this high over 60+ years of data. Recommendations in the geotechnical report suggest limiting the invert of the subsurface structure to 15 feet bgs due to the observed groundwater level. At this elevation, a design infiltration rate of 14.0 in/hr was calculated based on soil testing and appropriate degrees of safety. This favorable rate makes infiltration attractive for this project, especially considering that any captured stormwater would contribute to groundwater recharge. This design rate will be used in BMP modeling to simulate the infiltration option, but an even more conservative measure that considers only lateral infiltration will be assessed as well to ensure that if high groundwater does interact with this discharge option, realistic results for this option are considered against other discharge options.

On-site Irrigation Reuse

Capture, storage, and filtration of stormwater is increasingly utilized in the region for on-site irrigation as stormwater offers an attractive supplemental water source where irrigation demands can be met by dry-weather flows. This option will require a treatment system that filters and sanitizes stormwater so that it is safe for irrigation and able to meet or exceed National Sanitation Foundation NSF-350 standards for non-potable water, as well as Los Angeles County Department of Health Tier IV water quality standards. Based on long-term baseline models, dry-weather flows for the project storm drains are summarized in **Table 2**.

Table 2. Summary of dry-weather statistics.

Storm Drain	Average Daily Flowrate (cfs)	Average Monthly Volume (ac-ft)
BI9001	0.03	1.50
BI0021	0.02	1.19
SUM	***0.05***	***2.69***

Filtration / Return to Storm Drain

As an alternative to infiltration, the Hermosillo Park Project site could be designed to capture stormwater and filter it, using a proprietary stormwater filtration unit before returning captured flows to existing storm drains. This option typically offers an alternative discharge in areas where infiltration is infeasible or limited in throughput. However, in this location, the design infiltration rate is very high. Thus, the cost of filtration infrastructure and ongoing maintenance would not likely be justified. Despite this, filtration options were still included in modeling to be considered against the most conservative infiltration rate models and to make the most well-informed choice given initial project options considered.

STORMWATER CAPTURE OPTIMIZATION METHODOLOGY

WATER QUALITY OPTIMIZATION STRATEGY

The primary design goal of the Hermosillo Park Project is to reduce long-term annual loading of pollutants to the LSGR watershed using zinc as the limiting pollutant of interest in the analysis as established by the WMP for this watershed group. 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 balance design components (including BMP volume and inflow diversion rates) such that no one component limits the performance of the system subject to potential discharge options (see **Figure 3** at right). Optimization supports decision making throughout the design process by guiding selection of the most cost-effective system design.

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 below, and the results are presented thereafter.

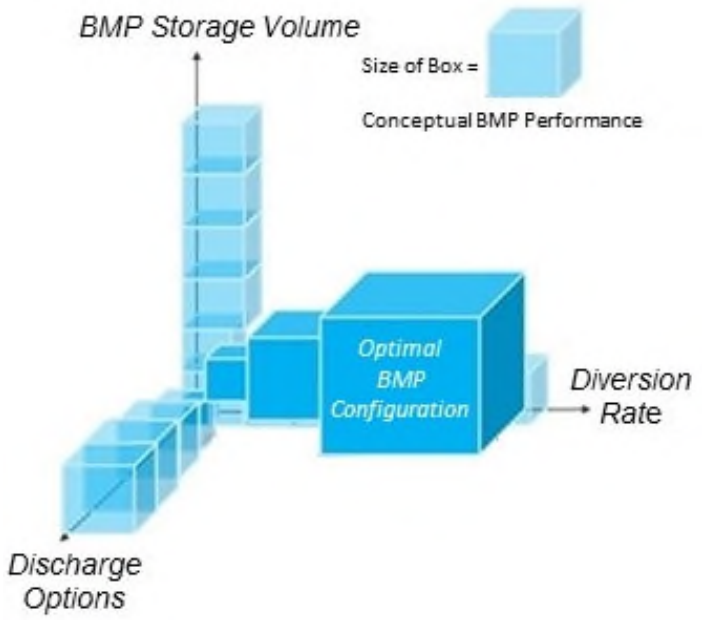


Figure 3. Conceptual illustration of optimization modeling balancing various design components to maximize performance.

PRELIMINARY SIZE AND DIVERSION OPTIMIZATION (SUSTAIN)

The first step of the modeling was to predict BMP performance for a range of potential BMP sizes, diversion inflow rates, and water-use/discharge alternatives. EPA's System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN) model was used for this analysis because its built-in optimization algorithms automate the process of evaluating many different BMP configurations to select a cost-effective solution related to project goals. The model was run using 10 years of runoff and pollutant loading time-series data generated by the WMMS at an hourly time step. During this preliminary decision-support modeling, the water-use alternatives were simulated using certain site constraints to capture approximate discharges at the same time as varying the diversion rate and storage volume. These preliminary optimization model runs produced a point cloud from which the optimal cost-effectiveness curves were extracted. Modeling efforts investigated the range of BMP configurations as detailed in the following subsections.

DIVERSION RATE

Multiple diversion points were modeled for this project based on the site location in relation to existing storm drains. The Horst Ave. diversion from BI9001 was configured to flow by gravity to BI0021 just upstream of the Park Bisect diversion. This main diversion from BI0021 into the BMP would incorporate stormwater from its associated drainage area in addition to that diverted from BI9001 (see schematic, **Figure 1**). Because of the invert depth of BI0021 (approximately 17.2 feet bgs; see **Figure 4**) in the vicinity of the project and the presence of moderately shallow groundwater, directing water via gravity-fed pipes to the BMP is not feasible. For this,

diverted stormwater will need to be pumped into the unit from the point of diversion. Diversion rates for the two potential points were modeled over the following ranges to assess the most cost-effective configuration:

- BI9001: 0 to 100 cfs, though ultimate feasibility of diversion rate will necessitate verification of hydraulic capacity of the BI0021 drain
- BI0021: 5 to 50 cfs, limited as such due to pumping requirements and feasibility

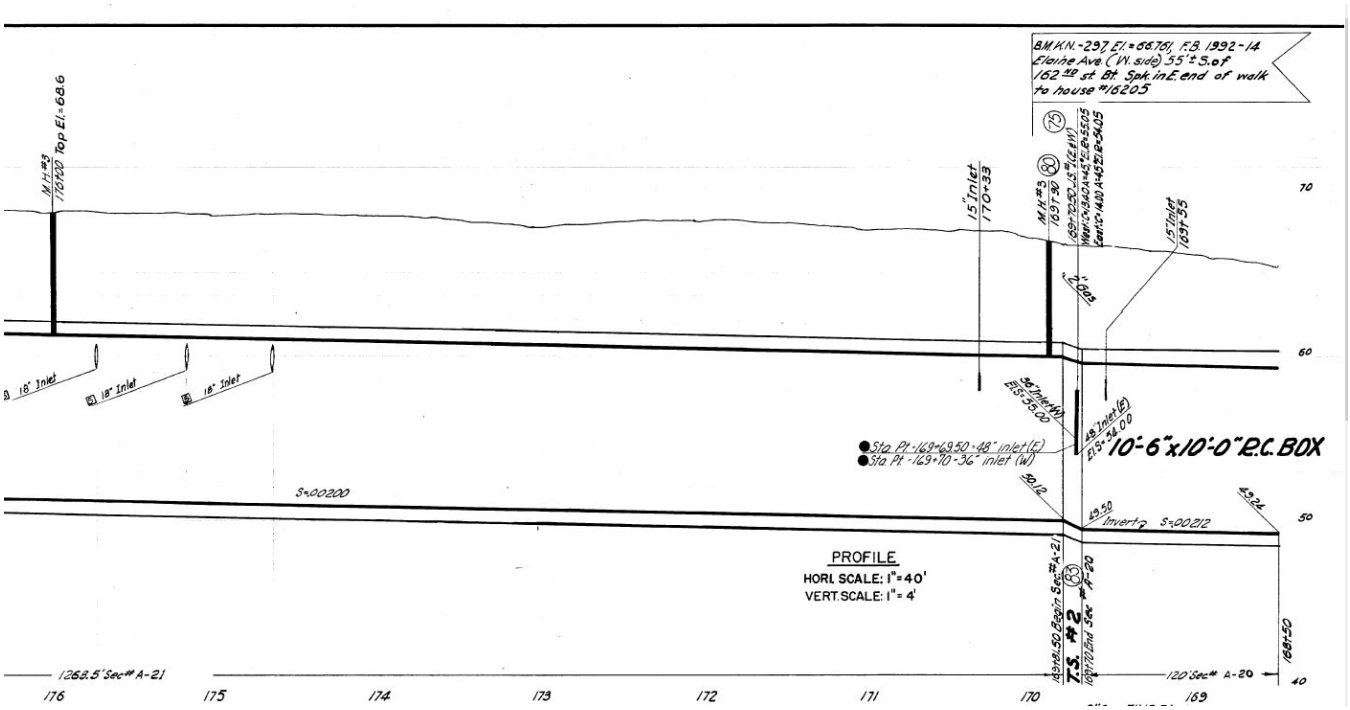


Figure 4. Portion of as-built for BI0021 showing deep invert elevation.

STORAGE VOLUME

Preliminary concepts for this project (**Figure 1**) show three separate pipe-connected subsurface storage vaults totaling 12.1 ac-ft in size. These initial estimates for potential storage were developed with consideration of groundwater conditions, assuming a maximum ponding depth of 5.5 feet for any units at Hermosillo Park. These preliminary footprints also consider necessary setbacks from existing structures as well as future site plans for the Park. Modeling was carried out for BMPs ranging from 0.1 to 15.0 ac-ft to assess a full range of potential options and better understand the point of diminishing return for this project in relation to storage so that the right project size was always considered for this site.

DISCHARGE ALTERNATIVES

Once the diversion rate and range of storage volumes to be modeled were determined, the modeling of feasible discharge alternatives proceeded by capturing differences in BMP configuration that pertained to each of these alternatives. These model representations were then carried out using SUSTAIN to assess the associated water quality benefits of all different alternatives (30,000+ BMP configurations for each discharge alternative). Analysis of cost-effectiveness for each discharge alternative was conducted by extracting the optimal front from the point cloud of modeled alternatives when plotting average annual zinc reduction against estimated project costs

(**Figure 5**). Each point along this front has an associated diversion rate and storage volume that will directly inform design recommendations and ultimate BMP configuration for the Hermosillo Park Project.

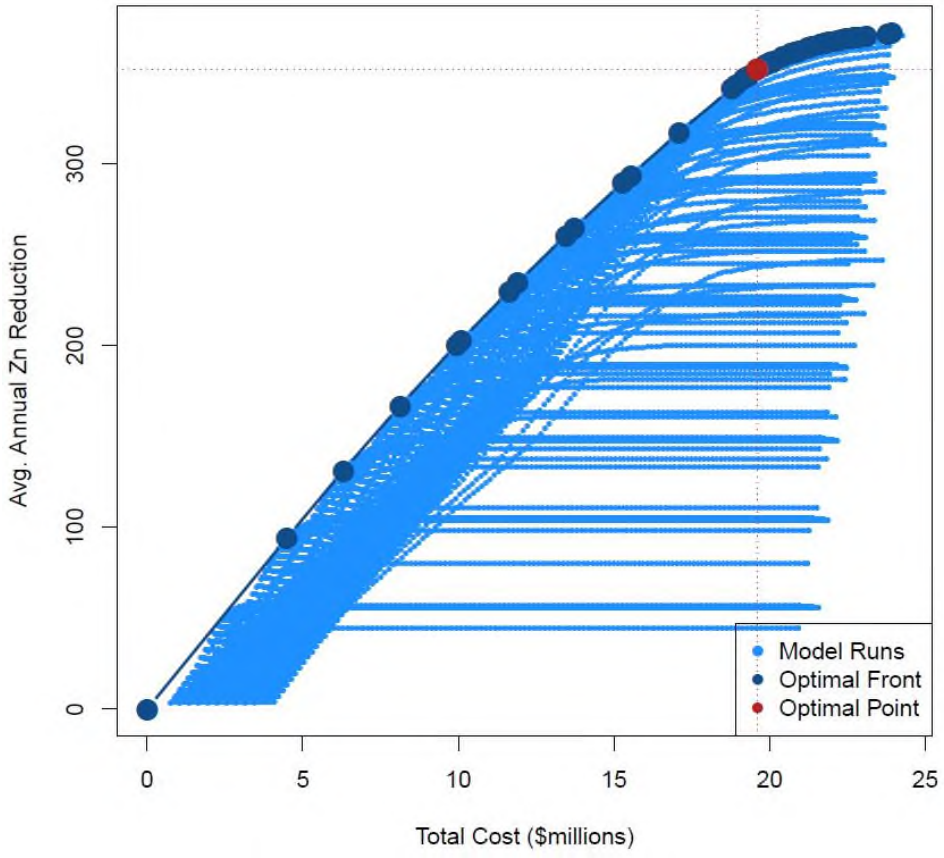


Figure 5. Example of optimal front identification

OPTIMIZATION MODELING RESULTS

The optimization analysis aimed to maximize the long-term pollutant load reduction and 85th percentile design storm volume capture by simultaneously varying the diversion rate, BMP size, and discharge rates related to options previously discussed. Each of these design features has an associated range of options that were modeled to assess alternatives against long-term water quality benefits and identify the most effective. Additionally, different configurations were paired with estimated cost data to assess alternatives and options against each other to ultimately determine the best configuration for this site. By optimizing based on these variables, multiple pathways to achieve maximum water quality benefit were identified and the most cost-effective alternatives were determined. Different configuration alternatives and modeling parameters are now presented to demonstrate the cost-effectiveness associated with these options and narrow them down to a few key recommended project configurations that will meet different needs for the LSGR watershed and contribute to the goals of the WMP.

Infiltration

Results for a BMP discharging via infiltration are presented in **Figure 6**. The difference between the two curves is notable, with the conservative infiltration estimate demonstrating substantially less zinc reduction than that of the BMP with the design infiltration rate of 14.0 in/hr. The conservative infiltration rate was modeled to allow infiltration via lateral movement only in the aquifer between the BMP invert elevation (10.5 feet bgs) and the observed groundwater elevation of 26.5 feet bgs found in the geotechnical report (NorCal Engineering 2016). This is associated with substantially less stormwater throughput than the full unconstrained 14.0 in/hr in the vertical direction would be given no groundwater interaction with infiltrating stormwater. It is difficult to know how often these types of groundwater conditions persist and how often infiltrative performance might exist given limited site-specific groundwater information. Therefore, it is recommended that further geotechnical investigation accompany later stages of design for this project in order to set realistic performance expectations given the use of infiltration for discharge of captured runoff for the Project.

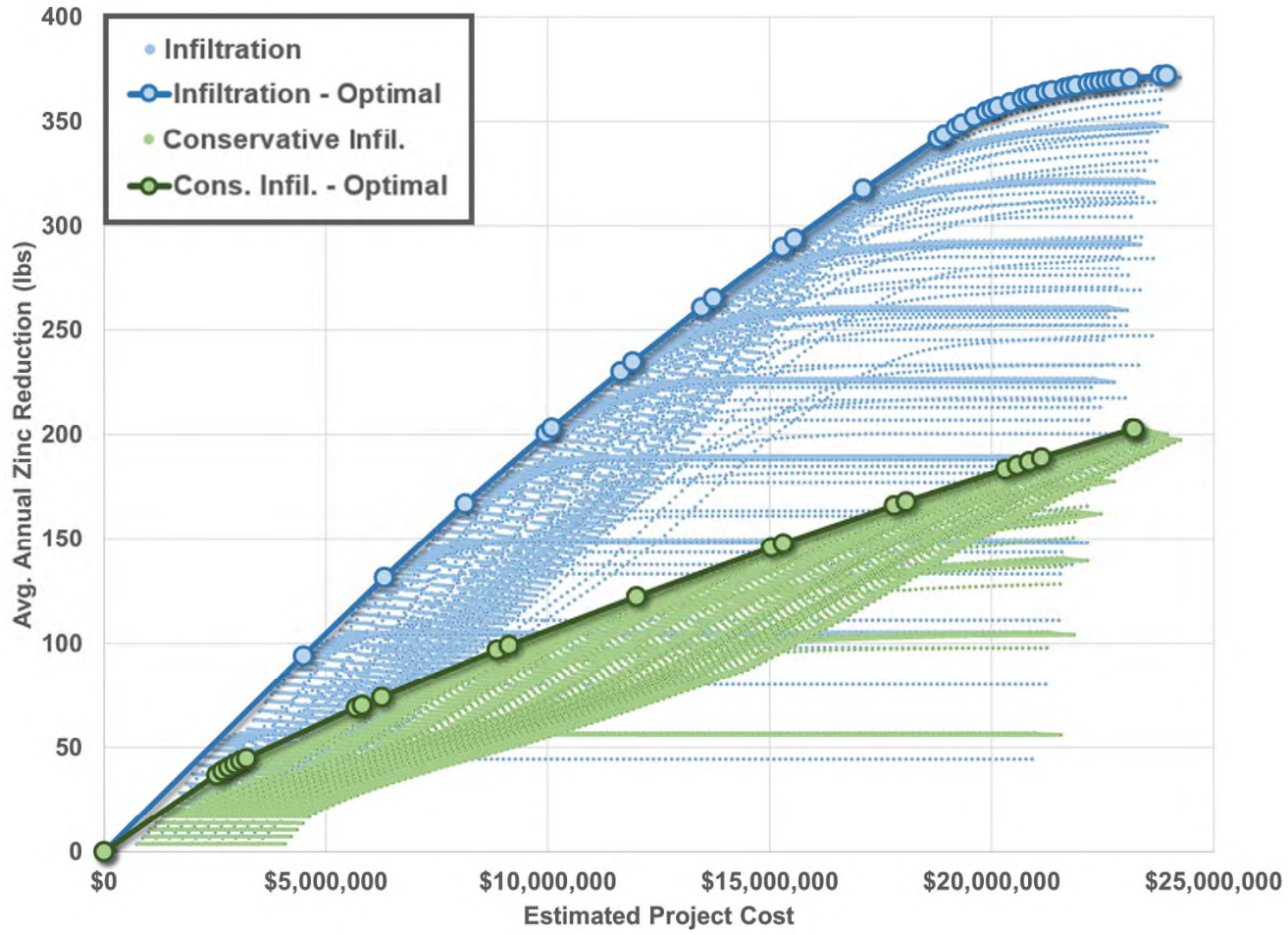


Figure 6. Cost-effective curves for infiltration discharge option

On-Site Irrigation Reuse

The use of captured stormwater for irrigation use was not explicitly modeled. This is because this reuse option would accompany either infiltration or filtration options and would not have a significant impact on overall annual water quality benefit estimates. Dry-weather flows are typically tapped as a resource for irrigation reuse because the volume is more manageable, reliable, and appropriate for use as an irrigation water source. Irrigation does not typically occur during wet-weather events, and the large runoff volumes collected during these events would not likely be used on-site within recommended storage volume drawdown time periods (96 hours). As it is, there is typically adequate available storage in the BMP during dry conditions to capture all dry-weather flows and either filter them for irrigation use or allow them to discharge normally. To better understand on-site irrigation demands, monthly estimates for Hermosillo Park were calculated based on 10 years of evapotranspiration data (coinciding with modeled water years; CIMIS 2019) using the SLIDE rule (*Simplified Landscape Irrigation Demand Estimation*; ANSI 2017). These results are displayed in **Figure 7**, and they indicate that average monthly irrigation demand for the Park peaks at 2.14 ac-ft in July. Baseline modeling estimated average monthly dry-weather flows of approximately 2.69 ac-ft for the two diverted storm drains (**Table 2**), in excess of this irrigation demand estimate. Based on this analysis, there is excess supply of dry-weather runoff to meet nearly all irrigation demands at Hermosillo Park. Filtration equipment, irrigation system upgrades, and associated O&M activities and costs should be weighed throughout design processes to determine if this discharge option is desirable for the Hermosillo Park Project.

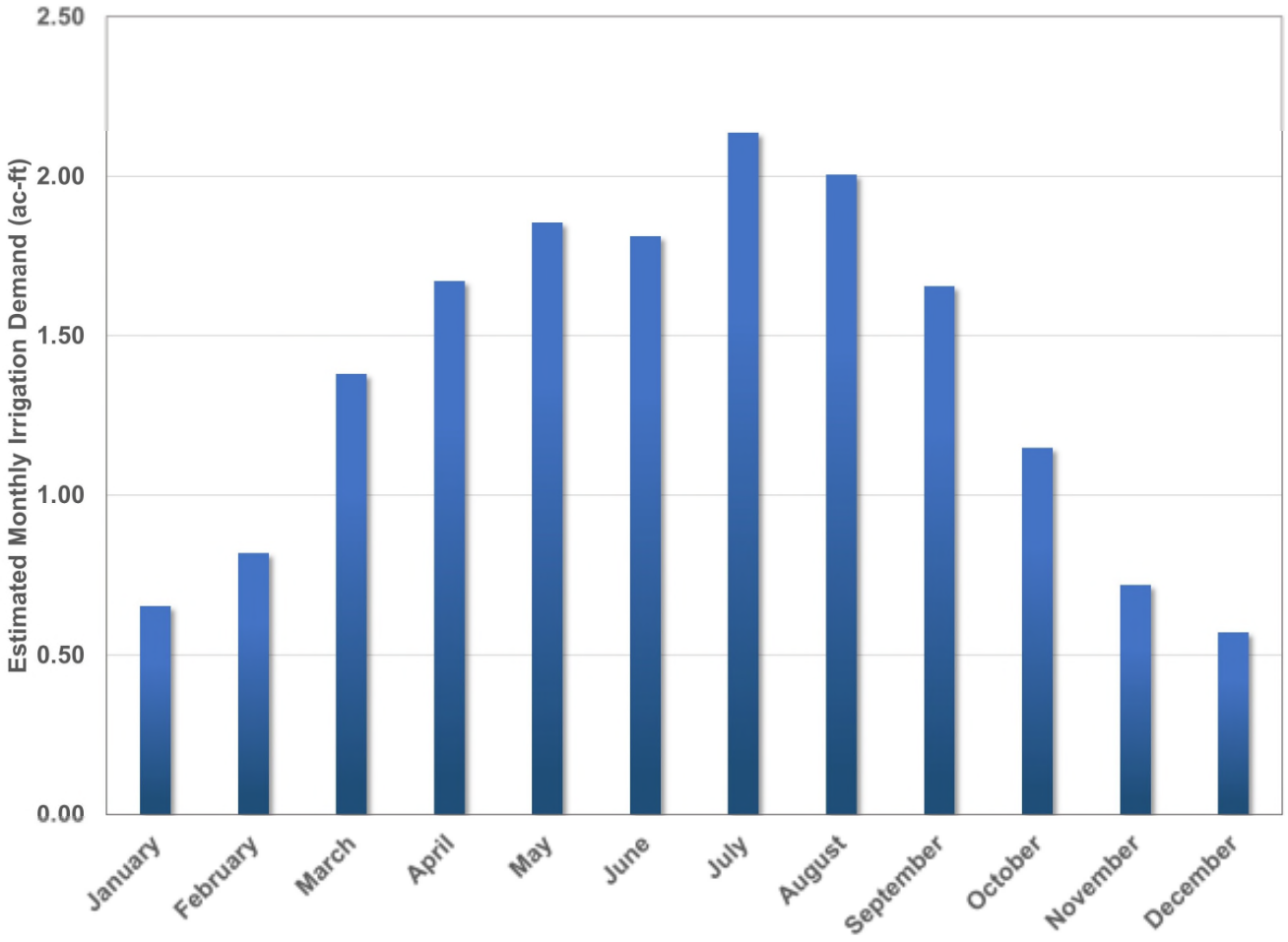


Figure 7. Estimated irrigation water demand for Hermosillo Park

Filtration/Return to Storm Drain

Results for the filtration discharge options are presented in **Figure 8** and demonstrate a similar performance trend between the two options as both increase nearly linearly with cost at the same rate. The difference however is that the double filtration option (5.76 cfs) provides about 20 lbs. more zinc reduction annually than the single filtration unit option (2.88 cfs) for BMPs of similar cost. Should filtration be selected as the discharge option for this project, this gain would need to be weighed against the additional cost of the second filtration unit as well as the O&M involved with it. This could be cross-referenced with other projects in planning stages among the LSGR WMP Group to validate the cost-effectiveness against these other projects addressing the same zinc reduction targets for a more comprehensive assessment given available data. The increase in throughput that is realized in adding a second filtration unit is the driving factor on the difference in performance as two filtration units can filter more stormwater during larger events, providing greater capacity for further capture of any given event and thus superior overall performance. How water quality benefits from filtration compare to those realized using infiltration will ultimately guide selection between these two main discharge options, so all options must be considered together to make a well-guided recommendation for the Project.

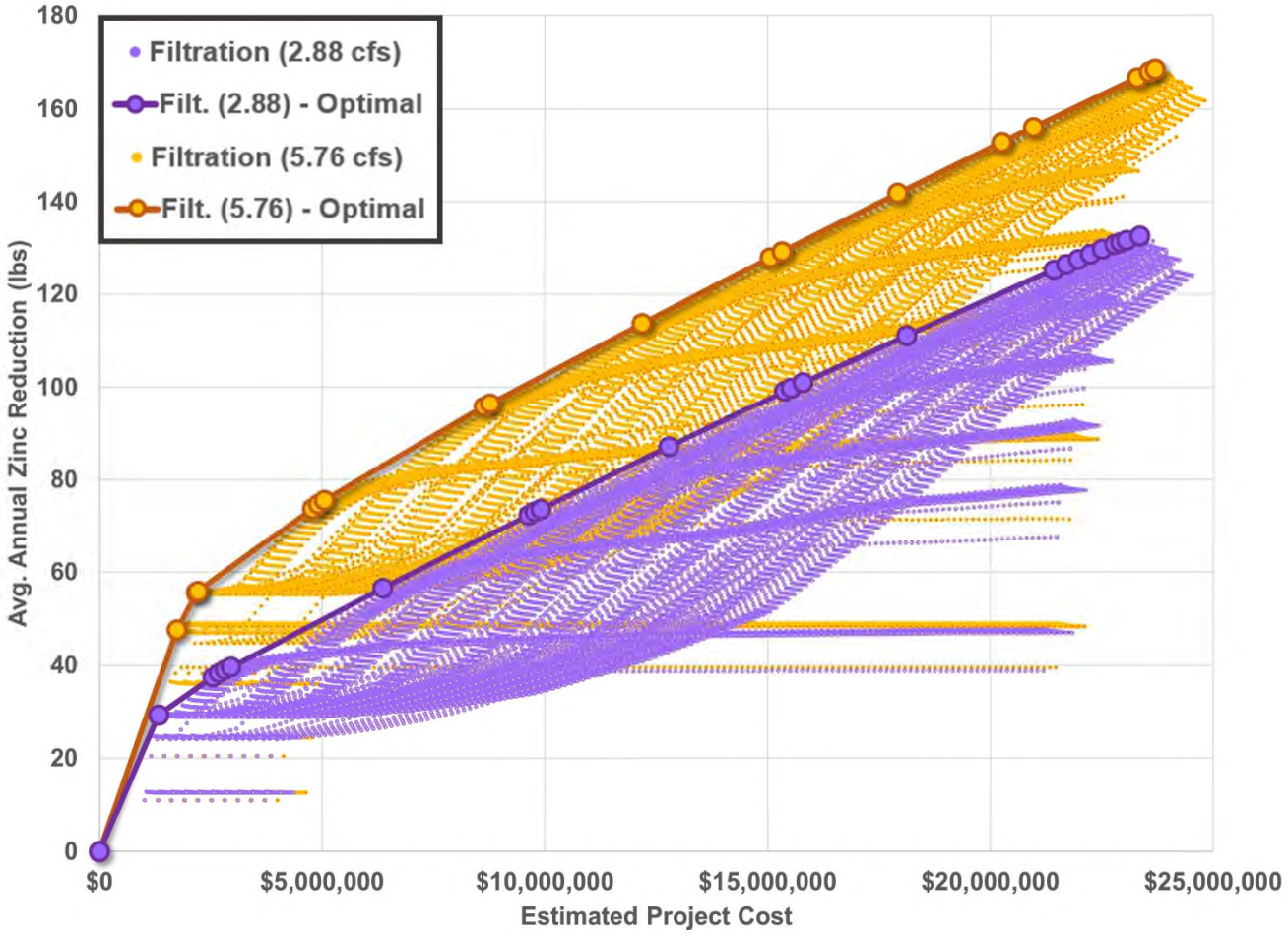


Figure 8. Cost-effectiveness curves for filtration discharge options

COST CONSIDERATIONS AND PROJECT COST COMPARISON

To make final recommendations, water quality benefits predicted for the different BMP configuration options must be weighed against construction and O&M costs (20 years included) to determine the optimal choice for the Hermosillo Park Project. While these are planning level costs, they do form a strong basis to weigh alternatives against one another in determining the best project for the site. **Table 3** details key aspects that are both consistent between and differentiate the various options. This list is not exhaustive, and more detailed cost assessment will be included in the final design report.

Table 3. Summary of key cost components for different discharge options.

Cost applicable to….	Key Cost Components	O&M Cost Components
All Options	Diversion Infrastructure, Pretreatment	Inspection, Sediment Removal
Infiltration Vault	Concrete Vault Structure, Pump to Vault	Pumping Maintenance/Electricity
Irrigation Reuse	Filtration Unit, Irrigation System	Filter Operation, Cleaning/Replacement
Filtration/Detention	Excavation, Filtration Unit(s)	Filter Cartridge Cleaning

Project Cost Comparisons

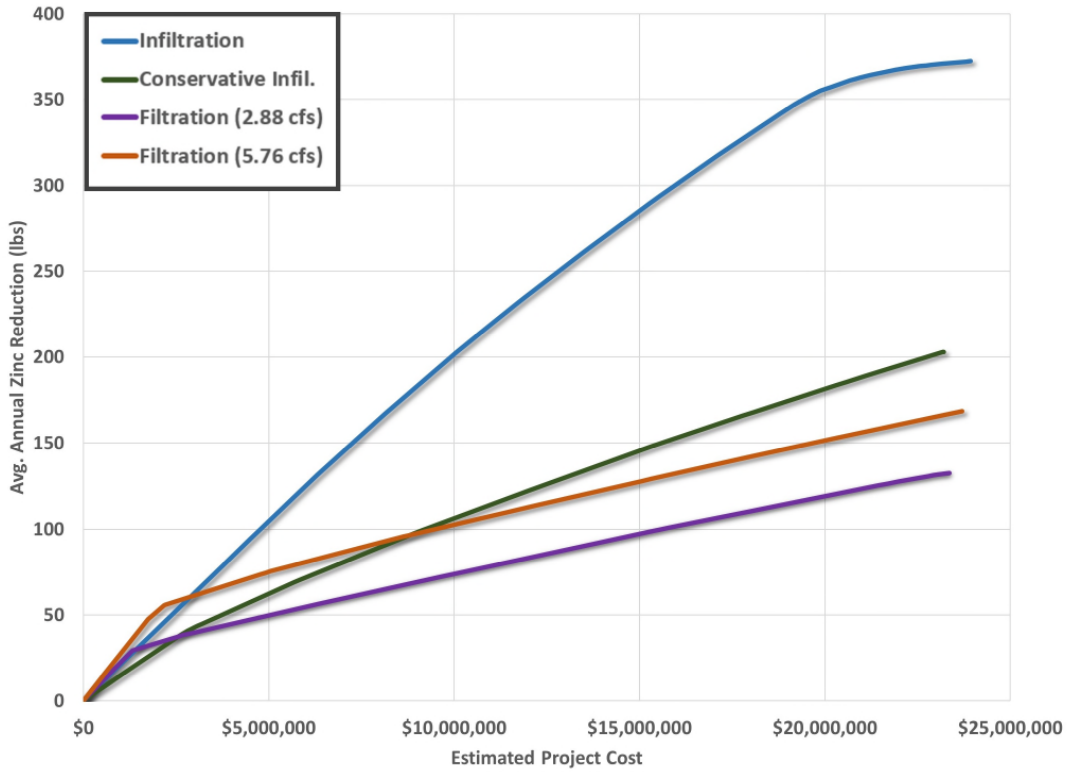


Figure 9. Comparison of optimal cost-effective curves for discharge options

Optimal cost-effectiveness curves plotting project cost against average annual zinc reduction from model results are shown in **Figure 9**. Putting all four curves on the same axes provides a clear evaluation of the performance differences between the discharge options. The filtration discharge options outperform infiltrative options at smaller project costs (mostly related to storage volume as the dominant cost component in subsurface BMPs). However, once the BMP storage exceeds a certain threshold volume, infiltrative options are superior to filtration and return. This is related to throughput and the fact that it increases with the overall project footprint for infiltrative options beyond flowrates that filtration units can provide. It should be noted too that the infiltrative options are clearly better near the point diminishing returns which starts to occur at or near the $20 million project mark for the full infiltration rate BMP performance curve. Thus, infiltration discharge is recommended for the Hermosillo Park Project moving forward due to the favorable soil conditions at the project site.

BMP Size – Minimum, Maximum, and Optimal

The following BMP sizes and diversion rates are recommended based on different endpoints of design and with the range of performance that might be realized using infiltration as discharge at this site (**Figure 10**):

Capture of 85th percentile design storm

Feasible capture of the full 85th percentile can be challenging for larger drainage areas. This type of capture requires diversion rates in excess of the peak flow rates associated with the 85th percentile as well as storage volume and discharge throughput large enough to handle the full volume of runoff over the events duration. Timeseries analysis was performed using 85th percentile storm event runoff to the two points of diversion to determine the necessary storage volumes needed to capture this storm from each storm drain alone as well as the two combined. Diversion rates were set to ensure full capture of the peak hour associated with the design storm runoff. Results are summarized in **Table 4**. While it would be feasible to capture the 85th percentile storm runoff from the BI0021 storm drain by itself given the full design infiltration rate, this might not be the case given groundwater interaction with infiltrative throughput represented using the conservative infiltration estimate. Most of these BMP sizes are infeasible at this site and given other constraints.

Table 4. Summary of configurations needed to capture the 85th percentile storm runoff

85th Percentile Storm Capture	BI9001 Only	BI0021 Only	Both Drains
BI9001 Diversion Rate	**77 cfs**	**No diversion**	**77 cfs**
BI0021 Diversion Rate	**No diversion**	**48 cfs**	**125 cfs**
Storage Volume (Full Infiltration Rate)	**12.5 ac-ft**	**8.0 ac-ft**	**20.5 ac-ft**
Storage Volume (Conservative Infil. Rate)	**28.2 ac-ft**	**16.7 ac-ft**	**50.6 ac-ft**

Maximum capture of dry/wet weather

To capture the most dry/wet weather possible for the Hermosillo Park Project, it is recommended to build the BMP to the maximum size modeled, 15.0 ac-ft (if feasible). Both curves (**Figure 10**) still indicate increased zinc reduction beyond this point, though it is much flatter given the full design infiltration rate. This point was identified on the optimal curve and is associated with different diversion rates given the realized infiltration rate (**Table 5**).

Table 5. Summary of BMP recommendations given infiltration for maximum capture

Infiltration Rate	BI9001 Diversion Rate	BI0021 Diversion Rate	Storage Volume	Estimated Cost	Avg. Annual Zinc Reduction (lbs)
Full Design	50 cfs	50 cfs	15.0 ac-ft	$23,933,000	372.4
Conservative	30 cfs	40 cfs	15.0 ac-ft	$23,204,000	202.9

Most cost-effective BMP size for the Hermosillo Park site

When examining the cost-effective curve for the full design infiltration rate BMP model, it is evident that the maximum capture BMP option is beyond the point of diminishing returns in terms of zinc reduction. It is for this that the cost-effective BMP is slightly smaller so that too much redundancy is not created in the system by overbuilding BMPs at a great expense to the Group. Diversion rates and performance details for the recommended cost-effective BMP at Hermosillo Park are summarized in **Table 6**. While there is a large difference in performance between models for the two infiltrative discharge options, it should be noted that the conservative option has only been presented here as a sort of worst-case scenario for infiltration. This serves to ensure that filtration was not preferable in the case that unfavorable infiltrative conditions were to persist at the site. Because this was not the case, the recommendation to pursue infiltration for the Hermosillo Park Project is sound. Design infiltration rates utilized in modeling have already been reduced by factors of safety included in the geotechnical report, so realized rates may be even higher in operation, and thus the performance would be even better than what was modeled using the full design infiltration rate. Nevertheless, further geotechnical investigation may be warranted to better characterize local groundwater conditions and weigh the options presented herein.

Table 6. Summary of BMP recommendations given infiltration for cost-effective capture

Infiltration Rate	BI9001 Diversion Rate	BI0021 Diversion Rate	Storage Volume	Estimated Cost	Avg. Annual Zinc Reduction (lbs)
Full Design	50 cfs	50 cfs	11.8 ac-ft	$19,601,000	352.2
Conservative	50 cfs	50 cfs	11.8 ac-ft	$19,601,000	152.4

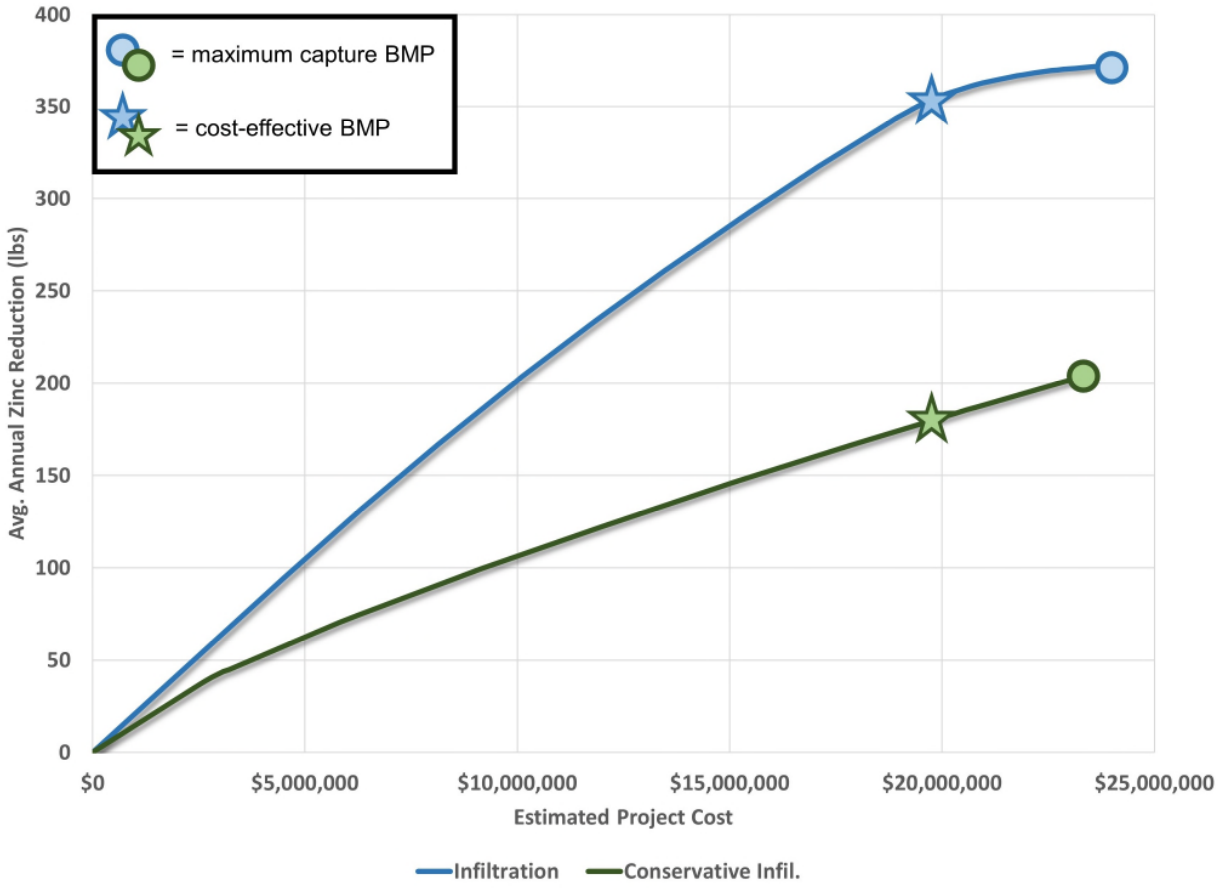


Figure 10. Recommended projects for infiltration discharge option

REFERENCES

ANSI (American National Standards Institute). 2017. *Determining Landscape Plant Water Demands*. January 2017.

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ATTACHMENT G: MONITORING PLAN

Monitoring plan will be developed concurrently with the 100% design.

ATTACHMENT H: OPERATIONS & MAINTENANCE PLAN

A full Operations & Maintenance Plan will be developed concurrently with the 100% design.