City of Escondido
PRIORITY DEVELOPMENT PROJECT (PDP)
PRELIMINARY SWQMP

ESCONDIDO 7-ELEVEN

900 WEST MISSON AVENUE
ESCONDIDO, CA 92025

ASSESSOR'S PARCEL NUMBER(S):
228-220-043

ENGINEER OF WORK:

REGISTERED PROFESSIONAL ENGINEER
JAMES RON BAZUA
No 58394
Exp. 12/31/20
CIVIL
STATE OF CALIFORNIA

JAMES BAZUA – RCE 58394
[INSERT CIVIL ENGINEER'S NAME AND PE NUMBER HERE, PROVIDE WET SIGNATURE AND STAMP ABOVE LINE]

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PDP SWQMP PREPARED BY:

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DATE OF SWQMP:
OCTOBER 22, 2020

PLANS PREPARED BY:

PAUL BEDINGTON
ATC DESIGN GROUP
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SWQMP APPROVED BY:
[FOR CITY STAFF ONLY]

APPROVAL DATE:

ESCONDIDO
City of Choice

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ACRONYMS

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
DMA	Drainage Management Area
EOW	Engineer of Work
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
PDP	Priority Development Project
PE	Professional Engineer
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWDM	Storm Water Design Manual
SWQMP	Storm Water Quality Management Plan
WMAA	Watershed Management Area Analysis
WQIP	Water Quality Improvement Plan

PDP SWQMP PREPARER'S CERTIFICATION PAGE

Project Name: Escondido 7-Eleven
Permit Application Number:

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of Escondido Storm Water Design Manual, which is a design manual for compliance with the City of Escondido Municipal Code (Chapter 22, Article 2) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the City of Escondido has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by City staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

RCE 58394 Exp. 12/31/20
Engineer of Work's Signature, PE Number & Expiration Date

James Bazua
Print Name

The Altum Group
Company

June 12, 2020
Date

Engineer's Seal:

SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1	October 22,2020	Initial Submittal
2		
3		
4		

Final Design

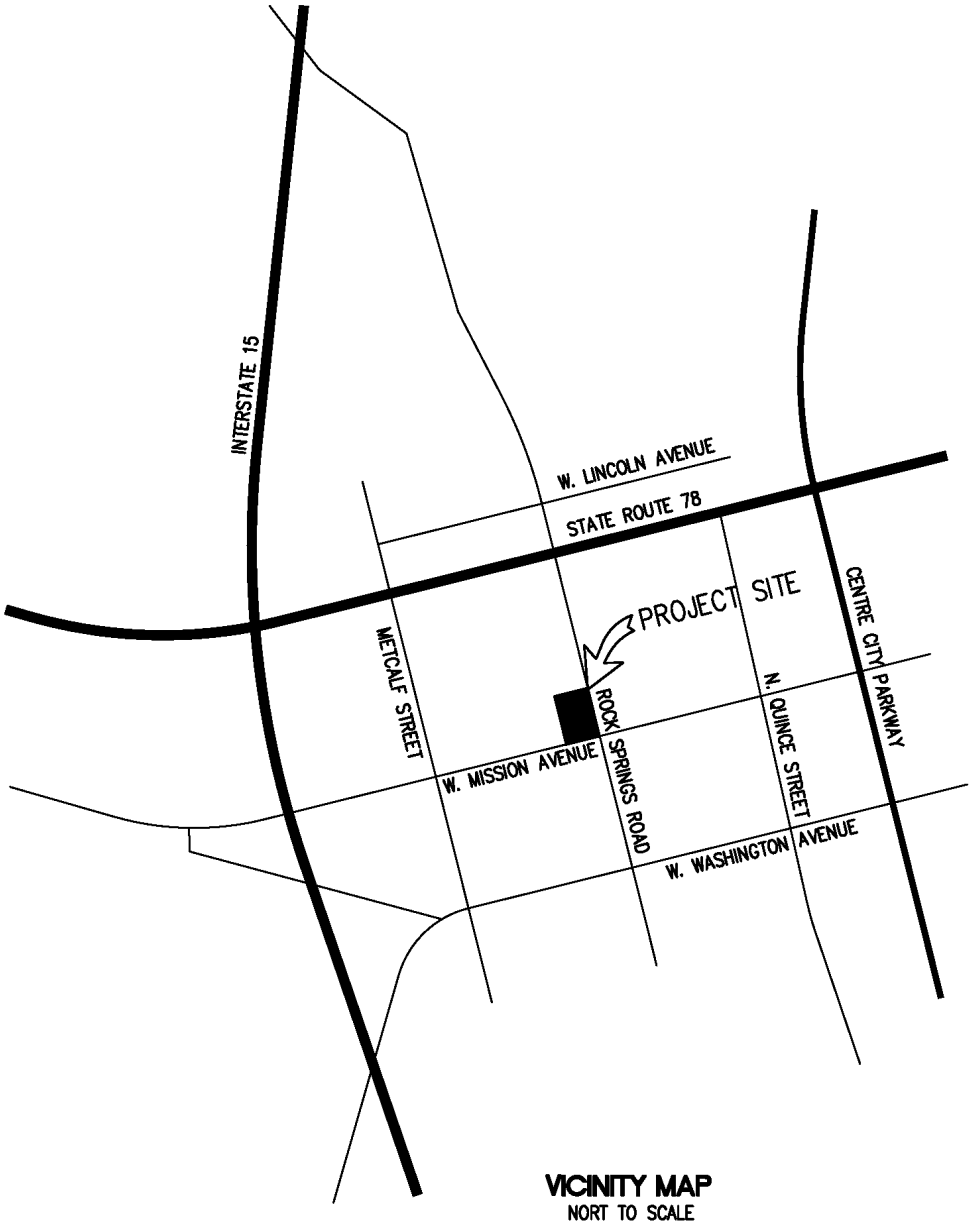
Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Plan Changes

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

PROJECT VICINITY **MAP**

Project Name: Escondido 7-Eleven
Permit Application Number:



Step 1: Project type determination (Standard or Priority Development Project) (Form I-2a)

Project Summary Information	
Project Name	ESCONDIDO 7-ELEVEN
Project Address	900 W MISSION AVENUE ESCONDIDO, CA 92025
Assessor's Parcel Number(s)	228-220-043
Permit Application Number	
Project Watershed (Hydrologic Unit)	Carlsbad 904
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	1.11 Acres (48,442 Square Feet)
Area to be disturbed by the project (Project Area)	1.08 Acres (46,852 Square Feet)
Project Proposed Impervious Area (subset of Project Area)	0.75 Acres (32,692 Square Feet)
Project Proposed Pervious Area (subset of Project Area)	0.33 Acres (14,160 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	
Confirmation of Priority Development Project Determination	
The project is : Redevelopment[1]	
The total proposed newly created or replaced impervious area is: 32,692 ft^2	

[1] Redevelopment is defined as: The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; new sidewalks construction; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Solar energy farms that are not also one of the categories listed in Step 2b of Table 1-1. City staff must also determine that appropriate BMPs are provided to mitigate for downstream impacts due to significant changes to the existing hydrology

Is the project in any of the following categories, (a) through (f)?			
Yes ☐	No X	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes X	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes X	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes ☐	No X	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.*
Yes X	No ☐	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Yes	No		
X	☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See Storm Water Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

☐ No – the project is not a Priority Development Project (Standard Project).

X Yes – the project is a Priority Development Project (PDP).

Further guidance may be found in Chapter 1 and Table 1-2 of the Storm Water Design Manual.

The following is for **redevelopment PDPs only**:

The area of existing (pre-project) impervious area at the project site is: 46,852 ft^2

(A) The total proposed newly created or replaced impervious area is 32,692 ft^2

(B) Percent impervious surface created or replaced (B/A)*100: 70 %

The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – **only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements**

OR

X greater than fifty percent (50%) – **the entire project site is considered a PDP and subject to stormwater requirements**

Step 1.1: Storm Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the Storm Water Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Form I-1.**
	X PDP	Standard and PDP requirements apply, including PDP SWQMP. **SWQMP Required.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

Is the project exempt from PDP definitions based on either of the following:	If so:
☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Green Streets Infrastructure;	Standard Project requirements apply, AND any additional requirements specific to the type of project. City concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.*
☐ Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the City of Escondido Guidance on Green Infrastructure.	**PDP Exempt.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:	

Step 2: Construction Storm Water BMPs

Construction storm water BMPs shall be shown on the Grading Plan and (if applicable) included in the Storm Water Pollution Prevention Plan (SWPPP).

Step 3: City of Escondido PDP SWQMP Site Information Checklist (Form I-2a)

Step 3.1: Description of Existing Site Condition

Current Status of the Site (select all that apply):
X Existing development
☐Previously graded but not built out
☐Demolition completed without new construction
☐Agricultural or other non-impervious use
☐Vacant, undeveloped/natural

Description / Additional Information:

Existing Land Cover Includes (select all that apply and provide each area on site):
☐Vegetative Cover _____Acres (_____Square Feet)
☐Non-Vegetated Pervious Areas _____Acres (_____Square Feet)
X Impervious Areas 1.07 Acres (46,462 Square Feet)

Description / Additional Information:

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):
☐NRCS Type A
X NRCS Type B
☐NRCS Type C
☐NRCS Type D

Approximate Depth to Groundwater (GW) (or N/A for no infiltration BMPs):
☐GW Depth < 5 feet
☐5 feet < GW Depth < 10 feet
☐ 10 feet < GW Depth < 20 feet
X GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):
☐Watercourses
☐Seeps
☐Springs
☐Wetlands
X None
☐Other

Description / Additional Information:

Step 3.2: Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

(1) Whether existing drainage conveyance is natural or urban;
(2) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:

The existing site is an automotive repair lot that has more than 95% impervious area. The site drains via surface flow directly onto W Mission Avenue, then in an easterly direction where storm flows are captured by an existing storm drain curb inlet. The existing storm drain curb inlet is part of an underground storm drain system that conveys collected storm run-off to Escondido Creek.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:

The proposed land use is a 7-Eleven retail outlet and gas filling station.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

The proposed commercial site will consist of one retail building, a covered filling station canopy as well as a parking area with drive aisles. The site will be graded so that no on-site runoff may enter the gas filling station area under the canopy. No spills are surface water from cleaning activity will be allowed to leave the filling station area underneath the canopy.

List/describe proposed pervious features of the project (e.g., landscape areas):

The proposed commercial development will introduce natural landscape areas will sparse planting covering 31% of the project site.

Does the project include grading and changes to site topography?

☐Yes

☒ No

Description / Additional Information:

Site grading will continue to fall in elevation from north to south. Only minor surface (fine) grading will be introduced to direct surface flows to infiltration BMP systems.

Insert acreage or square feet for the different land cover types in the table below:

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation			
Pervious (non-vegetated)	1,980 s.f.	14,160 s.f.	+ 715%
Impervious	46,462 s.f.	32,692 s.f.	- 30%

Step 3.4: Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒ Yes
☐ No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

The proposed commercial site will consist of one retail building, a covered filling station canopy well as a parking area with drive aisles. The site has one DMA which is self-mitigating and two DMAs which drain via surface flow to two biofiltration basins BF-1 for treatment. The biofiltration basins will provide treatment of the water quality DCV of each DMA. The water will then be directed to the backside of an existing storm drain at the South-East corner of the project site. The existing storm drain is part of an underground storm drain system that conveys collected storm run-off to Escondido Creek.

Step 3.5: Potential Pollutant Source Areas

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply).

☐On-site storm drain inlets
X Interior floor drains and elevator shaft sump pumps
☐Interior parking garages
☐Need for future indoor & structural pest control
☐Landscape/Outdoor Pesticide Use
☐Pools, spas, ponds, decorative fountains, and other water features
☐Food service
X Refuse areas
☐Industrial processes
☐Outdoor storage of equipment or materials
☐Vehicle and Equipment Cleaning
☐Vehicle/Equipment Repair and Maintenance
X Fuel Dispensing Areas
☐Loading Docks
☐Fire Sprinkler Test Water
☐Miscellaneous Drain or Wash Water
X Plazas, sidewalks, and parking lots
☐Other (provide description)

Description / Additional Information:

Step 3.6: Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):
The site drains via surface flow directly onto W Mission Avenue, then in an easterly direction where storm flows are captured by an existing storm drain curb inlet. The existing storm drain curb inlet. The existing storm drain curb inlet is part of an underground storm drain system that conveys collected storm run-off to Escondido Creek which ultimately flows into San Elijo Lagoon.

List any 303(d) impaired water bodies[2] within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
ESCONDIDO CREEK	TOXICITY, PESTICIDES, NUTRIENTS	TDML, RIPARIAN HABITAT DEGRADATION
SAN ELIJO LAGOON	BACTERIA, SEDIMENT	

Identification of Project Site Pollutants*

*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated).

Identify pollutants expected from the project site based on all proposed use(s) of the site (see Storm Water Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	**X**		
Nutrients	**X**		
Heavy Metals		**X**	**X** (TOXICITY)
Organic Compounds		**X**	
Trash & Debris		**X**	
Oxygen Demanding Substances		**X**	
Oil & Grease		**X**	
Bacteria & Viruses	**X**		
Pesticides	**X**		

[2] The current list of Section 303(d) impaired water bodies can be found at http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired

Step 3.7: Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the Storm Water Design Manual)?

☐Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.

X No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA[3] for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

The proposed project site drains into an adjacent public storm drain curb inlet that carries storm flow to a hardened conveyance pipe that drains directly into Escondido Creek. Projects that discharge runoff via a hardened conveyance (pipe) directly to Escondido Creek meet a hydromodification exemption PER City of Escondido standards.

[3]The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]. It is available online at the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248

Step 3.7.1: Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

- Yes
- No, no critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the manual been performed?

- 6.2.1 Verification of GLUs (classification that provides an estimate of sediment yield based on geology, hillslope, and land cover) Onsite
- 6.2.2 Downstream Systems Sensitivity to Coarse Sediment
- 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
- No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what is the final result?

- No critical coarse sediment yield areas to be protected based on verification of GLUs onsite.
- Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 8 of the SWQMP.
- Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Flow Control for Post-Project Runoff*

***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.
Has a geomorphic assessment been performed for the receiving channel(s)? ☐No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐Yes, the result is the low flow threshold is 0.1Q2 ☐Yes, the result is the low flow threshold is 0.3Q2 ☐Yes, the result is the low flow threshold is 0.5Q2 *If a geomorphic assessment has been performed, provide title, date, and preparer:* *Discussion / Additional Information: (optional)*

Step 3.8: Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.

Step 4: Source Control BMP Checklist (Form I-2b)

Source Control BMPs

All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the City Storm Water Design Manual for information to implement source control BMPs shown in this checklist. The following checklists serve as guides only. Mark what elements are included in your project. See Storm Water Design Manual Chapter 4 and Appendix E for more information on determining appropriate BMPs for your project.

Answer each category below pursuant to the following:

- "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the City Storm Water Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	☒ Yes	☐No	☐N/A
X Direct irrigation water away from impervious surfaces □ Direct vehicle wash water away from impervious surfaces □ Other: _____ *Discussion / justification if SC-1 not implemented:*			
SC-2 Storm Drain Stenciling or Signage	☐Yes	☐No	☒ N/A
□ Stencil or stamp storm drains with anti-dumping message □ Post signs prohibiting illegal dumping □ Other *Discussion / justification if SC-2 not implemented:*			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒ N/A
□ Store materials inside a covered enclosure □ Direct runoff from downspouts and roofs away from storage areas □ Other *Discussion / justification if SC-3 not implemented:*			

SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	X N/A
□ Locate work area away from storm drains or catch basins □ Work over impermeable surfaces where spills and pollutants can be captured and removed *Discussion / justification if SC-4 not implemented:*			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	X Yes	☐No	☐N/A
□ Locate trash containers in a roofed, walled enclosure X Locate trash containers away from storm drains *Discussion / justification if SC-5 not implemented:*			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☐ A. On-site storm drain inlets	☐Yes	☐No	X N/A
☐ B. Interior floor drains and elevator shaft sump pumps	X Yes	☐No	☐N/A
☐ C. Interior parking garages	☐Yes	☐No	X N/A
☐ D. Need for future indoor & structural pest control	X Yes	☐No	☐N/A
☐ E. Landscape/outdoor pesticide use	☐Yes	No	X N/A
☐ F. Pools, spas, ponds, fountains, and other water features	☐Yes	☐No	X N/A
☐ G. Food service	☐Yes	☐No	X N/A
☐ H. Refuse areas	☐Yes	☐No	X N/A
☐ I. Industrial processes	☐Yes	☐No	X N/A
☐ J. Outdoor storage of equipment or materials	☐Yes	☐No	X N/A
☐ K. Vehicle and equipment cleaning	☐Yes	☐No	X N/A
☐ L. Vehicle/equipment repair and maintenance	☐Yes	☐No	X N/A
☐ M. Fuel dispensing areas	X Yes	☐No	☐N/A
☐ N. Loading docks	☐Yes	☐No	X N/A
☐ O. Fire sprinkler test water	☐Yes	☐No	X N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☐No	X N/A
☐ Q. Plazas, sidewalks, and parking lots	X Yes	☐No	N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Note: Show all source control measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 5: Site Design BMP Checklist (Form I-2c)

Site Design BMPs

All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the City Storm Water Design Manual for information to implement site design BMPs shown in this checklist. The following checklists serve as guides only. Mark what elements are included in your project. See Storm Water Design Manual Chapter 4 and Appendix E for more information on determining appropriate BMPs for your project.

Answer each category below pursuant to the following:

- "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the City Storm Water Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☒ Yes	☐No	☐N/A
X Maintain existing drainage patterns *Discussion / justification if SD-1 not implemented:*			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☐Yes	☐No	☒ N/A
□ Preserve trees (see Zoning Code Art. 55 Grading & Erosion Control; Art. 62 Landscape Regulations) □ Avoid sensitive areas such as wetlands and waterways *Discussion / justification if SD-2 not implemented:*			
SD-3 Minimize Impervious Area	☒ Yes	☐No	☐N/A
□ Install parking and driving aisles to minimum width required to meet standards *Discussion / justification if SD-3 not implemented:*			

SD-4 Minimize Soil Compaction	X Yes	☐No	☐N/A
□ Avoid compaction in planned landscaped spaces □ Till and amend soil for improved infiltration capacity *Discussion / justification if SD-4 not implemented:*			
SD-5 Impervious Area Dispersion	X Yes	☐No	☐N/A
□ Drain rooftops, roads or sidewalks into adjacent landscape areas □ Drain impervious surfaces through pervious areas *Discussion / justification if SD-5 not implemented:*			
SD-6 Runoff Collection	☐Yes		
Discussion / justification if SD-6 not implemented:	X Yes	☐No	☐N/A
SD-7 Landscaping with Native or Drought Tolerant Species			
Discussion / justification if SD-7 not implemented:	X Yes	☐No	☐N/A
SD-8 Harvesting and Using Precipitation			
Discussion / justification if SD-8 not implemented:	X Yes	☐No	☐N/A

Note: Show all site design measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 6: PDP Structural BMPs (Form I-3)

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the Storm Water Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the Storm Water Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the City at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 8.2.3.2 of the Storm Water Design Manual). PDP structural BMPs must be maintained into perpetuity, and the City must confirm the maintenance (see Section 7 of the Storm Water Design Manual).

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [Step 6.2] as many times as needed to provide summary information for each individual structural BMP).

Step 6.1: Description of structural BMP strategy

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the Storm Water D*esign Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. At the end of this discussion provide a summary of all the structural BMPs within the project including the type and number.*

The 1.1 acre site is currently developed with total impervious coverage. Under the proposed condition, 31% of the site will be converted to pervious landscape area. The existing topography slopes from north to south and the same general drainage pattern will be maintained. However, instead of allowing runoff directly off-site, all runoff equal to the design capture volume will be directed to landscape infiltration basins.

The easterly portion of the site where the proposed retail building is located includes pervious planter area covering the property from westerly limit to the easterly limit. This areas serves as a self mitigating drainage management area.

(Continue on following page as necessary.)

Description of structural **BMP** strategy continued
(Page reserved for continuation of description of general strategy for structural **BMP** implementation at the site)

(Continued from previous page)

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No.	
Construction Plan Sheet No.	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐Retention by bioretention (INF-2) ☐Retention by permeable pavement (INF-3) ☐Partial retention by biofiltration with partial retention (PR-1) X Biofiltration (BF-1) ☐Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐Detention pond or vault for hydromodification management ☐Other (describe in discussion section below)	
Purpose: X Pollutant control only ☐Hydromodification control only ☐Combined pollutant control and hydromodification control ☐Pre-treatment/forebay for another structural BMP ☐Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 8.2.3.2 of the Storm Water Design Manual)	Engineer-of-Record (to be determined during Final Engineering Phase)
Who will be the final owner of this BMP?	☐HOA X Property Owner ☐City ☐Other (describe)
Who will maintain this BMP into perpetuity?	☐HOA X Property Owner ☐City ☐Other (describe)
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

Step 6.3: Offsite Alternative Compliance Participation Form

THIS FORM IS NOT APPLICABLE AT THIS TIME: An Alternative Compliance Program is under consideration by the City of Escondido.	
PDP INFORMATION	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐Yes ☐No	Will your ACP project be completed prior to the completion of the PDP? ☐Yes ☐No
Does your ACP account for all Deficits generated by the PDP? ☐Yes ☐No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.)	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits) _____

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.2-1 (Required) -Worksheet B.3-1 (Form I-4; Required) -Worksheet B.4-1 (if applicable) -Worksheet B.5-1 (if applicable) -Worksheet B.5-2 (if applicable) -Worksheet B.5-3 (if applicable) -Worksheet B.6-1 (if applicable) -Summary Worksheet (optional)	X Included
Attachment 1b	Form I-5, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the Storm Water Design Manual to complete Form I-5.	**X** Included ☐Not included because the entire project will use harvest and use BMPs
Attachment 1c	Form I-6, Factor of Safety and Design Infiltration Rate Worksheet (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the Storm Water Design Manual to complete Form I-6.	**X** Included ☐Not included because the entire project will use harvest and use BMPs
Attachment 1d	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	**X** Included
Attachment 1e	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☐Included

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Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

X Underlying hydrologic soil group
X Approximate depth to groundwater
N/A Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
N/A Critical coarse sediment yield areas to be protected
X Existing topography and impervious areas
N/A Existing and proposed site drainage network and connections to drainage offsite
X Proposed demolition
X Proposed grading
X Proposed impervious features
X Proposed design features and surface treatments used to minimize imperviousness
X Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
X Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
X Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

Attachment 1a

Storm Water Pollutant Control Worksheet Calculations

Automated Worksheet B.1: Calculation of Design Capture Volume (V2.0)

Category	#	Description	*iii*	*iv*	*v*	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	Area-1	Area-2		unitless
	2	85th Percentile 24-hr Storm Depth	0.54	0.54		inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	10,089	22,603		sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)				sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)				sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)				sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)	1,558	3,694		sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)				sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)				sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No		yes/no
	11	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)				sq-ft
	12	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)				sq-ft
	13	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)				sq-ft
	14	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)				sq-ft
	15	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)				sq-ft
	16	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)				sq-ft
	17	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)				sq-ft
	18	Number of Tree Wells Proposed per SD-A				#
	19	Average Mature Tree Canopy Diameter				ft
	20	Number of Rain Barrels Proposed per SD-E				#
	21	Average Rain Barrel Size				gal
Initial Runoff Factor Calculation	22	Total Tributary Area	11,646	26,297	0	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.80	0.79	0.00	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.80	0.79	0.00	unitless
	26	Initial Design Capture Volume	419	935	0	cubic-feet
Dispersion Area Adjustments	27	Total Impervious Area Dispersed to Pervious Surface	0	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.80	0.79	n/a	unitless
	32	Design Capture Volume After Dispersion Techniques	419	935	0	cubic-feet
Tree & Barrel Adjustments	33	Total Tree Well Volume Reduction	0	0	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	cubic-feet
Results	35	Final Adjusted Runoff Factor	0.80	0.79	0.00	unitless
	36	Final Effective Tributary Area	9,317	20,775	0	sq-ft
	37	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	cubic-feet
	38	Final Design Capture Volume Tributary to BMP	419	935	0	cubic-feet

No Warning Messages

Automated Worksheet B.2: Retention Requirements (V2.0)

Category	#	Description	*iii*	*iv*	*v*	Units
Basic Analysis	1	Drainage Basin ID or Name	Area-1	Area-2	-	unitless
	2	85th Percentile Rainfall Depth	0.54	0.54	-	inches
	3	Predominant NRCS Soil Type Within BMP Location	B	B		unitless
	4	Is proposed BMP location Restricted or Unrestricted for Infiltration Activities?	Restricted	Restricted		unitless
	5	Nature of Restriction	n/a	n/a		unitless
	6	Do Minimum Retention Requirements Apply to this Project?	Yes	Yes		yes/no
	7	Are Habitable Structures Greater than 9 Stories Proposed?	No	No		yes/no
Advanced Analysis	8	Has Geotechnical Engineer Performed an Infiltration Analysis?	Yes	Yes		yes/no
	9	Design Infiltration Rate Recommended by Geotechnical Engineer	0.261	0.261		in/hr
Result	10	Design Infiltration Rate Used To Determine Retention Requirements	0.000	0.000	-	in/hr
	11	Percent of Average Annual Runoff that Must be Retained within DMA	4.5%	4.5%	-	percentage
	12	Fraction of DCV Requiring Retention	0.02	0.02	-	ratio
	13	Required Retention Volume	8	19	-	cubic-feet

No Warning Messages

Automated Worksheet B.3: BMP Performance (V2.0)

Category	#	Description	*iii*	*iv*	*v*	Units
BMP Inputs	1	Drainage Basin ID or Name	Area-1	Area-2	-	sq-ft
	2	Design Infiltration Rate Recommended	0.000	0.000	-	in/hr
	3	Design Capture Volume Tributary to BMP	419	935	-	cubic-feet
	4	Is BMP Vegetated or Unvegetated?	Vegetated	Vegetated		unitless
	5	Is BMP Impermeably Lined or Unlined?	Lined	Lined		unitless
	6	Does BMP Have an Underdrain?	Underdrain	Underdrain		unitless
	7	Does BMP Utilize Standard or Specialized Media?	Standard	Standard		unitless
	8	Provided Surface Area	691	1,576		sq-ft
	9	Provided Surface Ponding Depth	6	6		inches
	10	Provided Soil Media Thickness	18	18		inches
	11	Provided Gravel Thickness (Total Thickness)	10	10		inches
	12	Underdrain Offset	3	3		inches
	13	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	0.50	0.50		inches
	14	Specialized Soil Media Filtration Rate				in/hr
	15	Specialized Soil Media Pore Space for Retention				unitless
	16	Specialized Soil Media Pore Space for Biofiltration				unitless
	17	Specialized Gravel Media Pore Space				unitless
Retention Calculations	18	Volume Infiltrated Over 6 Hour Storm	0	0	0	cubic-feet
	19	Ponding Pore Space Available for Retention	0.00	0.00	1.00	unitless
	20	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	unitless
	21	Gravel Pore Space Available for Retention (Above Underdrain)	0.00	0.00	0.40	unitless
	22	Gravel Pore Space Available for Retention (Below Underdrain)	0.40	0.40	0.40	unitless
	23	Effective Retention Depth	2.10	2.10	0.00	inches
	24	Fraction of DCV Retained (Independent of Drawdown Time)	0.29	0.30	0.00	ratio
	25	Calculated Retention Storage Drawdown Time	120	120	0	hours
	26	Efficacy of Retention Processes	0.30	0.31	0.00	ratio
	27	Volume Retained by BMP (Considering Drawdown Time)	125	287	0	cubic-feet
	28	Design Capture Volume Remaining for Biofiltration	294	648	0	cubic-feet
Biofiltration Calculations	29	Max Hydromod Flow Rate through Underdrain	0.0105	0.0105	0.0000	cfs
	30	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.66	0.29	0.00	in/hr
	31	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	in/hr
	32	Soil Media Filtration Rate to be used for Sizing	0.66	0.29	0.00	in/hr
	33	Depth Biofiltered Over 6 Hour Storm	3.94	1.73	0.00	inches
	34	Ponding Pore Space Available for Biofiltration	1.00	1.00	0.00	unitless
	35	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	unitless
	36	Gravel Pore Space Available for Biofiltration (Above Underdrain)	0.40	0.40	0.40	unitless
	37	Effective Depth of Biofiltration Storage	12.40	12.40	0.00	inches
	38	Drawdown Time for Surface Ponding	9	21	0	hours
	39	Drawdown Time for Effective Biofiltration Depth	19	43	0	hours
	40	Total Depth Biofiltered	16.34	14.13	0.00	inches
	41	Option 1 - Biofilter 1.50 DCV: Target Volume	441	973	0	cubic-feet
	42	Option 1 - Provided Biofiltration Volume	441	973	0	cubic-feet
	43	Option 2 - Store 0.75 DCV: Target Volume	221	486	0	cubic-feet
	44	Option 2 - Provided Storage Volume	221	486	0	cubic-feet
	45	Portion of Biofiltration Performance Standard Satisfied	1.00	1.00	0.00	ratio
Result	46	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	-	yes/no
	47	Overall Portion of Performance Standard Satisfied (BMP Efficacy Factor)	1.00	1.00	0.00	ratio
	48	**Deficit of Effectively Treated Stormwater**	**0**	**0**	**n/a**	cubic-feet

No Warning Messages

Attachment 1b

Form I-5, Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition	Form I-5

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form I-5			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	**X**	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

Form I-5

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		

Provide basis:

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-5			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	**X**	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		

Form I-5 Certification

The Geotechnical Engineer certifies they completed Form I-5 except Criteria 4 & 8 (see Appendix C.4.3).

Professional Geotechnical Engineer's Printed Name: _____

Professional Geotechnical Engineer's Signed Name: _____

Date: _____

[SEAL]

The Project Design Engineer certifies they completed Criteria 4 & 8 (see Appendix C.4.4).

Professional Project Design Engineer's Printed Name: JAMES BAZUA

Professional Project Design Engineer's Signed Name: _____

Date: 10/21/20

[SEAL]

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Attachment 1c

Form I-6, Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet				Form I-6	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/resiliency	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					
Supporting Data					
Briefly describe infiltration test and provide reference to test forms:					

Factor of Safety and Design Infiltration Rate Worksheet	Form I-6 Certification

The Geotechnical Engineer certifies they completed Form I-6 (see Appendix C.4.3).

Professional Geotechnical Engineer's Printed Name:

_____

Professional Geotechnical Engineer's Signed Name:

_____

Date: _____

[SEAL]

Attachment 1d

DMA Exhibit

IN THE CITY OF ESCONDIDO, STATE OF CALIFORNIA

ESCONDIDO 7-ELEVEN
SWQMP AND HYDROLOGY SITE PLAN

EXISTING SITE:

TOTAL SITE AREA = 1.11 AC.

LANDSCAPE AREA (PERVIOUS) = 0.05 AC.

PERVIOUS AREA RATIO = 0.05 AC./1.11 AC. = 5%

PROPOSED SITE:

TOTAL SITE AREA = 1.08 AC.

LANDSCAPE AREA (PERVIOUS) = 0.33 AC.

PERVIOUS AREA RATIO = 0.33 AC./1.08 AC. = 31%

DESIGN CAPTURE VOLUME (DCV) = 1,354 CU. FT.

BIOFILTRATION BMP VOLUME PROVIDED = 1,414 CU. FT

HYDRAULIC SOIL GROUP

UNDERLYING SOIL GROUP 'TYPE B'

EXISTING NATURAL HYDRAULIC FEATURES

N/A (NONE EXISTING)

CRITICAL COURSE SEDIMENT YIELD AREAS

N/A (NONE EXISTING)

DEPTH TO GROUNDWATER

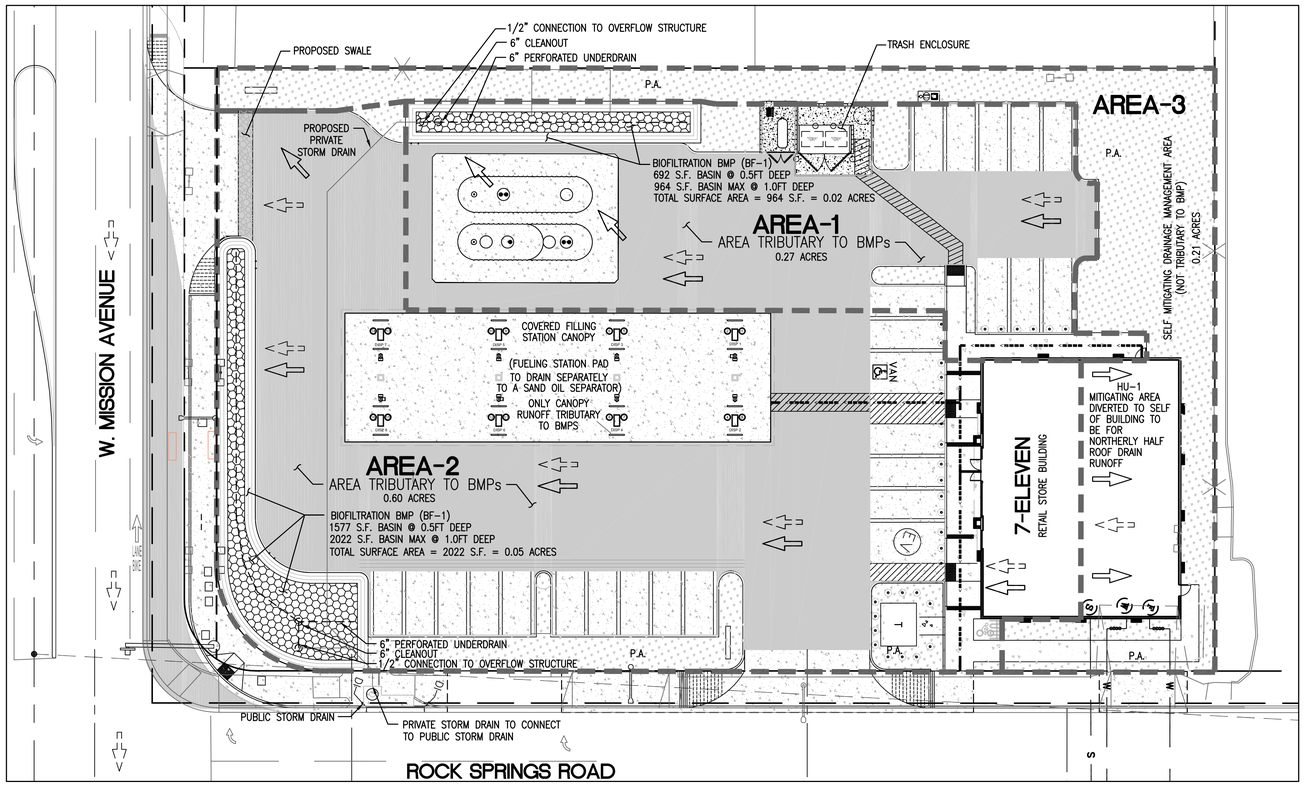
ESTIMATED GROUNDWATER DEPTH= > 20 FT

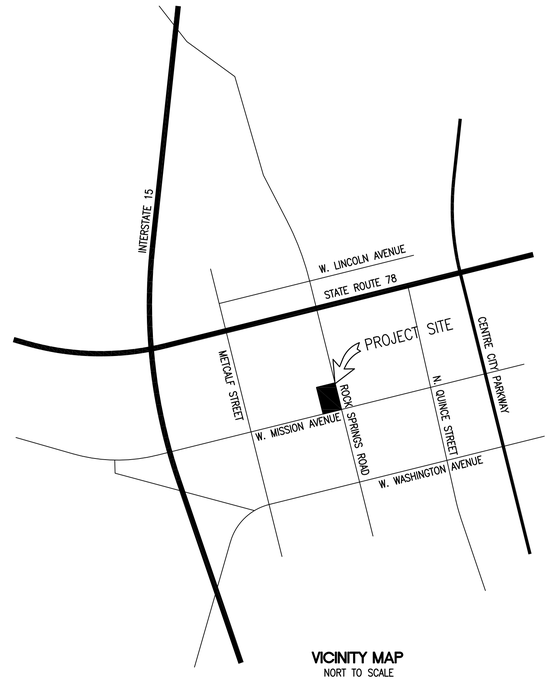
SITE ADDRESS

900 W. MISSION AVENUE, ESCONDIDO, CA 92025

LEGEND

TRIBUTARY AREA	
HISTORIC DRAINAGE PATH	
PROPOSED DRAINAGE PATH	
PLANTER AREA	P.A.





VICINITY MAP
NORT TO SCALE

GRAPHIC SCALE
SCALE 1"=20'
0 10 20 40 60 80

DRAINAGE MANAGEMENT AREA TABLE					
DMA ID	AREA (AC)	SURFACE TYPE	BMP	DCV	Q100
AREA-1	0.27	0.23 AC (IMPERVIOUS) 0.04 AC (TYPE B SOIL)	BF-1	419 CF	1.44 CFS
AREA-2	0.60	0.52 AC (IMPERVIOUS) 0.08 AC (TYPE B SOIL)	BF-1	935 CF	3.04 CFS
AREA-3	0.21		(SELF MITIGATING)		
TOTAL	1.08			1354 CF	4.48 CFS

PREPARED BY:

The Altum Group

ENGINEERING | PLANNING | SURVEY | ENVIRONMENTAL

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Palm Desert, CA 92260
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CITY OF ESCONDIDO

SWQMP AND HYDROLOGY SITE PLAN
ESCONDIDO 7-ELEVEN
PROPOSED CONDITION

FOR:

SHEET 1

OF 1

ATTACHMENT 2

BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the Storm Water Design Manual	☐Included ☐Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☐Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the Storm Water Design Manual.	☐Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped in the WMAA AND, ☐Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment OR, ☐Demonstration that project does not generate a net impact on the receiving water.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the Storm Water Design Manual.	☐Not performed ☐Included ☐Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐Included ☐Not required because BMPs will drain in less than 96 hours

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Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

- ☐Underlying hydrologic soil group
- ☐Approximate depth to groundwater
- ☐Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☐Critical coarse sediment yield areas to be protected
- ☐Existing topography
- ☐Existing and proposed site drainage network and connections to drainage offsite
- ☐Proposed grading
- ☐Proposed impervious features
- ☐Proposed design features and surface treatments used to minimize imperviousness
- ☐Point(s) of Compliance (POC) for Hydromodification Management
- ☐Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- ☐Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

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ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required) **TO BE PROVIDED AT FINAL WQMP STAGE**	☐Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Storm Water Control Facilities Maintenance Agreement (SWCFMA) (when applicable)	☐Included ☐Not Applicable

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Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3a must identify:

- ☐Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the Storm Water Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐How to access the structural BMP(s) to inspect and perform maintenance
- ☐Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐Recommended equipment to perform maintenance
- ☐When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the City's standard format (PDP applicant to contact City staff to obtain the current maintenance agreement forms or download from City's website).

TO BE PROVIDED AT FINAL WQMP STAGE

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ATTACHMENT 4

City of Escondido PDP Structural BMP Verification for Permitted Land Development Projects

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City of Escondido Storm Water Structural BMP Verification Form Page 1 of 4	
Project Summary Information	
Project Name	
Record ID (e.g., grading/improvement plan number)	
Project Address	
Assessor's Parcel Number(s) (APN(s))	
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	
Maintenance Notification / Agreement No.	
Responsible Party for Construction Phase	
Developer's Name	
Address	
Email Address	
Phone Number	
Engineer of Work	
Engineer's Phone Number	
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	
Address	
Email Address	
Phone Number	
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

City of Escondido Storm Water Structural BMP Verification Form Page 2 of 4				
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)				
Description/Type of Structural BMP	**Plan Sheet #**	**Structural BMP ID#**	**Maintenance Agreement Recorded Doc #**	**Revisions**
BIOFILTRATION BASIN		BF-1		
BIOFILTRATION BASIN		BF-1		
*All Priority Development Projects (PDPs) require a Structural BMP				

Note: If this is a partial verification of Structural BMPs, provide a list and map denoting Structural BMPs that have already been submitted, those for this submission, and those anticipated in future submissions.

City of Escondido Storm Structural BMP Verification Form Page 3 of 4

Checklist for Engineer of Work (EOW) to submit to Field Engineering:

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Storm Water Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs are in substantial conformance with the approved plans and applicable regulations. I understand the City reserves the right to inspect the above BMPs to verify compliance with the approved plans and Storm Water Ordinance. Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign your name and seal.

Professional Engineer's Printed Name:

_____

Professional Engineer's Signed Name:

_____

[SEAL]

Date: _____

City of Escondido Storm Water Structural BMP Verification Form Page 4 of 4

CITY - OFFICIAL USE ONLY:

Permit #:_____

City Inspector: _____

Date Project has/expects to close: _____

Date verification received from Engineer of Work (EOW): _____

By signing below, City Inspector concurs that every noted Structural BMP has been installed per plan.

City Inspector's Signature: _____Date: _____

FOR Environmental Programs:

Date Received from Field Engineering:_____

Environmental Programs Submittal Reviewer:_____

Environmental Programs Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

List **acceptable** Structural BMPs:

Environmental Programs Reviewer's Signature: _____

Date: _____

ATTACHMENT 5

Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design

This is the cover sheet for Attachment 5.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

☐Structural BMP(s) with ID numbers matching Step 6 Summary of PDP Structural BMPs
☐The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☐Details and specifications for construction of structural BMP(s)
☐Signage indicating the location and boundary of structural BMP(s) as required by City staff
☐How to access the structural BMP(s) to inspect and perform maintenance
☐Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐Recommended equipment to perform maintenance
☐When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☐Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☐All BMPs must be fully dimensioned on the plans
☐When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
☐Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

***Note: Plan sheets included in this attachment can be full size or half size.**

To be provided during final design once improvement plan construction drawings are available.

Appendix

Reference Material

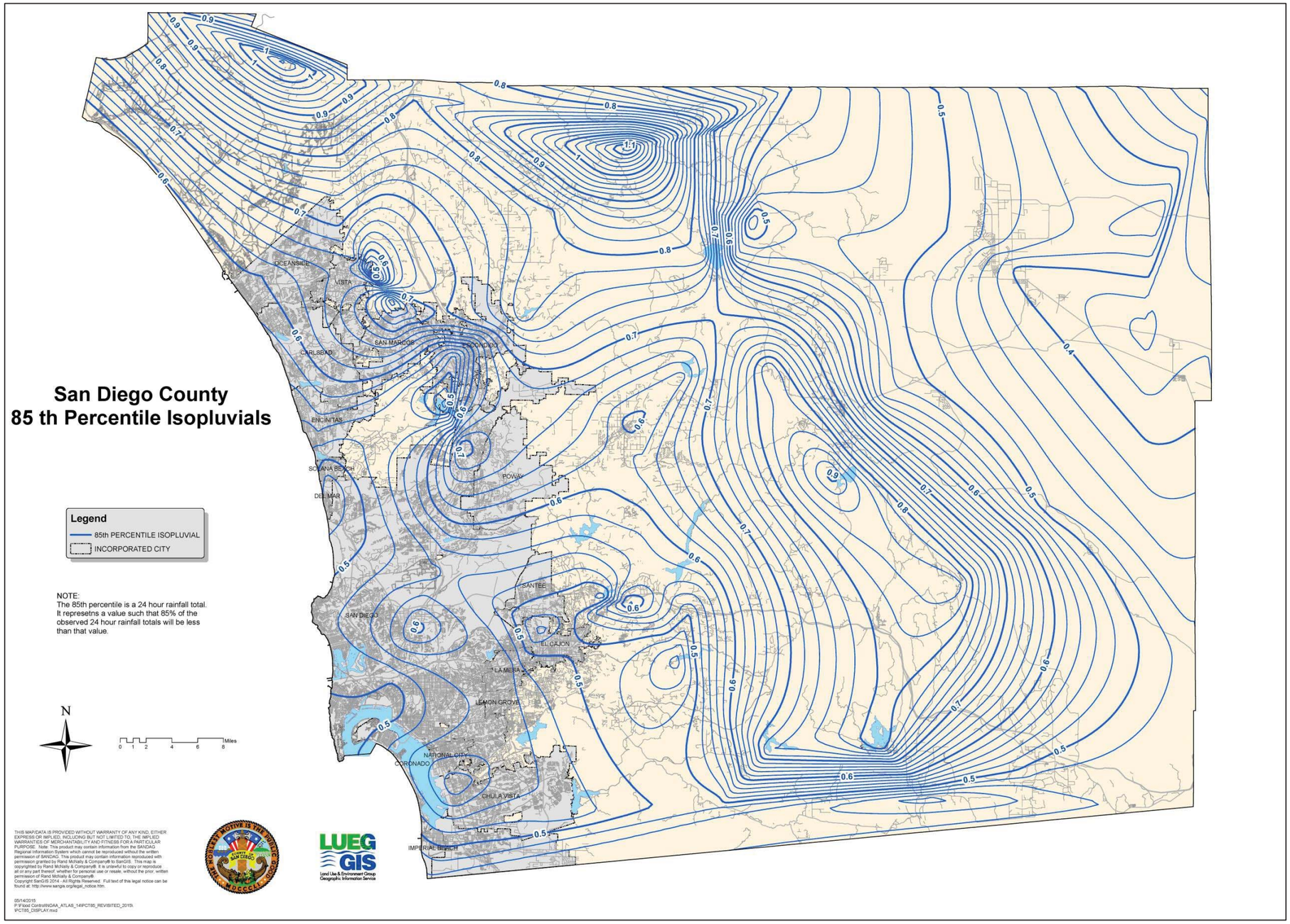


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

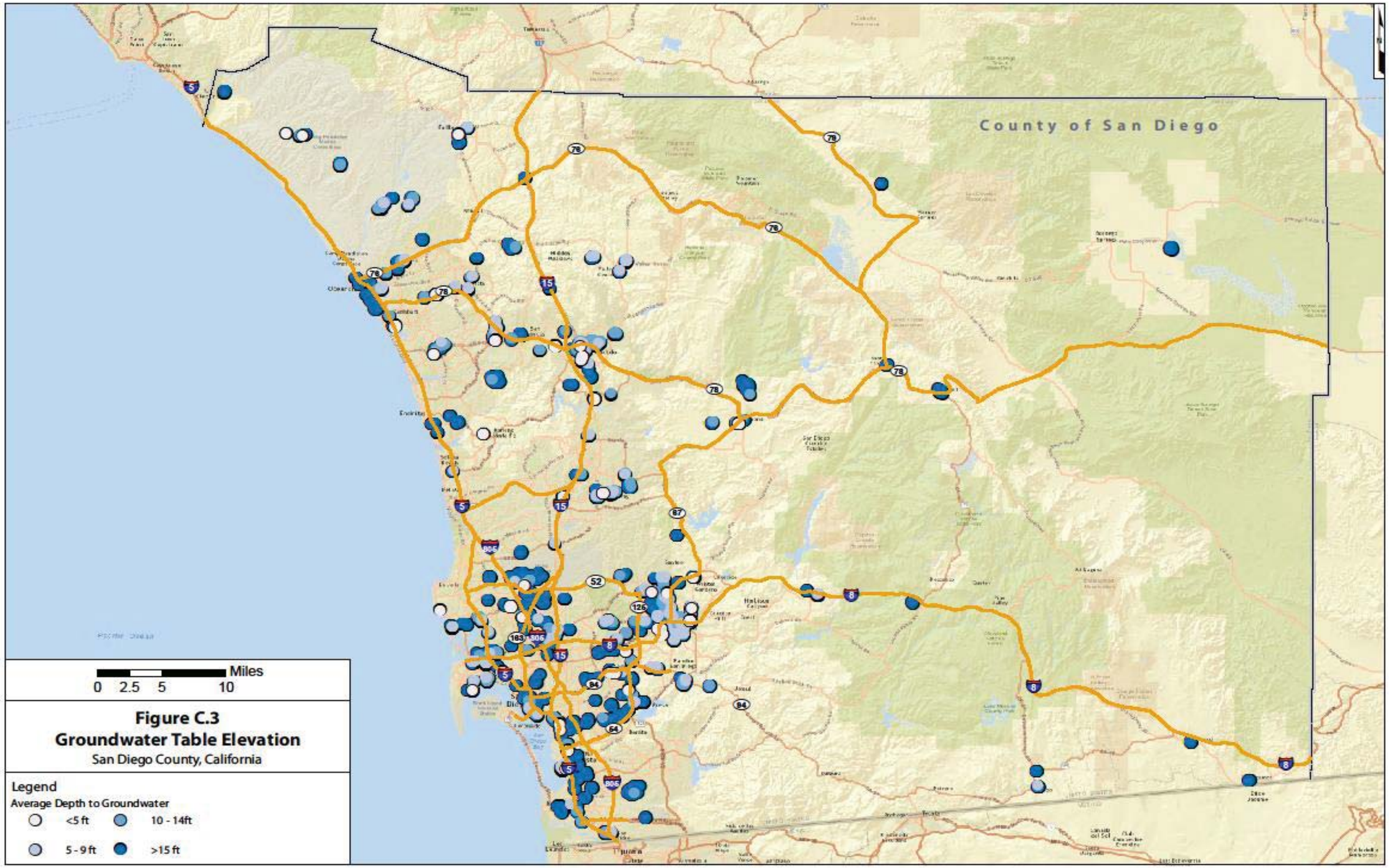


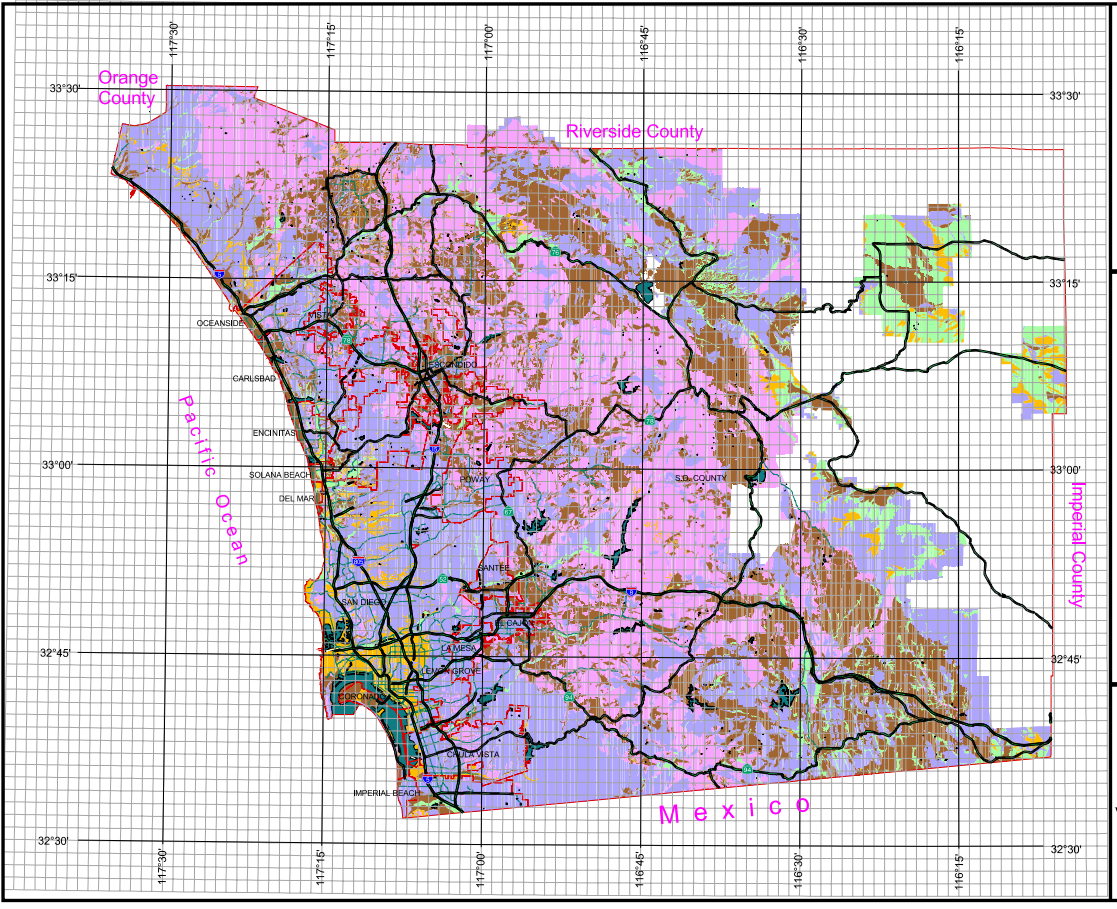
Figure C.3
Groundwater Table Elevation
San Diego County, California

Legend
Average Depth to Groundwater

- <5 ft
- 5 - 9 ft
- 10 - 14ft
- >15 ft

County of San Diego Hydrology Manual

Soil Hydrologic Groups



Legend

Soil Groups

- Group A
- Group B
- Group C
- Group D
- Undetermined
- Data Unavailable

DPW GIS — Department of Public Works Geographic Information Services

SanGIS — We Have San Diego Covered!

N W E S

3 0 3 Miles

THIS MAP IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
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E.19 BF-1 Biofiltration

Location: 43rd Street and Logan Avenue, San Diego, California

MS4 Permit Category
Biofiltration

Manual Category
Biofiltration

Applicable Performance Standard
Pollutant Control
Flow Control

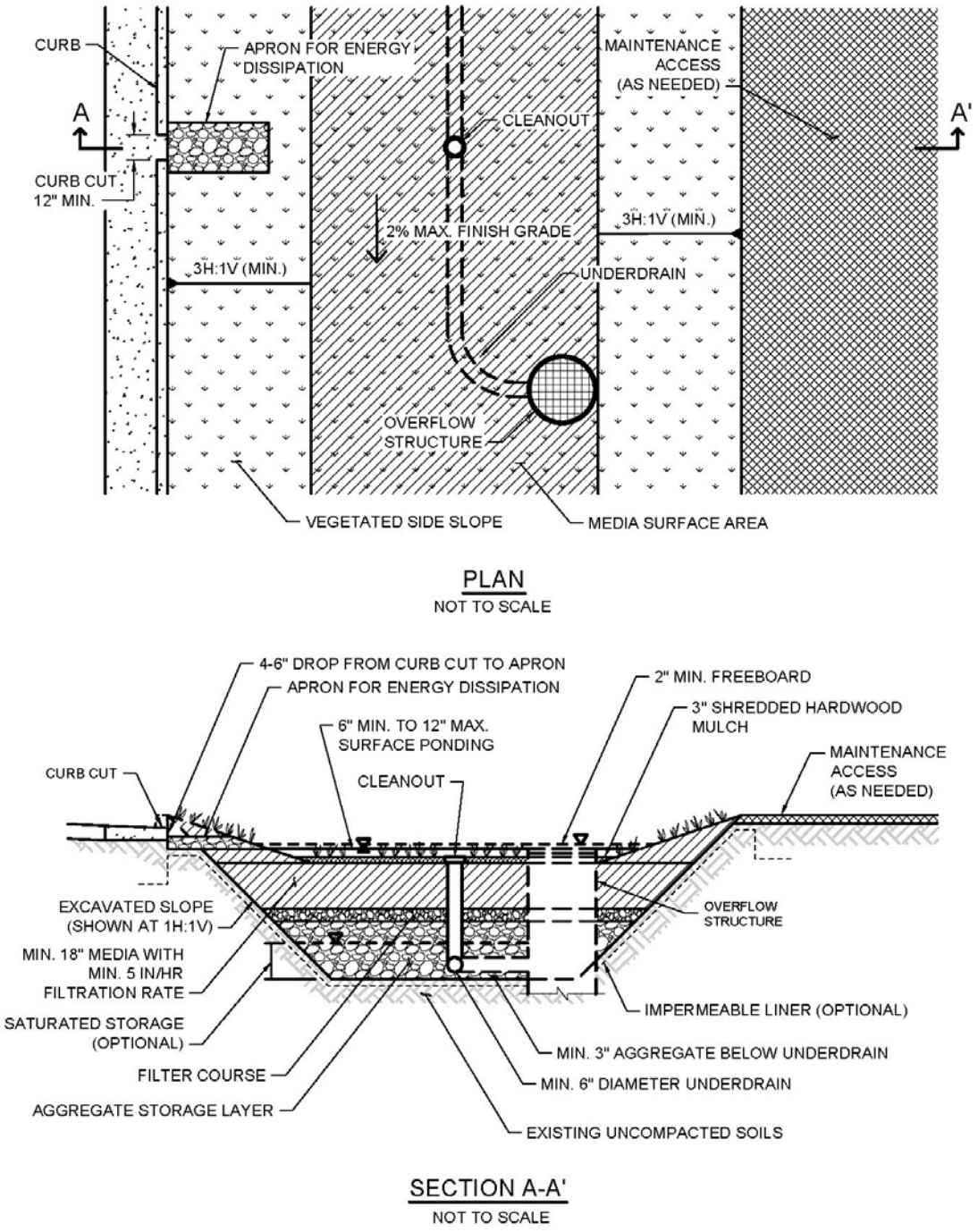
Primary Benefits
Treatment
Volume Reduction (Incidental)
Peak Flow Attenuation (Optional)

Description

Biofiltration (Bioretention with underdrain) facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system. Bioretention with underdrain facilities are commonly incorporated into the site within parking lot landscaping, along roadsides, and in open spaces. Because these types of facilities have limited or no infiltration, they are typically designed to provide enough hydraulic head to move flows through the underdrain connection to the storm drain system. Treatment is achieved through filtration, sedimentation, sorption, biochemical processes and plant uptake.

Typical biofiltration components include:

- Inflow distribution mechanisms (e.g, perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on expected climate and ponding depth
- Non-floating mulch layer
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Impermeable liner or uncompacted native soils at the bottom of the facility
- Overflow structure



Typical plan and Section view of a Biofiltration BMP

Design Adaptations for Project Goals

Biofiltration Treatment BMP for storm water pollutant control. The system is lined or un-lined to provide incidental infiltration, and an underdrain is provided at the bottom to carry away filtered

runoff. This configuration is considered to provide biofiltration treatment via flow through the media layer. Storage provided above the underdrain within surface ponding, media, and aggregate storage is considered included in the biofiltration treatment volume. Saturated storage within the aggregate storage layer can be added to this design by raising the underdrain above the bottom of the aggregate storage layer or via an internal weir structure designed to maintain a specific water level elevation.

Integrated storm water flow control and pollutant control configuration. The system can be designed to provide flow rate and duration control by primarily providing increased surface ponding and/or having a deeper aggregate storage layer above the underdrain. This will allow for significant detention storage, which can be controlled via inclusion of an outlet structure at the downstream end of the underdrain.

Recommended Siting Criteria

	Siting Criteria	*Intent/Rationale*
☐	Placement observes geotechnical recommendations regarding potential hazards (e.g., slope stability, landslides, liquefaction zones) and setbacks (e.g., slopes, foundations, utilities).	Must not negatively impact existing site geotechnical concerns.
☐	An impermeable liner or other hydraulic restriction layer is included if site constraints indicate that infiltration or lateral flows should not be allowed.	Lining prevents storm water from impacting groundwater and/or sensitive environmental or geotechnical features. Incidental infiltration, when allowable, can aid in pollutant removal and groundwater recharge.
☐	Contributing tributary area must be ≤ 5 acres (≤ 1 acre preferred).	Bigger BMPs require additional design features for proper performance. Contributing tributary area greater than 5 acres may be allowed at the discretion of County staff if the following conditions are met: 1) incorporate design features (e.g. flow spreaders) to minimize short circuiting of flows in the BMP and 2) incorporate additional design features requested by County staff for proper performance of the regional BMP.
☐	Finish grade of the facility is ≤ 2%.	Flatter surfaces reduce erosion and channelization within the facility.

Design Criteria and Considerations

Biofiltration must meet the following design criteria. Deviations from the below criteria may be approved at the discretion of County staff if it is determined to be appropriate:

Siting and Design		*Intent/Rationale*
Surface Ponding		
☐	Surface ponding is limited to a 24-hour drawdown time.	Surface ponding limited to 24 hour for plant health. Surface ponding drawdown time greater than 24-hours but less than 96 hours may be allowed at the discretion of County staff if certified by a landscape architect or agronomist.
☐	Surface ponding depth is ≥ 6 and ≤ 12 inches.	Surface ponding capacity lowers subsurface storage requirements. Deep surface ponding raises safety concerns. Surface ponding depth greater than 12 inches (for additional pollutant control or surface outlet structures or flow-control orifices) may be allowed at the discretion of County staff if the following conditions are met: 1) surface ponding depth drawdown time is less than 24 hours; and 2) safety issues and fencing requirements are considered (typically ponding greater than 18" will require a fence and/or flatter side slopes) and 3) potential for elevated clogging risk is considered.
☐	A minimum of 2 inches of freeboard is provided.	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge.
☐	Side slopes are stabilized with vegetation and are = 3H:1V or shallower.	Gentler side slopes are safer, less prone to erosion, able to establish vegetation more quickly and easier to maintain.
Vegetation		

Siting and Design		*Intent/Rationale*
☐	Plantings are suitable for the climate and expected ponding depth. A plant list to aid in selection can be found in Appendix F.	Plants suited to the climate and ponding depth are more likely to survive.
☐	An irrigation system with a connection to water supply should be provided as needed.	Seasonal irrigation might be needed to keep plants healthy.
Mulch (Mandatory)		
☐	3 inches of well-aged, shredded hardwood mulch.	Mulch will suppress weeds and maintain moisture for plant growth.
Media Layer		
☐	Media maintains a minimum filtration rate of 5 in/hr over lifetime of facility. An initial filtration rate of 8 to 12 in/hr is recommended to allow for clogging over time; the initial filtration rate should not exceed 12 inches per hour.	A filtration rate of at least 5 inches per hour allows soil to drain between events. The initial rate should be higher than long term target rate to account for clogging over time. However an excessively high initial rate can have a negative impact on treatment performance, therefore an upper limit is needed.
☐	Media is a minimum 18 inches deep, meeting either of these two media specifications: Appendix F.2 Biofiltration Soil Media (BSM) **or** County of San Diego Low Impact Development Handbook: Appendix G -Bioretention Soil Specification (June 2014, unless superseded by more recent edition). Alternatively, for proprietary designs and custom media mixes not meeting the media specifications, the media meets the pollutant treatment performance criteria in Section F.1.1.	A deep media layer provides additional filtration and supports plants with deeper roots. Standard specifications must be followed. For non-standard or proprietary designs, compliance with F.1.1 ensures that adequate treatment performance will be provided.

Siting and Design		*Intent/Rationale*
☐	Media surface area is 3% of contributing area times adjusted runoff factor or greater. Unless demonstrated that the BMP surface area can be smaller than 3%.	Greater surface area to tributary area ratios: a) maximizes volume retention as required by the MS4 Permit and b) decrease loading rates per square foot and therefore increase longevity. Adjusted runoff factor is to account for site design BMPs implemented upstream of the BMP (such as rain barrels, impervious area dispersion, etc.). Refer to Appendix B guidance. If media surface area is under 3% of contributing area, refer to Sediment Loading calculations in Appendix B.
☐	Where receiving waters are impaired or have a TMDL for nutrients, the system is designed with nutrient sensitive media design (see fact sheet BF-2).	Potential for pollutant export is partly a function of media composition; media design must minimize potential for export of nutrients, particularly where receiving waters are impaired for nutrients.
Filter Course Layer		
☐	A filter course is used to prevent migration of fines through layers of the facility. Filter fabric is not used.	Migration of media can cause clogging of the aggregate storage layer void spaces or subgrade. Filter fabric is more likely to clog.
☐	Filter course is washed and free of fines.	Washing aggregate will help eliminate fines that could clog the facility and impede infiltration.
☐	Filter course calculations assessing suitability for particle migration prevention have been completed.	Gradation relationship between layers can evaluate factors (e.g., bridging, permeability, and uniformity) to determine if particle sizing is appropriate or if an intermediate layer is needed.
Aggregate Storage Layer		

Siting and Design		*Intent/Rationale*
☐	Class 2 Permeable per Caltrans specification 68-1.025 is recommended for the storage layer. Washed, open-graded crushed rock may be used, however a 4-6 inch washed pea gravel filter course layer at the top of the crushed rock is required.	Washing aggregate will help eliminate fines that could clog the aggregate storage layer void spaces or subgrade.
☐	The depth of aggregate provided (12-inch typical) and storage layer configuration is adequate for providing conveyance for underdrain flows to the outlet structure.	Proper storage layer configuration and underdrain placement will minimize facility drawdown time.
Inflow, Underdrain, and Outflow Structures		
☐	Inflow, underdrains and outflow structures are accessible for inspection and maintenance.	Maintenance will prevent clogging and ensure proper operation of the flow control structures.
☐	Inflow velocities are limited to 3 ft/s or less or use energy dissipation methods. (e.g., riprap, level spreader) for concentrated inflows.	High inflow velocities can cause erosion, scour and/or channeling.
☐	Curb cut inlets are at least 12 inches wide, have a 4-6 inch reveal (drop) and an apron and energy dissipation as needed.	Inlets must not restrict flow and apron prevents blockage from vegetation as it grows in. Energy dissipation prevents erosion.
☐	Underdrain outlet elevation should be a minimum of 3 inches above the bottom elevation of the aggregate storage layer.	A minimal separation from subgrade or the liner lessens the risk of fines entering the underdrain and can improve hydraulic performance by allowing perforations to remain unblocked.
☐	Minimum underdrain diameter is 6 inches.	Smaller diameter underdrains are prone to clogging.
Inflow, Underdrain, and Outflow Structures		
☐	Underdrains are made of slotted, PVC pipe conforming to ASTM D 3034 or equivalent or corrugated, HDPE pipe conforming to AASHTO 252M or equivalent.	Slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.

Siting and Design		*Intent/Rationale*
☐	An underdrain cleanout with a minimum 6-inch diameter and lockable cap is placed every 250 to 300 feet as required based on underdrain length.	Properly spaced cleanouts will facilitate underdrain maintenance.
☐	Overflow is safely conveyed to a downstream storm drain system or discharge point Size overflow structure to pass 100-year peak flow for on-line infiltration basins and water quality peak flow for off-line basins.	Planning for overflow lessens the risk of property damage due to flooding.

Conceptual Design and Sizing Approach for Storm Water Pollutant Control Only

To design biofiltration for storm water pollutant control only (no flow control required), the following steps should be taken:

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Calculate the DCV per Appendix B based on expected site design runoff for tributary areas.
3. Use the sizing worksheet presented in Appendix B.5 to size biofiltration BMPs.

Conceptual Design and Sizing Approach when Storm Water Flow Control is Applicable

Control of flow rates and/or durations will typically require significant surface ponding and/or aggregate storage volumes, and therefore the following steps should be taken prior to determination of storm water pollutant control design. Pre-development and allowable post-project flow rates and durations should be determined as discussed in Chapter 6 of the manual.

1. Verify that siting and design criteria have been met, including placement requirements, contributing tributary area, maximum side and finish grade slopes, and the recommended media surface area tributary ratio.
2. Iteratively determine the facility footprint area, surface ponding and/or aggregate storage layer depth required to provide detention storage to reduce flow rates and durations to allowable limits. Flow rates and durations can be controlled from detention storage by altering outlet structure orifice size(s) and/or water control levels. Multi-level orifices can be used within an outlet structure to control the full range of flows.
3. If bioretention with underdrain cannot fully provide the flow rate and duration control required by this manual, an upstream or downstream structure with significant storage volume

such as an underground vault can be used to provide remaining controls.

4. After bioretention with underdrain has been designed to meet flow control requirements, calculations must be completed to verify if storm water pollutant control requirements to treat the DCV have been met.

Maintenance Overview

Normal Expected Maintenance. Biofiltration requires routine maintenance to: remove accumulated materials such as sediment, trash or debris; maintain vegetation health; maintain infiltration capacity of the media layer; replenish mulch; and maintain integrity of side slopes, inlets, energy dissipators, and outlets. A summary table of standard inspection and maintenance indicators is provided within this Fact Sheet.

Non-Standard Maintenance or BMP Failure. If any of the following scenarios are observed, the BMP is not performing as intended to protect downstream waterways from pollution and/or erosion. Corrective maintenance, increased inspection and maintenance, BMP replacement, or a different BMP type will be required.

- The BMP is not drained between storm events. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the media layer, filter course, aggregate storage layer, underdrain, or outlet structure. The specific cause of the drainage issue must be determined and corrected.

- Sediment, trash, or debris accumulation greater than 25% of the surface ponding volume within one month. This means the load from the tributary drainage area is too high, reducing BMP function or clogging the BMP. This would require pretreatment measures within the tributary area draining to the BMP to intercept the materials. Pretreatment components, especially for sediment, will extend the life of components that are more expensive to replace such as media, filter course, and aggregate layers.

- Erosion due to concentrated storm water runoff flow that is not readily corrected by adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.

Other Special Considerations. Biofiltration is a vegetated structural BMP. Vegetated structural BMPs that are constructed in the vicinity of, or connected to, an existing jurisdictional water or wetland could inadvertently result in creation of expanded waters or wetlands. As such, vegetated structural BMPs have the potential to come under the jurisdiction of the United States Army Corps of Engineers, SDRWQCB, California Department of Fish and Wildlife, or the United States Fish and

Wildlife Service. This could result in the need for specific resource agency permits and costly mitigation to perform maintenance of the structural BMP. Along with proper placement of a structural BMP, routine maintenance is key to preventing this scenario.

Sediment Loading. Consider the effects of BMP design and tributary area land uses on the clogging potential of the BMP. Complete the sediment loading analysis included in Appendix F.

Summary of Standard Inspection and Maintenance

The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district.

Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation or compaction of the media layer.	• Inspect monthly. If the BMP is 25% full* or more in one month, increase inspection frequency to monthly plus after every 0.1-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Obstructed inlet or outlet structure	Clear blockage.	• Inspect monthly and after every 0.5-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable	• Inspect annually. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.
Dead or diseased vegetation	Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintain when needed.
Overgrown vegetation	Mow or trim as appropriate.	• Inspect monthly. • Maintain when needed.
2/3 of mulch has decomposed, or mulch has been removed	Remove decomposed fraction and top off with fresh mulch to a total depth of 3 inches.	• Inspect monthly. • Replenish mulch annually, or more frequently when needed based on inspection.
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.	• Inspect monthly. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.	• Inspect after every 0.5-inch or larger storm event. If erosion due to storm water flow has been observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed. If the issue is not corrected by restoring the BMP to the original plan and grade, the County reviewer shall be contacted prior to any additional repairs or reconstruction.
Standing water in BMP for longer than 24 hours following a storm event Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains, or repairing/replacing clogged or compacted soils.	• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed.

Threshold/Indicator	Maintenance Action	Inspection and Maintenance Frequency
Presence of mosquitos/larvae For images of egg rafts, larva, pupa, and adult mosquitos, see http://www.mosquito.org/biology	If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water. If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria due to release rates controlled by an orifice installed on the underdrain, the County reviewer shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.	• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintain when needed.
Underdrain clogged	Clear blockage.	Inspect if standing water is observed for longer than 24-96 hours following a storm event. Maintain when needed.

"25% full" is defined as ¼ of the depth from the design bottom elevation to the crest of the outflow structure (e.g., if the height to the outflow opening is 12 inches from the bottom elevation, then the materials must be removed when there is 3 inches of accumulation – this should be marked on the outflow structure).

FOR REFERENCE ONLY

August 28, 2019
Project No. 9135001

Mr. Max Antono
The Altum Group
73-710 Fred Waring Drive
Suite 219
Palm Desert, California 92260

Subject: Geotechnical and Geologic Hazard Evaluation
7-Eleven Convenience Store
West Mission Avenue and Rock Springs Road
Escondido, California

Dear Mr. Antono,

We are pleased to submit our Geotechnical and Geologic Hazard Evaluation in support of the Initial Study/Mitigated Negative Declaration for construction of the 7-Eleven Convenience store at the corner of West Mission Avenue and Rock Springs Road in Escondido, California. This report identifies geotechnical and geologic hazards that have the potential to affect the Project.

Respectfully submitted,

THE BODHI GROUP, INC.

Lee Vanderhurst, P.G.
Senior Geologist

Sree Gopinath
Principal Engineer

Distribution: 1) Addressee

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EXECUTIVE SUMMARY

This Geotechnical and Geologic Hazard Evaluation (Study) identifies geotechnical and geologic hazards that could have potentially adverse effects on the proposed 7-Eleven Convenience Store to be located on the northwest corner of West Mission Avenue and Rock Springs Road, Escondido, California (Study Area). For this study, we reviewed relevant geologic maps and planning documents published by the City of Escondido. In-house resources were researched, and a brief site reconnaissance was performed. Please note that this evaluation is not intended for design or construction and is being performed to support the Initial Study/Mitigated Negative Declaration document for construction of the 7-Eleven Store.

A summary of the geology and geologic hazards is provided below.

- The geologic units in the Study Area consists of fill and Older Alluvial Plain Deposits. The alluvial deposits are underlain at depth by granitic rock. Documentation of the fill compaction was not found in our Study and may need removal and recompaction beneath settlement sensitive improvements. The Older Alluvial Plain Deposits are moderately consolidated however, near the existing ground surface they can be soft and may need remedial earthwork to support structures.
- The Study Area is not underlain by an Alquist Priolo Special Studies Zone or known potentially active faults. The closest known active faults are the Rose Canyon fault zone (located 15 miles west of the Study Area) and the Elsinore fault zone (located 15 miles east of the Study Area. The Study Area, like the rest of San Diego County, is in a region of local and regional active faults and will be subject to strong ground motion in the event of an earthquake on these faults.
- Liquefaction occurs in soft, saturated soil during moderate to severe ground shaking during earthquakes. According to City of Escondido maps, the Study Area is not in an area with a potential for liquefaction. However, the County of San Diego considers the area to have a low potential for liquefaction. Previous geotechnical investigations for other projects in the immediate vicinity of the Study Area have estimated post liquefaction differential settlement to be less than ½ inch.
- Tsunami events caused by large offshore earthquakes or submarine landslides or seiches (waves within enclosed bodies of water) will not affect the Study area due to the elevation above sea level and absence of large enclosed bodies of water nearby.
- Landslide hazards have not been mapped in or in the immediate vicinity of the Study Area. The absence of steep or high slopes precludes landslides.
- Most of the Study Area is blanketed with soils that range from low to non-expansive in nature.
- Potentially corrosive soils may be present in some localized areas, which may be exacerbated by the presence of brackish groundwater.
- Infiltration rates for at grade soil may be affected by shallow groundwater (anticipated depth to groundwater is 10 feet below ground surface).

The geologic hazards identified above can be mitigated through engineering design in accordance with established State of California and City of Escondido requirements and codes. Storm water infiltration into soils may be limited and alternative systems like bioswales or bioretention basins may be needed. Geotechnical investigations are recommended to support the design and construction of the convenience store.

1. INTRODUCTION

The Bodhi Group has completed a Geotechnical and Geologic Hazards Study (Study) of the northwest corner of West Mission Avenue and Rock Springs Road in Escondido California. This report presents the results of our "desktop" evaluation of the geotechnical and geologic hazards potentially affecting the Study Area. The purpose of our evaluation was to identify geotechnical and geologic conditions or hazards that might affect development of the planned 7-Eleven Convenience Store on the Study Area. No mapping, subsurface exploration or laboratory testing was performed for this Study. The following services were provided.

- Reviewed relevant published geologic information including State of California-issued geologic and hazard maps, and the City of Escondido (City) General Plan, Downtown Specific Plan and Action Plan.
- Reviewed the Conceptual Site Plan for 7-11 #1045089, by Tait and Associates, dated 2018.
- Reviewed and summarized regional and local geology from publicly available resources and identified potential geotechnical and geologic hazards.
- Researched other City and County of San Diego resources, and our in-house library of historical aerial photographs, geotechnical and geological hazards such as faulting, seismicity, and liquefiable soils.
- Prepared this technical report that identifies geotechnical and geologic hazards. Included in this report is a location map (Figure 1), a map of the regional and Study Area geology showing distribution of surficial deposits and geologic units (Figure 2); and a map of the active regional faults in southern California (Figure 3).

1.1. Significant Assumptions

Documentation and data provided by the client or from the public domain, and referred to in the preparation of this study, are assumed to be complete and correct and have been used and referenced with the understanding that the Bodhi Group assumes no responsibility or liability for their accuracy. The conclusions contained herein are based upon such information and documentation. Because Study Area conditions may change and additional data may become available, data reported and conclusions drawn in this report are limited to current conditions and may not be relied upon on a significantly later date or if changes have occurred at the Study Area.

Reasonable CEQA-level efforts were made during the Study to identify geologic hazards. "Reasonable efforts" are limited to information gained from information readily-accessible to the public. Such methods may not identify Study Area geologic or geotechnical issues that are not listed in these sources. In the preparation of this report, the Bodhi Group has used the degree of care and skill ordinarily exercised by a reasonably prudent environmental professional in the same community and in the same time frame given the same or similar facts and circumstances. No other warranties are made to any third party, either expressed or implied.

This evaluation is not intended to replace or supplement geotechnical investigations that are required for design or construction of structures. Separate geotechnical investigations should be performed for the design and construction of the 7-Eleven convenience store project.

2. PROJECT LOCATION AND DESCRIPTION

The Study Area is approximately 1.14 acres and is located at the northeast corner of West Mission Avenue and Rock Springs Road in Escondido California. (Latitude 33.126892 degrees, Longitude -117.098107 degrees). The Study Area is currently occupied by a 5,300 square feet single story building and paved parking. Topographically, the Study Area level with elevations ranging from 653 feet to 647 feet from north to south relative to the North American Vertical Datum of 1988. Figure 1 depicts the location of the Study Area.

The planned project will include demolition of the existing 5300 square foot building and construction of a 4,088 square foot 7-Eleven Convenience Store and refueling station with a 4,284 square foot canopy. Underground tanks and utilities will also be constructed.

3. HISTORY

Review of in-house aerial photographs indicate that between 1953 and 1967, the Study Area was used for agriculture. Sometime before 1967 a structure was built in the Study Area that appears to be a single-family residence. Between 1967 and 1980, the Study Area was developed into its current configuration.

4. GEOLOGY

Escondido is located at the margin between the western (coastal) portion and central portion of the Peninsular Ranges Geomorphic Province of California. The Peninsular Ranges encompass an area that roughly extends from the Transverse Ranges and the Los Angeles Basin, south to the Mexican border, and beyond another approximately 800 miles to the tip of Baja California (Harden, 1998). The geomorphic province varies in width from approximately 30 to 100 miles, most of which is characterized by northwest-trending mountain ranges separated by subparallel fault zones. In general, the Peninsular Ranges are underlain by Jurassic-age metavolcanic and metasedimentary rocks and by Cretaceous-age igneous rocks of the southern California batholith. Geologic cover over the basement rocks in the westernmost portion of the province in San Diego County generally consists of Upper Cretaceous-, Tertiary-, and Quaternary-age sedimentary rocks. Figure 2, Regional Geologic Map, modified from Kennedy and Tan (2008), shows the regional geology.

Structurally, the Peninsular Ranges are traversed by several major active faults. The Elsinore, San Jacinto, and the San Andreas faults are major active fault systems located northeast of Escondido and the Rose Canyon, San Diego Trough, Coronado Bank and San Clemente faults are major active faults located west of Escondido. Major tectonic activity associated with these and other faults within this regional tectonic framework is generally right-lateral strike-slip movement. These faults, as well as other faults in the region, have the potential for generating strong ground motions in the Study Area. Figure 3, Regional Fault map shows the proximity of the Study Area to nearby mapped Quaternary faults.

4.1. Local Geology

The geologic units in the Study Area consists of fill and Older Alluvial Plain Deposits. Descriptions of the general characteristics of these units are presented below.

- Artificial fill – Fill associated with the existing development should be anticipated in the Study Area. The fills are likely relatively shallow and scattered. They were probably used to create drainage to street gutters, backfill of underground utility trenches and as pavement base. The fill is probably composed of reused underlying natural soil and sediments (silty and clayey fine sand) and import construction materials (gravel and pavement base course). Since no records of compaction were found during this Study, the fills should be considered compressible under new foundation or structural fill loads.
- Older Alluvial Plain Deposits – The Older Alluvial Plain Deposits typically consist of moderately consolidated, clayey and silty fine sand. These deposits typically range from 20 to 40 feet thick and overlie weathered crystalline rock. Readily available geotechnical reports in the nearby vicinity (Salem, 2015; Terracon, 2016) indicate that the upper portion of the deposits may be compressible and have recommended remedial grading to create a compacted fill mat beneath buildings and structural loads. Heavier structures may require deepened foundations. The Older Alluvial Plain deposits usually exhibit low to non-expansive potential but may be corrosive to steel and concrete. Where disturbed by demolition, the Older Alluvial Plain Deposits may require recompaction.

4.2. Local Structural Geology

The Older Alluvial Plain Deposits are relatively flat lying. There are no known active or potentially active faults within or projecting into the Study Area or nearby vicinity.

5. TECTONICS AND SEISMICITY

San Diego is affected by the boundary between the North American and Pacific tectonic plates. The boundary, in southern California is characterized by a wide zone of predominantly northwest-striking, right-slip faults that span the Imperial Valley and Peninsular Range to the offshore California Continental Borderland Province (from the California continental slope to the coast). The most active faults based on geodetic and seismic data are the San Andreas, San Jacinto, and Imperial faults. These faults take up most of the plate motion. Smaller faults, however, are active enough to create damaging earthquakes and these include the Elsinore, Newport-Inglewood-Rose Canyon, and the offshore Coronado Banks, San Diego Trough, and San Clemente fault zones (Figure 3).

5.1. Local and Regional Faults

Table 1 summarizes the local and regional fault characteristics for the active faults that will affect the Study area. A Quaternary fault is defined by the State of California (2007) as a fault that shows evidence of movement in the last 1.6 million years. Quaternary (Holocene and Pleistocene) faults can be classified as either active or potentially active faults. Active faults are those Quaternary Holocene faults which have been shown to have ruptured in the last 11,000 years. Potentially active faults are those Quaternary Pleistocene faults which have been shown to have ruptured during the 1.6 million years but not within the last 11,000 years. Potentially active faults have a much lower probability for future activity than active faults. Earthquakes on the faults summarized in Table 1 below will create ground shaking that can affect the study area.

Table 1 - Fault Characteristics for Active Faults in the Region

Fault Name	Approximate Distance to Study Area	Slip Rate (mm/yr)	Fault Length (miles)	Estimated Magnitude (Maximum Moment Magnitude (Mw))
Newport-Inglewood-Rose Canyon Fault Zone	15	1.5	130	7.2
Coronado Bank Fault Zone (offshore)	30	3.0	115	7.6
Elsinore Fault Zone	15	5.0	190	7.0
San Jacinto Fault Zone	40	4.0	152	6.8
Southern San Andreas Fault Zone	59	25	140	7.2

Table References USGS, 2009.

5.2. Historical Earthquakes

A majority of the historical earthquakes in excess of magnitude 5.0 closest to the Study Area have occurred on the San Jacinto fault east of Escondido. None of these earthquakes have caused any reported structural damage in the City of Escondido. There have been many smaller earthquakes on closer faults such as the Rose Canyon and Elsinore but have not resulted in any reported structural damage in the City of Escondido. An earthquake having a magnitude 6 or larger is possible on the active faults within 50 miles of the Study Area.

6. LANDSLIDES AND SLOPE STABILITY

The Study Area is relatively flat. Landslides and slope stability will not affect the Study Area.

7. SOILS AND INFILTRATION

The soils at the site are a mix of silty fine sand, sandy silt and sandy clay (City of Escondido, 2012) which suggest a moderate to slow infiltration rate. Shallow groundwater may affect storm water recharge systems. Other factors should be considered in evaluating storm water infiltration feasibility including lateral migration of water and groundwater mounding.

8. HYDROGEOLOGY

Groundwater data for the Study Area is based on nearby geotechnical reports (Salem, 2015; Terracon, 2016, and Atkins, 2012) which indicate the groundwater table is fairly consistent below the Escondido Valley at about 10 to 15 feet below existing ground. Groundwater elevations will vary with seasonal rainfall.

9. DRAINAGE AND FLOODING

The site is not within a flood plain (SANDAG, 2019).

10. GEOLOGIC HAZARDS AND IMPACTS

This section identifies geologic hazards that may affect proposed development of the Study Area. These hazards include earthquake shaking ground motion; liquefaction; seismically induced settlement; and subsidence. These hazards can be mitigated through engineering improvements (e.g., ground improvement, ground restraints, or appropriate structure foundation). Site-specific geotechnical investigations should be performed to evaluate the appropriate mitigation measure or combination of measures.

10.1. Seismicity and Ground Motion

An active fault is defined by the State Mining and Geology Board as one that has experienced surface displacement within the Holocene epoch, i.e., during the last 11,000 years (California Geological Survey, 2007). The Study Area is subject to potential ground shaking caused by activity along faults located near the Study Area.

Ground shaking during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and the type of geologic material underlying the area. The composition of underlying soils, even those relatively distant from faults, can intensify ground shaking. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as fill or unconsolidated alluvium.

As noted, the Study Area is subject to ground shaking hazards caused by earthquakes on regional active faults. Based on a Probabilistic Seismic Hazards Ground Motion Interpolator provided by the American Society of Civil Engineers (2018), the Study Area (Longitude -117.098107 Latitude 33.126892) is located in a zone where the horizontal peak ground acceleration having a 10 percent probability of exceedance in 50 years is about 0.5 g (where g represents the acceleration of gravity).

10.2. Ground Rupture

There are no known active or potentially active faults beneath or projecting into the Study Area. There are no Alquist-Priolo Special Studies Zones on or projecting toward the Study Area.

10.3. Liquefaction, Seismically Induced Settlement

Liquefaction is a phenomenon where the strength and stiffness of a soil is reduced by earthquake or other rapid loading. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables, and buildings with shallow foundations. Research and historical data indicate that loose granular soils and non-plastic silts that are saturated by a relatively shallow groundwater table are susceptible to liquefaction. For these reasons, there is a low potential for liquefaction at the Study Area.

Among the potential hazards related to liquefaction are seismically induced settlement. Seismically induced settlement is caused by the reduction of shear strength due to loss of grain-to-grain contact during liquefaction and may result in dynamic settlement on the order of several inches to several feet. Other factors such as earthquake magnitude, distance from the earthquake epicenter, thickness of the liquefiable layers, and the fines content and particle sizes of the liquefiable layers will also affect the amount of settlement. Geotechnical investigations in the nearby vicinity (Salem, 2015, Terracon, 2016) have found

that seismically induced differential settlement of ½ inch can be expected in soils similar to the materials underlying the Study Area.

10.4. Tsunamis, Seiches, and Dam Failure

A tsunami is a sea wave generated by a submarine earthquake, landslide, or volcanic action. The Study Area's elevation is too high to be affected by a tsunami. A seiche is a seismic wave in an enclosed body of water such as a lake or bay. There are no enclosed bodies of water near the Study Area that produce a seiche that could affect the Study Area.

An earthquake-induced dam failure can result in a severe flood event. Based on review of the 2010 San Diego County Multi-Jurisdictional Hazard Mitigation Plan Dam Failure map, the Study Area is outside dam inundation zones.

10.5. Subsidence

Subsidence typically occurs when extraction of fluids (water or oil) cause the reservoir rock to consolidate. Water extraction is minimal in the Study Area and the geologic materials area well consolidated. Subsidence is not a hazard in the Study Area.

Settlement of unconsolidated soil (fill or alluvial/estuarine sediments) may occur locally where new loads are imposed on previously uncompacted fill or unconsolidated alluvium.

10.6. Infiltration

The soil under the Study Area will likely exhibit moderate to low infiltration rates. Onsite storm water infiltration facilities will need to account for shallow groundwater during design (approximately 10 feet below the existing ground surface).

10.7. Expansive or Corrosive Soils

The soil in the Study Area is expected to have a low expansion potential. Low to moderate corrosion potential was experienced on nearby sites with similar soil conditions (Salem, 2015, Terracon, 2016).

11. IMPACT MITIGATION

The impacts summarized above may be mitigated through engineering improvements (e.g., ground improvement, ground restraints, remedial grading or foundation design). Site specific geotechnical investigations are required to recommend the appropriate mitigation measure(s).

11.1. Seismicity and Ground Motion

The entire Study Area will be affected by seismicity and ground motion. Mitigation can be accomplished by geotechnical and structural engineering design. Geotechnical investigations should be conducted in accordance with local guidelines and State of California requirements. Most mitigation measures will involve foundation design and/or ground improvement.

11.2. Liquefaction, Seismically Induced Settlement

The Study Area may be susceptible to seismically induced settlement or post liquefaction settlement and should be considered during design of structures. Mitigation can be accomplished by ground improvement and or foundation design. Geotechnical investigations should be conducted in accordance with local guidelines and State of California requirements.

11.3. Subsidence

Construction of improvements in areas underlain by alluvium or fill should be designed to withstand settlement of unconsolidated soil. Geotechnical investigations for design of settlement resistant structures should be conducted in accordance with local guidelines and State of California requirements. Mitigation measures typically include ground improvement and/or foundation design.

11.4. Corrosive Soil

Corrosive soil should be evaluated by a Corrosion Engineer for recommendations for soil replacement or cathodic protection.

11.5. Infiltration

Infiltration potential should be evaluated in accordance with County of San Diego Best Management Manual, (County of San Diego, 2019).

12. THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the CEQA Guidelines, the project will have significant effect on the environment if:

G-1: Expose people to potential substantial adverse effects, including the risk of loss, injury or death involving: a) fault rupture, b) seismic shaking, c) seismic ground failure, d) landsliding.

G-2: Result in substantial soil erosion or loss of top soil.

G-3: Be located in a geologic unit or soil that is unstable (landsliding, settlement, lateral spreading) or that would become unstable as a result of the project.

G-4: Be located on expansive soil causing substantial risk to life or property.

G-5: Having soils incapable of supporting the use of septic tanks where sewers are not available.

12.1. Threshold G-1 a) Fault Rupture

No significant effect. There are no known active or potentially active faults beneath or projecting into the Study Area.

12.2. Threshold G-1 b) Strong Seismic Ground Shaking

Less than significant effect. Construction of the structures, parking lots and underground utilities will be required to use seismic resistant designs in accordance with California and City standards and codes.

12.3. Threshold G-1 c) Seismic Ground Failure

Less than significant effect. Construction of structures, parking lots and underground utilities will be required to use seismic resistant designs in accordance with California and City standards and codes.

12.4. Threshold G-1 d) Seismic Induced Landsliding

Less than significant effect. The Study Area is flat and no slopes are planned.

12.5. Threshold G-2 Substantial Soil Erosion and Loss of Topsoil

Less than significant effect. The Study Area is covered in hardscape (pavement and buildings). The proposed development will not alter the hardscape coverage. No soil will be exposed to erosion. Since construction will be required to follow City and County standards and code that stipulate protection against temporary and permanent erosion, the impact of erosion and loss of topsoil is less than significant.

12.6. Threshold G-3 Unstable Soil (Landslide, Settlement, Lateral Spreading)

Landslide: Less than Significant. Landslide prone geologic formations and tall, steep slopes are not present in the Study Area.

Settlement: Less than Significant. Construction of structures and other settlement prone improvements will need to use designs resistant to passive and post liquefaction differential settlements in accordance with City of Escondido and County of San Diego as well as State of California standards and codes.

12.7. Threshold G-4 Expansive Soil

Less than Significant. Expansive soils are generally not present in the Study Area.

12.8. Threshold G-5 Soil Unsuitable for Onsite Sewage Disposal Systems

Less than Significant. Shallow groundwater and poor infiltration characteristics may preclude the use of onsite storm water systems in the Study Area. Alternatives include bioretention systems for storm water disposal. Underground sewer systems are available for sewage disposal.

13. CONCLUSIONS

The conclusions from this Study are listed below.

- There are no geologic hazards that cannot be avoided or addressed.
- The proposed land uses are compatible with the known geologic hazards.

14. LIMITATIONS

This report was prepared in general accordance with current guidelines and the standard-of-care exercised by professionals preparing similar documents near the Study Area. No warranty, expressed or implied, is made regarding the professional opinions presented in this document. As this report represents a review of existing documentation on geotechnical conditions of the planning areas rather than in-depth on-site investigation, it cannot account for variations in individual site conditions or changes to existing conditions. Please also note that this document did not include an evaluation of environmental hazards.

The conclusions, opinions, and recommendations as presented in this document, are based on a desktop analysis of data, some of which were obtained by others. It is our opinion that the data, as a whole, support the conclusions and recommendations presented in the report.

The purpose of this study was to evaluate geologic and geotechnical conditions within the planning areas to assist in the preparation of environmental impact documents for the project. Comprehensive geotechnical evaluations, including subsurface exploration and laboratory testing, should be performed prior to design and construction of structural improvements. Any future projects on individual sites in the planning areas will require site-specific geotechnical studies as required by State and City regulations.

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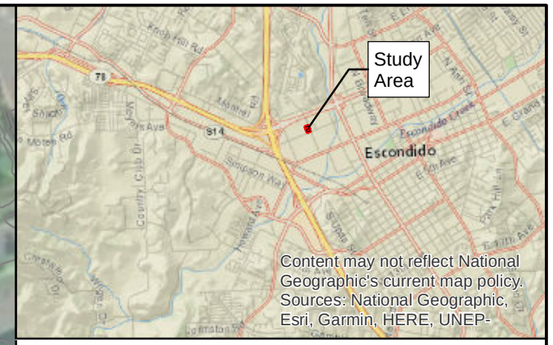
FIGURES



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

Topographical Elevation Contours in NAVD88 feet

Study Area

N

0 50 100 Feet

1 inch = 100 feet

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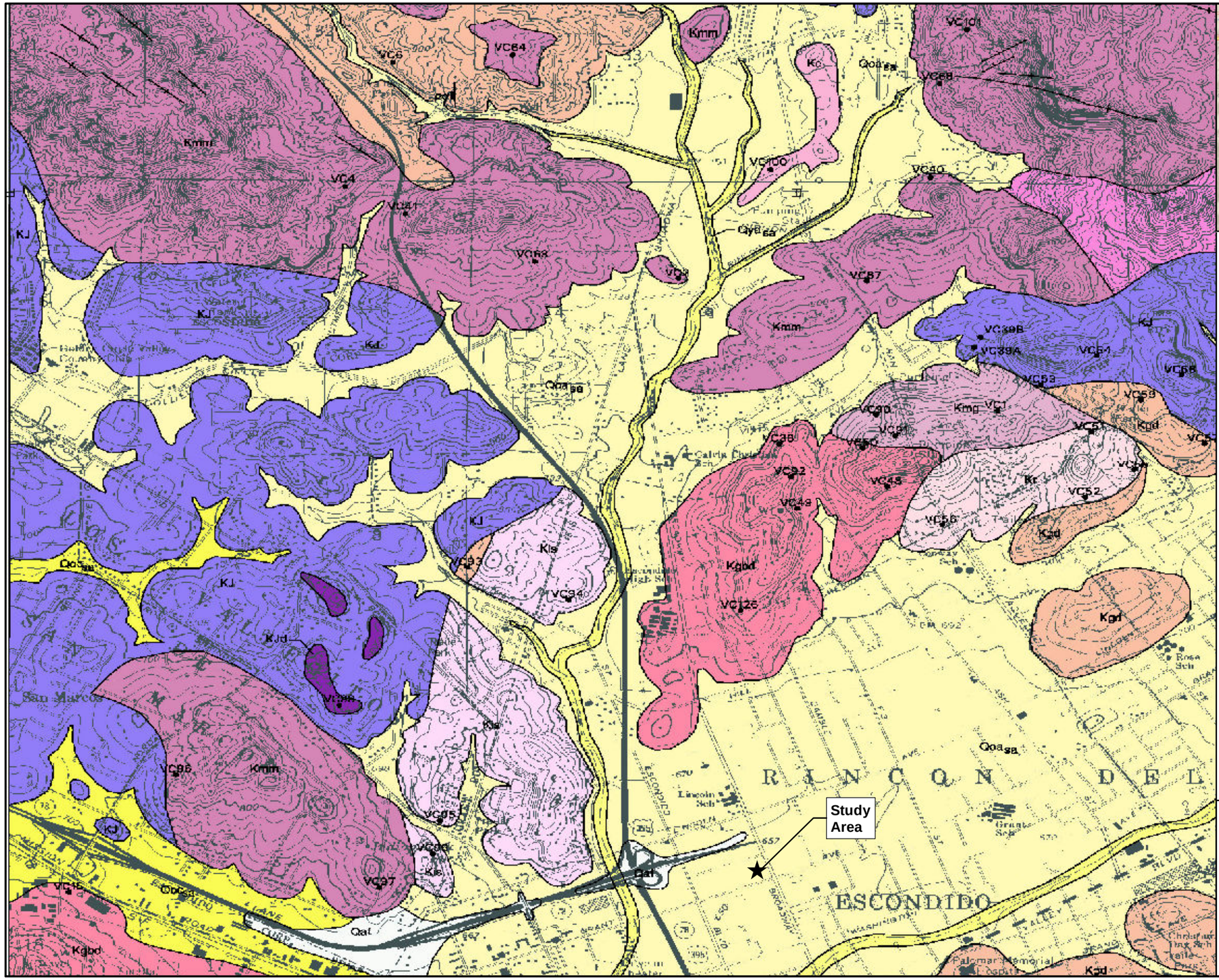
Site Location and Vicinity Map
7-Eleven Convenience Store
West Mission Avenue and
Rock Springs Road
Escondido, California

FIGURE 1

DATE: 09/2019



DESCRIPTION OF MAP UNITS

MODERN SURFICIAL DEPOSITS -- Sediment recently deposited in washes and artificial fills.

- Qaf — Artificial fill (late Holocene) - Sand, gravel, and boulders used for "man made" fills.

YOUNG SURFICIAL DEPOSITS -- Sedimentary units that are slightly consolidated to unconsolidated and slightly to moderately dissected.

- Qya — Young alluvial flood plain deposits (Holocene and late Pleistocene) - Mostly unconsolidated, poorly sorted, permeable flood plain sediment.
- Qyc — Young colluvial deposits (Holocene and late Pleistocene) - Mostly poorly consolidated and poorly sorted slope wash and stream deposits.
- Qls — Landslide deposits (Holocene to Pleistocene).

OLD SURFICIAL DEPOSITS -- Sedimentary units that are moderately consolidated and slightly to moderately well dissected. Older surficial deposits have upper surfaces that are capped by moderately to well-developed soils.

- Qoa — Older alluvial flood plain deposits (Pleistocene, younger than 500,000 years) - Mostly moderately well consolidated, poorly sorted, permeable flood plain deposits.
- Qoc — Older colluvial deposits (Pleistocene, younger than 500,000 years) - Mostly moderately well consolidated, poorly sorted slope wash and stream deposits.
- Qof — Older fan deposits (Pleistocene, younger than 500,000 years) - Mostly poorly consolidated fan, debris flow, and talus deposits.

BEDROCK UNITS

- Kmm — Granodiorite of Burnt Mountain (Cretaceous) - Leucocratic biotite granodiorite; very fine grained, massive.
- Kmm — Monzogranite of Morrison Mountain (Cretaceous) - Leucocratic hornblende-biotite monzogranite; medium to coarse grained, massive.
- Kqr — Quartz diorite of Mountain Meadows (Cretaceous) - Hornblende quartz diorite; medium grained, dark gray.
- Kdl — Granite of Dixon Lake (Cretaceous) - Leucocratic biotite granite, very fine grained, sub-porphyritic.
- Kr — Granodiorite of Rimrock (Cretaceous) - Biotite granodiorite; fine grained, sub-porphyritic.
- Kbp — Granite of Bottle Peak (Cretaceous) - Leucocratic, hornblende-biotite granite, coarse grained.
- Kvm — Quartz bearing diorite of Red Mountain (Cretaceous) - Biotite-hornblende diorite; coarse grained, dary gray, massive.
- Kve — Monzogranite of Valley Center (Cretaceous) - Leucocratic biotite monzogranite; coarse grained, massive.
- Kis — Granite of Indian Springs (Cretaceous) - Biotite granite fine grained granite similar in appearance to Kdl.
- Kqg — Tonalite of Cole Grade (Cretaceous) - Hornblende-biotite-tonalite, coarse grained, massive.
- Kg — Granite undivided (Cretaceous) - Mostly biotite granite, coarse to medium grained, massive.
- Kgd — Granodiorite undivided (Cretaceous) - Mostly hornblende-biotite granodiorite, coarse to medium grained.
- Kmg — Monzogranite undivided (Cretaceous) - Mostly biotite-hornblende monzogranite, coarse grained.
- Kqbd — Quartz bearing diorite undivided (Cretaceous) - Mostly biotite-hornblende, quartz bearing diorite, medium grained, dark gray, massive.
- Kd — Diorite undivided (Cretaceous) - Mostly hornblende diorite, medium to coarse grained, dark gray, massive.
- Kt — Tonalite undivided (Cretaceous) - Mostly hornblende-biotite tonalite; coarse grained, light gray.
- Kgb — Gabbro undivided (Cretaceous) - Mostly biotite-hornblende-hypersthene gabbro; coarse grained, dark gray, massive.
- KJ — Metavolcanic and metasedimentary rocks undivided (Cretaceous and Jurassic) - low grade (greenschist facies) rocks that are in part coeval with and in part older than the Cretaceous plutonic rocks they lie in contact with.
- Kvg — Metagranitic rocks (Cretaceous and Jurassic) - mostly gneiss; very light gray to white, massive.
- Kvd — Metavolcanic dikes undivided (Cretaceous and Jurassic) - dikes that cut KJ, very fine grained, dark gray, massive.

N

0 1,000 2,000 Feet

THE BODHI GROUP
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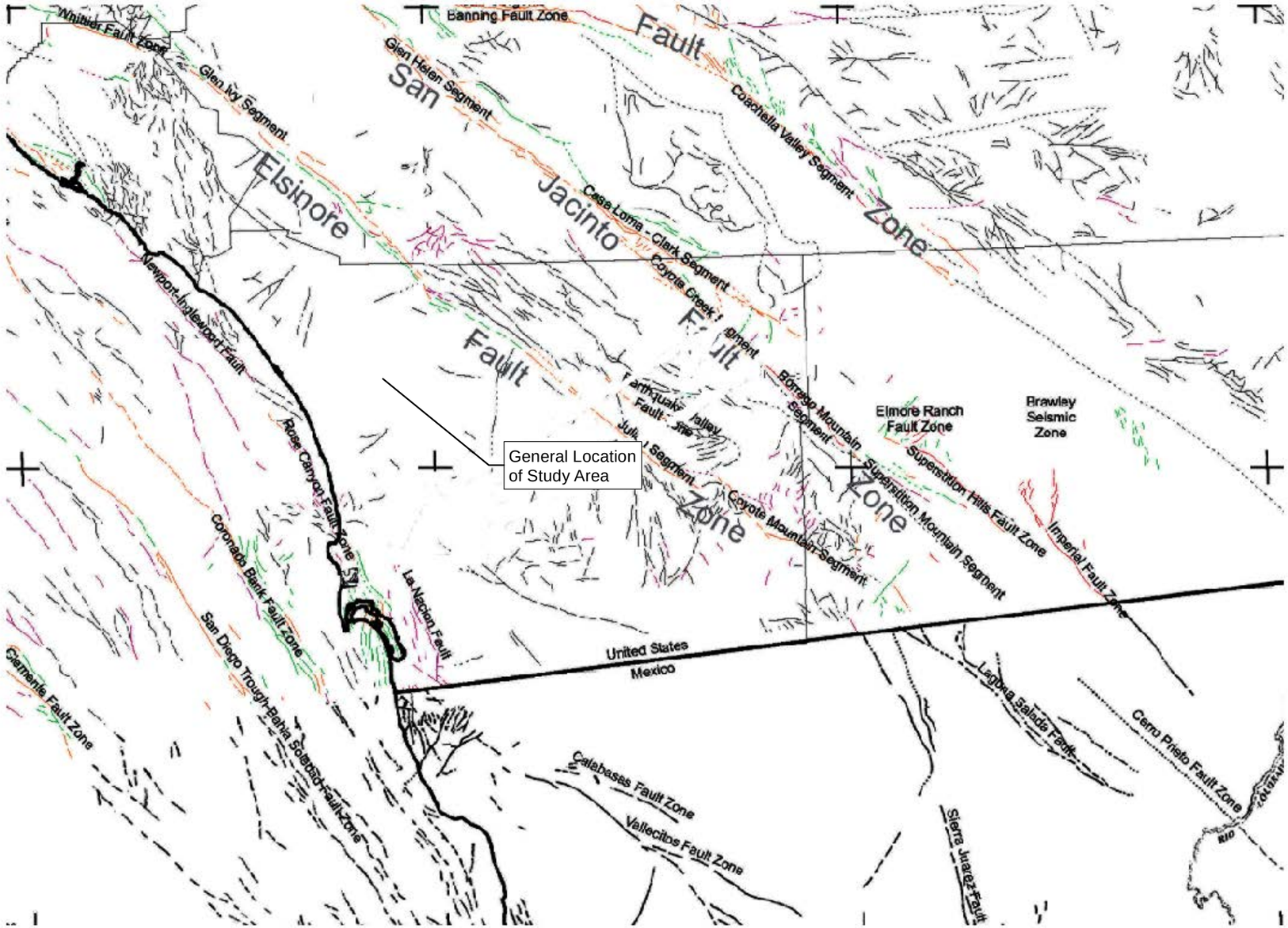
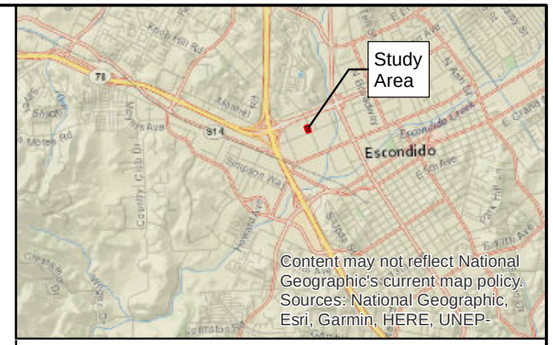
Regional Geology
7-Eleven Convenience Store
West Mission Avenue and
Rock Springs Road
Escondido, California

FIGURE 2

DATE: 09/2019





NOTATIONS

Holocene fault displacement (during past 10,000 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults that displace rocks of undifferentiated Plio-Pleistocene age. See Bulletin 201, Appendix D for source data.

Late Cenozoic faults within the Sierra Nevada including, but not restricted to, the Foothills fault system. Faults show stratigraphic and/or geomorphic evidence for displacement of late Miocene and Pliocene deposits. By analogy, late Cenozoic faults in this system that have been investigated in detail may have been active in Quaternary time (Data from PG&E, 1993.)

Pre-Quaternary fault (older than 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissance nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

N

Not To Scale

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Regional Fault Map
7-Eleven Convenience Store
West Mission Avenue and
Rock Springs Road
Escondido, California

FIGURE 3

DATE: 09/2019