**CITY OF SANTEE**
Planning & Building Department

# 8355 Graves Avenue RV and Self-Storage Project

## Class 32 CEQA Exemption Analysis

**September 2024**

# I. PROJECT CHARACTERISTICS

## 1. Project Title:

8355 Graves Avenue RV and Self-Storage Project (project)

## 2. Lead Agency Name and Address:

City of Santee
Planning & Building Department
10601 Magnolia Avenue
Santee, CA 92071

## 3. Contact Person and Phone Number:

Michael Coyne
Principal Planner
(619) 238-6417
10601 Magnolia Avenue
Santee, CA 92071
mcoyne@cityofsanteeca.gov

## 4. Project Location:

8355 Graves Avenue, Santee CA
Assessor's Parcel Numbers (APNs): 387-061-11 and -12

## 5. Project Sponsor's Name and Address:

Chris Cook, Vice President
Cameron Brothers Company, LLC
10580 Prospect Avenue, Suite 200
Santee, CA 92071

## 6. Property Owner:

Cameron Brothers Company, LLC
10580 Prospect Avenue, Suite 200
Santee, CA 92071

## 7. Existing General Plan Designation:

General Commercial (GC)

## 8. Existing Zoning:

General Commercial (GC)

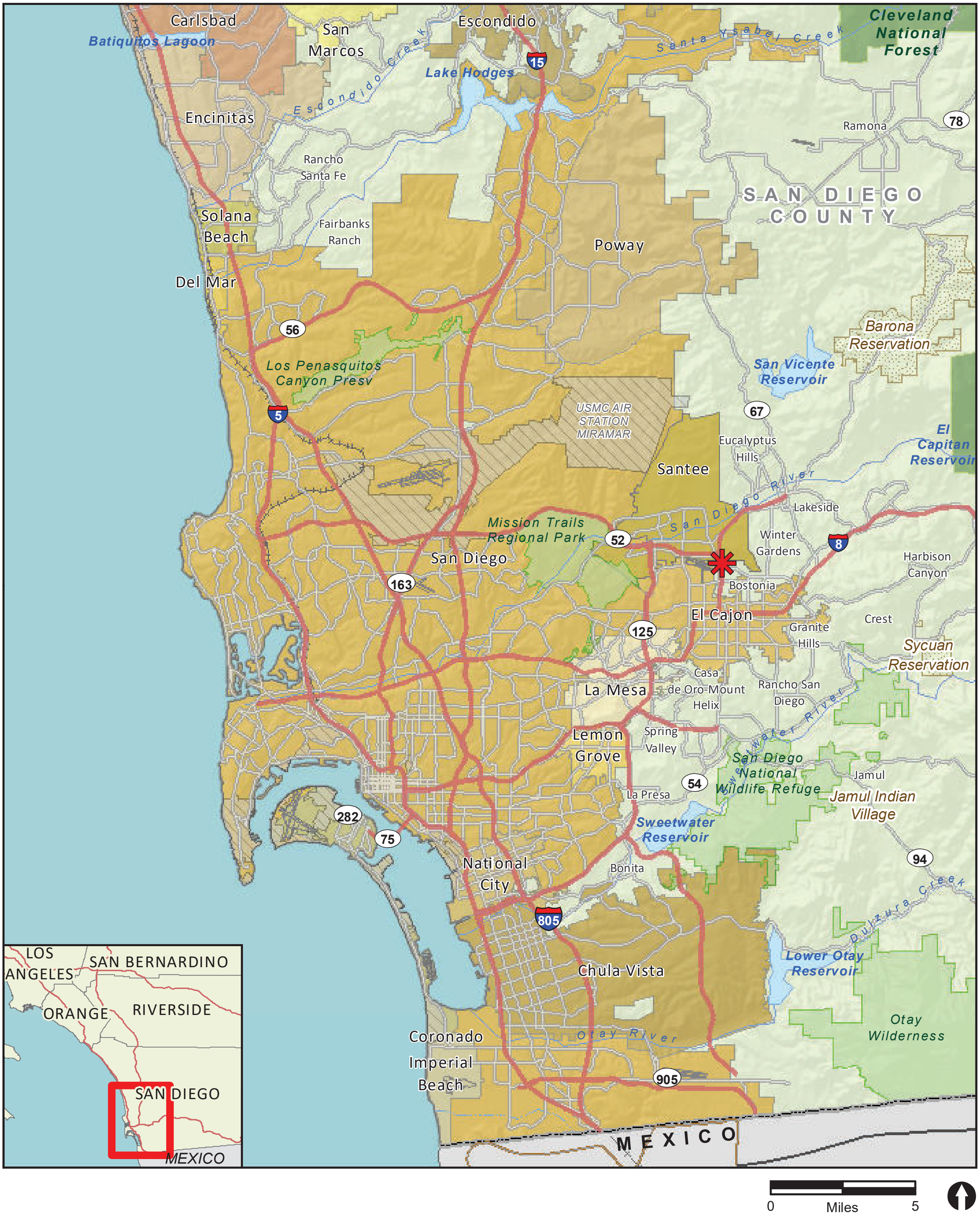
# II. EXECUTIVE SUMMARY

The project applicant, Cameron Brothers Company, LLC, has submitted an application (PA2023-3) to construct a recreational vehicle (RV) and self-storage facility on a 4.85-acre project site located at 8355 Graves Avenue (Assessor's Parcel Number 387-061-11 and -12). The project would be constructed in two phases. Phase 1 would construct a 178-space RV storage facility with associated parking, landscaping, and retention areas. Phase 2 would remove 97 of the RV parking spaces to construct two self-storage buildings totaling 136,600 square feet. Building A would be a 90,600-square-foot three-story building, and Building B would be a 46,000-square-foot two-story building.

The California Environmental Quality Act (CEQA) Analysis provided herein evaluates the consistency of the project with the exemption requirements for a Class 32 Categorical Exemption for infill development projects as set forth in CEQA Guidelines Section 15332. Based on the information and conclusions set forth on the following pages, this CEQA Analysis demonstrates the project's consistency with the requirements for a Class 32 Categorical Exemption. No additional environmental documentation or analysis is required. Figure 1 shows the project's regional location, Figure 2 shows the project location on an aerial photograph, Figure 3 shows the Phase 1 site plan, and Figure 4 shows the Phase 2 site plan. Table 1 summarizes the characteristics of the project.

**Table 1**
**Project Development Summary**

| Description | Amount |
|---|---|
| Total Lot Area | 211,072 square feet (4.85 acres) |
| Lot Coverage | 211,072 square feet (100 percent) |
| Total Floor Area | 136,600 square feet (Floor Area Ratio: 0.64) |
| Landscape Area | 27,395 square feet |
| Building Height | 36 feet to top of roof |
| Number of Parking Spaces | 4 vehicle parking spaces |




Project Location

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FIGURE 1
Regional Location

Image Source: NearMap (flown June 2023)


Project Boundary

FIGURE 2
Project Location on Aerial Photograph

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Map Source: Omega Engineering Consultants

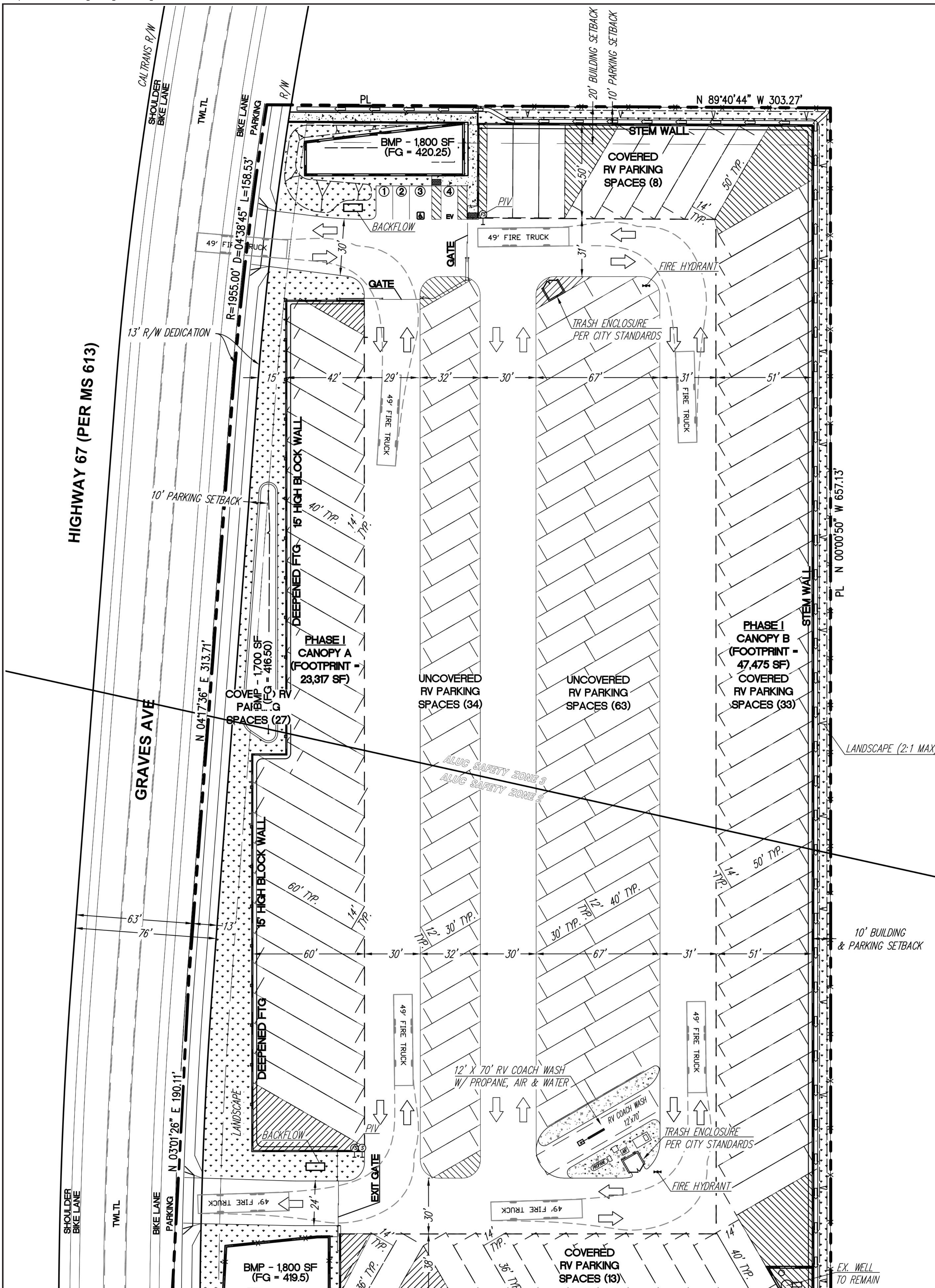


FIGURE 3
Phase 1 Site Plan

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Map Source: Omega Engineering Consultants

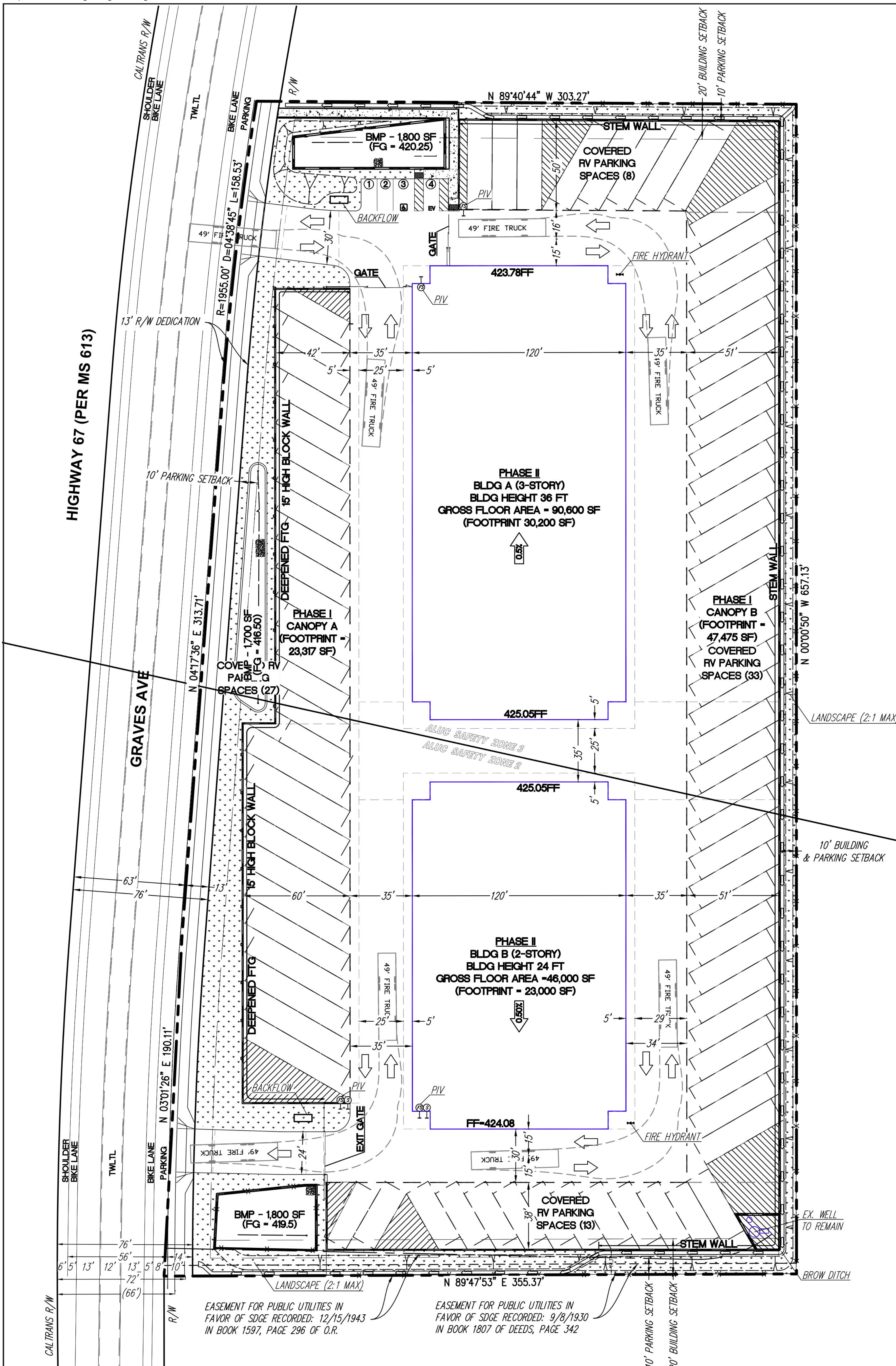


FIGURE 4
Phase 2 Site Plan

# III. PROJECT DESCRIPTION

## Proposed Project

The project would be constructed in two phases. Phase 1 would construct a 178-space RV storage facility with associated parking, landscaping, and retention areas. Phase 2 would remove 97 of the RV parking spaces to construct two self-storage buildings totaling 136,600 square feet. Building A would be a 90,600-square-foot three-story building, and Building B would be a 46,000-square-foot two-story building.

In order to meet the parking standards associated with the future storage use (Phase 2) the project proposes four parking spaces that would not be used for RV parking storage, and room along the drive aisles for parallel parking stalls. Access to the project site would be via two locations: a 24-foot-wide one-lane driveway and a 30-foot-wide two-lane driveway from Graves Avenue.

## Project Location

The project site is located at 8355 Graves Avenue (APNs 387-061-11 and -12) on a 4.85-acre project site in the city of Santee, California. The project site would contain two access points along Graves Avenue. Major roadways which lead to Graves Avenue include Magnolia Avenue and Prospect Avenue.

## Existing Conditions and Surrounding Land Uses

The 4.85-acre project site is currently vacant and undeveloped. Previously, the project site contained a single house which was demolished in August 2018. The project site is surrounded by single family residential uses to the east, multi-family residential uses to the north and south, and Graves Avenue and State Route 67 (SR-67) to the west.

## General Plan and Zoning

The project site's General Plan designation is general commercial. The general commercial designation provides for commercial areas with a wide range of retail and service activities. Intended uses include community shopping center, department stores, restaurants, financial institutions, automotive uses and other specialized services. This designation encourages the grouping of commercial outlets into consolidated centers. Appropriate areas to be established with general commercial activities should have direct access to major roads, prime arterials or freeways. The proposed RV storage and self-storage uses would be consistent with the general commercial designation.

The project site's zoning designation is general commercial. This general commercial zone is intended for general commercial activities and services of more intensive nature. These uses would be located primarily along major transportation routes and would include major shopping facilities, major service-oriented uses, and major financial and corporate headquarters which are designed to serve the city of Santee or the region as a whole. The proposed self-storage use is permitted within the general commercial zone and the proposed RV storage is permitted with approval of a conditional use permit (CUP).

## Project Construction

The project would be constructed over approximately 15 months. Grading would consist of importing 4,450 cubic yards. No export is proposed as part of the project.

## Standard Project Conditions

The following Standard Project Conditions would be required for the project. These measures would be incorporated as Conditions of Approval for the entitlement of the CUP and are typical for projects built on vacant land within the city of Santee. Such measures used to comply with building codes or to address common and typical concerns for new projects do not preclude CEQA exemptions (Berkeley Hillside Preservation v. City of Berkeley (2015) 241 Cal.App.4th 943, 960-961). The following measures are standard project conditions that are consistent with those required for similar development projects entitled in the past by the City of Santee (City):

### Standard Project Condition No. 1 – Nesting Birds:

The following standard biological resource measures shall be implemented with the project:

1. If construction initiation occurs between January 15 and September 15, a pre-construction nesting bird and raptor survey of the project impact area shall be completed by a qualified biologist prior to vegetation removal. The pre-construction survey shall be conducted within 10 calendar days prior to the start of construction activities (including removal of vegetation). If any active nests are detected, the area will be flagged and mapped along with a buffer as recommended by the qualified biologist. The buffer area(s) established by the qualified biologist will be avoided until the nesting cycle is complete or it is determined that the nest is no longer active. The qualified biologist shall be a person familiar with bird breeding behavior and capable of identifying the bird species of San Diego County by sight and sound and determining alterations of behavior as a result of human interaction. Buffers will be based on species-appropriate buffers and/or local topography and line of sight, species behavior and tolerance to disturbance, and existing disturbance levels, as determined appropriate by the qualified biologist.

### Standard Project Condition No. 2 – Air Quality:

The following standard air quality measures shall be implemented with the project:

1. The construction contractor shall use construction equipment powered by California Air Resources Board certified Tier 4, or newer, engines and haul trucks that conform to current U.S. Environmental Protection Agency truck standards.

2. During all grading and site preparation activities, the on-site construction superintendent shall ensure implementation of standard best management practices as required by the San Diego Air pollution Control District Rule 55, Fugitive Dust Control.

3. During all grading and site preparation activities, the on-site construction superintendent shall ensure implementation of applicable California Department of Resources Recycling and Recovery Sustainable (Green) Building Program Measures.

4. The project shall utilize high-efficiency equipment and fixtures consistent with the current California Green Building Standards Code and Title 24 of the California Code of Regulations.

5. The project shall include the installation of infrastructure necessary for electric vehicle parking, as well as providing preferential parking for electric vehicles. The project shall provide bike parking on-site.

6. The project shall comply with the Santee Water Efficient Landscape Ordinance. The ordinance promotes water conservation and efficiency by imposing various requirements related to evapotranspiration rates, irrigation efficiency, and plant factors.

7. The project shall comply with Chapters 9.02 and 9.04 of the Santee Municipal Code that pertain to solid waste management and demolition and construction debris recycling.

8. In conformance with San Diego Air Pollution Control District's Rule 67.0.1, Architectural Coatings, the project shall use low volatile organic compound paints.

**Standard Project Condition No. 3 – Geology/Soils:**

The following standard geology/soils measures shall be implemented with the project:

1. The construction contractor shall ensure that construction of the project complies with the recommendations identified in the project-specific geotechnical investigation. Recommendations related to general construction, seismic considerations, earthwork, foundations, building floor slabs, lateral earth pressures, corrosivity, drainage, storm infiltrations, exterior concrete and masonry flatwork and paved areas shall be adhered to during all project design and construction.

**Standard Project Condition No. 4 – Noise:**

The following standard noise measures shall be implemented with the project:

<u>Construction Best Business Practices:</u>

1. All construction plans shall include the following notes:
   a. Operations shall conform to the City's Municipal Code Section 5.04.090.
   b. All equipment shall be equipped with properly maintained mufflers.
   c. The construction contractor shall place noise-generating construction equipment and locate construction staging areas at the greatest possible distance from sensitive uses whenever feasible during all project construction.
   d. The construction contractor shall use on-site electrical sources to power equipment rather than diesel generators where feasible.

2. All residential units located within 500 feet of the construction site shall be sent a notice regarding the construction schedule. A sign legible at a distance of 50 feet shall also be posted at the construction site. All notices and the signs shall indicate the dates and durations of construction activities, as well as provide a telephone number for the "noise disturbance coordinator."

3. A “noise disturbance coordinator” shall be established. The disturbance coordinator shall be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler) and shall be required to implement reasonable measures to reduce noise levels.

4. The following shall be incorporated into the project construction plan: “Control of Construction Hours. Construction activities occurring as part of the project shall be subject to the limitations and requirements of Section 5.04.090 of the City Municipal Code which states that construction activities may occur between 7:00 a.m. and 7:00 p.m. Mondays through Saturdays. No construction activities shall be permitted outside of these hours or on Sundays and holidays.”

**Standard Project Condition No. 5 – Tribal/Archaeological Monitor:**

The following standard tribal/archaeological measures shall be implemented with the project:

1. Prior to the start of ground-disturbing activities, the applicant shall retain a qualified archaeologist who meets the Secretary of the Interior’s Professional Qualifications Standards for archaeology (U.S. Department of the Interior 2012). The applicant shall also retain a Native American monitor of Kumeyaay decent.

2. Prior to start of ground-disturbing activities, the qualified archaeologist shall conduct cultural resources sensitivity training for all construction personnel. Construction personnel shall be informed of the types of archaeological resources that may be encountered, and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources or human remains. The applicant shall ensure that construction personnel attend the training and sign an attendance acknowledgement form. The applicant shall retain documentation demonstrating attendance.

3. The qualified archaeologist, or an archaeological monitor (working under the direct supervision of the qualified archaeologist), shall observe all initial ground-disturbing activities, including but not limited to brush clearance, vegetation removal, grubbing, grading, and excavation. The qualified archaeologist, in coordination with the applicant and the City, may reduce or discontinue monitoring if it is determined by the qualified archaeologist that the possibility of encountering buried archaeological deposits is low based on observations of soil stratigraphy or other factors. Archaeological monitoring shall be conducted by an archaeologist familiar with the types of archaeological resources that could be encountered within the project site. The archaeological monitor shall be empowered to halt or redirect ground-disturbing activities away from the vicinity of a discovery until the qualified archaeologist has evaluated the discovery and determined appropriate treatment (as prescribed below). The archaeological monitor shall keep daily logs detailing the types of activities and soils observed, and any discoveries. After monitoring has been completed, the qualified archaeologist shall prepare a monitoring report that details the results of monitoring. The report shall be submitted to the City and any Native American groups who request a copy. A copy of the final report shall be filed at the South Coastal Information Center.

4. The Native American monitor shall be present for any pre-construction meeting and for all ground-disturbing activities associated with the project. Should any cultural or tribal

cultural resources be discovered, no further grading shall occur in the area of the discovery until the City Planner, or designee, with concurrence from the Native American monitor, are satisfied that treatment of the resource has occurred. In the event that a unique archaeological resource or tribal cultural resource is discovered, and in accordance with Public Resources Code Section 21083.2(b)(1), (2), and (4), the resource shall be moved and buried in an open space area identified by the Native American monitor, which will not be subject to further grading activity, erosion, flooding, or any other ground disturbance that has the potential to expose the resource. No identification of the resource shall be made; however, the applicant shall plot the new location of the resource on a map showing latitudinal and longitudinal coordinates and provide that map to the Native American Heritage Commission (NAHC) for inclusion in the Sacred Lands File. Disposition of the resources shall be at the discretion of the City of Santee, but in accordance with the foregoing.

5. In the event of the unanticipated discovery of archaeological materials, all work shall immediately cease in the area (within 100 feet) of the discovery until it can be evaluated by the qualified archaeologist in consultation with the Native American monitor. Construction shall not resume until the qualified archaeologist has conferred with the applicant and the City on the significance of the resource.

6. If it is determined that the discovered archaeological resource constitutes a historical resource or a unique archaeological resource under CEQA, avoidance and preservation in place is the preferred manner of mitigation. Preservation in place may be accomplished by, but is not limited to, avoidance, incorporating the resource into open space, capping, or deeding the site into a permanent conservation easement. In the event that preservation in place is demonstrated to be infeasible and data recovery through excavation is the only feasible mitigation available, a Cultural Resources Treatment Plan shall be prepared and implemented by the qualified archaeologist in consultation with the applicant and the City that provides for the adequate recovery of the scientifically consequential information contained in the archaeological resource. The qualified archaeologist and the City shall consult with appropriate Native American representatives in determining treatment for prehistoric or Native American resources to ensure cultural values ascribed to the resources, beyond those which are scientifically important, are considered.

7. If human remains are encountered, all work shall halt in the vicinity (within 100 feet) of the discovery and the San Diego County Coroner will be contacted in accordance with Public Resources Code (PRC) Section 5097.98 and Health and Safety Code Section 7050.5. The applicant and the City will also be notified. If the County Coroner determines that the remains are Native American, the NAHC will be notified in accordance with Health and Safety Code Section 7050.5, subdivision (c), and PRC Section 5097.98 (as amended by Assembly Bill 2641). The NAHC will designate a Most Likely Descendant (MLD) for the remains per PRC Section 5097.98. The MLD shall complete the inspection of the site within 48 hours of being granted access and shall provide recommendations for the treatment of the remains. Until the landowner has conferred with the MLD, the applicant will ensure that the immediate vicinity where the discovery occurred is not disturbed by further activity, is adequately protected according to generally accepted cultural or archaeological standards or practices.

# IV. CLASS 32 CATEGORICAL EXEMPTION ANALYSIS

The following analysis provides substantial evidence to support a conclusion that the project qualifies for an exemption under CEQA Guidelines Section 15332 as a Class 32 urban infill development, and would not have a significant effect on the environment.

**Class 32 Categorical Exemption:** Class 32 consists of projects characterized as in-fill development meeting the conditions described below:

(a) The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations.

(b) The proposed development occurs within city limits on a project site of no more than five acres substantially surrounded by urban uses.

(c) The project site has no value as habitat for endangered, rare or threatened species.

(d) Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality.

(e) The site can be adequately served by all required utilities and public services.

**Criterion Section 15332(a): General Plan and Zoning Consistency**

| Yes | No | |
|---|---|---|
| ☒ | ☐ | The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations. |

**General Plan**

The project site's General Plan designation is general commercial. The general commercial designation provides for commercial areas with a wide range of retail and service activities. Intended uses include community shopping centers, department stores, restaurants, financial institutions, automotive uses and other specialized services. Appropriate areas to be established with general commercial activities should have direct access to major roads, prime arterials or freeways. The proposed RV storage and self-storage uses would be consistent with the general commercial designation.

**Zoning**

The Zoning Classification of the project site is general commercial. The general commercial zone is intended for general commercial activities and services of more intensive nature. These uses would be located primarily along major transportation routes and would include major shopping facilities, major service-oriented uses, and major financial and corporate headquarters which are designed to serve the City or the region as a whole. The proposed self-storage use is permitted within the general commercial zone and the proposed RV storage is permitted with approval of a CUP.

### Criterion Section 15332(b): Project Location, Size, and Context

| Yes | No | |
|---|---|---|
| ☒ | ☐ | The proposed development occurs within city limits on a project site of no more than 5 acres substantially surrounded by urban uses. |

The 4.85-acre project site is located within the city and is currently vacant and undeveloped. Previously, the project site contained a single house which was demolished in August 2018. The project site is surrounded by single-family residential uses to the east, multi-family residential uses to the north and south, and Graves Avenue and SR-67 to the west. Therefore, the project is consistent with the Section 15332(b).

### Criterion Section 15332(c): Endangered, Rare, or Threatened Species

| Yes | No | |
|---|---|---|
| ☒ | ☐ | The project site has no value as habitat for endangered, rare or threatened species. |

The project site was included in the adopted City of Santee Housing Element Rezone Program Implementation Environmental Impact Report (EIR) (City of Santee 2022). The EIR stated that the project site is designated as urban/developed land and would not have potential for sensitive vegetation communities. Further, no mature trees are located on the project site. As such, the project site has no value as habitat for endangered, rare, or threatened species.

### Criterion Section 15332(d): Traffic, Noise, Air Quality, or Water Quality

| Yes | No | |
|---|---|---|
| ☒ | ☐ | Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality. |

The analysis below describes the project effects for the resource topics in this criterion, organized as follows: traffic, noise, air quality, and water quality.

### Traffic

The following analysis is based on California Emissions Estimator Model (CalEEMod) calculations within the Air Quality Analysis prepared for the project by RECON Environmental on May 9, 2024 (Attachment A).

The *2022 City of Santee VMT Analysis Guidelines* provides guidance regarding the evaluation of impacts related to vehicle miles traveled (VMT). The SANTEC/ITE Guidelines state that projects which are consistent with the existing designation and generate less than 500 or fewer net new daily vehicle trips can be presumed to have a less than significant impact related to VMT. As described in the Air Quality Analysis (see Attachment A), CalEEMod default trip lengths were modeled utilizing default vehicle emission factors based on CARB's 2021 Emissions Factor model. At buildout (post Phase 2), the project would generate 213 average daily trips (ADT). Furthermore, the project would be consistent with the existing zoning designation. Therefore, preparation of a VMT Analysis per CEQA Guidelines Section 15064.3, subdivision (b) was not required, and impacts would be less than significant.

Construction

Based on the CalEEMod calculations, project construction would require a maximum of 101 worker vehicle trips per day and 22 vendor trips per day during building construction activities. Therefore, construction traffic volumes generated by the project would not result in significant effects on the existing roadway and impacts would be less than significant.

Operation

Trips by individuals traveling to and from the project site would primarily consist of passenger vehicles and RVs. Vehicles would be mostly powered by gasoline, with some fueled by diesel or electricity. Based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition (2021), RV storage land uses generate 0.1796 trip per parking space and self-storage land uses generate 1.45 trips per 1,000 square feet. Based on these trip generation rates, Phase 1 would generate 32 daily trips and Phase 2 would generate 213 ADT. This ADT total is less than the trip threshold cited above and compared to the trips generated throughout the city of Santee, this amount of vehicle traffic would be negligible. Therefore, operation of the project would not result in any significant effect related to operational traffic. Impacts would be less than significant.

Access to the project site would be via two locations: a 24-foot-wide one-lane driveway and a 30-foot-wide two-lane driveway from Graves Avenue. Internal roadways would be constructed to follow established roadway design standards, allowing emergency access to the project site, and ensuring the project would not result in hazards due to a design feature. The nearest bus stops are located along Graves Avenue, approximately 54 feet to the south and 556 feet to the north of the project site. The nearest light rail trolley stop is Santee Trolley Square, located approximately 1.7 miles northwest of the project site. The project would widen Graves Avenue and construct a curb and gutter along Graves Avenue. The proposed off-site improvements would not impact the existing bus stops or light rail trolley stop. Review of Figure 7-2 of the General Plan Mobility Element (City of Santee 2017) determined that Graves Avenue does not include any existing or proposed bicycle facilities. Therefore, operation of the project would not result in any significant effects related to traffic and impacts would be less than significant.

**Noise**

The following analysis is based on the Noise Analysis prepared for the project by RECON Environmental on August 7, 2023 (Attachment B).

Construction Noise

Noise level limits for construction activities are established in Section 5.04.090 of the City's Municipal Code. Municipal Code Section 5.04.090, which specifically pertains to construction equipment, makes operation of any construction equipment outside the hours of 7:00 a.m. through 7:00 p.m., Monday through Saturday, except holidays, unlawful unless the operation is expressly approved by the Director of Development Services. Construction equipment with a manufacturer's noise rating of 85 A-weighted decibels maximum sound level [dB(A) $L_{max}$] or greater may only operate at a specific location for 10 consecutive workdays. If work involving such equipment would involve more than 10 consecutive workdays, a notice must be provided to all property owners and residents within 300 feet of the site no later than 10 days before the start of construction. The notice must be approved by the City and describe the proposed project and the expected duration of work and provide a point of contact to resolve noise complaints.

Surrounding land uses include single-family residential uses to the east and multi-family residential to the north and south. Noise associated with the construction of the project was modeled at a series of 10 receivers located at the adjacent properties. The results are summarized in Table 2.

**Table 2**
**Construction Noise Levels at Off-Site Receivers**
**[dB(A) $L_{eq}$]**

| Receiver | Land Use | Construction Noise Level |
|---|---|---|
| 1 | Multi-Family Residential | 72 |
| 2 | Multi-Family Residential | 71 |
| 3 | Single-Family Residential | 69 |
| 4 | Single-Family Residential | 72 |
| 5 | Single-Family Residential | 72 |
| 6 | Single-Family Residential | 72 |
| 7 | Single-Family Residential | 72 |
| 8 | Single-Family Residential | 68 |
| 9 | Multi-Family Residential | 71 |
| 10 | Multi-Family Residential | 71 |

dB(A) $L_{eq}$ = A-weighted decibels equivalent noise level.

As shown in Table 2, construction noise levels are anticipated to range from 68 to 72 A-weighted decibels equivalent noise level [dB(A) $L_{eq}$] at the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary. The project would not require construction equipment that has a manufacturer's noise rating of 85 dB or higher. In accordance with Section 5.04.090 of the City's Municipal Code, construction activities would not occur before 7:00 a.m. or after 7:00 p.m. on Mondays through Saturdays and would not occur any time on Sundays and holidays. As construction activities associated with the project would comply with requirements of the Noise Abatement and Control Ordinance, impacts associated with temporary increases in noise levels during construction would be less than significant.

<u>Operational Noise</u>

On-site generated noise is regulated by the City's Municipal Code, Title 5 Health and Safety, Chapter 5.04 Noise Abatement and Control. Section 5.04.040 of the City's Municipal Code states that "it is unlawful for any person to make, continue, or cause to be made or continued, within the limits of the City, any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area." Section 5.04.040 also provides the following requirements for heating, ventilation, and air conditioning (HVAC) units:

4. Heating and Air Conditioning Equipment and Generators.

    a. It is unlawful for any person to operate or allow the operation of any generator, air conditioning, refrigeration or heating equipment in such manner as to create a noise disturbance on the premises of any other occupied property, or if a condominium, apartment house, duplex, or attached business, within any adjoining unit.

b. All generators, heating, air conditioning, or refrigeration equipment are subject to the setback and screening requirements in this code.

Additionally, in accordance with the Noise Element of the General Plan, the noise level threshold is 65 dB(A) $L_{eq}$ at the property line. Using the parameters discussed in Section 4.3, property line noise levels due to on-site operational noise sources (RV parking, RV wash, and HVAC units) were modeled using SoundPLAN. The modeling results are summarized in Table 3.

**Table 3**
**Phase 1 and Phase 2 Operational Noise Levels at Off-Site Receivers**
**[dB(A) $L_{eq}$]**

| Receiver | Land Use | Phase 1 Operational Noise Level | Phase 2 Operational Noise Level |
|---|---|---|---|
| 1 | Multi-Family Residential | 46 | 45 |
| 2 | Multi-Family Residential | 46 | 46 |
| 3 | Single-Family Residential | 45 | 45 |
| 4 | Single-Family Residential | 48 | 48 |
| 5 | Single-Family Residential | 47 | 47 |
| 6 | Single-Family Residential | 48 | 48 |
| 7 | Single-Family Residential | 47 | 47 |
| 8 | Single-Family Residential | 43 | 44 |
| 9 | Multi-Family Residential | 47 | 46 |
| 10 | Multi-Family Residential | 44 | 43 |
| dB(A) $L_{eq}$ = A-weighted decibels equivalent noise level | | | |

As shown in Table 3, property line noise levels would range from 43 to 48 dB(A) $L_{eq}$ during operation of both Phases 1 and 2. Noise levels would not exceed 65 dB(A) $L_{eq}$. Noise at this level would not be considered a noise disturbance. Additionally, HVAC units would be operated in accordance with the requirements of the City's Municipal Code. Therefore, operational noise would not generate a substantial permanent increase in ambient noise levels for off-site noise sensitive land uses in excess of standards established in the City's General Plan, and impacts would be less than significant.

<u>Traffic Noise</u>

The project would increase traffic volumes on local roadways. However, the project would not substantially alter the vehicle classifications mix on local or regional roadways nor would the project alter the speed on an existing roadway or create a new roadway. Thus, the primary factor affecting off-site noise levels would be increased traffic volumes. While changes in noise levels would occur along any roadway where project-related traffic occurs, for noise assessment purposes, noise level increases are assumed to be greatest nearest the project site, as this location would represent the greatest concentration of project-related traffic. The City's General Plan Noise Element states that noise impacts would be significant if the project results in an increase of 3 dB or more where noise levels already exceed the land use compatibility levels. A 3 dB increase in noise is barely perceptible to the human ear.

Table 4 presents a conservative assessment of traffic noise levels based on the year 2025, year 2025 plus Phase 1, and year 2025 plus Phase 2. Table 4 also summarizes the traffic noise level increases due to the project. As shown, off-site noise level increases due to the project would be less than 3 dB and would not be perceptible. Therefore, impacts associated with off-site vehicle noise would be less than significant.

| Table 4<br>Off-Site Traffic Noise Levels<br>(CNEL) | | | | | |
|---|---|---|---|---|---|
| | Year 2025 | Year 2025 + Phase 1 | | Year 2025 + Phase 2 | |
| Roadway Segment | Noise Level | Noise Level | Increase Over Existing | Noise Level | Increase Over Existing |
| Graves Avenue – North of Prospect Avenue | 64.6 | 64.6 | 0.0 | 64.7 | 0.1 |
| Graves Avenue – Prospect Avenue to Pepper Avenue | 65.5 | 65.5 | 0.0 | 65.6 | 0.1 |
| Graves Avenue – South of Pepper Avenue | 61.8 | 61.8 | 0.0 | 62.1 | 0.3 |
| Prospect Avenue – West of Graves Avenue | 67.2 | 67.2 | 0.0 | 67.3 | 0.1 |
| SOURCE: Attachment B.<br>CNEL = community noise equivalent level | | | | | |

## Air Quality

The following analysis is based on the Air Quality Analysis prepared for the project by RECON Environmental on May 9, 2024 (see Attachment A).

Project consistency is based on whether the project would conflict with or obstruct implementation of the Regional Air Quality Standards (RAQS) and/or applicable portions of the State Implementation Plan (SIP), which would lead to increases in the frequency or severity of existing air quality violations.

The RAQS is the applicable regional air quality plan that sets forth the San Diego Air Pollution Control District's (SDAPCD) strategies for achieving the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The San Diego Air Basin (SDAB) is designated a non-attainment area for the federal and state ozone standard. Accordingly, the RAQS was developed to identify feasible emission control measures and provide expeditious progress toward attaining the standards for ozone. The two pollutants addressed in the RAQS are reactive organic gas (ROG) and oxides of nitrogen ($NO_X$), which are precursors to the formation of ozone. Projected increases in motor vehicle usage, population, and growth create challenges in controlling emissions and, by extension, to maintaining and improving air quality. The RAQS was most recently adopted in 2022 (SDAPCD 2022).

The growth projections used by the SDAPCD to develop the RAQS emissions budgets are based on the population, vehicle trends, and land use plans developed in general plans and used by the San Diego Association of Governments (SANDAG) in the development of the regional transportation plans and sustainable communities strategy. As such, projects that propose development that is consistent with the growth anticipated by SANDAG's growth projections and/or the General Plan would not conflict with the RAQS. In the event that a project would propose development that is less dense than anticipated by the growth projections, the project would likewise be consistent with the RAQS. In the event a project proposes development that is greater than anticipated in the growth projections, further analysis would be warranted to determine if the project would exceed the growth projections used in the RAQS for the specific subregional area.

The project site was evaluated as a part of the City's Housing Element Rezone Program Implementation EIR (City of Santee 2022). The project site is not identified as a housing site in the Housing Element; however, it was included in the analysis because it was designated as R-14 (Medium Density Residential) and was redesignated as General Commercial (GC) as a part of the Rezone Program. The project site was previously identified as a future housing site, but due to airport constraints it was removed from further consideration. The Housing Element Rezone Program was developed concurrently with the recent updates to the 2022 RAQS; therefore, the 2022 RAQS would have been based on the previous R-14 (Medium Density Residential) designation. With a designation of R-14 (Medium Density Residential), the project site could have been developed with 70 residential units. Using an ITE trip generation rate of 5.44 trips per unit, a hypothetical residential project would have generated 381 daily trips. As discussed, Phase 1 would generate 32 daily trips and Phase 2 would generate 213 daily trips which is less than the trips that would have been generated by a residential project. Therefore, the project would generate fewer emissions than what is accounted for in the 2022 RAQS and would not exceed the growth assumptions used in the 2022 RAQS. Furthermore, as shown in Tables 5 and 6, construction and operational emissions would not exceed the applicable significance thresholds for any criteria pollutants. Therefore, the project would not obstruct or conflict with implementation of the 2022 RAQS, and impacts would be less than significant.

**Table 5**
**Summary of Maximum Construction Emissions**
**(pounds per day)**

| Construction | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| PHASE 1 | | | | | | |
| Site Preparation | 4 | 36 | 34 | <1 | 9 | 5 |
| Grading | <1 | 1 | 1 | <1 | <1 | <1 |
| Paving | <1 | <1 | 1 | <1 | <1 | <1 |
| Architectural Coatings | 3 | 1 | 1 | <1 | <1 | <1 |
| **Phase 1 Maximum Daily Emissions** | **4** | **36** | **34** | **<1** | **9** | **5** |
| *Significance Threshold* | *250* | *250* | *550* | *250* | *100* | *67* |
| PHASE 2 | | | | | | |
| Site Preparation | 3 | 32 | 31 | <1 | 9 | 5 |
| Building Construction | 1 | 11 | 16 | <1 | 1 | 1 |
| Paving | 1 | 7 | 11 | <1 | <1 | <1 |
| Architectural Coatings | 34 | 1 | 2 | <1 | <1 | <1 |
| **Phase 2 Maximum Daily Emissions** | **34** | **32** | **31** | **<1** | **9** | **5** |
| *Significance Threshold* | *250* | *250* | *550* | *250* | *100* | *67* |

**Table 6**
**Summary of Project Operational Emissions**
**(pounds per day)**

| Source | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| PHASE 1 | | | | | | |
| Mobile | <1 | <1 | 1 | <1 | <1 | <1 |
| Area | <1 | <1 | <1 | <1 | <1 | <1 |
| Energy | <1 | <1 | <1 | <1 | <1 | <1 |
| **Phase 1 Total** | **<1** | **<1** | **1** | **<1** | **<1** | **<1** |
| *Significance Threshold* | *250* | *250* | *550* | *250* | *100* | *67* |
| PHASE 2 | | | | | | |
| Mobile | 1 | <1 | 6 | <1 | 1 | <1 |
| Area | 4 | <1 | 6 | <1 | <1 | <1 |
| Energy | <1 | <1 | <1 | <1 | <1 | <1 |
| **Phase 2 Total** | **5** | **1** | **12** | **<1** | **1** | **<1** |
| *Significance Threshold* | *250* | *250* | *550* | *250* | *100* | *67* |

## Water Quality

The following analysis is based on the Drainage Report prepared for the project by Omega Engineering Consultants on March 31, 2023 (Attachment C) and the and Storm Water Quality Management Plan (SWQMP) prepared by Omega Engineering Consultants on April 5, 2023 (Attachment D).

The project site is in the San Diego Hydrologic Unit (907) of the Lower San Diego River Watershed. Previously, the project site contained a single house which was demolished in August 2018. Currently, the project site contains a paved driveway and disturbed land. The project site has no existing on-site storm drain system. The project site drains to the west via surface flow and into an existing drainage ditch along Graves Avenue, and ultimately to a curb inlet at the end of the ditch. The runoff is then conveyed to the public storm drain system on Graves Avenue, then to Forester Creek and ultimately to the Lower San Diego River.

The project site would be graded and separated into five on-site drainage basins. The project site would modify the drainage patterns but keep the same discharge point as the existing conditions. The proposed biofiltration basins would be utilized for treatment, hydromodification, and 100-year flow attenuation. A brow ditch would be installed along the northeasterly and northerly property line that would convey a portion of the offsite runoff towards a curb outlet at the northwesterly corner of the site. The runoff would then drain to a curb inlet along Graves Avenue where it would drain to the public storm drain system.

The northeasterly portion of the site would drain via surface flow to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin located at the northwesterly corner of the site. After treatment, the basin would discharge to a curb outlet at the northwesterly corner of the site, and ultimately to a curb inlet along Graves Avenue where it would drain to the public storm drain system. The center portion of the site would drain to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin along the westerly portion of the site. After treatment, the basin would discharge to a curb inlet along Graves Avenue where it would drain to the public storm drain system. The southerly portion of the site would drain to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin located at the southwesterly corner of the site. After treatment, the basin would discharge to a curb inlet along Graves Avenue where it would drain to the public storm drain system. A brow ditch would be installed along the easterly and southerly property line that would convey a portion of the offsite runoff towards a curb outlet at the southwesterly corner of the site. The runoff generated by the entire site and the offsite areas ultimately confluence at the public storm drain system on Graves Avenue. The existing conditions has a 100-year flow of 18.52 cubic feet per second (cfs). The proposed conditions, post Phase 2 would have a 100-year flow of 18.24 cfs. Thus, implementation of the proposed project would reduce 0.28 cfs and result in drainage improvements from the existing condition. Further, project compliance with the requirements of the City's BMP Design Manual would ensure the project would not violate any water quality standards or waste discharge requirements, and impacts would be less than significant.

### Criterion Section 15332(e): Utilities and Public Services

| Yes | No | |
|---|---|---|
| ☒ | ☐ | The site can be adequately served by all required utilities and public services. |

The project site is located within the Padre Dam Municipal Water District (PDMWD) for sewer facilities and the Helix Water District for water facilities. As stated in the sewer project facility availability form (Attachment E), sewer facilities are available to serve the project site. As stated in the water project facility availability form (Attachment F), water facilities are available to serve the project site. Existing water and sewer facilities are available adjacent to the site within Graves Avenue, and improvements would be limited to extension of pipelines onto the project site. Therefore, the project would not require relocation or construction of new or expanded water or wastewater treatment facilities that would cause significant environmental effects, and impacts would be less than significant.

The project would be consistent with the existing land use and zoning designations. Consequently, the project would not consume additional electric power, natural gas, or telecommunication services beyond what has been anticipated by regional growth projections. Therefore, the project site would be adequately served by all required utilities and public services.

## V. EXCEPTIONS TO CATEGORICAL EXEMPTIONS

Under the Class 32 Categorical Exemption Overview, even if a project is ordinarily exempt under any of the potential categorical exemptions, CEQA Guidelines Section 15300.2 provides specific instances where exceptions to otherwise applicable exemptions apply. The following section addresses whether any of the exceptions to the CEQA exemption apply to the project, consistent with CEQA Guidelines Section 15300.2.

### Criterion 15300.2(a): Location

| Yes | No | |
|---|---|---|
| ☐ | ☒ | Is there an exception to the exemption for the project due to its location in a particularly sensitive environment, such that the project may impact an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies? |

This exception applies only to CEQA exemptions under Classes 3, 4, 5, 6 or 11. Since the project qualifies as a Class 32 urban infill exemption, this criterion is not applicable and is provided here for information purposes only. There are no environmental resources of hazardous or critical concern that are designated, precisely mapped, or officially adopted in the vicinity of the project site, or that could be adversely affected by the project. Therefore, exception under CEQA Guidelines Section 15300.2(a) does not apply to the project.

### Criterion 15300.2(b): Cumulative Impact

| Yes | No | |
|---|---|---|
| ☐ | ☒ | Is there an exception to the exemption for the project due to significant cumulative impacts of successive projects of the same type and in the same place, over time? |

As demonstrated under Criterion Section 15332(a), General Plan and Zoning Consistency, the project is consistent with the development density permitted under the General Plan, the proposed self-storage use is permitted within the general commercial zone and the proposed RV storage is permitted with approval of a conditional use permit. Successive projects of the same type and in the same place are unlikely to occur over time after the project is constructed. Therefore, the exception under CEQA Guidelines Section 15300.2(b) does not apply to the project.

### Criterion 15300.2(c): Significant Effect

| Yes | No | |
|---|---|---|
| ☐ | ☒ | Is there an exception to the exemption for the project because there is a reasonable possibility that the project will have a significant effect on the environment due to unusual circumstances? |

There are no known unusual circumstances applicable to the project or its site that may result in a significant effect on the environment. Greenhouse gas (GHG) emissions from the project were assessed as a possible unusual circumstance due to global climate change. The project would be consistent with the existing General Plan and zoning designations. Therefore, the project would be consistent with the land use assumptions used in the City's Sustainable Santee Plan. As demonstrated in the Sustainable Santee Action Plan Consistency Checklist (Attachment G), the project would implement all applicable GHG reduction measures related to energy efficiency, solid waste, and clean energy required by the City's Sustainable Santee Plan. Specifically, the project would be consistent with the following goals:

- Increase Energy Efficiency (Goal 4): The project would implement all feasible and applicable California Green Building Standards Code (CALGreen) Tier 2 Building Standards. The CALGreen Tier 2 measures that would be implemented by the project are related to planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality.

- Decrease Energy Demand through Reducing Urban Heat Island Effect (Goal 5): To achieve this goal, projects are required to utilize tree planting for shade and energy efficiency, and to use light-reflecting surfaces. The project would include landscaping along project frontages and throughout the project site to provide shade. Additionally, the project would reduce energy demand by constructing cool roofs.

- Solid Waste (Goal 9): The project would reduce waste at landfills by providing on-site recycling storage per CALGreen.

- Decrease GHG Emissions through Increased Clean Energy Use (Goal 10): The project would install solar photovoltaics (PV) systems in accordance with the Santee Sustainable Plan.

Based on the project's consistency with the City's Sustainable Santee Plan demonstrated in the Checklist, the project's contribution of GHGs to cumulative statewide emissions would be less than cumulatively considerable. Therefore, impacts associated with GHG emissions generated by the project would be less than significant. Therefore, an exception to the exemption under CEQA Guidelines Section 15300.2(c) does not apply to the project.

**Criterion 15300.2(d): Scenic Highway**

| Yes | No | |
|---|---|---|
| ☐ | ☒ | Is there an exception to the exemption for the project because project may result in damage to scenic resources including but not limited to, trees, historic buildings, rock outcroppings or similar resources, within a highway officially designated as a state scenic highway? |

There are no designated state scenic highways within the city of Santee. The segment of State Route 52 that is designated as a state scenic highway (Santo Road to Mast Boulevard) is located in the city of San Diego, approximately 4.5 miles west of the project site, and is not visible from the project site. The project site does not possess any scenic resources such as trees and rock outcroppings and is unremarkable in character. Therefore, the project would not result in damage to scenic resources including but not limited to, trees, historic buildings, rock outcroppings or similar resources, within a highway officially designated as a state scenic highway. Therefore, an exception to the exemption under CEQA Guidelines Section 15300.2(d) does not apply to the project.

**Criterion 15300.2(e): Hazardous Waste Sites**

| Yes | No | |
|---|---|---|
| ☐ | ☒ | Is there an exception to the exemption for the project because the project is located on a site which is included on any list compiled pursuant to Section 65962.5 of the Government Code? |

The provisions of Government Code Section 65962.5 are commonly referred to as the "Cortese List." The provisions require the Department of Toxic Substance Control, the State Water Resources Control Board, the California Department of Public Health, and the California Department of Resources Recycling and Recovery to submit information pertaining to sites associated with solid waste disposal, hazardous waste disposal, leaking underground tank sites, and/or hazardous materials releases to the Secretary of California Environmental Protection Agency. The project site is not identified on any lists compiled pursuant to Section 65962.5 of the Government Code. Therefore, an exception to the exemption under CEQA Guidelines Section 15300.2(e) does not apply to the project.

**Criterion 15300.2(f): Historical Resources**

| Yes | No | |
|---|---|---|
| ☐ | ☒ | Is there an exception to the exemption for the project because the project may cause a substantial adverse change in the significance of a historical resource? |

The term “historic resources” applies to any such resource that is at least 50 years old and is listed or determined eligible for listing in the California Register of Historical Resources. The project site was graded in the past and is currently vacant and undeveloped. Therefore, the project would not affect a known historical resource pursuant to CEQA Guidelines Section 15064.5. No impact would occur. Therefore, an exception to the exemption under CEQA Guidelines Section 15300.2(f) does not apply to the project.

# VI. REFERENCES

1. City of Santee VMT Analysis Guidelines. 2022.

2. City of Santee Housing Element Rezone Program Environmental Impact Report (EIR). 2022.

3. City of Santee Mobility Element. 2017. http://sntbberry.cityofsanteeca.gov/sites/FanitaRanch/Public/Remainder%20of%20the%20Record/(10)%20Planning%20Documents%20Adopted%20by%20City%20of%20Santee/Tab%2006%20-%202017-10-25%20General%20Plan%20Mobility%20Element%202017.pdf.

4. Institute of Transportation Engineers (ITE). 2021. Trip Generation Manual 11th Edition. September 2021.

5. San Diego Air Pollution Control District (SDAPCD). 2022. Revision of the Regional Air Quality Strategy for San Diego County.

6. U.S. Department of the Interior. 2012. Secretary of the Interior's Professional Qualifications Standards for Archaeology.

# ATTACHMENTS

# ATTACHMENT A

Air Quality Analysis

RECON

An Employee-Owned Company

May 9, 2024

Mr. Jim Moxham, CEO
Cameron Brothers Company, LLC
10580 Prospect Avenue, Suite 200
Santee, CA 92071

Reference: Air Quality Analysis for the 8355 Graves Avenue RV and Self-Storage Project (RECON Number 10396)

Dear Mr. Moxham:

The purpose of this report is to assess potential short-term local and regional air quality impacts resulting from development of the 8355 Graves Avenue RV and Self-Storage Project (project) located in the city of Santee, California. The analysis of impacts is based on state and federal Ambient Air Quality Standards (AAQS) and assessed in accordance with the regional guidelines, policies, and standards and the San Diego Air Pollution Control District (SDAPCD) and the City of Santee (City).

## 1.0 Project Description

The project site is located at 8355 Graves Avenue (Assessor Parcel Numbers 387-061-11 and -12) in the city of Santee, California. The project site is surrounded by single family uses to the east, multi-family uses to the north and south, and Graves Avenue and State Route 67 to the west. The 4.85-acre project site is currently undeveloped. Figure 1 shows the regional location. Figure 2 shows an aerial photograph of the project site and vicinity.

The project would be constructed in two phases. Phase 1 would construct a 178-space recreational vehicle (RV) storage facility with associated parking, landscaping, and retention areas. Phase 2 would remove 97 of the RV parking spaces to construct two self-storage buildings totaling 136,600 square feet. Building A would be a 90,600-square-foot, three-story building and Building B would be a 46,000-square-foot, two-story building. Figure 3 shows the Phase 1 site plan and Figure 4 shows the Phase 2 site plan.

## 2.0 Environmental Setting

## 2.1 Regulatory Setting

### 2.1.1 Federal Regulations

AAQS represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The federal Clean Air Act (CAA) was enacted in 1970 and amended in 1977 and 1990 (42 U.S. Code [U.S.C.] 7401) for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. In 1971, in order to achieve the purposes of Section 109 of the CAA [42 U.S.C. 7409], the U.S. Environmental Protection Agency (U.S. EPA) developed primary and secondary National AAQS (NAAQS).

Six pollutants of primary concern were designated: ozone, carbon monoxide (CO), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), lead (Pb), particulate matter with a diameter of 10 microns and less ($PM_{10}$), and particulate matter with a diameter of 2.5 microns and less ($PM_{2.5}$). The primary NAAQS "in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health…." and the secondary standards "… protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air" [42 U.S.C. 7409(b)(2)]. The primary NAAQS were established, with a margin of safety, considering long-term exposure for the most sensitive groups in the general population (i.e., children, senior citizens, and people with breathing difficulties). The NAAQS are presented in Table 1 (California Air Resources Board [CARB] 2016).

If an air basin is not in either federal or state attainment for a particular pollutant, the basin is classified as non-attainment area for that pollutant. The San Diego Air Basin (SDAB) is currently classified as a federal non-attainment area for ozone.

### 2.1.2 State Regulations

#### Criteria Pollutants

The CARB has developed the California AAQS (CAAQS) and generally has set more stringent limits on the criteria pollutants than the NAAQS (see Table 1). In addition to the federal criteria pollutants, the CAAQS also specify standards for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride.

Similar to the federal CAA, the state classifies either "attainment" or "non-attainment" areas for each pollutant based on the comparison of measured data with the CAAQS. The SDAB is a non-attainment area for the state ozone standards, the state $PM_{10}$ standard, and the state $PM_{2.5}$ standard. The California CAA, which became effective on January 1, 1989, requires all areas of the State to attain the CAAQS at the earliest practicable date. The California CAA has specific air quality management strategies that must be adopted by the agency responsible for the non-attainment area. In the case of the SDAB, the responsible agency is the SDAPCD.

#### Toxic Air Contaminants

The public's exposure to toxic air contaminants (TACs) is a significant public health issue in California. Diesel particulate matter (DPM) emissions have been identified as TACs. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (Assembly Bill [AB] 1807: Health and Safety Code Sections 39650–39674). The California Legislature established a two-step process to address the potential health effects from TACs. The first step is the risk assessment (or identification) phase. The second step is the risk management (or control) phase of the process.

The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels.

The Children's Environmental Health Protection Act, California Senate Bill 25 (Chapter 731, Escutia, Statutes of 1999), focuses on children's exposure to air pollutants. The act requires CARB to review its air quality standards from a children's health perspective, evaluate the statewide air monitoring network, and develop any additional air toxic control measures needed to protect children's health. Locally, toxic air pollutants are regulated through the SDAPCD Regulation XII. Of particular concern statewide are DPM emissions. DPM was established as a TAC in 1998 and is estimated to represent a majority of the cancer risk from TACs statewide (based on the statewide average). Diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB and are listed as carcinogens either under the state's Proposition 65 or under the federal Hazardous Air Pollutants program.

| Table 1<br>Ambient Air Quality Standards | | | | | | |
|---|---|---|---|---|---|---|
| Pollutant | Averaging Time | California Standards[1] | | National Standards[2] | | |
| | | Concentration[3] | Method[4] | Primary[3,5] | Secondary[3,6] | Method[7] |
| Ozone[8] | 1 Hour | 0.09 ppm (180 µg/m$^3$) | Ultraviolet Photometry | – | Same as Primary Standard | Ultraviolet Photometry |
| | 8 Hour | 0.07 ppm (137 µg/m$^3$) | | 0.070 ppm (137 µg/m$^3$) | | |
| Respirable Particulate Matter ($PM_{10}$)[9] | 24 Hour | 50 µg/m$^3$ | Gravimetric or Beta Attenuation | 150 µg/m$^3$ | Same as Primary Standard | Inertial Separation and Gravimetric Analysis |
| | Annual Arithmetic Mean | 20 µg/m$^3$ | | – | | |
| Fine Particulate Matter ($PM_{2.5}$)[9] | 24 Hour | No Separate State Standard | | 35 µg/m$^3$ | Same as Primary Standard | Inertial Separation and Gravimetric Analysis |
| | Annual Arithmetic Mean | 12 µg/m$^3$ | Gravimetric or Beta Attenuation | 12 µg/m$^3$ | 15 µg/m$^3$ | |
| Carbon Monoxide (CO) | 1 Hour | 20 ppm (23 mg/m$^3$) | Non-dispersive Infrared Photometry | 35 ppm (40 mg/m$^3$) | – | Non-dispersive Infrared Photometry |
| | 8 Hour | 9.0 ppm (10 mg/m$^3$) | | 9 ppm (10 mg/m$^3$) | – | |
| | 8 Hour (Lake Tahoe) | 6 ppm (7 mg/m$^3$) | | – | – | |
| Nitrogen Dioxide ($NO_2$)[10] | 1 Hour | 0.18 ppm (339 µg/m$^3$) | Gas Phase Chemi-luminescence | 100 ppb (188 µg/m$^3$) | – | Gas Phase Chemi-luminescence |
| | Annual Arithmetic Mean | 0.030 ppm (57 µg/m$^3$) | | 0.053 ppm (100 µg/m$^3$) | Same as Primary Standard | |
| Sulfur Dioxide ($SO_2$)[11] | 1 Hour | 0.25 ppm (655 µg/m$^3$) | Ultraviolet Fluorescence | 75 ppb (196 µg/m$^3$) | – | Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method) |
| | 3 Hour | – | | – | 0.5 ppm (1,300 µg/m$^3$) | |
| | 24 Hour | 0.04 ppm (105 µg/m$^3$) | | 0.14 ppm (for certain areas)[11] | – | |
| | Annual Arithmetic Mean | – | | 0.030 ppm (for certain areas)[11] | – | |
| Lead[12,13] | 30 Day Average | 1.5 µg/m$^3$ | Atomic Absorption | – | – | High Volume Sampler and Atomic Absorption |
| | Calendar Quarter | – | | 1.5 µg/m$^3$ (for certain areas)[12] | Same as Primary Standard | |
| | Rolling 3-Month Average | – | | 0.15 µg/m$^3$ | | |
| Visibility Reducing Particles[14] | 8 Hour | See footnote 14 | Beta Attenuation and Transmittance through Filter Tape | No National Standards | | |
| Sulfates | 24 Hour | 25 µg/m$^3$ | Ion Chroma-tography | | | |
| Hydrogen Sulfide | 1 Hour | 0.03 ppm (42 µg/m$^3$) | Ultraviolet Fluorescence | | | |
| Vinyl Chloride[12] | 24 Hour | 0.01 ppm (26 µg/m$^3$) | Gas Chroma-tography | | | |

**Table 1**
**Ambient Air Quality Standards**

NOTES:
ppm = parts per million; ppb = parts per billion; μg/m$^3$ = micrograms per cubic meter; – = not applicable.

1 California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, particulate matter ($PM_{10}$, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For $PM_{10}$, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m$^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 Any equivalent measurement method which can be shown to the satisfaction of the Air Resources Board to give equivalent results at or near the level of the air quality standard may be used.

5 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7 Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

9 On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m$^3$ to 12.0 μg/m$^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m$^3$, as was the annual secondary standards of 15 μg/m$^3$. The existing 24-hour $PM_{10}$ standards (primary and secondary) of 150 μg/m$^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

10 To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

11 On June 2, 2010, a new 1-hour $SO_2$ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99$^{th}$ percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 $SO_2$ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

12 The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

13 The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 μg/m$^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

14 In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

SOURCE: CARB 2016.

The California Air Toxics Program establishes the process for the identification and control of TACs and includes provisions to make the public aware of significant toxic exposures and for reducing risk. Additionally, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly Bill) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air.

Following the identification of DPM as a TAC in 1998, CARB has worked on developing strategies and regulations aimed at reducing the risk from DPM. The overall strategy for achieving these reductions is found in the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB 2000). A stated goal of the plan is to reduce the statewide cancer risk arising from exposure to DPM by 85 percent by 2020.

In April 2005, CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB 2005). The handbook makes recommendations directed at protecting sensitive land uses from air pollutant emissions while balancing a myriad of other land use issues (e.g., housing, transportation needs, economics, etc.). Sensitive land uses include but are not limited to, schools, hospitals, residences, resident care facilities, and day-care centers. The handbook is not regulatory or binding on local agencies and recognizes that application takes a qualitative approach. Therefore, the CARB has provided guidelines for the siting of land uses near heavily traveled roadways. Of pertinence to this study, the CARB guidelines indicate that siting new sensitive land uses within 500 feet of a freeway or urban roads with 100,000 or more vehicles/day should be avoided when possible.

As an ongoing process, CARB will continue to establish new programs and regulations for the control of DPM and other air-toxics emissions as appropriate. The continued development and implementation of these programs and policies will ensure that the public's exposure to DPM and other TACs will continue to decline.

#### State Implementation Plan

The State Implementation Plan (SIP) is a collection of documents that set forth the state's strategies for achieving the NAAQS. In California, the SIP is a compilation of new and previously submitted plans, programs (such as air quality management plans, monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. The CARB is the lead agency for all purposes related to the SIP under state law. Local air districts and other agencies, such as the Department of Pesticide Regulation and the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. The CARB then forwards SIP revisions to the U.S. EPA for approval and publication in the Federal Register. All of the items included in the California SIP are listed in the Code of Federal Regulations (CFR) at 40 CFR 52.220.

The SDAPCD is responsible for preparing and implementing the portion of the SIP applicable to the SDAB. The SIP plans for San Diego County specifically include the Redesignation Request and Maintenance Plan for the 1997 National Ozone Standard for San Diego County (2012), and the 2004 Revision to the California State Implementation Plan for Carbon Monoxide–Updated Maintenance Plan for Ten Federal Planning Areas.

#### California Environmental Quality Act

Section 15125(d) of the California Environmental Quality Act (CEQA) Guidelines requires discussion of any inconsistencies between the project and applicable general plans and regional plans, including the applicable air quality attainment or maintenance plan (or SIP).

### 2.1.3 Regional Air Quality Strategy

The SDAPCD prepared the original 1991/1992 Regional Air Quality Strategy (RAQS) in response to requirements set forth in the California CAA. The California CAA requires areas that are designated state non-attainment areas for ozone, CO, $SO_2$, and $NO_2$ prepare and implement plans to attain the standards by the earliest practicable date. The California CAA does not provide guidance on timing or requirements for attaining the state $PM_{10}$ and $PM_{2.5}$ standards. Attached as part of the RAQS are the Transportation Control Measures (TCMs) adopted by the San Diego Association of Governments (SANDAG). Updates of the RAQS and corresponding TCM are required every three years. The RAQS and TCM set forth the steps needed to accomplish attainment of NAAQS and CAAQS. The most recent 2022 RAQS and TCM was adopted in 2023.

## 2.2 Existing Air Quality

The project is located in San Diego County, within the SDAB and approximately 17 miles east of the Pacific Ocean. The SDAB is currently classified as a federal non-attainment area for ozone, and a state non-attainment area for ozone, $PM_{10}$, and $PM_{2.5}$. The eastern portion of the SDAB is surrounded by mountains to the north, east, and south. These mountains tend to restrict airflow and concentrate pollutants in the valleys and low-lying areas.

### 2.2.1 Climate and Meteorology

The project area, like the rest of San Diego County, has a Mediterranean climate characterized by warm, dry summers and mild winters. The mean annual temperature for the project area is 65 degrees Fahrenheit (°F). The average annual precipitation is 12 inches, falling primarily from November to April. Winter low temperatures in the project area average about 43°F, and summer high temperatures average about 86°F. The average relative humidity is 69 percent and is based on the yearly average humidity at Lindbergh Field (Western Regional Climate Center 2022).

The dominant meteorological feature affecting the region is the Pacific High Pressure Zone, which produces the prevailing westerly to northwesterly winds. These winds tend to blow pollutants away from the coast toward the inland areas. Consequently, air quality near the coast is generally better than that which occurs at the base of the coastal mountain range.

Fluctuations in the strength and pattern of winds from the Pacific High Pressure Zone creates a temperature inversion layer (a layer in the atmosphere in which temperature increases with height) that acts as a lid to the vertical dispersion of air pollutants in the SDAB. Beneath the inversion layer pollutants become “trapped” as their ability to disperse diminishes. Sunlight reacts with air pollutants (reactive organic gas [ROG] and oxides of nitrogen [$NO_X$]) to create ozone ($O_3$). Thus, poorly dispersed pollutants along with strong sunlight results in the creation of ozone at this surface layer.

The prevailing wind pattern in the western portion of the SDAB includes a daytime onshore flow (i.e., sea breeze) and nighttime offshore flow (i.e., land breeze), which leads to pollutants being blown out to sea at night and returning to land the following day. The prevailing westerly wind pattern is sometimes interrupted by regional “Santa Ana” conditions. A Santa Ana occurs when a strong high pressure develops over the Nevada-Utah area and overcomes the prevailing westerly coastal winds, sending strong, steady, hot, dry northeasterly winds over the mountains and out to sea.

Strong Santa Ana winds tend to blow pollutants out over the ocean, producing clear days. However, at the onset or during breakdown of these conditions, or if the Santa Ana is weak, local air quality may be adversely affected. In these cases, emissions from the South Coast Air Basin to the north are blown out over the ocean, and low pressure over Baja California, Mexico, draws this pollutant-laden air mass southward. As the high pressure weakens, prevailing northwesterly winds reassert themselves and send this cloud of contamination ashore in the SDAB. When this event does occur, the combination of transported and locally produced contaminants results in air quality conditions worse than normal.

### 2.2.2 Background Air Quality

Air quality at a particular location is a function of the kinds, amounts, and dispersal rates of pollutants being emitted into the air locally and throughout the basin. The major factors affecting pollutant dispersion are wind speed and direction, the vertical dispersion of pollutants (which is affected by inversions), and the local topography.

Air quality is commonly expressed as the number of days in which air pollution levels exceed state standards set by the CARB or federal standards set by the U.S. EPA. The SDAPCD maintains 11 air quality monitoring stations located throughout the greater San Diego metropolitan region. Air pollutant concentrations and meteorological information are continuously recorded at these stations. Measurements are then used by scientists to help forecast daily air pollution levels.

The closest station is the El Cajon – Lexington Elementary School monitoring station located at 533 South First Street, approximately three miles southeast of the project site. The El Cajon – Lexington Elementary School monitoring station measures ozone, $NO_2$, $PM_{10}$, and $PM_{2.5}$. Table 2 provides a summary of the measurements collected at the El Cajon – Lexington Elementary School monitoring station for the years 2017 through 2021.

Table 2
Summary of Air Quality Measurements Recorded at the
El Cajon-Lexington Elementary School Air Quality Monitoring Station

| Pollutant/Standard | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|
| Ozone | | | | | |
| Federal Max 8-hr (ppm) | 0.081 | 0.079 | 0.074 | 0.083 | 0.076 |
| Days 2015 Federal 8-hour Standard Exceeded (0.07 ppm) | 9 | 2 | 2 | 14 | 3 |
| Days 2008 Federal 8-hour Standard Exceeded (0.075 ppm) | 5 | 2 | 0 | 5 | 2 |
| State Max 8-hr (ppm) | 0.082 | 0.079 | 0.075 | 0.083 | 0.077 |
| Days State 8-hour Standard Exceeded (0.07 ppm) | 9 | 2 | 2 | 14 | 3 |
| Max. 1-hr (ppm) | 0.096 | 0.087 | 0.094 | 0.094 | 0.088 |
| Days State 1-hour Standard Exceeded (0.09 ppm) | 1 | 0 | 0 | 0 | 0 |
| Nitrogen Dioxide | | | | | |
| Max 1-hr (ppm) | 0.045 | 0.045 | 0.039 | 0.044 | 0.038 |
| Days State 1-hour Standard Exceeded (0.18 ppm) | 0 | 0 | 0 | 0 | 0 |
| Days Federal 1-hour Standard Exceeded (0.100 ppm) | 0 | 0 | 0 | 0 | 0 |
| Annual Average (ppm) | 0.010 | 0.008 | 0.008 | 0.008 | 0.006 |
| $PM_{10}$* | | | | | |
| Federal Max. Daily ($\mu g/m^3$) | 50.0 | 43.0 | 38.7 | -- | -- |
| Measured Days Federal 24-hour Standard Exceeded (150 $\mu g/m^3$) | 0 | 0 | 0 | 0 | 0 |
| Calculated Days Federal 24-hour Standard Exceeded (150 $\mu g/m^3$) | 0.0 | 0.0 | 0.0 | -- | -- |
| Federal Annual Average ($\mu g/m^3$) | 22.6 | 22.6 | 20.1 | -- | -- |
| State Max. Daily ($\mu g/m^3$) | 49.4 | 44.7 | 37.4 | -- | -- |
| Measured Days State 24-hour Standard Exceeded (50 $\mu g/m^3$) | 0 | 0 | 0 | 0 | 0 |
| Calculated Days State 24-hour Standard Exceeded (50 $\mu g/m^3$) | 0.0 | 0.0 | -- | -- | -- |
| State Annual Average ($\mu g/m^3$) | 23.0 | 23.0 | -- | -- | -- |

| Table 2<br>Summary of Air Quality Measurements Recorded at the<br>El Cajon-Lexington Elementary School Air Quality Monitoring Station | | | | | |
|---|---|---|---|---|---|
| Pollutant/Standard | 2017 | 2018 | 2019 | 2020 | 2021 |
| $PM_{2.5}$* | | | | | |
| Federal Max. Daily (μg/$m^3$) | 31.8 | 36.2 | 23.8 | 38.2 | 30.2 |
| Measured Days Federal 24-hour Standard Exceeded (35 μg/$m^3$) | 0 | 1 | 0 | 2 | 0 |
| Calculated Days Federal 24-hour Standard Exceeded (35 μg/$m^3$) | 0.0 | 1.0 | 0.0 | 2.2 | 0.0 |
| Federal Annual Average (μg/$m^3$) | 9.5 | 9.6 | 8.5 | 10.3 | 9.7 |
| State Max. Daily (μg/$m^3$) | 35.6 | 42.0 | 25.7 | 41.6 | 31.5 |
| State Annual Average (μg/$m^3$) | 9.6 | 10.5 | -- | 11.6 | 10.4 |

SOURCE: CARB 2023.
ppm = parts per million; μg/$m^3$ = micrograms per cubic meter; -- = Not available.
* Calculated days value. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

## 3.0 Thresholds of Significance

Thresholds used to evaluate potential impacts to air quality are based on applicable criteria in the CEQA Guidelines Appendix G. The project would have a significant air quality impact if it would:

1. Obstruct or conflict with the implementation of the RAQS.
2. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
3. Expose sensitive receptors to substantial pollutant concentrations.
4. Result in other emissions such as those leading to odors adversely affecting a substantial number of people.

The City has not adopted air quality significance thresholds. The SDAPCD also does not provide specific numeric thresholds for determining the significance of air quality impacts under CEQA. However, the SDAPCD does specify Air Quality Impact Analysis trigger levels for new or modified stationary sources (SDAPCD Rules 20.1, 20.2, and 20.3). The SDAPCD does not consider these trigger levels to represent adverse air quality impacts; rather, if these trigger levels are exceeded by a project, the SDAPCD requires an air quality analysis to determine if a significant air quality impact would occur. While these trigger levels do not generally apply to mobile sources or general land development projects, for comparative purposes these levels are used to evaluate the increased emissions that would be discharged to the SDAB if the project were approved. The air quality impact screening levels used in this analysis are shown in Table 3.

| Table 3<br>Air Quality Impact Screening Levels | | | |
|---|---|---|---|
| Pollutant | Emission Rate | | |
| | Pounds/Hour | Pounds/Day | Tons/Year |
| $NO_X$ | 25 | 250 | 40 |
| $SO_X$ | 25 | 250 | 40 |
| CO | 100 | 550 | 100 |
| $PM_{10}$ | -- | 100 | 15 |
| Lead | -- | 3.2 | 0.6 |
| VOC, ROG[1] | -- | 250 | -- |
| $PM_{2.5}$ | -- | 67 | 10 |

SOURCE: SDAPCD, Rules 20.1, 20.2, 20.3.
[1]ROG threshold based on federal General Conformity *de minimus* levels for ozone precursors.

## 4.0 Emission Calculations

Air emissions were calculated using California Emissions Estimator Model (CalEEMod) 2022.1 (California Air Pollution Control Officers Association 2022). CalEEMod is a tool used to estimate air emissions resulting from land development projects in the state of California. The model generates air quality emission estimates from construction activities and breaks down operational criteria pollutant emissions into three categories: mobile sources (e.g., traffic), area sources (e.g., landscaping equipment, consumer projects, and architectural coatings), and energy sources (e.g., natural gas heating). CalEEMod provides emission estimates of $NO_X$, CO, $SO_X$, $PM_{10}$, $PM_{2.5}$, and ROG.

Inputs to CalEEMod include such items as the air basin containing the project, land uses, trip generation rates, trip lengths, as well as other parameters. The complete CalEEMod model outputs for Phases 1 and 2 are included in Attachments 1 and 2, respectively.

## 4.1 Construction Emissions

Construction-related activities are temporary, short-term sources of air emissions. Sources of construction-related air emissions include the following:

- Fugitive dust from grading activities;
- Construction equipment exhaust;
- Construction-related trips by workers, delivery trucks, and material-hauling trucks; and
- Construction-related power consumption.

Construction-related pollutants result from dust raised during demolition and grading, emissions from construction vehicles, and chemicals used during construction. Fugitive dust emissions vary greatly during construction and are dependent on the amount and type of activity, silt content of the soil, and the weather. Vehicles moving over paved and unpaved surfaces, demolition, excavation, earth movement, grading, and wind erosion from exposed surfaces are all sources of fugitive dust. Construction operations are subject to the requirements established in Regulation 4, Rules 52, 54, and 55, of the SDAPCD's rules and regulations.

Heavy-duty construction equipment is usually diesel powered. In general, emissions from diesel-powered equipment contain more $NO_X$, $SO_X$, and particulate matter than gasoline-powered engines. However, diesel-powered engines generally produce less CO and less ROG than do gasoline-powered engines. Standard construction equipment includes tractors/loaders/backhoes, rubber-tired dozers, excavators, graders, cranes, forklifts, rollers, paving equipment, generator sets, welders, cement and mortar mixers, and air compressors. Due to the small size of the project site, only a minimal amount of heavy construction equipment would be used. However, as a conservative analysis, default CalEEMod construction equipment types and amounts were modeled.

Primary inputs are the numbers of each piece of equipment and the length of each construction stage. Specific construction phasing and equipment parameters are not available at this time. However, CalEEMod can estimate the required construction equipment when project-specific information is unavailable. The estimates are based on surveys, performed by the South Coast Air Quality Management District and the Sacramento Metropolitan Air Quality Management District, of typical construction projects which provide a basis for scaling equipment needs and schedule with a project's size. Air emission estimates in CalEEMod are based on the duration of construction phases; construction equipment type, quantity, and usage; grading area; season; and ambient temperature, among other parameters.

Construction emissions were modeled assuming construction of Phase 1 would begin in July 2024 and would include the following CalEEMod default phases: site preparation, grading, building construction, and architectural coatings. Grading for Phase 1 would require the import of 4,520 cubic yards of soil. The exact timing of Phase 2 is not known at this time. Phase 2 construction emissions were modeled beginning as soon as July 2025. This is conservative since construction equipment is cleaner over time with continued implementation of regulations for off-road equipment, therefore, if Phase 2 construction were to begin later than 2025, emissions would be less than those modeled in this analysis. Phase 2 construction emissions were modeled for the following phases: site preparation, building construction, paving, and architectural coatings. Building demolition and site grading would not be required for Phase 2. Default construction phase durations and construction equipment were modeled.

Table 4 summarizes the modeled construction parameters.

Table 4
Construction Phases and Equipment

| Equipment | Quantity | Daily Operation Time (Hours) |
|---|---|---|
| PHASE 1 | | |
| Site Preparation (10 days) | | |
| Rubber Tired Dozers | 3 | 8 |
| Tractors/Loaders/Backhoes | 4 | 8 |
| Grading (20 days) | | |
| Excavators | 1 | 8 |
| Graders | 1 | 8 |
| Rubber Tired Dozers | 1 | 8 |
| Tractors/Loaders/Backhoes | 3 | 8 |
| Paving (20 days) | | |
| Pavers | 2 | 8 |
| Paving Equipment | 2 | 8 |
| Rollers | 2 | 8 |
| Architectural Coatings (20 days) | | |
| Air Compressor | 1 | 6 |

| Table 4<br>Construction Phases and Equipment | | |
|---|---|---|
| Equipment | Quantity | Daily Operation Time (Hours) |
| PHASE 2 | | |
| Site Preparation (10 days) | | |
| Rubber Tired Dozers | 3 | 8 |
| Tractors/Loaders/Backhoes | 4 | 8 |
| Building Construction (230 days) | | |
| Cranes | 1 | 7 |
| Forklifts | 3 | 8 |
| Generator Sets | 1 | 8 |
| Tractors/Loaders/Backhoes | 3 | 7 |
| Welders | 1 | 8 |
| Paving (20 days) | | |
| Pavers | 2 | 8 |
| Paving Equipment | 2 | 8 |
| Rollers | 2 | 8 |
| Architectural Coatings (20 days) | | |
| Air Compressor | 1 | 6 |
| NOTE: Each phase would also include vehicles associated with work commutes, dump trucks for hauling, and trucks for deliveries. | | |

Table 5 shows the total projected construction maximum daily emission levels for each criteria pollutant. The CalEEMod output files for construction emissions for Phases 1 and 2 are contained in Attachments 1 and 2, respectively.

| Table 5<br>Summary of Maximum Construction Emissions<br>(pounds per day) | | | | | | |
|---|---|---|---|---|---|---|
| Construction | Pollutant | | | | | |
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| PHASE 1 | | | | | | |
| Site Preparation | 4 | 36 | 34 | <1 | 9 | 5 |
| Grading | <1 | 1 | 1 | <1 | <1 | <1 |
| Paving | <1 | <1 | 1 | <1 | <1 | <1 |
| Architectural Coatings | 3 | 1 | 1 | <1 | <1 | <1 |
| **Phase 1 Maximum Daily Emissions** | **4** | **36** | **34** | **<1** | **9** | **5** |
| *Significance Threshold* | *250* | *250* | *550* | *250* | *100* | *67* |
| PHASE 2 | | | | | | |
| Site Preparation | 3 | 32 | 31 | <1 | 9 | 5 |
| Building Construction | 1 | 11 | 16 | <1 | 1 | 1 |
| Paving | 1 | 7 | 11 | <1 | <1 | <1 |
| Architectural Coatings | 34 | 1 | 2 | <1 | <1 | <1 |
| **Phase 2 Maximum Daily Emissions** | **34** | **32** | **31** | **<1** | **9** | **5** |
| *Significance Threshold* | *250* | *250* | *550* | *250* | *100* | *67* |

Standard dust control measures would be implemented as a part of project construction in accordance with SDAPCD rules and regulations. Fugitive dust emissions were calculated using CalEEMod default values and did not take into account the required dust control measures. Thus, the emissions shown in Table 5 are conservative.

For assessing the significance of the air quality emissions resulting during construction of the project, the construction emissions were compared to the screening thresholds shown in Table 5. As shown in Table 5, maximum daily construction emissions associated with the project are projected to be less than the applicable thresholds for all criteria pollutants. Construction-related air quality impacts would be less than significant.

## 4.2 Operational Emissions

### 4.2.1 Mobile Emissions

Mobile emissions are calculated based on the vehicle type and the trip rate. Mobile-source emissions were modeled using Institute of Transportation Engineers (ITE) Trip Generation Manual, 11$^{th}$ Edition trip generation rates. Based on the ITE Trip Generation Manual, 11$^{th}$ Edition, RV storage land uses generate 0.1796 trip per parking space and self-storage land uses generate 1.45 trips per 1,000 square feet. Based on these trip generation rates, Phase 1 would generate 32 daily trips and Phase 2 would generate 213 daily trips. CalEEMod default trip lengths were modeled utilizing default vehicle emission factors based on CARB's 2021 Emissions Factor model.

### 4.2.2 Energy Source Emissions

Energy source emissions associated with the project include natural gas used in space and water heating. Combustion of any type of fuel, including natural gas, emits criteria pollutants directly into the atmosphere. When this occurs within buildings, it is considered a direct emission source associated with that building. CalEEMod uses the California Commercial End Use Survey database to develop energy intensity values (electricity and natural gas usage per square foot per year) for non-residential buildings. Energy source emissions were modeled using CalEEMod default values.

### 4.2.3 Area Source Emissions

Area source emissions associated with the project include consumer products, architectural coatings, and landscaping equipment. Consumer products are chemically formulated products used by household and institutional consumers, including but not limited to detergents, cleaning compounds, polishes, floor finishes, disinfectants, sanitizers, and aerosol paints but do not include other paint products, furniture coatings, or architectural coatings.

For architectural coatings, emissions result from evaporation of solvents contained in surface coatings such as in paints and primers. Emission estimates are based on the building square footage and parking lot surface area, architectural coating emission factors, and a reapplication rate of 10 percent of area per year. Architectural coatings would comply with SDAPCD Rule 67.0.1, which limits the VOC content of paints sold within the county.

Landscaping maintenance includes fuel combustion emission from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers as well as air compressors, generators, and pumps. Emission calculations take into account building area, equipment emission factors, and the number of operational days (summer days).

### 4.2.4 Total Operational Emissions

Using the parameters discussed above, operational emissions associated with the project were calculated. Daily operational emissions are summarized in Table 6. The CalEEMod output files for Phases 1 and 2 are contained in Attachments 1 and 2, respectively.

Table 6
Summary of Project Operational Emissions
(pounds per day)

| Source | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| PHASE 1 | | | | | | |
| Mobile | <1 | <1 | 1 | <1 | <1 | <1 |
| Area | <1 | <1 | <1 | <1 | <1 | <1 |
| Energy | <1 | <1 | <1 | <1 | <1 | <1 |
| **Phase 1 Total** | **<1** | **<1** | **1** | **<1** | **<1** | **<1** |
| *Significance Threshold* | *250* | *250* | *550* | *250* | *100* | *67* |
| PHASE 2 | | | | | | |
| Mobile | 1 | <1 | 6 | <1 | 1 | <1 |
| Area | 4 | <1 | 6 | <1 | <1 | <1 |
| Energy | <1 | <1 | <1 | <1 | <1 | <1 |
| **Phase 2 Total** | **5** | **1** | **12** | **<1** | **1** | **<1** |
| *Significance Threshold* | *250* | *250* | *550* | *250* | *100* | *67* |

As shown in Table 6, maximum daily operational emissions associated with the project are projected to be less than the applicable thresholds for all criteria pollutants. Operation related air quality impacts would be less than significant.

## 5.0 Air Quality Impact Analysis

1. *Would the project conflict with or obstruct the implementation of the RAQS and/or applicable portions of the SIP?*

Project consistency is based on whether the project would conflict with or obstruct implementation of the RAQS and/or applicable portions of the SIP, which would lead to increases in the frequency or severity of existing air quality violations.

The RAQS is the applicable regional air quality plan that sets forth the SDAPCD's strategies for achieving the NAAQS and CAAQS. The SDAB is designated a non-attainment area for the federal and state ozone standard. Accordingly, the RAQS was developed to identify feasible emission control measures and provide expeditious progress toward attaining the standards for ozone. The two pollutants addressed in the RAQS are ROG and $NO_X$, which are precursors to the formation of ozone. Projected increases in motor vehicle usage, population, and growth create challenges in controlling emissions and, by extension, to maintaining and improving air quality. The RAQS was most recently adopted in 2022 (SDAPCD 2022).

The growth projections used by the SDAPCD to develop the RAQS emissions budgets are based on the population, vehicle trends, and land use plans developed in general plans and used by SANDAG in the development of the regional transportation plans and sustainable communities strategy. As such, projects that propose development that is consistent with the growth anticipated by SANDAG's growth projections and/or the General Plan would not conflict with the RAQS. In the event that a project would propose development that is less dense than anticipated by the growth projections, the project would likewise be consistent with the RAQS. In the event a project proposes development that is greater than anticipated in the growth projections, further analysis would be warranted to determine if the project would exceed the growth projections used in the RAQS for the specific subregional area.

The project site was evaluated as a part of the City's Housing Element Rezone Program Implementation Environmental Impact Report (EIR) (City of Santee 2022). The project site is not identified as a housing site in the Housing Element; however, it was included in the analysis because it was designated as R-14 (Medium Density Residential) and was redesignated as General Commercial (GC) as a part of the Rezone Program. This is because the project site was previously identified as a housing site, but due to airport constraints it would be difficult for future residential development. The Housing Element Rezone Program was developed concurrently with the recent updates to the 2022 RAQS; therefore, the 2022 RAQS would have been based on the previous R-14 (Medium Density Residential) designation. With a designation of R-14 (Medium Density Residential), the project site could have been developed with 70 residential units. Using an ITE trip generation rate of 5.44 trips per unit, a hypothetical residential project would have generated 381 daily trips. As discussed, Phase 1 would generate 32 daily trips and Phase 2 would generate 213 daily trips which is less than the trips that would have been generated by a residential project. Therefore, the project would generate fewer emissions than what is accounted for in the 2022 RAQS and would not exceed the growth assumptions used in the 2022 RAQS. Furthermore, as shown in Table 6 above, project emissions would not exceed the applicable significance thresholds for any criteria pollutants. Therefore, the project would not obstruct or conflict with implementation of the 2022 RAQS, and impacts would be less than significant.

2. *Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard ($PM_{10}$, $PM_{2.5}$, or exceed quantitative thresholds for ozone precursors: $NO_x$ and ROG)?*

The region is classified as an attainment area for all criterion pollutants except ozone, $PM_{10}$, and $PM_{2.5}$. The SDAB is a non-attainment area for the 8-hour federal and state ozone standards. Ozone is not emitted directly, but is a result of atmospheric activity on precursors. $NO_X$ and ROG are known as the chief "precursors" of ozone. These compounds react in the presence of sunlight to produce ozone. $PM_{2.5}$ includes fine particles that are found in smoke and haze and are emitted from all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. $PM_{10}$ includes both fine and coarse dust particles, and sources include crushing or grinding operations and dust from paved or unpaved roads.

As shown in Table 5 above, project construction would not exceed the applicable regional emissions thresholds, which are designed to provide limits below which project emissions would not significantly change regional air quality. Therefore, project construction would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and impacts would be less than significant.

Long-term emissions of regional air pollutants occur from operational sources. As shown in Table 6 above, the project's daily operational emissions would not exceed the applicable regional emissions thresholds for any pollutant. These thresholds align with attainment of the NAAQS which were developed to protect the public health, specifically the health of "sensitive" populations, including asthmatics, children, and the elderly. Consequently, project operation would not impact any sensitive populations. Therefore, project operation would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and impacts would be less than significant.

3. *Would the project expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, day-care centers and project residents) to substantial pollutant concentrations?*

Sensitive land uses include schools and schoolyards, parks and playgrounds, day care centers, nursing homes, hospitals, and residential communities. Surrounding land uses include single family residential uses to the east and multi-family residential to the north and south.

## Carbon Monoxide Hot Spots

Localized CO concentration is a direct function of motor vehicle activity at signalized intersections (e.g., idling time and traffic flow conditions), particularly during peak commute hours and meteorological conditions. The SDAB is a CO maintenance area under the federal CAA. This means that SDAB was previously a non-attainment area and is currently implementing a 10-year plan for continuing to meet and maintain air quality standards.

Due to increased requirements for cleaner vehicles, equipment, and fuels, CO levels in the state have dropped substantially. All air basins are attainment or maintenance areas for CO. Therefore, more recent screening procedures based on more current methodologies have been developed. The Sacramento Metropolitan Air Quality Management District developed a screening threshold in 2011, which states that any project involving an intersection experiencing 31,600 vehicles per hour or more will require detailed analysis. In addition, the Bay Area Air Quality Management District developed a screening threshold in 2010 which states that any project involving an intersection experiencing 44,000 vehicles per hour would require detailed analysis. This analysis conservatively assesses potential CO hot spots using the Sacramento Metropolitan Air Quality Management District screening threshold of 31,600 vehicles per hour.

Based on SANDAG daily roadway segment traffic projections, Graves Avenue is projected to carry 8,400 Average Daily Traffic (ADT) and the two nearest intersecting roadways, Prospect Avenue and Pepper Drive, are projected to carry 18,400 and 7,700 ADT, respectively (SANDAG 2023). Peak hour volume equals approximately 10 percent of the daily roadway segment volume. Based on these parameters, intersections in the vicinity of the project site are projects well less than 31,600 vehicles per hour. Therefore, the project would not generate a CO hot spot that could expose sensitive receptors to substantial pollutant concentration, and impacts would be less than significant.

## Diesel Particulate Matter – Construction

Construction of the project and associated infrastructure would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Construction of the project would result in the generation of diesel-exhaust DPM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities and on-road diesel equipment used to bring materials to and from the project site.

Generation of DPM from construction projects typically occurs in a single area for a short period. Construction is anticipated to last for approximately 16 months for both Phases 1 and 2. The dose to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the Maximally Exposed Individual. The risks estimated for a Maximally Exposed Individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (OEHHA 2015). Thus, if the duration of proposed construction activities near any specific sensitive receptor were 16 months, the exposure would be less than 4 percent of the total 30-year exposure period (1.33 years divided by 30 years) used for health risk calculation. Because construction of the project would be short term (16 months), project construction would not expose nearby residents to substantial pollutant concentrations, and impacts would be less than significant.

4. *Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*

The potential for an odor impact is dependent on a number of variables, including the nature of the odor source, distance between the receptor and odor source, and local meteorological conditions. During construction, construction equipment may generate some nuisance odors. Sensitive receptors near the project site include residential uses; however, exposure to odors associated with project construction would be short term and temporary in nature (16 months), and only a minimal amount of construction equipment would be required. Therefore, project construction would not generate other emissions (such as those leading to odors) adversely affecting a substantial number of people, and impacts would be less than significant.

The following list provides some common types of facilities that are known producers of objectionable odors (Bay Area Air Quality Management District 2017). This list of facilities is not meant to be all-inclusive.

- Wastewater Treatment Plant
- Wastewater Pumping Facilities
- Sanitary Landfill
- Transfer Station
- Composting Facility
- Petroleum Refinery
- Asphalt Batch Plant
- Chemical Manufacturing
- Fiberglass Manufacturing
- Painting/Coating Operations
- Rendering Plant
- Coffee Roaster
- Food Processing Facility
- Confined Animal Facility/Feed Lot/Dairy
- Green Waste and Recycling Operations
- Metal Smelting Plants

The project does not include any of these uses that are typically associated with odor complaints. The project does not propose any uses or activities that would result in potentially significant operational-source odor impacts. Therefore, project operation would not generate other emissions (such as those leading to odors) adversely affecting a substantial number of people, and impacts would be less than significant.

## 6.0 Conclusions

The primary goal of the RAQS is to reduce ozone precursor emissions. The project site was designated as General Commercial as a part of the Housing Element Rezone Program. The project would be consistent with this designation. Additionally, the project would generate fewer emissions than a residential project that would be consistent with the previous R-14 (Medium Density Residential) designation for the project site. Therefore, the project would generate fewer emissions than what is accounted for in the RAQS and would not exceed the growth assumptions used in the RAQS. Furthermore, as shown in Table 6, project emissions would not exceed the applicable significance thresholds for any criteria pollutants. Therefore, the project would not obstruct or conflict with the implementation of the RAQS, and impacts would be less than significant.

As shown in Table 5 above, project construction emissions would not exceed the applicable regional emissions thresholds, which are designed to provide limits below which project emissions would not significantly change regional air quality. Therefore, project construction would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and impacts would be less than significant. Additionally, construction emissions would be temporary, intermittent, and would cease at the end of project construction.

Long-term emissions of regional air pollutants occur from operational sources. As shown in Table 6 above, project operational emissions would not exceed the applicable regional emissions thresholds. Therefore, project operation would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and impacts would be less than significant.

Sensitive land uses include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities. Residential uses are located adjacent to the project site. The project is not anticipated to result in a CO hot spot at project area intersections. Construction of the project and associated infrastructure would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. However, because construction of the project would be short term (16 months), project construction is not anticipated to result in the exposure of nearby residents to substantial pollutant concentrations. Therefore, the project would not expose sensitive receptors to substantial pollutant concentrations during construction or operation, and impacts would be less than significant.

The project does not include heavy industrial or agricultural uses that are typically associated with objectionable odors. The project would involve the use of diesel-powered construction equipment. Diesel exhaust may be noticeable temporarily at adjacent properties; however, construction activities would be temporary and only a minimal amount of construction equipment would be required. Therefore, the project would not generate other emissions (such as those leading to odors) adversely affecting a substantial number of people, and impacts would be less than significant.

If you have any questions about the results of this analysis, please contact me at jfleming@reconenvironmental.com or (619) 308-9333 extension 177.

Sincerely,

Jessica Fleming

Jessica Fleming
Senior Air Quality Specialist

JLF:jg

Attachments

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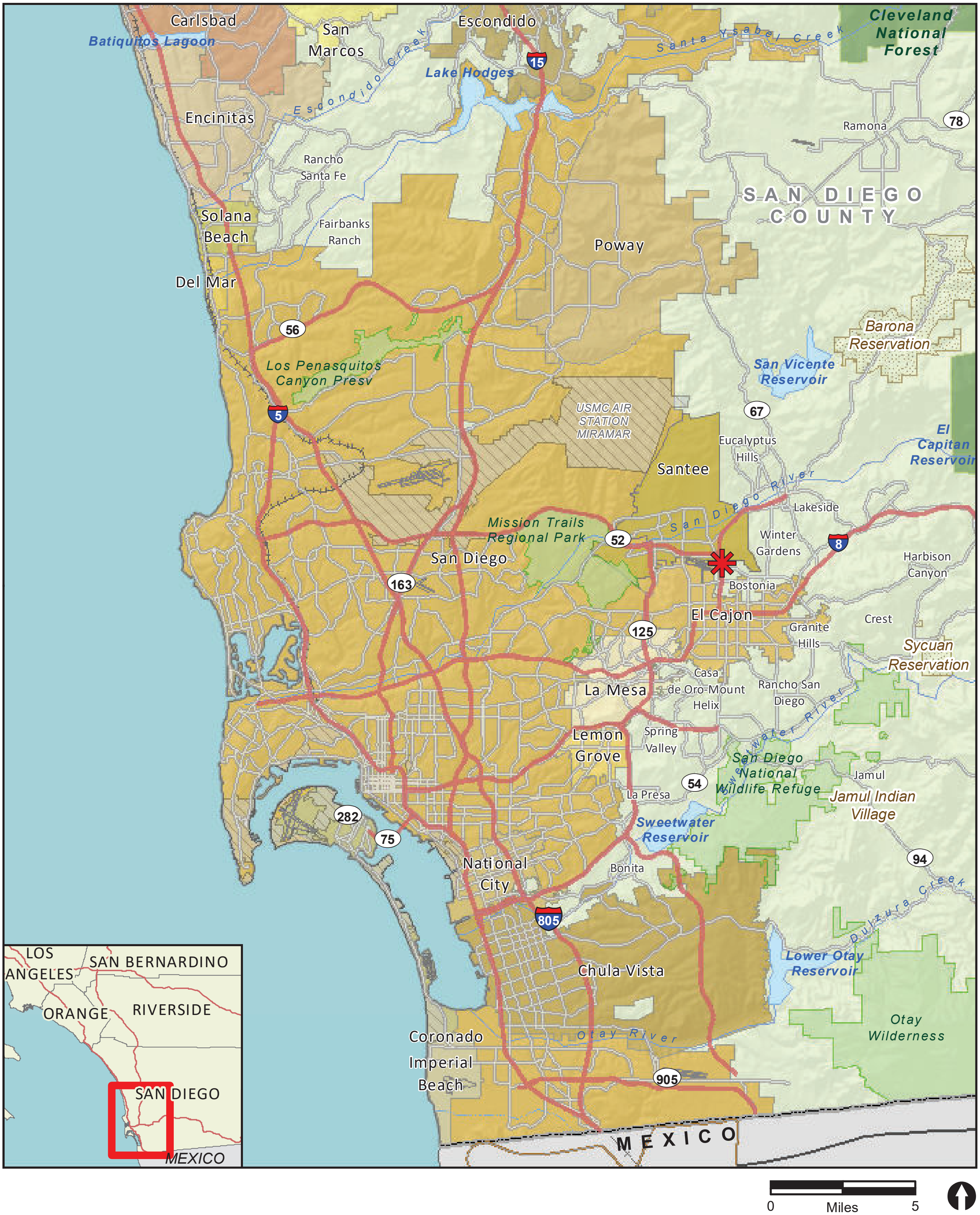


Project Location

RECON

M:\JOBS6\10396\common_gis\MXD\fig1.mxd 08/02/2023 bma

FIGURE 1
Regional Location

Image Source: NearMap (flown June 2023)


Project Boundary

FIGURE 2
Project Location on Aerial Photograph

RECON

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Map Source: Omega Engineering Consultants

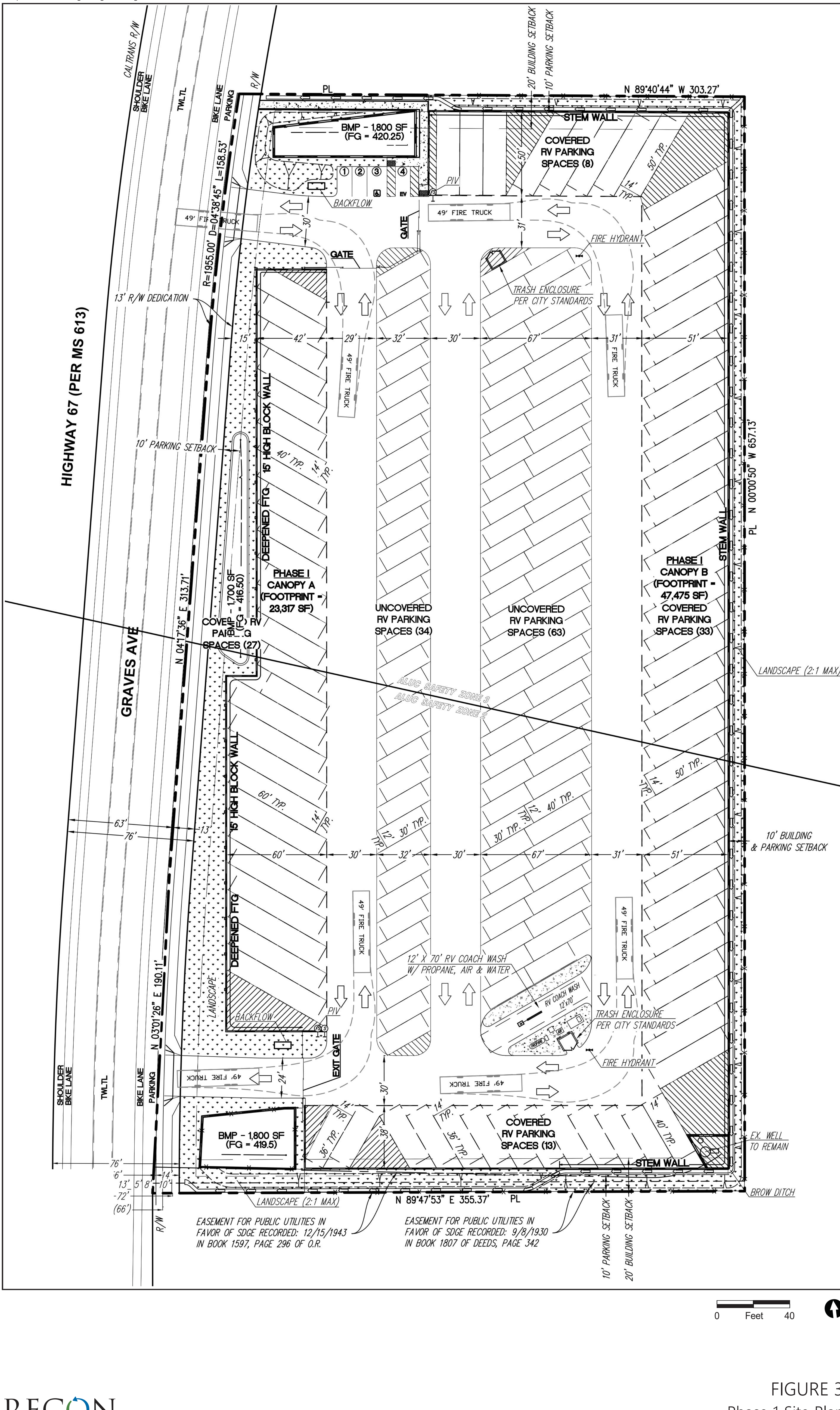


FIGURE 3
Phase 1 Site Plan

Map Source: Omega Engineering Consultants

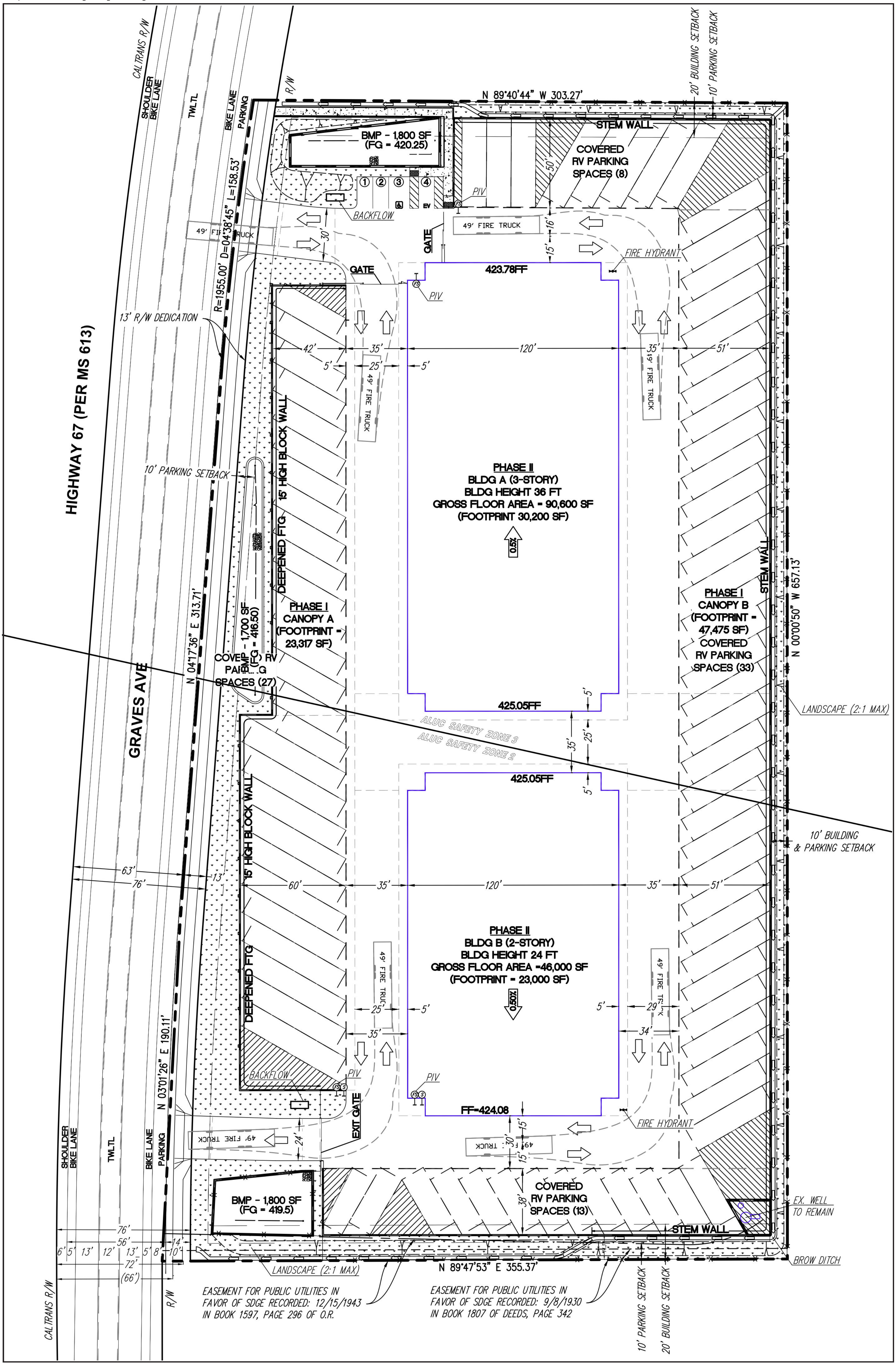


FIGURE 4
Phase 2 Site Plan

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# ATTACHMENTS

# ATTACHMENT 1

CalEEMod Output – Phase 1

# 8355 Graves Avenue Phase 1 Detailed Report

## Table of Contents

# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | 8355 Graves Avenue Phase 1 |
| Construction Start Date | 7/1/2024 |
| Operational Year | 2025 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 8.00 |
| Location | 8355 Graves Ave, Santee, CA 92071, USA |
| County | San Diego |
| City | Santee |
| Air District | San Diego County APCD |
| Air Basin | San Diego |
| TAZ | 6539 |
| EDFZ | 12 |
| Electric Utility | San Diego Gas & Electric |
| Gas Utility | San Diego Gas & Electric |
| App Version | 2022.1.1.14 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | 5.04 | Acre | 5.04 | 0.00 | 27,387 | 0.00 | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 4.42 | 3.72 | 36.0 | 33.8 | 0.05 | 1.60 | 7.81 | 9.41 | 1.47 | 3.97 | 5.45 | — | 5,465 | 5,465 | 0.24 | 0.36 | 4.97 | 5,486 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.17 | 3.19 | 0.91 | 1.15 | < 0.005 | 0.03 | 0.00 | 0.03 | 0.03 | 0.00 | 0.03 | — | 134 | 134 | 0.01 | < 0.005 | 0.00 | 134 |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.33 | 0.47 | 2.63 | 2.69 | < 0.005 | 0.11 | 0.41 | 0.52 | 0.11 | 0.19 | 0.30 | — | 529 | 529 | 0.02 | 0.02 | 0.14 | 536 |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.06 | 0.09 | 0.48 | 0.49 | < 0.005 | 0.02 | 0.07 | 0.10 | 0.02 | 0.04 | 0.05 | — | 87.6 | 87.6 | < 0.005 | < 0.005 | 0.02 | 88.8 |
| Exceeds (Daily Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Threshold | — | 250 | 250 | 550 | 250 | — | — | 100 | — | — | 67.0 | — | — | — | — | — | — | — |
| Unmit. | — | No | No | No | No | — | — | No | — | — | No | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exceeds (Average Daily) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Threshold | — | 250 | 250 | 550 | 250 | — | — | 100 | — | — | 67.0 | — | — | — | — | — | — | — |
| Unmit. | — | No | No | No | No | — | — | No | — | — | No | — | — | — | — | — | — | — |

## 2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2024 | 4.42 | 3.72 | 36.0 | 33.8 | 0.05 | 1.60 | 7.81 | 9.41 | 1.47 | 3.97 | 5.45 | — | 5,465 | 5,465 | 0.24 | 0.36 | 4.97 | 5,486 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2024 | 0.17 | 3.19 | 0.91 | 1.15 | < 0.005 | 0.03 | 0.00 | 0.03 | 0.03 | 0.00 | 0.03 | — | 134 | 134 | 0.01 | < 0.005 | 0.00 | 134 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2024 | 0.33 | 0.47 | 2.63 | 2.69 | < 0.005 | 0.11 | 0.41 | 0.52 | 0.11 | 0.19 | 0.30 | — | 529 | 529 | 0.02 | 0.02 | 0.14 | 536 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2024 | 0.06 | 0.09 | 0.48 | 0.49 | < 0.005 | 0.02 | 0.07 | 0.10 | 0.02 | 0.04 | 0.05 | — | 87.6 | 87.6 | < 0.005 | < 0.005 | 0.02 | 88.8 |

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unmit. | 0.14 | 0.17 | 0.09 | 0.89 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | 0.00 | 211 | 211 | 0.01 | 0.01 | 0.75 | 214 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.14 | 0.16 | 0.10 | 0.85 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | 0.00 | 202 | 202 | 0.01 | 0.01 | 0.02 | 204 |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.14 | 0.16 | 0.10 | 0.85 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | 0.00 | 203 | 203 | 0.01 | 0.01 | 0.33 | 206 |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.03 | 0.03 | 0.02 | 0.15 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | 0.00 | 33.6 | 33.6 | < 0.005 | < 0.005 | 0.05 | 34.1 |
| Exceeds (Daily Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Threshold | — | 250 | 250 | 550 | 250 | — | — | 100 | — | — | 67.0 | — | — | — | — | — | — | — |
| Unmit. | — | No | No | No | No | — | — | No | — | — | No | — | — | — | — | — | — | — |
| Exceeds (Average Daily) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Threshold | — | 250 | 250 | 550 | 250 | — | — | 100 | — | — | 67.0 | — | — | — | — | — | — | — |
| Unmit. | — | No | No | No | No | — | — | No | — | — | No | — | — | — | — | — | — | — |

## 2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 0.14 | 0.13 | 0.09 | 0.89 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | — | 207 | 207 | 0.01 | 0.01 | 0.75 | 211 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Energy | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 3.50 | 3.50 | < 0.005 | < 0.005 | — | 3.52 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.14 | 0.17 | 0.09 | 0.89 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | 0.00 | 211 | 211 | 0.01 | 0.01 | 0.75 | 214 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 0.14 | 0.13 | 0.10 | 0.85 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | — | 198 | 198 | 0.01 | 0.01 | 0.02 | 201 |
| Area | — | 0.03 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Energy | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 3.50 | 3.50 | < 0.005 | < 0.005 | — | 3.52 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.14 | 0.16 | 0.10 | 0.85 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | 0.00 | 202 | 202 | 0.01 | 0.01 | 0.02 | 204 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 0.14 | 0.13 | 0.10 | 0.85 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | — | 199 | 199 | 0.01 | 0.01 | 0.33 | 203 |
| Area | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Energy | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 3.50 | 3.50 | < 0.005 | < 0.005 | — | 3.52 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.14 | 0.16 | 0.10 | 0.85 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | 0.00 | 203 | 203 | 0.01 | 0.01 | 0.33 | 206 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 0.03 | 0.02 | 0.02 | 0.15 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 33.0 | 33.0 | < 0.005 | < 0.005 | 0.05 | 33.5 |
| Area | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Energy | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.58 | 0.58 | < 0.005 | < 0.005 | — | 0.58 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.03 | 0.03 | 0.02 | 0.15 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | 0.00 | 33.6 | 33.6 | < 0.005 | < 0.005 | 0.05 | 34.1 |

# 3. Construction Emissions Details

## 3.1. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 4.34 | 3.65 | 36.0 | 32.9 | 0.05 | 1.60 | — | 1.60 | 1.47 | — | 1.47 | — | 5,296 | 5,296 | 0.21 | 0.04 | — | 5,314 |
| Dust From Material Movement | — | — | — | — | — | — | 7.67 | 7.67 | — | 3.94 | 3.94 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.12 | 0.10 | 0.99 | 0.90 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 145 | 145 | 0.01 | < 0.005 | — | 146 |
| Dust From Material Movement | — | — | — | — | — | — | 0.21 | 0.21 | — | 0.11 | 0.11 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.18 | 0.16 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 24.0 | 24.0 | < 0.005 | < 0.005 | — | 24.1 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | — | 0.04 | 0.04 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.06 | 0.86 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.03 | 0.03 | — | 169 | 169 | 0.01 | 0.01 | 0.68 | 172 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 4.42 | 4.42 | < 0.005 | < 0.005 | 0.01 | 4.48 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.73 | 0.73 | < 0.005 | < 0.005 | < 0.005 | 0.74 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.3. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 2.26 | 1.90 | 18.2 | 18.8 | 0.03 | 0.84 | — | 0.84 | 0.77 | — | 0.77 | — | 2,958 | 2,958 | 0.12 | 0.02 | — | 2,969 |
| Dust From Material Movement | — | — | — | — | — | — | 2.77 | 2.77 | — | 1.34 | 1.34 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.12 | 0.10 | 1.00 | 1.03 | < 0.005 | 0.05 | — | 0.05 | 0.04 | — | 0.04 | — | 162 | 162 | 0.01 | < 0.005 | — | 163 |
| Dust From Material Movement | — | — | — | — | — | — | 0.15 | 0.15 | — | 0.07 | 0.07 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.18 | 0.19 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 26.8 | 26.8 | < 0.005 | < 0.005 | — | 26.9 |
| Dust From Material Movement | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.05 | 0.74 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 145 | 145 | 0.01 | 0.01 | 0.58 | 147 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.16 | 0.04 | 2.75 | 0.98 | 0.01 | 0.04 | 0.52 | 0.55 | 0.04 | 0.14 | 0.18 | — | 2,043 | 2,043 | 0.11 | 0.33 | 4.39 | 2,148 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.58 | 7.58 | < 0.005 | < 0.005 | 0.01 | 7.69 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.16 | 0.05 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 112 | 112 | 0.01 | 0.02 | 0.10 | 118 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.25 | 1.25 | < 0.005 | < 0.005 | < 0.005 | 1.27 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | < 0.005 | 0.03 | 0.01 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 18.5 | 18.5 | < 0.005 | < 0.005 | 0.02 | 19.5 |

## 3.5. Paving (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.01 | 0.85 | 7.81 | 10.0 | 0.01 | 0.39 | — | 0.39 | 0.36 | — | 0.36 | — | 1,512 | 1,512 | 0.06 | 0.01 | — | 1,517 |
| Paving | — | 0.66 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.05 | 0.43 | 0.55 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 82.8 | 82.8 | < 0.005 | < 0.005 | — | 83.1 |
| Paving | — | 0.04 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.08 | 0.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 13.7 | 13.7 | < 0.005 | < 0.005 | — | 13.8 |
| Paving | — | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.05 | 0.74 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 145 | 145 | 0.01 | 0.01 | 0.58 | 147 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.58 | 7.58 | < 0.005 | < 0.005 | 0.01 | 7.69 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.25 | 1.25 | < 0.005 | < 0.005 | < 0.005 | 1.27 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.7. Architectural Coating (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.17 | 0.14 | 0.91 | 1.15 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | — | 3.06 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.17 | 0.14 | 0.91 | 1.15 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | — | 3.06 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.01 | 0.01 | 0.05 | 0.06 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 7.32 | 7.32 | < 0.005 | < 0.005 | — | 7.34 |
| Architectural Coatings | — | 0.17 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.21 | 1.21 | < 0.005 | < 0.005 | — | 1.22 |
| Architectural Coatings | — | 0.03 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.14 | 0.13 | 0.09 | 0.89 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | — | 207 | 207 | 0.01 | 0.01 | 0.75 | 211 |
| Total | 0.14 | 0.13 | 0.09 | 0.89 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | — | 207 | 207 | 0.01 | 0.01 | 0.75 | 211 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.14 | 0.13 | 0.10 | 0.85 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | — | 198 | 198 | 0.01 | 0.01 | 0.02 | 201 |
| Total | 0.14 | 0.13 | 0.10 | 0.85 | < 0.005 | < 0.005 | 0.17 | 0.17 | < 0.005 | 0.04 | 0.05 | — | 198 | 198 | 0.01 | 0.01 | 0.02 | 201 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.03 | 0.02 | 0.02 | 0.15 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 33.0 | 33.0 | < 0.005 | < 0.005 | 0.05 | 33.5 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 0.03 | 0.02 | 0.02 | 0.15 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 33.0 | 33.0 | < 0.005 | < 0.005 | 0.05 | 33.5 |

## 4.2. Energy

### 4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |

### 4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |

## 4.3. Area Emissions by Source

### 4.3.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | — | 0.02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architectural Coatings | — | 0.02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | — | 0.02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | — | 0.02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | 0.03 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | — | < 0.005 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | — | < 0.005 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |

# 4.4. Water Emissions by Land Use

## 4.4.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 3.50 | 3.50 | < 0.005 | < 0.005 | — | 3.52 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 3.50 | 3.50 | < 0.005 | < 0.005 | — | 3.52 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 3.50 | 3.50 | < 0.005 | < 0.005 | — | 3.52 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 3.50 | 3.50 | < 0.005 | < 0.005 | — | 3.52 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.58 | 0.58 | < 0.005 | < 0.005 | — | 0.58 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.58 | 0.58 | < 0.005 | < 0.005 | — | 0.58 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequest ered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Remove d | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequest ered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Remove d | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequest ered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Site Preparation | Site Preparation | 7/1/2024 | 7/12/2024 | 5.00 | 10.0 | — |
| Grading | Grading | 7/16/2024 | 8/12/2024 | 5.00 | 20.0 | — |
| Paving | Paving | 8/13/2024 | 9/9/2024 | 5.00 | 20.0 | — |
| Architectural Coating | Architectural Coating | 9/10/2024 | 10/7/2024 | 5.00 | 20.0 | — |

## 5.2. Off-Road Equipment

### 5.2.1. Unmitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | Diesel | Average | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | Diesel | Average | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Graders | Diesel | Average | 1.00 | 8.00 | 148 | 0.41 |
| Grading | Excavators | Diesel | Average | 1.00 | 8.00 | 36.0 | 0.38 |
| Grading | Tractors/Loaders/Backhoes | Diesel | Average | 3.00 | 8.00 | 84.0 | 0.37 |
| Grading | Rubber Tired Dozers | Diesel | Average | 1.00 | 8.00 | 367 | 0.40 |
| Paving | Pavers | Diesel | Average | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Average | 2.00 | 8.00 | 89.0 | 0.36 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Paving | Rollers | Diesel | Average | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Average | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.1. Unmitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 12.0 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 7.63 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 15.0 | 12.0 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 7.63 | HHDT,MHDT |
| Grading | Hauling | 27.9 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 12.0 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 7.63 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 0.00 | 12.0 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 7.63 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |
| Architectural Coating | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

## 5.5. Architectural Coatings

| Phase Name | Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|---|
| Architectural Coating | 0.00 | 0.00 | 0.00 | 0.00 | 13,183 |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (Cubic Yards) | Material Exported (Cubic Yards) | Acres Graded (acres) | Material Demolished (sq. ft.) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Site Preparation | 0.00 | 0.00 | 15.0 | 0.00 | — |
| Grading | 4,450 | 0.00 | 20.0 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 5.04 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 2 | 61% | 61% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Other Asphalt Surfaces | 5.04 | 100% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2024 | 0.00 | 589 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.1. Unmitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | 32.0 | 32.0 | 32.0 | 11,672 | 244 | 244 | 244 | 89,103 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.1. Unmitigated

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 0 | 0.00 | 0.00 | 0.00 | 13,183 |

### 5.10.3. Landscape Equipment

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 180 |

## 5.11. Operational Energy Consumption

### 5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.00 | 589 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.1. Unmitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Other Asphalt Surfaces | 0.00 | 409,276 |

## 5.13. Operational Waste Generation

### 5.13.1. Unmitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Other Asphalt Surfaces | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.1. Unmitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|

## 5.15. Operational Off-Road Equipment

### 5.15.1. Unmitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|
| — | — |

## 5.18. Vegetation

### 5.18.1. Land Use Change

#### 5.18.1.1. Unmitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

#### 5.18.1.1. Unmitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

#### 5.18.2.1. Unmitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 12.4 | annual days of extreme heat |
| Extreme Precipitation | 3.90 | annual days with precipitation above 20 mm |
| Sea Level Rise | 0.00 | meters of inundation depth |
| Wildfire | 7.98 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 1 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | N/A | N/A | N/A | N/A |

| | | | | |
|---|---|---|---|---|
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | 0 | 0 | 0 | N/A |
| Drought | 0 | 0 | 0 | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 1 | 1 | 1 | 2 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | N/A | N/A | N/A | N/A |
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | 1 | 1 | 1 | 2 |
| Drought | 1 | 1 | 1 | 2 |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

## 6.4. Climate Risk Reduction Measures

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 65.7 |
| AQ-PM | 44.3 |
| AQ-DPM | 53.7 |
| Drinking Water | 64.1 |
| Lead Risk Housing | 24.1 |
| Pesticides | 0.00 |
| Toxic Releases | 29.0 |
| Traffic | 70.3 |
| Effect Indicators | — |
| CleanUp Sites | 18.7 |
| Groundwater | 85.9 |
| Haz Waste Facilities/Generators | 65.2 |
| Impaired Water Bodies | 83.0 |
| Solid Waste | 14.7 |
| Sensitive Population | — |
| Asthma | 16.1 |
| Cardio-vascular | 6.61 |
| Low Birth Weights | 51.8 |
| Socioeconomic Factor Indicators | — |
| Education | 32.9 |
| Housing | 40.3 |
| Linguistic | 22.2 |
| Poverty | 29.2 |

| | |
|---|---|
| Unemployment | 43.1 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 69.57525985 |
| Employed | 83.06172206 |
| Median HI | 68.81817015 |
| Education | — |
| Bachelor's or higher | 46.15680739 |
| High school enrollment | 100 |
| Preschool enrollment | 34.72346978 |
| Transportation | — |
| Auto Access | 52.9449506 |
| Active commuting | 7.134607982 |
| Social | — |
| 2-parent households | 88.72064673 |
| Voting | 78.04439882 |
| Neighborhood | — |
| Alcohol availability | 68.63852175 |
| Park access | 17.96484024 |
| Retail density | 11.62581804 |
| Supermarket access | 2.399589375 |
| Tree canopy | 20.03079687 |
| Housing | — |
| Homeownership | 57.5003208 |

| | |
|---|---|
| Housing habitability | 83.60066727 |
| Low-inc homeowner severe housing cost burden | 51.57192352 |
| Low-inc renter severe housing cost burden | 90.2219941 |
| Uncrowded housing | 71.88502502 |
| Health Outcomes | — |
| Insured adults | 58.96317208 |
| Arthritis | 0.0 |
| Asthma ER Admissions | 68.6 |
| High Blood Pressure | 0.0 |
| Cancer (excluding skin) | 0.0 |
| Asthma | 0.0 |
| Coronary Heart Disease | 0.0 |
| Chronic Obstructive Pulmonary Disease | 0.0 |
| Diagnosed Diabetes | 0.0 |
| Life Expectancy at Birth | 41.6 |
| Cognitively Disabled | 26.7 |
| Physically  Disabled | 73.0 |
| Heart Attack ER Admissions | 78.9 |
| Mental Health Not Good | 0.0 |
| Chronic Kidney Disease | 0.0 |
| Obesity | 0.0 |
| Pedestrian Injuries | 39.8 |
| Physical Health Not Good | 0.0 |
| Stroke | 0.0 |
| Health Risk Behaviors | — |
| Binge Drinking | 0.0 |
| Current Smoker | 0.0 |

| | |
|---|---|
| No Leisure Time for Physical Activity | 0.0 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 31.0 |
| Elderly | 57.3 |
| English Speaking | 75.5 |
| Foreign-born | 10.2 |
| Outdoor Workers | 31.9 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 74.2 |
| Traffic Density | 61.8 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 39.5 |
| Other Decision Support | — |
| 2016 Voting | 77.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 31.0 |
| Healthy Places Index Score for Project Location (b) | 66.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|
| Construction: Construction Phases | No demo, no building construction<br>Remaining phases modeled as default |
| Operations: Vehicle Data | 5.044 acres<br>178 RV storage spaces, 0.1796 trips/space (ITE 11th Ed.), 32 trips<br>6.34 trips/acres |

# ATTACHMENT 2

CalEEMod Output – Phase 2

# 8355 Graves Avenue - Phase 2 Detailed Report

## Table of Contents

# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | 8355 Graves Avenue - Phase 2 |
| Construction Start Date | 7/1/2025 |
| Operational Year | 2026 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 8.00 |
| Location | 8355 Graves Ave, Santee, CA 92071, USA |
| County | San Diego |
| City | Santee |
| Air District | San Diego County APCD |
| Air Basin | San Diego |
| TAZ | 6539 |
| EDFZ | 12 |
| Electric Utility | San Diego Gas & Electric |
| Gas Utility | San Diego Gas & Electric |
| App Version | 2022.1.1.14 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | 3.82 | Acre | 3.82 | 0.00 | 0.00 | 0.00 | — | — |
| Unrefrigerated Warehouse-No Rail | 137 | 1000sqft | 1.22 | 136,600 | 27,387 | 0.00 | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 4.02 | 34.1 | 31.7 | 31.0 | 0.05 | 1.37 | 7.81 | 9.18 | 1.26 | 3.97 | 5.23 | — | 5,461 | 5,461 | 0.22 | 0.12 | 3.50 | 5,482 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 1.64 | 1.38 | 11.4 | 15.7 | 0.03 | 0.44 | 0.63 | 1.07 | 0.40 | 0.15 | 0.56 | — | 3,472 | 3,472 | 0.15 | 0.12 | 0.09 | 3,512 |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.66 | 2.33 | 4.66 | 6.09 | 0.01 | 0.18 | 0.42 | 0.61 | 0.17 | 0.16 | 0.33 | — | 1,306 | 1,306 | 0.06 | 0.04 | 0.51 | 1,320 |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.12 | 0.42 | 0.85 | 1.11 | < 0.005 | 0.03 | 0.08 | 0.11 | 0.03 | 0.03 | 0.06 | — | 216 | 216 | 0.01 | 0.01 | 0.08 | 219 |
| Exceeds (Daily Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Threshold | — | 250 | 250 | 550 | 250 | — | — | 100 | — | — | 67.0 | — | — | — | — | — | — | — |
| Unmit. | — | No | No | No | No | — | — | No | — | — | No | — | — | — | — | — | — | — |
| Exceeds (Average Daily) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Threshold | — | 250 | 250 | 550 | 250 | — | — | 100 | — | — | 67.0 | — | — | — | — | — | — | — |
| Unmit. | — | No | No | No | No | — | — | No | — | — | No | — | — | — | — | — | — | — |

## 2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 4.02 | 3.38 | 31.7 | 31.0 | 0.05 | 1.37 | 7.81 | 9.18 | 1.26 | 3.97 | 5.23 | — | 5,461 | 5,461 | 0.22 | 0.12 | 3.50 | 5,482 |
| 2026 | 1.57 | 34.1 | 10.7 | 15.8 | 0.03 | 0.39 | 0.63 | 1.01 | 0.36 | 0.15 | 0.51 | — | 3,480 | 3,480 | 0.14 | 0.12 | 3.21 | 3,522 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 1.64 | 1.38 | 11.4 | 15.7 | 0.03 | 0.44 | 0.63 | 1.07 | 0.40 | 0.15 | 0.56 | — | 3,472 | 3,472 | 0.15 | 0.12 | 0.09 | 3,512 |
| 2026 | 1.55 | 1.29 | 10.8 | 15.5 | 0.03 | 0.39 | 0.63 | 1.01 | 0.36 | 0.15 | 0.51 | — | 3,451 | 3,451 | 0.14 | 0.12 | 0.08 | 3,490 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 0.66 | 0.55 | 4.66 | 6.09 | 0.01 | 0.18 | 0.42 | 0.61 | 0.17 | 0.16 | 0.33 | — | 1,306 | 1,306 | 0.06 | 0.04 | 0.51 | 1,320 |
| 2026 | 0.52 | 2.33 | 3.64 | 5.28 | 0.01 | 0.13 | 0.20 | 0.33 | 0.12 | 0.05 | 0.17 | — | 1,131 | 1,131 | 0.05 | 0.04 | 0.43 | 1,143 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 0.12 | 0.10 | 0.85 | 1.11 | < 0.005 | 0.03 | 0.08 | 0.11 | 0.03 | 0.03 | 0.06 | — | 216 | 216 | 0.01 | 0.01 | 0.08 | 219 |
| 2026 | 0.10 | 0.42 | 0.66 | 0.96 | < 0.005 | 0.02 | 0.04 | 0.06 | 0.02 | 0.01 | 0.03 | — | 187 | 187 | 0.01 | 0.01 | 0.07 | 189 |

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 2.02 | 4.96 | 1.13 | 12.0 | 0.02 | 0.06 | 1.15 | 1.21 | 0.06 | 0.29 | 0.35 | 130 | 3,328 | 3,457 | 13.3 | 0.21 | 4.51 | 3,858 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.94 | 3.97 | 1.14 | 5.82 | 0.02 | 0.05 | 1.15 | 1.20 | 0.05 | 0.29 | 0.34 | 130 | 3,243 | 3,373 | 13.3 | 0.21 | 0.12 | 3,770 |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 1.45 | 4.44 | 1.16 | 8.73 | 0.02 | 0.06 | 1.15 | 1.20 | 0.05 | 0.29 | 0.35 | 130 | 3,265 | 3,394 | 13.3 | 0.21 | 1.95 | 3,793 |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.27 | 0.81 | 0.21 | 1.59 | < 0.005 | 0.01 | 0.21 | 0.22 | 0.01 | 0.05 | 0.06 | 21.5 | 540 | 562 | 2.21 | 0.04 | 0.32 | 628 |
| Exceeds (Daily Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Threshold | — | 250 | 250 | 550 | 250 | — | — | 100 | — | — | 67.0 | — | — | — | — | — | — | — |
| Unmit. | — | No | No | No | No | — | — | No | — | — | No | — | — | — | — | — | — | — |
| Exceeds (Average Daily) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Threshold | — | 250 | 250 | 550 | 250 | — | — | 100 | — | — | 67.0 | — | — | — | — | — | — | — |
| Unmit. | — | No | No | No | No | — | — | No | — | — | No | — | — | — | — | — | — | — |

## 2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 0.90 | 0.83 | 0.55 | 5.64 | 0.01 | 0.01 | 1.15 | 1.16 | 0.01 | 0.29 | 0.30 | — | 1,350 | 1,350 | 0.07 | 0.05 | 4.51 | 1,371 |
| Area | 1.06 | 4.10 | 0.05 | 5.94 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 24.4 | 24.4 | < 0.005 | < 0.005 | — | 24.5 |
| Energy | 0.06 | 0.03 | 0.54 | 0.45 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 1,603 | 1,603 | 0.11 | 0.01 | — | 1,608 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 60.5 | 350 | 411 | 6.23 | 0.15 | — | 611 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.92 | 0.00 | — | 242 |
| Total | 2.02 | 4.96 | 1.13 | 12.0 | 0.02 | 0.06 | 1.15 | 1.21 | 0.06 | 0.29 | 0.35 | 130 | 3,328 | 3,457 | 13.3 | 0.21 | 4.51 | 3,858 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 0.89 | 0.82 | 0.60 | 5.37 | 0.01 | 0.01 | 1.15 | 1.16 | 0.01 | 0.29 | 0.30 | — | 1,290 | 1,290 | 0.07 | 0.06 | 0.12 | 1,308 |
| Area | — | 3.12 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Energy | 0.06 | 0.03 | 0.54 | 0.45 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 1,603 | 1,603 | 0.11 | 0.01 | — | 1,608 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 60.5 | 350 | 411 | 6.23 | 0.15 | — | 611 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.92 | 0.00 | — | 242 |
| Total | 0.94 | 3.97 | 1.14 | 5.82 | 0.02 | 0.05 | 1.15 | 1.20 | 0.05 | 0.29 | 0.34 | 130 | 3,243 | 3,373 | 13.3 | 0.21 | 0.12 | 3,770 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 0.87 | 0.81 | 0.59 | 5.35 | 0.01 | 0.01 | 1.15 | 1.16 | 0.01 | 0.29 | 0.30 | — | 1,299 | 1,299 | 0.07 | 0.06 | 1.95 | 1,319 |
| Area | 0.52 | 3.60 | 0.02 | 2.93 | < 0.005 | 0.01 | — | 0.01 | < 0.005 | — | < 0.005 | — | 12.0 | 12.0 | < 0.005 | < 0.005 | — | 12.1 |
| Energy | 0.06 | 0.03 | 0.54 | 0.45 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 1,603 | 1,603 | 0.11 | 0.01 | — | 1,608 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 60.5 | 350 | 411 | 6.23 | 0.15 | — | 611 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.92 | 0.00 | — | 242 |
| Total | 1.45 | 4.44 | 1.16 | 8.73 | 0.02 | 0.06 | 1.15 | 1.20 | 0.05 | 0.29 | 0.35 | 130 | 3,265 | 3,394 | 13.3 | 0.21 | 1.95 | 3,793 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 0.16 | 0.15 | 0.11 | 0.98 | < 0.005 | < 0.005 | 0.21 | 0.21 | < 0.005 | 0.05 | 0.05 | — | 215 | 215 | 0.01 | 0.01 | 0.32 | 218 |
| Area | 0.10 | 0.66 | < 0.005 | 0.53 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.99 | 1.99 | < 0.005 | < 0.005 | — | 2.00 |
| Energy | 0.01 | 0.01 | 0.10 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 265 | 265 | 0.02 | < 0.005 | — | 266 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 10.0 | 58.0 | 68.1 | 1.03 | 0.02 | — | 101 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 11.5 | 0.00 | 11.5 | 1.15 | 0.00 | — | 40.1 |
| Total | 0.27 | 0.81 | 0.21 | 1.59 | < 0.005 | 0.01 | 0.21 | 0.22 | 0.01 | 0.05 | 0.06 | 21.5 | 540 | 562 | 2.21 | 0.04 | 0.32 | 628 |

# 3. Construction Emissions Details

## 3.1. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 3.94 | 3.31 | 31.6 | 30.2 | 0.05 | 1.37 | — | 1.37 | 1.26 | — | 1.26 | — | 5,295 | 5,295 | 0.21 | 0.04 | — | 5,314 |
| Dust From Material Movement | — | — | — | — | — | — | 7.67 | 7.67 | — | 3.94 | 3.94 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.11 | 0.09 | 0.87 | 0.83 | < 0.005 | 0.04 | — | 0.04 | 0.03 | — | 0.03 | — | 145 | 145 | 0.01 | < 0.005 | — | 146 |
| Dust From Material Movement | — | — | — | — | — | — | 0.21 | 0.21 | — | 0.11 | 0.11 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.16 | 0.15 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 24.0 | 24.0 | < 0.005 | < 0.005 | — | 24.1 |
| Dust From Material Movement | — | — | — | — | — | — | 0.04 | 0.04 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.05 | 0.81 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.03 | 0.03 | — | 166 | 166 | 0.01 | 0.01 | 0.62 | 169 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 4.33 | 4.33 | < 0.005 | < 0.005 | 0.01 | 4.40 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.72 | 0.72 | < 0.005 | < 0.005 | < 0.005 | 0.73 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.3. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.35 | 1.13 | 10.4 | 13.0 | 0.02 | 0.43 | — | 0.43 | 0.40 | — | 0.40 | — | 2,398 | 2,398 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.35 | 1.13 | 10.4 | 13.0 | 0.02 | 0.43 | — | 0.43 | 0.40 | — | 0.40 | — | 2,398 | 2,398 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.45 | 0.37 | 3.47 | 4.34 | 0.01 | 0.14 | — | 0.14 | 0.13 | — | 0.13 | — | 798 | 798 | 0.03 | 0.01 | — | 800 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.08 | 0.07 | 0.63 | 0.79 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | — | 132 | 132 | 0.01 | < 0.005 | — | 133 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.25 | 0.23 | 0.18 | 2.66 | 0.00 | 0.00 | 0.49 | 0.49 | 0.00 | 0.11 | 0.11 | — | 544 | 544 | 0.03 | 0.02 | 2.04 | 553 |
| Vendor | 0.05 | 0.02 | 0.75 | 0.35 | < 0.005 | 0.01 | 0.14 | 0.15 | 0.01 | 0.04 | 0.05 | — | 560 | 560 | 0.02 | 0.08 | 1.45 | 586 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.25 | 0.23 | 0.20 | 2.33 | 0.00 | 0.00 | 0.49 | 0.49 | 0.00 | 0.11 | 0.11 | — | 514 | 514 | 0.03 | 0.02 | 0.05 | 521 |
| Vendor | 0.05 | 0.02 | 0.77 | 0.36 | < 0.005 | 0.01 | 0.14 | 0.15 | 0.01 | 0.04 | 0.05 | — | 561 | 561 | 0.02 | 0.08 | 0.04 | 585 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.06 | 0.79 | 0.00 | 0.00 | 0.16 | 0.16 | 0.00 | 0.04 | 0.04 | — | 173 | 173 | 0.01 | 0.01 | 0.29 | 175 |
| Vendor | 0.02 | 0.01 | 0.26 | 0.12 | < 0.005 | < 0.005 | 0.05 | 0.05 | < 0.005 | 0.01 | 0.02 | — | 186 | 186 | 0.01 | 0.03 | 0.21 | 195 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.14 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.01 | 0.01 | — | 28.6 | 28.6 | < 0.005 | < 0.005 | 0.05 | 29.0 |
| Vendor | < 0.005 | < 0.005 | 0.05 | 0.02 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 30.9 | 30.9 | < 0.005 | < 0.005 | 0.03 | 32.2 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.5. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.28 | 1.07 | 9.85 | 13.0 | 0.02 | 0.38 | — | 0.38 | 0.35 | — | 0.35 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.28 | 1.07 | 9.85 | 13.0 | 0.02 | 0.38 | — | 0.38 | 0.35 | — | 0.35 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.38 | 0.32 | 2.93 | 3.86 | 0.01 | 0.11 | — | 0.11 | 0.10 | — | 0.10 | — | 713 | 713 | 0.03 | 0.01 | — | 716 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.07 | 0.06 | 0.53 | 0.70 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 118 | 118 | < 0.005 | < 0.005 | — | 118 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.24 | 0.21 | 0.16 | 2.48 | 0.00 | 0.00 | 0.49 | 0.49 | 0.00 | 0.11 | 0.11 | — | 533 | 533 | 0.03 | 0.02 | 1.87 | 541 |
| Vendor | 0.04 | 0.02 | 0.71 | 0.33 | < 0.005 | 0.01 | 0.14 | 0.15 | 0.01 | 0.04 | 0.05 | — | 550 | 550 | 0.02 | 0.08 | 1.34 | 575 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.23 | 0.20 | 0.18 | 2.19 | 0.00 | 0.00 | 0.49 | 0.49 | 0.00 | 0.11 | 0.11 | — | 504 | 504 | 0.03 | 0.02 | 0.05 | 510 |
| Vendor | 0.04 | 0.02 | 0.74 | 0.34 | < 0.005 | 0.01 | 0.14 | 0.15 | 0.01 | 0.04 | 0.05 | — | 550 | 550 | 0.02 | 0.08 | 0.03 | 574 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.05 | 0.66 | 0.00 | 0.00 | 0.14 | 0.14 | 0.00 | 0.03 | 0.03 | — | 151 | 151 | 0.01 | 0.01 | 0.24 | 153 |
| Vendor | 0.01 | 0.01 | 0.22 | 0.10 | < 0.005 | < 0.005 | 0.04 | 0.04 | < 0.005 | 0.01 | 0.01 | — | 164 | 164 | 0.01 | 0.02 | 0.17 | 171 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.12 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.01 | 0.01 | — | 25.0 | 25.0 | < 0.005 | < 0.005 | 0.04 | 25.4 |
| Vendor | < 0.005 | < 0.005 | 0.04 | 0.02 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 27.1 | 27.1 | < 0.005 | < 0.005 | 0.03 | 28.3 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.7. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.91 | 0.76 | 7.12 | 9.94 | 0.01 | 0.32 | — | 0.32 | 0.29 | — | 0.29 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | — | 0.50 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.05 | 0.04 | 0.39 | 0.54 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 82.8 | 82.8 | < 0.005 | < 0.005 | — | 83.1 |
| Paving | — | 0.03 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.07 | 0.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 13.7 | 13.7 | < 0.005 | < 0.005 | — | 13.8 |
| Paving | — | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.05 | 0.04 | 0.65 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.03 | 0.03 | — | 139 | 139 | 0.01 | < 0.005 | 0.49 | 142 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.28 | 7.28 | < 0.005 | < 0.005 | 0.01 | 7.39 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.21 | 1.21 | < 0.005 | < 0.005 | < 0.005 | 1.22 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.9. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.15 | 0.12 | 0.86 | 1.13 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | — | 34.0 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.05 | 0.06 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 7.32 | 7.32 | < 0.005 | < 0.005 | — | 7.34 |
| Architectural Coatings | — | 1.86 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.21 | 1.21 | < 0.005 | < 0.005 | — | 1.22 |
| Architectural Coatings | — | 0.34 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.04 | 0.03 | 0.50 | 0.00 | 0.00 | 0.10 | 0.10 | 0.00 | 0.02 | 0.02 | — | 107 | 107 | 0.01 | < 0.005 | 0.37 | 108 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.02 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 5.57 | 5.57 | < 0.005 | < 0.005 | 0.01 | 5.65 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.92 | 0.92 | < 0.005 | < 0.005 | < 0.005 | 0.94 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.06 | 0.06 | 0.04 | 0.40 | < 0.005 | < 0.005 | 0.08 | 0.08 | < 0.005 | 0.02 | 0.02 | — | 94.9 | 94.9 | < 0.005 | < 0.005 | 0.32 | 96.5 |
| Unrefrigerated Warehouse-No Rail | 0.84 | 0.78 | 0.51 | 5.24 | 0.01 | 0.01 | 1.07 | 1.08 | 0.01 | 0.27 | 0.28 | — | 1,255 | 1,255 | 0.06 | 0.05 | 4.19 | 1,275 |
| Total | 0.90 | 0.83 | 0.55 | 5.64 | 0.01 | 0.01 | 1.15 | 1.16 | 0.01 | 0.29 | 0.30 | — | 1,350 | 1,350 | 0.07 | 0.05 | 4.51 | 1,371 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.06 | 0.06 | 0.04 | 0.38 | < 0.005 | < 0.005 | 0.08 | 0.08 | < 0.005 | 0.02 | 0.02 | — | 90.7 | 90.7 | < 0.005 | < 0.005 | 0.01 | 92.0 |
| Unrefrigerated Warehouse-No Rail | 0.82 | 0.76 | 0.56 | 4.99 | 0.01 | 0.01 | 1.07 | 1.08 | 0.01 | 0.27 | 0.28 | — | 1,199 | 1,199 | 0.07 | 0.05 | 0.11 | 1,216 |
| Total | 0.89 | 0.82 | 0.60 | 5.37 | 0.01 | 0.01 | 1.15 | 1.16 | 0.01 | 0.29 | 0.30 | — | 1,290 | 1,290 | 0.07 | 0.06 | 0.12 | 1,308 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.01 | 0.01 | 0.01 | 0.07 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 15.1 | 15.1 | < 0.005 | < 0.005 | 0.02 | 15.4 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unrefrigerated Warehouse-No | 0.15 | 0.14 | 0.10 | 0.91 | < 0.005 | < 0.005 | 0.19 | 0.20 | < 0.005 | 0.05 | 0.05 | — | 200 | 200 | 0.01 | 0.01 | 0.30 | 203 |
| Total | 0.16 | 0.15 | 0.11 | 0.98 | < 0.005 | < 0.005 | 0.21 | 0.21 | < 0.005 | 0.05 | 0.05 | — | 215 | 215 | 0.01 | 0.01 | 0.32 | 218 |

## 4.2. Energy

### 4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | — | 961 | 961 | 0.05 | 0.01 | — | 964 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 961 | 961 | 0.05 | 0.01 | — | 964 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | — | 961 | 961 | 0.05 | 0.01 | — | 964 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 961 | 961 | 0.05 | 0.01 | — | 964 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | — | 159 | 159 | 0.01 | < 0.005 | — | 160 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 159 | 159 | 0.01 | < 0.005 | — | 160 |

## 4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | 0.06 | 0.03 | 0.54 | 0.45 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 642 | 642 | 0.06 | < 0.005 | — | 644 |
| Total | 0.06 | 0.03 | 0.54 | 0.45 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 642 | 642 | 0.06 | < 0.005 | — | 644 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unrefrigerated Warehouse-No Rail | 0.06 | 0.03 | 0.54 | 0.45 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 642 | 642 | 0.06 | < 0.005 | — | 644 |
| Total | 0.06 | 0.03 | 0.54 | 0.45 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 642 | 642 | 0.06 | < 0.005 | — | 644 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | 0.01 | 0.01 | 0.10 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 106 | 106 | 0.01 | < 0.005 | — | 107 |
| Total | 0.01 | 0.01 | 0.10 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 106 | 106 | 0.01 | < 0.005 | — | 107 |

## 4.3. Area Emissions by Source

### 4.3.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | — | 2.94 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | — | 0.19 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 1.06 | 0.98 | 0.05 | 5.94 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 24.4 | 24.4 | < 0.005 | < 0.005 | — | 24.5 |
| Total | 1.06 | 4.10 | 0.05 | 5.94 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 24.4 | 24.4 | < 0.005 | < 0.005 | — | 24.5 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | — | 2.94 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | — | 0.19 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | 3.12 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Consumer Products | — | 0.54 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | — | 0.03 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 0.10 | 0.09 | < 0.005 | 0.53 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.99 | 1.99 | < 0.005 | < 0.005 | — | 2.00 |
| Total | 0.10 | 0.66 | < 0.005 | 0.53 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.99 | 1.99 | < 0.005 | < 0.005 | — | 2.00 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | 60.5 | 350 | 411 | 6.23 | 0.15 | — | 611 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 60.5 | 350 | 411 | 6.23 | 0.15 | — | 611 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | 60.5 | 350 | 411 | 6.23 | 0.15 | — | 611 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 60.5 | 350 | 411 | 6.23 | 0.15 | — | 611 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | 10.0 | 58.0 | 68.1 | 1.03 | 0.02 | — | 101 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 10.0 | 58.0 | 68.1 | 1.03 | 0.02 | — | 101 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.92 | 0.00 | — | 242 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.92 | 0.00 | — | 242 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.92 | 0.00 | — | 242 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.92 | 0.00 | — | 242 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Other Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Unrefrigerated Warehouse-No Rail | — | — | — | — | — | — | — | — | — | — | — | 11.5 | 0.00 | 11.5 | 1.15 | 0.00 | — | 40.1 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | — | — | — | — | — | — | — | — | — | — | — | 11.5 | 0.00 | 11.5 | 1.15 | 0.00 | — | 40.1 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

### 4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Site Preparation | Site Preparation | 7/1/2025 | 7/14/2025 | 5.00 | 10.0 | — |
| Building Construction | Building Construction | 7/15/2025 | 6/1/2026 | 5.00 | 230 | — |

| | | | | | | |
|---|---|---|---|---|---|---|
| Paving | Paving | 6/2/2026 | 6/29/2026 | 5.00 | 20.0 | — |
| Architectural Coating | Architectural Coating | 6/30/2026 | 7/27/2026 | 5.00 | 20.0 | — |

## 5.2. Off-Road Equipment

### 5.2.1. Unmitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | Diesel | Average | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | Diesel | Average | 4.00 | 8.00 | 84.0 | 0.37 |
| Building Construction | Forklifts | Diesel | Average | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Cranes | Diesel | Average | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Welders | Diesel | Average | 1.00 | 8.00 | 46.0 | 0.45 |
| Building Construction | Tractors/Loaders/Backhoes | Diesel | Average | 3.00 | 7.00 | 84.0 | 0.37 |
| Paving | Pavers | Diesel | Average | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Average | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Average | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Average | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.1. Unmitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 12.0 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 7.63 | HHDT,MHDT |

| | | | | |
|---|---|---|---|---|
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |
| Site Preparation | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 57.4 | 12.0 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 22.4 | 7.63 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 12.0 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 7.63 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 11.5 | 12.0 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 7.63 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |
| Architectural Coating | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

## 5.5. Architectural Coatings

| Phase Name | Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|---|
| Architectural Coating | 0.00 | 0.00 | 204,900 | 68,300 | 9,992 |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (Cubic Yards) | Material Exported (Cubic Yards) | Acres Graded (acres) | Material Demolished (sq. ft.) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Site Preparation | 0.00 | 0.00 | 15.0 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 3.82 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 2 | 61% | 61% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Other Asphalt Surfaces | 3.82 | 100% |
| Unrefrigerated Warehouse-No Rail | 0.00 | 0% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2025 | 0.00 | 589 | 0.03 | < 0.005 |
| 2026 | 0.00 | 589 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.1. Unmitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | 15.0 | 15.0 | 15.0 | 5,470 | 114 | 114 | 114 | 41,756 |
| Unrefrigerated Warehouse-No Rail | 198 | 198 | 198 | 72,296 | 1,512 | 1,512 | 1,512 | 551,884 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.1. Unmitigated

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 0 | 0.00 | 204,900 | 68,300 | 9,992 |

### 5.10.3. Landscape Equipment

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 180 |

## 5.11. Operational Energy Consumption

### 5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.00 | 589 | 0.0330 | 0.0040 | 0.00 |
| Unrefrigerated Warehouse-No Rail | 595,570 | 589 | 0.0330 | 0.0040 | 2,003,529 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.1. Unmitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Other Asphalt Surfaces | 0.00 | 0.00 |
| Unrefrigerated Warehouse-No Rail | 31,588,750 | 409,276 |

## 5.13. Operational Waste Generation

### 5.13.1. Unmitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Other Asphalt Surfaces | 0.00 | — |
| Unrefrigerated Warehouse-No Rail | 128 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.1. Unmitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|

## 5.15. Operational Off-Road Equipment

### 5.15.1. Unmitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|
| — | — |

## 5.18. Vegetation

### 5.18.1. Land Use Change

#### 5.18.1.1. Unmitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

#### 5.18.1.1. Unmitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

#### 5.18.2.1. Unmitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 12.4 | annual days of extreme heat |
| Extreme Precipitation | 3.90 | annual days with precipitation above 20 mm |
| Sea Level Rise | 0.00 | meters of inundation depth |
| Wildfire | 7.98 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 1 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | N/A | N/A | N/A | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | 0 | 0 | 0 | N/A |
| Drought | 0 | 0 | 0 | N/A |

| | | | | |
|---|---|---|---|---|
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 1 | 1 | 1 | 2 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | N/A | N/A | N/A | N/A |
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | 1 | 1 | 1 | 2 |
| Drought | 1 | 1 | 1 | 2 |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

## 6.4. Climate Risk Reduction Measures

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|

| | |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 65.7 |
| AQ-PM | 44.3 |
| AQ-DPM | 53.7 |
| Drinking Water | 64.1 |
| Lead Risk Housing | 24.1 |
| Pesticides | 0.00 |
| Toxic Releases | 29.0 |
| Traffic | 70.3 |
| Effect Indicators | — |
| CleanUp Sites | 18.7 |
| Groundwater | 85.9 |
| Haz Waste Facilities/Generators | 65.2 |
| Impaired Water Bodies | 83.0 |
| Solid Waste | 14.7 |
| Sensitive Population | — |
| Asthma | 16.1 |
| Cardio-vascular | 6.61 |
| Low Birth Weights | 51.8 |
| Socioeconomic Factor Indicators | — |
| Education | 32.9 |
| Housing | 40.3 |
| Linguistic | 22.2 |
| Poverty | 29.2 |
| Unemployment | 43.1 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
| --- | --- |
| Economic | — |
| Above Poverty | 69.57525985 |
| Employed | 83.06172206 |
| Median HI | 68.81817015 |
| Education | — |
| Bachelor's or higher | 46.15680739 |
| High school enrollment | 100 |
| Preschool enrollment | 34.72346978 |
| Transportation | — |
| Auto Access | 52.9449506 |
| Active commuting | 7.134607982 |
| Social | — |
| 2-parent households | 88.72064673 |
| Voting | 78.04439882 |
| Neighborhood | — |
| Alcohol availability | 68.63852175 |
| Park access | 17.96484024 |
| Retail density | 11.62581804 |
| Supermarket access | 2.399589375 |
| Tree canopy | 20.03079687 |
| Housing | — |
| Homeownership | 57.5003208 |
| Housing habitability | 83.60066727 |
| Low-inc homeowner severe housing cost burden | 51.57192352 |
| Low-inc renter severe housing cost burden | 90.2219941 |
| Uncrowded housing | 71.88502502 |

| | |
|---|---|
| Health Outcomes | — |
| Insured adults | 58.96317208 |
| Arthritis | 0.0 |
| Asthma ER Admissions | 68.6 |
| High Blood Pressure | 0.0 |
| Cancer (excluding skin) | 0.0 |
| Asthma | 0.0 |
| Coronary Heart Disease | 0.0 |
| Chronic Obstructive Pulmonary Disease | 0.0 |
| Diagnosed Diabetes | 0.0 |
| Life Expectancy at Birth | 41.6 |
| Cognitively Disabled | 26.7 |
| Physically  Disabled | 73.0 |
| Heart Attack ER Admissions | 78.9 |
| Mental Health Not Good | 0.0 |
| Chronic Kidney Disease | 0.0 |
| Obesity | 0.0 |
| Pedestrian Injuries | 39.8 |
| Physical Health Not Good | 0.0 |
| Stroke | 0.0 |
| Health Risk Behaviors | — |
| Binge Drinking | 0.0 |
| Current Smoker | 0.0 |
| No Leisure Time for Physical Activity | 0.0 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |

| | |
|---|---|
| Children | 31.0 |
| Elderly | 57.3 |
| English Speaking | 75.5 |
| Foreign-born | 10.2 |
| Outdoor Workers | 31.9 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 74.2 |
| Traffic Density | 61.8 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 39.5 |
| Other Decision Support | — |
| 2016 Voting | 77.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 31.0 |
| Healthy Places Index Score for Project Location (b) | 66.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|
| Land Use | 136,600 square feet storage (53,200 square foot footprint)<br>Remainder of site RV parking<br>5.044 acre site |
| Construction: Construction Phases | No demo or grading needed for Phase 2 |
| Operations: Vehicle Data | RV - 3.823 acres, 81 RV storage spaces, 0.1796 trips/space (ITE 11th Ed.), 15 trips, 3.92 trips/acres<br>Storage - 136,600 square feet, 1.45 trips/ksf (ITE 11th Ed.), 198 trips |

# ATTACHMENT B

Noise Analysis

RECON

An Employee-Owned Company

August 7, 2023

Mr. Jim Moxham, CEO
Cameron Brothers Company, LLC
10580 Prospect Ave, Suite 200
Santee, CA 92071

Reference: Noise Analysis for the 8355 Graves Avenue RV and Self-Storage Project (RECON Number 10396)

Dear Mr. Moxham:

The purpose of this report is to assess potential noise impacts from construction and operation of the 8355 Graves Avenue RV and Self-Storage Project (project). Impacts are assessed in accordance with standards established in the City of Santee's (City) General Plan Noise Element and the City's Municipal Code.

## 1.0 Introduction

### 1.1 Project Description

The project site is located at 8355 Graves Avenue (Assessor Parcel Numbers 387-061-11 and -12) in the city of Santee, California. The project site is surrounded by single family uses to the east, multi-family uses to the north and south, and Graves Avenue and State Route 67 to the west. The 4.85-acre project site is currently undeveloped. Figure 1 shows the regional location. Figure 2 shows an aerial photograph of the project site and vicinity.

The project would be constructed in two phases. Phase 1 would construct a 178-space recreational vehicle (RV) storage facility with associated parking, landscaping, and retention areas. Phase 2 would remove 97 of the RV parking spaces to construct two self-storage buildings totaling 136,600 square feet. Building A would be a 90,600-square-foot, three-story building, and Building B would be a 46,000-square-foot, two-story building. Figure 3 shows the Phase 1 site plan, and Figure 4 shows the Phase 2 site plan.

### 1.2 Fundamentals of Noise

Sound levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Additionally, in technical terms, sound levels are described as either a "sound power level" or a "sound pressure level," which while commonly confused are two distinct characteristics of sound. Both share the same unit of measure, the dB. However, sound power, expressed as $L_{pw}$, is the energy converted into sound by the source. The $L_{pw}$ is used to estimate how far a noise will travel and to predict the sound levels at various distances from the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers such as an eardrum or microphone and is the sound pressure level. Noise measurement instruments only measure sound pressure, and noise level limits used in standards are generally sound pressure levels.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the "A-weighted" noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are designated with the notation dB(A). The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this study are the one-hour equivalent noise level ($L_{eq}$), the community noise equivalent level (CNEL), and the day night equivalent level ($L_{dn}$). The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies an additional 5 dB(A) penalty to noise occurring during evening hours, between 7:00 p.m. and 10:00 p.m., and an additional 10 dB(A) penalty is added to noise occurring during the night, between 10:00 p.m. and 7:00 a.m. These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night. Similar to the CNEL, the $L_{dn}$ is a 24-hour equivalent level that applies an additional 10 dB(A) penalty to noise occurring during the night.

Sound from a small, localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dB(A) for each doubling of the distance.

Traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is 3 dB(A) for each doubling of distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dB(A) per doubling of distance. Thus, a point source over a soft site would attenuate at 7.5 dB(A) per doubling of distance.

Human perception of noise has no simple correlation with acoustical energy. A change in noise levels is generally perceived as follows: 3 dB(A) barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise (California Department of Transportation 2013).

## 2.0 Applicable Standards

### 2.1 General Plan

The City's General Plan Noise Element includes various goals, objectives, and policies related to noise standards and protections against excessive noise exposure, including the following:

**Objective 1.0**. Control noise from sources adjacent to residential, institutional, and other noise-sensitive receptors.

- **Policy 1.1**: The City shall support a coordinated program to protect and improve the acoustical environment of the City including development review for new public and private development and code compliance for existing development.

- **Policy 1.2**: The City shall utilize noise studies and noise contour maps when evaluating development proposals during the discretionary review process.

- **Policy 1.4**: The City shall promote alternative sound attenuation measures rather than traditional wall barrier wherever feasible; these may include glass or polycarbonate walls, berms, landscaping, and the siting of noise-sensitive uses on a parcel away from the roadway or other noise source.

- **Policy 1.5**: The City shall review future projects with particular scrutiny regarding the reduction of unnecessary noise near noise-sensitive areas such as hospitals, schools, parks, etc.

**Objective 2.0**. Ensure that future developments will be constructed to minimize interior and exterior noise levels.

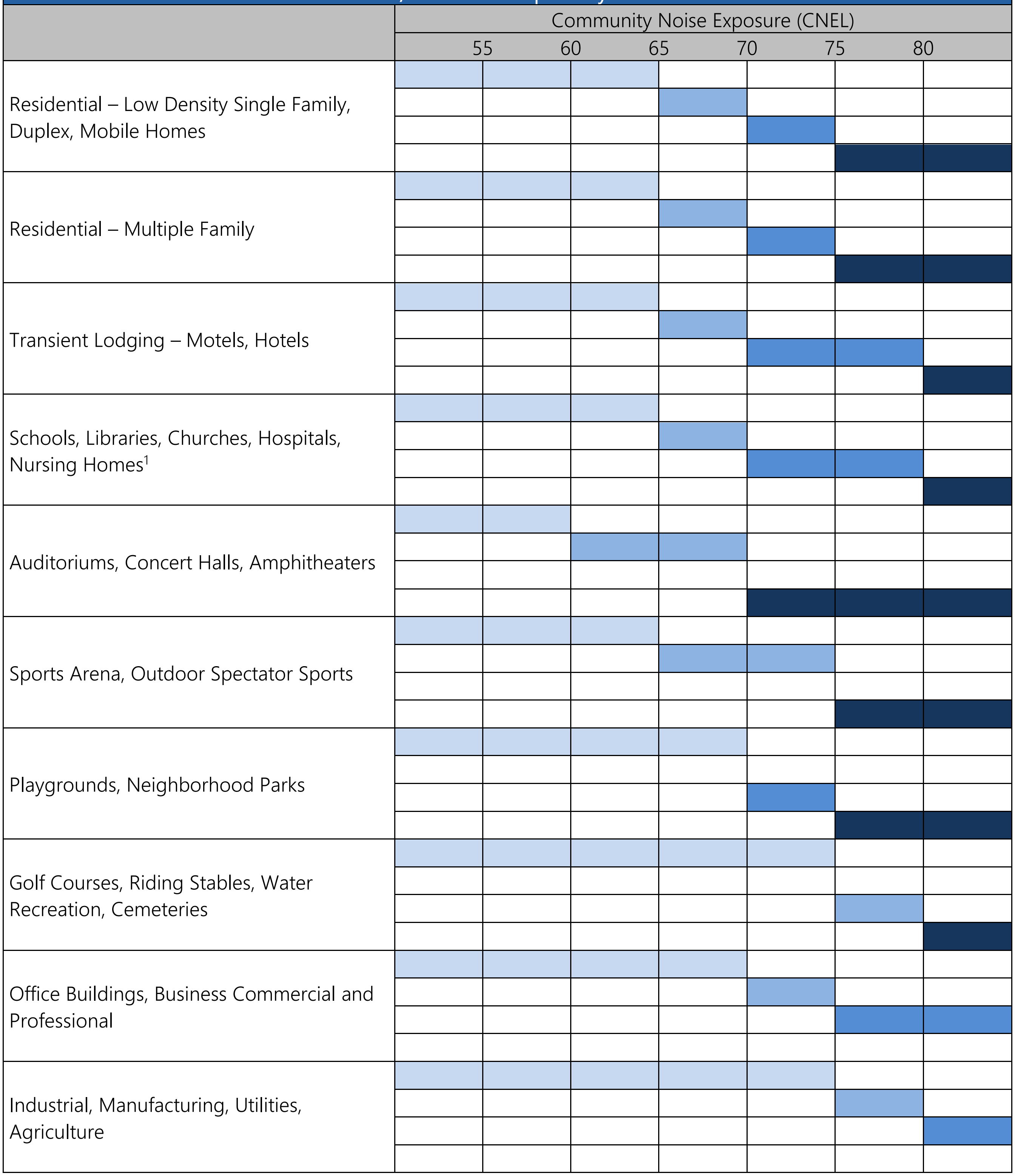
- **Policy 2.1**: The City shall adhere to planning guidelines and building codes which include noise control for the exterior and interior living space of all new residential developments within noise impacted areas.

- **Policy 2.2**: The City should require new development to mitigate noise impacts to existing uses resulting from new development when: (1) such development adds traffic to existing City streets that necessitates the widening of the street; and (2) the additional traffic generated by new development causes the noise standard or significance thresholds to be exceeded.

- **Policy 2.3**: The City should not require new development to mitigate noise impacts to existing uses when new development only adds traffic already anticipated by the City's General Plan to an existing street but does not necessitate widening of that street.

The Noise Element also provides guidelines for determining acceptable and unacceptable community noise exposure limits for various land use categories (Table 1). Normally acceptable noise levels are defined as satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Conditionally acceptable noise levels indicate that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features have been included in the design. Conventional construction with closed windows and fresh air supply systems or air conditioning will normally suffice. The City's General Plan states that these compatibility guidelines are not prohibitive but should be used as a guide and a resource (City of Santee 2003). The project does not propose a noise-sensitive land use. The project site is surrounded by single family and multi-family residential land uses. As shown in Table 1 below, residential land uses are normally acceptable with noise levels up to 65 CNEL, conditionally acceptable with noise levels from 65 to 70 CNEL, normally unacceptable with noise levels from 70 to 75 CNEL, and clearly unacceptable with noise levels above 75 CNEL.

Table 1
Noise/Land Use Compatibility Guide



| Table 1<br>Noise/Land Use Compatibility Guide | |
|---|---|
| [1]Applies to noise sensitive areas which serve a significant function for the use which could be adversely affected by noise; such as, outside areas used primarily for instruction, meditation areas, rest and relaxation areas, and other areas where general peace and quiet are important. | |
| | **Normally Acceptable:**<br>Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. |
| | **Conditionally Acceptable:**<br>New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. |
| | **Normally Unacceptable:**<br>New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. |
| | **Clearly Unacceptable:**<br>New construction or development should generally not be undertaken. |

The Noise Element further states that when new development may result in the exposure of existing or future noise-sensitive uses to noise levels in excess of 65 dB(A) $L_{dn}$, an acoustical study will be required. If the acoustical study shows that the noise levels at any noise-sensitive area will exceed 65 dB(A) $L_{dn}$, the development should not be approved unless the following findings are made:

1. Modifications to the development have been, or will be made, which will reduce the exterior noise levels in noise-sensitive areas to 65 dB(A) $L_{dn}$ or less, or

2. If, with current noise abatement technology, it is not feasible to reduce the exterior noise levels to 65 dB(A) $L_{dn}$ or less, then modifications to the development have been, or will be made, which reduce the exterior noise level to the maximum extent feasible and the interior noise level to 45 dB(A) $L_{dn}$ or less. Particular attention shall be given to noise-sensitive spaces such as bedrooms.

3. For rooms in noise-sensitive areas which are occupied only for a part of the day (schools, libraries, or similar), the interior 1-hour average sound level during occupation, due to noise outside, should not exceed 45 dB(A) $L_{eq}$.

Further, noise impacts shall be considered significant if any of the following occur as a result of the project:

1. If, as a direct result of the project, noise levels for any existing or planned development will exceed the noise levels considered compatible for that use as identified in Table 1.

2. If, as a direct result of the proposed development, noise levels which already exceed the levels considered compatible for that use are increased by 3 dB or more.

Section 8.0, Implementation of the Noise Element lists the following measures that may be incorporated into a proposed project as mitigation measures. The following measures are not always required, and mitigation is not limited to this list:

1. The use of site design techniques, such as the provision of buffers to increase distances between the noise source and receiver, siting of buildings and parking areas, and the careful siting of noise-sensitive outdoor features to minimize noise impacts.

2. Provision of berms, landscaping, and other sound barriers, without the exclusive use of walls (e.g., a combination of a small wall and a berm in concert with the overall streetscape in the area could be appropriate).

3. Insulation of buildings against noise, including thicker-than-standard glazing and mechanical ventilation.

4. Improvement of traffic circulation to "smooth" flow by such measures as interconnecting traffic signals.

5. Consideration of the use of innovative construction technologies and materials in constructing or reconstructing streets.

6. Setting of time limits on certain noisy activities.

7. Purchasing of demonstrably quiet equipment for City use.

## 2.2 Municipal Code

### Title 5 - Health and Safety

Chapter 5.04 Noise Abatement and Control Ordinance

On-site generated noise is regulated by the City's Municipal Code, Title 5 Health and Safety, Chapter 5.04 Noise Abatement and Control. The sections applicable to the project are as follows:

Section 5.04.040 General Noise Regulations

A. General Prohibitions. It is unlawful for any person to make, continue, or cause to be made or continued, within the limits of the City, any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area. The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists, include, but are not limited to, the following:

    1. The level of the noise;
    2. Whether the nature of the noise is usual or unusual;
    3. Whether the origin of the noise is natural or unnatural;

4. The level of the background noise;
5. The proximity of the noise to sleeping facilities;
6. The nature and zoning of the area within which the noise emanates;
7. The density of the inhabitation of the area within which the noise emanates;
8. The time of day or night the noise occurs;
9. The duration of the noise;
10. Whether the noise is recurrent, intermittent, or constant; and
11. Whether the noise is produced by a commercial or noncommercial activity.

B. Disturbing, Excessive or Offensive Noises. The following acts, among others, are declared to be disturbing, excessive and offensive noises in violation of this section:

1. Heating and Air Conditioning Equipment and Generators.

   a. It is unlawful for any person to operate or allow the operation of any generator, air conditioning, refrigeration or heating equipment in such manner as to create a noise disturbance on the premises of any other occupied property, or if a condominium, apartment house, duplex, or attached business, within any adjoining unit.

   b. All generators, heating, air conditioning, or refrigeration equipment are subject to the setback and screening requirements in this code.

Section 5.04.070 Motorized Equipment

It is unlawful to operate any lawn mower, backpack blower, lawn edger, leaf blower, riding tractor, or any other machinery, equipment, or other device, or any hand tool which creates a loud, raucous or impulsive sound, within or adjacent to any residential zone between the hours of 10:00 p.m. and 7:00 a.m. of the following day.

Section 5.04.130 Loading and Unloading Operations

A. It is unlawful for any person to engage in loading, unloading, opening, idling of trucks, closing or other handling of boxes, crates, containers, building materials, garbage cans, dumpsters or similar objects between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to cause a noise disturbance within or adjacent to a residential district.

Section 5.04.160 Limitations on sources of noise not otherwise addressed:

A. Between 10:00 p.m. and 7:00 a.m., it is unlawful for any person to generate any noise on the public way that is louder than average conversational level at a distance of 50 feet or more, vertically or horizontally, from the source.

B. Between 10:00 p.m. and 7:00 a.m., no person is permitted to generate any noise on any private open space that is louder than average conversational level at a distance of 50 feet or more, measured from the property line of the property from which the noise is being generated.

The Noise Abatement and Control Ordinance establishes the City's noise regulation, generally prohibits nuisance noise and states that it is unlawful for any person to make, continue, or cause to be made or continued within the City limits any disturbing, excessive, or offensive noise that causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area [Municipal Code Section 5.04.040(A)].

Municipal Code Section 5.04.090, which specifically pertains to construction equipment, makes operation of any construction equipment outside the hours of 7:00 a.m. through 7:00 p.m., Monday through Saturday, except holidays, unlawful unless the operation is expressly approved by the Director of Development Services. Construction equipment with a manufacturer's noise rating of 85 dBA $L_{max}$ or greater may only operate at a specific location for 10 consecutive workdays. If work involving such equipment would involve more than 10 consecutive workdays, a notice must be provided to all property owners and residents within 300 feet of the site no later than 10 days before the start of construction. The notice must be approved by the City and describe the proposed project and the expected duration of work and provide a point of contact to resolve noise complaints.

### Title 13 - Zoning

Chapter 13.30 General Development and Performance Standards

The intent of this section is to protect properties in all districts and the health and safety of persons from environmental nuisances and hazards and to provide a pleasing environment in keeping with the nature of the district character. Section 13.30.030 applies to operation of land uses and states that no operation or activity is permitted which will create vibration noticeable without instruments at the perimeter of the subject property.

## 3.0 Existing Conditions

Existing noise levels at the project site were measured on August 2, 2023, using one Larson-Davis LxT Sound Expert Sound Level Meter, serial number 3896. The following parameters were used:

| | |
|---|---|
| Filter: | A-weighted |
| Response: | Slow |
| Time History Period: | 5 seconds |

The meter was calibrated before and after the measurements. The meter was set 5 feet above the ground level for each measurement. Noise measurements were taken to obtain typical ambient noise levels at the project site and in the vicinity. The weather was warm and sunny with a slight breeze. Two 15-minute measurements were taken. The measurement locations are shown on Figure 5. Measurement 1 was located 50 feet from the edge of Graves Avenue and Measurement 2 was located 50 feet from the eastern property line. The main source of noise was vehicle traffic on Graves Avenue and State Route 67. The average measured noise levels at Measurement 1 and Measurement 2 were 65.7 and 58.1 dB(A) $L_{eq}$, respectively.

## 4.0 Methodology

Noise level predictions and contour mapping were developed using noise modeling software, SoundPlan Essential, version 4.1 (Navcon Engineering 2018). SoundPLAN calculates noise propagation based on the International Organization for Standardization method (ISO 9613-2 – Acoustics, Attenuation of Sound during Propagation Outdoors). The model calculates noise levels at selected receiver locations using input parameter estimates such as total noise generated by each noise source; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. The model outputs can be developed as noise level contour maps or noise levels at specific receivers. In all cases, receivers were modeled at 5 feet above ground elevation, which represents the average height of the human ear.

### 4.1 Construction Noise Analysis

Project construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, building construction, loading, unloading, and placing materials and paving. Diesel engine-driven trucks also would bring materials to the site and remove the soils from excavation.

Construction equipment with a diesel engine typically generates maximum noise levels from 70 to 95 dB(A) $L_{eq}$ at a distance of 50 feet (Federal Highway Administration 2006 and 2008; Federal Transit Authority 2006). During construction, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Table 2 summarizes typical construction equipment noise levels and duty cycles.

During excavation, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Although maximum noise levels may be 70 to 95 dB(A) at a distance of 50 feet during most construction activities, hourly average noise levels from the grading phase of construction would be 85 dB(A) $L_{eq}$ at 50 feet from the center of construction activity when assessing the loudest pieces of equipment–dozer, excavator, and loader–working simultaneously. Noise levels were modeled as an area source over the footprint of the project. It was assumed that noise generated by construction of Phase 1 would be the same as noise generated by construction of Phase 2.

Table 2
Typical Construction Equipment Noise Levels

| Equipment | Noise Level at 50 Feet [dB(A) $L_{eq}$] | Typical Duty Cycle |
|---|---|---|
| Auger Drill Rig | 85 | 20% |
| Backhoe | 80 | 40% |
| Blasting | 94 | 1% |
| Chain Saw | 85 | 20% |
| Clam Shovel | 93 | 20% |
| Compactor (ground) | 80 | 20% |
| Compressor (air) | 80 | 40% |
| Concrete Mixer Truck | 85 | 40% |
| Concrete Pump | 82 | 20% |
| Concrete Saw | 90 | 20% |
| Crane (mobile or stationary) | 85 | 20% |
| Dozer | 85 | 40% |
| Dump Truck | 84 | 40% |
| Excavator | 85 | 40% |
| Front End Loader | 80 | 40% |
| Generator (25 kilovolt amps or less) | 70 | 50% |
| Generator (more than 25 kilovolt amps) | 82 | 50% |
| Grader | 85 | 40% |
| Hydra Break Ram | 90 | 10% |
| Impact Pile Driver (diesel or drop) | 95 | 20% |
| In situ Soil Sampling Rig | 84 | 20% |
| Jackhammer | 85 | 20% |
| Mounted Impact Hammer (hoe ram) | 90 | 20% |
| Paver | 85 | 50% |
| Pneumatic Tools | 85 | 50% |

| Table 2<br>Typical Construction Equipment Noise Levels | | |
|---|---|---|
| Equipment | Noise Level at 50 Feet [dB(A) $L_{eq}$] | Typical Duty Cycle |
| Pumps | 77 | 50% |
| Rock Drill | 85 | 20% |
| Roller | 74 | 40% |
| Scraper | 85 | 40% |
| Tractor | 84 | 40% |
| Vacuum Excavator (vac-truck) | 85 | 40% |
| Vibratory Concrete Mixer | 80 | 20% |
| Vibratory Pile Driver | 95 | 20% |
| dB(A) $L_{eq}$ = A-weighted decibels average noise level<br>SOURCE: Federal Highway Administration 2006 and 2008; Federal Transit Authority 2006. | | |

## 4.2 On-Site Noise Analysis

The operational noise sources on the project site are anticipated to be those that would be typical of any RV and self-storage facility. Based on similar operational uses, on-site operational noise sources associated with the project are anticipated to be RV parking, RV washing, and heating, ventilations, and air conditioning (HVAC) units.

RV noise at the project site would include idling and air brake activity. Based on noise measurements taken at an RV facility, RV idling and air brakes generate a noise level of 62.4 dB(A) $L_{eq}$ at 50 feet (Urban Crossroads 2017). It was assumed that it would take an RV up to five minutes to park. Taking this duration into account, hourly noise levels would be 51.6 dB(A) $L_{eq}$ at 50 feet per RV, which is equivalent to a sound power level of approximately 83 dB(A). A peak hour of 20 percent the daily traffic volume was assumed, for maximum peak hour volumes of 6 RVs per hour for Phase 1 and 3 RVs per hour for Phase 2. The RV noise level was modeled as an area source at RV parking locations.

Phase 1 would also include an RV wash area at the southern portion of the project site. Noise associated with RV washing was assumed to be similar to noise generated by water being discharged from a water tank. Noise spectrum data that results in a sound power level of 80.5 dB(A) was obtained from the SoundPLAN model database (Navcon Engineering 2018). The RV wash area would be removed when the Phase 2 buildings are constructed.

Phase 2 of the project would include rooftop HVAC units on Buildings 1 and 2. Based on review of manufacturer specifications for a sample unit (Trane Model T/YSCE120ED), a representative noise level for a 10-ton unit would be a sound power level of 79 dB (Attachment 1). Typically, a capacity of one ton per 340 square feet would be required for large office buildings. It was assumed that the storage facility would have similar cooling requirements. Based on this ratio, Building 1 would require a capacity equivalent to 27 units and Building 2 would require a capacity equivalent to 14 units. All HVAC units were modeled at full capacity during the daytime and nighttime hours.

## 4.3 Traffic Noise Analysis

Off-site traffic noise was modeled using the Federal Highway Administration Traffic Noise Prediction Model algorithms and reference levels. Traffic noise levels were calculated at 50 feet from the centerline of the affected roadways to determine the noise level increase associated with the project. The model uses various input parameters, such as traffic volumes, vehicle mix, distribution, and speed.

Roadways in the vicinity of the project site that would be affected by project-generated traffic include Graves Avenue and Prospect Avenue. Traffic noise levels were calculated based on the total average daily traffic volume on each roadway segment. For modeling purposes, "hard" ground conditions were used for the analysis of future conditions, since a majority of the project area is paved and the hard site provides the most conservative impact assessment. Noise levels were modeled at 50 feet from roadway centerlines. Modeled noise levels do not account for shielding provided by intervening barriers and structures.

Year 2025 traffic volumes for Graves Avenue and Prospect Avenue were obtained from the San Diego Association of Governments (SANDAG) Transportation Forecast Information Center (SANDAG 2023). Based on the Institute of Traffic Engineers Trip Generation Manual 11th Edition, RV storage land uses generate 0.1796 trip per parking space and self-storage land uses generate 1.45 trips per 1,000 square feet. Based on these trip generation rates, Phase 1 would generate 32 daily trips and Phase 2 would generate 213 daily trips. As a conservative analysis, it was assumed that 100 percent of project-generated traffic would use each modeled segment of Graves Avenue and Prospect Avenue. Modeled traffic volumes are summarized in Table 3.

Table 3
Roadway Traffic Volumes

| Roadway Segment | Year 2025 | Year 2025 + Phase 1 | Year 2025 + Phase 2 | Speed (mph) |
|---|---|---|---|---|
| Graves Avenue – North of Prospect Avenue | 6,800 | 6,832 | 7,013 | 35 |
| Graves Avenue – Prospect Avenue to Pepper Avenue | 8,400 | 8,432 | 8,613 | 35 |
| Graves Avenue – South of Pepper Avenue | 3,600 | 3,632 | 3,813 | 35 |
| Prospect Avenue – West of Graves Avenue | 12,400 | 12,432 | 12,613 | 35 |

mph = miles per hour
SOURCE: SANDAG 2023

## 5.0 Noise Impacts

### 5.1 Construction Noise Analysis

Noise level limits for construction activities are established in Section 5.04.090 of the City's Municipal Code. These limits state that a notice must be provided to all owners and occupants within 300 feet of the project site if the construction equipment has a manufacturer's noise rating of 85 dB and operates at a specific location for 10 consecutive workdays.

In addition, Section 5.04.090 of the City's Municipal Code states that no construction equipment is permitted before 7:00 a.m. or after 7:00 p.m. on Mondays through Saturdays and all times on Sundays and holidays.

Surrounding land uses include single family residential uses to the east and multi-family residential to the north and south. Noise associated with the construction of the project was modeled at a series of 10 receivers located at the adjacent properties. The results are summarized in Table 4. Construction noise contours are shown in Figure 6. SoundPLAN data is contained in Attachment 2.

| Table 4<br>Construction Noise Levels at Off-Site Receivers<br>[dB(A) $L_{eq}$] | | |
|---|---|---|
| Receiver | Land Use | Construction Noise Level |
| 1 | Multi-Family Residential | 72 |
| 2 | Multi-Family Residential | 71 |
| 3 | Single Family Residential | 69 |
| 4 | Single Family Residential | 72 |
| 5 | Single Family Residential | 72 |
| 6 | Single Family Residential | 72 |
| 7 | Single Family Residential | 72 |
| 8 | Single Family Residential | 68 |
| 9 | Multi-Family Residential | 71 |
| 10 | Multi-Family Residential | 71 |
| dB(A) $L_{eq}$ = A-weighted decibels equivalent noise level. | | |

As shown in Table 4, construction noise levels are anticipated to range from 68 to 72 dB(A) $L_{eq}$ at the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary. The project would not require construction equipment that has a manufacturer's noise rating of 85 dB or higher. In accordance with Section 5.04.090 of the City's Municipal Code, construction activities would not occur before 7:00 a.m. or after 7:00 p.m. on Mondays through Saturdays and would not occur any time on Sundays and holidays. As construction activities associated with the project would comply with requirements of the Noise Abatement and Control Ordinance, impacts associated with temporary increases in noise levels during construction would be less than significant.

## 5.2 On-Site Noise Analysis

On-site generated noise is regulated by the City's Municipal Code, Title 5 Health and Safety, Chapter 5.04 Noise Abatement and Control. Section 5.04.040 of the City's Municipal Code states that "it is unlawful for any person to make, continue, or cause to be made or continued, within the limits of the City, any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area." Section 5.04.040 also provides the following requirements for HVAC units:

4. Heating and Air Conditioning Equipment and Generators.

    a. It is unlawful for any person to operate or allow the operation of any generator, air conditioning, refrigeration or heating equipment in such manner as to create a noise disturbance on the premises of any other occupied property, or if a condominium, apartment house, duplex, or attached business, within any adjoining unit.

    b. All generators, heating, air conditioning, or refrigeration equipment are subject to the setback and screening requirements in this code.

Additionally, in accordance with the Noise Element of the General Plan, the noise level threshold is 65 dB(A) $L_{eq}$ at the property line. Using the parameters discussed in Section 4.3, property line noise levels due to on-site operational noise sources (RV parking, RV wash, and HVAC units) were modeled using SoundPLAN. The modeling results are summarized in Table 5. Phase 1 operational noise contours and shown in Figure 7, and SoundPLAN data is contained in Attachment 3. Phase 2 operational noise contours and shown in Figure 8, and SoundPLAN data is contained in Attachment 4.

Table 5
Phase 1 and Phase 2 Operational Noise Levels at Off-Site Receivers
[dB(A) $L_{eq}$]

| Receiver | Land Use | Phase 1 Operational Noise Level | Phase 2 Operational Noise Level |
|---|---|---|---|
| 1 | Multi-Family Residential | 46 | 45 |
| 2 | Multi-Family Residential | 46 | 46 |
| 3 | Single Family Residential | 45 | 45 |
| 4 | Single Family Residential | 48 | 48 |
| 5 | Single Family Residential | 47 | 47 |
| 6 | Single Family Residential | 48 | 48 |
| 7 | Single Family Residential | 47 | 47 |
| 8 | Single Family Residential | 43 | 44 |
| 9 | Multi-Family Residential | 47 | 46 |
| 10 | Multi-Family Residential | 44 | 43 |

dB(A) $L_{eq}$ = A-weighted decibels equivalent noise level

As shown in Table 5, property line noise levels would range from 43 to 48 dB(A) $L_{eq}$ during operation of both Phases 1 and 2. Noise levels would not exceed 65 dB(A) $L_{eq}$. Noise at this level would not be considered a noise disturbance. Additionally, l HVAC units would be operated in accordance with the requirements of the City's Municipal Code. Therefore, operational noise would not generate a substantial permanent increase in ambient noise levels for off-site noise sensitive land uses in excess of standards established in the City's General Plan, and impacts would be less than significant.

## 5.3 Traffic Noise Analysis

The project would increase traffic volumes on local roadways. However, the project would not substantially alter the vehicle classifications mix on local or regional roadways nor would the project alter the speed on an existing roadway or create a new roadway. Thus, the primary factor affecting off-site noise levels would be increased traffic volumes. While changes in noise levels would occur along any roadway where project-related traffic occurs, for noise assessment purposes, noise level increases are assumed to be greatest nearest the project site, as this location would represent the greatest concentration of project-related traffic. As discussed in Section 2.1 above, the City's General Plan Noise Element states that noise impacts would be significant if the project results in an increase of 3 dB or more where noise levels already exceed the land use compatibility levels. A 3 dB increase in noise is barely perceptible to the human ear.

Table 6 presents a conservative assessment of traffic noise levels based on the year 2025, year 2025 plus Phase 1, and year 2025 plus Phase 2. Table 6 also summarizes the traffic noise level increases due to the project. Noise level calculations are contained in Attachment 5. As shown, off-site noise level increases due to the project would be less than 3 dB and would not be perceptible. Therefore, impacts associated with off-site vehicle noise would be less than significant.

| Table 6<br>Off-Site Traffic Noise Levels<br>(CNEL) | | | | | |
|---|---|---|---|---|---|
| | | Year 2025 + Phase 1 | | Year 2025 + Phase 2 | |
| Roadway Segment | Year 2025 Noise Level | Noise Level | Increase Over Existing | Noise Level | Increase Over Existing |
| Graves Avenue -North of Prospect Avenue | 64.6 | 64.6 | 0.0 | 64.7 | 0.1 |
| Graves Avenue – Prospect Avenue to Pepper Avenue | 65.5 | 65.5 | 0.0 | 65.6 | 0.1 |
| Graves Avenue – South of Pepper Avenue | 61.8 | 61.8 | 0.0 | 62.1 | 0.3 |
| Prospect Avenue – West of Graves Avenue | 67.2 | 67.2 | 0.0 | 67.3 | 0.1 |
| CNEL = community noise equivalent level<br>SOURCE: Attachment 5 | | | | | |

## 6.0 Conclusions

Noise impacts due to construction and operation of the project were assessed in accordance with standards established in the City's General Plan Noise Element and the City's Municipal Code. As discussed in this analysis, construction noise levels are anticipated to range from 68 to 72 dB(A) $L_{eq}$ at the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary. As construction activities associated with the project would comply with requirements of the Noise Abatement and Control Ordinance, impacts associated with temporary increases in noise levels during construction would be less than significant.

Property line noise levels due to operation of both Phases 1 and 2 would range from 43 to 48 dB(A) $L_{eq}$. Noise at this level would not be considered a noise disturbance. Additionally, the HVAC units would be operated in accordance with the requirements of the City's Municipal Code. Therefore, operational noise would not generate a substantial permanent increase in ambient noise levels for off-site noise sensitive land uses in excess of standards established in the City's General Plan, and impacts would be less than significant.

The project would contribute traffic to the local roadways. As calculated in this analysis, noise level increases due to the addition of project traffic to area roadways would be well less than 3 dB and would not be perceptible. Therefore, operational roadway noise would not generate a substantial permanent increase in ambient noise levels for off-site noise sensitive land uses, and impacts would be less than significant.

If you have any questions about the results of this analysis, please contact me at jfleming@reconenvironmental.com or (619) 308-9333 extension 177.

Sincerely,

Jessica Fleming

Jessica Fleming
Senior Noise Analyst

JLF:jg

Attachments

## 7.0 References Cited

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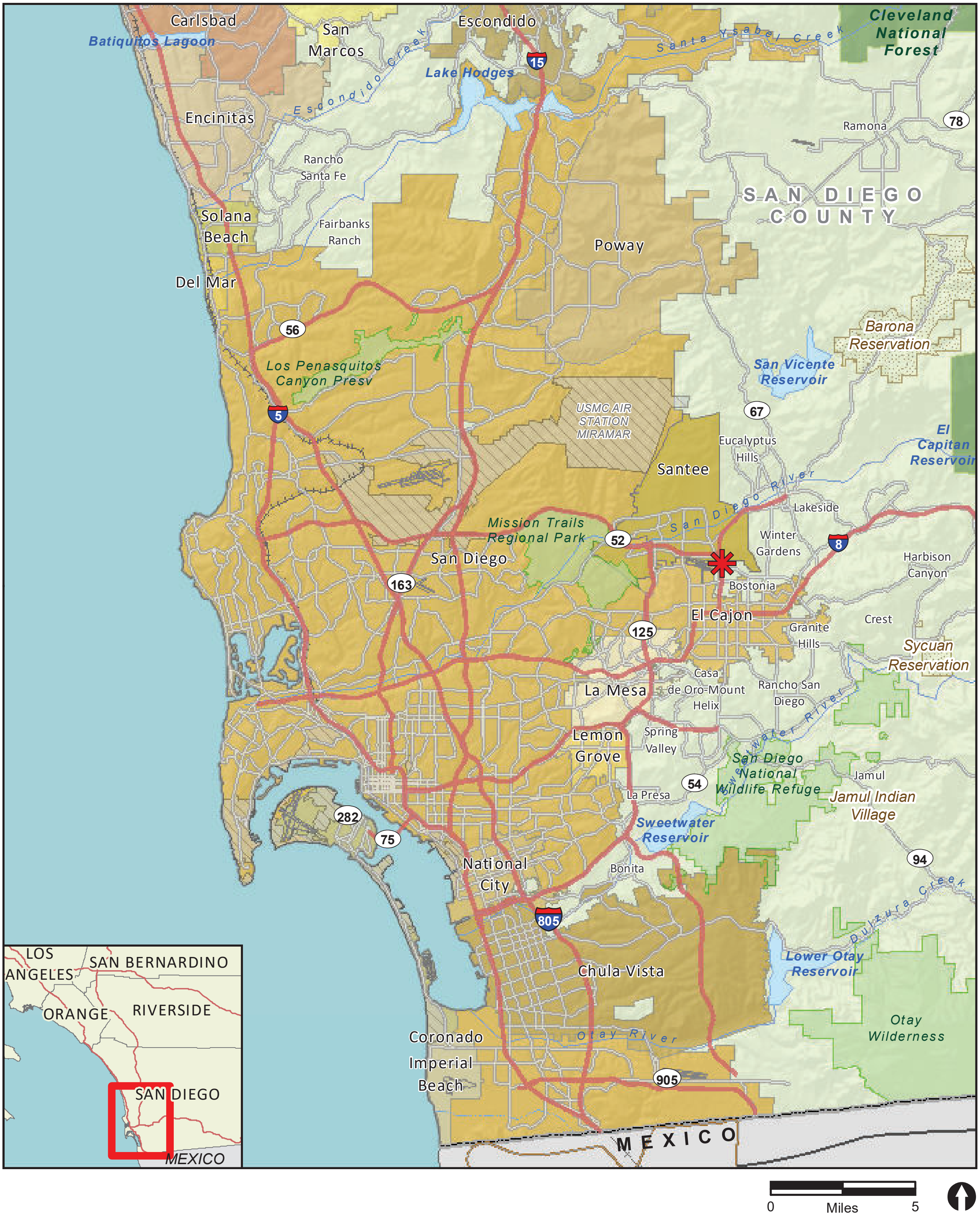


Project Location

FIGURE 1
Regional Location

RECON

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Image Source: NearMap (flown June 2023)


Project Boundary

FIGURE 2

Project Location on Aerial Photograph

RECON

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Map Source: Omega Engineering Consultants

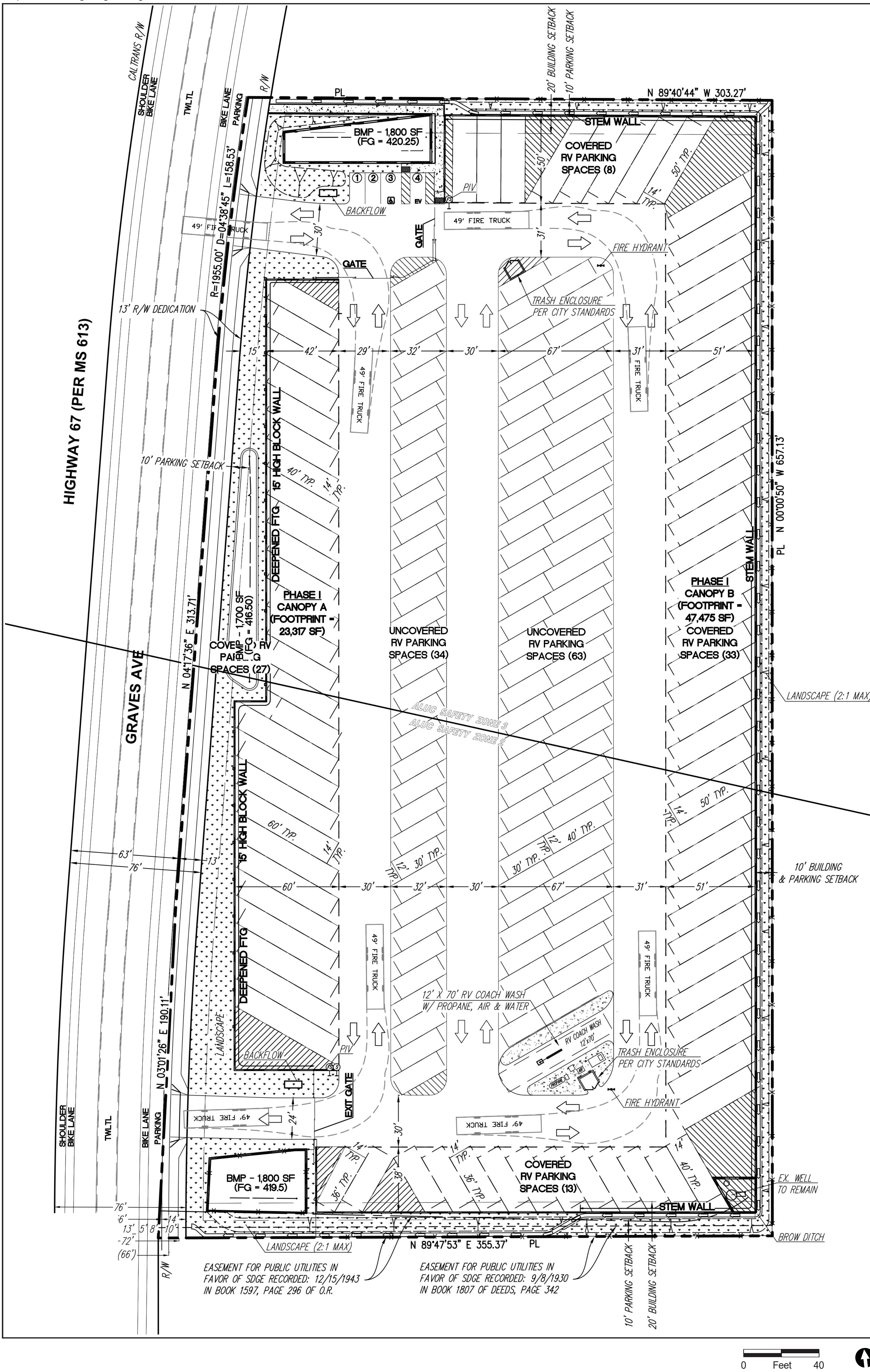


FIGURE 3
Phase 1 Site Plan

Map Source: Omega Engineering Consultants

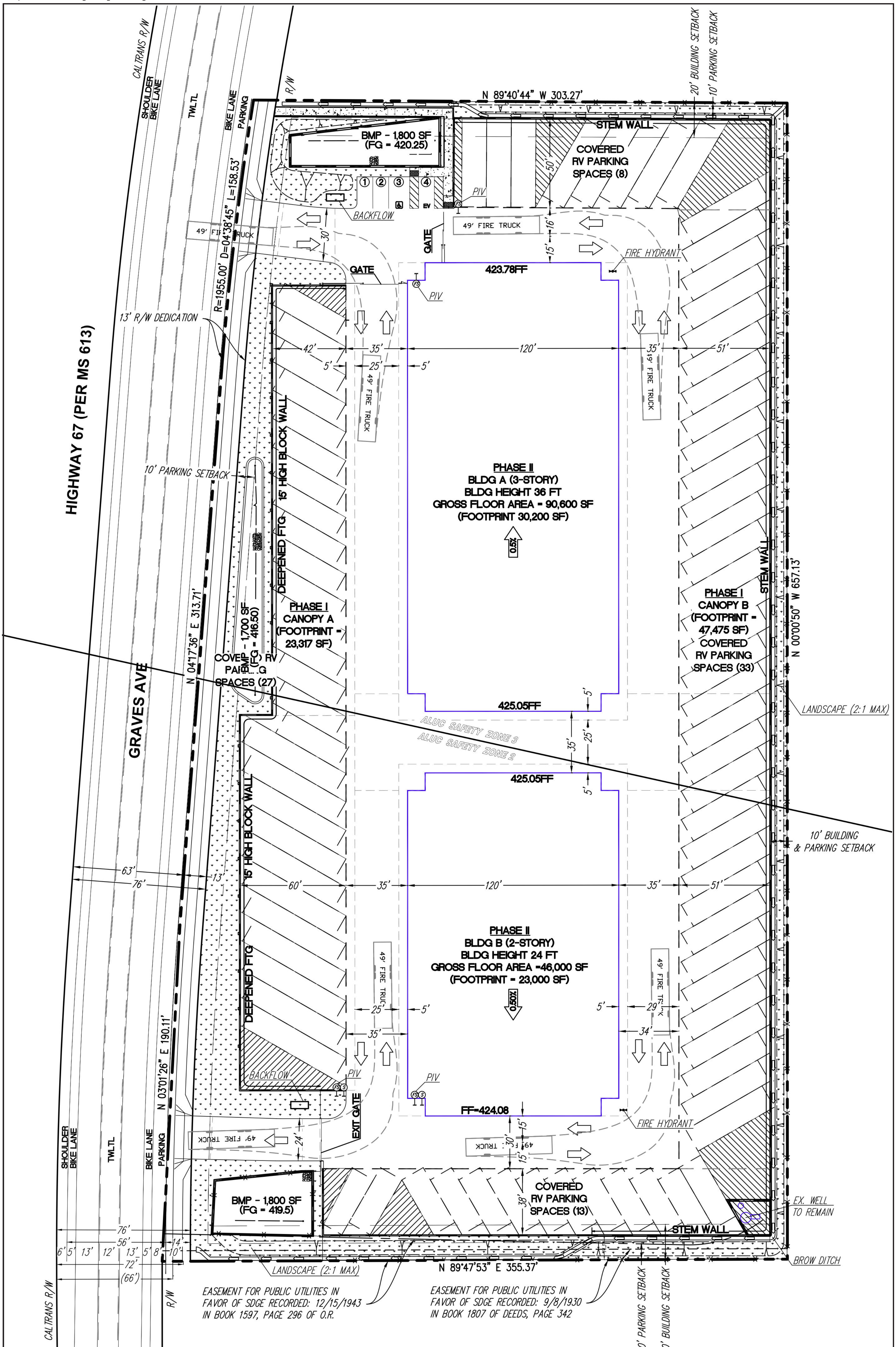


FIGURE 4
Phase 2 Site Plan

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Image Source: NearMap (flown June 2023)


FIGURE 5
Noise Measurement Locations

RECON

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Image Source: NearMap (flown June 2023)


FIGURE 6
Construction Noise Contours

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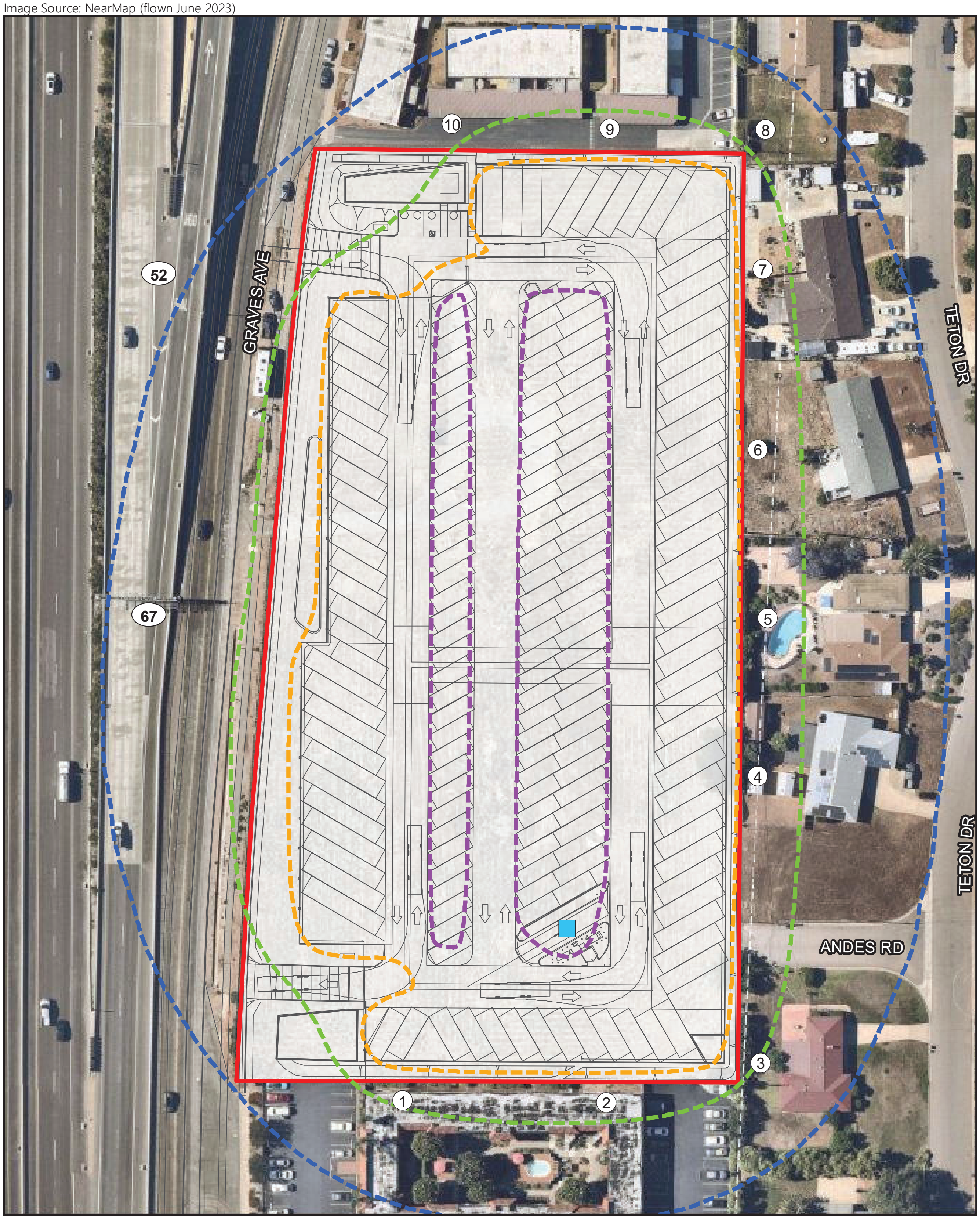
Image Source: NearMap (flown June 2023)



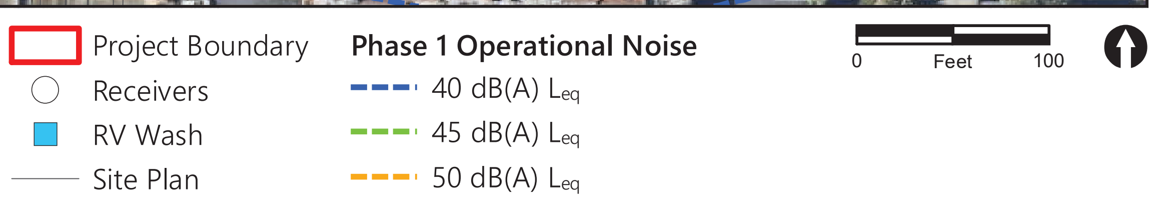




FIGURE 7

Phase 1 Operational Noise Contours

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Image Source: NearMap (flown June 2023)

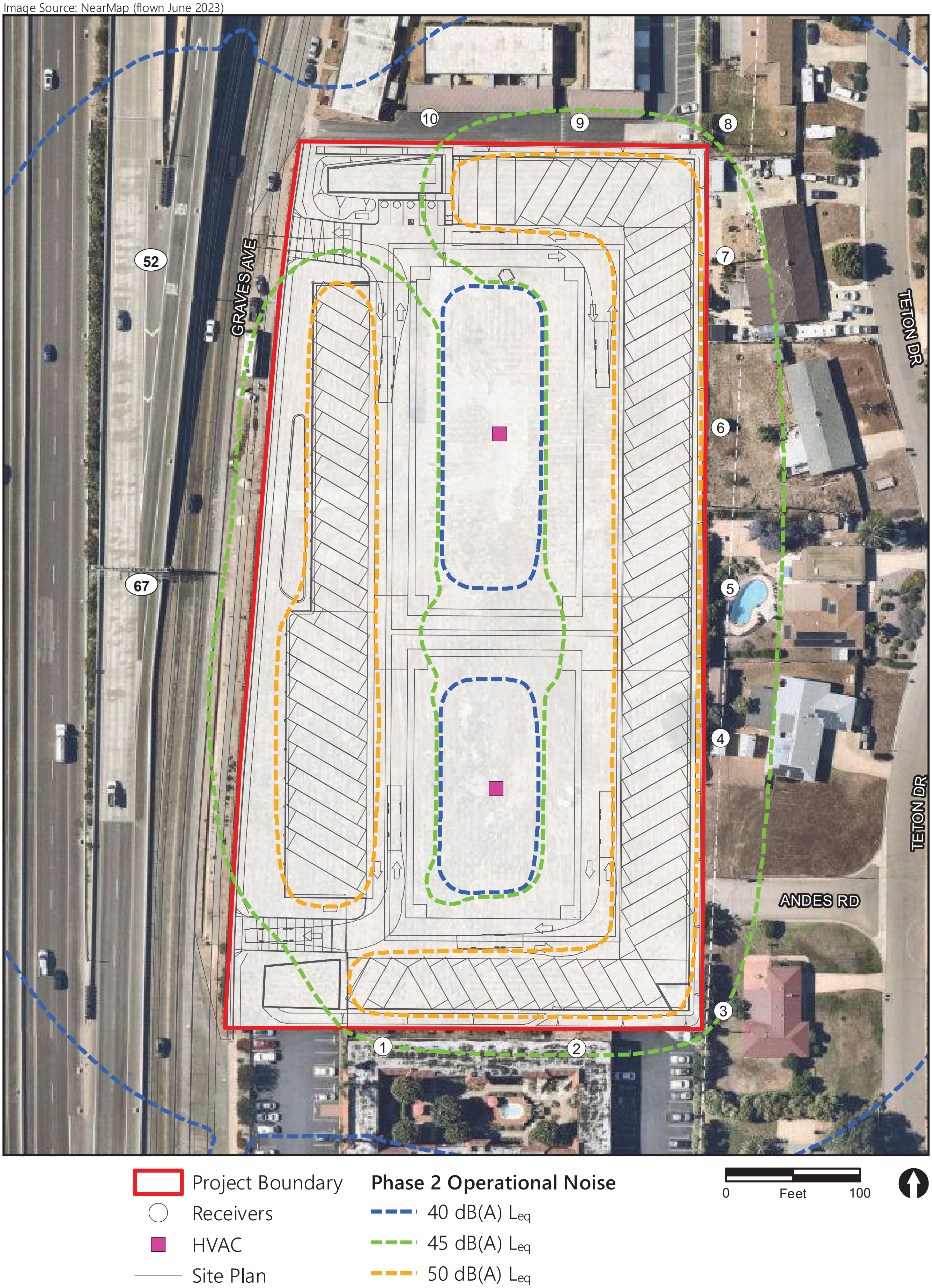


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FIGURE 8
Phase 2 Operational Noise Contours

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ATTACHMENTS

# ATTACHMENT 1

HVAC Specifications

Table 6. Standard motor & low static drive accessory sheave/fan speed (rpm)

| Tons | Unit Model Number | Fan Sheave | 6 Turns Open | 5 Turns Open | 4 Turns Open | 3 Turns Open | 2 Turns Open | 1 Turn Open | Closed |
|---|---|---|---|---|---|---|---|---|---|
| 5 | WSC060ED | AK44x3/4" | N/A | 720 | 791 | 861 | 931 | 1002 | 1072 |
| 6 | WSC072ED | AK56x1" | N/A | 558 | 612 | 665 | 718 | 772 | 825 |
| 7½ | WSC090ED | AK57x1" | N/A | 688 | 737 | 787 | 837 | 887 | N/A |
| 10 | WSC120ED | AK105X1" | N/A | 724 | 776 | 828 | 880 | 932 | 984 |

**Note:** Factory set at 3 turns open.

Table 7. Standard motor & high static drive accessory sheave/fan speed (rpm)

| Tons | Unit Model Number | Fan Sheave | 6 Turns Open | 5 Turns Open | 4 Turns Open | 3 Turns Open | 2 Turns Open | 1 Turn Open | Closed |
|---|---|---|---|---|---|---|---|---|---|
| 6 | WSC072ED | AK56x1" | N/A | 968 | 1018 | 1068 | 1118 | 1169 | 1219 |
| 7½ | WSC090ED | AK57x1" | 1053 | 1091 | 1129 | 1166 | 1204 | 1242 | N/A |
| 10 | WSC120ED | AK105X1" | 1110 | 1159 | 1209 | 1258 | 1308 | 1357 | N/A |

**Note:** Factory set at 3 turns open.

Table 8. Oversized motor & high static drive accessory sheave/fan speed (rpm)

| Tons | Unit Model Number | Fan Sheave | 6 Turns Open | 5 Turns Open | 4 Turns Open | 3 Turns Open | 2 Turns Open | 1 Turn Open | Closed |
|---|---|---|---|---|---|---|---|---|---|
| 7½ | WSC090ED | AK85x1" | 1186 | 1249 | 1311 | 1373 | 1436 | N/A | N/A |

**Note:** Factory set at 3 turns open.

Table 9. Outdoor sound power level—dB (ref. 10—2 W)

| Tons | Unit Model Number | Octave Center Frequency | | | | | | | | Overall dBA |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 5 | T/YSC060ED | 84 | 91 | 79 | 77 | 74 | 71 | 68 | 63 | 80 |
| 6 | T/YSC072ED | 83 | 90 | 86 | 82 | 79 | 75 | 70 | 63 | 85 |
| 7½ | T/YSC090ED | 83 | 90 | 86 | 83 | 80 | 75 | 71 | 64 | 85 |
| 8.5 | T/YSC102ED | 83 | 89 | 84 | 81 | 77 | 72 | 69 | 62 | 83 |
| 10 | T/YSC120ED | 83 | 86 | 80 | 77 | 73 | 69 | 66 | 60 | 79 |

**Note:** Tests follow ARI270-95.

Table 10. Outdoor sound power level—dB (ref. 10—12 W)

| Tons | Unit Model Number | Octave Center Frequency | | | | | | | | Overall dBA |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 5 | WSC060ED | 84 | 91 | 79 | 77 | 74 | 71 | 68 | 63 | 80 |
| 6 | WSC072ED | 83 | 90 | 86 | 82 | 79 | 75 | 70 | 63 | 85 |
| 7½ | WSC090ED | 83 | 90 | 86 | 83 | 80 | 75 | 71 | 64 | 85 |
| 10 | WSC120ED | 83 | 86 | 80 | 77 | 73 | 69 | 66 | 60 | 79 |

**Note:** Tests follow ARI270-95.

# ATTACHMENT 2

SoundPLAN Data – Construction Noise

10396 - 8355 Graves Avenue RV and Self-Storage

SoundPLAN Data - Construction

| Source name | Reference | Level | Corrections | | |
|---|---|---|---|---|---|
| | | Leq1 | Cwall | CI | CT |
| | | dB(A) | dB(A) | dB(A) | dB(A) |
| Construction | Lw/unit | 116.3 | - | - | - |

10396 - 8355 Graves Avenue RV and Self-Storage

SoundPLAN Data - Construction

| No. | Coordinates X | Coordinates Y | Noise Level |
|---|---|---|---|
| | (meters) | | dB(A) |
| 1 | 503648.61 | 3632110.98 | 71.7 |
| 2 | 503692.67 | 3632110.98 | 71.2 |
| 3 | 503726.00 | 3632119.71 | 69.2 |
| 4 | 503724.81 | 3632181.63 | 72.2 |
| 5 | 503726.80 | 3632215.76 | 71.6 |
| 6 | 503724.42 | 3632252.27 | 72.4 |
| 7 | 503725.21 | 3632291.16 | 71.6 |
| 8 | 503725.61 | 3632321.33 | 67.5 |
| 9 | 503691.87 | 3632321.33 | 71.0 |
| 10 | 503657.74 | 3632322.12 | 70.6 |

# ATTACHMENT 3

SoundPLAN Data – Phase 1 Operation

| Source name | Reference | Noise Level dB(A) | Frequency spectrum [dB(A)] 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | Corrections Cwall dB(A) | CI dB(A) | CT dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RV Parking Area 1 | Lw/unit | 86.1 | | | | | | | | | - | - | - |
| RV Parking Area 2 | Lw/unit | 83.1 | | | | | | | | | - | - | - |
| RV Parking Area 3 | Lw/unit | 84.1 | | | | | | | | | - | - | - |
| RV Parking Area 4 | Lw/unit | 86.8 | | | | | | | | | - | - | - |
| RV Wash | Lw/unit | 80.5 | 53.8 | 64.9 | 66.4 | 75.8 | 73 | 75.2 | 71 | 63.9 | - | - | - |

10396 - 8355 Graves Avenue RV and Self-Storage

SoundPLAN Data - Operation Phase 1

| No. | Coordinates X (meters) | Y | Noise Level dB(A) |
|---|---|---|---|
| 1 | 503648.61 | 3632110.98 | 45.5 |
| 2 | 503692.67 | 3632110.98 | 46.4 |
| 3 | 503726.00 | 3632119.71 | 44.8 |
| 4 | 503724.81 | 3632181.63 | 47.9 |
| 5 | 503726.80 | 3632215.76 | 47.2 |
| 6 | 503724.42 | 3632252.27 | 47.9 |
| 7 | 503725.21 | 3632291.16 | 47.1 |
| 8 | 503725.61 | 3632321.33 | 42.9 |
| 9 | 503691.87 | 3632321.33 | 46.5 |
| 10 | 503657.74 | 3632322.12 | 43.5 |

| Source name | Noise Level dB(A) |
|---|---|
| 1 1.Fl 45.5 0.0 | |
| RV Parking Area 1 | 43.7 |
| RV Parking Area 2 | 34.2 |
| RV Parking Area 3 | 35.4 |
| RV Parking Area 4 | 35.3 |
| RV Wash | 33.4 |
| 2 1.Fl 46.4 0.0 | |
| RV Parking Area 1 | 45.0 |
| RV Parking Area 2 | 30.9 |
| RV Parking Area 3 | 33.5 |
| RV Parking Area 4 | 36.4 |
| RV Wash | 36.2 |
| 3 1.Fl 44.8 0.0 | |
| RV Parking Area 1 | 43.4 |
| RV Parking Area 2 | 29.0 |
| RV Parking Area 3 | 31.4 |
| RV Parking Area 4 | 35.5 |
| RV Wash | 33.4 |
| 4 1.Fl 47.9 0.0 | |
| RV Parking Area 1 | 46.3 |
| RV Parking Area 2 | 31.1 |
| RV Parking Area 3 | 34.2 |
| RV Parking Area 4 | 40.8 |
| RV Wash | 33.1 |
| 5 1.Fl 47.2 0.0 | |
| RV Parking Area 1 | 45.5 |
| RV Parking Area 2 | 31.0 |
| RV Parking Area 3 | 34.3 |
| RV Parking Area 4 | 40.9 |
| RV Wash | 29.0 |
| 6 1.Fl 47.9 0.0 | |
| RV Parking Area 1 | 46.5 |
| RV Parking Area 2 | 30.7 |
| RV Parking Area 3 | 34.2 |
| RV Parking Area 4 | 41.0 |
| RV Wash | 25.7 |
| 7 1.Fl 47.1 0.0 | |
| RV Parking Area 1 | 46.1 |
| RV Parking Area 2 | 29.4 |
| RV Parking Area 3 | 32.6 |
| RV Parking Area 4 | 38.7 |
| RV Wash | 22.8 |
| 8 1.Fl 42.9 0.0 | |
| RV Parking Area 1 | 41.5 |
| RV Parking Area 2 | 27.9 |
| RV Parking Area 3 | 30.7 |
| RV Parking Area 4 | 35.4 |
| RV Wash | 21.0 |
| 9 1.Fl 46.5 0.0 | |
| RV Parking Area 1 | 45.5 |
| RV Parking Area 2 | 30.0 |
| RV Parking Area 3 | 33.2 |
| RV Parking Area 4 | 37.7 |
| RV Wash | 21.2 |
| 10 1.Fl 43.5 0.0 | |
| RV Parking Area 1 | 41.1 |
| RV Parking Area 2 | 32.1 |
| RV Parking Area 3 | 34.8 |
| RV Parking Area 4 | 36.6 |
| RV Wash | 21.1 |

# ATTACHMENT 4

SoundPLAN Data – Phase 2 Operation

10396 - 8355 Graves Avenue RV and Self-Storage

SoundPLAN Data - Operation Phase 2

| Source name | Reference | Noise Level dB(A) | Corrections Cwall dB(A) | CI dB(A) | CT dB(A) |
|---|---|---|---|---|---|
| RV Parking Area 1 | Lw/unit | 86.1 | - | - | - |
| RV Parking Area 2 | Lw/unit | 83.1 | - | - | - |
| HVAC 1 | Lw/unit | 93.3 | - | - | - |
| HVAC 2 | Lw/unit | 90.5 | - | - | - |

Noise Source

10396 - 8355 Graves Avenue RV and Self-Storage

SoundPLAN Data - Operation Phase 2

| No. | Coordinates X (meters) | Coordinates Y (meters) | Noise Level dB(A) |
|---|---|---|---|
| 1 | 503648.61 | 3632110.98 | 44.7 |
| 2 | 503692.67 | 3632110.98 | 45.6 |
| 3 | 503726.00 | 3632119.71 | 45.0 |
| 4 | 503724.81 | 3632181.63 | 47.6 |
| 5 | 503726.80 | 3632215.76 | 47.2 |
| 6 | 503724.42 | 3632252.27 | 47.9 |
| 7 | 503725.21 | 3632291.16 | 47.3 |
| 8 | 503725.61 | 3632321.33 | 43.6 |
| 9 | 503691.87 | 3632321.33 | 46.1 |
| 10 | 503657.74 | 3632322.12 | 42.7 |

| Source name | Noise Level dB(A) |
|---|---|
| 1 1.Fl 44.7 0.0 | |
| HVAC 1 | 28.8 |
| HVAC 2 | 33.9 |
| RV Parking Area 1 | 43.7 |
| RV Parking Area 2 | 34.4 |
| 2 1.Fl 45.6 0.0 | |
| HVAC 1 | 27.7 |
| HVAC 2 | 34.1 |
| RV Parking Area 1 | 45.1 |
| RV Parking Area 2 | 25.8 |
| 3 1.Fl 45.0 0.0 | |
| HVAC 1 | 36.4 |
| HVAC 2 | 36.2 |
| RV Parking Area 1 | 43.6 |
| RV Parking Area 2 | 17.5 |
| 4 1.Fl 47.6 0.0 | |
| HVAC 1 | 38.1 |
| HVAC 2 | 37.6 |
| RV Parking Area 1 | 46.5 |
| RV Parking Area 2 | 19.6 |
| 5 1.Fl 47.2 0.0 | |
| HVAC 1 | 39.9 |
| HVAC 2 | 36.5 |
| RV Parking Area 1 | 45.7 |
| RV Parking Area 2 | 24.1 |
| 6 1.Fl 47.9 0.0 | |
| HVAC 1 | 40.6 |
| HVAC 2 | 35.1 |
| RV Parking Area 1 | 46.8 |
| RV Parking Area 2 | 12.2 |
| 7 1.Fl 47.3 0.0 | |
| HVAC 1 | 39.5 |
| HVAC 2 | 34.4 |
| RV Parking Area 1 | 46.2 |
| RV Parking Area 2 | 12.1 |
| 8 1.Fl 43.6 0.0 | |
| HVAC 1 | 38.1 |
| HVAC 2 | 32.2 |
| RV Parking Area 1 | 41.7 |
| RV Parking Area 2 | 18.2 |
| 9 1.Fl 46.1 0.0 | |
| HVAC 1 | 35.6 |
| HVAC 2 | 24.8 |
| RV Parking Area 1 | 45.6 |
| RV Parking Area 2 | 24.5 |
| 10 1.Fl 42.7 0.0 | |
| HVAC 1 | 35.5 |
| HVAC 2 | 24.8 |
| RV Parking Area 1 | 41.2 |
| RV Parking Area 2 | 32.1 |

# ATTACHMENT 5

FHWA RD-77-108 Off-Site Traffic Noise

FHWA RD-77-108

# Traffic Noise Prediction Model

Data Input Sheet

**Project Name :** 8355 Graves Avenue RV and Self-Storage Project
**Project Number :** 10396
**Modeled Condition :** Year 2025 Without Project

**Surface Refelction:** CNEL
**Assessment Metric:** Hard
**Peak ratio to ADT:** 10.00
**Traffic Desc. (Peak or ADT) :** ADT

| Segment | | Roadway Name | Traffic Vol. | Speed (Mph) | Distance to CL | % Autos | %MT | % HT | Day % | Eve % | Night % | K-Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Graves Avenue | North of Prospect Avenue | 6,800 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 2 | Graves Avenue | Prospect Avenue to Pepper Avenue | 8,400 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 3 | Graves Avenue | South of Pepper Avenue | 3,600 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 4 | Prospect Avenue | West of Graves Avenue | 12,400 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |

FHWA RD-77-108

# Traffic Noise Prediction Model

Predicted Noise Levels

**Project Name :** 8355 Graves Avenue RV and Self-Storage Project
**Project Number :** 10396
**Modeled Condition :** Year 2025 Without Project
**Assessment Metric:** Hard

| | | | Noise Levels, dBA Hard | | | | Distance to Traffic Noise Level Contours, Feet | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Segment | 0 | Roadway Name | Auto | MT | HT | Total | 75 dB | 70 dB | 65 dB | 60 dB | 55 dB | 50 dB |
| 1 | Graves Avenue | North of Prospect Avenue | 62.8 | 55.6 | 57.8 | 64.6 | 5 | 14 | 46 | 144 | 456 | 1,442 |
| 2 | Graves Avenue | Prospect Avenue to Pepper Avenue | 63.7 | 56.5 | 58.7 | 65.5 | 6 | 18 | 56 | 177 | 561 | 1,774 |
| 3 | Graves Avenue | South of Pepper Avenue | 60.0 | 52.9 | 55.0 | 61.8 | 2 | 8 | 24 | 76 | 239 | 757 |
| 4 | Prospect Avenue | West of Graves Avenue | 65.4 | 58.2 | 60.4 | 67.2 | 8 | 26 | 83 | 262 | 830 | 2,624 |

FHWA RD-77-108

## Traffic Noise Prediction Model

Data Input Sheet

Project Name : 8355 Graves Avenue RV and Self-Storage Project
Project Number : 10396
Modeled Condition : Year 2025 With Phase 1

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

| Segment | | Roadway Name | Traffic Vol. | Speed (Mph) | Distance to CL | % Autos | %MT | % HT | Day % | Eve % | Night % | K-Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Graves Avenue | North of Prospect Avenue | 6,832 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 2 | Graves Avenue | Prospect Avenue to Pepper Avenue | 8,432 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 3 | Graves Avenue | South of Pepper Avenue | 3,632 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 4 | Prospect Avenue | West of Graves Avenue | 12,432 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |

FHWA RD-77-108

## Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : 8355 Graves Avenue RV and Self-Storage Project
Project Number : 10396
Modeled Condition : Year 2025 With Phase 1
Assessment Metric: Hard

| | | | Noise Levels, dBA Hard | | | | Distance to Traffic Noise Level Contours, Feet | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Segment | 0 | Roadway Name | Auto | MT | HT | Total | 75 dB | 70 dB | 65 dB | 60 dB | 55 dB | 50 dB |
| 1 | Graves Avenue | North of Prospect Avenue | 62.8 | 55.6 | 57.8 | 64.6 | 5 | 14 | 46 | 144 | 456 | 1,442 |
| 2 | Graves Avenue | Prospect Avenue to Pepper Avenue | 63.7 | 56.5 | 58.7 | 65.5 | 6 | 18 | 56 | 177 | 561 | 1,774 |
| 3 | Graves Avenue | South of Pepper Avenue | 60.1 | 52.9 | 55.1 | 61.8 | 2 | 8 | 24 | 76 | 239 | 757 |
| 4 | Prospect Avenue | West of Graves Avenue | 65.4 | 58.2 | 60.4 | 67.2 | 8 | 26 | 83 | 262 | 830 | 2,624 |

FHWA RD-77-108

## Traffic Noise Prediction Model

Data Input Sheet

Project Name : 8355 Graves Avenue RV and Self-Storage Project
Project Number : 10396
Modeled Condition : Year 2025 With Phase 2

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

| Segment | | Roadway Name | Traffic Vol. | Speed (Mph) | Distance to CL | % Autos | %MT | % HT | Day % | Eve % | Night % | K-Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Graves Avenue | North of Prospect Avenue | 7,013 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 2 | Graves Avenue | Prospect Avenue to Pepper Avenue | 8,613 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 3 | Graves Avenue | South of Pepper Avenue | 3,813 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |
| 4 | Prospect Avenue | West of Graves Avenue | 12,613 | 35 | 50 | 97.00 | 2.00 | 1.00 | 77.00 | 10.00 | 13.00 | |

FHWA RD-77-108

## Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : 8355 Graves Avenue RV and Self-Storage Project
Project Number : 10396
Modeled Condition : Year 2025 With Phase 2
Assessment Metric: Hard

| | | | Noise Levels, dBA Hard | | | | Distance to Traffic Noise Level Contours, Feet | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Segment | 0 | Roadway Name | Auto | MT | HT | Total | 75 dB | 70 dB | 65 dB | 60 dB | 55 dB | 50 dB |
| 1 | Graves Avenue | North of Prospect Avenue | 62.9 | 55.7 | 57.9 | 64.7 | 5 | 15 | 47 | 148 | 467 | 1,476 |
| 2 | Graves Avenue | Prospect Avenue to Pepper Avenue | 63.8 | 56.6 | 58.8 | 65.6 | 6 | 18 | 57 | 182 | 574 | 1,815 |
| 3 | Graves Avenue | South of Pepper Avenue | 60.3 | 53.1 | 55.3 | 62.1 | 3 | 8 | 26 | 81 | 256 | 811 |
| 4 | Prospect Avenue | West of Graves Avenue | 65.5 | 58.3 | 60.5 | 67.3 | 8 | 27 | 85 | 269 | 849 | 2,685 |

# ATTACHMENT C

## Drainage Study

# Drainage Study
# Graves Avenue RV Storage
### 8353 Graves Avenue
### Santee, CA 92071

**Date Prepared:**
March 31st, 2023

**Prepared for:**
Cameron Brothers Company, LLC
10580 Prospect Avenue, Suite 200
Santee, CA 92071
619-562-3050

**Prepared By:**

OMEGA
ENGINEERING CONSULTANTS
4320 Viewridge Ave, Suite C
San Diego, CA 92113
Ph: (858) 634-8620

**Declaration of Responsible Charge:**
I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current standards. I understand that the check of the project drawings and specifications by the City of Santee is confined to a review only and does not relieve me, as an engineer of work, of my responsibilities for project design.

Patric T. de Boer — RCE 83583
Registration Expires — 3-31-2025

REGISTERED PROFESSIONAL ENGINEER
PATRIC T DEBOER
No.83583
CIVIL
STATE OF CALIFORNIA

# Table of Contents



# Appendices

## Site & Project Description

This project proposes to construct an RV storage yard and two (2) self-storage buildings at the vacant lot at 8353 Graves Avenue in Santee, California. The site was the location of a recently demolished single family home with several outbuildings and a steel garage structures. The structures have been removed but portions of the associated pavement remain onsite.

The site is located adjacent to California State Route 67 and 0.30 miles south of State Route 52. See page 7 for Vicinity Map.

The proposed project will be built with its corresponding private storm drain system. Three (3) fully lined biofiltration basins will be constructed for 100-year flow attenuation, treatment and hydromodification purposes. The treatment and hydromodification properties of the facility are detailed in a separate Stormwater Quality Report (SWQMP).

## Methodology

This drainage report has been prepared in accordance with current County of San Diego regulations and procedures. The Modified Rational Method was used to compute the anticipated peak runoff flowrates generated by the existing conditions. Where flow from independent drainage systems confluences, the junction equations  from page 3-24 of the San Diego County Hydrology Manual were used.

A SWMM model was generated to demonstrate that the proposed biofiltration basins will provide sufficient storage to attenuate the 100-year storm flow rates to match the existing conditions. The SWMM model routes hydrographs through detention nodes with storage curves corresponding to the surface ponding of each basin.  RatHydro was used to generate the input hydrographs, using the Rational Method calculations results as input values.

The proposed storm drain pipes and channels were sized using Manning's Equation as specified for circular on page 7-78 & 7-18 of *The Handbook of Hydraulics,* by Brater & King.

The initial time of concentration (Ti) and maximum overland flow length (Lm) were determined using Table 3-2 of the Hydrology Manual included as Appendix 6 on this report.

The 100-yr, 6-hr storm depth ($P_6$) was determined using the isopluvial map included as Appendix 2 of this report.

The total time of concentration was determined by adding the Ti value to the travel time (Tt).

$$\mathbf{Tc = Ti + Tt}$$

The Tc and the $P_6$ values were entered into the peak intensity formula from page 3-7 of the hydrology manual to determine the intensity of the rainfall during the peak of the 100-year, 6-hr storm.

$$\mathbf{I = 7.44 \times P_6 \times Tc^{-0.645}}$$

The peak discharge rate was determined using the Rational Method Formula.

**Rational Method**

Q=CIA

Where:

| | | |
|---|---|---|
| Q | = | peak discharge, in cubic feet per second (cfs) |
| C | = | runoff coefficient, proportion of the rainfall that runs off the surface (no units) |
| | = | (0.90*(% impervious)+Cp*(1-% Impervious)) page 5, County Hydrology Manual |
| I | = | average rainfall intensity for a duration equal to the Tc for the area, (in/hr) |
| | = | 7.44*P6*Tc-0.645 |
| A | = | drainage area contributing to the design location, in acres |
| Cp | = | Pervious Coefficient Runoff County Hydrology Manual minimum of 0.35 |
| Tc | = | Ti+Tt |
| Ti | = | Per Table 3-2 of the County Hydrology Manual |
| Tt | = | Per the Kirpich Formula as detailed on Figure 3-4 of the County Hydrology Manual |

The following references have been used in preparation of this report:

(1) Handbook of Hydraulics, E.F. Brater & H.W. King, 6th Ed., 1976.
(2) Modern Sewer Design, American Iron & Steel Institute, 1st Ed., 1980.
(3) County of San Diego Hydrology Manual, 2003

## Existing Conditions

The existing site is a vacant parcel located east of Highway 67 along the easterly frontage of Graves Avenue. The site recently was cleared of a single-family residence and associated outbuildings. The remaining asphalt driveway with a turnaround loop extends from the west boundary into the center of the site. The demolished building footprints and driveway are included as impervious areas in the existing calculations.

The site slopes from the east boundary to the west at approximately 2%. Runoff that flows over the westerly boundary is intercepted by an existing concrete drainage ditch and is conveyed south to a storm drain headwall near the southwesterly corner of the site. The storm drain headwall is considered the discharge point for this analysis, as all flow generated by the site and tributary areas confluences just upstream of the headwall. The project site receives runoff from several houses in a neighborhood located directly east of the site. This runoff flows over the east property line at several locations and across the site to the west boundary.

## Proposed Conditions

The project proposes to regrade the entire site and will modify the oniste drainage patterns but will keep the same discharge point as the existing conditions.

A brow ditch will be installed along the northeasterly and northerly property line that will convey a portion of the offsite runoff towards a curb outlet at the northwesterly corner of the site. The runoff will thence drain to a curb inlet along Graves Avenue where it will drain to the public storm drain system.

The northeasterly portion of the site will drain via surface flow to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin located at the northwesterly corner of the site. After treatment, the basin will discharge to a curb outlet at the northwesterly corner of the site, and ultimately to a curb inlet along Graves Avenue where it will drain to the public storm drain system.

The center portion of the site will drain to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin along the westerly portion of the site. After treatment, the basin will discharge to a curb inlet along Graves Avenue where it will drain to the public storm drain system.

The southerly portion of the site will drain to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin located at the southwesterly corner of the site. After treatment, the basin will discharge to a curb inlet along Graves Avenue where it will drain to the public storm drain system.

A brow ditch will be installed along the easterly and southerly property line that will convey a portion of the offsite runoff towards a curb outlet at the southwesterly corner of the site.

## Existing Runoff Analysis

The existing site is modeled as four (4) on-site and four (4) offsite drainage basins. The existing drainage basins are referred to as E-1.1, E-1.2, E-1.3, E-1.4, O-1.1, O-1.2, O-1.3 and O-1.4 in this report. The slope of the basins varies between 1.7% and 3.9%.

Below is a summary of the input data and the resulting flowrates for the 100-year, 6-hour storm for the existing conditions.

**Existing Rational Calculation Summary**

| Basin | Impervious % | C | Tc (mins) | $I_{100}$ (in/hr) | Area (ac) | $Q_{100}$ (cfs) |
|---|---|---|---|---|---|---|
| E-1.1 | 8% | 0.40 | 9.40 | 4.56 | 0.38 | 0.69 |
| E-1.2 | 26% | 0.49 | 8.57 | 4.84 | 1.35 | 4.67 |
| E-1.3 | 9% | 0.40 | 9.79 | 4.44 | 1.16 | 4.05 |
| E-1.4 | 2% | 0.36 | 10.83 | 4.16 | 1.95 | 4.92 |
| O-1.1 | 41% | 0.58 | 7.38 | 5.33 | 0.72 | 2.21 |
| O-1.2 | 72% | 0.74 | 5.38 | 6.53 | 0.40 | 1.95 |
| O-1.3 | 31% | 0.52 | 6.84 | 5.60 | 0.86 | 2.51 |
| O-1.4 | 36% | 0.55 | 8.61 | 4.82 | 0.88 | 2.33 |

Below is a summary of the existing confluence flow calculations.

**Existing Flow Junction Calculation Summary**

| Confluence Pt. | Tributary Flows | Tc (mins) | $I_{100}$ (in/hr) | $Q_{100}$ (cfs) | Confluence Flow (cfs) |
|---|---|---|---|---|---|
| CP-1 | O-1.1 | 7.38 | 5.33 | 2.21 | 2.75 |
| | E-1.1 | 9.40 | 4.56 | 0.69 | |
| CP-2 | O-1.2 | 5.38 | 6.53 | 1.95 | 6.11 |
| | E-1.2 | 8.57 | 4.84 | 4.67 | |

| | | | | | |
|---|---|---|---|---|---|
| CP-3 | CP-1 | 7.38 | 5.33 | 2.75 | 8.61 |
| | CP-2 | 8.57 | 4.84 | 6.11 | |
| CP-4 | O-1.3 | 6.84 | 5.60 | 2.51 | 6.04 |
| | E-1.3 | 9.79 | 4.44 | 4.05 | |
| CP-5 | CP-3 | 8.57 | 4.84 | 8.61 | 13.90 |
| | CP-4 | 9.79 | 4.44 | 6.04 | |
| CP-6 | O-1.4 | 8.61 | 4.82 | 2.33 | 6.92 |
| | E-1.4 | 10.83 | 4.16 | 4.92 | |
| DP-1 | CP-5 | 8.57 | 4.84 | 13.90 | 19.96 |
| | CP-6 | 9.79 | 4.44 | 6.92 | |

The total area of analysis generates 19.96 cfs for the 100-year storm in the existing conditions.

## Proposed Runoff Analysis

The proposed site is modeled as five (5) on-site and four (4) offsite drainage basins. The existing drainage basins are referred to as P-1.1, P-1.2, P-1.3, P-1.4, P-1.5, O-1.1, O-1.2, O-1.3 and O-1.4 in this report. The slope of the basins varies between 0.6% and 2.6%.

Below is a summary of the input data and the resulting flowrates for the 100-year, 6-hour storm for the proposed conditions.

**Proposed Rational Calculation Summary**

| Basin | Impervious % | C | Tc (mins) | $I_{100}$ (in/hr) | Area (ac) | $Q_{100}$ Unmitigated (cfs) | $Q_{100}$ Mitigated (cfs) |
|---|---|---|---|---|---|---|---|
| P-1.1 | 0% | 0.35 | 11.00 | 4.12 | 0.08 | 0.11 | - |
| P-1.2 | 96% | 0.88 | 5.00 | 6.85 | 1.33 | 7.96 | 2.49 |
| P-1.3 | 95% | 0.87 | 5.00 | 6.85 | 1.38 | 8.25 | 3.87 |
| P-1.4 | 96% | 0.88 | 5.00 | 6.85 | 1.51 | 9.08 | 4.08 |
| P-1.5 | 12% | 0.41 | 12.85 | 3.73 | 0.56 | 0.86 | - |
| O-1.1 | 41% | 0.58 | 7.38 | 5.33 | 0.72 | 3.80 | - |
| O-1.2 | 72% | 0.74 | 5.38 | 6.53 | 0.40 | 1.95 | - |
| O-1.3 | 31% | 0.52 | 6.84 | 5.60 | 0.86 | 2.51 | - |
| O-1.4 | 36% | 0.55 | 8.61 | 4.82 | 0.88 | 2.33 | - |

Below is a summary of the proposed confluence flow calculations.

**Proposed Flow Junction Calculation Summary**

| Confluence Pt. | Tributary Flows | Tc (mins) | $I_{100}$ (in/hr) | $Q_{100}$ (cfs) | Confluence Flow (cfs) |
|---|---|---|---|---|---|
| CP-1 | O-1.2 | 5.38 | 6.53 | 1.95 | 5.40 |
| | O-1.1 | 7.38 | 5.33 | 3.80 | |
| CP-2 | CP-1 | 7.38 | 5.33 | 5.40 | 5.47 |
| | P-1.1 | 11.00 | 4.12 | 0.11 | |
| CP-3 | CP-2 | 7.38 | 5.33 | 5.47 | 7.41 |
| | P-1.2 | 5.00 | 6.85 | 2.49 | |
| CP-4 | CP-3 | 7.38 | 5.33 | 7.41 | 10.42 |
| | P-1.3 | 5.00 | 6.85 | 3.87 | |
| CP-5 | CP-4 | 7.38 | 5.33 | 10.42 | 13.59 |
| | P-1.4 | 5.00 | 6.85 | 4.08 | |
| CP-6 | O-1.3 | 6.84 | 5.60 | 2.51 | 4.35 |
| | O-1.4 | 8.61 | 4.82 | 2.33 | |
| CP-7 | CP-6 | 6.84 | 5.60 | 4.35 | 4.81 |
| | P-1.5 | 12.85 | 3.73 | 0.86 | |
| DP-1 | CP-5 | 7.38 | 5.33 | 13.59 | 18.78 |
| | CP-7 | 6.84 | 5.60 | 4.81 | |

The total area of analysis generates 18.78 cfs for the 100-year storm in the proposed conditions. Discharge Point # 1 experiences a decrease of 1.18 cfs in the proposed conditions.

## SWMM Analysis

The 100-year peak flowrate is attenuated by the proposed biofiltration basins. To model the 100-year flowrate generated from Basins P-1.2, P-1.3 & P-1.4, a hydrograph was required for each basin. RatHydro, a hydrograph generating program, was used to produce a hydrograph based on the inflow from the tributary basin.

The hydrograph generated by RatHydro was input manually into SWMM 5.1 as a time series. The hydrograph was then routed through an outlet link that discharges to an outfall link. This process was done for the three drainage basins, being basins P-1.2, P-1.3 and P-1.3, that drain to the three proposed BMP's.

The outlet link for BMP-1 represents a 12" Nyloplast Dome Grate riser 9" above the finish grade of the basin. The outlet links for BMP-2 and BMP-3 represent a 15" Nyloplast Dome Grate riser 9" above the finish grade of the basin.

The storage curve for each BMP represents the surface storage starting at the elevation of the outlet links. This only counts storage that is above the water quality and HMP volume.

The peak mitigated outflow for BMP-1 is 2.49 cfs vs the peak inflow of 7.96 cfs. This is a reduction of 5.47 cfs for the peak flow exiting the node versus entering.

The peak mitigated outflow for BMP-2 is 3.87 cfs vs the peak inflow of 8.25 cfs. This is a reduction of 4.38 cfs for the peak flow exiting the node versus entering.

The peak mitigated outflow for BMP-3 is 4.08 cfs vs the peak inflow of 9.08 cfs. This is a reduction of 5.0 cfs for the peak flow exiting the node versus entering.

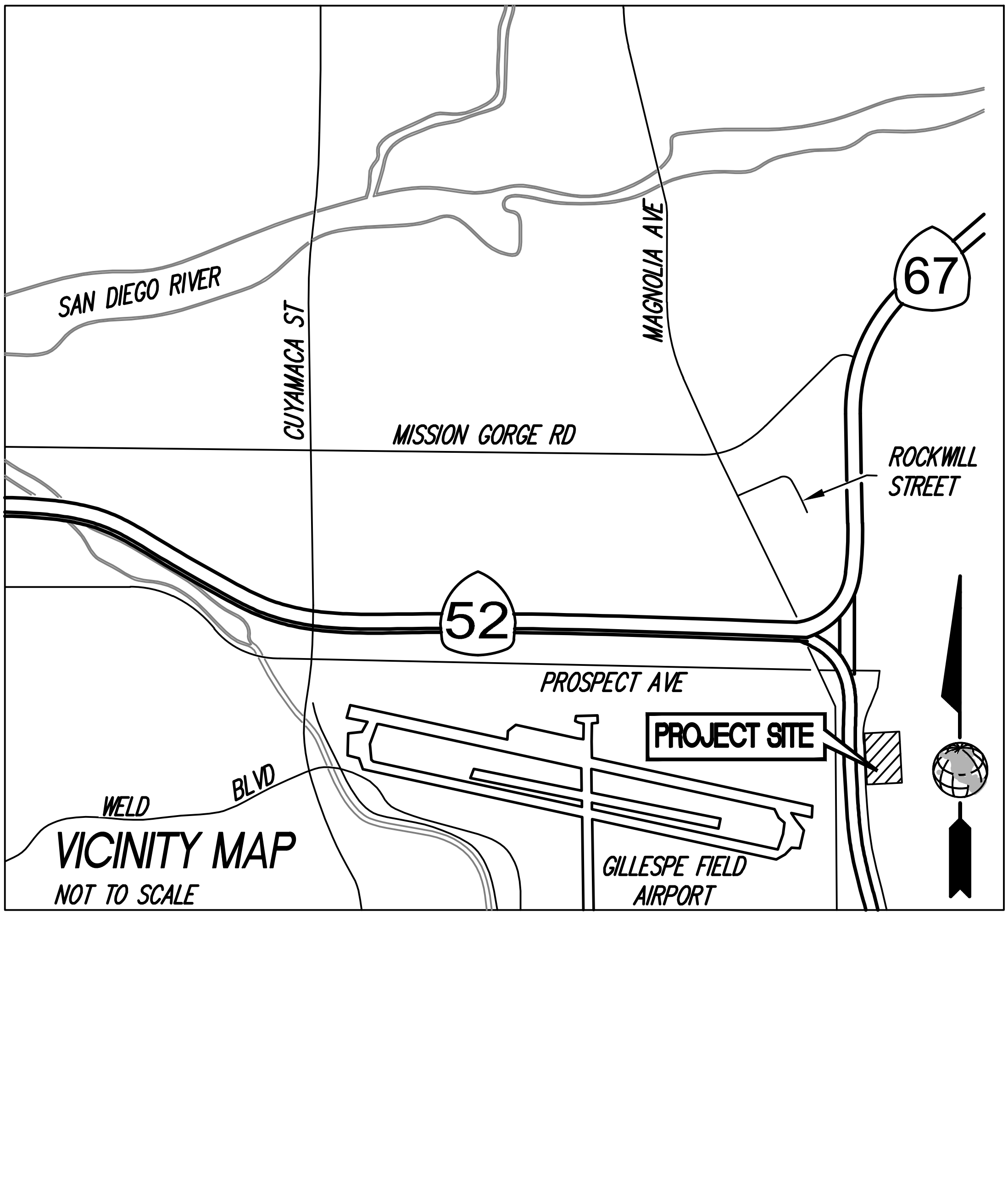
## Results and Conclusions

The proposed improvements result in a decrease of generated runoff during the peak of the 100-year, 6-hr storm. Below is a summary of the existing and proposed peak flowrates.

| | Area (ac) | Tc (min) | $I_{100}$ (in/hr) | $Q_{100}$ (cfs) |
|---|---|---|---|---|
| Existing Conditions | 7.70 | 8.57 | 4.84 | 19.96 |
| Proposed Conditions | 7.70 | 7.38 | 5.33 | 18.78 |

The proposed project will not place any structures in the 100-year flood hazard areas or flood plain as mapped on the FEMA National Flood Hazard Layer FIRMette (See Appendix 10). The proposed project will not place any structures within a 100-year flood hazard area which will impede or redirect flood flows.

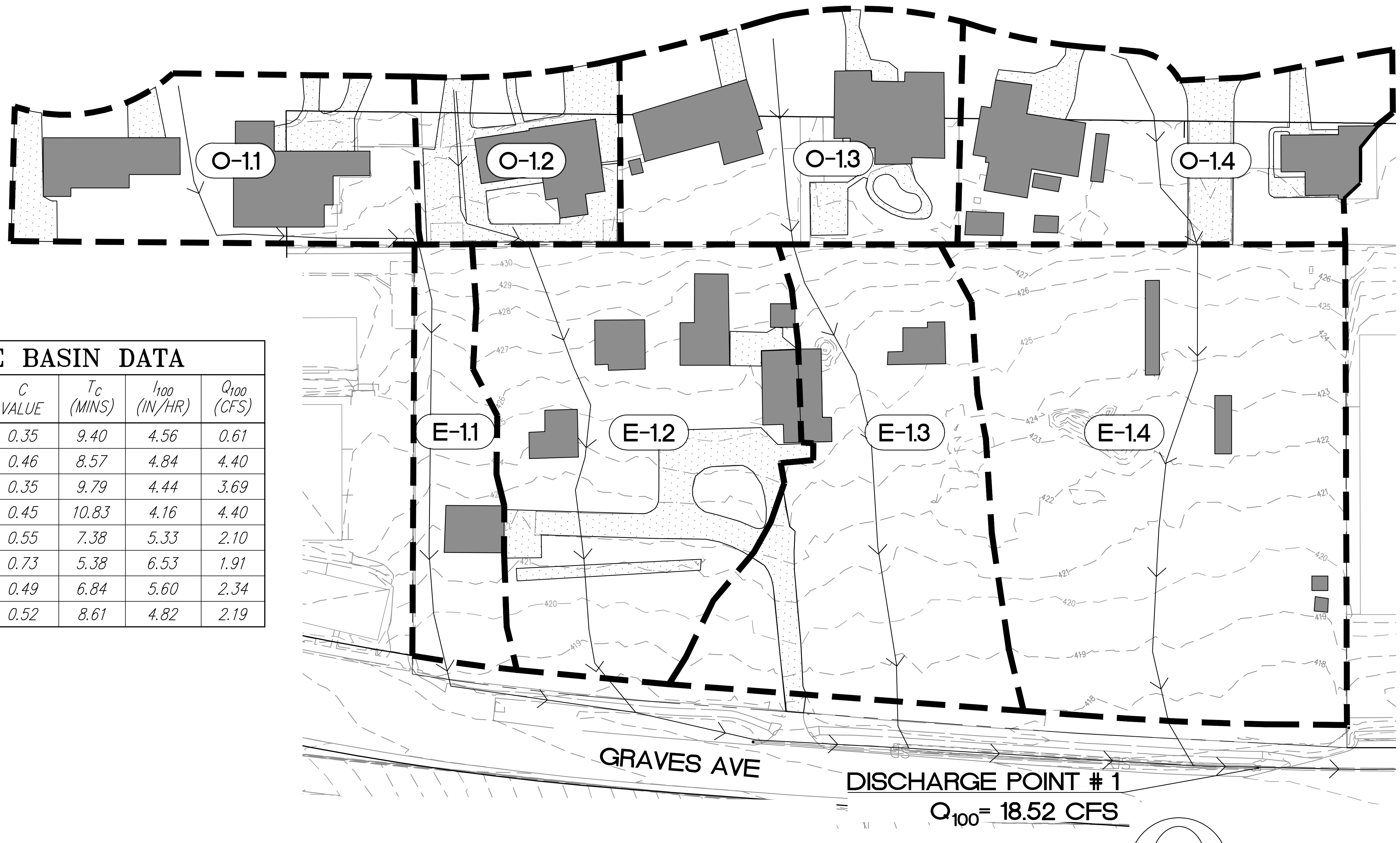
It is the opinion of Omega Engineering Consultants that the project will not cause adverse effects to the downstream facilities or receiving waters. A separate Storm Water Quality Management Plan has been prepared to discuss the water quality impacts for the proposed development.


SAN DIEGO RIVER
CUYAMACA ST
MAGNOLIA AVE
67
MISSION GORGE RD
ROCKWILL
STREET
52
PROSPECT AVE
PROJECT SITE
WELD
BLVD
GILLESPE FIELD
AIRPORT
VICINITY MAP
NOT TO SCALE

## LEGEND

BASIN NUMBER ............ E-#
AREA LIMITS
FLOW PATH
PAVEMENT AREA
BUILDING AREA
PERVIOUS AREA

GRAPHICAL SCALE: 1" = 80'
0 40 80 160




### DRAINAGE BASIN DATA

| BASIN # | AREA (AC) | C VALUE | $T_C$ (MINS) | $I_{100}$ (IN/HR) | $Q_{100}$ (CFS) |
|---|---|---|---|---|---|
| E-1.1 | 0.38 | 0.35 | 9.40 | 4.56 | 0.61 |
| E-1.2 | 1.35 | 0.46 | 8.57 | 4.84 | 4.40 |
| E-1.3 | 1.16 | 0.35 | 9.79 | 4.44 | 3.69 |
| E-1.4 | 1.95 | 0.45 | 10.83 | 4.16 | 4.40 |
| O-1.1 | 0.72 | 0.55 | 7.38 | 5.33 | 2.10 |
| O-1.2 | 0.40 | 0.73 | 5.38 | 6.53 | 1.91 |
| O-1.3 | 0.86 | 0.49 | 6.84 | 5.60 | 2.34 |
| O-1.4 | 0.88 | 0.52 | 8.61 | 4.82 | 2.19 |

# GRAVES AVENUE
# EXISTING HYDROLOGY EXHIBIT

OMEGA

EX. HYDROLOGY EXHIBIT

## PIPE DATA

| PIPE # | DIAMETER (INCHES) | SLOPE (%) | DEPTH/ DIA | $V_{100}$ (FPS) | $Q_{100}$ (CFS) |
|---|---|---|---|---|---|
| 1 | 18 | 0.5 | 0.65 | 4.70 | 5.71 |
| 2 | 18 | 0.5 | 0.80 | 4.81 | 7.29 |
| 3 | 18 | 0.5 | 0.91 | 4.72 | 7.96 |
| 4 | 18 | 1.0 | 0.40 | 4.85 | 2.22 |
| 5 | 15 | 1.5 | 0.84 | 7.37 | 8.11 |
| 6 | 15 | 4.3 | 0.56 | 11.46 | 8.11 |
| 7 | 15 | 1.6 | 0.56 | 8.07 | 8.23 |
| 8 | 18 | 2.0 | 0.69 | 11.43 | 26.44 |
| 9 | 24 | 0.7 | 0.84 | 5.67 | 8.98 |
| 10 | 18 | 18.0 | 0.30 | 20.32 | 9.06 |
| 11 | 18 | 7.4 | 0.51 | 16.48 | 14.94 |

## DRAINAGE BASIN DATA

| BASIN # | AREA (AC) | C VALUE | $T_C$ (MINS) | $I_{100}$ (IN/HR) | $Q_{100}$ (CFS) |
|---|---|---|---|---|---|
| P-1.1 | 0.08 | 0.35 | 11.00 | 4.12 | 0.11 |
| P-1.2 | 1.33 | 0.88 | 5.00 | 6.85 | 7.96 |
| P-1.3 | 1.38 | 0.87 | 5.00 | 6.85 | 8.25 |
| P-1.4 | 1.51 | 0.88 | 5.00 | 6.85 | 9.08 |
| P-1.5 | 0.56 | 0.41 | 12.85 | 3.73 | 0.86 |
| O-1.1 | 0.72 | 0.58 | 7.38 | 5.33 | 3.80 |
| O-1.2 | 0.40 | 0.74 | 5.38 | 6.53 | 1.95 |
| O-1.3 | 0.86 | 0.52 | 6.84 | 5.60 | 2.51 |
| O-1.4 | 0.88 | 0.55 | 8.61 | 4.82 | 2.33 |

## DITCH DATA

| X | TOP WIDTH (INCHES) | SLOPE (%) | D/T | $V_{100}$ (FPS) | $Q_{100}$ (CFS) |
|---|---|---|---|---|---|
| 1 | 24 | 1.98 | 0.27 | 7.88 | 5.40 |
| 2 | 24 | 1.50 | 0.28 | 6.68 | 4.81 |

## LEGEND

- BASIN NUMBER ............ P-#
- AREA LIMITS ............
- FLOW PATH ............
- PAVEMENT AREA ............
- BUILDING AREA ............
- PERVIOUS AREA ............

GRAPHICAL SCALE: 1" = 80'

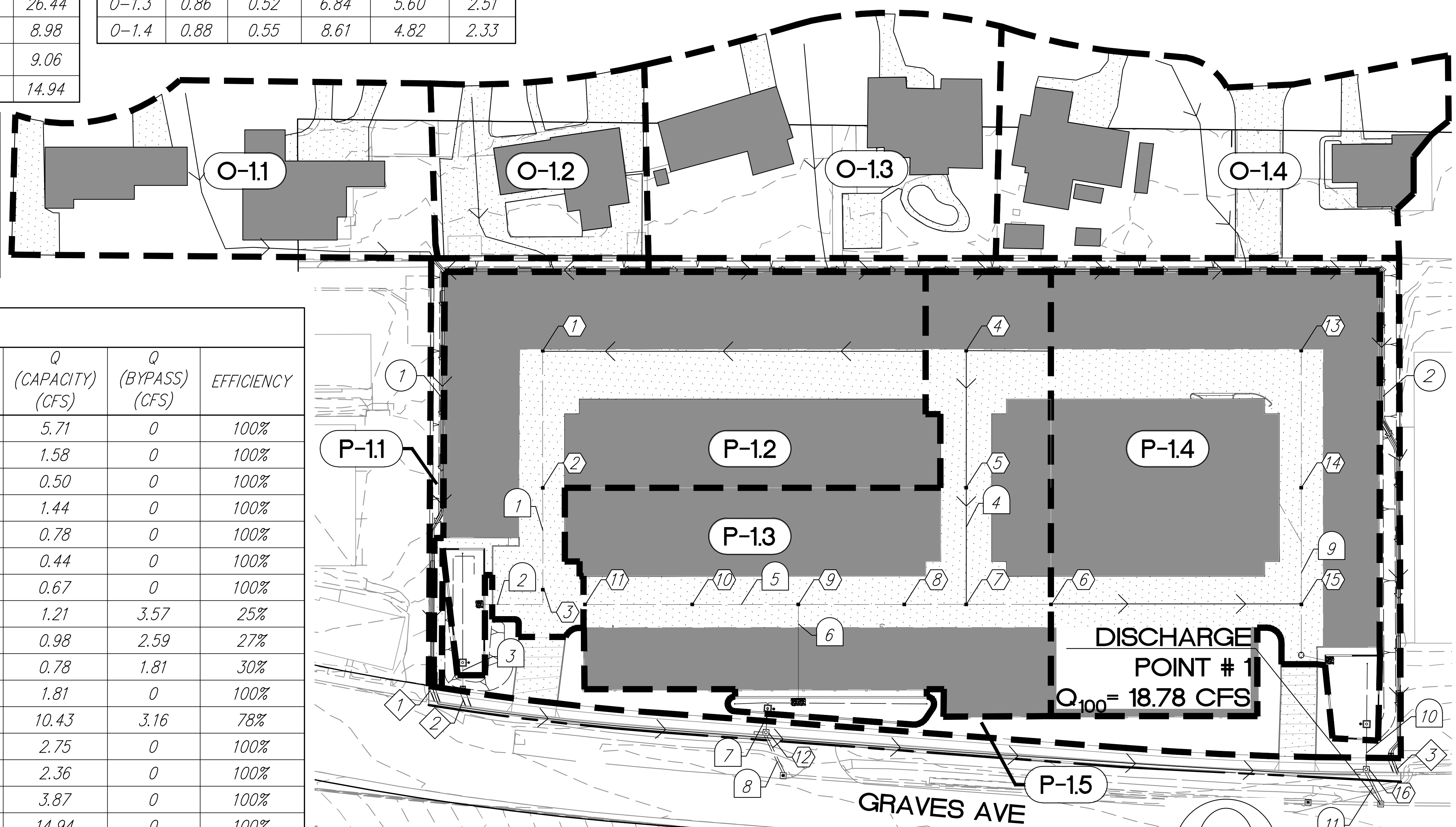
0 40 80 160

## CHANNEL DATA

| X | WIDTH (INCHES) | DEPTH (INCHES) | SLOPE (%) | $V_{100}$ (FPS) | $Q_{100}$ (CFS) |
|---|---|---|---|---|---|
| 1 | 36 | 3.24 | 2.08 | 6.75 | 5.47 |
| 2 | 36 | 1.80 | 2.08 | 5.51 | 2.48 |
| 3 | 36 | 2.88 | 2.08 | 5.93 | 4.80 |

## INLET DATA TABLE

| INLET # | DESCRIPTION | $Q_{100}$ (CFS) | Q (CAPACITY) (CFS) | Q (BYPASS) (CFS) | EFFICIENCY |
|---|---|---|---|---|---|
| 1 | 2'X2' GRATED INLET (SAG) | 5.71 | 5.71 | 0 | 100% |
| 2 | 2'X2' GRATED INLET (SAG) | 1.58 | 1.58 | 0 | 100% |
| 3 | 2'X2' GRATED INLET (SAG) | 0.50 | 0.50 | 0 | 100% |
| 4 | 2'X2' GRATED INLET (SAG) | 1.44 | 1.44 | 0 | 100% |
| 5 | 2'X2' GRATED INLET (SAG) | 0.78 | 0.78 | 0 | 100% |
| 6 | 2'X2' GRATED INLET (SAG) | 0.44 | 0.44 | 0 | 100% |
| 7 | 2'X2' GRATED INLET (SAG) | 0.67 | 0.67 | 0 | 100% |
| 8 | 2'X2' GRATED INLET (ON GRADE) | 4.78 | 1.21 | 3.57 | 25% |
| 9 | 2'X2' GRATED INLET (ON GRADE) | 3.57 | 0.98 | 2.59 | 27% |
| 10 | 2'X2' GRATED INLET (ON GRADE) | 2.59 | 0.78 | 1.81 | 30% |
| 11 | 2'X2' GRATED INLET (SAG) | 1.81 | 1.81 | 0 | 100% |
| 12 | B-INLET W/ 10' WING (ON GRADE) | 14.33 | 10.43 | 3.16 | 78% |
| 13 | 2'X2' GRATED INLET (SAG) | 2.75 | 2.75 | 0 | 100% |
| 14 | 2'X2' GRATED INLET (SAG) | 2.36 | 2.36 | 0 | 100% |
| 15 | 2'X2' GRATED INLET | 3.87 | 3.87 | 0 | 100% |
| 16 | B-INLET W/ 10' WING (SAG) | 14.94 | 14.94 | 0 | 100% |




# GRAVES AVENUE
# PROPOSED HYDROLOGY EXHIBIT

ΩMEGA

PROP. HYDROLOGY EXHIBIT

| BASIN | AREA (SF) | AREA (AC) | % Imp | "C" Value |
|---|---|---|---|---|
| | | | | |
| E-1.1 | 16,560 | 0.38 | 8% | 0.40 |
| E-1.2 | 58,943 | 1.35 | 26% | 0.49 |
| E-1.3 | 50,720 | 1.16 | 9% | 0.40 |
| E-1.4 | 84,877 | 1.95 | 2% | 0.36 |
| O-1.1 | 31,373 | 0.72 | 41% | 0.58 |
| O-1.2 | 17,465 | 0.40 | 72% | 0.74 |
| O-1.3 | 37,310 | 0.86 | 31% | 0.52 |
| O-1.4 | 38,263 | 0.88 | 36% | 0.55 |
| | | | | |
| **EXISTING TOTAL** | **335,511** | **7.70** | 21.9% | 0.47 |
| | | | | |
| | | | | |
| P-1.1 | 3,402 | 0.08 | 0% | 0.350 |
| P-1.2 | 57,759 | 1.33 | 96% | 0.877 |
| P-1.3 | 59,968 | 1.38 | 95% | 0.875 |
| P-1.4 | 65,722 | 1.51 | 96% | 0.878 |
| P-1.5 | 24,249 | 0.56 | 12% | 0.414 |
| O-1.1 | 31,373 | 0.72 | 41% | 0.577 |
| O-1.2 | 17,465 | 0.40 | 72% | 0.744 |
| O-1.3 | 37,310 | 0.86 | 31% | 0.522 |
| O-1.4 | 38,263 | 0.88 | 36% | 0.549 |
| | | | | |
| **PROP TOTAL** | **335,511** | 7.70 | 68% | 0.726 |
| | | | | |
| | | | | |

| Basin Confluence | Symbol |
|---|---|
| **EXISTING** | |
| O-1.1 + E-1.1 | CP -1 |
| O-1.2 + E-1.2 | CP-2 |
| CP-1 + CP-2 | CP-3 |
| O-1.3 + E-1.3 | CP-4 |
| CP-3 + CP-4 | CP-5 |
| O-1.4 + E-1.4 | CP-6 |
| CP-5 + CP-6 | DP-1 |
| | |
| **PROPOSED** | |
| O-1.2 + O-1.1 | CP -1 |
| CP-1 + P-1.1 | CP-2 |
| CP-2 + P-1.2 | CP-3 |
| CP-3 + P-1.3 | CP-4 |
| CP-4 + P-1.4 | CP-5 |
| O-1.3 + O-1.4 | CP-6 |
| CP-6 + P-1.5 | CP-7 |
| CP-5 + CP-7 | DP-1 |

(A) C value for bare ground is 0.35 (Table 3-1 County Hydrology Manual)

C value for impervious surfaces is 0.9
Basins with mixed surface type use a weighted average
of these 2 values. (impervious % x 0.9)+(pervious % x 0.35)

**GRAVES AVENUE RV STORAGE**
**EXISTING CONDITIONS - HYDROLOGY AND HYDRAULICS CALCS (Table No. 2)**

4/10/2023

| Sub-Basin | AREA Ac. | "C" | CA | ΣCA | L (ft) Overland | L (ft) Travel | H (ft) (elev) | S(%) (avg.) | Ti mins | Tt mins | Tc mins | I in/hr | Q tot cfs | NOTES 100-Year Storm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | P(6)= 2.60 |
| O-1.1 | 0.72 | 0.58 | 0.42 | 0.42 | 100 | 140 | 4.0 | 1.7% | 6.00 | 1.38 | 7.38 | 5.33 | 2.21 | |
| E-1.1 | 0.38 | 0.40 | 0.15 | 0.15 | 100 | 205 | 12.0 | 3.9% | 8.00 | 1.40 | 9.40 | 4.56 | 0.69 | |
| | | | | | | | | | | | 7.38 | 5.33 | 2.75 | **Confluence Point-1** |
| O-1.2 | 0.40 | 0.74 | 0.30 | 0.30 | 90 | 51 | 3.0 | 2.1% | 4.90 | 0.48 | 5.38 | 6.53 | 1.95 | |
| E-1.2 | 1.35 | 0.49 | 0.67 | 0.97 | 100 | 226 | 12.0 | 3.7% | 7.00 | 1.57 | 8.57 | 4.84 | 4.67 | |
| | | | | | | | | | | | 8.57 | 4.84 | 6.11 | **Confluence Point-2** |
| | | | | | | | | | | | 8.57 | 4.84 | 8.61 | **Confluence Point-3** |
| O-1.3 | 0.86 | 0.52 | 0.45 | 0.45 | 100 | 15 | 2.0 | 1.7% | 6.70 | 0.14 | 6.84 | 5.60 | 2.51 | |
| E-1.3 | 1.16 | 0.40 | 0.47 | 0.91 | 100 | 253 | 12.0 | 3.4% | 8.00 | 1.79 | 9.79 | 4.44 | 4.05 | |
| | | | | | | | | | | | 9.79 | 4.44 | 6.04 | **Confluence Point-4** |
| | | | | | | | | | | | 8.57 | 4.84 | 13.90 | **Confluence Point-5** |
| O-1.4 | 0.88 | 0.55 | 0.48 | 0.48 | 80 | 125 | 4.0 | 2.0% | 7.40 | 1.21 | 8.61 | 4.82 | 2.33 | |
| E-1.4 | 1.95 | 0.36 | 0.70 | 1.18 | 100 | 267 | 9.0 | 2.5% | 8.70 | 2.13 | 10.83 | 4.16 | 4.92 | |
| | | | | | | | | | | | 9.79 | 4.44 | 6.92 | **Confluence Point-6** |
| | | | | | | | | | | | **8.57** | **4.84** | **19.96** | **Total flow at Discharge Point-1** |

| Sub-Basin | AREA Ac. | "C" | CA | ΣCA | L (ft) Overland | L (ft) Travel | H (ft) (elev) | S(%) (avg.) | Ti mins | Tt mins | Tc mins | I in/hr | Q tot cfs | NOTES 100-Year Storm (Unmitigated) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | P(6)= 2.60 |
| O-1.2 | 0.40 | 0.74 | 0.30 | 0.30 | 90 | 51 | 3.00 | 2.1% | 4.90 | 0.48 | 5.38 | 6.53 | 1.95 | |
| O-1.1 | 0.72 | 0.58 | 0.42 | 0.71 | 100 | 140 | 4.00 | 1.7% | 6.00 | 1.38 | 7.38 | 5.33 | 3.80 | |
| | | | | | | | | | | | 7.38 | 5.33 | 5.40 | Confluence Point-1 |
| P-1.1 | 0.08 | 0.35 | 0.03 | 0.03 | 100 | 320 | 11.00 | 2.6% | 10.30 | 0.70 | 11.00 | 4.12 | 0.11 | |
| | | | | | | | | | | | 7.38 | 5.33 | 5.47 | Confluence Point-2 |
| P-1.2 | 1.33 | 0.88 | 1.16 | 1.16 | 60 | 200 | 3.50 | 1.3% | 3.20 | 1.42 | 5.00 | 6.85 | 7.96 | |
| | | | | | | | | | | | 5.00 | 6.85 | 11.67 | Confluence Point-3 |
| P-1.3 | 1.38 | 0.87 | 1.20 | 1.20 | 60 | 10 | 0.50 | 0.7% | 3.20 | 0.07 | 5.00 | 6.85 | 8.25 | |
| | | | | | | | | | | | 5.00 | 6.85 | 19.92 | Confluence Point-4 |
| P-1.4 | 1.51 | 0.88 | 1.33 | 1.33 | 50 | 120 | 1.07 | 0.6% | 3.70 | 1.25 | 5.00 | 6.85 | 9.08 | |
| | | | | | | | | | | | 5.00 | 6.85 | 29.00 | Confluence Point-5 |
| O-1.3 | 0.86 | 0.52 | 0.45 | 0.45 | 100 | 15 | 2.00 | 1.7% | 6.70 | 0.14 | 6.84 | 5.60 | 2.51 | |
| O-1.4 | 0.88 | 0.55 | 0.48 | 0.48 | 80 | 125 | 4.00 | 2.0% | 7.40 | 1.21 | 8.61 | 4.82 | 2.33 | |
| | | | | | | | | | | | 6.84 | 5.60 | 4.35 | Confluence Point-6 |
| P-1.5 | 0.56 | 0.41 | 0.23 | 0.23 | 85 | 745 | 12.40 | 1.5% | 10.9 | 1.9 | 12.85 | 3.73 | 0.86 | |
| | | | | | | | | | | | 6.84 | 5.60 | 4.81 | Confluence Point-7 |
| | | | | | | | | | | | **5.00** | **6.85** | **32.52** | **Total flow at Discharge Point-1** |

**PROPOSED CONDITIONS (MITIGATED) - HYDROLOGY AND HYDRAULICS CALCS (Table No. 4)**



| Sub-Basin | AREA Ac. | "C" | CA | ΣCA | L (ft) Overland | L (ft) Travel | H (ft) (elev) | S(%) (avg.) | Ti mins | Tt mins | Tc mins | I in/hr | Q tot cfs | NOTES 100-Year Storm (Mitigated) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | P(6)= 2.60 |
| O-1.2 | 0.40 | 0.74 | 0.30 | 0.30 | 90 | 51 | 3.00 | 2.1% | 4.90 | 0.48 | 5.38 | 6.53 | 1.95 | |
| O-1.1 | 0.72 | 0.58 | 0.42 | 0.71 | 100 | 140 | 4.00 | 1.7% | 6.00 | 1.38 | 7.38 | 5.33 | 3.80 | |
| | | | | | | | | | | | 7.38 | 5.33 | 5.40 | Confluence Point-1 |
| P-1.1 | 0.08 | 0.35 | 0.03 | 0.03 | 100 | 320 | 11.00 | 2.6% | 10.30 | 0.70 | 11.00 | 4.12 | 0.11 | |
| | | | | | | | | | | | 7.38 | 5.33 | 5.47 | Confluence Point-2 |
| P-1.2 | 1.33 | 0.88 | 1.16 | 1.16 | 60 | 200 | 3.50 | 1.3% | 3.20 | 1.42 | 5.00 | 6.85 | 2.49 | |
| | | | | | | | | | | | 7.38 | 5.33 | 7.41 | Confluence Point-3 |
| P-1.3 | 1.38 | 0.87 | 1.20 | 1.20 | 60 | 10 | 0.50 | 0.7% | 3.20 | 0.07 | 5.00 | 6.85 | 3.87 | |
| | | | | | | | | | | | 7.38 | 5.33 | 10.42 | Confluence Point-4 |
| P-1.4 | 1.51 | 0.88 | 1.33 | 1.33 | 50 | 120 | 1.07 | 0.6% | 3.70 | 1.25 | 5.00 | 6.85 | 4.08 | |
| | | | | | | | | | | | 7.38 | 5.33 | 13.59 | Confluence Point-5 |
| O-1.3 | 0.86 | 0.52 | 0.45 | 0.45 | 100 | 15 | 2.00 | 1.7% | 6.70 | 0.14 | 6.84 | 5.60 | 2.51 | |
| O-1.4 | 0.88 | 0.55 | 0.48 | 0.48 | 80 | 125 | 4.00 | 2.0% | 7.40 | 1.21 | 8.61 | 4.82 | 2.33 | |
| | | | | | | | | | | | 6.84 | 5.60 | 4.35 | Confluence Point-6 |
| P-1.5 | 0.56 | 0.41 | 0.23 | 0.23 | 85 | 745 | 12.40 | 1.5% | 10.9 | 1.9 | 12.85 | 3.73 | 0.86 | |
| | | | | | | | | | | | 6.84 | 5.60 | 4.81 | Confluence Point-7 |
| | | | | | | | | | | | **7.38** | **5.33** | **18.78** | **Total flow at Discharge Point-1** |

**CONDUIT SIZING CALCULATIONS**

The following chart details the sizing parameters and for conduits that convey runoff on the site.
Flow parameters from *Handbook of Hydraulics, King & Brater* were used, see following page.

| | | |
|---|---|---|
| K'= Discharge factor | = | $(Q*n)/(d^{8/3}*s^{1/2})$ |
| n= Mannings coefficient | = | 0.013 for PVC & HDPE |
| d=diameter of conduit (ft) | = | per chart |
| Q= Discharge | = | based off portions of basins tributary to outlet |
| s=Minimum Pipe Slope (ft/ft) | = | per chart |
| D=depth of flow | = | From table 7-4 of the *Handbook of Hydraulics, King & Brater* See right |
| $C_a$= Flow factor | = | From table 7-14 of the *Handbook of Hydraulics, King & Brater* See right |
| A=Cross sectional area of flow | = | $C_a*d^2$ |
| V=Velocity | = | Q/A |

**Pipe Flow**

| Pipe | Tributary Areas | Q (cfs) | S (%) | d (in) | K' | D/d | $C_a$ | A (sf) | V (fps) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **Flow captured by Inlet # 1** | 5.71 | 0.5 | 18 | 0.3561 | 0.65 | 0.54 | 1.215 | 4.70 |
| 2 | **Flow captured by Inlets # 1-2** | 7.29 | 0.5 | 18 | 0.4791 | 0.84 | 0.704 | 1.584 | 4.60 |
| 3 | **Discharge from BMP-1** | 7.96 | 0.5 | 18 | 0.4966 | 0.91 | 0.75 | 1.688 | 4.72 |
| 4 | **Flow captured by Inlets # 4-5** | 2.22 | 1.0 | 15 | 0.1593 | 0.40 | 0.293 | 0.458 | 4.85 |
| 5 | **Flow captured by Inlets # 4-11** | 8.11 | 1.5 | 15 | 0.4748 | 0.84 | 0.704 | 1.100 | 7.37 |
| 6 | **Flow captured by Inlets # 4-11** | 8.11 | 4.3 | 15 | 0.2805 | 0.56 | 0.453 | 0.708 | 11.46 |
| 7 | **Discharge from BMP-2** | 8.23 | 1.6 | 18 | 0.2869 | 0.56 | 0.453 | 1.019 | 8.07 |
| 8 | **Northerly offsite flow, Basins O-1.1, O-1.2, P-1.1, P-1.2 & P-1.3** | 26.44 | 2.0 | 24 | 0.3827 | 0.69 | 0.578 | 2.312 | 11.43 |
| 9 | **Flow captured by Inlets # 13-15** | 8.98 | 0.7 | 18 | 0.4734 | 0.84 | 0.704 | 1.584 | 5.67 |
| 10 | **Basin P-1.4** | 9.06 | 18.0 | 18 | 0.0942 | 0.30 | 0.198 | 0.446 | 20.32 |
| 11 | **Westerly portion of Graves Ave., Basins P-1.4 & P-1.5** | 14.94 | 7.4 | 18 | 0.2422 | 0.51 | 0.403 | 0.907 | 16.48 |
| | | | | | | | | | |

Table 7-4. For Determining the Area $a$ of the Cross Section of a Circular Conduit Flowing Part Full

Let $\frac{\text{depth of water}}{\text{diameter of channel}} = \frac{D}{d}$ and $C_a$ = the tabulated value. Then $a = C_a d^2$.

| $\frac{D}{d}$ | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| .0 | .0000 | .0013 | .0037 | .0069 | .0105 | .0147 | .0192 | .0242 | .0294 | .0350 |
| .1 | .0409 | .0470 | .0534 | .0600 | .0668 | .0739 | .0811 | .0885 | .0961 | .1039 |
| .2 | .1118 | .1199 | .1281 | .1365 | .1449 | .1535 | .1623 | .1711 | .1800 | .1890 |
| .3 | .1982 | .2074 | .2167 | .2260 | .2355 | .2450 | .2546 | .2642 | .2739 | .2836 |
| .4 | .2934 | .3032 | .3130 | .3229 | .3328 | .3428 | .3527 | .3627 | .3727 | .3827 |
| .5 | .393 | .403 | .413 | .423 | .433 | .443 | .453 | .462 | .472 | .482 |
| .6 | .492 | .502 | .512 | .521 | .531 | .540 | .550 | .559 | .569 | .578 |
| .7 | .587 | .596 | .605 | .614 | .623 | .632 | .640 | .649 | .657 | .666 |
| .8 | .674 | .681 | .689 | .697 | .704 | .712 | .719 | .725 | .732 | .738 |
| .9 | .745 | .750 | .756 | .761 | .766 | .771 | .775 | .779 | .782 | .784 |

Table 7-14. Values of $K'$ for Circular Channels in the Formula

$$Q = \frac{K'}{n} d^{8/3} s^{1/2}$$

$D$ = depth of water $d$ = diameter of channel

| $\frac{D}{d}$ | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| .0 | | .00007 | .00031 | .00074 | .00138 | .00222 | .00328 | .00455 | .00604 | .00775 |
| .1 | .00967 | .0118 | .0142 | .0167 | .0195 | .0225 | .0257 | .0291 | .0327 | .0366 |
| .2 | .0406 | .0448 | .0492 | .0537 | .0585 | .0634 | .0686 | .0738 | .0793 | .0849 |
| .3 | .0907 | .0966 | .1027 | .1089 | .1153 | .1218 | .1284 | .1352 | .1420 | .1490 |
| .4 | .1561 | .1633 | .1705 | .1779 | .1854 | .1929 | .2005 | .2082 | .2160 | .2238 |
| .5 | .232 | .239 | .247 | .255 | .263 | .271 | .279 | .287 | .295 | .303 |
| .6 | .311 | .319 | .327 | .335 | .343 | .350 | .358 | .366 | .373 | .380 |
| .7 | .388 | .395 | .402 | .409 | .416 | .422 | .429 | .435 | .441 | .447 |
| .8 | .453 | .458 | .463 | .468 | .473 | .477 | .481 | .485 | .488 | .491 |
| .9 | .494 | .496 | .497 | .498 | .498 | .498 | .496 | .494 | .489 | .483 |
| 1.0 | .463 | | | | | | | | | |

**DITCH SIZING CALCULATIONS**

The following chart details the sizing parameters and for conduits that convey runoff on the site.

| | | |
|---|---|---|
| K'= Discharge factor | = | $(Q*n)/(d^{8/3}*s^{1/2})$ |
| n= Mannings coefficient | = | 0.013 for PVC & HDPE |
| d=diameter of conduit (ft) | = | per chart |
| Q= Discharge | = | based off portions of basins tributary to outlet |
| s=Minimum Pipe Slope (ft/ft) | = | per chart |
| D=depth of flow | = | From table 7-4 See right |
| $C_a$= Flow factor | = | From table 7-14 See right |
| A=Cross sectional area of flow | = | $C_a*d^2$ |
| V=Velocity | = | Q/A |

**Ditch Flow**

| Pipe | Tributary Areas | Q (cfs) | S (%) | d (in) | K' | D/T | $C_a$ | A (sf) | V (fps) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **Brow ditch along the northeasterly and northerly properly line of the site** | 5.40 | 1.98 | 24 | 0.0785 | 0.27 | 0.171 | 0.684 | 7.88 |
| 2 | **Brow ditch along the easterly and southerlyy properly line of the site** | 4.81 | 1.50 | 24 | 0.0804 | 0.28 | 0.18 | 0.720 | 6.68 |
| | | | | | | | | | |
| | | | | | | | | | |

Table 7-4. For Determining the Area $a$ of the Cross Section of a Circular Conduit Flowing Part Full

Let $\frac{\text{depth of water}}{\text{diameter of channel}} = \frac{D}{d}$ and $C_a$ = the tabulated value. Then $a = C_a d^2$.

| $\frac{D}{d}$ | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| .0 | .0000 | .0013 | .0037 | .0069 | .0105 | .0147 | .0192 | .0242 | .0294 | .0350 |
| .1 | .0409 | .0470 | .0534 | .0600 | .0668 | .0739 | .0811 | .0885 | .0961 | .1039 |
| .2 | .1118 | .1199 | .1281 | .1365 | .1449 | .1535 | .1623 | .1711 | .1800 | .1890 |
| .3 | .1982 | .2074 | .2167 | .2260 | .2355 | .2450 | .2546 | .2642 | .2739 | .2836 |
| .4 | .2934 | .3032 | .3130 | .3229 | .3328 | .3428 | .3527 | .3627 | .3727 | .3827 |
| .5 | .393 | .403 | .413 | .423 | .433 | .443 | .453 | .462 | .472 | .482 |
| .6 | .492 | .502 | .512 | .521 | .531 | .540 | .550 | .559 | .569 | .578 |
| .7 | .587 | .596 | .605 | .614 | .623 | .632 | .640 | .649 | .657 | .666 |
| .8 | .674 | .681 | .689 | .697 | .704 | .712 | .719 | .725 | .732 | .738 |
| .9 | .745 | .750 | .756 | .761 | .766 | .771 | .775 | .779 | .782 | .784 |

Table 7-14. Values of $K'$ for Circular Channels in the Formula

$$Q = \frac{K'}{n} d^{8/3} s^{1/2}$$

$D$ = depth of water  $d$ = diameter of channel

| $\frac{D}{d}$ | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| .0 | | .00007 | .00031 | .00074 | .00138 | .00222 | .00328 | .00455 | .00604 | .00775 |
| .1 | .00967 | .0118 | .0142 | .0167 | .0195 | .0225 | .0257 | .0291 | .0327 | .0366 |
| .2 | .0406 | .0448 | .0492 | .0537 | .0585 | .0634 | .0686 | .0738 | .0793 | .0849 |
| .3 | .0907 | .0966 | .1027 | .1089 | .1153 | .1218 | .1284 | .1352 | .1420 | .1490 |
| .4 | .1561 | .1633 | .1705 | .1779 | .1854 | .1929 | .2005 | .2082 | .2160 | .2238 |
| .5 | .232 | .239 | .247 | .255 | .263 | .271 | .279 | .287 | .295 | .303 |
| .6 | .311 | .319 | .327 | .335 | .343 | .350 | .358 | .366 | .373 | .380 |
| .7 | .388 | .395 | .402 | .409 | .416 | .422 | .429 | .435 | .441 | .447 |
| .8 | .453 | .458 | .463 | .468 | .473 | .477 | .481 | .485 | .488 | .491 |
| .9 | .494 | .496 | .497 | .498 | .498 | .498 | .496 | .494 | .489 | .483 |
| 1.0 | .463 | | | | | | | | | |

## Rectangular Channel Sizing Calculation

K'= Discharge Factor
n= Mannings coefficient
D=depth of water in channel
b=width of bottom of channel (ft)
Q= Discharge (cfs)
s=Pipe Slope (ft/ft)
n= 0.013

**Rectangular Conduit**

Q=(K'/n)*b^(8/3)*s^(0.5)

| Tributary Area | Q per conduit (cfs) | S (%) | Width (inches) | K' | D/b | Depth of water in conduit (inches) | Cross sectional area of flow (sf) | Velocity (ft/ sec) |
|---|---|---|---|---|---|---|---|---|
| P-1.1 | 5.47 | 2.08 | 36 | 0.0263 | 0.09 | 3.24 | 0.81 | 6.75 |
| P-1.2 | 2.48 | 2.08 | 36 | 0.0119 | 0.05 | 1.80 | 0.45 | 5.51 |
| O-1.3, O-1.4 & P-1.5 | 4.81 | 2.08 | 36 | 0.0232 | 0.08 | 2.88 | 0.72 | 6.68 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Notes:
1) Standard D-25 curb outlet structures that discharge to Graves Avenue.

STEADY UNIFORM FLOW IN OPEN CHANNELS 7-43

Table 7-11. Values of $K'$ in Formula $Q = \frac{K'}{n} b^{8/3} s^{1/2}$ for

Trapezoidal Channels

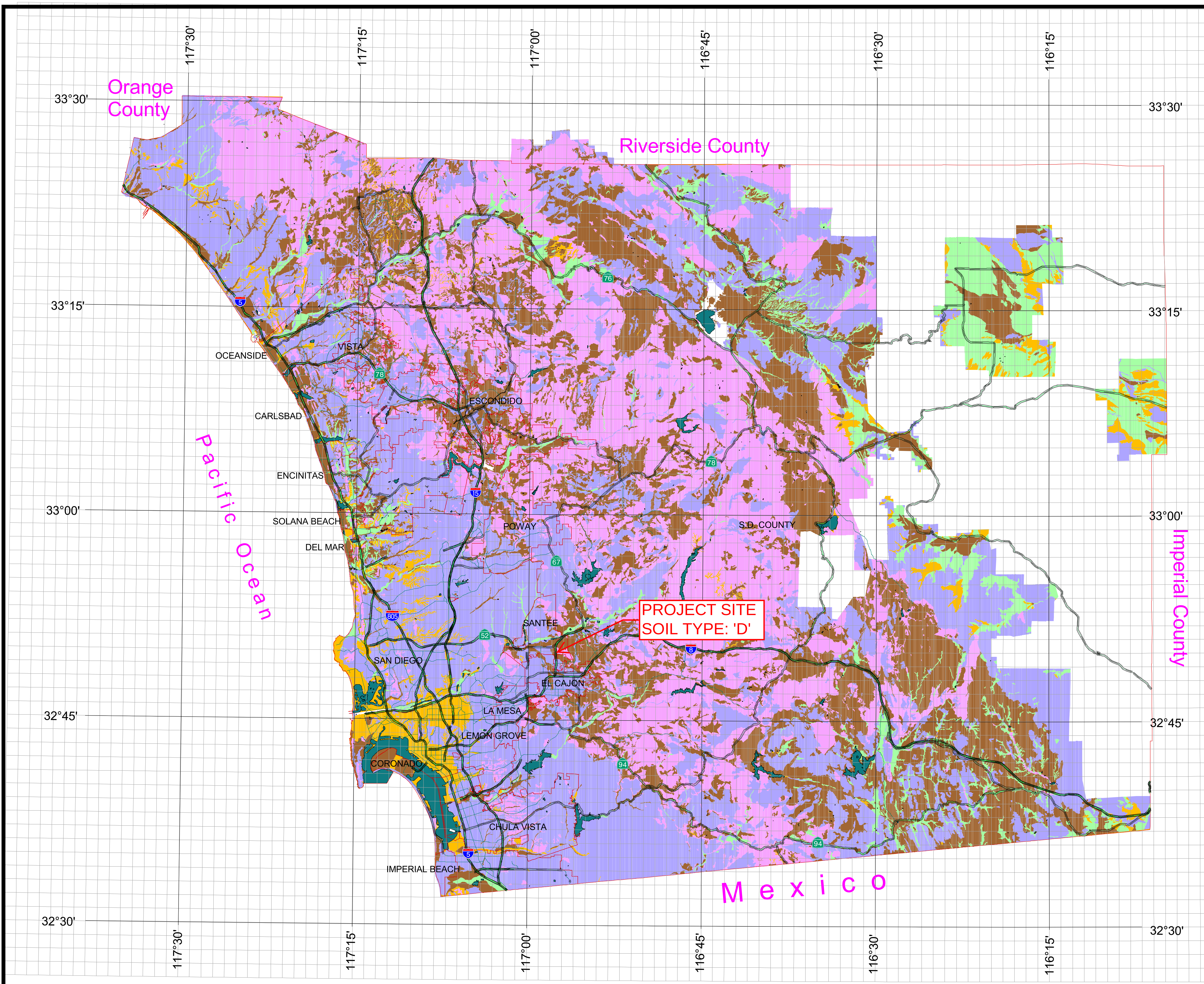
$D$ = depth of water $b$ = bottom width of channel

| $\frac{D}{b}$ | Side slopes of channel, ratio of horizontal to vertical | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Vertical | ¼–1 | ½–1 | ¾–1 | 1–1 | 1½–1 | 2–1 | 2½–1 | 3–1 | 4–1 |
| .01 | .0006 | .00068 | .00069 | .00069 | .00069 | .00069 | .00069 | .00069 | .00070 | .00070 |
| .02 | .0021 | .00215 | .00216 | .00217 | .00218 | .00220 | .00221 | .00222 | .00223 | .00225 |
| .03 | .0041 | .00419 | .00423 | .00426 | .00428 | .00433 | .00436 | .00439 | .00443 | .00449 |
| .04 | .0066 | .00670 | .00679 | .00685 | .00691 | .00700 | .00708 | .00716 | .00723 | .00736 |
| .05 | .0094 | .00964 | .00979 | .00991 | .01002 | .01019 | .01033 | .01047 | .01060 | .01086 |
| .06 | .0127 | .0130 | .0132 | .0134 | .0136 | .0138 | .0141 | .0143 | .0145 | .0150 |
| .07 | .0162 | .0166 | .0170 | .0173 | .0175 | .0180 | .0183 | .0187 | .0190 | .0197 |
| .08 | .0200 | .0206 | .0211 | .0215 | .0219 | .0225 | .0231 | .0236 | .0240 | .0250 |
| .09 | .0241 | .0249 | .0256 | .0262 | .0267 | .0275 | .0282 | .0289 | .0296 | .0310 |
| .10 | .0284 | .0294 | .0304 | .0311 | .0318 | .0329 | .0339 | .0348 | .0358 | .0376 |
| .11 | .0329 | .0343 | .0354 | .0364 | .0373 | .0387 | .0400 | .0413 | .0424 | .0448 |
| .12 | .0376 | .0393 | .0408 | .0420 | .0431 | .0450 | .0466 | .0482 | .0497 | .0527 |
| .13 | .0425 | .0446 | .0464 | .0480 | .0493 | .0516 | .0537 | .0556 | .0575 | .0613 |
| .14 | .0476 | .0502 | .0524 | .0542 | .0559 | .0587 | .0612 | .0636 | .0659 | .0706 |
| .15 | .0528 | .0559 | .0585 | .0608 | .0627 | .0662 | .0692 | .0721 | .0749 | .0805 |
| .16 | .0582 | .0619 | .0650 | .0676 | .0700 | .0740 | .0777 | .0811 | .0845 | .0912 |
| .17 | .0638 | .0680 | .0716 | .0748 | .0775 | .0823 | .0866 | .0907 | .0947 | .1026 |
| .18 | .0695 | .0744 | .0786 | .0822 | .0854 | .0910 | .0960 | .1008 | .1055 | .1148 |
| .19 | .0753 | .0809 | .0857 | .0899 | .0936 | .1001 | .1059 | .1115 | .1169 | .1277 |
| .20 | .0812 | .0876 | .0931 | .0979 | .1021 | .1096 | .1163 | .1227 | .1290 | .1414 |
| .21 | .0873 | .0945 | .101 | .106 | .111 | .120 | .127 | .135 | .142 | .156 |
| .22 | .0934 | .1015 | .109 | .115 | .120 | .130 | .139 | .147 | .155 | .171 |
| .23 | .0997 | .1087 | .117 | .124 | .130 | .141 | .150 | .160 | .169 | .187 |
| .24 | .1061 | .1161 | .125 | .133 | .140 | .152 | .163 | .173 | .184 | .204 |
| .25 | .1125 | .1236 | .133 | .142 | .150 | .163 | .176 | .188 | .199 | .222 |
| .26 | .119 | .131 | .142 | .152 | .160 | .175 | .189 | .202 | .215 | .241 |
| .27 | .126 | .139 | .151 | .162 | .171 | .188 | .203 | .218 | .232 | .260 |
| .28 | .132 | .147 | .160 | .172 | .182 | .201 | .217 | .234 | .249 | .281 |
| .29 | .139 | .155 | .170 | .182 | .194 | .214 | .232 | .250 | .268 | .302 |
| .30 | .146 | .163 | .179 | .193 | .205 | .228 | .248 | .267 | .287 | .324 |
| .31 | .153 | .172 | .189 | .204 | .218 | .242 | .264 | .285 | .306 | .347 |
| .32 | .160 | .180 | .199 | .215 | .230 | .256 | .281 | .304 | .327 | .371 |
| .33 | .167 | .189 | .209 | .227 | .243 | .271 | .298 | .323 | .348 | .396 |
| .34 | .174 | .198 | .219 | .238 | .256 | .287 | .316 | .343 | .370 | .423 |
| .35 | .181 | .207 | .230 | .251 | .269 | .303 | .334 | .363 | .392 | .450 |
| .36 | .189 | .216 | .241 | .263 | .283 | .319 | .353 | .385 | .416 | .478 |
| .37 | .196 | .225 | .252 | .275 | .297 | .336 | .372 | .406 | .440 | .507 |
| .38 | .203 | .234 | .263 | .288 | .312 | .353 | .392 | .429 | .465 | .537 |
| .39 | .211 | .244 | .274 | .301 | .326 | .371 | .413 | .452 | .491 | .568 |
| .40 | .218 | .253 | .286 | .315 | .341 | .389 | .434 | .476 | .518 | .600 |
| .41 | .226 | .263 | .297 | .328 | .357 | .408 | .456 | .501 | .546 | .633 |
| .42 | .233 | .273 | .309 | .342 | .373 | .427 | .478 | .526 | .574 | .668 |
| .43 | .241 | .283 | .321 | .357 | .389 | .447 | .501 | .553 | .603 | .703 |
| .44 | .248 | .293 | .334 | .371 | .405 | .467 | .525 | .580 | .633 | .740 |
| .45 | .256 | .303 | .346 | .386 | .422 | .488 | .549 | .607 | .664 | .777 |

# Appendix 1

# County of San Diego Hydrology Manual

*Soil Hydrologic Groups*




## Legend

Soil Groups

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

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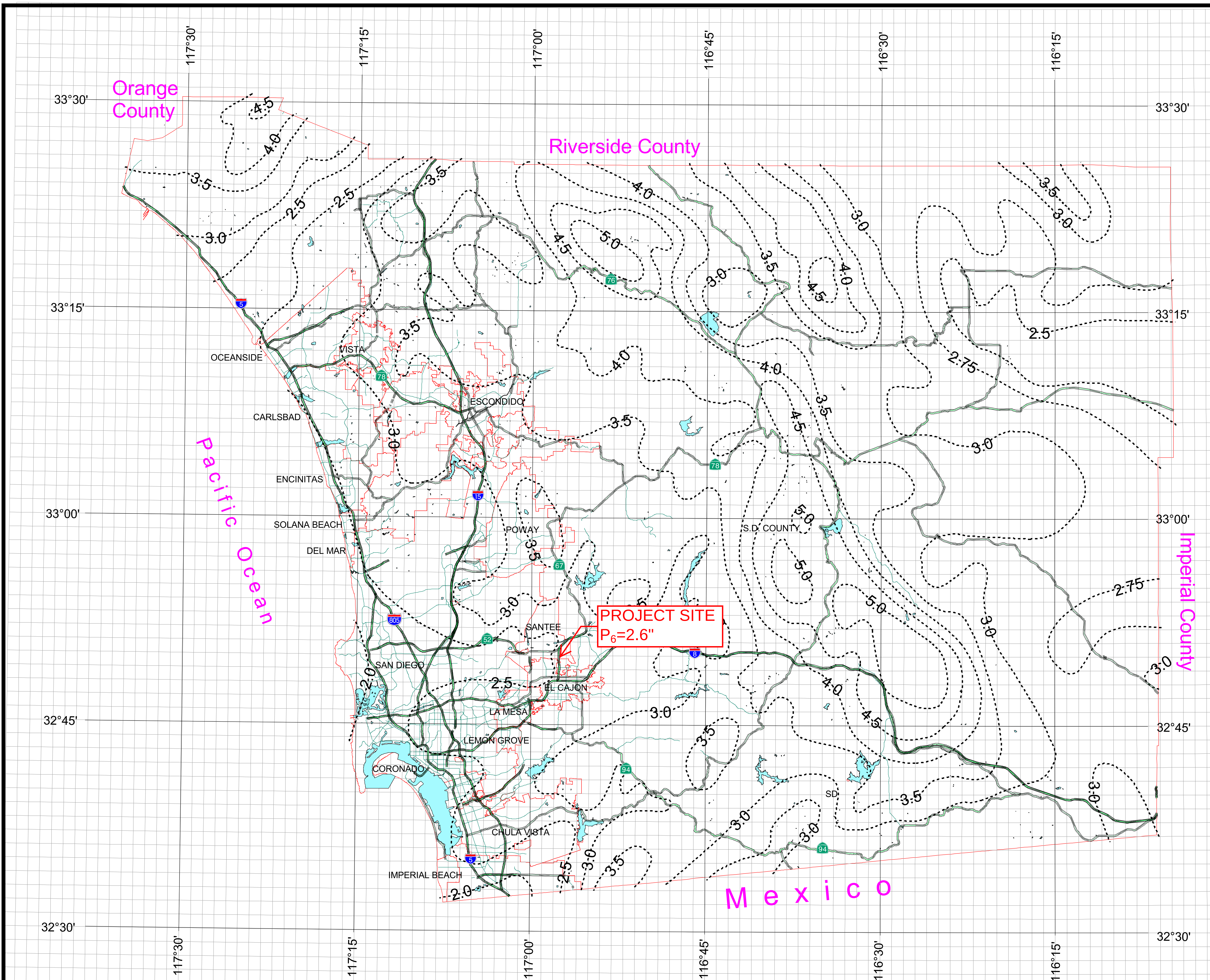
N S W E



3 0 3 Miles

APPENDIX 1.0

# Appendix 2




# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**100 Year Rainfall Event - 6 Hours**

Isopluvial (inches)

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Geographic Information Services

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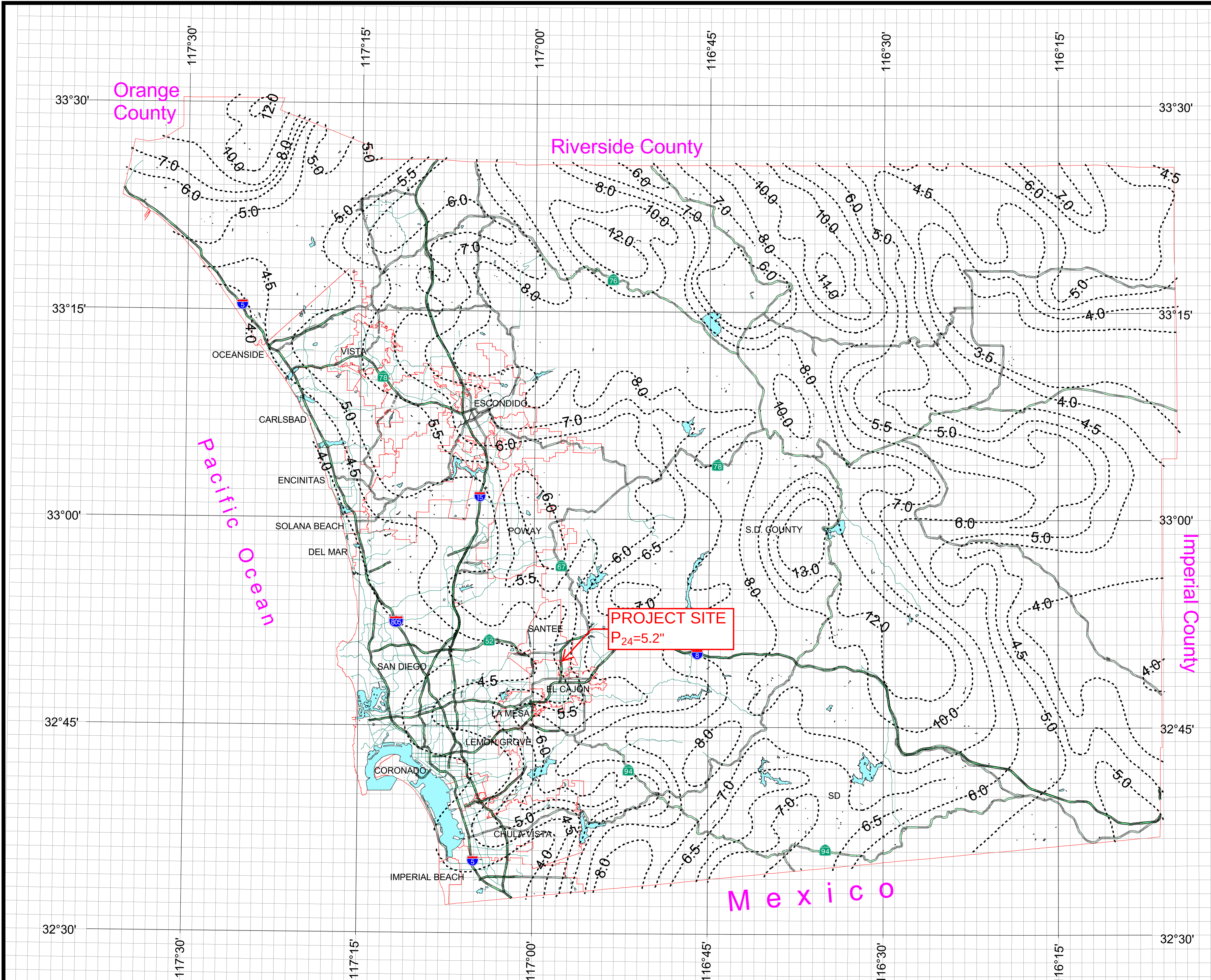
N
W E
S



3 0 3 Miles

APPENDIX 2.0

# Appendix 3




# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**100 Year Rainfall Event - 24 Hours**

| | |
|---|---|
| ------- | Isopluvial (inches) |

DPW GIS Department of Public Works Geographic Information Services

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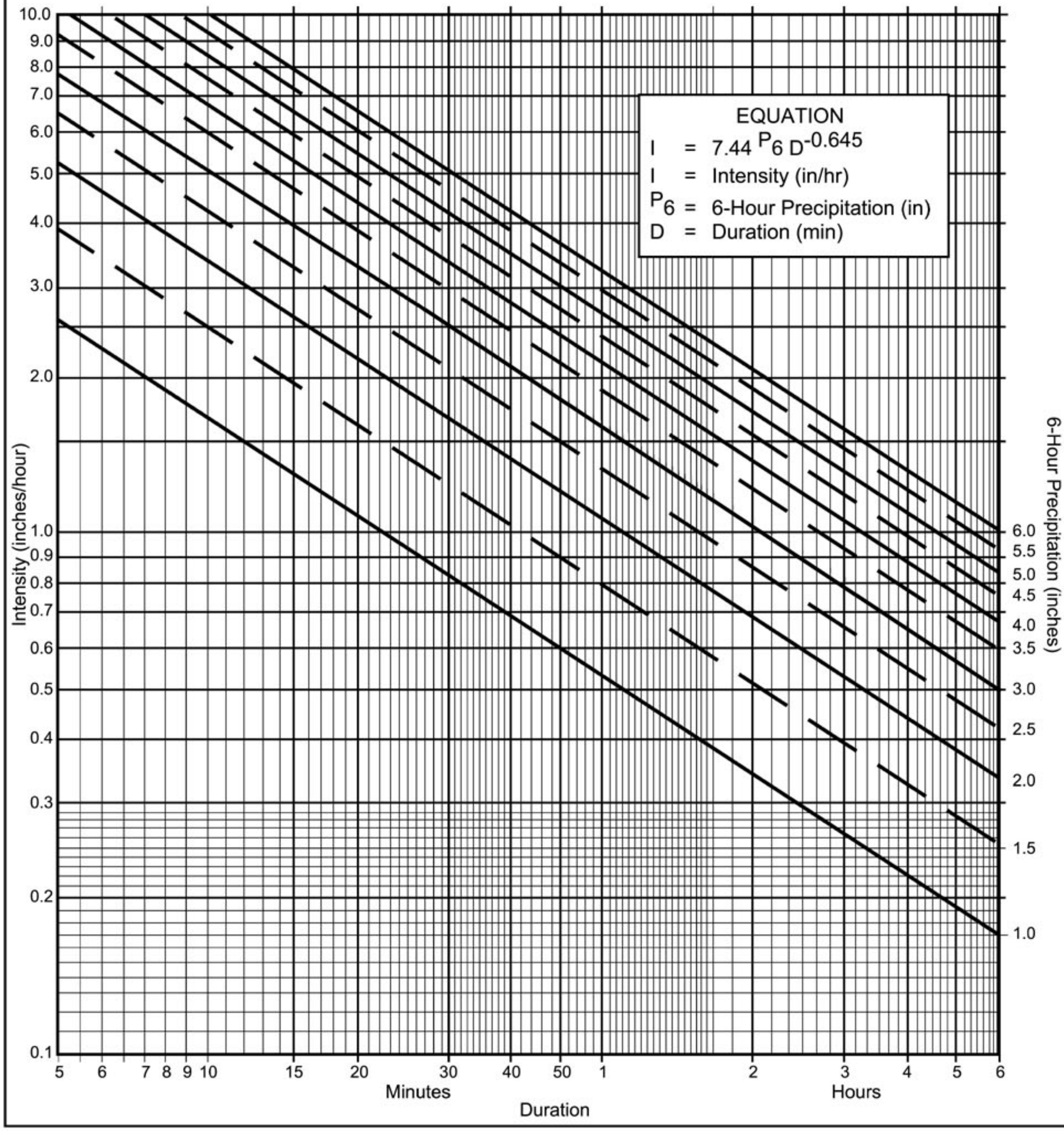
N W E S



3 0 3 Miles

APPENDIX 3.0

# Appendix 4




**Directions for Application:**

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

**Application Form:**

(a) Selected frequency 100 year

(b) $P_6$ = 2.6" in., $P_{24}$ = 5.2" , $\frac{P_6}{P_{24}}$ = 50.0 %(2)

(c) Adjusted $P_6^{(2)}$ = ______ in.

(d) $t_x$ = ______ min. see calculations for values of each basin

(e) I = ______ in./hr. See methodology to see the equations used for Intensity and time of concentration

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

| P6 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Duration | I | I | I | I | I | I | I | I | I | I | I |
| **5** | 2.63 | 3.95 | 5.27 | 6.59 | 7.90 | 9.22 | 10.54 | 11.86 | 13.17 | 14.49 | 15.81 |
| **7** | 2.12 | 3.18 | 4.24 | 5.30 | 6.36 | 7.42 | 8.48 | 9.54 | 10.60 | 11.66 | 12.72 |
| **10** | 1.68 | 2.53 | 3.37 | 4.21 | 5.05 | 5.90 | 6.74 | 7.58 | 8.42 | 9.27 | 10.11 |
| **15** | 1.30 | 1.95 | 2.59 | 3.24 | 3.89 | 4.54 | 5.19 | 5.84 | 6.49 | 7.13 | 7.78 |
| **20** | 1.08 | 1.62 | 2.15 | 2.69 | 3.23 | 3.77 | 4.31 | 4.85 | 5.39 | 5.93 | 6.46 |
| **25** | 0.93 | 1.40 | 1.87 | 2.33 | 2.80 | 3.27 | 3.73 | 4.20 | 4.67 | 5.13 | 5.60 |
| **30** | 0.83 | 1.24 | 1.66 | 2.07 | 2.49 | 2.90 | 3.32 | 3.73 | 4.15 | 4.56 | 4.98 |
| **40** | 0.69 | 1.03 | 1.38 | 1.72 | 2.07 | 2.41 | 2.76 | 3.10 | 3.45 | 3.79 | 4.13 |
| **50** | 0.60 | 0.90 | 1.19 | 1.49 | 1.79 | 2.09 | 2.39 | 2.69 | 2.98 | 3.28 | 3.58 |
| **60** | 0.53 | 0.80 | 1.06 | 1.33 | 1.59 | 1.86 | 2.12 | 2.39 | 2.65 | 2.92 | 3.18 |
| **90** | 0.41 | 0.61 | 0.82 | 1.02 | 1.23 | 1.43 | 1.63 | 1.84 | 2.04 | 2.25 | 2.45 |
| **120** | 0.34 | 0.51 | 0.68 | 0.85 | 1.02 | 1.19 | 1.36 | 1.53 | 1.70 | 1.87 | 2.04 |
| **150** | 0.29 | 0.44 | 0.59 | 0.73 | 0.88 | 1.03 | 1.18 | 1.32 | 1.47 | 1.62 | 1.76 |
| **180** | 0.26 | 0.39 | 0.52 | 0.65 | 0.78 | 0.91 | 1.04 | 1.18 | 1.31 | 1.44 | 1.57 |
| **240** | 0.22 | 0.33 | 0.43 | 0.54 | 0.65 | 0.76 | 0.87 | 0.98 | 1.08 | 1.19 | 1.30 |
| **300** | 0.19 | 0.28 | 0.38 | 0.47 | 0.56 | 0.66 | 0.75 | 0.85 | 0.94 | 1.03 | 1.13 |
| **360** | 0.17 | 0.25 | 0.33 | 0.42 | 0.50 | 0.58 | 0.67 | 0.75 | 0.84 | 0.92 | 1.00 |

**Intensity-Duration Design Chart - Template**

**FIGURE**

**3-1**

# Appendix 5

**Table 3-1**
**RUNOFF COEFFICIENTS FOR URBAN AREAS**

| Land Use | | Runoff Coefficient "C" | | | | |
|---|---|---|---|---|---|---|
| | | | Soil Type | | | |
| NRCS Elements | County Elements | % IMPER. | A | B | C | D |
| Undisturbed Natural Terrain (Natural) | Permanent Open Space | 0* | 0.20 | 0.25 | 0.30 | $\boxed{0.35}$ |
| Low Density Residential (LDR) | Residential, 1.0 DU/A or less | 10 | 0.27 | 0.32 | 0.36 | 0.41 |
| Low Density Residential (LDR) | Residential, 2.0 DU/A or less | 20 | 0.34 | 0.38 | 0.42 | 0.46 |
| Low Density Residential (LDR) | Residential, 2.9 DU/A or less | 25 | 0.38 | 0.41 | 0.45 | 0.49 |
| Medium Density Residential (MDR) | Residential, 4.3 DU/A or less | 30 | 0.41 | 0.45 | 0.48 | 0.52 |
| Medium Density Residential (MDR) | Residential, 7.3 DU/A or less | 40 | 0.48 | 0.51 | 0.54 | 0.57 |
| Medium Density Residential (MDR) | Residential, 10.9 DU/A or less | 45 | 0.52 | 0.54 | 0.57 | 0.60 |
| Medium Density Residential (MDR) | Residential, 14.5 DU/A or less | 50 | 0.55 | 0.58 | 0.60 | 0.63 |
| High Density Residential (HDR) | Residential, 24.0 DU/A or less | 65 | 0.66 | 0.67 | 0.69 | 0.71 |
| High Density Residential (HDR) | Residential, 43.0 DU/A or less | 80 | 0.76 | 0.77 | 0.78 | 0.79 |
| Commercial/Industrial (N. Com) | Neighborhood Commercial | 80 | 0.76 | 0.77 | 0.78 | 0.79 |
| Commercial/Industrial (G. Com) | General Commercial | 85 | 0.80 | 0.80 | 0.81 | 0.82 |
| Commercial/Industrial (O.P. Com) | Office Professional/Commercial | 90 | 0.83 | 0.84 | 0.84 | 0.85 |
| Commercial/Industrial (Limited I.) | Limited Industrial | 90 | 0.83 | 0.84 | 0.84 | 0.85 |
| Commercial/Industrial (General I.) | General Industrial | 95 | 0.87 | 0.87 | 0.87 | 0.87 |

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

# Appendix 6

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length ($L_M$)) of sheet flow to be used in hydrology studies. Initial $T_i$ values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

**Table 3-2**

**MAXIMUM OVERLAND FLOW LENGTH ($L_M$)
& INITIAL TIME OF CONCENTRATION ($T_i$)**

| % IMP | Element* | DU/ Acre | .5% | | 1% | | 2% | | 3% | | 5% | | 10% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ |
| 0 | Natural | | 50 | 13.2 | 70 | 12.5 | 85 | 10.9 | 100 | 10.3 | 100 | 8.7 | 100 | 6.9 |
| 10 | LDR | 1 | 50 | 12.2 | 70 | 11.5 | 85 | 10.0 | 100 | 9.5 | 100 | 8.0 | 100 | [illegible] |
| 20 | LDR | 2 | 50 | 11.3 | 70 | 10.5 | 85 | 9.2 | 100 | 8.8 | 100 | 7.4 | 100 | 5.8 |
| 25 | LDR | 2.9 | 50 | 10.[illegible] | [illegible] | [illegible] | 85 | 8.8 | 95 | 8.1 | 100 | 7.0 | 100 | [illegible] |
| 30 | MDR | 4.3 | 50 | 10.2 | 70 | 9.6 | 80 | 8.1 | 95 | 7.8 | 100 | 6.7 | 100 | [illegible] |
| 40 | MDR | 7.3 | 50 | 9.2 | 65 | 8.4 | 80 | 7.4 | 95 | 7.0 | 100 | 6.0 | 100 | 4.8 |
| 45 | MDR | 10.9 | 50 | 8.7 | 65 | 7.9 | 80 | 6.9 | 90 | 6.4 | 100 | 5.7 | 100 | 4.5 |
| 50 | MDR | 14.5 | 50 | 8.2 | 65 | 7.4 | 80 | 6.5 | 90 | 6.0 | 100 | [illegible] | [illegible] | [illegible]3 |
| 65 | HDR | 24 | 50 | 6.7 | 65 | 6.1 | 75 | 5.1 | 90 | 4.9 | 95 | 4.3 | 100 | 3.5 |
| 80 | HDR | 43 | 50 | 5.3 | 65 | 4.7 | 75 | 4.0 | 85 | 3.8 | 95 | 3.4 | 100 | 2.7 |
| 80 | N. Com | | 50 | 5.3 | 60 | 4.5 | 75 | 4.0 | 85 | 3.8 | 95 | 3.4 | 100 | 2.7 |
| 85 | G. Com | | 50 | 4.7 | 60 | 4.1 | 75 | 3.6 | 85 | 3.4 | 90 | 2.9 | 100 | 2.4 |
| 90 | O.P./Com | | 50 | 4.2 | 60 | 3.7 | 70 | 3.1 | 80 | 2.9 | 90 | 2.6 | 100 | 2.2 |
| 90 | Limited I. | | 50 | 4.2 | 60 | 3.7 | 70 | 3.1 | 80 | 2.9 | 90 | 2.6 | 100 | 2.2 |
| 95 | General I. | | 50 | 3.7 | 60 | 3.2 | 70 | 2.7 | 80 | 2.6 | 90 | 2.3 | 100 | 1.9 |

Basin E-1.4
Basins E-1.1 & E-1.3
Basin E-1.2
Basin O-1.3
Basin O-1.3
Basin O-1.1
Basin O-1.2

*See Table 3-1 for more detailed description

**Proposed Conditions**



Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length ($L_M$)) of sheet flow to be used in hydrology studies. Initial $T_i$ values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

**Table 3-2**

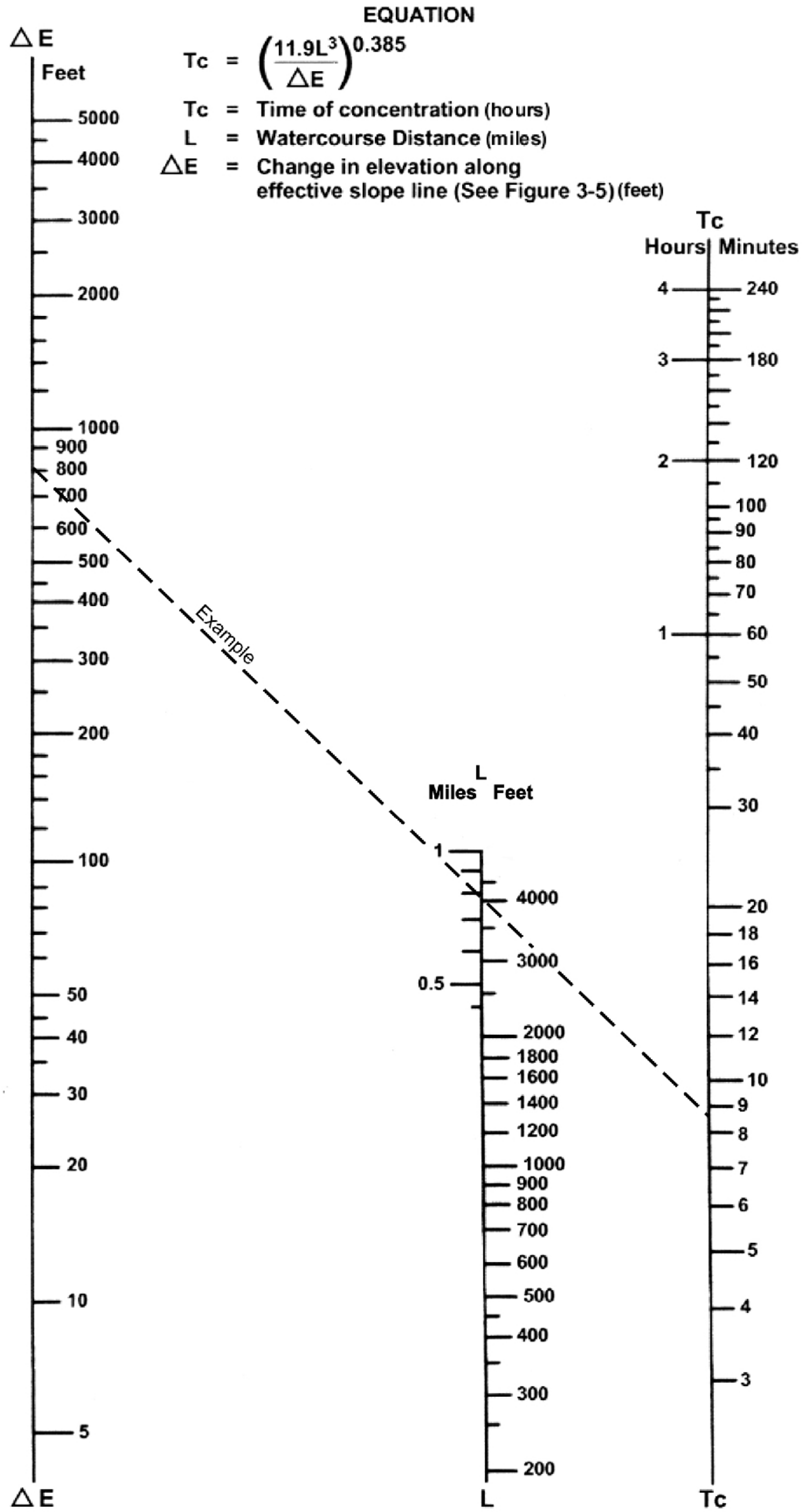
**MAXIMUM OVERLAND FLOW LENGTH ($L_M$)**
**& INITIAL TIME OF CONCENTRATION ($T_i$)**

| % IMP | Element* | DU/ Acre | .5% | | 1% | | 2% | | 3% | | 5% | | 10% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ |
| 0 | Natural | | 50 | 13.2 | 70 | 12.5 | 85 | 10.9 | 100 | 10.3 | 100 | 8.7 | 100 | 6.9 |
| 10 | LDR | 1 | 50 | 12.2 | 70 | 11.5 | 85 | 10.0 | 100 | 9.5 | 100 | 8.0 | 100 | 6.4 |
| 20 | LDR | 2 | 50 | 11.3 | 70 | 10.5 | 85 | 9.2 | [illegible] | [illegible] | 100 | 7.4 | 100 | 5.8 |
| 25 | LDR | 2.9 | 50 | 10.[illegible] | [illegible] | [illegible] | 85 | 8.8 | 95 | 8.1 | 100 | 7.0 | 100 | 5.6 |
| 30 | MDR | 4.3 | 50 | 10.2 | 70 | 9.6 | 80 | 8.1 | 95 | 7.8 | 100 | 6.7 | 100 | [illegible] |
| 40 | MDR | 7.3 | 50 | 9.2 | 65 | 8.4 | 80 | 7.4 | 95 | 7.0 | 100 | 6.0 | 100 | 4.8 |
| 45 | MDR | 10.9 | 50 | 8.7 | 65 | 7.9 | 80 | 6.9 | 90 | 6.4 | 100 | 5.7 | 100 | [illegible] |
| 50 | MDR | 14.5 | 50 | 8.2 | 65 | 7.4 | 80 | 6.5 | 90 | 6.0 | 100 | [illegible] | [illegible] | [illegible] |
| 65 | HDR | 24 | 50 | 6.7 | 65 | 6.1 | 75 | 5.1 | 90 | 4.9 | 95 | 4.3 | 100 | 3.5 |
| 80 | HDR | 43 | 50 | 5.3 | 65 | 4.7 | 75 | 4.0 | 85 | 3.8 | 95 | 3.4 | 100 | 2.7 |
| 80 | N. Com | | 50 | 5.3 | 60 | 4.5 | 75 | 4.0 | 85 | 3.8 | 95 | 3.4 | 100 | 2.7 |
| 85 | G. Com | | 50 | 4.7 | 60 | 4.1 | 75 | 3.6 | 85 | 3.4 | 90 | 2.9 | 100 | 2.4 |
| 90 | O.P./Com | | 50 | 4.2 | 60 | 3.7 | 70 | [illegible] | [illegible] | [illegible] | 90 | 2.6 | 100 | 2.2 |
| 90 | Limited I. | | 50 | 4.2 | 60 | 3.7 | 70 | 3.1 | 80 | 2.9 | 90 | 2.6 | 100 | 2.2 |
| 95 | General I. | | 50 | 3.7 | 60 | 3.2 | 70 | 2.7 | 80 | 2.6 | 90 | 2.3 | 100 | 1.9 |

*See Table 3-1 for more detailed description

Basin P-1.1
Basin P-1.5
Basin O-1.3
Basin O-1.3
Basin O-1.1
Basin O-1.2
Basin P-1.4
Basins P-1.2 & P-1.3

# Appendix 7




SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE **3-4**

Nomograph for Determination of
Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds

# Appendix 8

# Channel Report



## Basin P-1.2 - Drive AIsle Cross Section

**User-defined**

| | |
|---|---|
| Invert Elev (ft) | = 423.08 |
| Slope (%) | = 0.50 |
| N-Value | = Composite |

**Calculations**

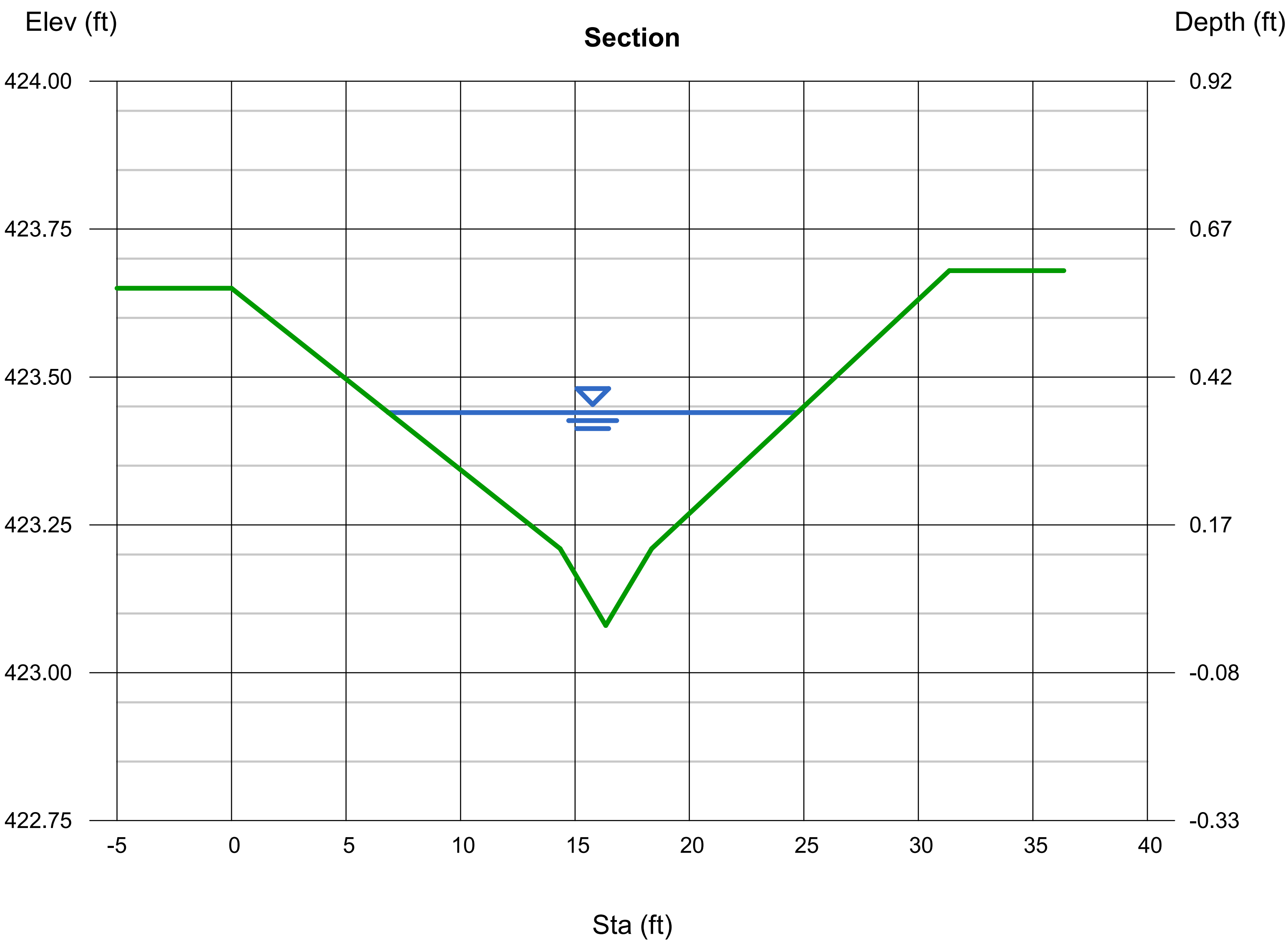
| | |
|---|---|
| Compute by: | Q vs Depth |
| No. Increments | = 10 |

**Highlighted**

| | |
|---|---|
| Depth (ft) | = 0.36 |
| Q (cfs) | = 6.486 |
| Area (sqft) | = 2.77 |
| Velocity (ft/s) | = 2.34 |
| Wetted Perim (ft) | = 17.88 |
| Crit Depth, Yc (ft) | = 0.37 |
| Top Width (ft) | = 17.86 |
| EGL (ft) | = 0.44 |

**(Sta, El, n)-(Sta, El, n)...**

( 0.00, 423.65)-(14.35, 423.21, 0.013)-(16.35, 423.08, 0.013)-(18.35, 423.21, 0.013)-(31.35, 423.68, 0.013)



# Channel Report



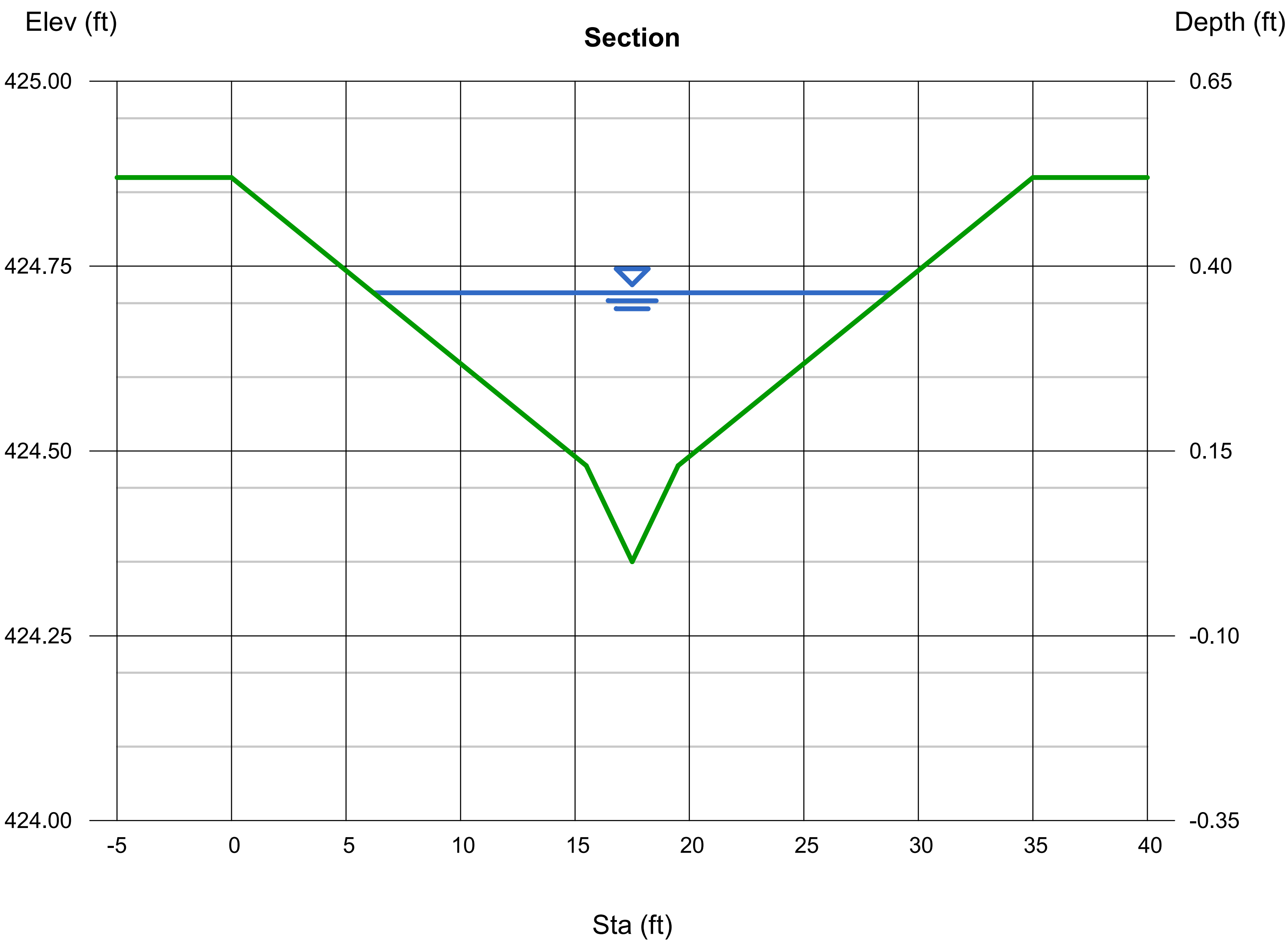
## Basin P-1.3 - Drive AIsle Cross Section

**User-defined**
Invert Elev (ft) = 424.35
Slope (%) = 0.50
N-Value = Composite

**Calculations**
Compute by: Q vs Depth
No. Increments = 10

**Highlighted**
Depth (ft) = 0.36
Q (cfs) = 7.675
Area (sqft) = 3.37
Velocity (ft/s) = 2.28
Wetted Perim (ft) = 22.61
Crit Depth, Yc (ft) = 0.37
Top Width (ft) = 22.60
EGL (ft) = 0.44

**(Sta, El, n)-(Sta, El, n)...**
( 0.00, 424.87)-(15.50, 424.48, 0.013)-(17.50, 424.35, 0.013)-(19.50, 424.48, 0.013)-(35.00, 424.87, 0.013)



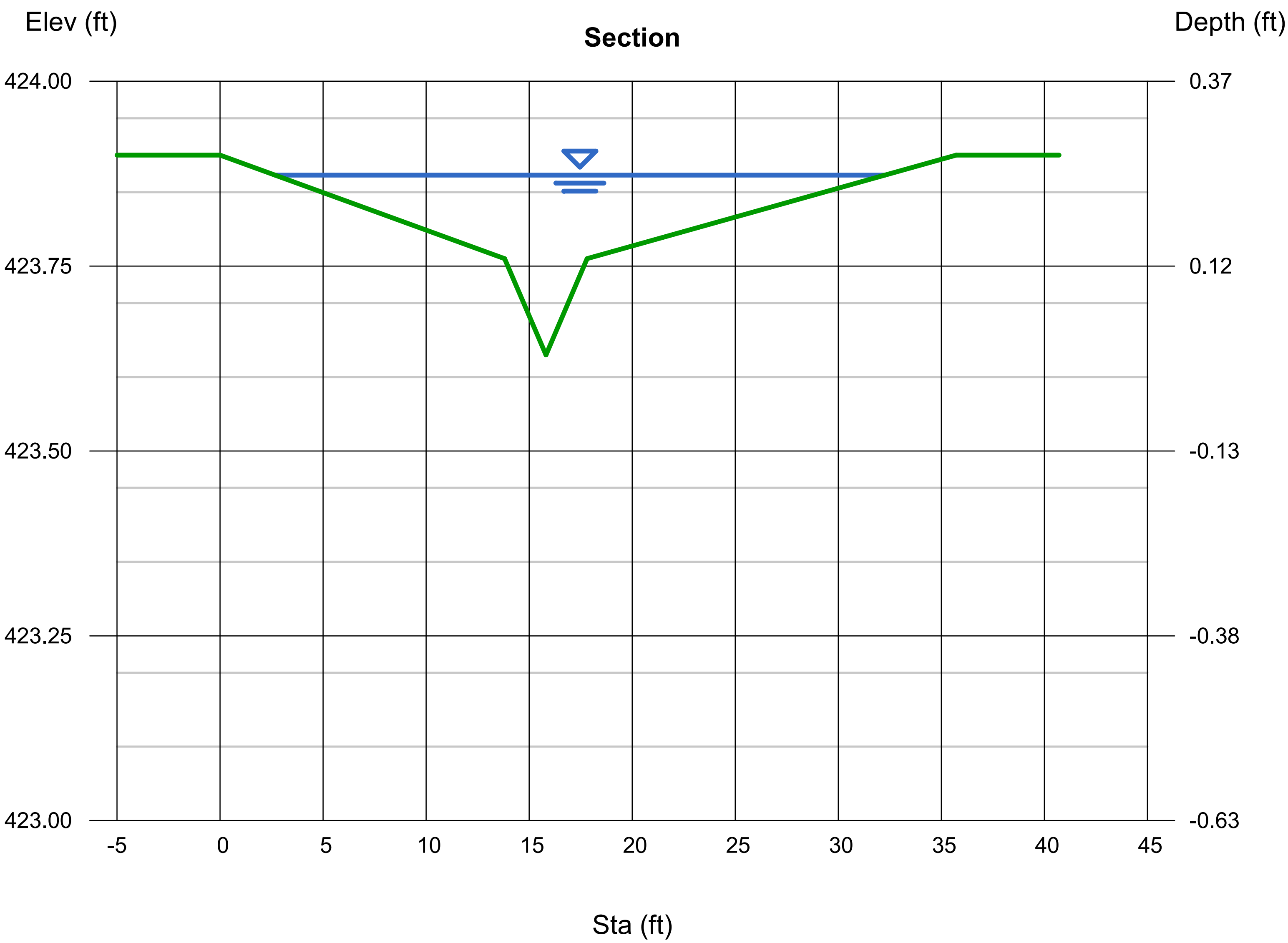
# Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Mar 30 2023

## Basin P-1.4 - Drive AIsle Cross Section

| | | | |
|---|---|---|---|
| **User-defined** | | **Highlighted** | |
| Invert Elev (ft) | = 423.63 | Depth (ft) | = 0.24 |
| Slope (%) | = 0.64 | Q (cfs) | = 3.448 |
| N-Value | = Composite | Area (sqft) | = 2.16 |
| | | Velocity (ft/s) | = 1.60 |
| **Calculations** | | Wetted Perim (ft) | = 29.61 |
| Compute by: | Q vs Depth | Crit Depth, Yc (ft) | = 0.25 |
| No. Increments | = 10 | Top Width (ft) | = 29.60 |
| | | EGL (ft) | = 0.28 |

**(Sta, El, n)-(Sta, El, n)...**
( 0.00, 423.90)-(13.81, 423.76, 0.013)-(15.81, 423.63, 0.013)-(17.81, 423.76, 0.013)-(35.72, 423.90, 0.013)



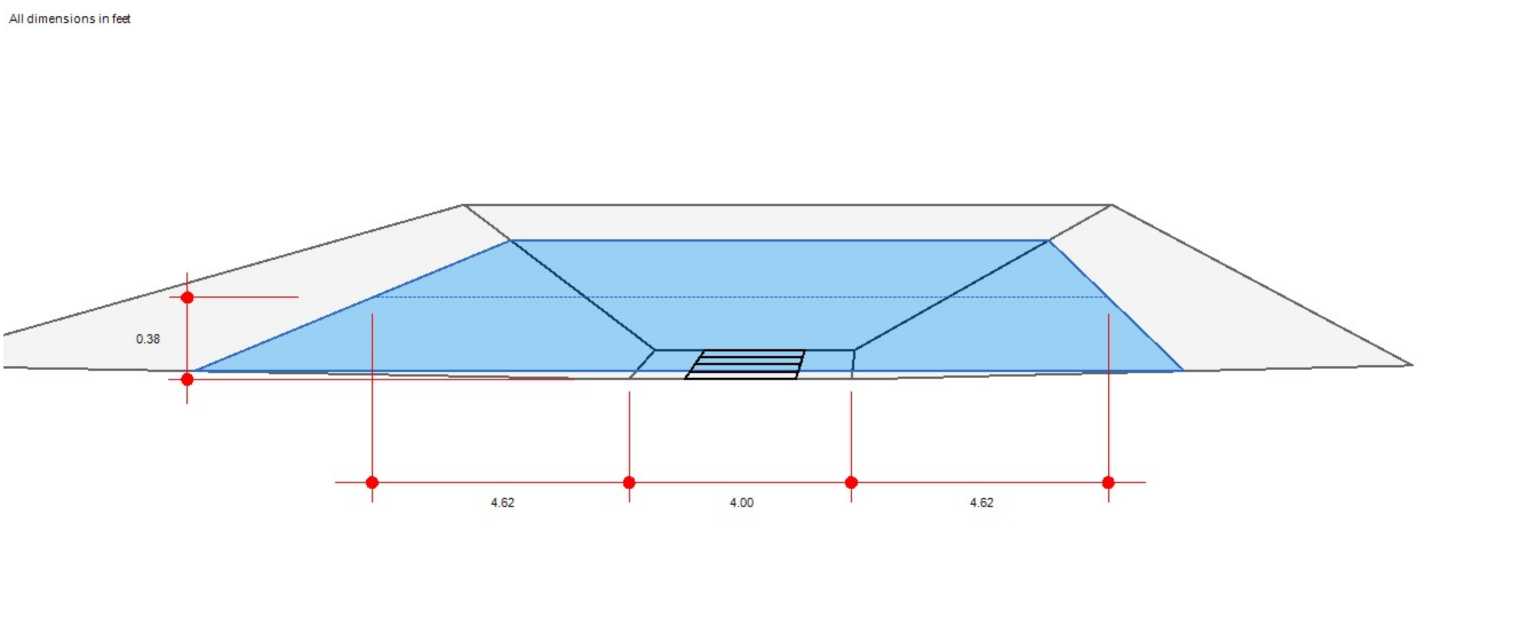
# Appendix 9

# Inlet Report



## Inlet # 1

| | | | |
|---|---|---|---|
| **Drop Grate Inlet** | | **Calculations** | |
| Location | = Sag | Compute by: | Known Q |
| Curb Length (ft) | = -0- | Q (cfs) | = 5.71 |
| Throat Height (in) | = -0- | | |
| Grate Area (sqft) | = 4.00 | **Highlighted** | |
| Grate Width (ft) | = 2.00 | Q Total (cfs) | = 5.71 |
| Grate Length (ft) | = 2.00 | Q Capt (cfs) | = 5.71 |
| | | Q Bypass (cfs) | = -0- |
| **Gutter** | | Depth at Inlet (in) | = 4.61 |
| Slope, Sw (ft/ft) | = 0.083 | Efficiency (%) | = 100 |
| Slope, Sx (ft/ft) | = 0.083 | Gutter Spread (ft) | = 13.25 |
| Local Depr (in) | = -0- | Gutter Vel (ft/s) | = -0- |
| Gutter Width (ft) | = 4.00 | Bypass Spread (ft) | = -0- |
| Gutter Slope (%) | = -0- | Bypass Depth (in) | = -0- |
| Gutter n-value | = -0- | | |

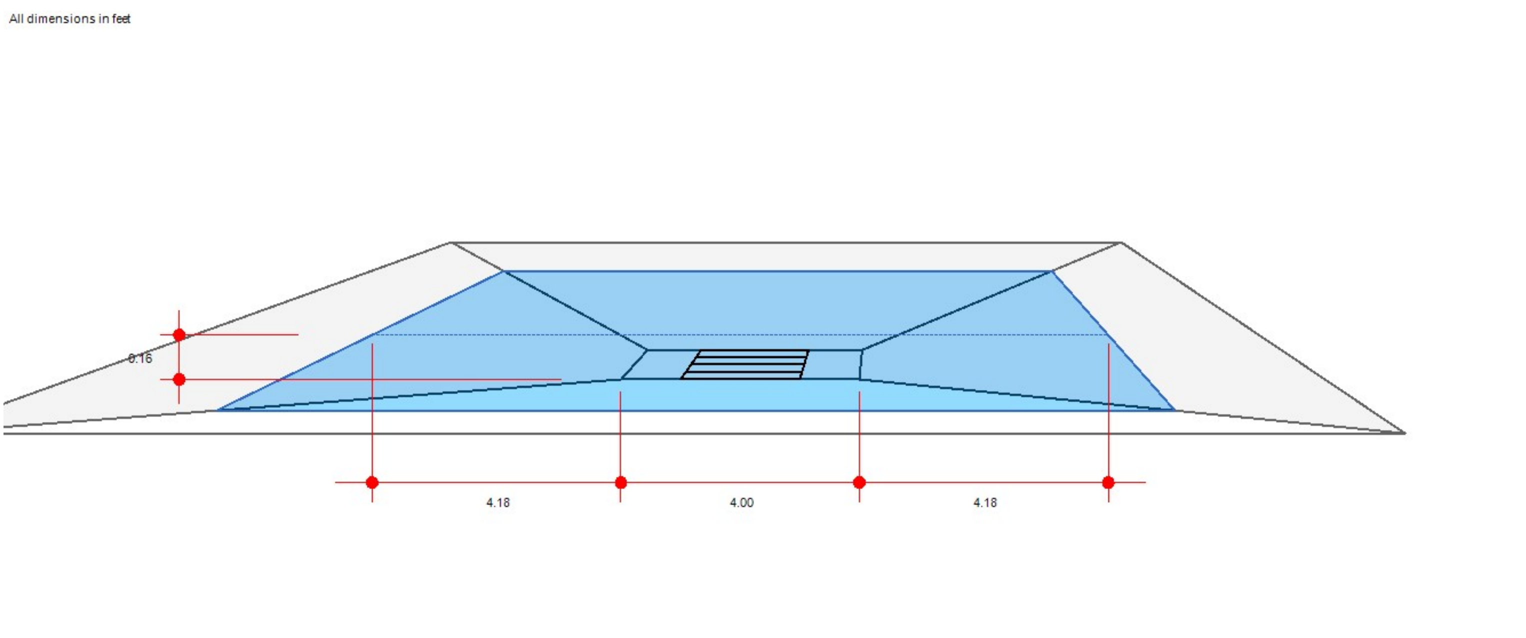


# Inlet Report



## Inlet # 2

| **Drop Grate Inlet** | | **Calculations** | |
|---|---|---|---|
| Location | = Sag | Compute by: | Known Q |
| Curb Length (ft) | = -0- | Q (cfs) | = 1.58 |
| Throat Height (in) | = -0- | | |
| Grate Area (sqft) | = 4.00 | **Highlighted** | |
| Grate Width (ft) | = 2.00 | Q Total (cfs) | = 1.58 |
| Grate Length (ft) | = 2.00 | Q Capt (cfs) | = 1.58 |
| | | Q Bypass (cfs) | = -0- |
| **Gutter** | | Depth at Inlet (in) | = 1.95 |
| Slope, Sw (ft/ft) | = 0.039 | Efficiency (%) | = 100 |
| Slope, Sx (ft/ft) | = 0.039 | Gutter Spread (ft) | = 12.35 |
| Local Depr (in) | = -0- | Gutter Vel (ft/s) | = -0- |
| Gutter Width (ft) | = 4.00 | Bypass Spread (ft) | = -0- |
| Gutter Slope (%) | = -0- | Bypass Depth (in) | = -0- |
| Gutter n-value | = -0- | | |

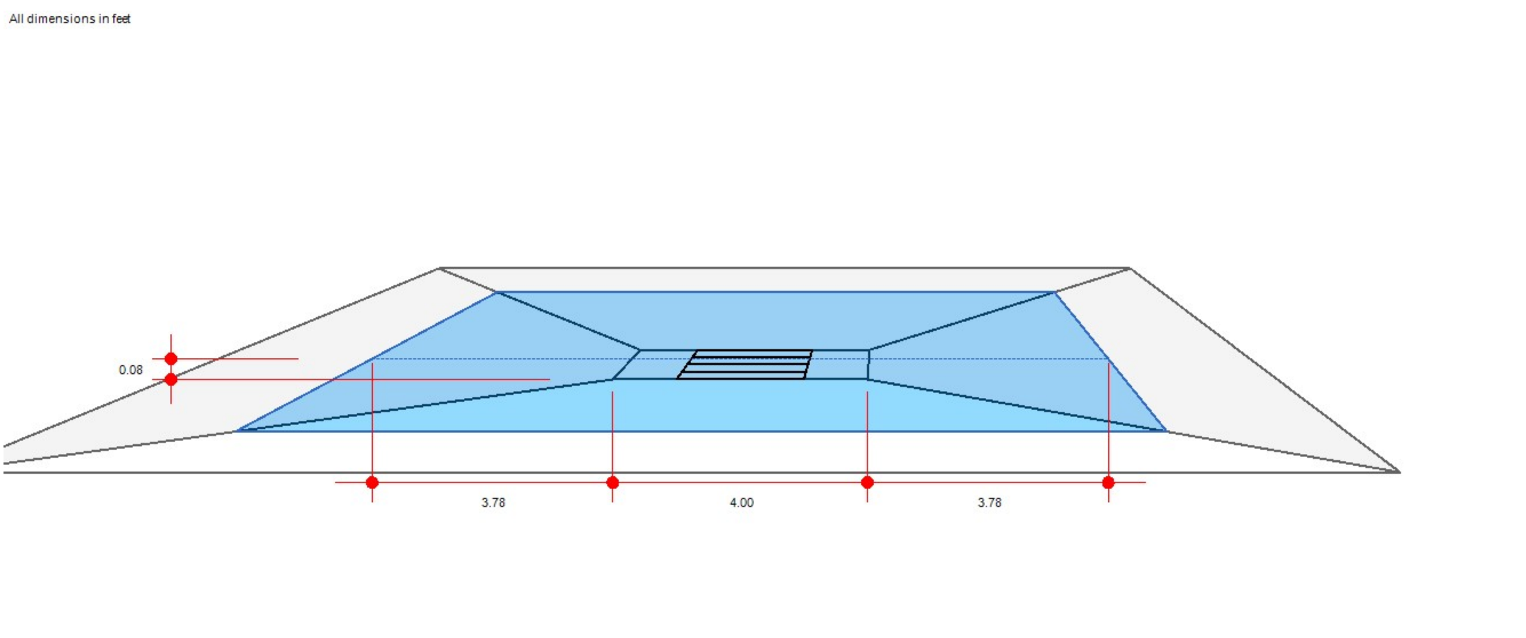


# Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Apr 5 2023

## Inlet # 3

| **Drop Grate Inlet** | | **Calculations** | |
|---|---|---|---|
| Location | = Sag | Compute by: | Known Q |
| Curb Length (ft) | = -0- | Q (cfs) | = 0.50 |
| Throat Height (in) | = -0- | | |
| Grate Area (sqft) | = 4.00 | **Highlighted** | |
| Grate Width (ft) | = 2.00 | Q Total (cfs) | = 0.50 |
| Grate Length (ft) | = 2.00 | Q Capt (cfs) | = 0.50 |
| | | Q Bypass (cfs) | = -0- |
| **Gutter** | | Depth at Inlet (in) | = 0.91 |
| Slope, Sw (ft/ft) | = 0.020 | Efficiency (%) | = 100 |
| Slope, Sx (ft/ft) | = 0.020 | Gutter Spread (ft) | = 11.56 |
| Local Depr (in) | = -0- | Gutter Vel (ft/s) | = -0- |
| Gutter Width (ft) | = 4.00 | Bypass Spread (ft) | = -0- |
| Gutter Slope (%) | = -0- | Bypass Depth (in) | = -0- |
| Gutter n-value | = -0- | | |

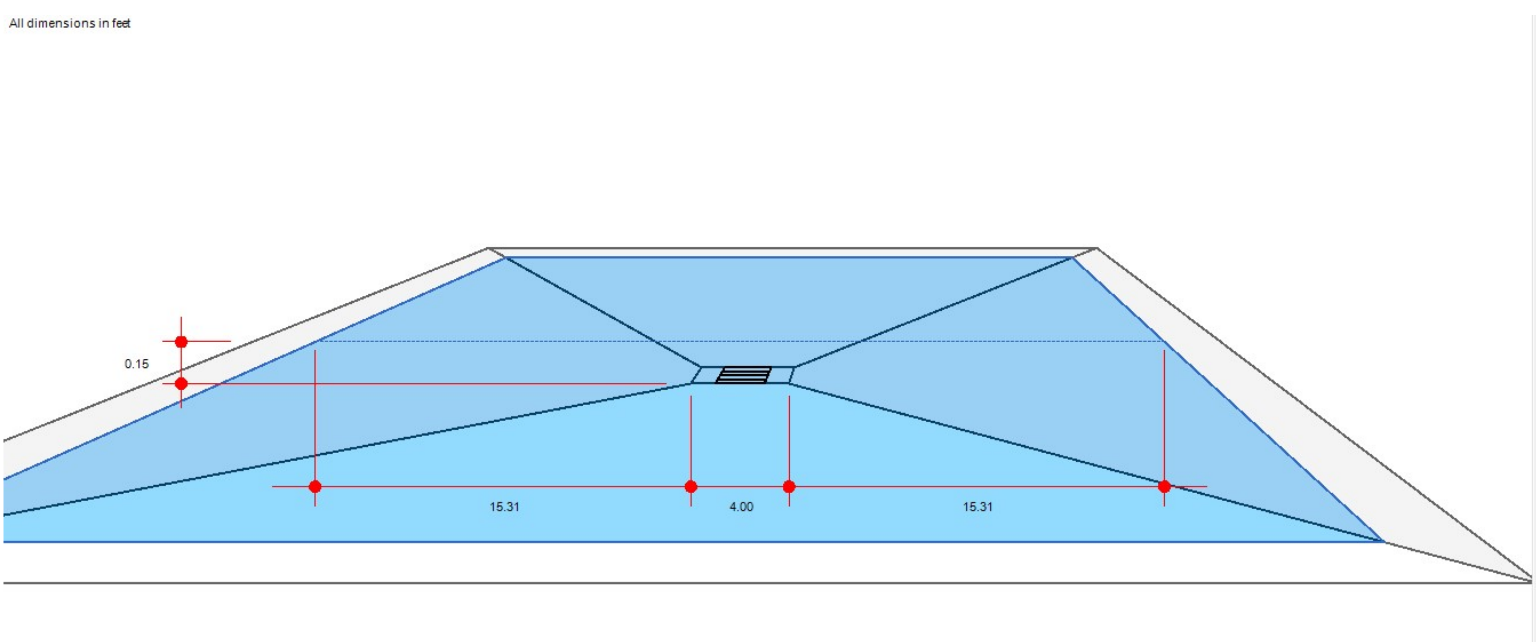


# Inlet Report



## Inlet # 4

| Drop Grate Inlet | | Calculations | |
|---|---|---|---|
| Location | = Sag | Compute by: | Known Q |
| Curb Length (ft) | = -0- | Q (cfs) | = 1.44 |
| Throat Height (in) | = -0- | | |
| Grate Area (sqft) | = 4.00 | **Highlighted** | |
| Grate Width (ft) | = 2.00 | Q Total (cfs) | = 1.44 |
| Grate Length (ft) | = 2.00 | Q Capt (cfs) | = 1.44 |
| | | Q Bypass (cfs) | = -0- |
| **Gutter** | | Depth at Inlet (in) | = 1.84 |
| Slope, Sw (ft/ft) | = 0.010 | Efficiency (%) | = 100 |
| Slope, Sx (ft/ft) | = 0.010 | Gutter Spread (ft) | = 34.62 |
| Local Depr (in) | = -0- | Gutter Vel (ft/s) | = -0- |
| Gutter Width (ft) | = 4.00 | Bypass Spread (ft) | = -0- |
| Gutter Slope (%) | = -0- | Bypass Depth (in) | = -0- |
| Gutter n-value | = -0- | | |



# Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Apr 6 2023

## Inlet # 5

**Drop Grate Inlet**

| | |
|---|---|
| Location | = Sag |
| Curb Length (ft) | = -0- |
| Throat Height (in) | = -0- |
| Grate Area (sqft) | = 4.00 |
| Grate Width (ft) | = 2.00 |
| Grate Length (ft) | = 2.00 |

**Gutter**

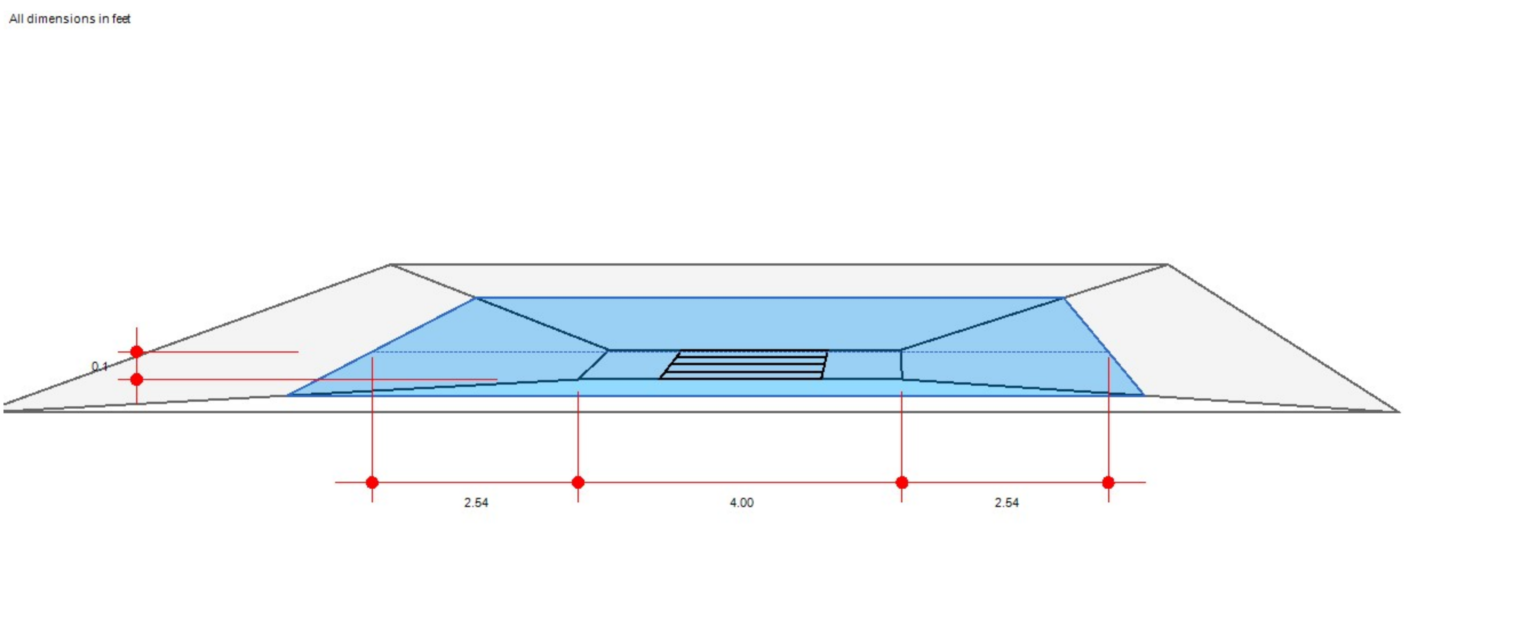
| | |
|---|---|
| Slope, Sw (ft/ft) | = 0.040 |
| Slope, Sx (ft/ft) | = 0.040 |
| Local Depr (in) | = -0- |
| Gutter Width (ft) | = 4.00 |
| Gutter Slope (%) | = -0- |
| Gutter n-value | = -0- |

**Calculations**

| | |
|---|---|
| Compute by: | Known Q |
| Q (cfs) | = 0.78 |

**Highlighted**

| | |
|---|---|
| Q Total (cfs) | = 0.78 |
| Q Capt (cfs) | = 0.78 |
| Q Bypass (cfs) | = -0- |
| Depth at Inlet (in) | = 1.22 |
| Efficiency (%) | = 100 |
| Gutter Spread (ft) | = 9.09 |
| Gutter Vel (ft/s) | = -0- |
| Bypass Spread (ft) | = -0- |
| Bypass Depth (in) | = -0- |



# Inlet Report



## Inlet # 6

**Drop Grate Inlet**

| | |
|---|---|
| Location | = Sag |
| Curb Length (ft) | = -0- |
| Throat Height (in) | = -0- |
| Grate Area (sqft) | = 4.00 |
| Grate Width (ft) | = 2.00 |
| Grate Length (ft) | = 2.00 |

**Gutter**

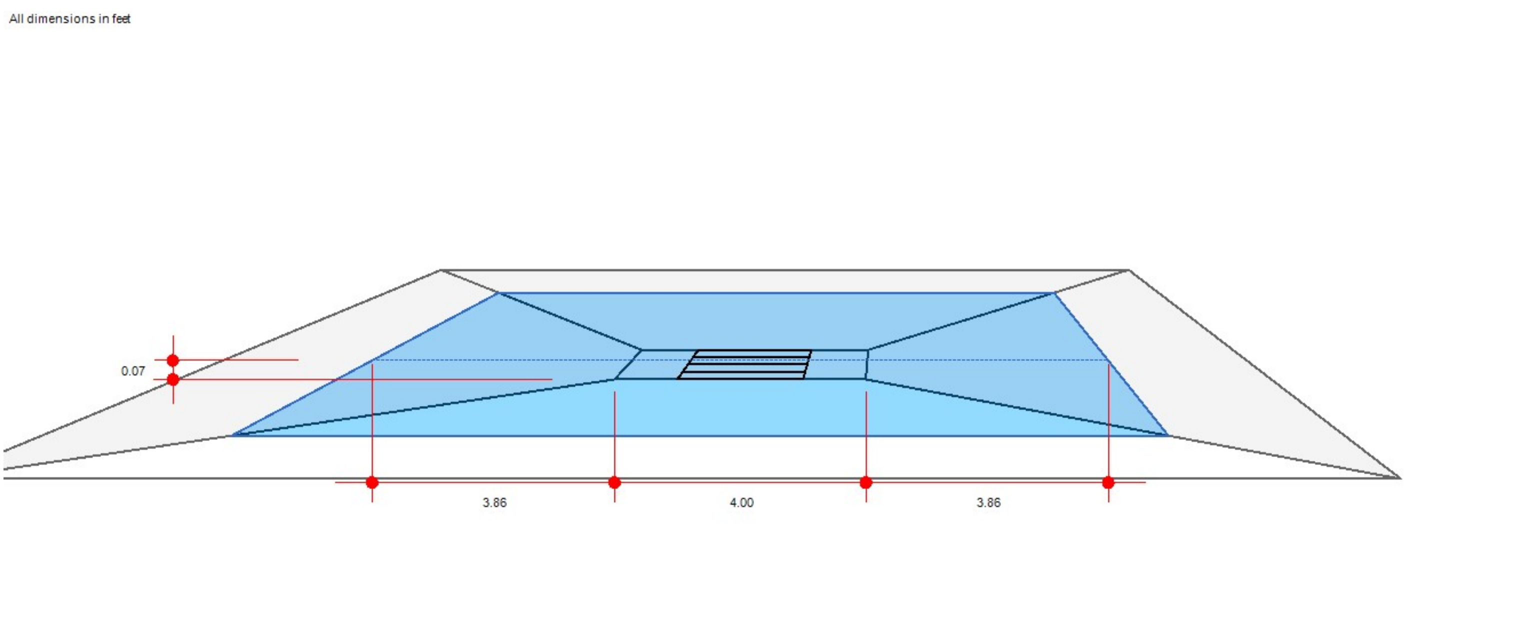
| | |
|---|---|
| Slope, Sw (ft/ft) | = 0.018 |
| Slope, Sx (ft/ft) | = 0.018 |
| Local Depr (in) | = -0- |
| Gutter Width (ft) | = 4.00 |
| Gutter Slope (%) | = -0- |
| Gutter n-value | = -0- |

**Calculations**

| | |
|---|---|
| Compute by: | Known Q |
| Q (cfs) | = 0.44 |

**Highlighted**

| | |
|---|---|
| Q Total (cfs) | = 0.44 |
| Q Capt (cfs) | = 0.44 |
| Q Bypass (cfs) | = -0- |
| Depth at Inlet (in) | = 0.83 |
| Efficiency (%) | = 100 |
| Gutter Spread (ft) | = 11.72 |
| Gutter Vel (ft/s) | = -0- |
| Bypass Spread (ft) | = -0- |
| Bypass Depth (in) | = -0- |



# Inlet Report



## Inlet # 7

**Drop Grate Inlet**

| | |
|---|---|
| Location | = Sag |
| Curb Length (ft) | = -0- |
| Throat Height (in) | = -0- |
| Grate Area (sqft) | = 4.00 |
| Grate Width (ft) | = 2.00 |
| Grate Length (ft) | = 2.00 |

**Gutter**

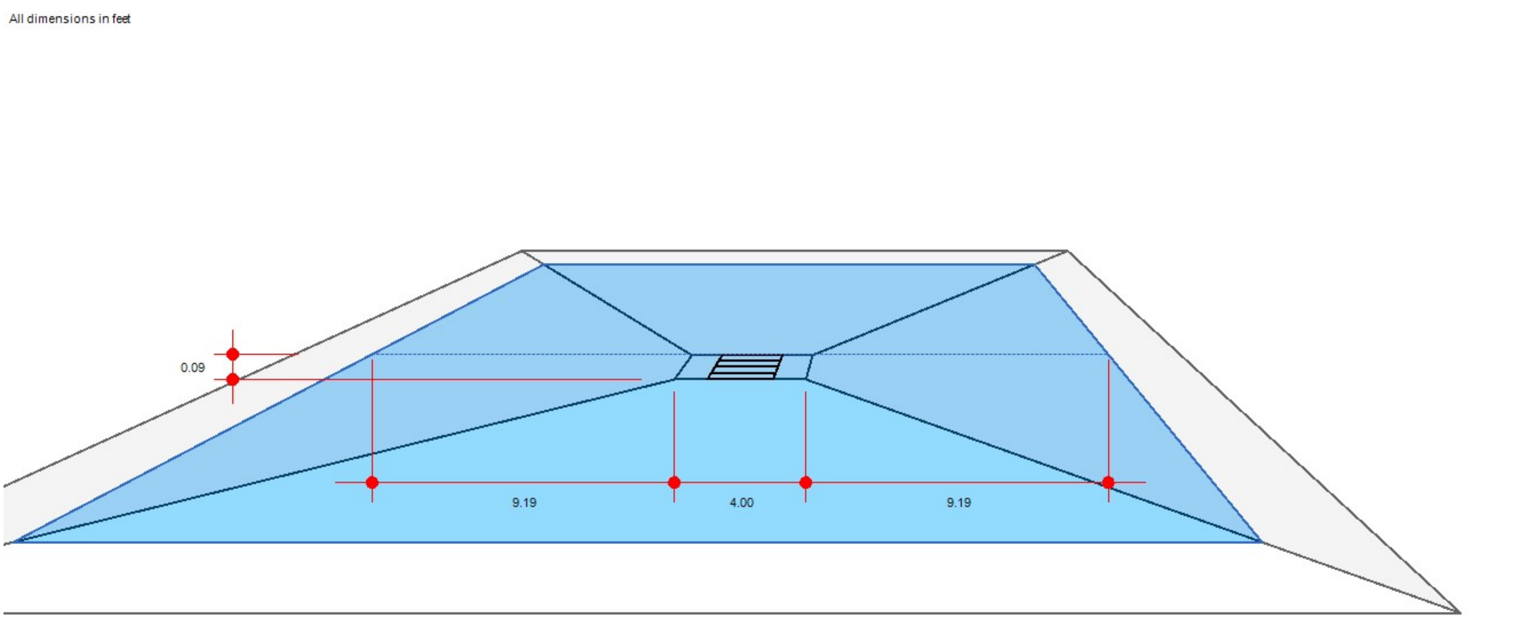
| | |
|---|---|
| Slope, Sw (ft/ft) | = 0.010 |
| Slope, Sx (ft/ft) | = 0.010 |
| Local Depr (in) | = -0- |
| Gutter Width (ft) | = 4.00 |
| Gutter Slope (%) | = -0- |
| Gutter n-value | = -0- |

**Calculations**

| | |
|---|---|
| Compute by: | Known Q |
| Q (cfs) | = 0.67 |

**Highlighted**

| | |
|---|---|
| Q Total (cfs) | = 0.67 |
| Q Capt (cfs) | = 0.67 |
| Q Bypass (cfs) | = -0- |
| Depth at Inlet (in) | = 1.10 |
| Efficiency (%) | = 100 |
| Gutter Spread (ft) | = 22.38 |
| Gutter Vel (ft/s) | = -0- |
| Bypass Spread (ft) | = -0- |
| Bypass Depth (in) | = -0- |



# Inlet Report



## Inlet # 8

**Drop Grate Inlet**

| | |
|---|---|
| Location | = On grade |
| Curb Length (ft) | = -0- |
| Throat Height (in) | = -0- |
| Grate Area (sqft) | = -0- |
| Grate Width (ft) | = 2.00 |
| Grate Length (ft) | = 2.00 |

**Gutter**

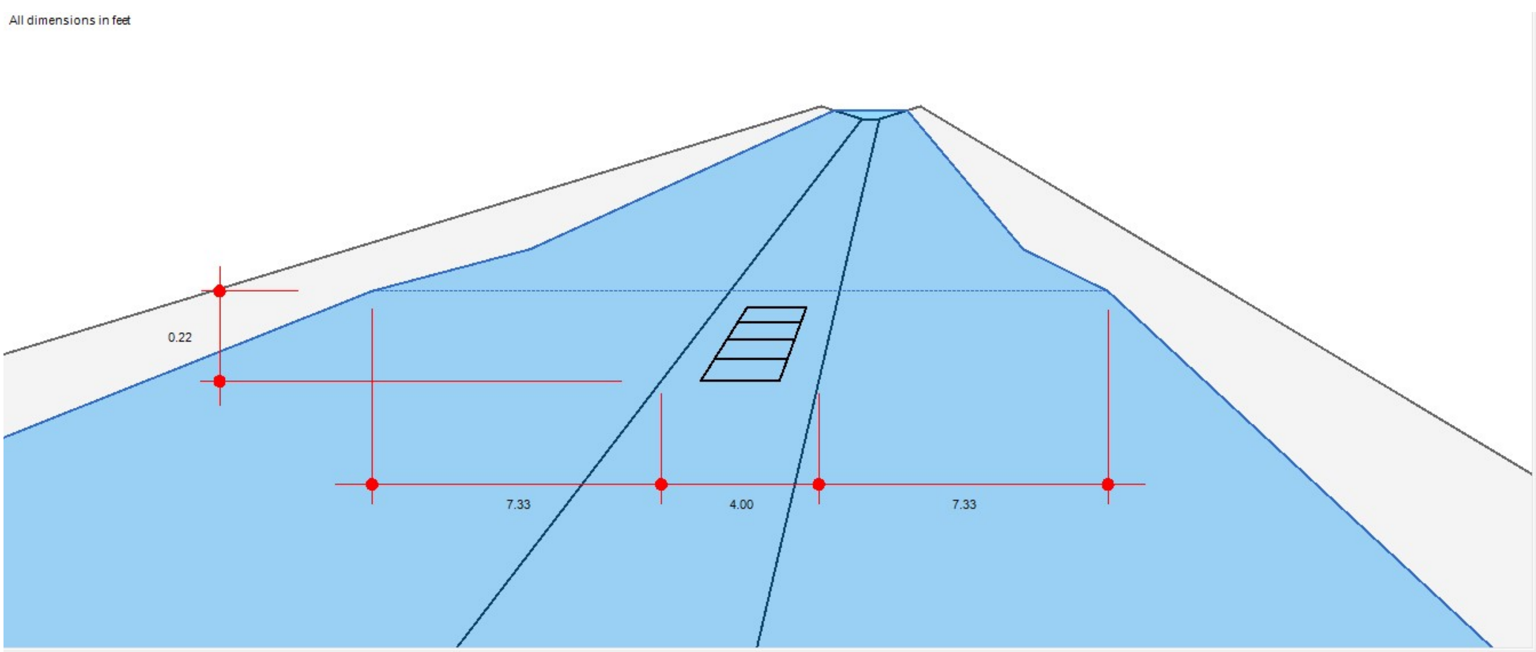
| | |
|---|---|
| Slope, Sw (ft/ft) | = 0.030 |
| Slope, Sx (ft/ft) | = 0.030 |
| Local Depr (in) | = -0- |
| Gutter Width (ft) | = 4.00 |
| Gutter Slope (%) | = 0.50 |
| Gutter n-value | = 0.013 |

**Calculations**

| | |
|---|---|
| Compute by: | Known Q |
| Q (cfs) | = 4.78 |

**Highlighted**

| | |
|---|---|
| Q Total (cfs) | = 4.78 |
| Q Capt (cfs) | = 1.21 |
| Q Bypass (cfs) | = 3.57 |
| Depth at Inlet (in) | = 2.64 |
| Efficiency (%) | = 25 |
| Gutter Spread (ft) | = 18.67 |
| Gutter Vel (ft/s) | = 1.92 |
| Bypass Spread (ft) | = 16.67 |
| Bypass Depth (in) | = 2.28 |



# Inlet Report



## Inlet # 9

**Drop Grate Inlet**

| | |
|---|---|
| Location | = On grade |
| Curb Length (ft) | = -0- |
| Throat Height (in) | = -0- |
| Grate Area (sqft) | = -0- |
| Grate Width (ft) | = 2.00 |
| Grate Length (ft) | = 2.00 |

**Gutter**

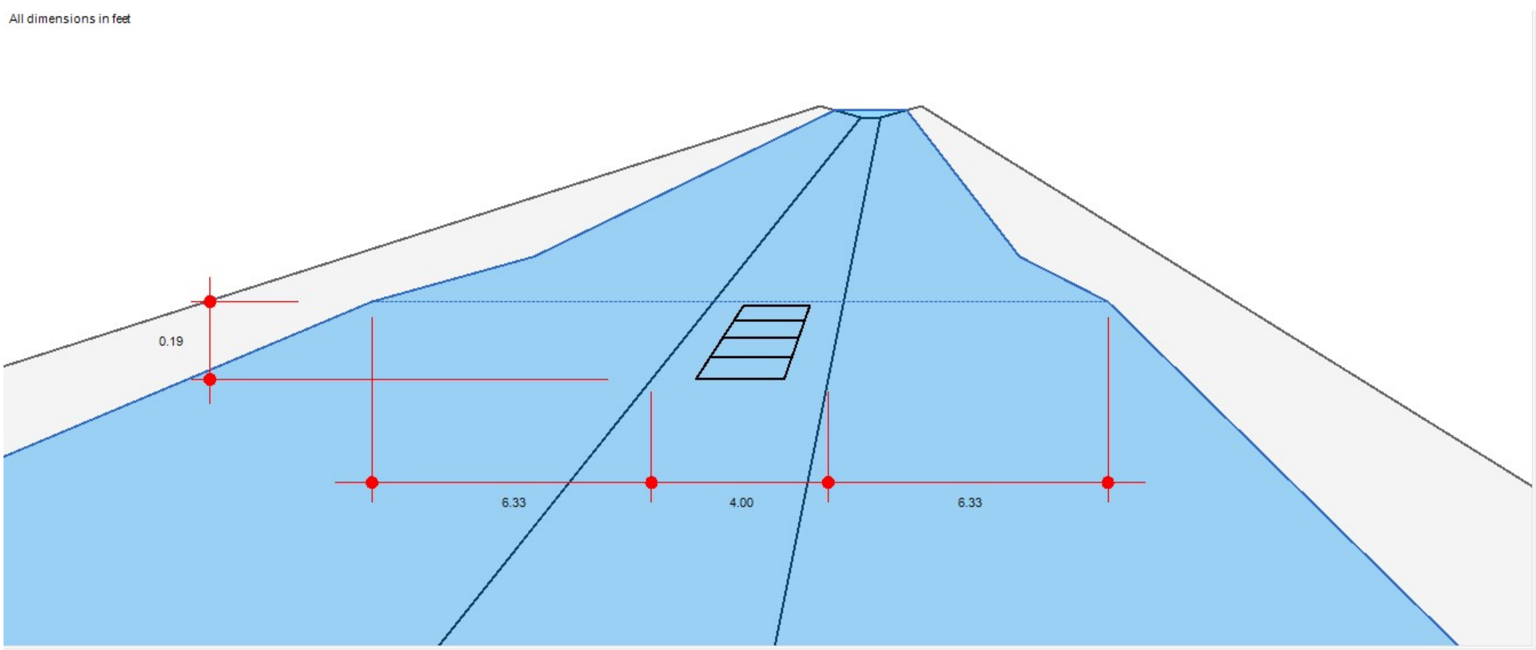
| | |
|---|---|
| Slope, Sw (ft/ft) | = 0.030 |
| Slope, Sx (ft/ft) | = 0.030 |
| Local Depr (in) | = -0- |
| Gutter Width (ft) | = 4.00 |
| Gutter Slope (%) | = 0.50 |
| Gutter n-value | = 0.013 |

**Calculations**

| | |
|---|---|
| Compute by: | Known Q |
| Q (cfs) | = 3.57 |

**Highlighted**

| | |
|---|---|
| Q Total (cfs) | = 3.57 |
| Q Capt (cfs) | = 0.98 |
| Q Bypass (cfs) | = 2.59 |
| Depth at Inlet (in) | = 2.28 |
| Efficiency (%) | = 27 |
| Gutter Spread (ft) | = 16.67 |
| Gutter Vel (ft/s) | = 1.82 |
| Bypass Spread (ft) | = 14.67 |
| Bypass Depth (in) | = 1.92 |



# Inlet Report



## Inlet # 10

**Drop Grate Inlet**

| | | |
|---|---|---|
| Location | = | On grade |
| Curb Length (ft) | = | -0- |
| Throat Height (in) | = | -0- |
| Grate Area (sqft) | = | -0- |
| Grate Width (ft) | = | 2.00 |
| Grate Length (ft) | = | 2.00 |

**Gutter**

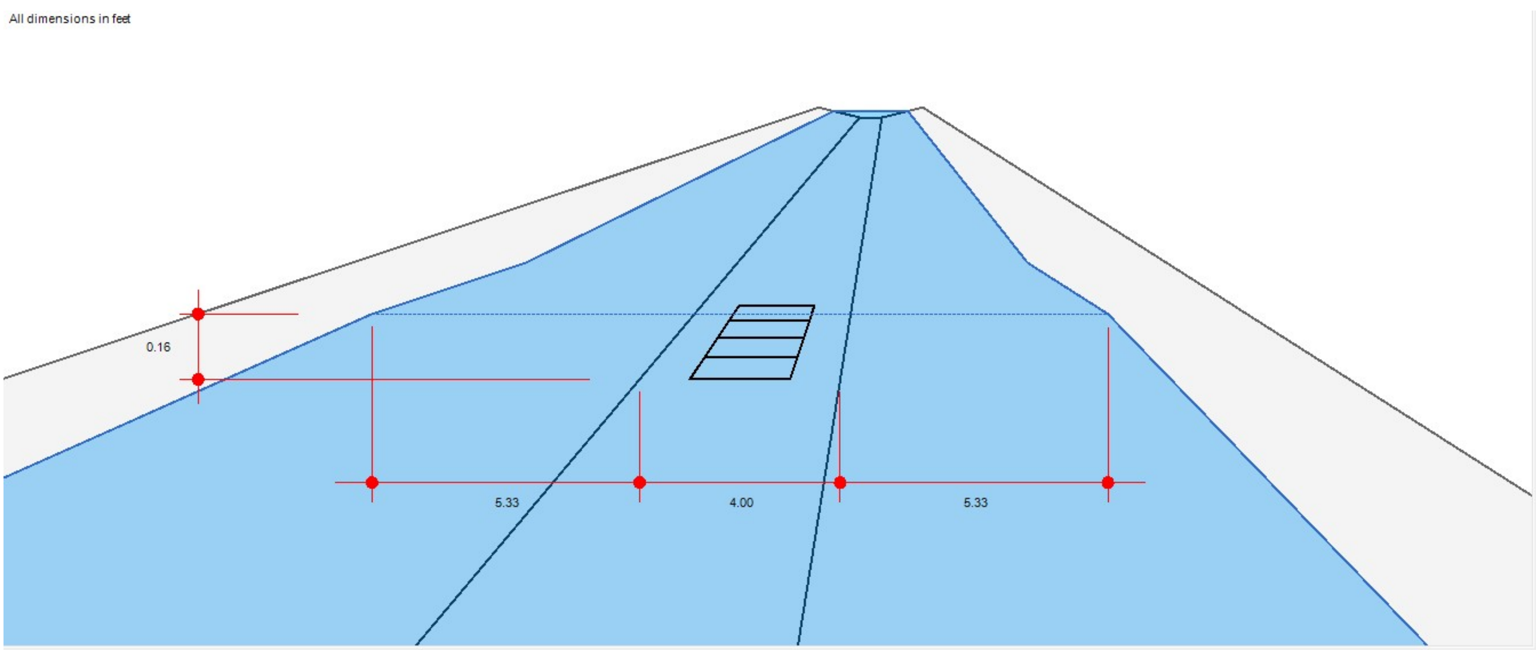
| | | |
|---|---|---|
| Slope, Sw (ft/ft) | = | 0.030 |
| Slope, Sx (ft/ft) | = | 0.030 |
| Local Depr (in) | = | -0- |
| Gutter Width (ft) | = | 4.00 |
| Gutter Slope (%) | = | 0.50 |
| Gutter n-value | = | 0.013 |

**Calculations**

| | | |
|---|---|---|
| Compute by: | | Known Q |
| Q (cfs) | = | 2.59 |

**Highlighted**

| | | |
|---|---|---|
| Q Total (cfs) | = | 2.59 |
| Q Capt (cfs) | = | 0.78 |
| Q Bypass (cfs) | = | 1.81 |
| Depth at Inlet (in) | = | 1.92 |
| Efficiency (%) | = | 30 |
| Gutter Spread (ft) | = | 14.67 |
| Gutter Vel (ft/s) | = | 1.73 |
| Bypass Spread (ft) | = | 13.33 |
| Bypass Depth (in) | = | 1.68 |

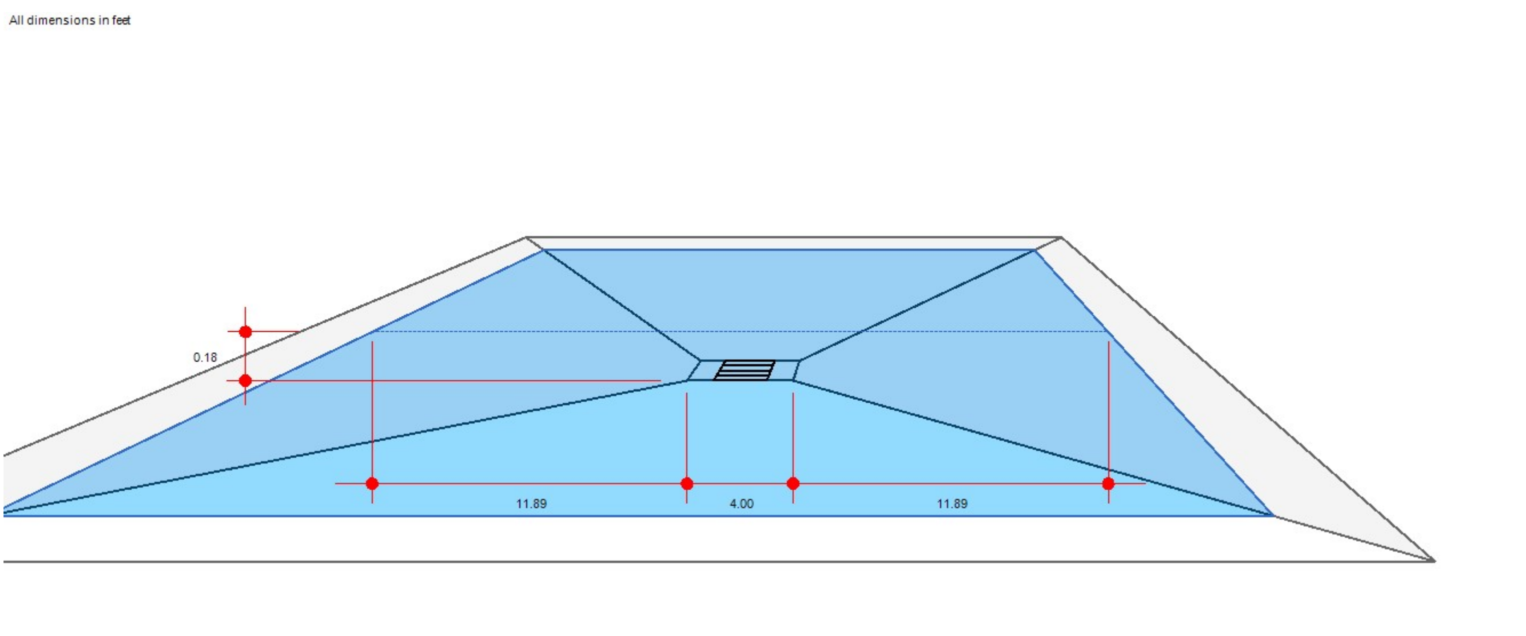


# Inlet Report



## Inlet # 11

| **Drop Grate Inlet** | | **Calculations** | |
|---|---|---|---|
| Location | = Sag | Compute by: | Known Q |
| Curb Length (ft) | = -0- | Q (cfs) | = 1.81 |
| Throat Height (in) | = -0- | | |
| Grate Area (sqft) | = 4.00 | **Highlighted** | |
| Grate Width (ft) | = 2.00 | Q Total (cfs) | = 1.81 |
| Grate Length (ft) | = 2.00 | Q Capt (cfs) | = 1.81 |
| | | Q Bypass (cfs) | = -0- |
| **Gutter** | | Depth at Inlet (in) | = 2.14 |
| Slope, Sw (ft/ft) | = 0.015 | Efficiency (%) | = 100 |
| Slope, Sx (ft/ft) | = 0.015 | Gutter Spread (ft) | = 27.78 |
| Local Depr (in) | = -0- | Gutter Vel (ft/s) | = 1.73 |
| Gutter Width (ft) | = 4.00 | Bypass Spread (ft) | = -0- |
| Gutter Slope (%) | = -0- | Bypass Depth (in) | = -0- |
| Gutter n-value | = -0- | | |

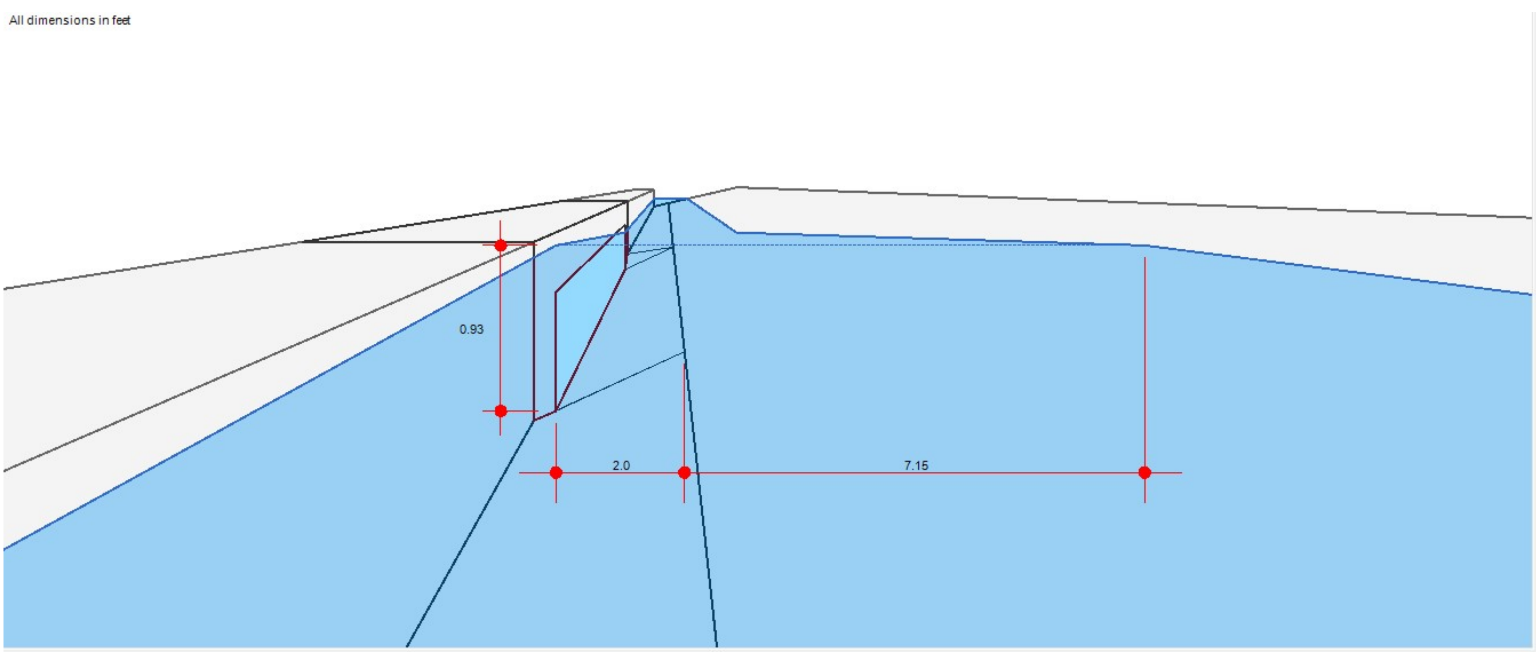


# Inlet Report



## Inlet # 12

| | | | |
|---|---|---|---|
| **Curb Inlet** | | **Calculations** | |
| Location | = On grade | Compute by: | Known Q |
| Curb Length (ft) | = 10.00 | Q (cfs) | = 14.33 |
| Throat Height (in) | = 4.00 | | |
| Grate Area (sqft) | = -0- | **Highlighted** | |
| Grate Width (ft) | = -0- | Q Total (cfs) | = 14.33 |
| Grate Length (ft) | = -0- | Q Capt (cfs) | = 12.00 |
| | | Q Bypass (cfs) | = 2.33 |
| **Gutter** | | Depth at Inlet (in) | = 11.12 |
| Slope, Sw (ft/ft) | = 0.083 | Efficiency (%) | = 84 |
| Slope, Sx (ft/ft) | = 0.083 | Gutter Spread (ft) | = 9.15 |
| Local Depr (in) | = 2.00 | Gutter Vel (ft/s) | = 4.12 |
| Gutter Width (ft) | = 2.00 | Bypass Spread (ft) | = 4.63 |
| Gutter Slope (%) | = 0.50 | Bypass Depth (in) | = 4.61 |
| Gutter n-value | = 0.016 | | |

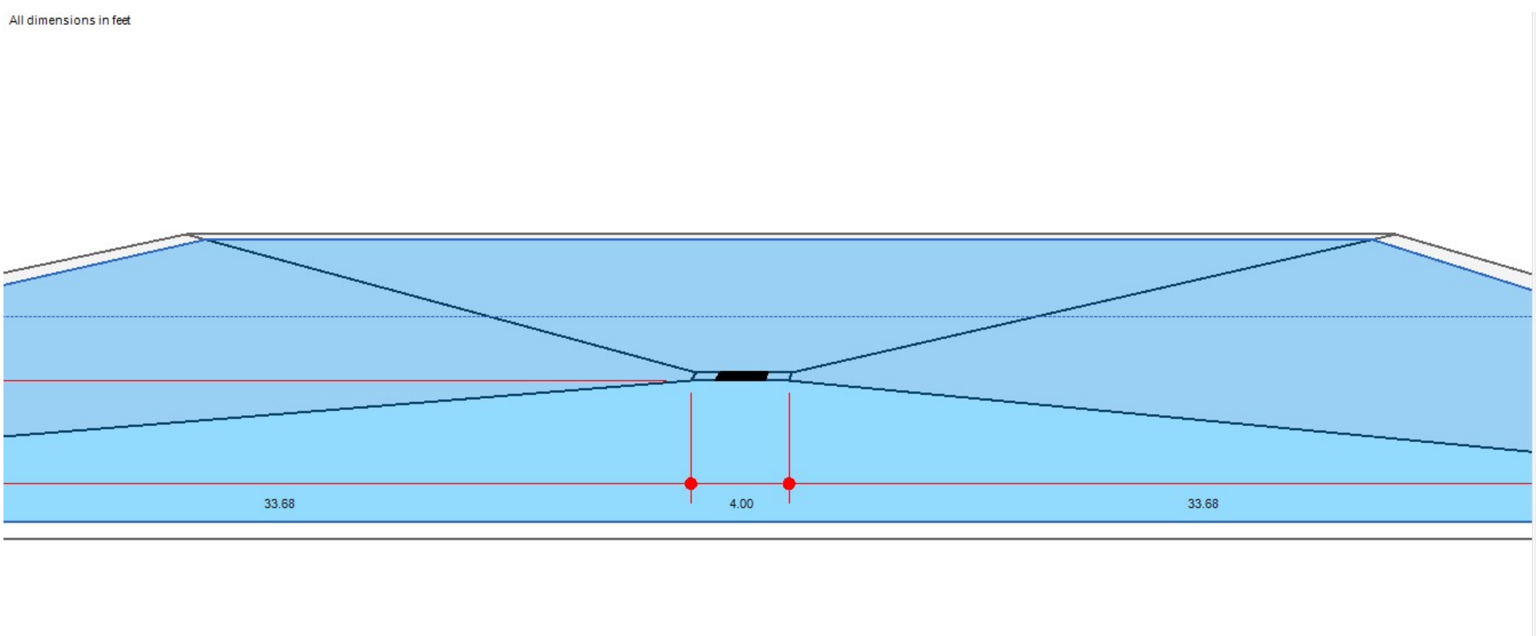


# Inlet Report



## Inlet # 13

| **Drop Grate Inlet** | | **Calculations** | |
|---|---|---|---|
| Location | = Sag | Compute by: | Q vs Depth |
| Curb Length (ft) | = -0- | Max Depth (in) | = 3 |
| Throat Height (in) | = -0- | | |
| Grate Area (sqft) | = 4.00 | **Highlighted** | |
| Grate Width (ft) | = 2.00 | Q Total (cfs) | = 2.75 |
| Grate Length (ft) | = 2.00 | Q Capt (cfs) | = 2.75 |
| | | Q Bypass (cfs) | = -0- |
| **Gutter** | | Depth at Inlet (in) | = 2.83 |
| Slope, Sw (ft/ft) | = 0.007 | Efficiency (%) | = 100 |
| Slope, Sx (ft/ft) | = 0.007 | Gutter Spread (ft) | = 71.35 |
| Local Depr (in) | = -0- | Gutter Vel (ft/s) | = 2.83 |
| Gutter Width (ft) | = 4.00 | Bypass Spread (ft) | = -0- |
| Gutter Slope (%) | = -0- | Bypass Depth (in) | = -0- |
| Gutter n-value | = -0- | | |



# Inlet Report



## Inlet # 14

**Drop Grate Inlet**

| | |
|---|---|
| Location | = Sag |
| Curb Length (ft) | = -0- |
| Throat Height (in) | = -0- |
| Grate Area (sqft) | = 4.00 |
| Grate Width (ft) | = 2.00 |
| Grate Length (ft) | = 2.00 |

**Gutter**

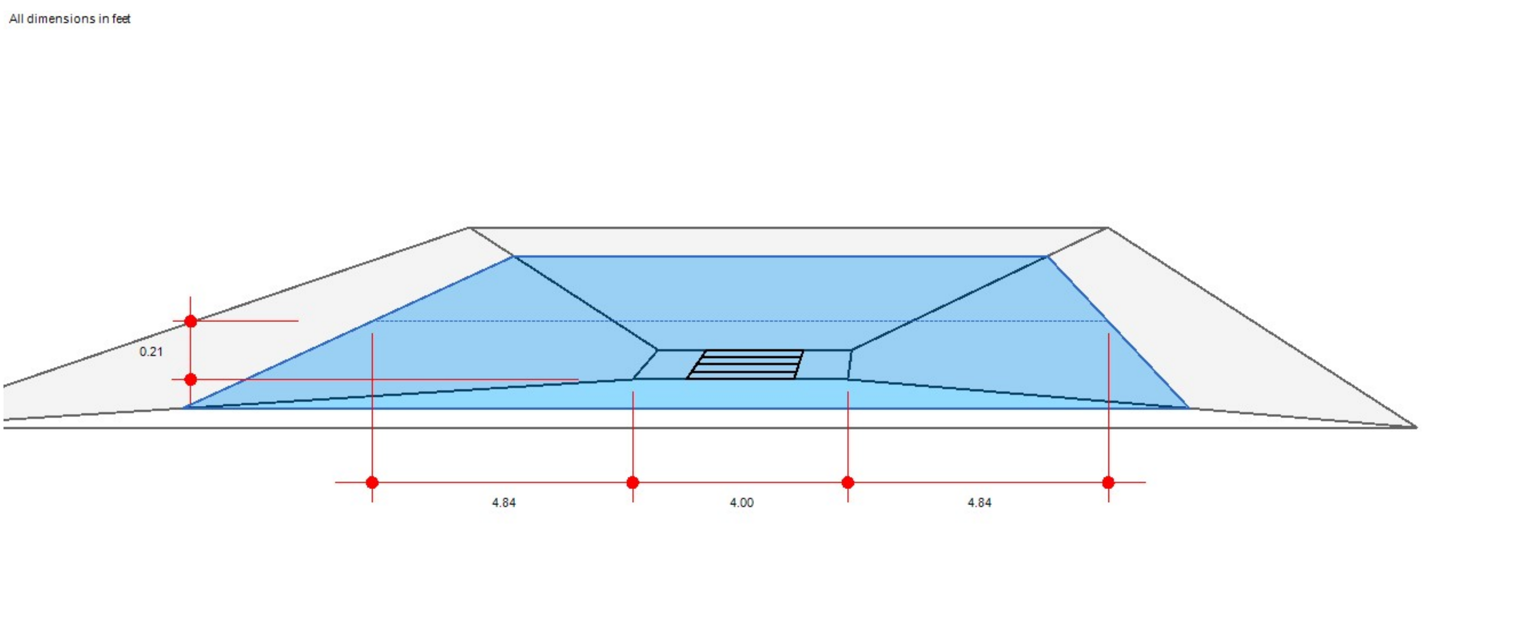
| | |
|---|---|
| Slope, Sw (ft/ft) | = 0.044 |
| Slope, Sx (ft/ft) | = 0.044 |
| Local Depr (in) | = -0- |
| Gutter Width (ft) | = 4.00 |
| Gutter Slope (%) | = -0- |
| Gutter n-value | = -0- |

**Calculations**

| | |
|---|---|
| Compute by: | Known Q |
| Q (cfs) | = 2.36 |

**Highlighted**

| | |
|---|---|
| Q Total (cfs) | = 2.36 |
| Q Capt (cfs) | = 2.36 |
| Q Bypass (cfs) | = -0- |
| Depth at Inlet (in) | = 2.55 |
| Efficiency (%) | = 100 |
| Gutter Spread (ft) | = 13.68 |
| Gutter Vel (ft/s) | = 2.83 |
| Bypass Spread (ft) | = -0- |
| Bypass Depth (in) | = -0- |



# Inlet Report



## Inlet # 15

**Curb Inlet**

| | | |
|---|---|---|
| Location | = | On grade |
| Curb Length (ft) | = | 10.00 |
| Throat Height (in) | = | 4.00 |
| Grate Area (sqft) | = | -0- |
| Grate Width (ft) | = | -0- |
| Grate Length (ft) | = | -0- |

**Gutter**

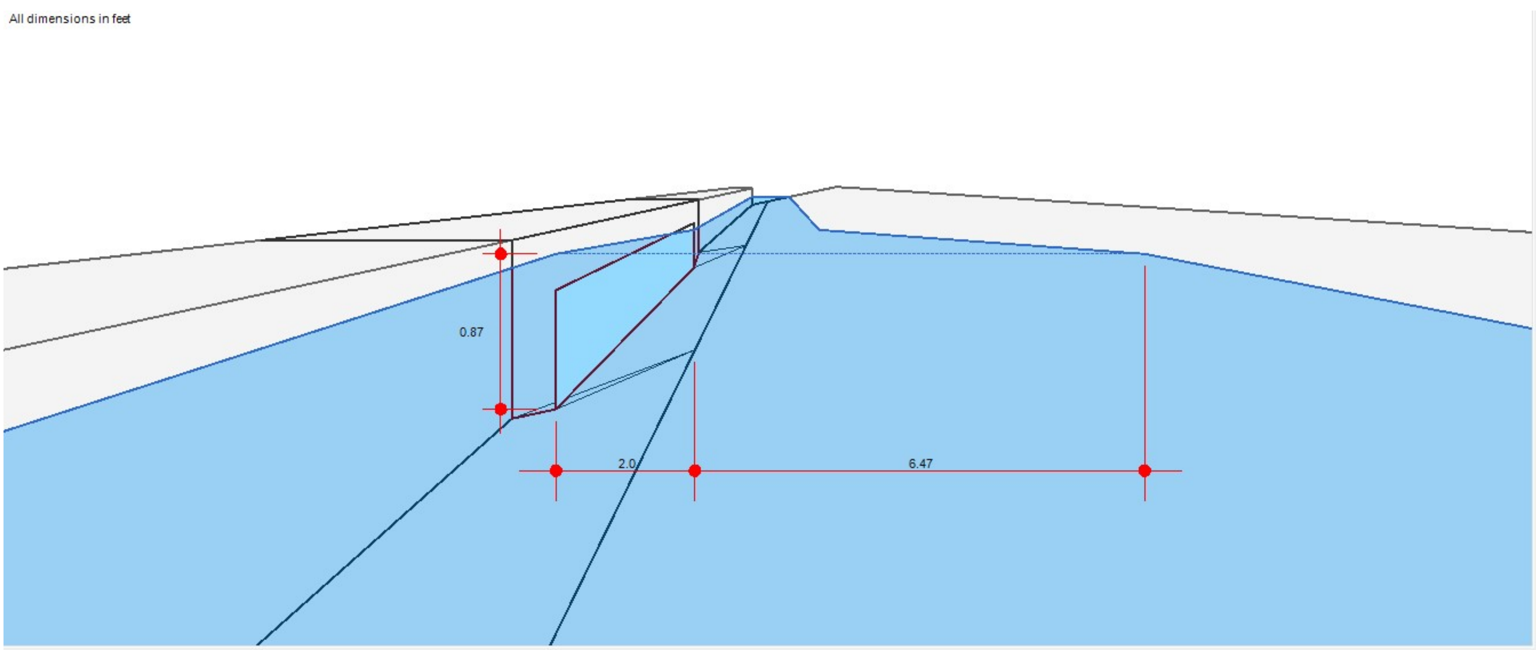
| | | |
|---|---|---|
| Slope, Sw (ft/ft) | = | 0.083 |
| Slope, Sx (ft/ft) | = | 0.083 |
| Local Depr (in) | = | 2.00 |
| Gutter Width (ft) | = | 2.00 |
| Gutter Slope (%) | = | 0.50 |
| Gutter n-value | = | 0.013 |

**Calculations**

| | | |
|---|---|---|
| Compute by: | | Known Q |
| Q (cfs) | = | 14.33 |

**Highlighted**

| | | |
|---|---|---|
| Q Total (cfs) | = | 14.33 |
| Q Capt (cfs) | = | 11.17 |
| Q Bypass (cfs) | = | 3.16 |
| Depth at Inlet (in) | = | 10.43 |
| Efficiency (%) | = | 78 |
| Gutter Spread (ft) | = | 8.47 |
| Gutter Vel (ft/s) | = | 4.81 |
| Bypass Spread (ft) | = | 4.80 |
| Bypass Depth (in) | = | 4.78 |

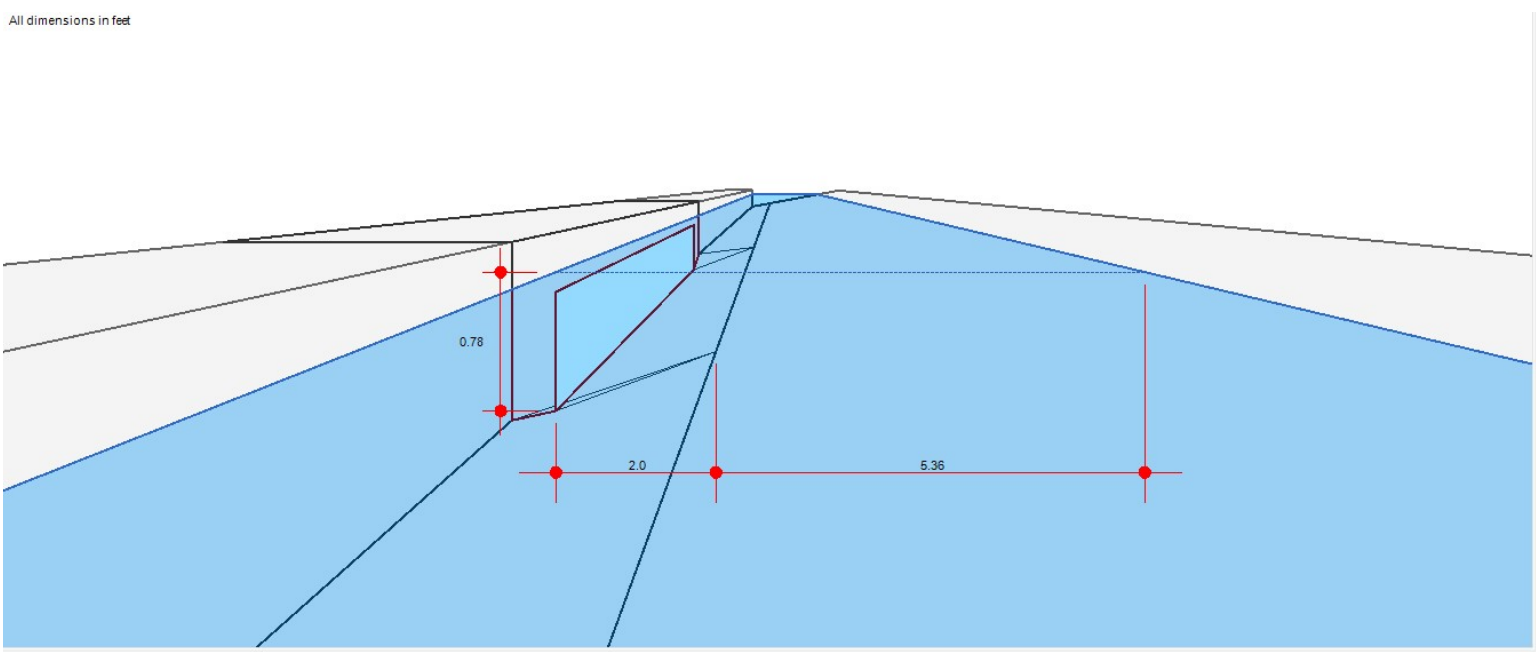


# Inlet Report



## Inlet # 16

| **Curb Inlet** | | **Calculations** | |
|---|---|---|---|
| Location | = Sag | Compute by: | Known Q |
| Curb Length (ft) | = 10.00 | Q (cfs) | = 14.94 |
| Throat Height (in) | = 4.00 | | |
| Grate Area (sqft) | = -0- | **Highlighted** | |
| Grate Width (ft) | = -0- | Q Total (cfs) | = 14.94 |
| Grate Length (ft) | = -0- | Q Capt (cfs) | = 14.94 |
| | | Q Bypass (cfs) | = -0- |
| **Gutter** | | Depth at Inlet (in) | = 9.33 |
| Slope, Sw (ft/ft) | = 0.083 | Efficiency (%) | = 100 |
| Slope, Sx (ft/ft) | = 0.083 | Gutter Spread (ft) | = 7.36 |
| Local Depr (in) | = 2.00 | Gutter Vel (ft/s) | = 4.81 |
| Gutter Width (ft) | = 2.00 | Bypass Spread (ft) | = -0- |
| Gutter Slope (%) | = -0- | Bypass Depth (in) | = -0- |
| Gutter n-value | = -0- | | |



# Appendix 10

```
[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           03/30/2023
START_TIME           00:00:00
REPORT_START_DATE    03/30/2023
REPORT_START_TIME    00:00:00
END_DATE             03/31/2023
END_TIME             12:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:00:01
WET_STEP             00:00:01
DRY_STEP             00:00:01
ROUTING_STEP         0:00:01
RULE_STEP            00:00:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.566
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO
```

```
[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
DP-1             0          FREE                        NO
DP-2             0          FREE                        NO
DP-3             0          FREE                        NO

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ----------- ---------- ---------------------------- -------- --------          -------- --------
BMP-1            0        1.15       0          TABULAR    BMP-1                        0        0
BMP-2            0        1.15       0          TABULAR    BMP-2                        0        0
BMP-3            0        1.15       0          TABULAR    BMP-3                        0        0

[OUTLETS]
;;Name           From Node        To Node          Offset     Type            QTable/Qcoeff    Qexpon     Gated
;;-------------- ---------------- ---------------- ---------- --------------- ---------------- ---------- --------
RISER_1          BMP-1            DP-1             0          TABULAR/HEAD    12INCH_NYLOPLAST            NO
RISER_2          BMP-2            DP-2             0          TABULAR/HEAD    15INCH_NYLOPLAST            NO
RISER_3          BMP-3            DP-3             0          TABULAR/HEAD    15INCH_NYLOPLAST            NO

[INFLOWS]
;;Node           Constituent      Time Series      Type     Mfactor  Sfactor  Baseline Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- --------
BMP-1            FLOW             P-1.2            FLOW     1.0      1.0
BMP-2            FLOW             P-1.3            FLOW     1.0      1.0
BMP-3            FLOW             P-1.4            FLOW     1.0      1.0

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
12INCH_NYLOPLAST Rating     0          0
12INCH_NYLOPLAST            0.05       0.05
12INCH_NYLOPLAST            0.10       0.30
12INCH_NYLOPLAST            0.15       0.55
12INCH_NYLOPLAST            0.20       0.85
12INCH_NYLOPLAST            0.25       1.15
12INCH_NYLOPLAST            0.30       1.27
12INCH_NYLOPLAST            0.35       1.35
12INCH_NYLOPLAST            0.40       1.47
12INCH_NYLOPLAST            0.45       1.57
12INCH_NYLOPLAST            0.50       1.65
12INCH_NYLOPLAST            0.55       1.72
12INCH_NYLOPLAST            0.60       1.80
12INCH_NYLOPLAST            0.65       1.85
12INCH_NYLOPLAST            0.70       1.95
12INCH_NYLOPLAST            0.75       2.02
```

```
12INCH_NYLOPLAST          0.80     2.07
12INCH_NYLOPLAST          0.85     2.12
12INCH_NYLOPLAST          0.90     2.22
12INCH_NYLOPLAST          0.95     2.27
12INCH_NYLOPLAST          1.0      2.32
12INCH_NYLOPLAST          1.05     2.37
12INCH_NYLOPLAST          1.10     2.45
12INCH_NYLOPLAST          1.15     2.50
12INCH_NYLOPLAST          1.20     2.54
12INCH_NYLOPLAST          1.25     2.58
12INCH_NYLOPLAST          1.30     2.62
12INCH_NYLOPLAST          1.35     2.68
12INCH_NYLOPLAST          1.40     2.72
12INCH_NYLOPLAST          1.45     2.76
12INCH_NYLOPLAST          1.50     2.80
12INCH_NYLOPLAST          1.55     2.84
12INCH_NYLOPLAST          1.60     2.88
12INCH_NYLOPLAST          1.65     2.92
12INCH_NYLOPLAST          1.70     2.96
12INCH_NYLOPLAST          1.75     3
12INCH_NYLOPLAST          1.80     3.02
12INCH_NYLOPLAST          1.85     3.04
12INCH_NYLOPLAST          1.90     3.06
12INCH_NYLOPLAST          1.95     3.08
12INCH_NYLOPLAST          2        3.10
;
15INCH_NYLOPLAST Rating   0        0
15INCH_NYLOPLAST          0.05     0.10
15INCH_NYLOPLAST          0.10     0.35
15INCH_NYLOPLAST          0.15     0.70
15INCH_NYLOPLAST          0.20     1.05
15INCH_NYLOPLAST          0.25     1.50
15INCH_NYLOPLAST          0.30     2.0
15INCH_NYLOPLAST          0.35     2.20
15INCH_NYLOPLAST          0.40     2.35
15INCH_NYLOPLAST          0.45     2.60
15INCH_NYLOPLAST          0.50     2.70
15INCH_NYLOPLAST          0.55     2.80
15INCH_NYLOPLAST          0.60     2.97
15INCH_NYLOPLAST          0.65     3.10
15INCH_NYLOPLAST          0.70     3.20
15INCH_NYLOPLAST          0.75     3.25
15INCH_NYLOPLAST          0.80     3.40
15INCH_NYLOPLAST          0.85     3.52
15INCH_NYLOPLAST          0.90     3.65
15INCH_NYLOPLAST          0.95     3.70
15INCH_NYLOPLAST          1.0      3.80
```

```
15INCH_NYLOPLAST          1.05      3.90
15INCH_NYLOPLAST          1.10      4
15INCH_NYLOPLAST          1.15      4.10
15INCH_NYLOPLAST          1.20      4.20
15INCH_NYLOPLAST          1.25      4.30
15INCH_NYLOPLAST          1.30      4.40
15INCH_NYLOPLAST          1.35      4.50
15INCH_NYLOPLAST          1.40      4.60
15INCH_NYLOPLAST          1.45      4.70
15INCH_NYLOPLAST          1.50      4.80
;
BMP-1           Storage    0         2200
BMP-1                      1.15      2200
;
BMP-2           Storage    0         1700
BMP-2                      1.15      1700
;
BMP-3           Storage    0         1800
BMP-3                      1.15      1800

[TIMESERIES]
;;Name          Date       Time       Value
;;-------------- ---------- ---------- ----------
P-1.2                      0:00       0
P-1.2                      0:05       0.2
P-1.2                      0:10       0.2
P-1.2                      0:15       0.2
P-1.2                      0:20       0.2
P-1.2                      0:25       0.2
P-1.2                      0:30       0.2
P-1.2                      0:35       0.2
P-1.2                      0:40       0.2
P-1.2                      0:45       0.2
P-1.2                      0:50       0.2
P-1.2                      0:55       0.2
P-1.2                      1:00       0.2
P-1.2                      1:05       0.2
P-1.2                      1:10       0.2
P-1.2                      1:15       0.2
P-1.2                      1:20       0.2
P-1.2                      1:25       0.2
P-1.2                      1:30       0.2
P-1.2                      1:35       0.2
P-1.2                      1:40       0.2
P-1.2                      1:45       0.3
P-1.2                      1:50       0.3
P-1.2                      1:55       0.3
```

| | | |
|---|---|---|
| P-1.2 | 2:00 | 0.3 |
| P-1.2 | 2:05 | 0.3 |
| P-1.2 | 2:10 | 0.3 |
| P-1.2 | 2:15 | 0.3 |
| P-1.2 | 2:20 | 0.3 |
| P-1.2 | 2:25 | 0.3 |
| P-1.2 | 2:30 | 0.3 |
| P-1.2 | 2:35 | 0.3 |
| P-1.2 | 2:40 | 0.3 |
| P-1.2 | 2:45 | 0.4 |
| P-1.2 | 2:50 | 0.4 |
| P-1.2 | 2:55 | 0.4 |
| P-1.2 | 3:00 | 0.4 |
| P-1.2 | 3:05 | 0.4 |
| P-1.2 | 3:10 | 0.5 |
| P-1.2 | 3:15 | 0.5 |
| P-1.2 | 3:20 | 0.5 |
| P-1.2 | 3:25 | 0.6 |
| P-1.2 | 3:30 | 0.6 |
| P-1.2 | 3:35 | 0.7 |
| P-1.2 | 3:40 | 0.8 |
| P-1.2 | 3:45 | 0.9 |
| P-1.2 | 3:50 | 1.1 |
| P-1.2 | 3:55 | 1.6 |
| P-1.2 | 4:00 | 2.3 |
| P-1.2 | 4:05 | 7.96 |
| P-1.2 | 4:10 | 1.3 |
| P-1.2 | 4:15 | 0.9 |
| P-1.2 | 4:20 | 0.7 |
| P-1.2 | 4:25 | 0.6 |
| P-1.2 | 4:30 | 0.5 |
| P-1.2 | 4:35 | 0.4 |
| P-1.2 | 4:40 | 0.4 |
| P-1.2 | 4:45 | 0.4 |
| P-1.2 | 4:50 | 0.3 |
| P-1.2 | 4:55 | 0.3 |
| P-1.2 | 5:00 | 0.3 |
| P-1.2 | 5:05 | 0.3 |
| P-1.2 | 5:10 | 0.3 |
| P-1.2 | 5:15 | 0.3 |
| P-1.2 | 5:20 | 0.2 |
| P-1.2 | 5:25 | 0.2 |
| P-1.2 | 5:30 | 0.2 |
| P-1.2 | 5:35 | 0.2 |
| P-1.2 | 5:40 | 0.2 |
| P-1.2 | 5:45 | 0.2 |
| P-1.2 | 5:50 | 0.2 |

| | | |
|---|---|---|
| P-1.2 | 5:55 | 0.2 |
| P-1.2 | 6:00 | 0.2 |
| P-1.2 | 6:05 | 0 |
| ; | | |
| P-1.3 | 0:00 | 0 |
| P-1.3 | 0:05 | 0.2 |
| P-1.3 | 0:10 | 0.2 |
| P-1.3 | 0:15 | 0.2 |
| P-1.3 | 0:20 | 0.2 |
| P-1.3 | 0:25 | 0.2 |
| P-1.3 | 0:30 | 0.2 |
| P-1.3 | 0:35 | 0.2 |
| P-1.3 | 0:40 | 0.2 |
| P-1.3 | 0:45 | 0.2 |
| P-1.3 | 0:50 | 0.2 |
| P-1.3 | 0:55 | 0.2 |
| P-1.3 | 1:00 | 0.2 |
| P-1.3 | 1:05 | 0.2 |
| P-1.3 | 1:10 | 0.2 |
| P-1.3 | 1:15 | 0.2 |
| P-1.3 | 1:20 | 0.2 |
| P-1.3 | 1:25 | 0.2 |
| P-1.3 | 1:30 | 0.2 |
| P-1.3 | 1:35 | 0.3 |
| P-1.3 | 1:40 | 0.3 |
| P-1.3 | 1:45 | 0.3 |
| P-1.3 | 1:50 | 0.3 |
| P-1.3 | 1:55 | 0.3 |
| P-1.3 | 2:00 | 0.3 |
| P-1.3 | 2:05 | 0.3 |
| P-1.3 | 2:10 | 0.3 |
| P-1.3 | 2:15 | 0.3 |
| P-1.3 | 2:20 | 0.3 |
| P-1.3 | 2:25 | 0.3 |
| P-1.3 | 2:30 | 0.3 |
| P-1.3 | 2:35 | 0.4 |
| P-1.3 | 2:40 | 0.4 |
| P-1.3 | 2:45 | 0.4 |
| P-1.3 | 2:50 | 0.4 |
| P-1.3 | 2:55 | 0.4 |
| P-1.3 | 3:00 | 0.4 |
| P-1.3 | 3:05 | 0.5 |
| P-1.3 | 3:10 | 0.5 |
| P-1.3 | 3:15 | 0.5 |
| P-1.3 | 3:20 | 0.5 |
| P-1.3 | 3:25 | 0.6 |
| P-1.3 | 3:30 | 0.6 |

| | | |
|---|---|---|
| P-1.3 | 3:35 | 0.7 |
| P-1.3 | 3:40 | 0.8 |
| P-1.3 | 3:45 | 1 |
| P-1.3 | 3:50 | 1.1 |
| P-1.3 | 3:55 | 1.6 |
| P-1.3 | 4:00 | 2.3 |
| P-1.3 | 4:05 | 8.25 |
| P-1.3 | 4:10 | 1.3 |
| P-1.3 | 4:15 | 0.9 |
| P-1.3 | 4:20 | 0.7 |
| P-1.3 | 4:25 | 0.6 |
| P-1.3 | 4:30 | 0.5 |
| P-1.3 | 4:35 | 0.4 |
| P-1.3 | 4:40 | 0.4 |
| P-1.3 | 4:45 | 0.4 |
| P-1.3 | 4:50 | 0.3 |
| P-1.3 | 4:55 | 0.3 |
| P-1.3 | 5:00 | 0.3 |
| P-1.3 | 5:05 | 0.3 |
| P-1.3 | 5:10 | 0.3 |
| P-1.3 | 5:15 | 0.3 |
| P-1.3 | 5:20 | 0.2 |
| P-1.3 | 5:25 | 0.2 |
| P-1.3 | 5:30 | 0.2 |
| P-1.3 | 5:35 | 0.2 |
| P-1.3 | 5:40 | 0.2 |
| P-1.3 | 5:45 | 0.2 |
| P-1.3 | 5:50 | 0.2 |
| P-1.3 | 5:55 | 0.2 |
| P-1.3 | 6:00 | 0.2 |
| P-1.3 | 6:05 | 0 |
| ; | | |
| P-1.4 | 0:00 | 0 |
| P-1.4 | 0:05 | 0.2 |
| P-1.4 | 0:10 | 0.2 |
| P-1.4 | 0:15 | 0.2 |
| P-1.4 | 0:20 | 0.2 |
| P-1.4 | 0:25 | 0.2 |
| P-1.4 | 0:30 | 0.2 |
| P-1.4 | 0:35 | 0.2 |
| P-1.4 | 0:40 | 0.2 |
| P-1.4 | 0:45 | 0.2 |
| P-1.4 | 0:50 | 0.2 |
| P-1.4 | 0:55 | 0.2 |
| P-1.4 | 1:00 | 0.2 |
| P-1.4 | 1:05 | 0.2 |
| P-1.4 | 1:10 | 0.3 |

| | | |
|---|---|---|
| P-1.4 | 1:15 | 0.3 |
| P-1.4 | 1:20 | 0.3 |
| P-1.4 | 1:25 | 0.3 |
| P-1.4 | 1:30 | 0.3 |
| P-1.4 | 1:35 | 0.3 |
| P-1.4 | 1:40 | 0.3 |
| P-1.4 | 1:45 | 0.3 |
| P-1.4 | 1:50 | 0.3 |
| P-1.4 | 1:55 | 0.3 |
| P-1.4 | 2:00 | 0.3 |
| P-1.4 | 2:05 | 0.3 |
| P-1.4 | 2:10 | 0.3 |
| P-1.4 | 2:15 | 0.3 |
| P-1.4 | 2:20 | 0.3 |
| P-1.4 | 2:25 | 0.4 |
| P-1.4 | 2:30 | 0.4 |
| P-1.4 | 2:35 | 0.4 |
| P-1.4 | 2:40 | 0.4 |
| P-1.4 | 2:45 | 0.4 |
| P-1.4 | 2:50 | 0.4 |
| P-1.4 | 2:55 | 0.5 |
| P-1.4 | 3:00 | 0.5 |
| P-1.4 | 3:05 | 0.5 |
| P-1.4 | 3:10 | 0.5 |
| P-1.4 | 3:15 | 0.6 |
| P-1.4 | 3:20 | 0.6 |
| P-1.4 | 3:25 | 0.7 |
| P-1.4 | 3:30 | 0.7 |
| P-1.4 | 3:35 | 0.8 |
| P-1.4 | 3:40 | 0.9 |
| P-1.4 | 3:45 | 1.1 |
| P-1.4 | 3:50 | 1.2 |
| P-1.4 | 3:55 | 1.8 |
| P-1.4 | 4:00 | 2.6 |
| P-1.4 | 4:05 | 9.08 |
| P-1.4 | 4:10 | 1.4 |
| P-1.4 | 4:15 | 1 |
| P-1.4 | 4:20 | 0.8 |
| P-1.4 | 4:25 | 0.6 |
| P-1.4 | 4:30 | 0.6 |
| P-1.4 | 4:35 | 0.5 |
| P-1.4 | 4:40 | 0.4 |
| P-1.4 | 4:45 | 0.4 |
| P-1.4 | 4:50 | 0.4 |
| P-1.4 | 4:55 | 0.4 |
| P-1.4 | 5:00 | 0.3 |
| P-1.4 | 5:05 | 0.3 |

```
P-1.4                 5:10      0.3
P-1.4                 5:15      0.3
P-1.4                 5:20      0.3
P-1.4                 5:25      0.3
P-1.4                 5:30      0.3
P-1.4                 5:35      0.2
P-1.4                 5:40      0.2
P-1.4                 5:45      0.2
P-1.4                 5:50      0.2
P-1.4                 5:55      0.2
P-1.4                 6:00      0.2
P-1.4                 6:05      0

[REPORT]
;;Reporting Options
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 0.000 0.000 10000.000 10000.000
Units      None

[COORDINATES]
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;;-------------- ------------------ ------------------
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DP-2            2994.398           5248.485
DP-3            4391.639           5239.860
BMP-1           1726.532           7663.468
BMP-2           3000.961           7710.793
BMP-3           4391.639           7715.218

[VERTICES]
;;Link          X-Coord            Y-Coord
;;-------------- ------------------ ------------------
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RATIONAL METHOD HYDROGRAPH PROGRAM


Basin P-1.2

RUN DATE 4/7/2023
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 2.6 INCHES
BASIN AREA 1.33 ACRES
RUNOFF COEFFICIENT 0.88
PEAK DISCHARGE 7.96 CFS

| | |
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RATIONAL METHOD HYDROGRAPH PROGRAM


Basin P-1.3

RUN DATE 4/7/2023
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 2.6 INCHES
BASIN AREA 1.38 ACRES
RUNOFF COEFFICIENT 0.87
PEAK DISCHARGE 8.25 CFS

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RATIONAL METHOD HYDROGRAPH PROGRAM


Basin P-1.4

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TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 2.6 INCHES
BASIN AREA 1.51 ACRES
RUNOFF COEFFICIENT 0.88
PEAK DISCHARGE 9.08 CFS

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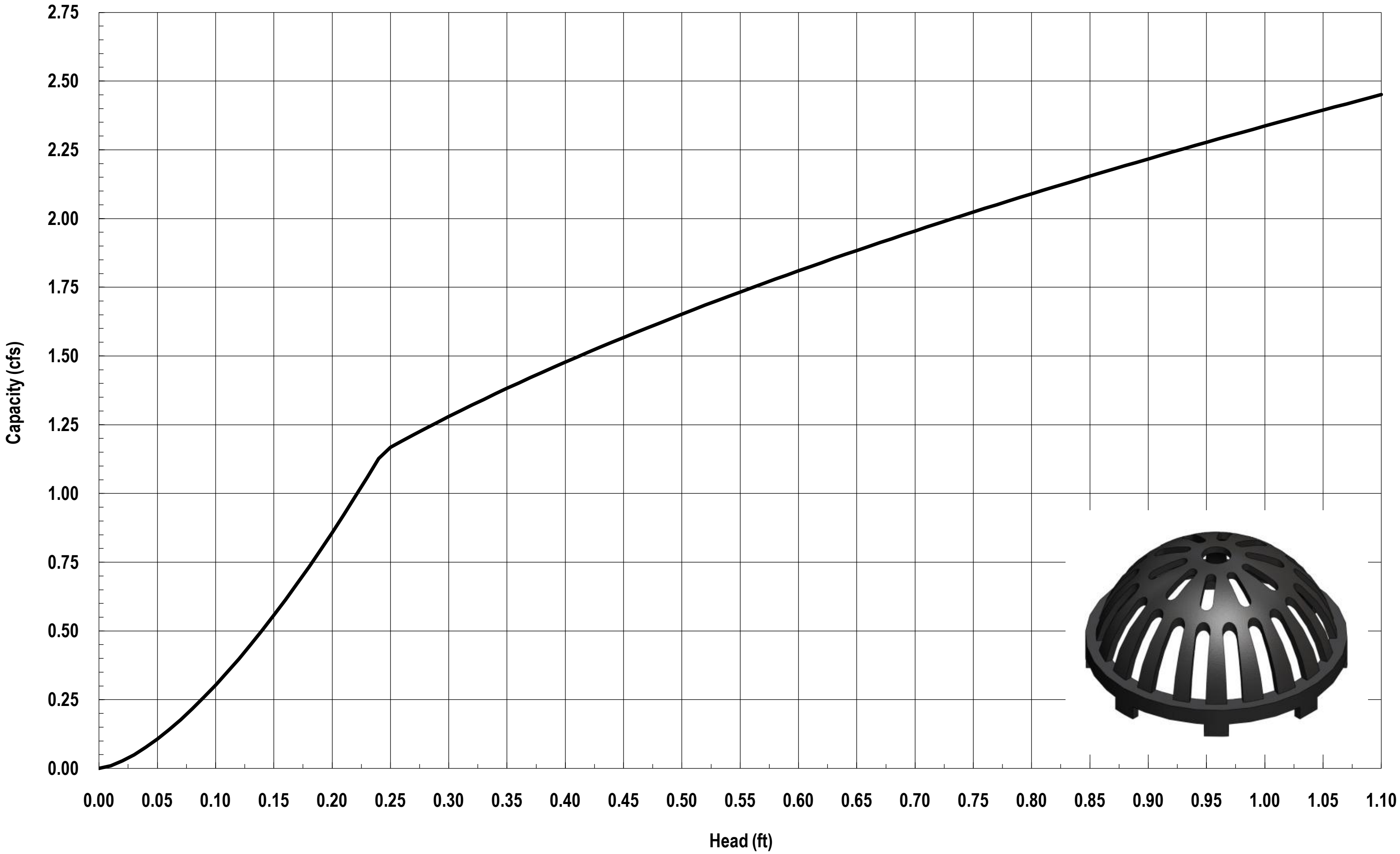
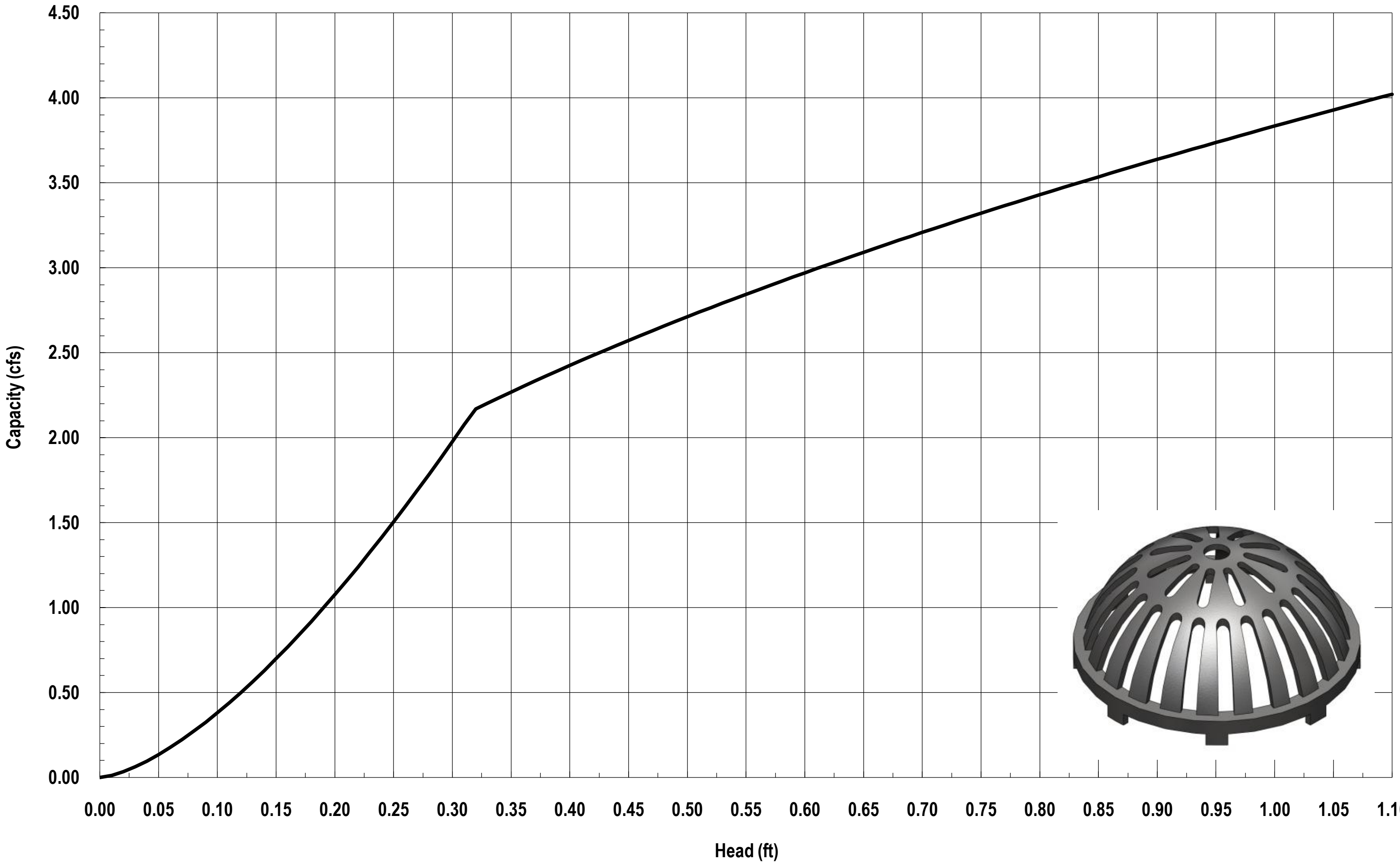
# Nyloplast 12" Dome Grate Inlet Capacity Chart





Nyloplast®
3130 Verona Avenue • Buford, GA 30518
(866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490

## Nyloplast 15" Dome Grate Inlet Capacity Chart




Nyloplast®

3130 Verona Avenue • Buford, GA 30518
(866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490

# Appendix 11

# National Flood Hazard Layer FIRMette

FEMA

116°58'W 32°49'56"N


0 250 500 1,000 1,500 2,000 Feet

1:6,000

116°57'22"W 32°49'26"N

*Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020*

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/31/2023 at 6:41 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# ATTACHMENT D

Storm Water Quality Management Plan (SWQMP)

# CITY OF SANTEE

**PRIORITY DEVELOPMENT PROJECT (PDP)**

## STORM WATER QUALITY MANAGEMENT PLAN (SWQMP)

**FOR**
**Graves Avenue RV Storage**
**Project No. TBD**

**8353 Graves Avenue**
**Santee, CA 92071**

**ASSESSOR'S PARCEL NUMBER(S):**
**387-061-11 & 12**
**ENGINEER OF WORK:**

_______________________________________________

**Patric T. de Boer, R.C.E 83583**

PREPARED FOR:

Cameron Brothers Company, LLC
10580 Prospect Ave., Suite 200
Santee, CA 92071
(619) 562-3050

PDP SWQMP PREPARED BY:

Patric T. De Boer
4320 Viewridge Ave., Suite C
San Diego, CA 92123
(858) 634-8620

DATE OF SWQMP:
04/05/2023

PLANS PREPARED BY:
4320 Viewridge Ave., Suite C
San Diego, CA 92123
(858) 634-8620

PDP SWQMP Template Date: February 2016
PDP SWQMP Preparation Date: 03/27/2023

## TABLE OF CONTENTS

## ACRONYMS

| | |
|---|---|
| APN | Assessor's Parcel Number |
| BMP | Best Management Practice |
| HMP | Hydromodification Management Plan |
| HSG | Hydrologic Soil Group |
| MS4 | Municipal Separate Storm Sewer System |
| N/A | Not Applicable |
| NRCS | Natural Resources Conservation Service |
| 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 |
| SWQMP | Storm Water Quality Management Plan |

# SWQMP PREPARER'S
# CERTIFICATION PAGE

**Project Name: Graves Avenue RV Storage**
**Permit Application Number: TBD**

**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 Santee BMP Design Manual, which is a design manual for compliance with local City of Santee and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP 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 the City Engineer 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.

____________________________________________________
Engineer of Work's Signature, RCE 83583

Patric T. De Boer
Print Name

Omega Engineering Consultants
Company

__________________________
Date

Engineer's Seal:

# SWQMP PROJECT OWNER'S
# CERTIFICATION PAGE

**Project Name: Graves Avenue RV Storage**
**Permit Application Number: TBD**

**PROJECT OWNER'S CERTIFICATION**

This PDP SWQMP has been prepared for Cameron Brothers Company, LLC by Omega Engineering Consultants. The PDP SWQMP is intended to comply with the PDP requirements of the City of Santee BMP Design Manual, which is a design manual for compliance with local City of Santee and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan, including ensuring on-going operation and maintenance of structural BMPs. A signed copy of this document shall be available on the subject property into perpetuity.

______________________________________________________
Project Owner's Signature

______________________________________________________
Print Name

Cameron Brothers Company, LLC
Company

___________________________
Date

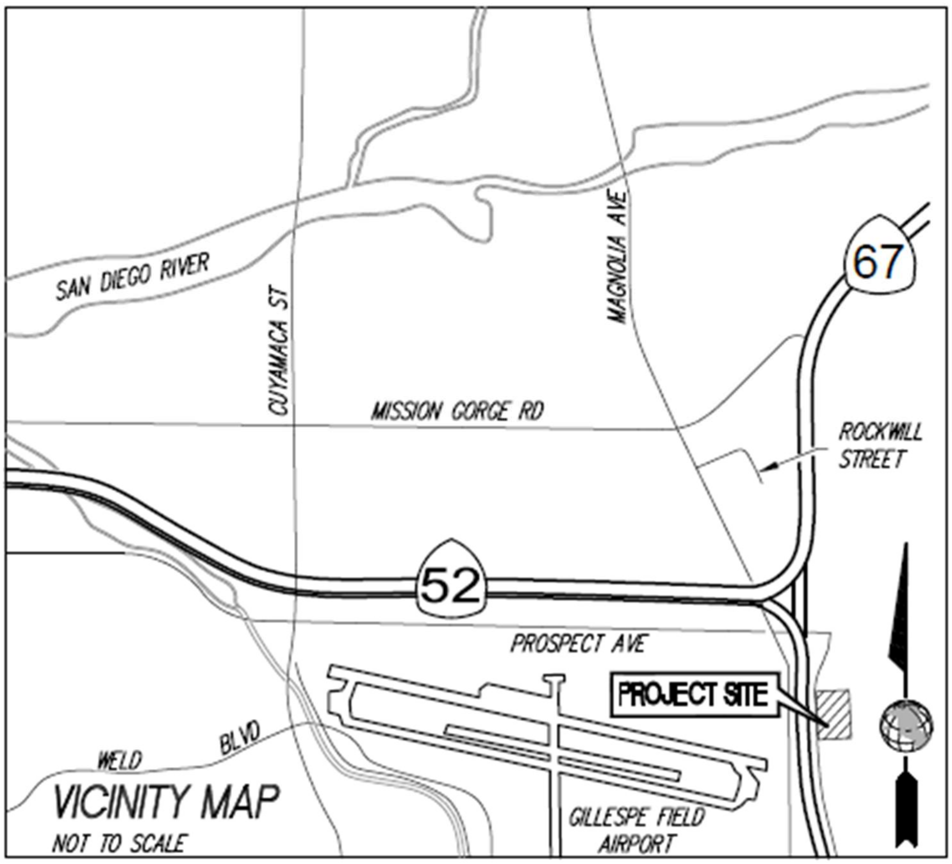
## SUBMITTAL RECORD

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.

| Submittal Number | Date | Project Status | Summary of Changes |
|---|---|---|---|
| 1 | 04/05/2023 | ☐ Preliminary Design / Planning/ CEQA<br>☒ Final Design | Initial Submittal |
| 2 | | ☐ Preliminary Design / Planning/ CEQA<br>☐ Final Design | |
| 3 | | ☐ Preliminary Design / Planning/ CEQA<br>☐ Final Design | |
| 4 | | ☐ Preliminary Design / Planning/ CEQA<br>☐ Final Design | |

## PROJECT VICINITY MAP

**Project Name: Graves Avenue RV Storage**
**Permit Application Number: TBD**



| **Applicability of Permanent, Post-Construction Storm Water BMP Requirements** (Storm Water Intake Form for all Development Permit Applications) | | | **Form I-1** Model BMP Design Manual [August 31, 2015] |
|---|---|---|---|
| **Project Identification** | | | |
| Project Name: Graves Avenue RV Storage | | | |
| Permit Application Number: TBD | | | Date: 04/05/2023 |
| Project Address: 8353 Graves Avenue, Santee, CA 92071 | | | |
| **Determination of Requirements** | | | |
| The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.<br><br>Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop". **Upon reaching a Stop, do not complete further Steps beyond the Stop.**<br><br>Refer to BMP Design Manual sections and/or separate forms referenced in each step below. | | | |
| **Step** | **Answer** | **Progression** | |
| **Step 1:** Is the project a "development project"?<br>See Section 1.3 of the BMP Design Manual for guidance. | ☒ Yes | Go to Step 2. | |
| | ☐ No | Stop.<br>Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below. | |
| Discussion / justification if the project is not a "development project" (e.g., the project includes *only* interior remodels within an existing building): | | | |
| **Step 2:** Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions?<br>To answer this item, see Section 1.4 of the BMP Design Manual *in its entirety* for guidance, AND complete Form I-2, Project Type Determination. | ☐ Standard Project | Stop.<br>Only Standard Project requirements apply, including Standard Project SWQMP. | |
| | ☒ PDP | Standard and PDP requirements apply, including PDP SWQMP.<br>Go to Step 3. | |
| | ☐ Exception to PDP definitions | Stop.<br>Standard Project requirements apply, and any additional requirements specific to the type of project. Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP. | |

<table>
<tr><th colspan="3">Form I-1 Page 2, Form Template Date: August 31, 2015</th></tr>
<tr><td colspan="3">[Step 2 Continued from Page 1] Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:</td></tr>
<tr><td rowspan="2">Step 3 (PDPs only). Is the project subject to earlier PDP requirements due to a prior lawful approval?<br>See Section 1.10 of the BMP Design Manual for guidance.</td><td>☐ Yes</td><td>Consult the [City Engineer] to determine requirements. Provide discussion and identify requirements below.<br>Go to Step 4.</td></tr>
<tr><td>☒ No</td><td>BMP Design Manual PDP requirements apply.<br>Go to Step 4.</td></tr>
<tr><td colspan="3">Discussion / justification of prior lawful approval, and identify requirements (not required if prior lawful approval does not apply):</td></tr>
<tr><td rowspan="2">Step 4 (PDPs only). Do hydromodification control requirements apply?<br>See Section 1.6 of the BMP Design Manual for guidance.</td><td>☒ Yes</td><td>PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6).<br>Go to Step 5.</td></tr>
<tr><td>☐ No</td><td>Stop.<br>PDP structural BMPs required for pollutant control (Chapter 5) only.<br>Provide brief discussion of exemption to hydromodification control below.</td></tr>
<tr><td colspan="3">Discussion / justification if hydromodification control requirements do <u>not</u> apply:</td></tr>
<tr><td rowspan="2">Step 5 (PDPs subject to hydromodification control requirements only). Does protection of critical coarse sediment yield areas apply based on review of WMAA Potential Critical Coarse Sediment Yield Area Map?<br>See Section 6.2 of the BMP Design Manual for guidance.</td><td>☐ Yes</td><td>Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2).<br>Stop.</td></tr>
<tr><td>☒ No</td><td>Management measures not required for protection of critical coarse sediment yield areas.<br>Provide brief discussion below.<br>Stop.</td></tr>
</table>

| Priority Determination Form | **Form I-2**<br>Model BMP Design Manual<br>[August 31, 2015] |
|---|---|

| **Project Information** | |
|---|---|
| Project Name: Graves Avenue RV Storage | |
| Permit Application Number: TBD | Date: 04/05/2023 |
| Project Address: 8353 Graves Avenue, Santee, CA 92071 | |

**Project Type Determination: Standard Project or Priority Development Project (PDP)**

The project is (select one): ☐ New Development ☒ Redevelopment

The total proposed newly created or replaced impervious area is: _178,537_ $ft^2$ (_4.10_) acres

Is the project in any of the following categories, (a) through (f)?

| Yes | No | | |
|---|---|---|---|
| Yes ☐ | No ☒ | (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 ☒ | 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 ☐ | 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:<br>estaurants. This category is defined as a facility that sells prepared foods and drinks r consumption, including stationary lunch counters and refreshment stands selling epared foods and drinks for immediate consumption (Standard Industrial assification (SIC) code 5812).<br>llside development projects. This category includes development on any natural ope that is twenty-five percent or greater.<br>arking lots. This category is defined as a land area or facility for the temporary arking or storage of motor vehicles used personally, for business, or for commerce.<br>treets, roads, highways, freeways, and driveways. This category is defined as any aved impervious surface used for the transportation of automobiles, trucks, otorcycles, and other vehicles. |

| Form I-2 Page 2, Form Template Date: August 31, 2015 | | | |
|---|---|---|---|
| Yes ☐ | No ☒ | (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).<br>*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. See BMP Design Manual Section 1.4.2 for additional guidance.* |
| Yes ☐ | 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:<br>(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.<br>(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 ☒ | (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.<br>*Note: See BMP 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?<br>☐ No – the project is <u>not</u> a Priority Development Project (Standard Project).<br>☒ Yes – the project is a Priority Development Project (PDP). | | | |
| The following is for redevelopment PDPs only:<br><br>The area of existing (pre-project) impervious area at the project site is: <u>22,592</u> $ft^2$ (A)<br>The total proposed newly created or replaced impervious area is <u>178,537</u> $ft^2$ (B)<br>Percent impervious surface created or replaced (B/A)*100: <u>790</u> %<br>The percent impervious surface created or replaced is (select one based on the above calculation):<br>☐ less than or equal to fifty percent (50%) – only new impervious areas are considered PDP<br>OR<br>☒ greater than fifty percent (50%) – the entire project site is a PDP | | | |

| Site Design Checklist For PDPs | **Form I-3B (PDPs)** Model BMP Design Manual [August 31, 2015] |
|---|---|
| **Project Summary Information** | |
| Project Name | Graves Avenue RV Storage |
| Project Address | 8353 Graves Avenue, Santee, CA 92071 |
| Assessor's Parcel Number(s) (APN(s)) | 387-061-11 & 12 |
| Permit Application Number | TBD |
| Project Hydrologic Unit | Select One:<br>☐ Santa Margarita 902<br>☐ San Luis Rey 903<br>☐ Carlsbad 904<br>☐ San Dieguito 905<br>☐ Penasquitos 906<br>☒ San Diego 907<br>☐ Pueblo San Diego 908<br>☐ Sweetwater 909<br>☐ Otay 910<br>☐ Tijuana 911 |
| Project Watershed<br>(Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier) | San Diego, Lower San Diego, Santee, 907.12 |
| Parcel Area<br>(total area of Assessor's Parcel(s) associated with the project) | 5.04 Acres ( 219,720 Square Feet) |
| Area to be Disturbed by the Project<br>(Project Area) | 4.85 Acres ( 211,100 Square Feet) |
| Project Proposed Impervious Area<br>(subset of Project Area) | 4.10 Acres ( 178,537 Square Feet) |
| Project Proposed Pervious Area<br>(subset of Project Area) | 0.75 Acres ( 32,563 Square Feet) |
| Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area. | |

| Form I-3B Page 2 of 10, Form Template Date: August 31, 2015 |
|---|
| **Description of Existing Site Condition** |
| Current Status of the Site (select all that apply):<br>☒ Existing development<br>☐ Previously graded but not built out<br>☐ Demolition completed without new construction<br>☐ Agricultural or other non-impervious use<br>☐ Vacant, undeveloped/natural<br><br>Description / Additional Information:<br>The existing single-house development was demo-ed approximately in August of 2018. Currently, the site only has a paved driveway, while the rest of the site is covered in seasonal grass. For the purpose of this analysis, the existing conditions will consider the single-house development, sheds and paved driveway. |
| Existing Land Cover Includes (select all that apply):<br>☒ Vegetative Cover<br>☐ Non-Vegetated Pervious Areas<br>☒ Impervious Areas<br><br>Description / Additional Information:<br>The vegetative cover in the existing site consists of seasonal grass. The impervious area consists of building roof and asphalt driveway. |
| Underlying Soil belongs to Hydrologic Soil Group (select all that apply):<br>☐ NRCS Type A<br>☐ NRCS Type B<br>☐ NRCS Type C<br>☒ NRCS Type D |
| Approximate Depth to Groundwater (GW):<br>☐ GW Depth < 5 feet<br>☐ 5 feet < GW Depth < 10 feet<br>☐ 10 feet < GW Depth < 20 feet<br>☒ GW Depth > 20 feet |

Existing Natural Hydrologic Features (select all that apply):

☐ Watercourses

☐ Seeps

☐ Springs

☐ Wetlands

☒ None

Description / Additional Information:

| Form I-3B Page 3 of 10, Form Template Date: August 31, 2015 |
|---|
| **Description of Existing Site Drainage Patterns** |
| How is storm water runoff conveyed from the site? At a minimum, this description should answer:<br><br>(1) whether existing drainage conveyance is natural or urban;<br><br>(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;<br><br>(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<br><br>(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.<br><br><br>Describe existing site drainage patterns:<br><br>1. The existing drainage conveyance is urban.<br><br>2. The site accepts offsite runoff via surface flow from seven (7) single-house developments along the easterly property line.<br><br>3. The existing site has no existing on-site storm drain system. The entire site drains via surface flow.<br><br>4. The existing site drains to the west via surface flow, thence to an existing drainage ditch along Graves Avenue, and ultimately to a curb inlet at the end of the ditch. The runoff is then conveyed to the public storm drain system on Graves Avenue, thence to Forester creek and ultimately to the Lower San Diego River. |

| Form I-3B Page 4 of 10, Form Template Date: August 31, 2015 |
|---|
| **Description of Proposed Site Development** |
| Project Description / Proposed Land Use and/or Activities:<br><br>The project proposes to construct two 2-story self-storage buildings and RV parking spaces covered with canopies. The site will also include an RV car wash. |
| List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):<br><br>The proposed impervious features consist of building roof, RV parking canopy, car wash, asphalt pavement parking lot and concrete sidewalks. |
| List/describe proposed pervious features of the project (e.g., landscape areas):<br><br>The proposed pervious features consist of landscape areas and three biofiltration basins. |
| Does the project include grading and changes to site topography?<br>☒ Yes<br>☐ No<br><br>Description / Additional Information:<br><br>The project site will be graded to accommodate the new improvements. The proposed site will keep the same discharge location as the existing conditions. |

| Form I-3B Page 5 of 10, Form Template Date: August 31, 2015 |
|---|
| **Description of Proposed Site Drainage Patterns** |
| Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?<br><br>☒ Yes<br>☐ No<br><br>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.<br><br>Describe proposed site drainage patterns:<br><br>The site will be graded and separated into five (5) on-site drainage basins. The site will modify the drainage patterns of the site but will keep the same discharge point as the existing conditions. The proposed biofiltration basins will be utilized for treatment, hydromodification, and 100-year flow attenuation.<br><br>A brow ditch will be installed along the northeasterly and northerly property line that will convey a portion of the offsite runoff towards a curb outlet at the northwesterly corner of the site. The runoff will thence drain to a curb inlet along Graves Avenue where it will drain to the public storm drain system.<br><br>The northeasterly portion of the site will drain via surface flow to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin located at the northwesterly corner of the site. After treatment, the basin will discharge to a curb outlet at the northwesterly corner of the site, and ultimately to a curb inlet along Graves Avenue where it will drain to the public storm drain system.<br><br>The center portion of the site will drain to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin along the westerly portion of the site. After treatment, the basin will discharge to a curb inlet along Graves Avenue where it will drain to the public storm drain system.<br><br>The southerly portion of the site will drain to a series of grated inlets along the drive aisle that drain to a proposed biofiltration basin located at the southwesterly corner of the site. After treatment, the basin will discharge to a curb inlet along Graves Avenue where it will drain to the public storm drain system.<br><br>A brow ditch will be installed along the easterly and southerly property line that will convey a portion of the offsite runoff towards a curb outlet at the southwesterly corner of the site.<br><br>The runoff generated by the entire site and the offsite areas ultimately confluence at the public storm drain system on Graves Avenue. The existing conditions has a 100-year flow of 18.52 cfs. The proposed conditions has a 100-year flow of 18.24 cfs. This is a reduction of 0.28 cfs. See Drainage Study for more details. |

| Form I-3B Page 6 of 10, Form Template Date: August 31, 2015 |
|---|
| Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):<br><br>☒ On-site storm drain inlets<br>☐ Interior floor drains and elevator shaft sump pumps<br>☐ Interior parking garages<br>☒ Need for future indoor & structural pest control<br>☒ Landscape/Outdoor Pesticide Use<br>☐ Pools, spas, ponds, decorative fountains, and other water features<br>☐ Food service<br>☒ Refuse areas<br>☐ Industrial processes<br>☐ Outdoor storage of equipment or materials<br>☒ Vehicle and Equipment Cleaning<br>☐ Vehicle/Equipment Repair and Maintenance<br>☐ Fuel Dispensing Areas<br>☐ Loading Docks<br>☒ Fire Sprinkler Test Water<br>☒ Miscellaneous Drain or Wash Water<br>☒ Plazas, sidewalks, and parking lots<br><br>Description / Additional Information: |

**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 discharges to the storm drain system on Graves Avenue, thence to Forester Creek, thence San Diego River (Lower), and finally to the Pacific Ocean.

List any 303(d) impaired water bodies 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 |
|---|---|---|
| Forester Creek | Benthic Community Effects, Chloride, Nitrogen, Phosphorus, Oxygen, Dissolved Selenium, Total Dissolved Solids, Turbidity | TMDL Required |
| San Diego River (Lower) | Bentic Community Effects, Bifenthrin, Chlordane, Chloride, Color, Cyfluthrin, Cypermethrin, Indicator Bacteria, Nitrogen, Oxygen, Dissolved, Phosphorus, Pyrethroids, Total Dissolved Solids, Toxicity, Torbidity | TMDL Required |

**Identification of Project Site Pollutants***

***Identification of project site pollutants 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 BMP Design Manual Appendix B.6):

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

| Hydromodification Management Requirements |
| --- |
| Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?<br><br>☒ Yes, hydromodification management flow control structural BMPs required.<br>☐ 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.<br>☐ 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.<br>☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.<br><br>Description / Additional Information (to be provided if a 'No' answer has been selected above): |
| **Critical Coarse Sediment Yield Areas***<br>***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 BMP Design Manual been performed?

☐ 6.2.1 Verification of Geomorphic Landscape Units (GLUs) 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 2.b 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:

See CCSYA Map in Attachment 2.

| Form I-3B Page 9 of 10, Form Template Date: August 31, 2015 |
| --- |
| **Flow Control for Post-Project Runoff*** <br> ***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. <br><br> The POC occurs at the public storm drain system on Graves Avenue along the southwesterly corner of the site. |
| Has a geomorphic assessment been performed for the receiving channel(s)? <br> ☒ No, the low flow threshold is 0.1Q2 (default low flow threshold) <br><br> ☐ Yes, the result is the low flow threshold is 0.1Q2 <br><br> ☐ Yes, the result is the low flow threshold is 0.3Q2 <br><br> ☐ Yes, the result is the low flow threshold is 0.5Q2 <br><br> If a geomorphic assessment has been performed, provide title, date, and preparer: <br><br> N/A <br><br> Discussion / Additional Information: (optional) <br><br> N/A |

| Form I-3B Page 10 of 10, Form Template Date: August 31, 2015 |
| --- |
| **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.<br><br>N/A |
| **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.<br><br>N/A |

| Source Control BMP Checklist for All Development Projects (Standard Projects and Priority Development Projects) | | | Form I-4 Model BMP Design Manual [August 31, 2015] |
|---|---|---|---|
| **Project Identification** | | | |
| Project Name: Graves Avenue RV Storage | | | |
| Permit Application Number: TBD | | | |
| **Source Control BMPs** | | | |
| All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the Model BMP Design Manual for information to implement source control BMPs shown in this checklist.<br><br>Answer each category below pursuant to the following.<br>• "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the Model BMP Design Manual. Discussion / justification is not required.<br>• "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.<br>• "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 may be provided. | | | |
| **Source Control Requirement** | **Applied?** | | |
| **SC-1** Prevention of Illicit Discharges into the MS4 | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SC-1 not implemented: | | | |
| **SC-2** Storm Drain Stenciling or Signage | ☒ Yes | ☐ No | ☐ N/A |
| 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 |
| Discussion / justification if SC-3 not implemented:<br>No outdoor material storage proposed. | | | |
| **SC-4** Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SC-4 not implemented:<br>No outdoor material storage proposed. | | | |

| Form I-4 Page 2 of 2, Form Template Date: August 31, 2015 | | | |
|---|---|---|---|
| **Source Control Requirement** | **Applied?** | | |
| **SC-5** Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal | ☒Yes | ☐ No | ☐ N/A |
| Discussion / justification if SC-5 not implemented: | | | |
| **SC-6** Additional BMPs Based on Potential Sources of Runoff Pollutants<br>(must answer for each source listed below) | | | |
| ☒ On-site storm drain inlets | ☒ Yes | ☐ No | ☐ N/A |
| ☐ Interior floor drains and elevator shaft sump pumps | ☐ Yes | ☐ No | ☒ N/A |
| ☐ Interior parking garages | ☐ Yes | ☐ No | ☒ N/A |
| ☒ Need for future indoor & structural pest control | ☒ Yes | ☐ No | ☐ N/A |
| ☒ Landscape/Outdoor Pesticide Use | ☒ Yes | ☐ No | ☐ N/A |
| ☐ Pools, spas, ponds, decorative fountains, and other water features | ☐ Yes | ☐ No | ☒ N/A |
| ☐ Food service | ☐ Yes | ☐ No | ☒ N/A |
| ☒ Refuse areas | ☒ Yes | ☐ No | ☐ N/A |
| ☐ Industrial processes | ☐ Yes | ☐ No | ☒ N/A |
| ☐ Outdoor storage of equipment or materials | ☐ Yes | ☐ No | ☒ N/A |
| ☒ Vehicle and Equipment Cleaning | ☒ Yes | ☐ No | ☐ N/A |
| ☐ Vehicle/Equipment Repair and Maintenance | ☐ Yes | ☐ No | ☒ N/A |
| ☐ Fuel Dispensing Areas | ☐ Yes | ☐ No | ☐ N/A |
| ☐ Loading Docks | ☐ Yes | ☐ No | ☒ N/A |
| ☒ Fire Sprinkler Test Water | ☒ Yes | ☐ No | ☐ N/A |
| ☒ Miscellaneous Drain or Wash Water | ☒ Yes | ☐ No | ☐ N/A |
| ☒ Plazas, sidewalks, and parking lots | ☒ 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.<br><br>Items labelled "No" or N/A" are not proposed on the site. | | | |

| Site Design BMP Checklist<br>for All Development Projects<br>(Standard Projects and Priority Development Projects) | | | Form I-5<br>Model BMP Design Manual<br>[August 31, 2015] |
|---|---|---|---|
| **Project Identification** | | | |
| Project Name: Graves Avenue RV Storage | | | |
| Permit Application Number: TBD | | | |
| **Site Design BMPs** | | | |
| All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the Model BMP Design Manual for information to implement site design BMPs shown in this checklist.<br><br>Answer each category below pursuant to the following.<br>• "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the Model BMP Design Manual. Discussion / justification is not required.<br>• "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.<br>• "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 may be provided. | | | |
| **Site Design Requirement** | **Applied?** | | |
| **SD-1** Maintain Natural Drainage Pathways and Hydrologic Features | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SD-1 not implemented:<br>No natural drainage features on-site. | | | |
| **SD-2** Conserve Natural Areas, Soils, and Vegetation | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SD-2 not implemented:<br>No natural areas, soils or vegetation on-site. | | | |
| **SD-3** Minimize Impervious Area | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-3 not implemented: | | | |
| **SD-4** Minimize Soil Compaction | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-4 not implemented: | | | |
| **SD-5** Impervious Area Dispersion | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-5 not implemented: | | | |

| Form I-5 Page 2 of 2, Form Template Date: August 31, 2015 | | | |
|---|---|---|---|
| **Site Design Requirement** | **Applied?** | | |
| **SD-6** Runoff Collection | ☐ Yes | ☐ No | ☒ N/A |
| Discussion / justification if SD-6 not implemented: | | | |
| **SD-7** Landscaping with Native or Drought Tolerant Species | ☒ Yes | ☐ No | ☐ N/A |
| Discussion / justification if SD-7 not implemented: | | | |
| **SD-8** Harvesting and Using Precipitation | ☐ Yes | ☒ No | ☐ N/A |
| Discussion / justification if SD-8 not implemented:<br>Harvesting precipitation is not feasible. See completed Form I-7. Rain barrels are infeasible to use as the selected landscape will be low water use and will not need irrigation in the 36 hours following a rainfall event. | | | |

| Summary of PDP Structural BMPs | **Form I-6 (PDPs)**<br>Model BMP Design Manual<br>[August 31, 2015] |
|---|---|
| **Project Identification** | |
| Project Name: Graves Avenue RV Storage | |
| Permit Application Number: TBD | |
| **PDP Structural BMPs** | |
| All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP 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 BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).<br><br>PDP structural BMPs must be verified by the local jurisdiction 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 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the BMP Design Manual).<br><br>Use this form 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 (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP). | |
| 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 BMP Design 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.<br><br>When designing the BMPs for the site, the first option that was considered was harvest and reuse. The demand was found to be insufficient.<br><br>The next option on the BMP hierarchy is full retention via infiltration. This was found to be infeasible due to low infiltration rate results and geological hazards in the potential infiltration locations.<br><br>We chose to use fully lined biofiltration basins to treat the site. The biofiltration basins have a soil filtration layer that will serve the purpose of pollutant control and proposed outlet orifices that will meet the hydromodification requirements. The basins were designed using the requirements shown in the City of Santee BMP Design Manual, Appendix E.12 (BF-1 Fact Sheet). The proposed cross-sections, size, and other basin details can be found on the DMA Sheet in Attachment 1A.<br><br>(Continue on page 2 as necessary.) | |

| Form I-6 Page 2 of 5, Form Template Date: August 31, 2015 |
| --- |
| **(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)** |
| (Continued from page 1) |

**Structural BMP Summary Information**
**(Copy this page as needed to provide information for each individual proposed structural BMP)**

Structural BMP ID No.: BMP-1

Construction Plan Sheet No.: Sheet C7

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)
☒ 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:
☐ 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 if required by the [City Engineer] (See Section 1.12 of the BMP Design Manual) | Andrew J. Kann<br>4320 Viewridge Ave., Suite C<br>San Diego, CA 92123<br>(858) 634-8620 |
| Who will be the final owner of this BMP? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |
| Who will maintain this BMP into perpetuity? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |
| What is the funding mechanism for maintenance? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |

**Structural BMP Summary Information**
**(Copy this page as needed to provide information for each individual proposed structural BMP)**

Structural BMP ID No.: BMP-2

Construction Plan Sheet No.: Sheet C7

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)
☒ 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:
☐ 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 if required by the [City Engineer] (See Section 1.12 of the BMP Design Manual) | Andrew J. Kann<br>4320 Viewridge Ave., Suite C<br>San Diego, CA 92123<br>(858) 634-8620 |
| Who will be the final owner of this BMP? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |
| Who will maintain this BMP into perpetuity? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |
| What is the funding mechanism for maintenance? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |

| Form I-6 Page 5 of 5 (Copy as many as needed) , Form Template Date: August 31, 2015 | |
|---|---|
| **Structural BMP Summary Information**<br>**(Copy this page as needed to provide information for each individual proposed structural BMP)** | |
| Structural BMP ID No.: BMP-3 | |
| Construction Plan Sheet No.: Sheet C7 | |
| Type of structural BMP:<br>☐ Retention by harvest and use (HU-1)<br>☐ Retention by infiltration basin (INF-1)<br>☐ Retention by bioretention (INF-2)<br>☐ Retention by permeable pavement (INF-3)<br>☐ Partial retention by biofiltration with partial retention (PR-1)<br>☒ Biofiltration (BF-1)<br>☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)<br>☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F<br>☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)<br>☐ 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)<br>☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)<br>☐ Detention pond or vault for hydromodification management<br>☐ Other (describe in discussion section below) | |
| Purpose:<br>☐ Pollutant control only<br>☐ Hydromodification control only<br>☒ Combined pollutant control and hydromodification control<br>☐ Pre-treatment/forebay for another structural BMP<br>☐ 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 if required by the [City Engineer] (See Section 1.12 of the BMP Design Manual) | Andrew J. Kann<br>4320 Viewridge Ave., Suite C<br>San Diego, CA 92123<br>(858) 634-8620 |
| Who will be the final owner of this BMP? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |
| Who will maintain this BMP into perpetuity? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |
| What is the funding mechanism for maintenance? | Cameron Brothers Company, LLC<br>10580 Prospect Ave., Suite 200, Santee, CA 92071<br>(619) 562-3050 |

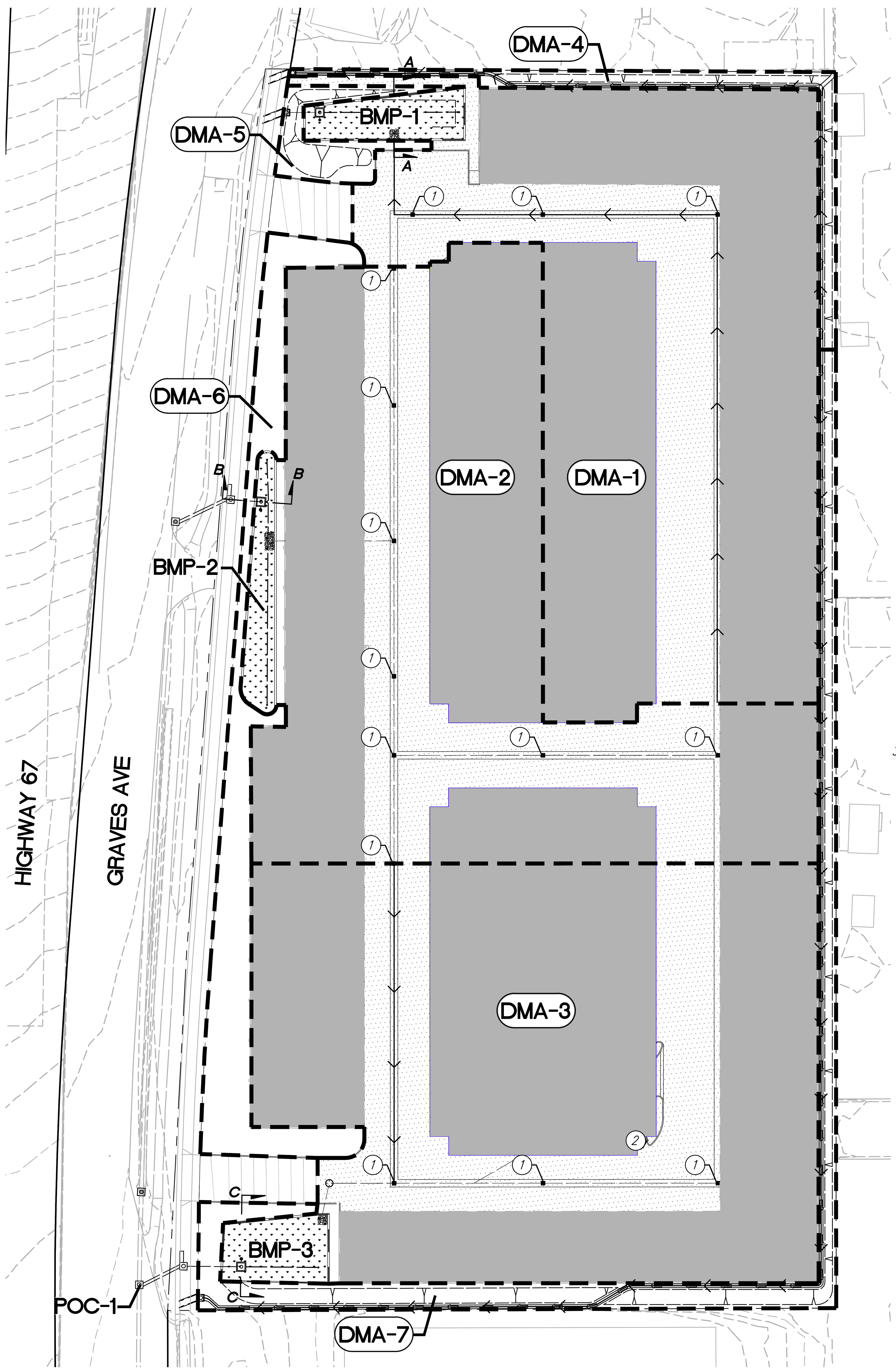
# ATTACHMENT 1
# BACKUP FOR PDP POLLUTANT CONTROL BMPS

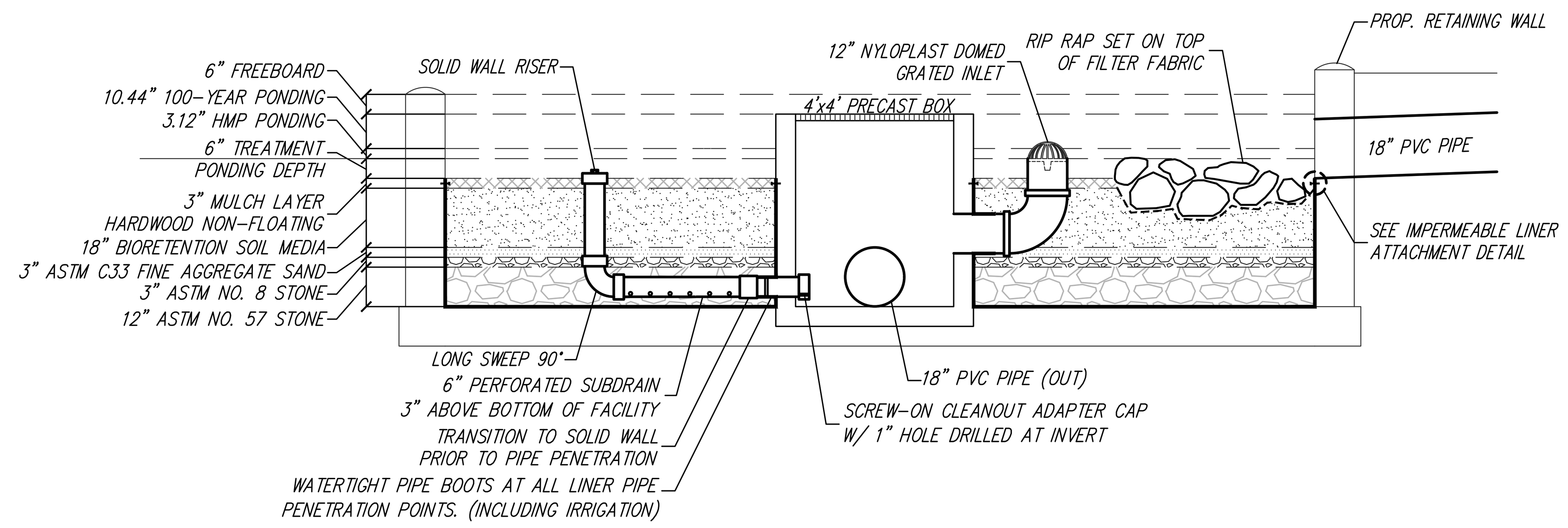
*This is the cover sheet for Attachment 1.*

**Indicate which Items are Included behind this cover sheet:**

| **Attachment Sequence** | **Contents** | **Checklist** |
|---|---|---|
| Attachment 1a | DMA Exhibit (Required)<br><br>See DMA Exhibit Checklist on the back of this Attachment cover sheet. | ☒ Included |
| Attachment 1b | Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)*<br><br>*Provide table in this Attachment OR on DMA Exhibit in Attachment 1a | ☒ Included on DMA Exhibit in Attachment 1a<br>☐ Included as Attachment 1b, separate from DMA Exhibit |
| Attachment 1c | Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs)<br><br>Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7. | ☒ Included<br>☐ Not included because the entire project will use infiltration BMPs |
| Attachment 1d | Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs)<br><br>Refer to Appendices C and D of the BMP Design Manual to complete Form I-8. | ☒ Included<br>☐ Not included because the entire project will use harvest and use BMPs |
| Attachment 1e | Pollutant Control BMP Design Worksheets / Calculations (Required)<br><br>Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines | ☒ Included |

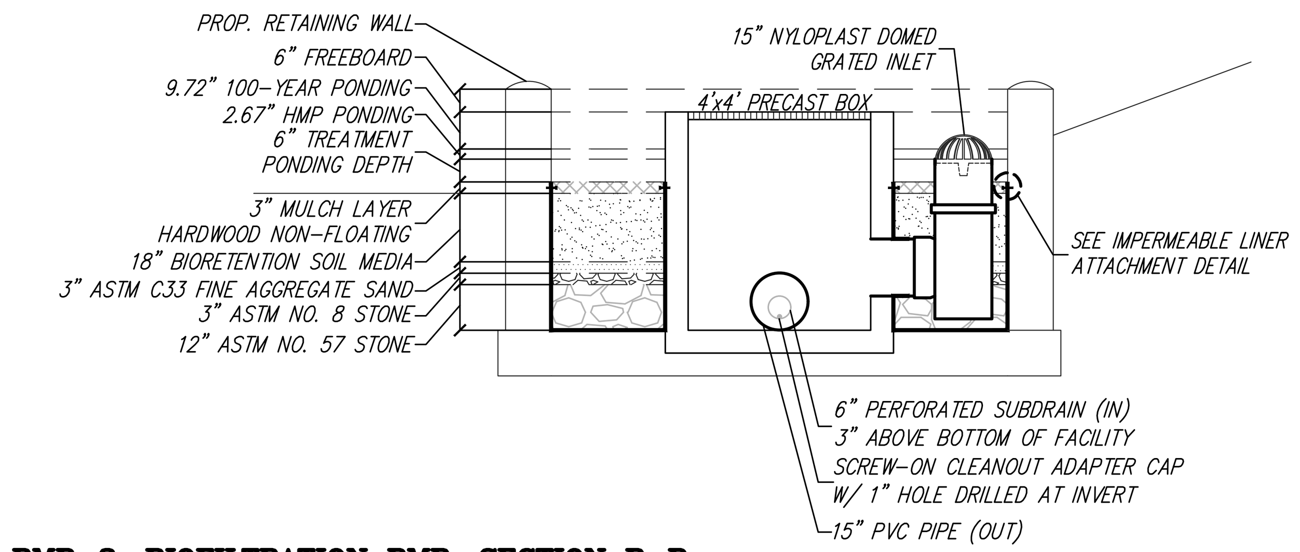
# DMA PLAN



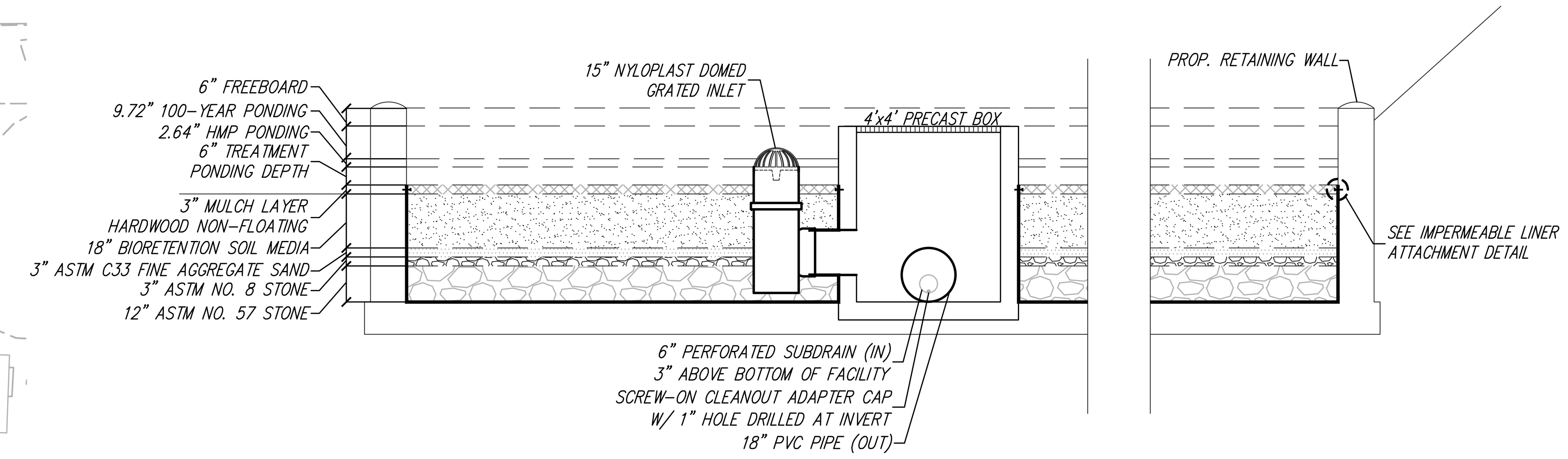

**BMP-1, BIOFILTRATION BMP, SECTION A-A** A

NOT TO SCALE



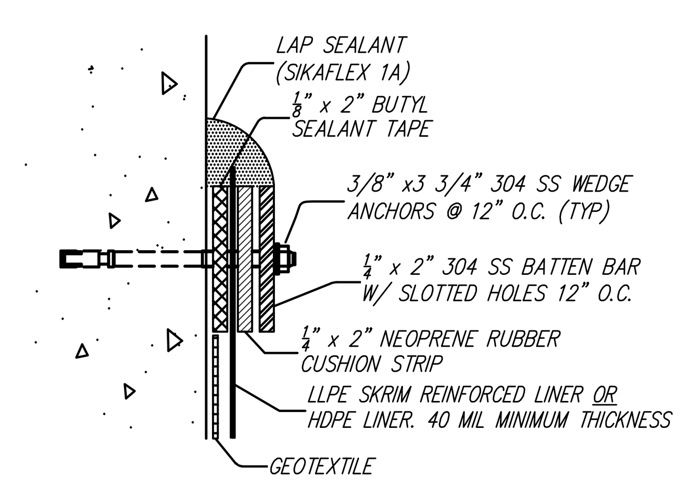

**BMP-2, BIOFILTRATION BMP, SECTION B-B** B

NOT TO SCALE



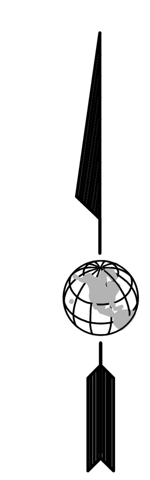

**BMP-3, BIOFILTRATION BMP, SECTION C-C** C

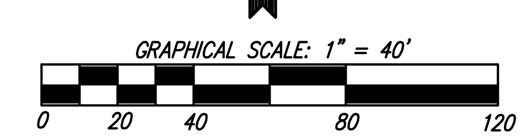
NOT TO SCALE




**IMPERMEABLE LINER ATTACHMENT DETAIL**

NOT TO SCALE






**LEGEND:**

| | |
|---|---|
| DMA BOUNDARY | |
| DRAINAGE ARROWS | |
| DRAINAGE MANAGEMENT AREA | DMA-# |
| STRUCTURAL BEST MANAGEMENT PRACTICE | BMP-# |
| IMPERVIOUS AREA | |
| ROOF AREA | |
| LANDSCAPED AREAS | |

**DMA DATA TABLE**

| DMA-NO. | TOT. AREA (SF) | IMPERVIOUS (%) | DCV (CF) | TYPE/TREATED BY |
|---|---|---|---|---|
| DMA-1 | 57,759 | 95.8 | 2,021 | BMP-1 |
| DMA-2 | 59,968 | 95.4 | 2,093 | BMP-2 |
| DMA-3 | 65,722 | 96.1 | 2,304 | BMP-3 |
| DMA-4 | 3,402 | 0 | - | SELF-MITIGATING |
| DMA-5 | 2,040 | 0 | - | SELF-MITIGATING |
| DMA-6 | 8,989 | 0 | - | SELF-MITIGATING |
| DMA-7 | 10,275 | 0 | - | SELF-MITIGATING |

**TREATMENT BMP DATA TABLE**

| BMP-# | TREATING | REQUIRED FOOTPRINT | PROPOSED FOOTPRINT | DESCRIPTION |
|---|---|---|---|---|
| BMP-1 | DMA-1 | 1,550 SF | 1,800 SF | FULLY LINED BIOFILTRATION BASIN W/ 1" LOW FLOW ORIFICE |
| BMP-2 | DMA-2 | 1,560 SF | 1,700 SF | FULLY LINED BIOFILTRATION BASIN W/ 1" LOW FLOW ORIFICE |
| BMP-3 | DMA-3 | 1,720 SF | 1,800 SF | FULLY LINED BIOFILTRATION BASIN W/ 1" LOW FLOW ORIFICE |

**BIORETENTION INSPECTION SCHEDULE NOTES**

CONTRACTOR MUST CONTACT ENGINEER FOR INSPECTION OF BMPS AT THE FOLLOWING STAGES OF CONSTRUCTION:

-PRIOR TO START OF CONSTRUCTION OF BIORETENTION AREA
-PRIOR TO CONSTRUCTION OF OUTLET STRUCTURE
-AFTER GRADING OF THE BASIN AREA FOR CERTIFICATION
-AFTER PLACEMENT OF IMPERMEABLE LINER (W/EXTRA LENGTH FOR EMBEDMENT)
-AFTER PLACEMENT OF SUB-DRAIN
-AFTER PLACEMENT OF GRAVEL DRAINAGE LAYER
-AFTER IRRIGATION AND LANDSCAPING ACTIVITIES

*SURVEY STAKED SHALL BE AVAILABLE FOR EACH AND EVERY INSPECTION

**NOTES**

1. UNDERLYING NRCS HYDROLOGIC SOIL GROUP FOR SITE IS TYPE C
2. PER THE GEOTECHNICAL INVESTIGATION PERFORMED BY GEOCON WEST INC. ON MARCH 8, 2023, GROUNDWATER IS EXPECTED TO BE LOCATED AT APPROXIMATELY 50 FEET BELOW GROUND SURFACE.
3. NO EXISTING NATURAL HYDROLOGIC FEATURES
4. NO CRITICAL COARSE SEDIMENT YIELD AREAS ON SITE
5. ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE CONDUCTED

**SOURCE CONTROL BMP NOTES**

ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE UTILIZED

A. ALL ONSITE INLETS TO BE MARKED "NO DUMPING" OR SIMILAR AND ALL OPERATIONAL PRECAUTIONS TO AVOID NON STORM WATER DISCHARGE SHALL BE FOLLOWED PER THE CITY'S BMP DESIGN MANUAL.
B. PROPOSED REFUSE AREA WILL REMAIN COVERED AND PROTECTED FROM WIND DISPERSAL. SIGNS SHALL BE PLACED WITH WORDS "DO NOT DUMP HAZARDOUS MATERIALS OR LIQUIDS HERE" OR SIMILAR. OWNER SHALL BE RESPONSIBLE TO KEEP THE AREA CLEAN OF LITTER AND SPILLS.
C. OWNER TO BE RESPONSIBLE FOR SWEEPING PLAZAS, SIDEWALKS, AND PARKING LOTS. THIS IS TO BE DONE REGULARLY AND AS NEEDED TO PREVENT ACCUMULATION OF LITTER AND DEBRIS.
D. FIRE SPRINKLER TEST WATER SHALL BE DRAINED TO THE BIOFILTRATION BASIN.
E. CONDENSATE DRAIN LINES INCLUDING AIR CONDITIONING SHALL BE ROUTED TO LANDSCAPE.
F. ROOFING, GUTTERS, AND TRIM SHALL NOT BE MADE OF COPPER OR OTHER UNPROTECTED METALS THAT MAY LEACH INTO RUNOFF MUST BE AVOIDED.

**SOURCE CONTROL BMPs**

| | |
|---|---|
| STORM DRAIN STENCILING | 1 |
| TRASH STORAGE AREA | 2 |

PLANS PREPARED BY:


**OMEGA ENGINEERING CONSULTANTS, INC.**
4320 Viewridge Avenue, Suite C, San Diego, CA 92123
T:858.634.8620 | F:858.634.8627 [ OEC Project Number 0430 ]


REGISTERED PROFESSIONAL ENGINEER SEAN M. SAVAGE No. 75677 CIVIL STATE OF CALIFORNIA

SEAN M. SAVAGE R.C.E. 75677 — 4/12/2023 DATE

CITY OF SANTEE

**PERMIT NO:**

APPLICANT: CAMERON BROTHERS CONSTRUCTION CO, L.P.
ASSESSORS PARCEL NO(S): 387-061-11-00 & 387-061-12-00
REQUEST:

PC RESOLUTION NO:
CC RESOLUTION NO:
ORDINANCE NO:

C-9

**Worksheet 0-2. Harvest and Use Feasibility Screening**

| Harvest and Use Feasibility Screening | Worsksheet B.3-1 |
|---|---|

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

- ■ Toilet and urinal flushing
- ■ Landscape irrigation
- ☐ Other:________________

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

Office: 7 gallons per day * 1.5 days per 36 hours; Demand = 10.5 Gal/36 hours
Landscaping: 390 Gal*(0.75 acres per 36 hours); Demand = 293 Gal/36 hours
Total Demand = 303 Gal/36 hours = 40.5 CF/36 hours

3. Calculate the DCV using worksheet B-2.1.

DCV = 6,418 CF

| 3a. Is the 36-hour demand greater than or equal to the DCV?<br>Yes ⇩ / No ⇨ | 3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?<br>Yes ⇩ / No ⇨ | 3c. Is the 36-hour demand less than 0.25DCV?<br>Yes ⇩ |
|---|---|---|
| Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria. | Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours. | Harvest and use is considered to be infeasible. |

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

| Category | # | Description | i | ii | iii | iv | v | vi | vii | viii | ix | x | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard Drainage Basin Inputs | 1 | Drainage Basin ID or Name | DMA-1 | DMA-2 | DMA-3 | | | | | | | | unitless |
| | 2 | 85th Percentile 24-hr Storm Depth | 0.48 | 0.48 | 0.48 | | | | | | | | inches |
| | 3 | Impervious Surfaces Not Directed to Dispersion Area (C=0.90) | 55,327 | 57,229 | 63,148 | | | | | | | | 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) | | | | | | | | | | | 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) | 2,432 | 2,739 | 2,574 | | | | | | | | sq-ft |
| Dispersion Area, Tree Well & Rain Barrel Inputs (Optional) | 10 | Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels? | No | 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 | 57,759 | 59,968 | 65,722 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 23 | Initial Runoff Factor for Standard Drainage Areas | 0.87 | 0.87 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 24 | Initial Runoff Factor for Dispersed & Dispersion Areas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 25 | Initial Weighted Runoff Factor | 0.87 | 0.87 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 26 | Initial Design Capture Volume | 2,010 | 2,087 | 2,313 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| Dispersion Area Adjustments | 27 | Total Impervious Area Dispersed to Pervious Surface | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 28 | Total Pervious Dispersion Area | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 29 | Ratio of Dispersed Impervious Area to Pervious Dispersion Area | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | ratio |
| | 30 | Adjustment Factor for Dispersed & Dispersion Areas | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | ratio |
| | 31 | Runoff Factor After Dispersion Techniques | 0.87 | 0.87 | 0.88 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | unitless |
| | 32 | Design Capture Volume After Dispersion Techniques | 2,010 | 2,087 | 2,313 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| Tree & Barrel Adjustments | 33 | Total Tree Well Volume Reduction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 34 | Total Rain Barrel Volume Reduction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| Results | 35 | Final Adjusted Runoff Factor | 0.87 | 0.87 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 36 | Final Effective Tributary Area | 50,250 | 52,172 | 57,835 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 37 | Initial Design Capture Volume Retained by Site Design Elements | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 38 | Final Design Capture Volume Tributary to BMP | 2,010 | 2,087 | 2,313 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |

**No Warning Messages**

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

| Category | # | Description | *i* | *ii* | *iii* | *iv* | *v* | *vi* | *vii* | *viii* | *ix* | *x* | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic Analysis | 1 | Drainage Basin ID or Name | DMA-1 | DMA-2 | DMA-3 | - | - | - | - | - | - | - | unitless |
| | 2 | 85th Percentile Rainfall Depth | 0.48 | 0.48 | 0.48 | - | - | - | - | - | - | - | inches |
| | 3 | Predominant NRCS Soil Type Within BMP Location | D | D | D | | | | | | | | unitless |
| | 4 | Is proposed BMP location Restricted or Unrestricted for Infiltration Activities? | Restricted | Restricted | Restricted | | | | | | | | unitless |
| | 5 | Nature of Restriction | Other | Other | Other | | | | | | | | unitless |
| | 6 | Do Minimum Retention Requirements Apply to this Project? | Yes | Yes | Yes | | | | | | | | yes/no |
| | 7 | Are Habitable Structures Greater than 9 Stories Proposed? | No | No | No | | | | | | | | yes/no |
| Advanced Analysis | 8 | Has Geotechnical Engineer Performed an Infiltration Analysis? | No | No | No | | | | | | | | yes/no |
| | 9 | Design Infiltration Rate Recommended by Geotechnical Engineer | | | | | | | | | | | in/hr |
| Result | 10 | Design Infiltration Rate Used To Determine Retention Requirements | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - | - | in/hr |
| | 11 | Percent of Average Annual Runoff that Must be Retained within DMA | 4.5% | 4.5% | 4.5% | - | - | - | - | - | - | - | percentage |
| | 12 | Fraction of DCV Requiring Retention | 0.02 | 0.02 | 0.02 | - | - | - | - | - | - | - | ratio |
| | 13 | Required Retention Volume | 40 | 42 | 46 | - | - | - | - | - | - | - | cubic-feet |

**No Warning Messages**

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

| Category | # | Description | i | ii | iii | iv | v | vi | vii | viii | ix | x | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BMP Inputs | 1 | Drainage Basin ID or Name | DMA-1 | DMA-2 | DMA-3 | - | - | - | - | - | - | - | sq-ft |
| | 2 | Design Infiltration Rate Recommended | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - | - | in/hr |
| | 3 | Design Capture Volume Tributary to BMP | 2,010 | 2,087 | 2,313 | - | - | - | - | - | - | - | cubic-feet |
| | 4 | Is BMP Vegetated or Unvegetated? | Vegetated | Vegetated | Vegetated | | | | | | | | unitless |
| | 5 | Is BMP Impermeably Lined or Unlined? | Lined | Lined | Lined | | | | | | | | unitless |
| | 6 | Does BMP Have an Underdrain? | Underdrain | Underdrain | Underdrain | | | | | | | | unitless |
| | 7 | Does BMP Utilize Standard or Specialized Media? | Standard | Standard | Standard | | | | | | | | unitless |
| | 8 | Provided Surface Area | 1,800 | 1,700 | 1,800 | | | | | | | | sq-ft |
| | 9 | Provided Surface Ponding Depth | 9 | 9 | 9 | | | | | | | | inches |
| | 10 | Provided Soil Media Thickness | 21 | 21 | 21 | | | | | | | | inches |
| | 11 | Provided Gravel Thickness (Total Thickness) | 12 | 12 | 12 | | | | | | | | inches |
| | 12 | Underdrain Offset | 3 | 3 | 3 | | | | | | | | inches |
| | 13 | Diameter of Underdrain or Hydromod Orifice (Select Smallest) | 1.00 | 1.00 | 1.00 | | | | | | | | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 19 | Ponding Pore Space Available for Retention | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | unitless |
| | 20 | Soil Media Pore Space Available for Retention | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | unitless |
| | 21 | Gravel Pore Space Available for Retention (Above Underdrain) | 0.00 | 0.00 | 0.00 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | unitless |
| | 22 | Gravel Pore Space Available for Retention (Below Underdrain) | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | unitless |
| | 23 | Effective Retention Depth | 2.25 | 2.25 | 2.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | inches |
| | 24 | Fraction of DCV Retained (Independent of Drawdown Time) | 0.17 | 0.15 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ratio |
| | 25 | Calculated Retention Storage Drawdown Time | 120 | 120 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | hours |
| | 26 | Efficacy of Retention Processes | 0.19 | 0.17 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ratio |
| | 27 | Volume Retained by BMP (Considering Drawdown Time) | 384 | 357 | 395 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 28 | Design Capture Volume Remaining for Biofiltration | 1,626 | 1,730 | 1,918 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| Biofiltration Calculations | 29 | Max Hydromod Flow Rate through Underdrain | 0.0470 | 0.0470 | 0.0470 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | cfs |
| | 30 | Max Soil Filtration Rate Allowed by Underdrain Orifice | 1.13 | 1.20 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | in/hr |
| | 31 | Soil Media Filtration Rate per Specifications | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | in/hr |
| | 32 | Soil Media Filtration Rate to be used for Sizing | 1.13 | 1.20 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | in/hr |
| | 33 | Depth Biofiltered Over 6 Hour Storm | 6.77 | 7.17 | 6.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | inches |
| | 34 | Ponding Pore Space Available for Biofiltration | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 35 | Soil Media Pore Space Available for Biofiltration | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | unitless |
| | 36 | Gravel Pore Space Available for Biofiltration (Above Underdrain) | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | unitless |
| | 37 | Effective Depth of Biofiltration Storage | 16.80 | 16.80 | 16.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | inches |
| | 38 | Drawdown Time for Surface Ponding | 8 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | hours |
| | 39 | Drawdown Time for Effective Biofiltration Depth | 15 | 14 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | hours |
| | 40 | Total Depth Biofiltered | 23.57 | 23.97 | 23.57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | inches |
| | 41 | Option 1 - Biofilter 1.50 DCV: Target Volume | 2,439 | 2,595 | 2,876 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 42 | Option 1 - Provided Biofiltration Volume | 2,439 | 2,595 | 2,876 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 43 | Option 2 - Store 0.75 DCV: Target Volume | 1,220 | 1,298 | 1,438 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 44 | Option 2 - Provided Storage Volume | 1,220 | 1,298 | 1,438 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | cubic-feet |
| | 45 | Portion of Biofiltration Performance Standard Satisfied | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ratio |
| Result | 46 | Do Site Design Elements and BMPs Satisfy Annual Retention Requirements? | Yes | Yes | Yes | - | - | - | - | - | - | - | yes/no |
| | 47 | Overall Portion of Performance Standard Satisfied (BMP Efficacy Factor) | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ratio |
| | 48 | **Deficit of Effectively Treated Stormwater** | **0** | **0** | **0** | **n/a** | **n/a** | **n/a** | **n/a** | **n/a** | **n/a** | **n/a** | cubic-feet |

**No Warning Messages**

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

The DMA 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 and impervious areas

☒ Existing and proposed site drainage network and connections to drainage offsite

☐ Proposed demolition

☒ Proposed grading

☒ Proposed impervious features

☒ Proposed design features and surface treatments used to minimize imperviousness

☒ 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)

☐ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)

☒ Structural BMPs (identify location, type of BMP, and size/detail)

# 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:**

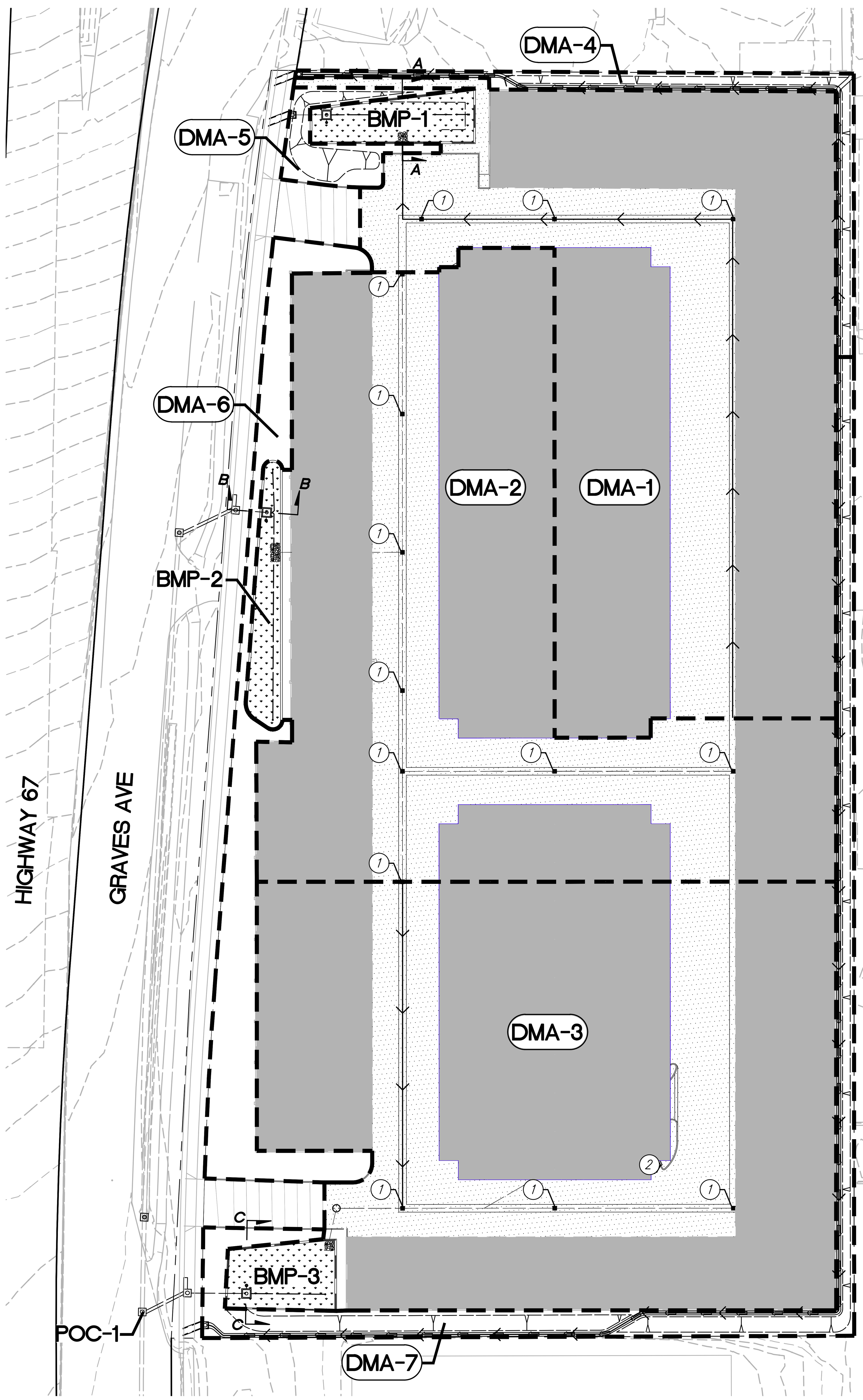
| **Attachment Sequence** | **Contents** | **Checklist** |
|---|---|---|
| Attachment 2a | Hydromodification Management Exhibit (Required) | ☒ Included<br><br>See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet. |
| Attachment 2b | Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional)<br><br>See Section 6.2 of the BMP Design Manual. | ☐ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required)<br><br>Optional analyses for Critical Coarse Sediment Yield Area Determination<br>☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite<br>☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment<br>☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite |
| Attachment 2c | Geomorphic Assessment of Receiving Channels (Optional)<br>See Section 6.3.4 of the BMP Design Manual. | ☒ Not performed<br>☐ Included<br>☐ Submitted as separate stand-alone document |
| Attachment 2d | Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required)<br>See Chapter 6 and Appendix G of the BMP Design Manual | ☒ Included<br>☐ Submitted as separate stand-alone document |
| Attachment 2e | Vector Control Plan (Required when structural BMPs will not drain in 96 hours) | ☐ Included<br>☒ Not required because BMPs will drain in less than 96 hours |

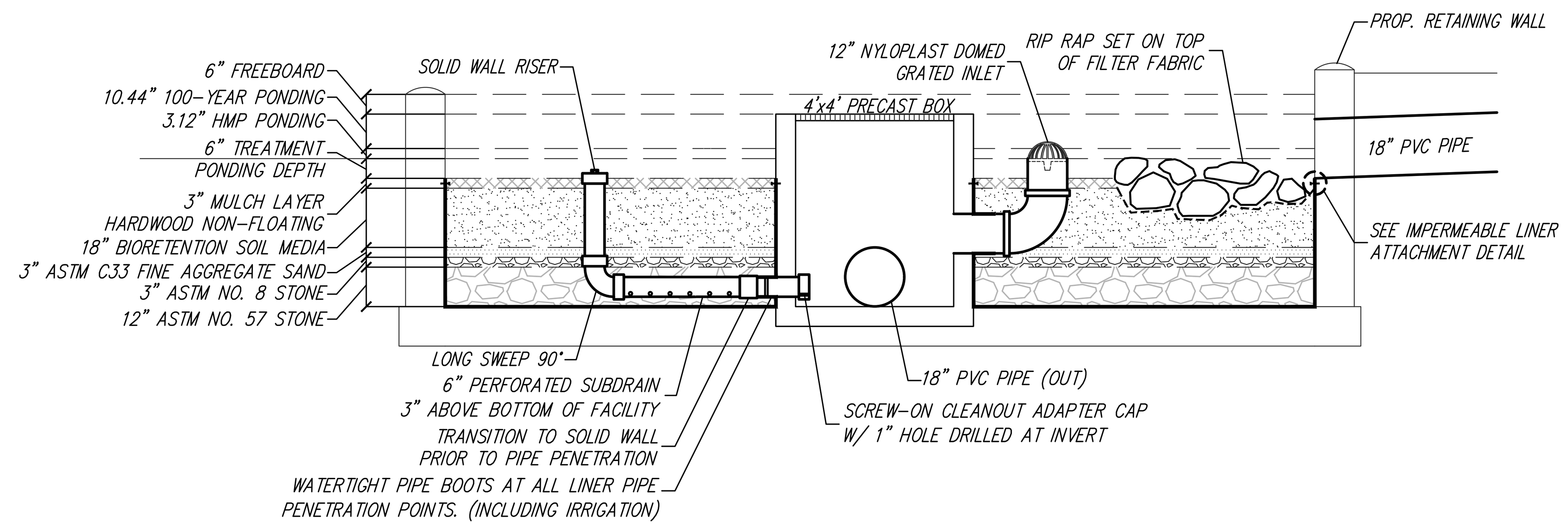
***Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:***

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)

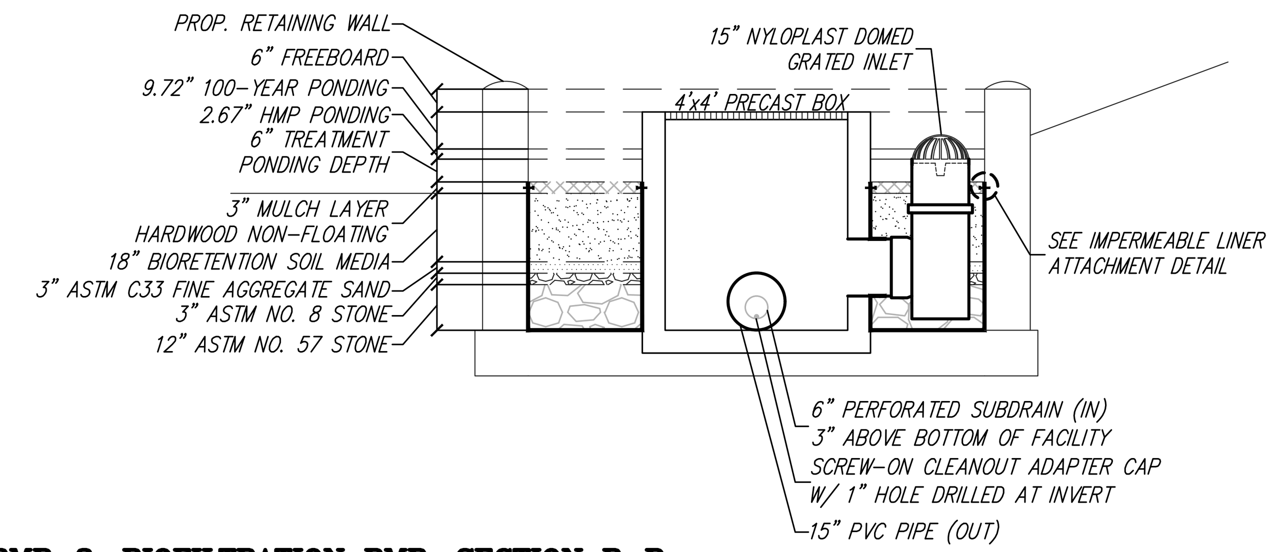
# DMA PLAN



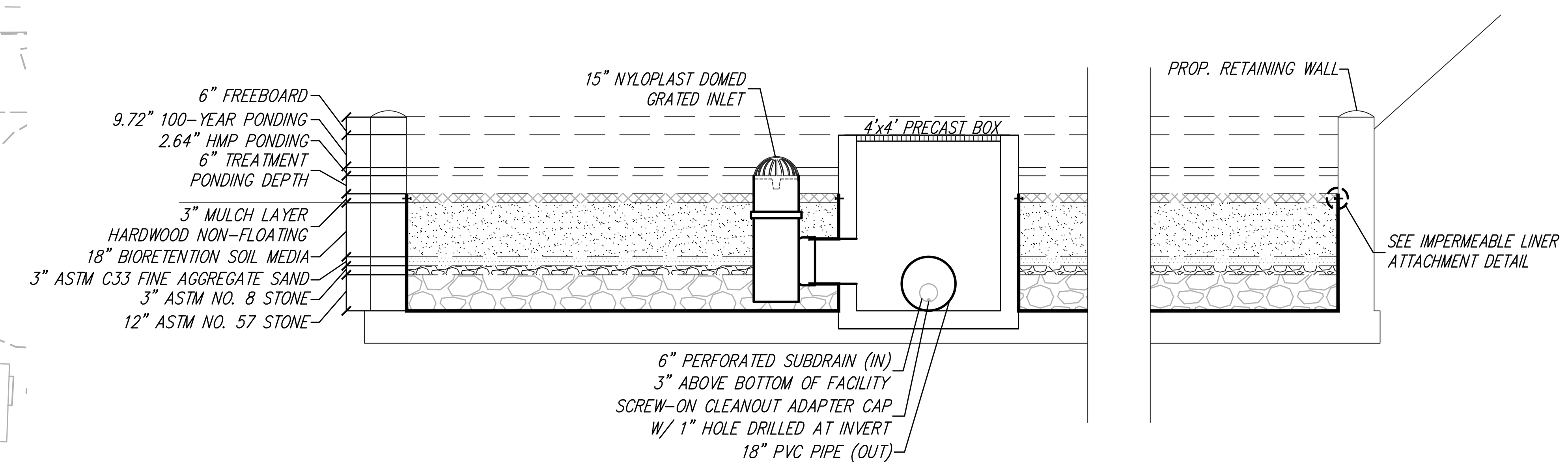

**BMP-1, BIOFILTRATION BMP, SECTION A-A** — A

NOT TO SCALE



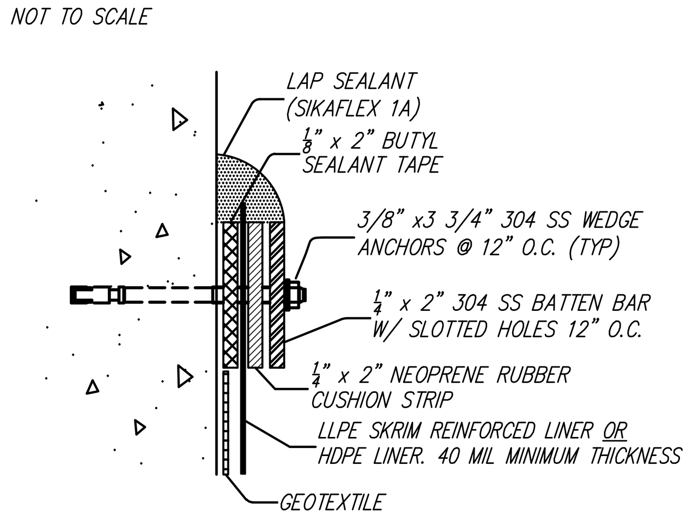

**BMP-2, BIOFILTRATION BMP, SECTION B-B** — B

NOT TO SCALE



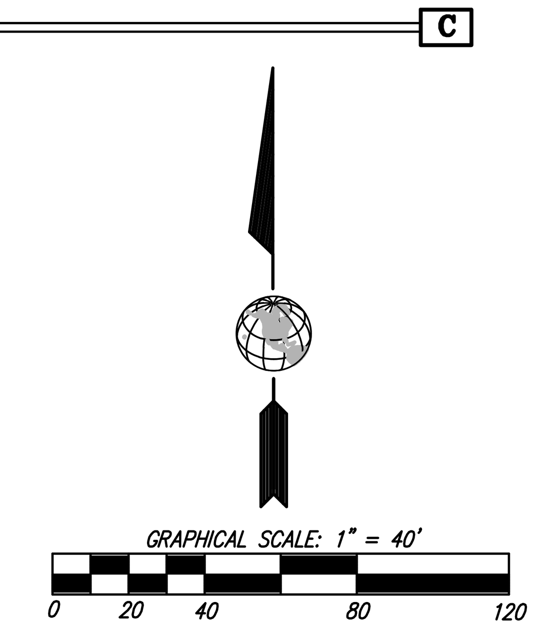

**BMP-3, BIOFILTRATION BMP, SECTION C-C** — C

NOT TO SCALE




**IMPERMEABLE LINER ATTACHMENT DETAIL**

NOT TO SCALE




**LEGEND:**

- DMA BOUNDARY
- DRAINAGE ARROWS
- DRAINAGE MANAGEMENT AREA — DMA-#
- STRUCTURAL BEST MANAGEMENT PRACTICE — BMP-#
- IMPERVIOUS AREA
- ROOF AREA
- LANDSCAPED AREAS

**DMA DATA TABLE**

| DMA-NO. | TOT. AREA (SF) | IMPERVIOUS (%) | DCV (CF) | TYPE/TREATED BY |
|---|---|---|---|---|
| DMA-1 | 57,759 | 95.8 | 2,021 | BMP-1 |
| DMA-2 | 59,968 | 95.4 | 2,093 | BMP-2 |
| DMA-3 | 65,722 | 96.1 | 2,304 | BMP-3 |
| DMA-4 | 3,402 | 0 | – | SELF-MITIGATING |
| DMA-5 | 2,040 | 0 | – | SELF-MITIGATING |
| DMA-6 | 8,989 | 0 | – | SELF-MITIGATING |
| DMA-7 | 10,275 | 0 | – | SELF-MITIGATING |

**TREATMENT BMP DATA TABLE**

| BMP-# | TREATING | REQUIRED FOOTPRINT | PROPOSED FOOTPRINT | DESCRIPTION |
|---|---|---|---|---|
| BMP-1 | DMA-1 | 1,550 SF | 1,800 SF | FULLY LINED BIOFILTRATION BASIN W/ 1" LOW FLOW ORIFICE |
| BMP-2 | DMA-2 | 1,560 SF | 1,700 SF | FULLY LINED BIOFILTRATION BASIN W/ 1" LOW FLOW ORIFICE |
| BMP-3 | DMA-3 | 1,720 SF | 1,800 SF | FULLY LINED BIOFILTRATION BASIN W/ 1" LOW FLOW ORIFICE |

## BIORETENTION INSPECTION SCHEDULE NOTES

CONTRACTOR MUST CONTACT ENGINEER FOR INSPECTION OF BMPS AT THE FOLLOWING STAGES OF CONSTRUCTION:

-PRIOR TO START OF CONSTRUCTION OF BIORETENTION AREA
-PRIOR TO CONSTRUCTION OF OUTLET STRUCTURE
-AFTER GRADING OF THE BASIN AREA FOR CERTIFICATION
-AFTER PLACEMENT OF IMPERMEABLE LINER (W/EXTRA LENGTH FOR EMBEDMENT)
-AFTER PLACEMENT OF SUB-DRAIN
-AFTER PLACEMENT OF GRAVEL DRAINAGE LAYER
-AFTER IRRIGATION AND LANDSCAPING ACTIVITIES

*SURVEY STAKED SHALL BE AVAILABLE FOR EACH AND EVERY INSPECTION

## NOTES

1. UNDERLYING NRCS HYDROLOGIC SOIL GROUP FOR SITE IS TYPE C
2. PER THE GEOTECHNICAL INVESTIGATION PERFORMED BY GEOCON WEST INC. ON MARCH 8, 2023, GROUNDWATER IS EXPECTED TO BE LOCATED AT APPROXIMATELY 50 FEET BELOW GROUND SURFACE.
3. NO EXISTING NATURAL HYDROLOGIC FEATURES
4. NO CRITICAL COARSE SEDIMENT YIELD AREAS ON SITE
5. ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE CONDUCTED

## SOURCE CONTROL BMP NOTES

ALL APPLICABLE SOURCE CONTROL BMPS SHALL BE UTILIZED

A. ALL ONSITE INLETS TO BE MARKED "NO DUMPING" OR SIMILAR AND ALL OPERATIONAL PRECAUTIONS TO AVOID NON STORM WATER DISCHARGE SHALL BE FOLLOWED PER THE CITY'S BMP DESIGN MANUAL.

B. PROPOSED REFUSE AREA WILL REMAIN COVERED AND PROTECTED FROM WIND DISPERSAL. SIGNS SHALL BE PLACED WITH WORDS "DO NOT DUMP HAZARDOUS MATERIALS OR LIQUIDS HERE" OR SIMILAR. OWNER SHALL BE RESPONSIBLE TO KEEP THE AREA CLEAN OF LITTER AND SPILLS.

C. OWNER TO BE RESPONSIBLE FOR SWEEPING PLAZAS, SIDEWALKS, AND PARKING LOTS. THIS IS TO BE DONE REGULARLY AND AS NEEDED TO PREVENT ACCUMULATION OF LITTER AND DEBRIS.

D. FIRE SPRINKLER TEST WATER SHALL BE DRAINED TO THE BIOFILTRATION BASIN.

E. CONDENSATE DRAIN LINES INCLUDING AIR CONDITIONING SHALL BE ROUTED TO LANDSCAPE.

F. ROOFING, GUTTERS, AND TRIM SHALL NOT BE MADE OF COPPER OR OTHER UNPROTECTED METALS THAT MAY LEACH INTO RUNOFF MUST BE AVOIDED.

## SOURCE CONTROL BMPs

- STORM DRAIN STENCILING — 1
- TRASH STORAGE AREA — 2


PLANS PREPARED BY:

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4320 Viewridge Avenue, Suite C, San Diego, CA 92123
T:858.634.8620 | F:858.634.8627 [ OEC Project Number 0430 ]

REGISTERED PROFESSIONAL ENGINEER SEAN M. SAVAGE No. 75677 CIVIL STATE OF CALIFORNIA

SEAN M. SAVAGE R.C.E. 75677 — 4/12/2023 DATE


CITY OF SANTEE

**PERMIT NO:**__________

APPLICANT: CAMERON BROTHERS CONSTRUCTION CO, L.P.
ASSESSORS PARCEL NO(S): 387-061-11-00 & 387-061-12-00
REQUEST:

PC RESOLUTION NO:
CC RESOLUTION NO:
ORDINANCE NO:

C-9

# Graves Avenue RV Storage
# Hydromodification SWMM Analysis

**8353 Graves Avenue**
**Santee, CA 92071**

**Date Prepared:**
April 6, 2023

**Prepared for:**
Cameron Brothers Company, LLC
10580 Prospect Avenue, Suite 200
Santee, CA 92071
619-562-3050

**Prepared By:**


OMEGA
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4320 Viewridge Ave, Suite C
San Diego, CA 92113
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| | |
|---|---|
| Patric T. de Boer | RCE 83583 |
| Registration Expires | 3-31-2025 |

## Introduction

This hydromodification report summarizes the approach and tools used to model the pre and post-development conditions at the project site at 8353 Graves Avenue to determine if the proposed project complies with the hydromodification flow control requirements set forth in the County of San Diego BMP Design Manual dated February 2016, and the San Diego Hydromodification Management Plan dated March 2011.

The analysis was performed using Stormwater Management Model 5.1 (SWMM) provided by the Environmental Protection Agency (EPA). SWMM was used to model the pre and post-development surface conditions as well as the proposed BMPs that will be used for post development flow control.

## SWMM Model Development

The project proposes to construct an RV storage yard and two (2) self-storage buildings at the vacant lot at 8353 Graves Avenue in Santee, California. The proposed project will be built with its corresponding private storm drain system. Three (3) fully lined biofiltration basins will be constructed for 100-year flow attenuation, treatment and hydromodification purposes.

The pre and post developed site will drain to the same Point of Compliance (POC) at the south boundary of the area to be developed. Both the pre and post-developed conditions were modelled side-by-side, within a single SWMM model, with the predeveloped sub catchment draining to E-POC and the post developed conditions draining to P-POC. Both E-POC and P-POC represent the same physical point.

The model uses the Santee Gauge data available on ProjectCleanwater.org. This gauge was chosen as it is the closest one to the site and is located in an area with a similar elevation and distance from the coast. The other atmospheric data that the model takes into account is the average evaporation rates in inches per day. Per the California Irrigation Management Information System (CIMIS) ETo map, the site is located in Reference Zone 4.

**Catchment Modeling**
For the pre -developed conditions, the underlying soil is assumed and modeled as Type 'D' soil. For the post development conditions, the soil is modeled as Type 'C' soil. This is in accordance with Section G.1.4.3 of the BMP design manual which allows soils in landscaped areas that are retilled/amended to be modeled as Type 'C'. All pervious areas on the project site will be landscaped. The soils in these areas will not be compacted

**Infiltration Values from Table G.1-4 of City BMP Design Manual**

| Condition | Suction Head | Conductivity | Initial Deficit |
|---|---|---|---|
| **Pre-developed** | 9.0 | 0.025 | 0.30 |
| **Post-developed** | 6.0 | 0.1 | 0.31 |

**Surface Parameters from Table G.1-4 of City BMP Design Manual**

| | Catchment | Area | Width | Slope | % Imperv | N-Imperv | N-Perv | Dstore Imperv | Dstor Perv | LID Controls |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre | EX-DMA-1 | 4.78 | 2449 | 3.9% | 0% | 0.012 | 0.08 | 0.05 | 0.10 | - |
| Post | DMA-1 | 1.33 | 963 | 0.7% | 95.8% | 0.012 | 0.08 | 0.05 | 0.10 | BMP-1 |
| | DMA-2 | 1.38 | 999 | 0.7% | 95.4% | 0.012 | 0.08 | 0.05 | 0.10 | BMP-2 |
| | DMA-3 | 1.51 | 1314 | 0.5% | 96.1% | 0.012 | 0.08 | 0.05 | 0.10 | BMP-3 |
| | DMA-4 | 0.08 | 34 | 0.5% | 0% | 0.012 | 0.08 | 0.05 | 0.10 | - |
| | DMA-5 | 0.05 | 24 | 2.6% | 0% | 0.012 | 0.08 | 0.05 | 0.10 | - |
| | DMA-6 | 0.21 | 106 | 0% | 0% | 0.012 | 0.08 | 0.05 | 0.10 | - |
| | DMA-7 | 0.24 | 121 | 1.5% | 0% | 0.012 | 0.08 | 0.05 | 0.10 | - |

The area, width, slope, and % impervious were all determined from the site-specific conditions. The N-Pervious values are taken from the County approved "Improving Accuracy in Continuous Hydrologic Modeling: Guidance for Selecting Pervious Overland Flow Manning's n Values in the San Diego Region", TRWE, 2016, more specifically Table 1, "Light Rain" section (Document provided on Attachment 11). N-Imperv, Dstor Imperv and Dstor Perv were taken from table G.1-4 of the County of San Diego BMP Design Manual.

The N-Perv value of 0.08 for the pre-developed conditions corresponds with the assumed chaparral natural landscape that consists of "shrubs and bushes."

The N-Perv Value of 0.08 for the post developed conditions was chosen, as the pervious area will be landscaped and mulched.

The slope of each catchment is determined by dividing the elevation differential by the length of the flowpath.

The width of the catchments is determined by dividing the catchment area by the overland flow length.

**Detention Facility Modeling**

In the post developed conditions, three (3) fully lined biofiltrations basin will be constructed. Each will be built with a low flow control orifice on the perforated subdrain, a Nyloplast dome grate outlet riser 9 inches above the finish grade of the basin and an emergency overflow above the HMP elevation and 100-year elevation. The outlet risers have rating curves that are specific to the geometry of the dome grates. These are modeled as outlet links with a rating curve applied to them. The rating curve is specific to the geometry of the dome grates, and the flow reduction they provide is used as a restricting element of the BMPs. The rating curves are provided by the manufacturer of the grates.

The treated stormwater of the three biofiltration basins outlet via an outlet structure to the storm drain system on Graves Avenue.

The biofiltration facilities are modeled using the LID Editor (See LID BMP Modeling section below for more details). The surface storage above the treatment elevation of the biofiltration facilities has been modeled as a separate storage node. See Storage Calculations section of this report.

**LID BMP Modeling**

The post developed conditions use the LID Modeling Module of SWMM 5.1 to model the effects that the proposed biofiltration basin will have on the discharge rates. The biofiltration basin is modeled as LID controls that are applied to a portion of the catchment that contains them.

**LID Control Parameters**

| | LID Control | BMP-1 | BMP-2 | BMP-3 |
|---|---|---|---|---|
| | **Area (sf)** | 1800 | 1700 | 1800 |
| **Surface** | **Berm Height (in)** | 9 | 9 | 9 |
| | ***Vegetation Volume** | 0.0 | 0.0 | 0.0 |
| | ***Surface Roughness** | 0.0 | 0.0 | 0.0 |
| | ***Surface Slope (%)** | 0.0 | 0.00 | 0.00 |
| **Soil** | **Thickness (in)** | 21 | 21 | 21 |
| | ***Porosity** | 0.4 | 0.4 | 0.4 |
| | ***Field Capacity** | 0.2 | 0.2 | 0.2 |
| | ***Wilting Point** | 0.1 | 0.1 | 0.1 |
| | ***Conductivity (in/hr)** | 5.0 | 5.0 | 5.0 |
| | ***Conductivity Slope** | 5.0 | 5.0 | 5.0 |
| | ***Suction Head (in)** | 1.5 | 1.5 | 1.5 |
| **Storage** | **Thickness (in)** | 12 | 12 | 12 |
| | ***Void Ratio** | 0.67 | 0.67 | 0.67 |
| | ***Seepage Rate (in/hr)** | 0.0 | 0.0 | 0.0 |
| | ***Clogging Factor** | 0.0 | 0.0 | 0.0 |
| **Drain** | **Flow Coefficient** | 0.19875 | 0.21044 | 0.19875 |
| | **Flow Exponent** | 0.5 | 0.5 | 0.5 |
| | **Offset Height (in)** | 0 | 0 | 0 |
| | **Outlet Orifice Dia. (in)** | 1.0 | 1.0 | 1.0 |

***Indicates that the parameters are taken from Table G.1-7 of the BMP design Manual.**

The drain offset in LID is considered to be 0 ft, as the volume in the 3" of gravel below the underdrain never leaves the facility.

**Outlet Orifice Size**
The low flow orifice on the subdrain of the biofiltration basins is modeled using the drain coefficients listed in the above table. The flow coefficient characterizes the rate of discharge to the outlet as a function of the height of water stored in the bio-retention cell.

The following equation is used to compute the flow coefficient (Per County of San Diego BMP Design Manual):

$$C = C_g \left(\frac{605}{A_{LID}}\right)\left(\frac{\pi D^2}{8}\right)\sqrt{\frac{g}{6}}$$

Where,

$\boldsymbol{C_g}$ is the orifice discharge coefficient (0.65)
$\boldsymbol{A_{LID}}$ is the cumulative footprint area (ft^2) of all LID controls
**D** is the underdrain orifice diameter (in)
**g** is the gravitational constant (32.2 ft/s^2)
**Flow Exponent:** A value that represents flow through an orifice (0.5)

## Storage Calculations

The LID module BMPs were found to have insufficient storage to bring the flow duration curve into compliance. The LID module does not account for surface storage above the specified Berm Height Parameter. Surface storage was modeled for both proposed BMP's as separate storage nodes located downstream of the LID BMP. The storage nodes have a storage curve reflecting the ponding area of stormwater above the Nyloplast risers.

The storage nodes drain via an outlet link with 0' offset. The outlet link represents a Nyloplast Dome Grate riser that is located 9" above the finish surface of the BMP.

## Flow Duration Curve Comparison

The Flow Duration Curves (FDCs) for the pre and post-developed conditions were compared at the POC. The FDCs were compared for flows within the flow thresholds. No erosion susceptibility analysis has been performed for the receiving waterway (Lower San Diego River). No accepted analyses are known to exist for the portion of Lower San Diego River that this project drains to.

The default flow thresholds of 0.1Q2-Q10 were used for this analysis. As can be seen in the plotted FDCs in Attachment 1, the post-developed FDC does not exceed the pre-developed FDC by more than 10% at any point for the peak flows within the flow threshold.

# Summary

Analysis duration curve of the flow duration curve comparison indicates that there are no exceedances of more than 110% of the predeveloped conditions were observed.

It is the opinion of Omega Engineering Consultants that this project has demonstrated compliance with the current hydromodification requirements.

# Attachments

1. Flow Frequency Curve
2. Flow Duration Curve
3. Flow Duration Curve Summary
4. SWMM Model Layout
5. SWMM input file
6. SWMM Output File
7. Flow Coefficient Calculation
8. Subcatchment Runoff Summary
9. LID Performance Summary
10. Node Depth Summary
11. Green Ampt Inputs
12. LID Control Editor Inputs
13. Improving Accuracy in Continuous Hydrologic Modeling: Guidance for Selecting Pervious Overland Flow Manning's n Values in the San Diego Region," TRWE, 2016

# Pre-project Flow Frequency - Long-term Simulation

| | | |
|---|---|---|
| **10-year Q:** | 3.784 | cfs |
| **2-year Q:** | 3.055 | cfs |
| **Lower Flow Threshold:** | 10% | |
| 0.1xQ2 (Pre): | 1.990 | cfs |

Statistics - Node E-POC Total Inflow

| Rank | Start Date | Event Duration (hours) | Event Peak (CFS) | Exceedance Frequency (percent) | Return Period (years) |
|---|---|---|---|---|---|
| 1 | 1/4/1978 | 1 | 4.538 | 0.4 | 37 |
| 2 | 2/16/1980 | 107 | 4.149 | 0.81 | 18.5 |
| 3 | 10/27/2004 | 34 | 4.028 | 1.21 | 12.33 |
| 4 | 10/22/1976 | 3 | 3.706 | 1.61 | 9.25 |
| 5 | 3/12/1982 | 1 | 3.574 | 2.02 | 7.4 |
| 6 | 2/7/1998 | 21 | 3.237 | 2.42 | 6.17 |
| 7 | 3/1/1983 | 80 | 3.107 | 2.82 | 5.29 |
| 8 | 9/10/1976 | 4 | 2.988 | 3.23 | 4.63 |
| 9 | 2/6/1992 | 5 | 2.805 | 3.63 | 4.11 |
| 10 | 1/28/1980 | 26 | 2.611 | 4.03 | 3.7 |
| 11 | 2/2/1998 | 12 | 2.526 | 4.44 | 3.36 |
| 12 | 3/6/1975 | 2 | 2.333 | 4.84 | 3.08 |
| 13 | 2/27/1991 | 39 | 2.228 | 5.24 | 2.85 |
| 14 | 2/11/1973 | 13 | 2.169 | 5.65 | 2.64 |
| 15 | 1/31/1979 | 23 | 2.167 | 6.05 | 2.47 |
| 16 | 11/20/1983 | 10 | 2.143 | 6.45 | 2.31 |
| 17 | 2/13/1998 | 7 | 2.081 | 6.85 | 2.18 |
| 18 | 3/6/1992 | 2 | 2.047 | 7.26 | 2.06 |
| 19 | 2/15/1992 | 3 | 1.942 | 7.66 | 1.95 |
| 20 | 3/24/1983 | 4 | 1.933 | 8.06 | 1.85 |
| 21 | 2/19/2007 | 9 | 1.931 | 8.47 | 1.76 |
| 22 | 8/17/1977 | 7 | 1.89 | 8.87 | 1.68 |
| 23 | 1/31/1993 | 3 | 1.874 | 9.27 | 1.61 |
| 24 | 12/4/1974 | 4 | 1.851 | 9.68 | 1.54 |
| 25 | 2/22/2004 | 13 | 1.812 | 10.08 | 1.48 |
| 26 | 12/9/2004 | 1 | 1.774 | 10.48 | 1.42 |
| 27 | 1/15/1993 | 82 | 1.77 | 10.89 | 1.37 |
| 28 | 12/28/1977 | 16 | 1.755 | 11.29 | 1.32 |
| 29 | 4/23/1980 | 2 | 1.753 | 11.69 | 1.28 |
| 30 | 1/13/1993 | 9 | 1.749 | 12.1 | 1.23 |
| 31 | 2/13/1973 | 3 | 1.739 | 12.5 | 1.19 |
| 32 | 1/6/1993 | 56 | 1.724 | 12.9 | 1.16 |
| 33 | 3/4/1978 | 23 | 1.714 | 13.31 | 1.12 |
| 34 | 2/15/1986 | 7 | 1.71 | 13.71 | 1.09 |
| 35 | 2/14/1995 | 3 | 1.67 | 14.11 | 1.06 |

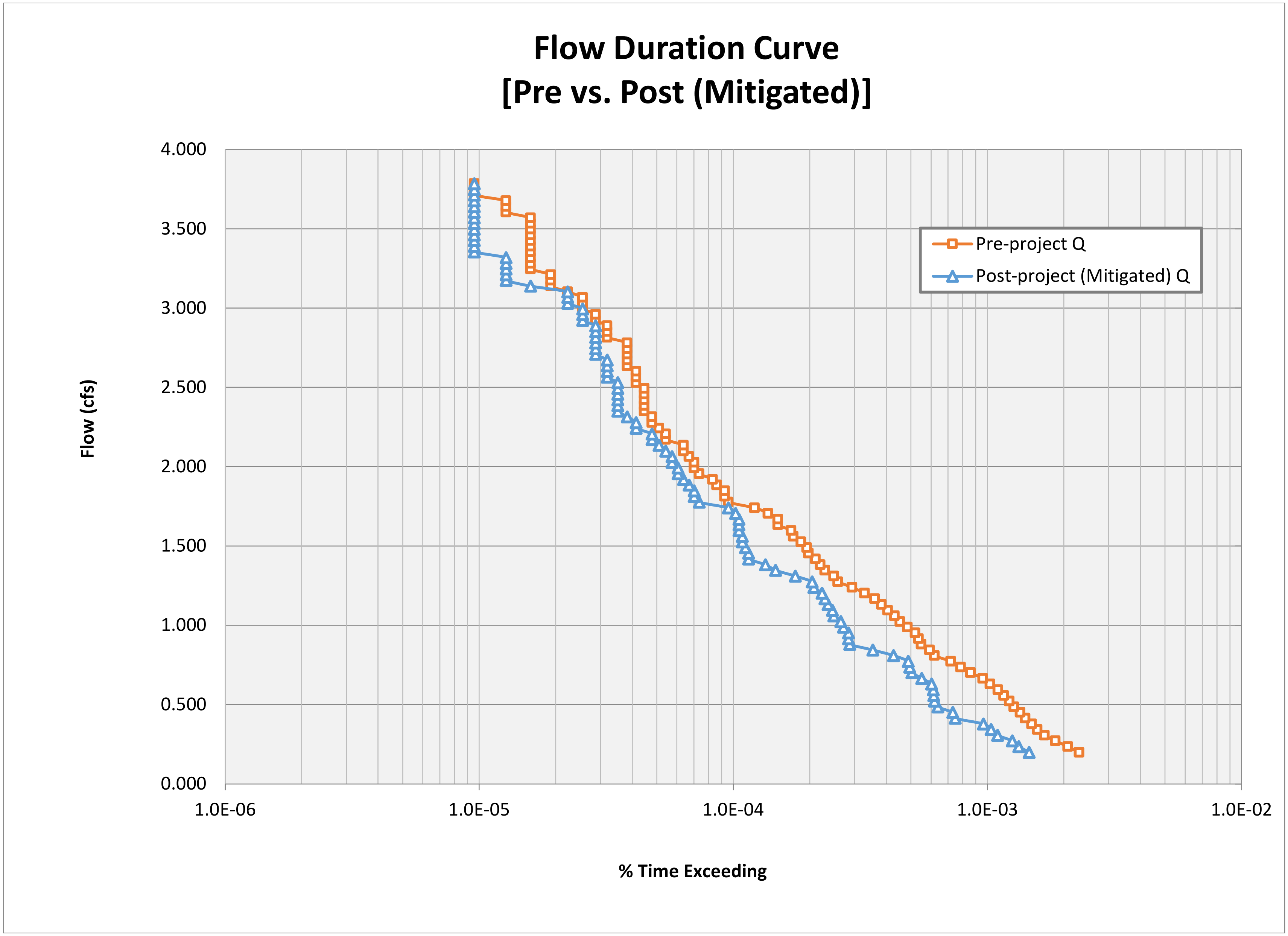
| | | |
|---|---|---|
| **Low-flow Threshold:** | 10% | |
| **0.1xQ2 (Pre):** | 0.199 | cfs |
| **Q10 (Pre):** | 3.784 | cfs |
| **Ordinate #:** | 100 | |
| **Incremental Q (Pre):** | 0.03585 | cfs |
| **Total Hourly Data:** | 313212 | hours |

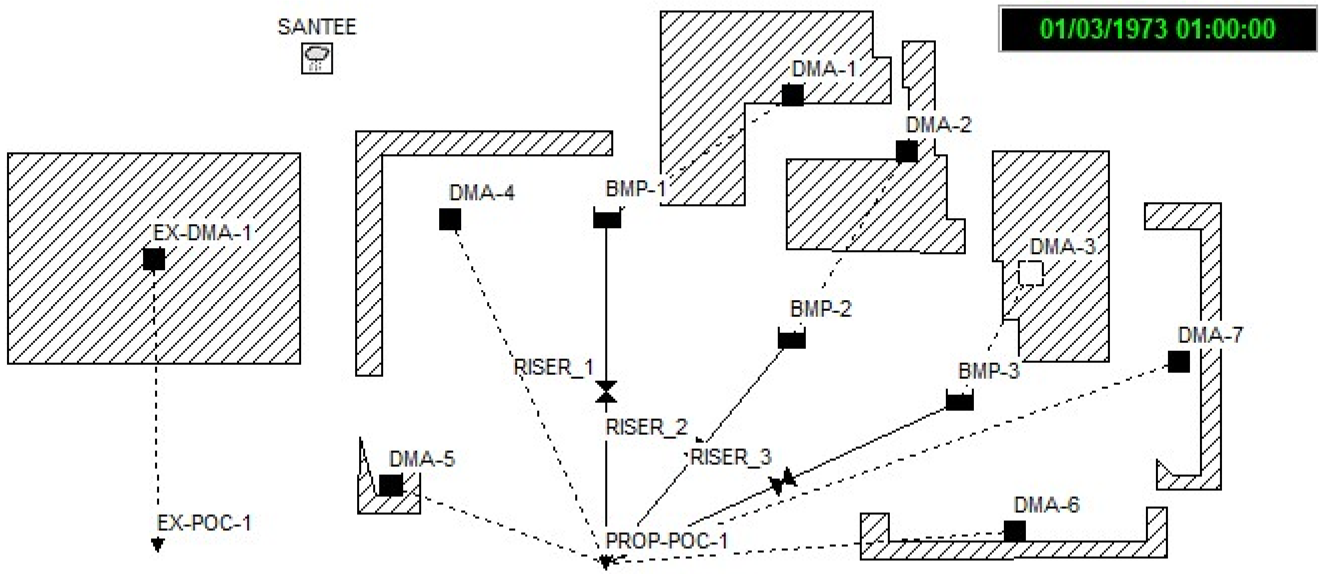
**The proposed BMP:** PASSED

| Interval | Pre-project Flow (cfs) | Pre-project Hours | Pre-project % Time Exceeding | Post-project Hours | Post-project % Time Exceeding | Percentage | Pass/Fail |
|---|---|---|---|---|---|---|---|
| 0 | 0.199 | 721 | 2.30E-03 | 458 | 1.46E-03 | 64% | Pass |
| 1 | 0.235 | 650 | 2.08E-03 | 417 | 1.33E-03 | 64% | Pass |
| 2 | 0.271 | 580 | 1.85E-03 | 393 | 1.25E-03 | 68% | Pass |
| 3 | 0.307 | 526 | 1.68E-03 | 344 | 1.10E-03 | 65% | Pass |
| 4 | 0.342 | 493 | 1.57E-03 | 324 | 1.03E-03 | 66% | Pass |
| 5 | 0.378 | 469 | 1.50E-03 | 302 | 9.64E-04 | 64% | Pass |
| 6 | 0.414 | 442 | 1.41E-03 | 234 | 7.47E-04 | 53% | Pass |
| 7 | 0.450 | 422 | 1.35E-03 | 229 | 7.31E-04 | 54% | Pass |
| 8 | 0.486 | 399 | 1.27E-03 | 200 | 6.39E-04 | 50% | Pass |
| 9 | 0.522 | 383 | 1.22E-03 | 194 | 6.19E-04 | 51% | Pass |
| 10 | 0.558 | 364 | 1.16E-03 | 193 | 6.16E-04 | 53% | Pass |
| 11 | 0.593 | 345 | 1.10E-03 | 192 | 6.13E-04 | 56% | Pass |
| 12 | 0.629 | 321 | 1.02E-03 | 189 | 6.03E-04 | 59% | Pass |
| 13 | 0.665 | 301 | 9.61E-04 | 173 | 5.52E-04 | 57% | Pass |
| 14 | 0.701 | 269 | 8.59E-04 | 158 | 5.04E-04 | 59% | Pass |
| 15 | 0.737 | 246 | 7.85E-04 | 155 | 4.95E-04 | 63% | Pass |
| 16 | 0.773 | 225 | 7.18E-04 | 153 | 4.88E-04 | 68% | Pass |
| 17 | 0.808 | 194 | 6.19E-04 | 134 | 4.28E-04 | 69% | Pass |
| 18 | 0.844 | 186 | 5.94E-04 | 111 | 3.54E-04 | 60% | Pass |
| 19 | 0.880 | 172 | 5.49E-04 | 90 | 2.87E-04 | 52% | Pass |
| 20 | 0.916 | 168 | 5.36E-04 | 89 | 2.84E-04 | 53% | Pass |
| 21 | 0.952 | 163 | 5.20E-04 | 89 | 2.84E-04 | 55% | Pass |
| 22 | 0.988 | 152 | 4.85E-04 | 85 | 2.71E-04 | 56% | Pass |
| 23 | 1.024 | 142 | 4.53E-04 | 83 | 2.65E-04 | 58% | Pass |
| 24 | 1.059 | 135 | 4.31E-04 | 78 | 2.49E-04 | 58% | Pass |
| 25 | 1.095 | 127 | 4.05E-04 | 77 | 2.46E-04 | 61% | Pass |
| 26 | 1.131 | 120 | 3.83E-04 | 74 | 2.36E-04 | 62% | Pass |
| 27 | 1.167 | 113 | 3.61E-04 | 72 | 2.30E-04 | 64% | Pass |
| 28 | 1.203 | 103 | 3.29E-04 | 70 | 2.23E-04 | 68% | Pass |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 29 | 1.239 | 92 | 2.94E-04 | 65 | 2.08E-04 | 71% | Pass |
| 30 | 1.275 | 81 | 2.59E-04 | 64 | 2.04E-04 | 79% | Pass |
| 31 | 1.310 | 78 | 2.49E-04 | 55 | 1.76E-04 | 71% | Pass |
| 32 | 1.346 | 72 | 2.30E-04 | 46 | 1.47E-04 | 64% | Pass |
| 33 | 1.382 | 69 | 2.20E-04 | 42 | 1.34E-04 | 61% | Pass |
| 34 | 1.418 | 66 | 2.11E-04 | 36 | 1.15E-04 | 55% | Pass |
| 35 | 1.454 | 62 | 1.98E-04 | 36 | 1.15E-04 | 58% | Pass |
| 36 | 1.490 | 61 | 1.95E-04 | 35 | 1.12E-04 | 57% | Pass |
| 37 | 1.526 | 58 | 1.85E-04 | 34 | 1.09E-04 | 59% | Pass |
| 38 | 1.561 | 54 | 1.72E-04 | 34 | 1.09E-04 | 63% | Pass |
| 39 | 1.597 | 53 | 1.69E-04 | 33 | 1.05E-04 | 62% | Pass |
| 40 | 1.633 | 47 | 1.50E-04 | 33 | 1.05E-04 | 70% | Pass |
| 41 | 1.669 | 47 | 1.50E-04 | 33 | 1.05E-04 | 70% | Pass |
| 42 | 1.705 | 43 | 1.37E-04 | 32 | 1.02E-04 | 74% | Pass |
| 43 | 1.741 | 38 | 1.21E-04 | 30 | 9.58E-05 | 79% | Pass |
| 44 | 1.777 | 30 | 9.58E-05 | 23 | 7.34E-05 | 77% | Pass |
| 45 | 1.812 | 29 | 9.26E-05 | 22 | 7.02E-05 | 76% | Pass |
| 46 | 1.848 | 29 | 9.26E-05 | 22 | 7.02E-05 | 76% | Pass |
| 47 | 1.884 | 27 | 8.62E-05 | 21 | 6.70E-05 | 78% | Pass |
| 48 | 1.920 | 26 | 8.30E-05 | 20 | 6.39E-05 | 77% | Pass |
| 49 | 1.956 | 23 | 7.34E-05 | 19 | 6.07E-05 | 83% | Pass |
| 50 | 1.992 | 22 | 7.02E-05 | 19 | 6.07E-05 | 86% | Pass |
| 51 | 2.028 | 22 | 7.02E-05 | 18 | 5.75E-05 | 82% | Pass |
| 52 | 2.063 | 21 | 6.70E-05 | 18 | 5.75E-05 | 86% | Pass |
| 53 | 2.099 | 20 | 6.39E-05 | 17 | 5.43E-05 | 85% | Pass |
| 54 | 2.135 | 20 | 6.39E-05 | 16 | 5.11E-05 | 80% | Pass |
| 55 | 2.171 | 17 | 5.43E-05 | 15 | 4.79E-05 | 88% | Pass |
| 56 | 2.207 | 17 | 5.43E-05 | 15 | 4.79E-05 | 88% | Pass |
| 57 | 2.243 | 16 | 5.11E-05 | 13 | 4.15E-05 | 81% | Pass |
| 58 | 2.279 | 15 | 4.79E-05 | 13 | 4.15E-05 | 87% | Pass |
| 59 | 2.314 | 15 | 4.79E-05 | 12 | 3.83E-05 | 80% | Pass |
| 60 | 2.350 | 14 | 4.47E-05 | 11 | 3.51E-05 | 79% | Pass |
| 61 | 2.386 | 14 | 4.47E-05 | 11 | 3.51E-05 | 79% | Pass |
| 62 | 2.422 | 14 | 4.47E-05 | 11 | 3.51E-05 | 79% | Pass |
| 63 | 2.458 | 14 | 4.47E-05 | 11 | 3.51E-05 | 79% | Pass |
| 64 | 2.494 | 14 | 4.47E-05 | 11 | 3.51E-05 | 79% | Pass |
| 65 | 2.530 | 13 | 4.15E-05 | 11 | 3.51E-05 | 85% | Pass |
| 66 | 2.565 | 13 | 4.15E-05 | 10 | 3.19E-05 | 77% | Pass |
| 67 | 2.601 | 13 | 4.15E-05 | 10 | 3.19E-05 | 77% | Pass |
| 68 | 2.637 | 12 | 3.83E-05 | 10 | 3.19E-05 | 83% | Pass |
| 69 | 2.673 | 12 | 3.83E-05 | 10 | 3.19E-05 | 83% | Pass |
| 70 | 2.709 | 12 | 3.83E-05 | 9 | 2.87E-05 | 75% | Pass |
| 71 | 2.745 | 12 | 3.83E-05 | 9 | 2.87E-05 | 75% | Pass |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 72 | 2.780 | 12 | 3.83E-05 | 9 | 2.87E-05 | 75% | Pass |
| 73 | 2.816 | 10 | 3.19E-05 | 9 | 2.87E-05 | 90% | Pass |
| 74 | 2.852 | 10 | 3.19E-05 | 9 | 2.87E-05 | 90% | Pass |
| 75 | 2.888 | 10 | 3.19E-05 | 9 | 2.87E-05 | 90% | Pass |
| 76 | 2.924 | 9 | 2.87E-05 | 8 | 2.55E-05 | 89% | Pass |
| 77 | 2.960 | 9 | 2.87E-05 | 8 | 2.55E-05 | 89% | Pass |
| 78 | 2.996 | 8 | 2.55E-05 | 8 | 2.55E-05 | 100% | Pass |
| 79 | 3.031 | 8 | 2.55E-05 | 7 | 2.23E-05 | 88% | Pass |
| 80 | 3.067 | 8 | 2.55E-05 | 7 | 2.23E-05 | 88% | Pass |
| 81 | 3.103 | 7 | 2.23E-05 | 7 | 2.23E-05 | 100% | Pass |
| 82 | 3.139 | 6 | 1.92E-05 | 5 | 1.60E-05 | 83% | Pass |
| 83 | 3.175 | 6 | 1.92E-05 | 4 | 1.28E-05 | 67% | Pass |
| 84 | 3.211 | 6 | 1.92E-05 | 4 | 1.28E-05 | 67% | Pass |
| 85 | 3.247 | 5 | 1.60E-05 | 4 | 1.28E-05 | 80% | Pass |
| 86 | 3.282 | 5 | 1.60E-05 | 4 | 1.28E-05 | 80% | Pass |
| 87 | 3.318 | 5 | 1.60E-05 | 4 | 1.28E-05 | 80% | Pass |
| 88 | 3.354 | 5 | 1.60E-05 | 3 | 9.58E-06 | 60% | Pass |
| 89 | 3.390 | 5 | 1.60E-05 | 3 | 9.58E-06 | 60% | Pass |
| 90 | 3.426 | 5 | 1.60E-05 | 3 | 9.58E-06 | 60% | Pass |
| 91 | 3.462 | 5 | 1.60E-05 | 3 | 9.58E-06 | 60% | Pass |
| 92 | 3.498 | 5 | 1.60E-05 | 3 | 9.58E-06 | 60% | Pass |
| 93 | 3.533 | 5 | 1.60E-05 | 3 | 9.58E-06 | 60% | Pass |
| 94 | 3.569 | 5 | 1.60E-05 | 3 | 9.58E-06 | 60% | Pass |
| 95 | 3.605 | 4 | 1.28E-05 | 3 | 9.58E-06 | 75% | Pass |
| 96 | 3.641 | 4 | 1.28E-05 | 3 | 9.58E-06 | 75% | Pass |
| 97 | 3.677 | 4 | 1.28E-05 | 3 | 9.58E-06 | 75% | Pass |
| 98 | 3.713 | 3 | 9.58E-06 | 3 | 9.58E-06 | 100% | Pass |
| 99 | 3.749 | 3 | 9.58E-06 | 3 | 9.58E-06 | 100% | Pass |
| 100 | 3.784 | 3 | 9.58E-06 | 3 | 9.58E-06 | 100% | Pass |


Flow Duration Curve
[Pre vs. Post (Mitigated)]
Pre-project Q
Post-project (Mitigated) Q
Flow (cfs)
4.000
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
1.0E-06
1.0E-05
1.0E-04
1.0E-03
1.0E-02
% Time Exceeding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SANTEE
DMA-1
DMA-2
DMA-3
DMA-4
DMA-5
DMA-6
DMA-7
EX-DMA-1
EX-POC-1
BMP-1
BMP-2
BMP-3
RISER_1
RISER_2
RISER_3
PROP-POC-1

```
[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option            Value
FLOW_UNITS          CFS
INFILTRATION        GREEN_AMPT
FLOW_ROUTING        KINWAVE
LINK_OFFSETS        DEPTH
MIN_SLOPE           0
ALLOW_PONDING       NO
SKIP_STEADY_STATE   NO

START_DATE          01/03/1973
START_TIME          00:00:00
REPORT_START_DATE   01/03/1973
REPORT_START_TIME   00:00:00
END_DATE            09/26/2008
END_TIME            11:59:00
SWEEP_START         01/01
SWEEP_END           12/31
DRY_DAYS            0
REPORT_STEP         01:00:00
WET_STEP            00:15:00
DRY_STEP            04:00:00
ROUTING_STEP        0:01:00
RULE_STEP           00:00:00

INERTIAL_DAMPING    PARTIAL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP       0.75
LENGTHENING_STEP    0
MIN_SURFAREA        12.566
MAX_TRIALS          8
HEAD_TOLERANCE      0.005
SYS_FLOW_TOL        5
LAT_FLOW_TOL        5
MINIMUM_STEP        0.5
THREADS             1

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
MONTHLY          .06   .08   .11   .15   .17   .19   .19   .18   .15   .11   .08   .06
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- ------ ------ ----------
```

```
SANTEE           INTENSITY 1:00     1.0      TIMESERIES SANTEE_RAIN_GAGE

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- ----------------
EX-DMA-1         SANTEE           EX-POC-1         4.78     0        2449     3.9      0
DMA-1            SANTEE           BMP-1            1.33     95.8     963      0.7      0
DMA-2            SANTEE           BMP-2            1.38     95.4     999      0.7      0
DMA-3            SANTEE           BMP-3            1.51     96.1     1314     0.5      0
DMA-4            SANTEE           PROP-POC-1       0.08     0        34       0.5      0
DMA-5            SANTEE           PROP-POC-1       0.05     0        24       2.6      0
DMA-6            SANTEE           PROP-POC-1       0.21     0        106      0        0
DMA-7            SANTEE           PROP-POC-1       0.24     0        121      1.5      0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
EX-DMA-1         0.012      0.08       0.05       0.10       25         OUTLET
DMA-1            0.012      0.08       0.05       0.10       25         PERVIOUS   100
DMA-2            0.012      0.08       0.05       0.10       25         PERVIOUS   100
DMA-3            0.012      0.08       0.05       0.10       25         PERVIOUS   100
DMA-4            0.012      0.08       0.05       0.10       25         OUTLET
DMA-5            0.012      0.08       0.05       0.10       25         OUTLET
DMA-6            0.012      0.08       0.05       0.10       25         OUTLET
DMA-7            0.012      0.08       0.05       0.10       25         OUTLET

[INFILTRATION]
;;Subcatchment   Param1     Param2     Param3     Param4     Param5
;;-------------- ---------- ---------- ---------- ---------- ----------
EX-DMA-1         9.0        0.025      0.30
DMA-1            6.0        0.1        0.32
DMA-2            6.0        0.1        0.32
DMA-3            6.0        0.1        0.32
DMA-4            6.0        0.1        0.32
DMA-5            6.0        0.1        0.32
DMA-6            6.0        0.1        0.32
DMA-7            6.0        0.1        0.32

[LID_CONTROLS]
;;Name           Type/Layer Parameters
;;-------------- ---------- ----------
BMP-1            BC
BMP-1            SURFACE    9          0          0          0          5
BMP-1            SOIL       21         0.40       0.2        0.1        5          5          1.5
BMP-1            STORAGE    12         0.67       0          0
BMP-1            DRAIN      0.19875    0.5        0          6          0          0

BMP-2            BC
BMP-2            SURFACE    9          0          0          0          5
BMP-2            SOIL       21         0.4        0.2        0.1        5          5          1.5
```

```
BMP-2          STORAGE    12        0.67      0         0
BMP-2          DRAIN      0.21044   0.5       0         6         0         0

BMP-3          BC
BMP-3          SURFACE    9         0         0         0         5
BMP-3          SOIL       21        0.4       0.2       0.1       5         5         1.5
BMP-3          STORAGE    12        0.67      0         0
BMP-3          DRAIN      0.19875   0.5       0         6         0         0

[LID_USAGE]
;;Subcatchment   LID Process      Number  Area       Width      InitSat    FromImp    ToPerv     RptFile                  DrainTo          FromPerv
;;-------------- ---------------- ------- ---------- ---------- ---------- ---------- ---------- ------------------------ ---------------- ----------
DMA-1            BMP-1            1       1800       0          0          100        0          *                        *                100
DMA-2            BMP-2            1       1700       0          0          100        0          *                        *                100
DMA-3            BMP-3            1       1800       0          0          100        0          *                        *                100

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
EX-POC-1         0          FREE                        NO
PROP-POC-1       0          FREE                        NO

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ----------- ---------- ---------------------------- -------- --------          -------- --------
BMP-1            0        0.5        0          TABULAR    BMP-1                        0        0
BMP-2            0        0.5        0          TABULAR    BMP-2                        0        0
BMP-3            0        0.5        0          TABULAR    BMP-3                        0        0

[OUTLETS]
;;Name           From Node        To Node          Offset     Type            QTable/Qcoeff    Qexpon     Gated
;;-------------- ---------------- ---------------- ---------- --------------- ---------------- ---------- --------
RISER_1          BMP-1            PROP-POC-1       0          TABULAR/HEAD    12INCH_NYLOPLAST            NO
RISER_2          BMP-2            PROP-POC-1       0          TABULAR/HEAD    15INCH_NYLOPLAST            NO
RISER_3          BMP-3            PROP-POC-1       0          TABULAR/HEAD    15INCH_NYLOPLAST            NO

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
12INCH_NYLOPLAST Rating     0          0
12INCH_NYLOPLAST            0.05       0.05
12INCH_NYLOPLAST            0.10       0.30
12INCH_NYLOPLAST            0.15       0.55
12INCH_NYLOPLAST            0.20       0.85
12INCH_NYLOPLAST            0.25       1.15
12INCH_NYLOPLAST            0.30       1.27
12INCH_NYLOPLAST            0.35       1.35
12INCH_NYLOPLAST            0.40       1.47
12INCH_NYLOPLAST            0.45       1.57
12INCH_NYLOPLAST            0.50       1.65
```

| | | | |
|---|---|---|---|
| 12INCH_NYLOPLAST | | 0.55 | 1.72 |
| 12INCH_NYLOPLAST | | 0.60 | 1.80 |
| 12INCH_NYLOPLAST | | 0.65 | 1.85 |
| 12INCH_NYLOPLAST | | 0.70 | 1.95 |
| 12INCH_NYLOPLAST | | 0.75 | 2.02 |
| 12INCH_NYLOPLAST | | 0.80 | 2.07 |
| 12INCH_NYLOPLAST | | 0.85 | 2.12 |
| 12INCH_NYLOPLAST | | 0.90 | 2.22 |
| 12INCH_NYLOPLAST | | 0.95 | 2.27 |
| 12INCH_NYLOPLAST | | 1.0 | 2.32 |
| 12INCH_NYLOPLAST | | 1.05 | 2.37 |
| 12INCH_NYLOPLAST | | 1.10 | 2.45 |
| 12INCH_NYLOPLAST | | 1.15 | 2.50 |
| 12INCH_NYLOPLAST | | 1.20 | 2.54 |
| 12INCH_NYLOPLAST | | 1.25 | 2.58 |
| 12INCH_NYLOPLAST | | 1.30 | 2.62 |
| 12INCH_NYLOPLAST | | 1.35 | 2.68 |
| 12INCH_NYLOPLAST | | 1.40 | 2.72 |
| 12INCH_NYLOPLAST | | 1.45 | 2.76 |
| 12INCH_NYLOPLAST | | 1.50 | 2.80 |
| 12INCH_NYLOPLAST | | 1.55 | 2.84 |
| 12INCH_NYLOPLAST | | 1.60 | 2.88 |
| 12INCH_NYLOPLAST | | 1.65 | 2.92 |
| 12INCH_NYLOPLAST | | 1.70 | 2.96 |
| 12INCH_NYLOPLAST | | 1.75 | 3 |
| 12INCH_NYLOPLAST | | 1.80 | 3.02 |
| 12INCH_NYLOPLAST | | 1.85 | 3.04 |
| 12INCH_NYLOPLAST | | 1.90 | 3.06 |
| 12INCH_NYLOPLAST | | 1.95 | 3.08 |
| 12INCH_NYLOPLAST | | 2 | 3.10 |
| ; | | | |
| 15INCH_NYLOPLAST | Rating | 0 | 0 |
| 15INCH_NYLOPLAST | | 0.05 | 0.10 |
| 15INCH_NYLOPLAST | | 0.10 | 0.35 |
| 15INCH_NYLOPLAST | | 0.15 | 0.70 |
| 15INCH_NYLOPLAST | | 0.20 | 1.05 |
| 15INCH_NYLOPLAST | | 0.25 | 1.50 |
| 15INCH_NYLOPLAST | | 0.30 | 2.0 |
| 15INCH_NYLOPLAST | | 0.35 | 2.20 |
| 15INCH_NYLOPLAST | | 0.40 | 2.35 |
| 15INCH_NYLOPLAST | | 0.45 | 2.60 |
| 15INCH_NYLOPLAST | | 0.50 | 2.70 |
| 15INCH_NYLOPLAST | | 0.55 | 2.80 |
| 15INCH_NYLOPLAST | | 0.60 | 2.97 |
| 15INCH_NYLOPLAST | | 0.65 | 3.10 |
| 15INCH_NYLOPLAST | | 0.70 | 3.20 |
| 15INCH_NYLOPLAST | | 0.75 | 3.25 |
| 15INCH_NYLOPLAST | | 0.80 | 3.40 |
| 15INCH_NYLOPLAST | | 0.85 | 3.52 |
| 15INCH_NYLOPLAST | | 0.90 | 3.65 |

```
15INCH_NYLOPLAST          0.95       3.70
15INCH_NYLOPLAST          1.0       3.80
15INCH_NYLOPLAST          1.05       3.90
15INCH_NYLOPLAST          1.10       4
15INCH_NYLOPLAST          1.15       4.10
15INCH_NYLOPLAST          1.20       4.20
15INCH_NYLOPLAST          1.25       4.30
15INCH_NYLOPLAST          1.30       4.40
15INCH_NYLOPLAST          1.35       4.50
15INCH_NYLOPLAST          1.40       4.60
15INCH_NYLOPLAST          1.45       4.70
15INCH_NYLOPLAST          1.50       4.80
;
BMP-1          Storage    0        1800
BMP-1                 0.5       1800
;
BMP-2          Storage    0        1700
BMP-2                 0.5       1700
;
BMP-3          Storage    0        1800
BMP-3                 0.5       1800

[TIMESERIES]
;;Name          Date       Time       Value
;;-------------- ---------- ---------- ----------
SANTEE_RAIN_GAGE 1/3/1973   12:00      0.1
SANTEE_RAIN_GAGE 1/3/1973   18:00      0.1
SANTEE_RAIN_GAGE 1/4/1973   11:00      0.1
SANTEE_RAIN_GAGE 1/4/1973   20:00      0.1
SANTEE_RAIN_GAGE 1/9/1973   15:00      0.1
SANTEE_RAIN_GAGE 1/10/1973  3:00       0.2
SANTEE_RAIN_GAGE 1/16/1973  20:00      0.1
SANTEE_RAIN_GAGE 1/16/1973  21:00      0.1
SANTEE_RAIN_GAGE 1/16/1973  22:00      0.2
SANTEE_RAIN_GAGE 1/16/1973  23:00      0.1
SANTEE_RAIN_GAGE 1/18/1973  22:00      0.2
SANTEE_RAIN_GAGE 1/18/1973  23:00      0.1
SANTEE_RAIN_GAGE 1/18/1973  24:00      0.2
SANTEE_RAIN_GAGE 1/19/1973  2:00       0.1
SANTEE_RAIN_GAGE 1/25/1973  21:00      0.1
SANTEE_RAIN_GAGE 1/30/1973  13:00      0.1
SANTEE_RAIN_GAGE 1/30/1973  14:00      0.1
SANTEE_RAIN_GAGE 2/3/1973   22:00      0.1
SANTEE_RAIN_GAGE 2/3/1973   24:00      0.1
SANTEE_RAIN_GAGE 2/6/1973   2:00       0.1
SANTEE_RAIN_GAGE 2/6/1973   3:00       0.1
SANTEE_RAIN_GAGE 2/6/1973   18:00      0.2
SANTEE_RAIN_GAGE 2/7/1973   19:00      0.1
SANTEE_RAIN_GAGE 2/10/1973  24:00      0.1
SANTEE_RAIN_GAGE 2/11/1973  6:00       0.2
```

Full rain gauge time series is not included here in the SWQMP as the full data set is 150+ pages long. The full time series was used in the analyses and can be found at projectcleanwater.org

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)
------------------------------------------------------------

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... GREEN_AMPT
Flow Routing Method ...... KINWAVE
Starting Date ............ 01/03/1973 00:00:00
Ending Date .............. 09/26/2008 11:59:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 01:00:00
Wet Time Step ............ 00:15:00
Dry Time Step ............ 04:00:00
Routing Time Step ........ 60.00 sec

| ************************** | Volume | Depth |
|---|---|---|
| Runoff Quantity Continuity | acre-feet | inches |
| ************************** | --------- | ------- |
| Initial LID Storage ...... | 0.021 | 0.027 |
| Total Precipitation ...... | 373.540 | 467.900 |
| Evaporation Loss ......... | 34.974 | 43.809 |
| Infiltration Loss ........ | 187.938 | 235.413 |
| Surface Runoff ........... | 56.140 | 70.322 |
| LID Drainage ............ | 100.770 | 126.225 |
| Final Storage ............ | 0.041 | 0.052 |
| Continuity Error (%) ..... | -1.687 | |

**************************

| Flow Routing Continuity | Volume acre-feet | Volume 10^6 gal |
|---|---|---|
| Dry Weather Inflow ....... | 0.000 | 0.000 |
| Wet Weather Inflow ....... | 156.910 | 51.131 |
| Groundwater Inflow ....... | 0.000 | 0.000 |
| RDII Inflow ............. | 0.000 | 0.000 |
| External Inflow .......... | 0.000 | 0.000 |
| External Outflow ......... | 156.904 | 51.130 |
| Flooding Loss ............ | 0.000 | 0.000 |
| Evaporation Loss ......... | 0.000 | 0.000 |
| Exfiltration Loss ........ | 0.000 | 0.000 |
| Initial Stored Volume .... | 0.000 | 0.000 |
| Final Stored Volume ...... | 0.000 | 0.000 |
| Continuity Error (%) ..... | 0.003 | |

********************************

Highest Flow Instability Indexes

********************************

All links are stable.

*************************

Routing Time Step Summary

*************************

Minimum Time Step : 59.00 sec
Average Time Step : 60.00 sec
Maximum Time Step : 60.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 1.00
Percent Not Converging : 0.00

***************************

Subcatchment Runoff Summary

***************************

| Subcatchment | Total Precip in | Total Runon in | Total Evap in | Total Infil in | Imperv Runoff in | Perv Runoff in | Total Runoff in | Total Runoff 10^6 gal | Peak Runoff CFS | Runoff Coeff |
|---|---|---|---|---|---|---|---|---|---|---|
| EX-DMA-1 | 467.90 | 0.00 | 13.69 | 367.09 | 0.00 | 90.84 | 90.84 | 11.79 | 4.54 | 0.194 |
| DMA-1 | 467.90 | 0.00 | 84.49 | 56.81 | 376.64 | 343.43 | 340.04 | 12.28 | 1.20 | 0.727 |
| DMA-2 | 467.90 | 0.00 | 82.92 | 61.75 | 376.16 | 340.15 | 337.02 | 12.63 | 1.24 | 0.720 |
| DMA-3 | 467.90 | 0.00 | 82.95 | 53.41 | 379.27 | 348.06 | 344.86 | 14.14 | 1.36 | 0.737 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DMA-4 | 467.90 | 0.00 | 3.44 | 438.66 | 0.00 | 26.83 | 26.83 | 0.06 | 0.06 | 0.057 |
| DMA-5 | 467.90 | 0.00 | 3.34 | 436.53 | 0.00 | 29.58 | 29.58 | 0.04 | 0.04 | 0.063 |
| DMA-6 | 467.90 | 0.00 | 4.51 | 463.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 |
| DMA-7 | 467.90 | 0.00 | 3.37 | 436.87 | 0.00 | 29.07 | 29.07 | 0.19 | 0.19 | 0.062 |

***********************
LID Performance Summary
***********************

| Subcatchment | LID Control | Total Inflow in | Evap Loss in | Infil Loss in | Surface Outflow in | Drain Outflow in | Initial Storage in | Final Storage in | Continuity Error % |
|---|---|---|---|---|---|---|---|---|---|
| DMA-1 | BMP-1 | 11521.82 | 575.47 | 0.00 | 1519.73 | 9425.05 | 2.10 | 4.07 | -0.00 |
| DMA-2 | BMP-2 | 12496.16 | 577.06 | 0.00 | 1882.73 | 10034.82 | 2.10 | 4.07 | -0.00 |
| DMA-3 | BMP-3 | 13187.01 | 582.95 | 0.00 | 2240.31 | 10362.19 | 2.10 | 4.08 | -0.00 |

******************
Node Depth Summary
******************

| Node | Type | Average Depth Feet | Maximum Depth Feet | Maximum HGL Feet | Time of Max Occurrence days | hr:min | Reported Max Depth Feet |
|---|---|---|---|---|---|---|---|
| EX-POC-1 | OUTFALL | 0.00 | 0.00 | 0.00 | 0 | 00:00 | 0.00 |
| PROP-POC-1 | OUTFALL | 0.00 | 0.00 | 0.00 | 0 | 00:00 | 0.00 |
| BMP-1 | STORAGE | 0.00 | 0.26 | 0.26 | 1388 | 17:02 | 0.26 |
| BMP-2 | STORAGE | 0.00 | 0.22 | 0.22 | 2604 | 18:53 | 0.22 |
| BMP-3 | STORAGE | 0.00 | 0.23 | 0.23 | 2604 | 18:54 | 0.23 |

*******************
Node Inflow Summary
*******************

| Node | Type | Maximum Lateral Inflow CFS | Maximum Total Inflow CFS | Time of Max Occurrence days | hr:min | Lateral Inflow Volume 10^6 gal | Total Inflow Volume 10^6 gal | Flow Balance Error Percent |
|---|---|---|---|---|---|---|---|---|
| EX-POC-1 | OUTFALL | 4.54 | 4.54 | 1827 | 21:01 | 11.8 | 11.8 | 0.000 |
| PROP-POC-1 | OUTFALL | 0.30 | 4.08 | 2604 | 19:01 | 0.288 | 39.3 | 0.000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BMP-1 | STORAGE | 1.20 | 1.20 | 2604 | 18:46 | 12.3 | 12.3 | 0.001 |
| BMP-2 | STORAGE | 1.24 | 1.24 | 2604 | 18:46 | 12.6 | 12.6 | 0.007 |
| BMP-3 | STORAGE | 1.36 | 1.36 | 2604 | 18:46 | 14.1 | 14.1 | 0.006 |

*********************
Node Flooding Summary
*********************

No nodes were flooded.

**********************
Storage Volume Summary
**********************

| Storage Unit | Average Volume 1000 ft3 | Avg Pcnt Full | Evap Pcnt Loss | Exfil Pcnt Loss | Maximum Volume 1000 ft3 | Max Pcnt Full | Time of Max Occurrence days hr:min | Maximum Outflow CFS |
|---|---|---|---|---|---|---|---|---|
| BMP-1 | 0.002 | 0 | 0 | 0 | 0.476 | 53 | 1388 17:02 | 1.19 |
| BMP-2 | 0.001 | 0 | 0 | 0 | 0.377 | 44 | 2604 18:51 | 1.24 |
| BMP-3 | 0.002 | 0 | 0 | 0 | 0.422 | 47 | 2604 18:52 | 1.36 |

***********************
Outfall Loading Summary
***********************

| Outfall Node | Flow Freq Pcnt | Avg Flow CFS | Max Flow CFS | Total Volume 10^6 gal |
|---|---|---|---|---|
| EX-POC-1 | 0.37 | 0.38 | 4.54 | 11.791 |
| PROP-POC-1 | 5.43 | 0.09 | 4.08 | 39.335 |
| System | 2.90 | 0.47 | 8.23 | 51.126 |

********************
Link Flow Summary
********************

-----------------------------------------------------------------------------
Maximum  Time of Max   Maximum    Max/    Max/

| Link | Type | \|Flow\| CFS | Occurrence days | hr:min | \|Veloc\| ft/sec | Full Flow | Full Depth |
|---|---|---|---|---|---|---|---|
| RISER_1 | DUMMY | 1.19 | 1388 | 17:02 | | | |
| RISER_2 | DUMMY | 1.24 | 2604 | 18:53 | | | |
| RISER_3 | DUMMY | 1.36 | 2604 | 18:54 | | | |

*************************
Conduit Surcharge Summary
*************************

No conduits were surcharged.

Analysis begun on:  Thu Apr  6 14:30:51 2023
Analysis ended on:  Thu Apr  6 14:31:12 2023
Total elapsed time: 00:00:21

# SWMM Model Flow Coefficient Calculation

BMP-1  Flow Coefficient & Orifice Size

| PARAMETER | ABBREV. | Bio-Retention Cell | |
|---|---|---|---|
| Ponding Depth | PD | 9 | in |
| Bioretention Soil Layer | S | 21 | in |
| Gravel Layer | G | 12 | in |
| TOTAL | | 3.5 | ft |
| | | 42 | in |
| Orifice Coefficient | $c_g$ | 0.65 | -- |
| Low Flow Orifice Diameter | D | 1.0000 | in |
| Drain exponent | n | 0.5 | -- |
| Ponding Depth Surface Area | $A_{PD}$ | 1800 | $ft^2$ |
| Bioretention Surface Area | $A_{S,} A_G$ | 1800 | $ft^2$ |
| | $A_{S,} A_G$ | 0.0413 | ac |
| Porosity of Bioretention Soil | n | 0.40 | - |
| Effective Ponding Depth | $PD_{eff}$ | **9.00** | in |
| Flow Coefficient | C | 0.19875 | -- |

Flow coefficient calculated per the County of San Diego BMP Design Manual, Page 471

$$C = c_g \left(\frac{605}{A_{LID}}\right)\left(\frac{\pi D^2}{8}\right)\sqrt{\frac{g}{6}}$$

## SWMM Model Flow Coefficient Calculation

BMP-2  Flow Coefficient & Orifice Size

| PARAMETER | ABBREV. | Bio-Retention Cell | |
|---|---|---|---|
| Ponding Depth | PD | 9 | in |
| Bioretention Soil Layer | S | 21 | in |
| Gravel Layer | G | 12 | in |
| TOTAL | | 3.5 | ft |
| | | 42 | in |
| Orifice Coefficient | $c_g$ | 0.65 | -- |
| Low Flow Orifice Diameter | D | 1.0000 | in |
| Drain exponent | n | 0.5 | -- |
| Ponding Depth Surface Area | $A_{PD}$ | 1700 | $ft^2$ |
| Bioretention Surface Area | $A_{S,} A_G$ | 1700 | $ft^2$ |
| | $A_{S,} A_G$ | 0.0390 | ac |
| Porosity of Bioretention Soil | n | 0.40 | - |
| Effective Ponding Depth | $PD_{eff}$ | **9.00** | in |
| Flow Coefficient | C | 0.21044 | -- |

Flow coefficient calculated per the County of San Diego BMP Design Manual, Page 471

$$C = c_g\left(\frac{605}{A_{LID}}\right)\left(\frac{\pi D^2}{8}\right)\sqrt{\frac{g}{6}}$$

## SWMM Model Flow Coefficient Calculation

BMP-3  Flow Coefficient & Orifice Size

| PARAMETER | ABBREV. | Bio-Retention Cell | |
|---|---|---|---|
| Ponding Depth | PD | 9 | in |
| Bioretention Soil Layer | S | 21 | in |
| Gravel Layer | G | 12 | in |
| TOTAL | | 3.5 | ft |
| | | 42 | in |
| Orifice Coefficient | $c_g$ | 0.65 | -- |
| Low Flow Orifice Diameter | D | 1.0000 | in |
| Drain exponent | n | 0.5 | -- |
| Ponding Depth Surface Area | $A_{PD}$ | 1800 | $ft^2$ |
| Bioretention Surface Area | $A_S, A_G$ | 1800 | $ft^2$ |
| | $A_S, A_G$ | 0.0413 | ac |
| Porosity of Bioretention Soil | n | 0.40 | - |
| Effective Ponding Depth | $PD_{eff}$ | **9.00** | in |
| Flow Coefficient | C | 0.19875 | -- |

Flow coefficient calculated per the County of San Diego BMP Design Manual, Page 471

$$C = c_g \left( \frac{605}{A_{LID}} \right) \left( \frac{\pi D^2}{8} \right) \sqrt{\frac{g}{6}}$$

Subcatchment Runoff Summary

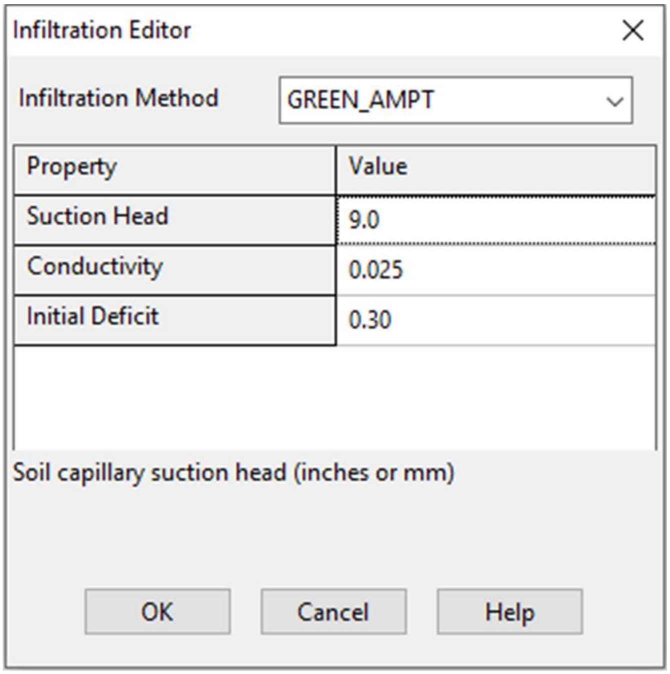
| Subcatchment | Total Precip in | Total Runon in | Total Evap in | Total Infil in | Imperv Runoff in | Perv Runoff in | Total Runoff in | Total Runoff 10^6 gal | Peak Runoff CFS | Runoff Coeff |
|---|---|---|---|---|---|---|---|---|---|---|
| EX-DMA-1 | 467.90 | 0.00 | 13.69 | 367.09 | 0.00 | 90.84 | 90.84 | 11.79 | 4.54 | 0.194 |
| DMA-1 | 467.90 | 0.00 | 84.49 | 56.81 | 376.64 | 343.43 | 340.04 | 12.28 | 1.20 | 0.727 |
| DMA-2 | 467.90 | 0.00 | 82.92 | 61.75 | 376.16 | 340.15 | 337.02 | 12.63 | 1.24 | 0.720 |
| DMA-3 | 467.90 | 0.00 | 82.95 | 53.41 | 379.27 | 348.06 | 344.86 | 14.14 | 1.36 | 0.737 |
| DMA-4 | 467.90 | 0.00 | 3.44 | 438.66 | 0.00 | 26.83 | 26.83 | 0.06 | 0.06 | 0.057 |
| DMA-5 | 467.90 | 0.00 | 3.34 | 436.53 | 0.00 | 29.58 | 29.58 | 0.04 | 0.04 | 0.063 |
| DMA-6 | 467.90 | 0.00 | 4.51 | 463.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 |
| DMA-7 | 467.90 | 0.00 | 3.37 | 436.87 | 0.00 | 29.07 | 29.07 | 0.19 | 0.19 | 0.062 |

LID Performance Summary

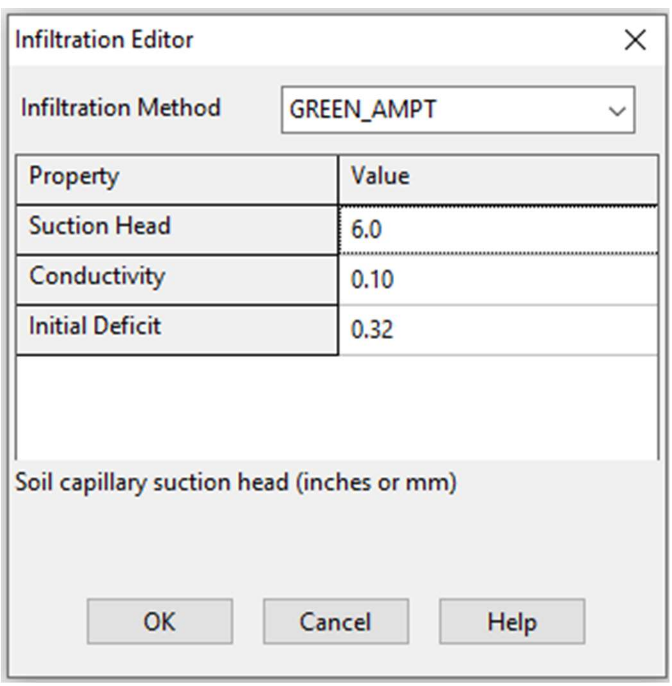
| Subcatchment | LID Control | Total Inflow in | Evap Loss in | Infil Loss in | Surface Outflow in | Drain Outflow in | Initial Storage in | Final Storage in | Continuity Error % |
|---|---|---|---|---|---|---|---|---|---|
| DMA-1 | BMP-1 | 11521.82 | 575.47 | 0.00 | 1519.73 | 9425.05 | 2.10 | 4.07 | -0.00 |
| DMA-2 | BMP-2 | 12496.16 | 577.06 | 0.00 | 1882.73 | 10034.82 | 2.10 | 4.07 | -0.00 |
| DMA-3 | BMP-3 | 13187.01 | 582.95 | 0.00 | 2240.31 | 10362.19 | 2.10 | 4.08 | -0.00 |

Green Amp Input Values

EX-1:

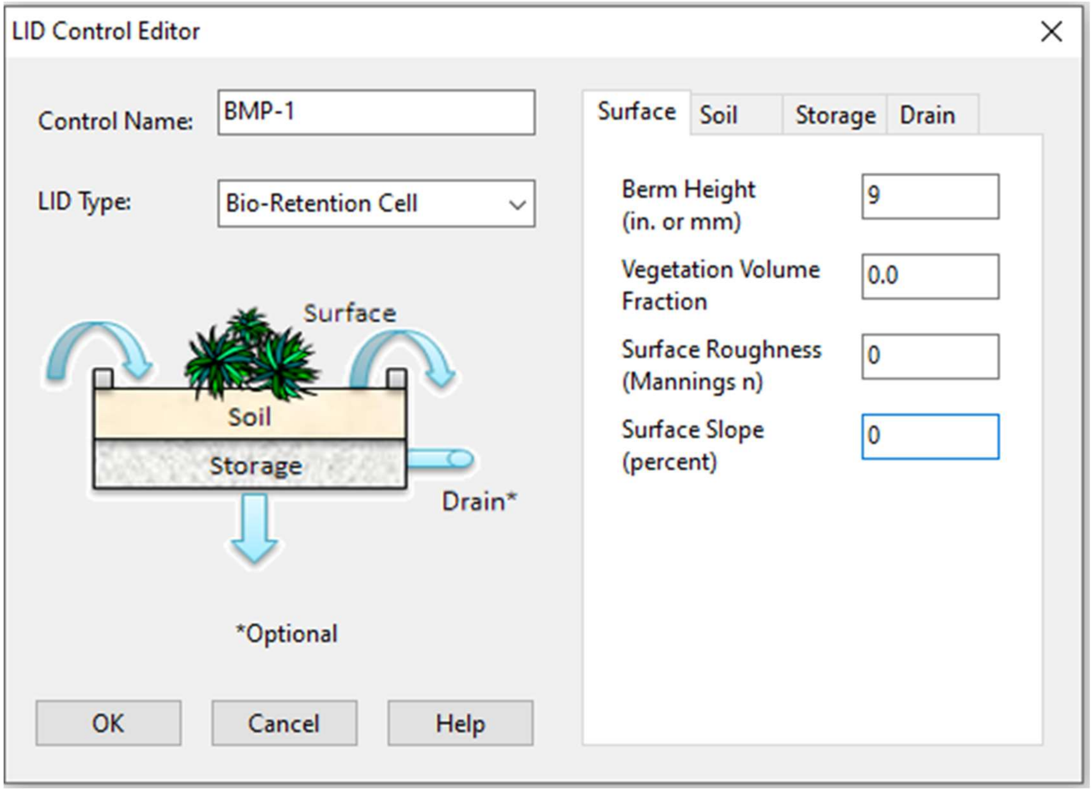


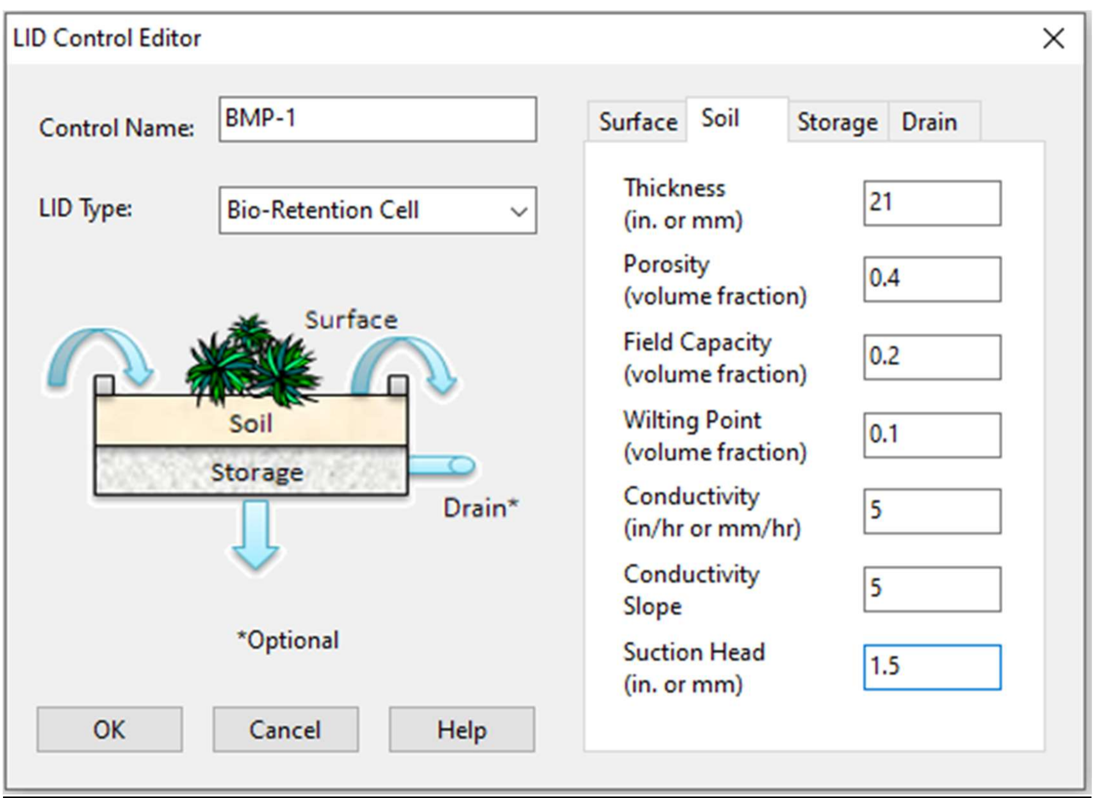

DMA-1 – DMA-7:

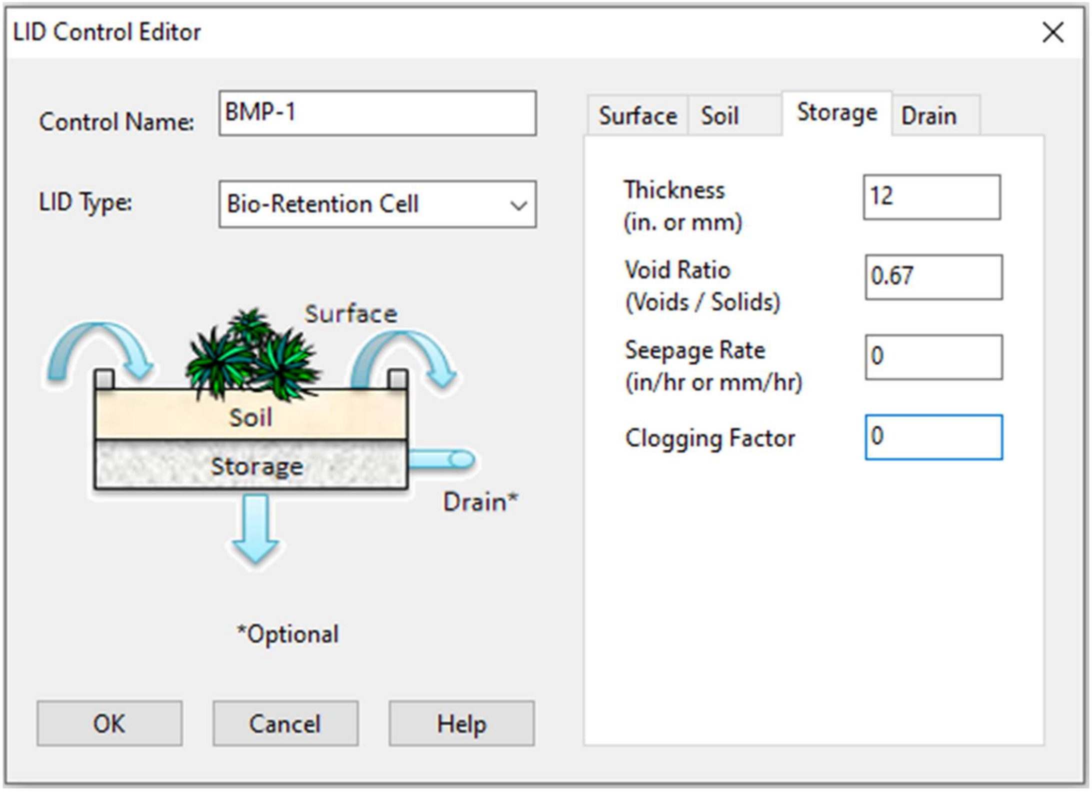


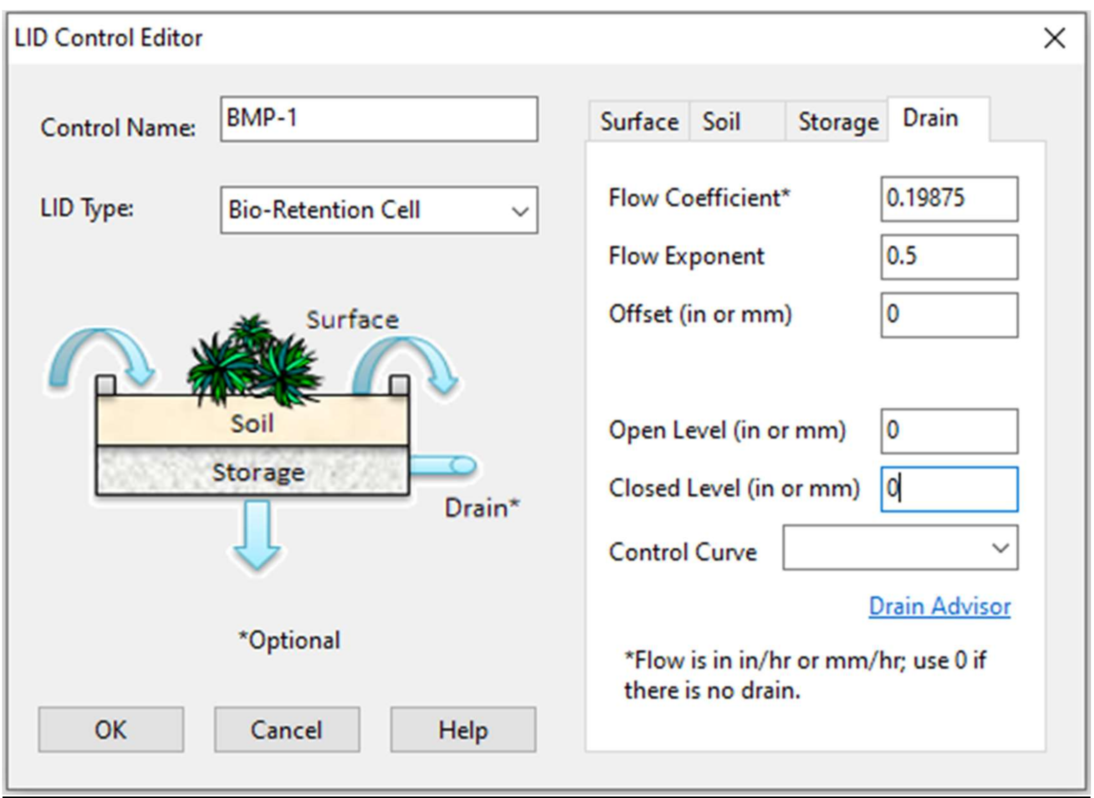

LID Editor:

BMP-1:

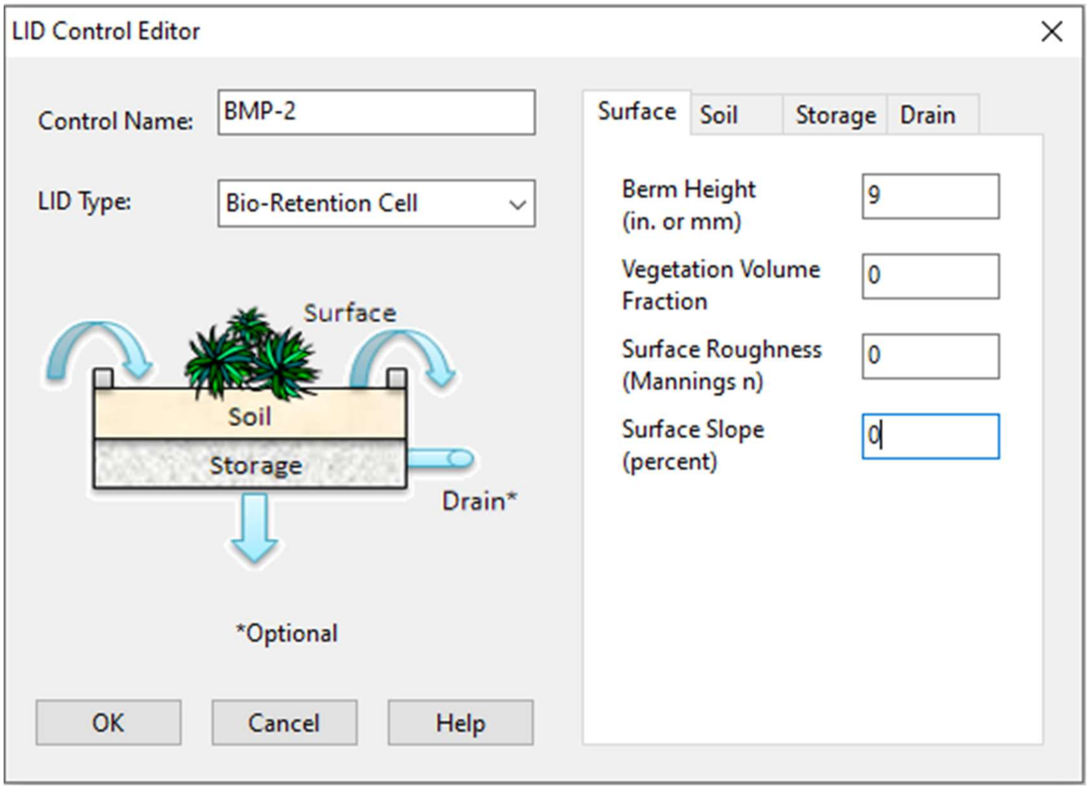

LID Control Editor
Control Name: BMP-1
LID Type: Bio-Retention Cell
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface
Soil
Storage
Drain
Berm Height (in. or mm) 9
Vegetation Volume Fraction 0.0
Surface Roughness (Mannings n) 0
Surface Slope (percent) 0


LID Control Editor
Control Name: BMP-1
LID Type: Bio-Retention Cell
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface
Soil
Storage
Drain
Thickness (in. or mm) 21
Porosity (volume fraction) 0.4
Field Capacity (volume fraction) 0.2
Wilting Point (volume fraction) 0.1
Conductivity (in/hr or mm/hr) 5
Conductivity Slope 5
Suction Head (in. or mm) 1.5


LID Control Editor
Control Name: BMP-1
LID Type: Bio-Retention Cell
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface Soil Storage Drain
Thickness (in. or mm) 12
Void Ratio (Voids / Solids) 0.67
Seepage Rate (in/hr or mm/hr) 0
Clogging Factor 0


LID Control Editor
Control Name: BMP-1
LID Type: Bio-Retention Cell
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface Soil Storage Drain
Flow Coefficient* 0.19875
Flow Exponent 0.5
Offset (in or mm) 0
Open Level (in or mm) 0
Closed Level (in or mm) 0
Control Curve
Drain Advisor
*Flow is in in/hr or mm/hr; use 0 if there is no drain.

BMP-2: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Control Name: BMP-2
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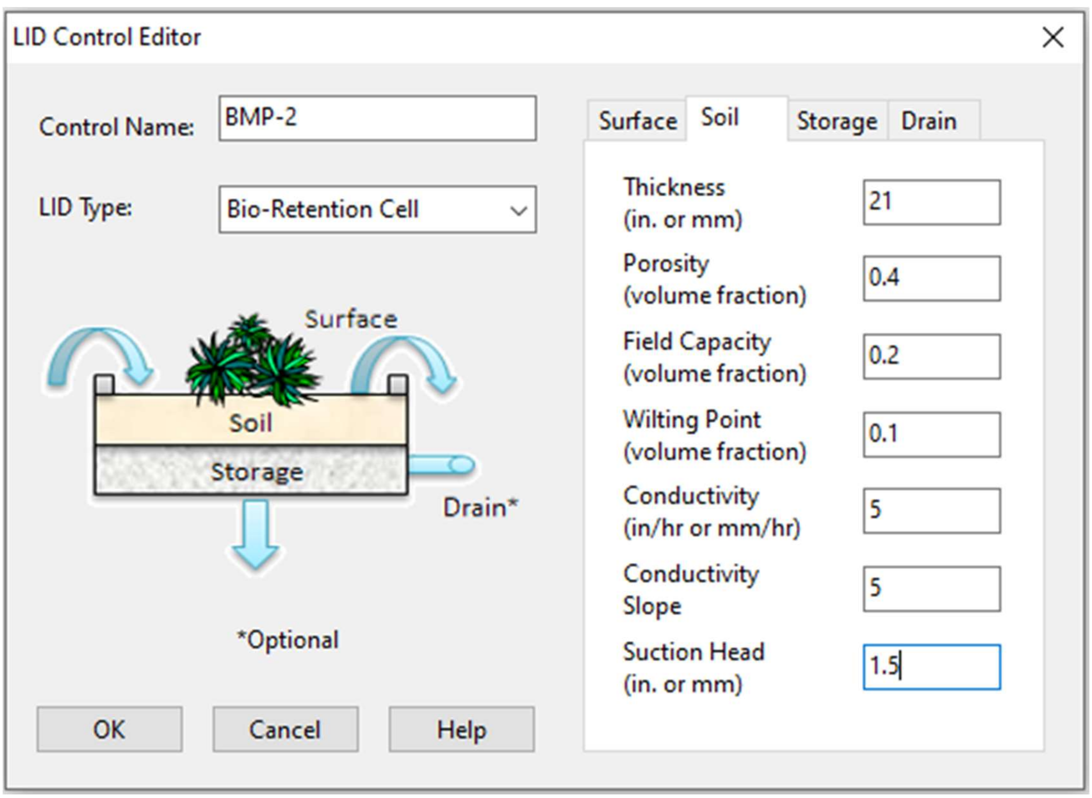
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface
Soil
Storage
Drain
Berm Height (in. or mm) 9
Vegetation Volume Fraction 0
Surface Roughness (Mannings n) 0
Surface Slope (percent) 0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Control Name: BMP-2
LID Type: Bio-Retention Cell
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Soil
Storage
Drain*
*Optional
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Cancel
Help
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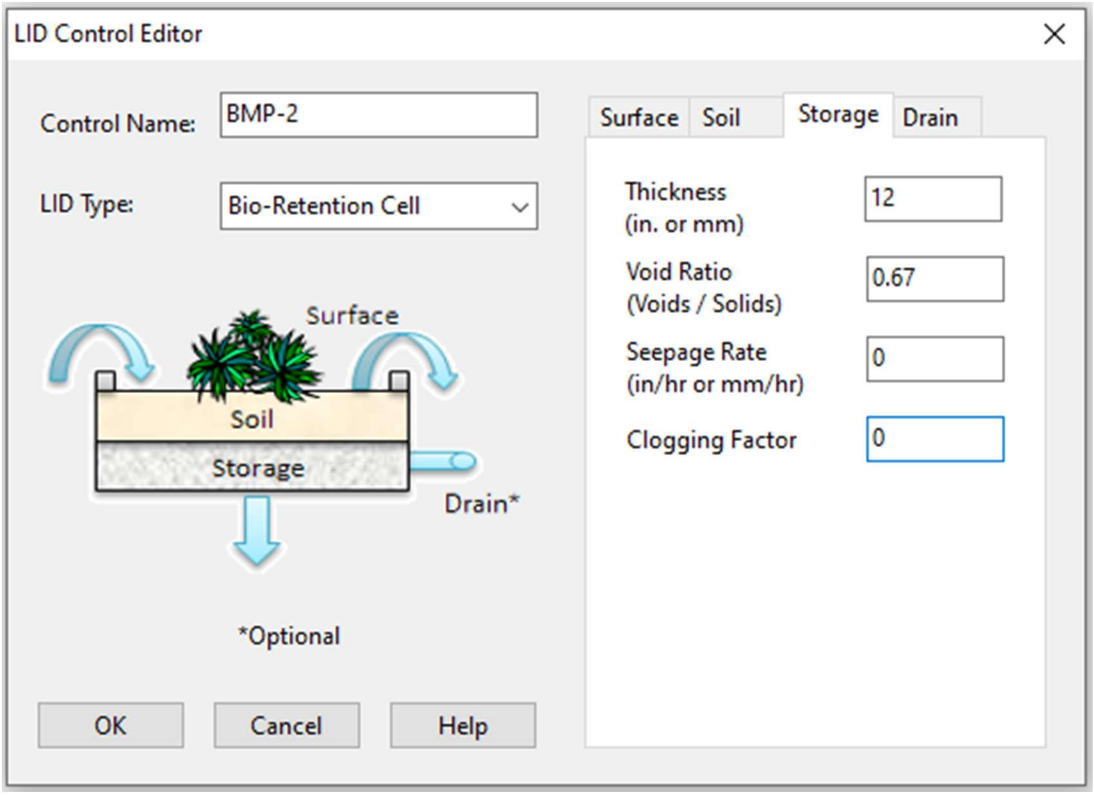
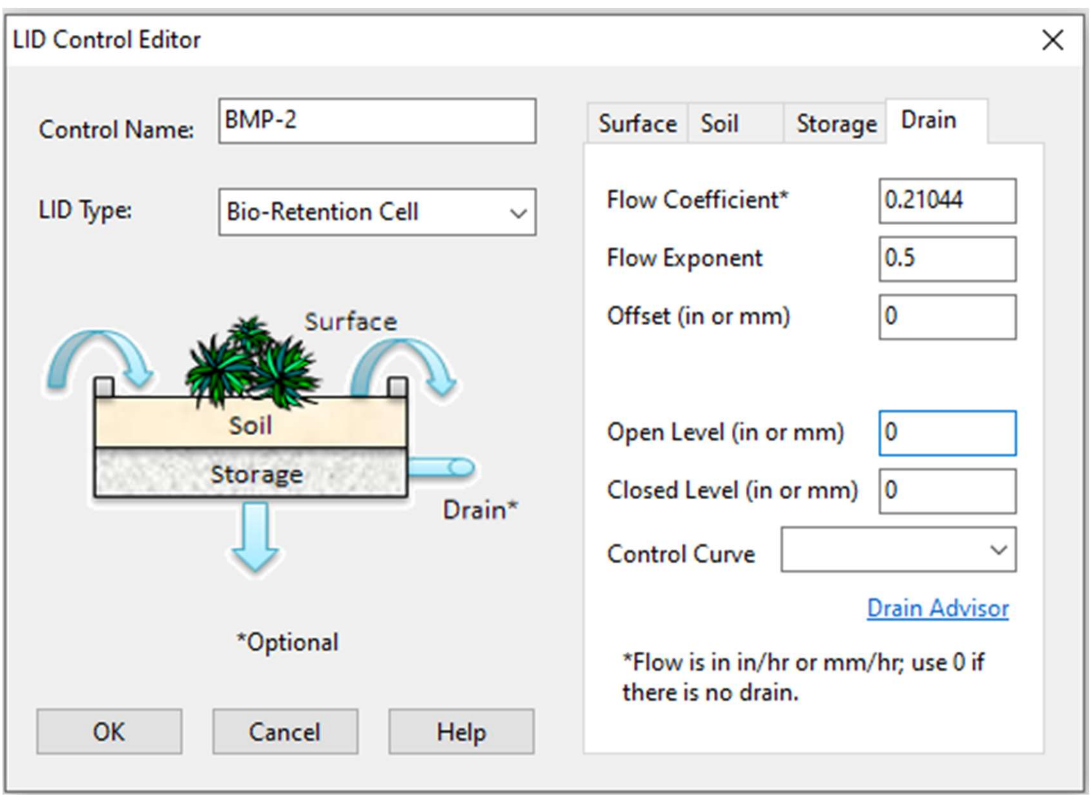
Soil
Storage
Drain
Thickness (in. or mm) 21
Porosity (volume fraction) 0.4
Field Capacity (volume fraction) 0.2
Wilting Point (volume fraction) 0.1
Conductivity (in/hr or mm/hr) 5
Conductivity Slope 5
Suction Head (in. or mm) 1.5


LID Control Editor
Control Name:
BMP-2
LID Type:
Bio-Retention Cell
Surface
Soil
Storage
Drain
Thickness
(in. or mm)
12
Void Ratio
(Voids / Solids)
0.67
Seepage Rate
(in/hr or mm/hr)
0
Clogging Factor
0
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help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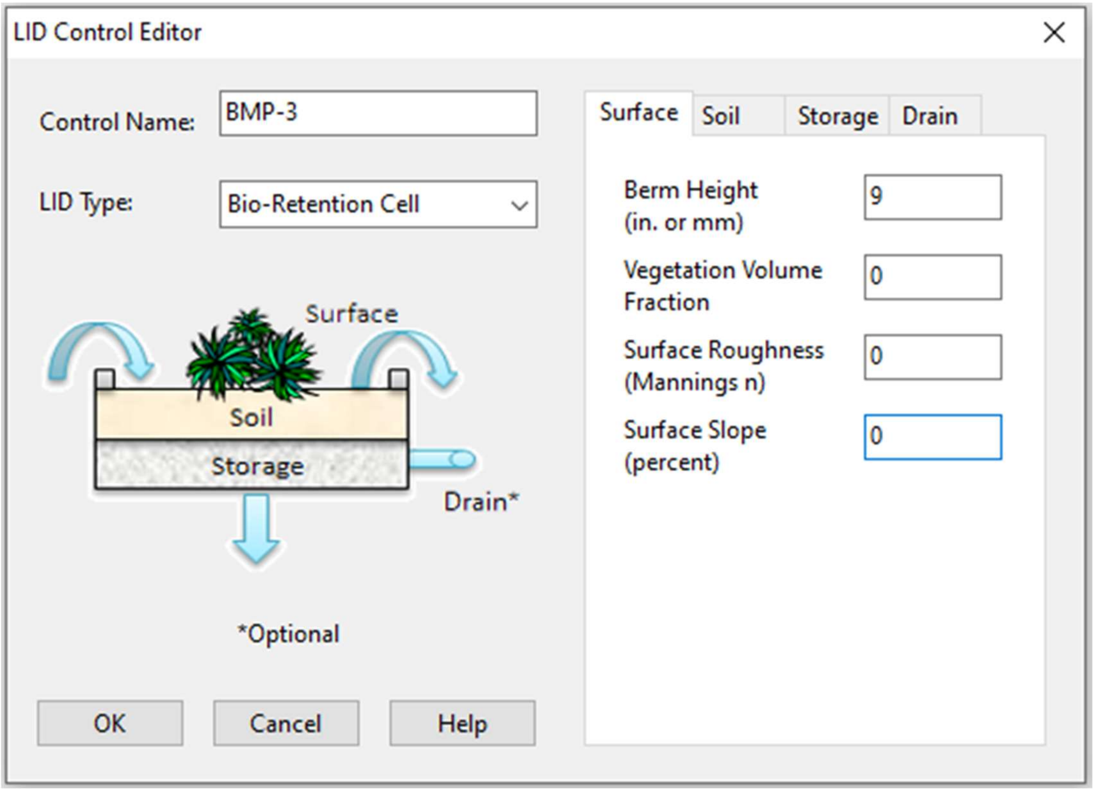
Control Name:
BMP-2
LID Type:
Bio-Retention Cell
Surface
Soil
Storage
Drain
Flow Coefficient*
0.21044
Flow Exponent
0.5
Offset (in or mm)
0
Open Level (in or mm)
0
Closed Level (in or mm)
0
Control Curve
Drain Advisor
*Flow is in in/hr or mm/hr; use 0 if there is no drain.
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help

BMP-3: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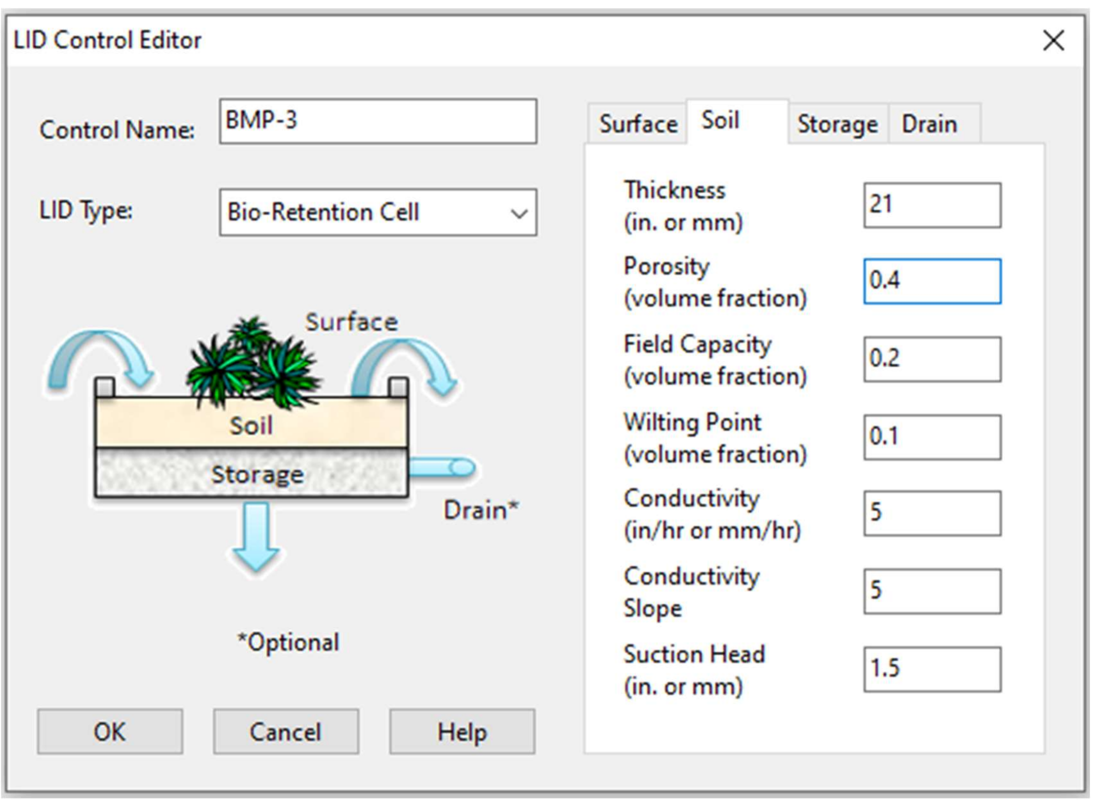
Control Name: BMP-3
LID Type: Bio-Retention Cell
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface
Soil
Storage
Drain
Berm Height
(in. or mm)
9
Vegetation Volume
Fraction
0
Surface Roughness
(Mannings n)
0
Surface Slope
(percent)
0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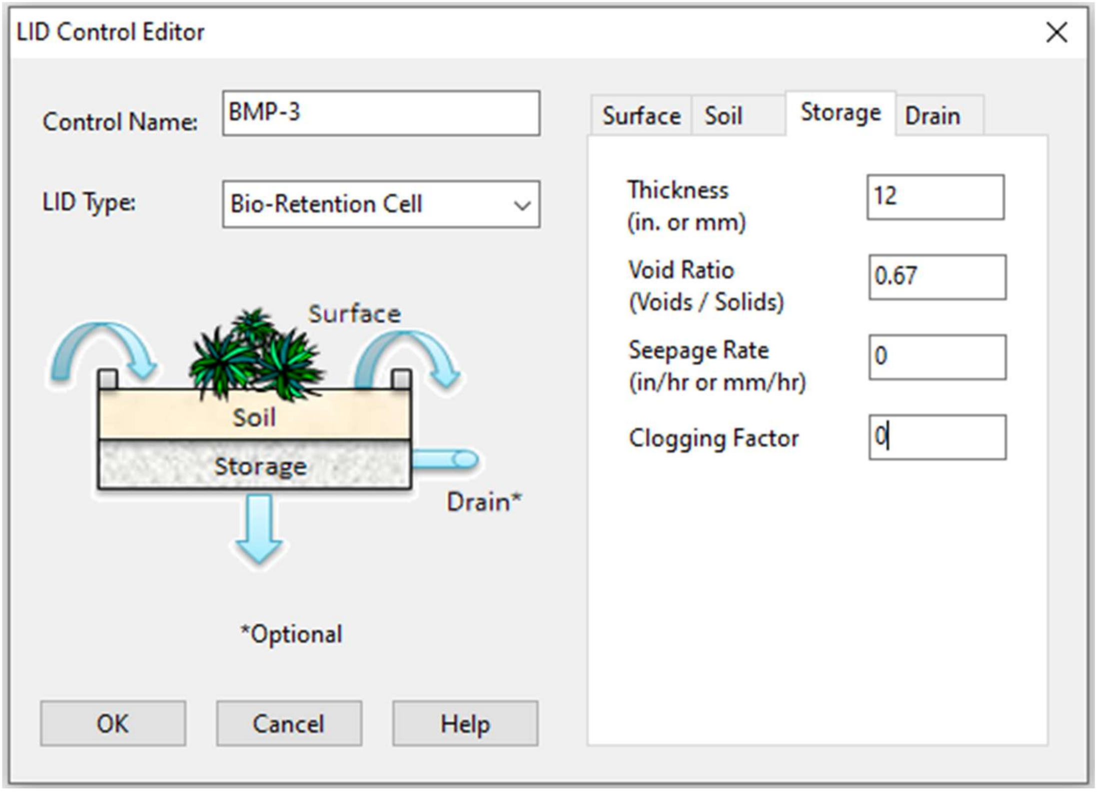
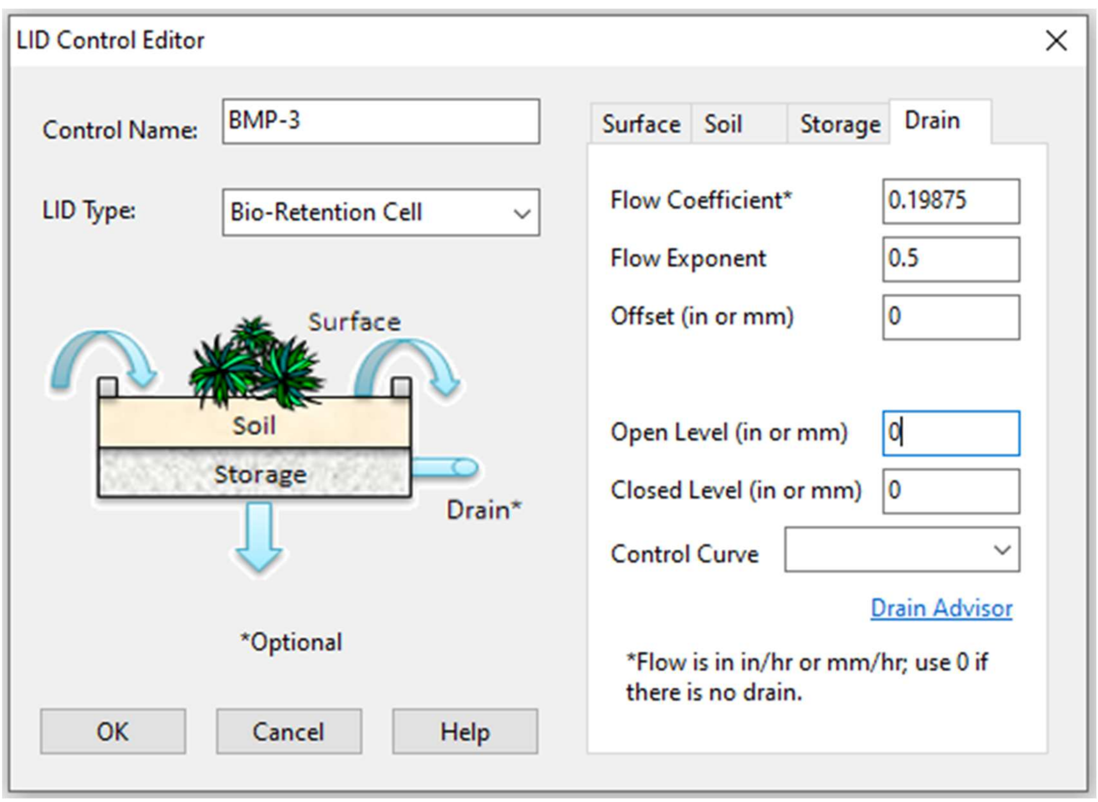
Control Name: BMP-3
LID Type: Bio-Retention Cell
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface
Soil
Storage
Drain
Thickness
(in. or mm)
21
Porosity
(volume fraction)
0.4
Field Capacity
(volume fraction)
0.2
Wilting Point
(volume fraction)
0.1
Conductivity
(in/hr or mm/hr)
5
Conductivity
Slope
5
Suction Head
(in. or mm)
1.5


LID Control Editor
Control Name: BMP-3
LID Type: Bio-Retention Cell
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface
Soil
Storage
Drain
Thickness
(in. or mm)
12
Void Ratio
(Voids / Solids)
0.67
Seepage Rate
(in/hr or mm/hr)
0
Clogging Factor
0


LID Control Editor
Control Name: BMP-3
LID Type: Bio-Retention Cell
Surface
Soil
Storage
Drain*
*Optional
OK
Cancel
Help
Surface
Soil
Storage
Drain
Flow Coefficient* 0.19875
Flow Exponent 0.5
Offset (in or mm) 0
Open Level (in or mm) 0
Closed Level (in or mm) 0
Control Curve
Drain Advisor
*Flow is in in/hr or mm/hr; use 0 if there is no drain.

**Improving Accuracy in Continuous Hydrologic Modeling:**

**Guidance for Selecting Pervious Overland Flow Manning's *n* Values in the San Diego Region**


Alex J. Smith, MS, EIT

Tory R. Walker, PE, CFM, LEED GA

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Vista, CA 92084

**Abstract**

Since the inception of the San Diego Hydromodification Management Plan (SD HMP), Tory R. Walker Engineering (TRWE) has become the local leader in site-specific hydromodification management BMP design using the EPA Storm Water Management Model (SWMM). TRWE has designed hydromodification management BMPs for over 100 projects throughout San Diego County. TRWE also continues to collaborate with San Diego Water Board staff, Copermittees, professional trade organizations, and environmental groups to inform and guide hydromodification management efforts within the San Diego Region. Keeping with our leadership and expertise, TRWE has taken the opportunity to provide additional guidance for practitioners who seek to design hydromodification management BMPs using SWMM. Specifically, this white paper serves as a technical resource for selecting appropriate pervious overland flow Manning's *n* values (N-Perv), as permitted by Appendix G of the San Diego Region Model BMP Design Manual (Model BMPDM) and subsequently adopted BMP Design Manuals for each San Diego County Copermittee. The desired outcome of this technical resource is to quickly guide those practitioners who seek to develop site-specific SWMM models that most accurately simulate the pre- and post-development hydrologic behavior exhibited throughout the San Diego Region. We have summarized our findings in a helpful table. We gladly welcome any comments, suggestions, or inquiries on the subject matter.

**Introduction**

The Model BMPDM Appendix G offers limited guidance to users of continuous simulation models, including Hydrological Simulation Program-Fortran (HSPF), San Diego Hydrology Model (SDHM), and Storm Water Management Model (SWMM). The guidance is provided through a series of narratives, tables, and figures. Sections G.1.4.2 to G.1.6.2 provide some direction to SWMM users, with the bulk of the information presented in Table G.1-4. The San Diego Copermittees have since adopted Model BMPDM Table G.1-4 into their own jurisdiction-specific BMP Design Manuals. When TRWE reviewed the Copermittees' BMP Design Manuals, we found that a source of significant inaccuracy has been propagated throughout: *the default assignment of short prairie grass for all pervious land surface cover*.

**The Default Value Will Likely Compromise Model Accuracy**

The implication of implementing the default pervious Manning's *n* value (N-Perv, or simply *n*) is that San Diego SWMM users will now regularly model all pervious surfaces as if they were covered by short prairie grass. We find several issues with this guidance.

First, there is no context provided as to what land surface cover is defined by "short prairie grass." In our dealings with this issue, we have found that opinions vary: some perceive short prairie grass to be any lightly to moderately vegetated surface cover, while others perceive it to describe a dense grass range. In the absence of a proper context, each is left to a subjective interpretation of the term. Therefore, TRWE conducted a scrupulous literature review to uncover the origin of "short prairie grass," in order that the appropriate interpretation may be understood by all vested parties. From our literature review we came to a clear definition of short prairie grass, as presented by the research that introduced the term.

David A. Woolhiser, a former United States Department of Agriculture (USDA) research hydraulic engineer, led a research effort to describe overland flow for small native short-grass prairie rangeland watersheds in western South Dakota[1]. In the literary record, we find the Manning's *n* for short prairie grass to be within the range 0.10 – 0.20, with the average (*n* = 0.15) taken as the conventional estimate (Woolhiser, 1975, p. 502), best described as short grasses with notable litter and nearly no exposed bare soil.

Having obtained a proper definition, we sought next to investigate the local existence of short prairie grass[2]. Based on our research and our experience in San Diego site development, we find that there are infrequent scenarios where an undeveloped open space hosts a pervious prairie-like surface cover—scenarios such as these may warrant the default estimate if they fit the above description. However, we find that redevelopment projects are normally characterized by a different set of known conditions, such as highly compacted soils, barren surface cover, or light vegetation. This reality leads to our second issue with the default estimate.

The BMP Design Manuals offer no distinction to assess what classification of pervious surface warrants the default estimate. In SWMM hydromodification management BMP design, pre- and post-development models are created to simulate the pre- and post-development hydrology, yet Table G.1-4 makes no differentiation between these scenarios. Also, as previously mentioned, no distinction is made between N-Perv application for new developments versus redevelopment projects, where existing site cover would differ considerably. Therefore, it is apparent in the BMP Design Manuals that pervious surfaces are also, by default, assumed to be short prairie grass in both the pre- and post-development scenarios, regardless of the project type, which is certainly not the case in reality. For instance: suppose a proposed redevelopment project seeks to develop a bare, existing graded lot into a multi-family residential dwelling. In the existing (pre-development) state, the site is completely pervious and has little to no vegetation. In the proposed (post-development) state, the site is mostly impervious, with a few lightly vegetated landscaped features. It is known that short prairie grasses (or similar) are not present either before or after development. In this scenario, the universal assignment of short prairie grass to all pre- and post-developed pervious surfaces would inevitably produce a hydrologic response that has no basis in reality, resulting in an incorrectly sized BMP footprint. We find that in order to model site-specific hydrology, selection of an alternative Manning's *n* value must be permitted, which leads to our third and final concern.

The BMP Design Manuals allow for a land surface description other than short prairie grass to be used for hydromodification BMP design only if documentation provided is consistent with Table A.6 of the SWMM 5 User's Manual. SWMM 5 User's Manual Table A.6 presents a short list of 18 land surface descriptions—most of which are rarely encountered in San Diego. The pervious land surface descriptions offered by SWMM 5 User's Manual Table A.6 are predominantly agricultural and fail to adequately describe local vegetation: fallow soils, cultivated soils, natural range, short prairie grass, dense grass, Bermuda grass, and woods with either light or dense underbrush. As one can readily infer from these

[1] This research is summarized on page 6 under "Summary of Research by David A. Woolhiser"
[2] Our findings are summarized on page 6 under "Local Existence of Short Prairie Grass"

listed surface descriptions, SWMM 5 User's Manual Table A.6 is notably limited for local application. Due to these limited options, the absence of additional references suitable for local use, and the streamlining appeal of a de facto value, we anticipate that jurisdictions will not be inclined to approve land surfaces other than short prairie grass. Therefore, in order to provide SWMM users with a wider range of land surfaces suitable for local application and to provide Copermittees with confidence in the design parameters, we recommend using the values published by Yen and Chow in Table 3-5 of the EPA SWMM Reference Manual Volume I – Hydrology.

**SWMM-Endorsed Values Will Improve Model Quality**

In January 2016, the EPA released the SWMM Reference Manual Volume I – Hydrology (SWMM Hydrology Reference Manual). The SWMM Hydrology Reference Manual complements the SWMM 5 User's Manual and SWMM 5 Applications Manual by providing an in-depth description of the program's hydrologic components (EPA 2016). Table 3-5 of the SWMM Hydrology Reference Manual expounds upon SWMM 5 User's Manual Table A.6 by providing Manning's *n* values for additional overland flow surfaces[3]. The values are provided in Table 1:

**Table 1: Manning's *n* Values for Overland Flow (EPA, 2016; Yen 2001; Yen and Chow, 1983).**

| Overland Surface | Light Rain (< 0.8 in/hr) | Moderate Rain (0.8-1.2 in/hr) | Heavy Rain (> 1.2 in/hr) |
|---|---|---|---|
| Smooth asphalt pavement | 0.010 | 0.012 | 0.015 |
| Smooth impervious surface | 0.011 | 0.013 | 0.015 |
| Tar and sand pavement | 0.012 | 0.014 | 0.016 |
| Concrete pavement | 0.014 | 0.017 | 0.020 |
| Rough impervious surface | 0.015 | 0.019 | 0.023 |
| Smooth bare packed soil | 0.017 | 0.021 | 0.025 |
| Moderate bare packed soil | 0.025 | 0.030 | 0.035 |
| Rough bare packed soil | 0.032 | 0.038 | 0.045 |
| Gravel soil | 0.025 | 0.032 | 0.045 |
| Mowed poor grass | 0.030 | 0.038 | 0.045 |
| Average grass, closely clipped sod | 0.040 | 0.050 | 0.060 |
| Pasture | 0.040 | 0.055 | 0.070 |
| Timberland | 0.060 | 0.090 | 0.120 |
| Dense grass | 0.060 | 0.090 | 0.120 |
| Shrubs and bushes | 0.080 | 0.120 | 0.180 |
| **Land Use** | | | |
| Business | 0.014 | 0.022 | 0.035 |
| Semibusiness | 0.022 | 0.035 | 0.050 |
| Industrial | 0.020 | 0.035 | 0.050 |
| Dense residential | 0.025 | 0.040 | 0.060 |
| Suburban residential | 0.030 | 0.055 | 0.080 |
| Parks and lawns | 0.040 | 0.075 | 0.120 |

[3] Further discussion is provided on page 6 under "Discussion of Differences Between Manning's *n* Values"

For purposes of local hydromodification management BMP design, these Manning's *n* values are an improvement upon the values presented by Engman (1986) in SWMM 5 User's Manual Table A.6. Values from SWMM 5 User's Manual Table A.6, while completely suitable for the intended application to certain agricultural land covers, come with the disclaimer that the provided Manning's *n* values are valid only for shallow-depth overland flow that match the conditions in the experimental plots (Engman, 1986, p. 51). Engman's experimental plots (predominantly agricultural) subject to high simulated rainfall intensities (2 to 4 inches/hour) do not represent typical conditions in San Diego County. Furthermore, it has been well documented that an increase in rainfall intensity produces a corresponding increase in the overland flow roughness factor for laminar flows on smooth surfaces (Engman, 1986, pp. 43, 51; Liang, 2010, p. 126; Wenzel, 1970, p. 23; Yen, 2001, p. 6.51); this relationship is noteworthy due to the common occurrence of sparsely vegetated overland flow surfaces in San Diego County. Based upon review of the Project Clean Water Oceanside hourly rainfall data, the range of geomorphically significant ($Q_2$ through $Q_{10}$) peak flow events are, on average, precipitated by rainfall events with intensities of less than 0.2 inches/hour (with an average maximum storm intensity of 0.55 inches/hour). Therefore, we recommend the use of "Light Rain" (or "Low") Table 1 values for site-specific SWMM design because: (1) these parameters provide estimates that describe land surfaces commonly encountered in San Diego, (2) account for the effect of local rainfall intensities, (3) are acknowledged to reflect empirical runoff behavior, (4) were developed for storm drainage facility design, and (5) are recommended for generalized use with EPA SWMM by the EPA (EPA, 2016; Yen, 2001; Yen and Chow, 1983). The Table 1 values are consistent with the intent and use of SWMM as a continuous simulation tool and provide both the SWMM user and Copermittee with a suite of locally relevant design values published by an authoritative source and intended for kinematic wave modeling purposes.

**References**

Engman, E.T. (1986). Roughness Coefficients for Routing Surface Runoff. *ASCE Journal of Irrigation and Drainage Engineering, 112*(1), 39-53.

Environmental Protection Agency (EPA). (2016). *Storm Water Management Model Reference Manual Volume I – Hydrology*. Cincinnati, OH: National Risk Management Laboratory, Office of Research and Development.

Liang, J. (2010). Evaluation of Runoff Response to Moving Rainstorms (Doctoral dissertation). Available from Marquette University.

Rebman, J.P., & Simpson, M.G. (2014). *Checklist of the Vascular Plants of San Diego County* (5th ed.). San Diego, CA: San Diego Natural History Museum.

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Sproul, F., Keeler-Wolf, T., Gordon-Reedy, P., Dunn, J., Klein, A., Harper, K. (2001). *Vegetation Classification Manual for Western San Diego County*. AECOM, California Department of Fish and Game Vegetation Classification and Mapping Program, and the Conservation Biology Institute.

United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (2016, February). *PLANTS Database*. Retrieved from USDA website http://plants.usda.gov.

Wenzel, H.G. (1970). WRC Research Report No. 34: The Effect of Raindrop Impact and Surface Roughness on Sheet Flow. *Project No. B-018-ILL*. Urbana, IL: University of Illinois, Water Resources Center.

Woolhiser, D. A. (1975). Chapter 12: Simulation of Unsteady Overland Flow. In K. Mahmood and V. Yevjevich (Eds.), *Unsteady Flow in Open Channels, Vol. II* (pp. 500-502). Fort Collins, CO: Water Resources Publications.

Woolhiser, D. A., Hanson, C. L., & Kuhlman, A. R. (1970). Overland Flow on Rangeland Watersheds. *Journal of Hydrology, (NZ)*, *9*(2), 336-356.

Yen, B.C. (2001). Chapter 6: Hydraulics of Sewer Systems. In L.M. Mays (Ed.), *Stormwater Collection Systems Design Handbook*. New York, NY: McGraw-Hill.

Yen, B.C., and Chow, V.T. (1983). *Local Design Storms* (Vols. 1-3). *Report No. FHWA-RD-82-063 to 065*. Washington, DC: United States Department of Transportation, Federal Highway Administration.

**ADDITIONAL REFERENCES**

**Summary of Research by David A. Woolhiser**

As presented in the 1970 publication of Woolhiser's research, vegetation samples from within each experimental watershed collectively defined short prairie grass as a compilation of the following short grasses and sedges (p. 344):

- buffalograss (*Buchloe dactyloides*)
- blue grama (*Bouteloua gracilis*)
- threadleaf sedge (*Carex filifolia*)
- needleleaf sedge (*Carex eleocharis*)
- Sandberg's bluegrass (*Poa secunda*)

Basal covers from these experimental watersheds were composed of *at least* 58% of the said short grasses and sedges, 23% litter, and 8% forbs, rocks, and bare soil (Woolhiser, 1970, p. 344). Woolhiser (1975) later summarized his research into a textbook that presented the overland flow roughness for short prairie grass in terms of a Manning's *n* value. For the first time in the literary record, we find the Manning's *n* for short prairie grass to be within the range 0.10 – 0.20, with the average (*n* = 0.15) taken as the conventional estimate (Woolhiser, 1975, p. 502). Therefore, we reasonably conclude that "short prairie grass" land cover is best described by a given area with basal cover composed by at least half of any combination of the five aforementioned (or similar) short grasses with notable litter and nearly no exposed bare soil.

**Local Existence of Short Prairie Grass**

According to the United States Department of Agriculture (USDA) and National Resources Conservation Service's (NRCS) PLANTS Database, only Sandberg's bluegrass (*Poa secunda*) is present within San Diego County. The San Diego County Plant Atlas has established the existence of unspecified densities of *Poa secunda* within predominantly undevelopable localities (Anza-Borrego Desert State Park, Camp Pendleton Marine Corps Base, Cleveland National Forest, Palomar Mountain State Park, etc.). In 2011, Sproul, Keeler-Wolf, Gordon-Reedy, Dunn, Klein, and Harper produced the Vegetation Classification Manual for Western San Diego County, which serves to confirm the limited existence of *Poa secunda*, as suggested by the SD County Plant Atlas (pp. 5-32, 5-43, 5-51, 5-53). Based upon the findings provided through available literature, there emerges a significant lack of evidence to support the notion that short prairie grasses are representative of developable pervious land surfaces (rural or urban) within San Diego watersheds. Therefore, to assume pervious land surfaces to be dominated by the 6 to 12 inch tall blue grama or the densely-rooted sod-like structure of buffalograss is found to have no technical basis for default assignment within the San Diego Region.

**Discussion of Differences Between Manning's *n* Values**

Table 3-5 of the SWMM Hydrology Reference Manual provides Manning's *n* values for overland flow published by Crawford and Linsley (1966) from calibration of the Stanford Watershed Model, Engman

(1986) from runoff plot data originally collected for erosion studies, and Yen (2001) for SWMM application by kinematic wave analysis modified for composite land surfaces of heterogeneous nature. The SWMM Hydrology Reference Manual recommends the values for use in SWMM in conjunction with adjusting the subcatchment width parameter to calibrate the model. However, in the absence of recorded rainfall-runoff data for each proposed site development, site-specific model calibration is not possible for BMP design purposes. The inability to calibrate does not prohibit physically based site-specific hydrologic models from calculating reasonable outputs, so long as the model inputs reflect the site conditions (Yen 2001).

It has been well documented that increases in rainfall intensity produce a corresponding increase in the overland flow roughness factor for laminar flows on smooth surfaces (Engman, 1986, pp. 43, 51; Liang, 2010, p. 126; Wenzel, 1970, p. 23; Yen, 2001, p. 6.51). Engman's (1986) experimental plots were subject to high rainfall intensities (2 to 4 inches/hour) (p. 51), were assumed to be turbulent (p. 44), and had varying degrees of non-vegetated cover (p. 51). If the flows from these experimental plots were incorrectly assumed to be turbulent, then the sensitive relationship between rainfall intensity and surface roughness may explain the higher *n* values for Engman's non-vegetated surfaces when compared with those from Yen & Chow. Yen's values address this sensitive relationship through the inclusion of a rainfall intensity constant in the development of his Manning's *n* values (low, medium, and high roughness values corresponding to low, medium, and high rainfall intensities).

Manning's *n* comparison between various authors is also not straightforward due to the ambiguous relationship between terms. Engman provides *n* values for fallow ground, chisel plow, disk/harrow, no till, moldboard plow, coulter, range, and grass (1986, p. 51). When compared to Yen's land surface descriptions, no clear equation between terms can be clearly established. Therefore, we find that the inconsistency between values does not compromise the integrity of either dataset, but should be observed with the unique experimental context in mind, as has been conducted by Engman (1986, pp. 49-51). Based upon the literature review, we believe that Yen's values lend themselves to be a more reliable set of values for site-specific hydrology of lightly vegetated sites subject to known low rainfall intensities, whereas Engman's values favor application for densely vegetated undisturbed sites subject to higher rainfall intensities. Finally, we note that the same source should be used for selection of both pre- and post-developed pervious roughness values, as selecting separate values from differing sources will undoubtedly compromise model accuracy.

**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 Thresholds and Actions (Required) | ☐ Included<br><br>See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet. |
| Attachment 3b | Draft Maintenance Agreement (when applicable) | ☐ Included<br>☐ Not Applicable |

**ATTACHMENT 3 WILL BE PROVIDED IN MINISTERIAL REVIEW**

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

☒ **Preliminary Design / Planning / CEQA level submittal:**

Attachment 3a must identify:

☒ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual

Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

☐ **Final Design level submittal:**

Attachment 3a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP 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 private entity operation and maintenance, Attachment 3b shall include a draft maintenance agreement in the local jurisdiction's standard format (PDP applicant to contact the [City Engineer] to obtain the current maintenance agreement forms).

## ATTACHMENT 4
## Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

**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 Form I-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 the [City Engineer]

☒ 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 shall be provided. Photocopies of general brochures are not acceptable.

# ATTACHMENT E

Project Facility Availability Form – Sewer

# CITY OF SANTEE

## PROJECT FACILITY AVAILABILITY FORM, Sewer

***Please type or use pen***

Cameron Brothers Construction Co., L.P. (619) 562-3050
Owner's Name — Phone

10580 Prospect Avenue - Suite 200
Owner's Mailing Address — Street

Santee — CA — 92071
City — State — Zip

ORG ____
ACCT ____
ACT ____
TASK ____
DATE ____
AMT $ ____

**S**

*DISTRICT CASHIER'S USE ONLY*

**SECTION 1. PROJECT DESCRIPTION** — **TO BE COMPLETED BY APPLICANT**

A. ☐ Major Subdivision (TM)
☐ Minor Subdivision (TPM)
☐ Boundary Adjustment
☐ Rezone (Reclassification) from ____ to ____ zone.
☒ Major Use Permit (MUP), purpose: RV Storage Facility
☐ Time Extension?Case No. ____
☐ Expired Map?Case No. ____
☐ Other ____
☐ Specific Plan or Specific Plan Amendment
☐ Certificate of Compliance: ____

Assessor's Parcel Number(s)
(Add extra if necessary)

| | |
|---|---|
| 387-061-11 | 387-061-12 |
| | |
| | |
| | |

B. ☐ Residential . . . . . . Total number of dwelling units ____
☒ Commercial. . . . . . Gross floor area 219, 918 sqft.
☐ Industrial . . . . . . . Gross floor area ____
☐ Other . . . . . . . . . . Gross floor area ____

Thomas Bros. Page 1251 Grid F1

8355 Graves Avenue
Project address — Street

Santee — 92071
Community Planning Area/Subregion — Zip

C. ☒ Total Project acreage 5.04 Total number of lots 2

D. Is the project proposing its own wastewater treatment plant? ☐ Yes ☒ No
Is the project proposing the use of reclaimed water? ☐ Yes ☒ No

Owner/Applicant agrees to pay all necessary construction costs, dedicate all district required easements to extend service to the project.
OWNER/APPLICANT MUST COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: [signature] Date: 3-17-2023

Address: 10580 Prospect Ave, Suite 200, Santee, CA 92071 Phone: 619-562-3050

**(On completion of above, present to the district that provides water protection to complete Section 2 below.)**

**SECTION 2: FACILITY AVAILABILITY** — **TO BE COMPLETED BY DISTRICT**

***LETTER EXPIRES 4/24/2024

District Name: **PADRE DAM MUNICIPAL WATER DISTRICT** Service area WSA

A. ☒ Project is in the district.
☐ Project is not in the district but is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the district and is not within its Sphere of Influence boundary.
☐ The project is not located entirely within the district and a potential boundary issue exists with the ____ District.

B. ☒ Facilities to serve the project ☒ ARE ☐ ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached ____. (Number of sheets)
☐ Project will not be served for the following reason(s): ____

C. ☒ District conditions are atttached. Number of sheets attached: 1
☐ District has specific water reclamation conditions which are attached. Number of sheets attached: ____
☐ District will submit conditions at a later date.
☐ Additional District conditions: ____

D. ☐ How far will the pipeline(s) have to be extended to serve the project? ____

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized signature: [signature] Print name VINCENT E. DEANDA

Print title ENG. TECH / PROJECT MANAGER Phone 619-258-4636 Date 04/21/2023

**NOTE: THIS DOCUMENT IS NOT A COMMITMENT OF SERVICE OR FACILITIES BY THE DISTRICT**
On completion of Section 2 by the district, applicant is to submit this form with application to:
Department of Development Services, 10601 Magnolia Avenue, Santee, CA 92071

PADRE DAM
Municipal Water District

9300 Fanita Parkway, Santee
**619-258-4635**

**SEWER AVAILABILITY ATTACHMENT**
**CONDITIONS OF APPROVAL**

PROJECT NAME: Cameron Bros. Storage FOR: Cameron Brothers Construction MAP NUMBER: ______________

Address/A.P.N.(s) 387-061-11 & 12

**FACILITIES**

Project location and proposed grading information is necessary to determine if the proposed project will require a public sewer main extension. A sewer study may be needed based on the complexity of the improvements. If a sewer main extension is necessary, the following will be requirements to proceed with the project. The Developer / Property Owner shall:

[ X ] Prepare plans for a Public Sewer system according to Padre Dam's Requirements. Deposits for plan review shall be paid in accordance with Padre Dam's rules and regulations. Plans will be reviewed by Padre Dam for conformance to adopted design guidelines, specifications, and standards.

[ X ] Provide the applicable agreements and securities required by the County / City and/or Padre Dam to install the public sewer system required for the project. Agreements shall be fully executed, securities shall be in place, and the deposit for inspection services shall be in place prior to commencement of construction and/or recordation of a Final Map.

[ X ] Install a Sewer System per the Padre Dam Rules and Regulations and Standard Specifications. Water services shall not be established until installation, testing, and acceptance of the water system by Padre Dam. For phased construction, a phasing plan shall be submitted for review and approval by Padre Dam.

[ X ] Pay for all installation and capacity fees for each lateral connection, each lot, or each building. (As determined by project need prior to District providing service or a commitment letter) Sewer services shall not be established until installation, testing, and acceptance of the sewer system by Padre Dam. For phased construction, a phasing plan shall be submitted for review and approval by Padre Dam.

[ X ] Install private/public potable water, reclaimed water and sewer lines with the required separation as determined by the Health Department and Padre Dam.

Padre Dam does not require that all lots be connected to the public sewer system. Alternate sources of sewer disposal are under the jurisdiction of the County of San Diego, or the City of Santee.

**EASEMENTS**

[ X ] Dedicate to Padre Dam all necessary easements for installation, operation , access, and maintenance of that portion of the sewer system which is to be public. All easements shall be dedicated to Padre Dam and accepted prior to the installation of the sewer lateral. Easements shall be dedicated free and clear from exclusions.

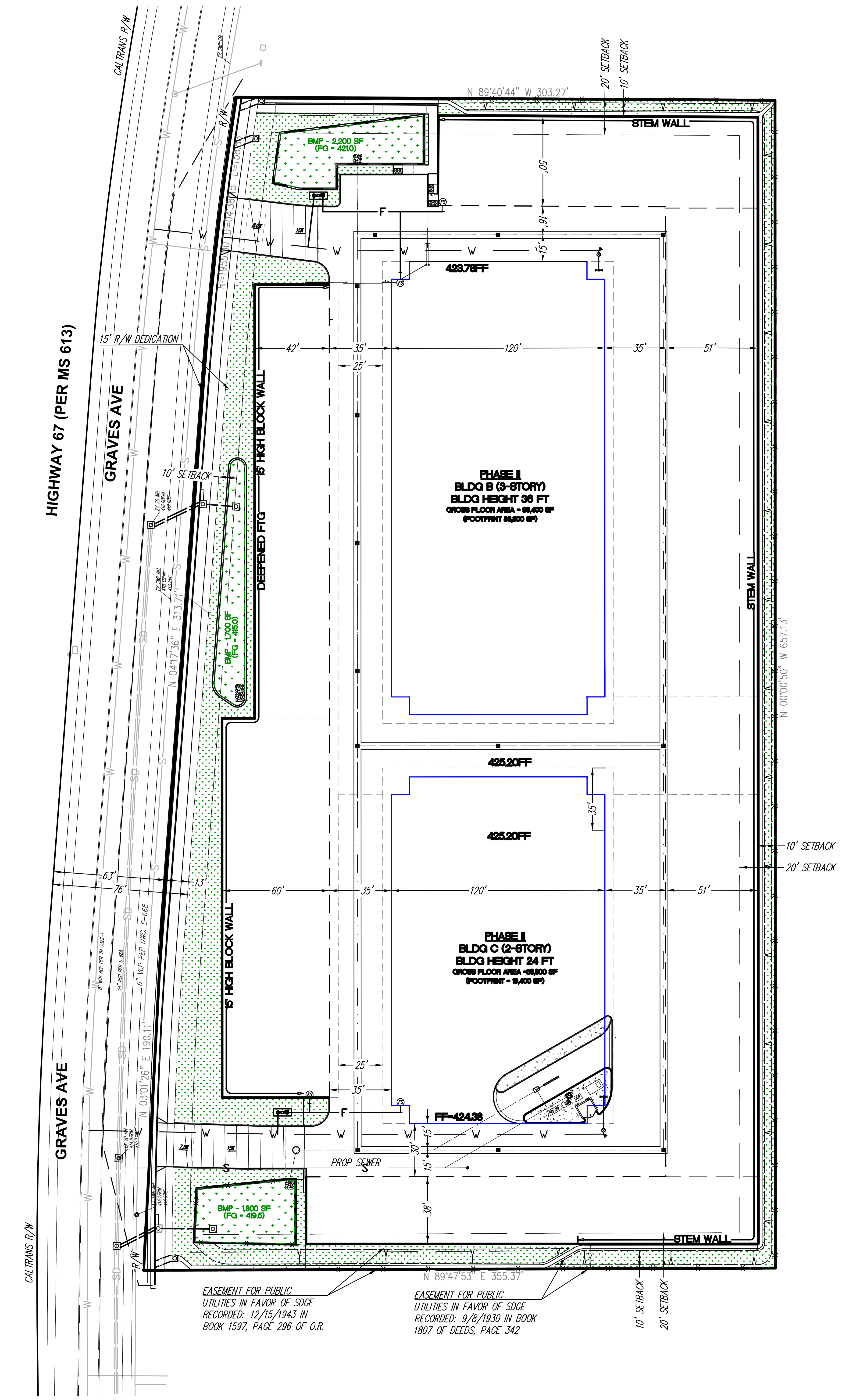
[ X ] Dedicate offsite easements that may be required by Padre Dam to allow for future main extensions to serve property beyond the boundaries of the map/project. Offsite easements shall be dedicated and accepted by Padre Dam prior to commencement of construction. Developer is responsible for all costs and expenses related to obtaining easements outside of the property boundary.

**SPECIAL CONDITIONS**

[ X ] Sewer mains, services, and appurtenances shall not be located in within 5' of post construction storm water quality BMP, retaining wall, structures, or large trees. Appurtenances shall not be placed in areas with decorative pavement. Exceptions may be granted at the discretion of the Director of Engineering and will require an Encroachment Agreement.

[ X ] Any existing sewer services not used as part of this project are to be abandoned at the main by Padre Dam at developer expense and removed from the ground by the developer.

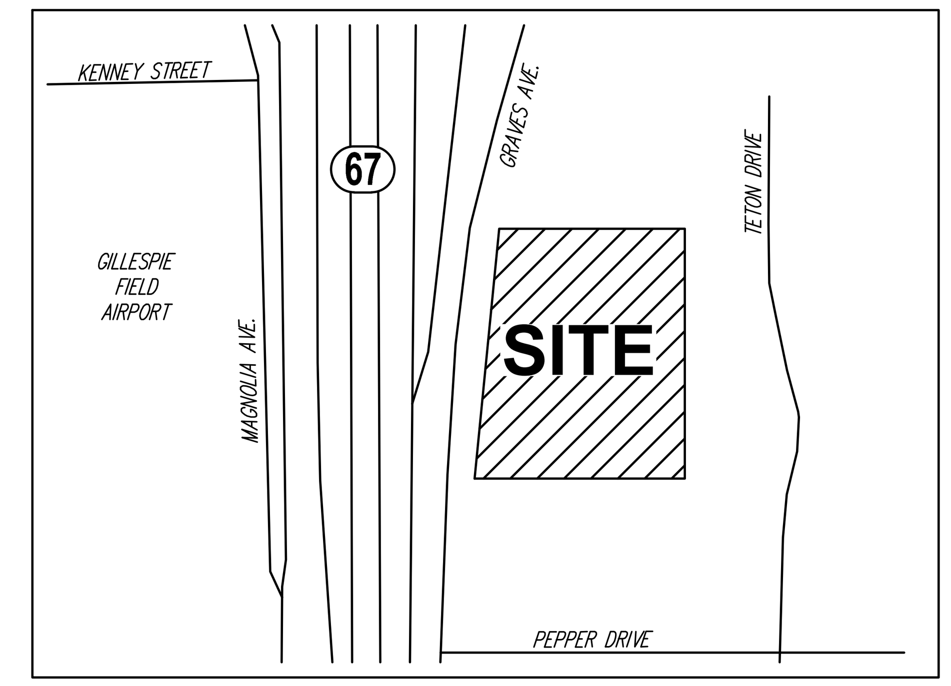
Approved by: Vincent E. De Anda
Date: 04/21/2023

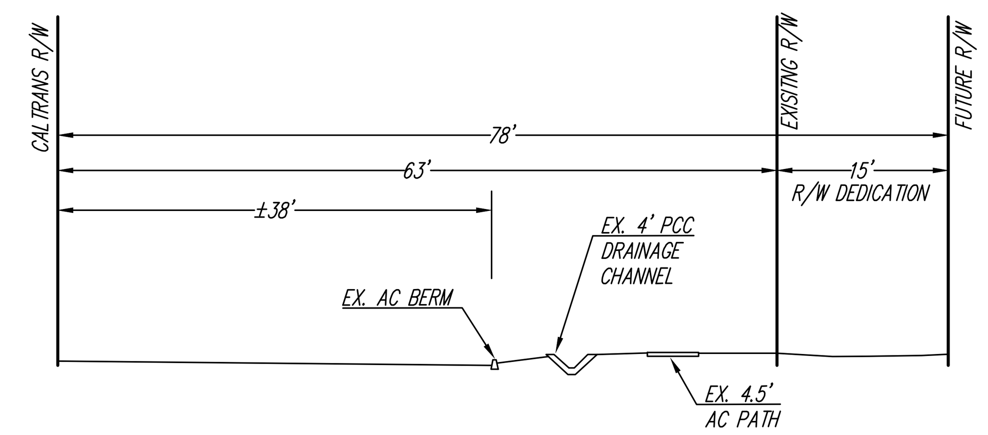



SITE PLAN - PHASE 2

## VICINITY MAP:

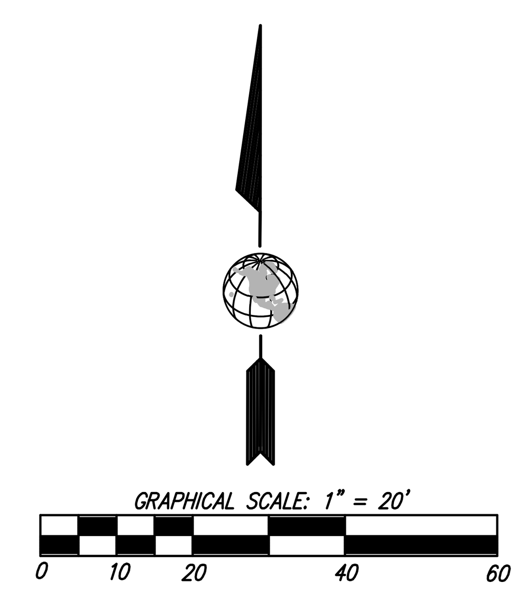
NOT TO SCALE




## GRAVES AVE TYPICAL SECTION:

NOT TO SCALE




## PROJECT DATA:

| | |
|---|---|
| SITE ADDRESS | 8355 GRAVES AVENUE (VACANT LOT)<br>SANTEE, CA 92071 |
| APN | 387-061-11 & 387-061-12 |
| SITE AREA (GROSS) | 219,720 SQ. FT.<br>(5.04 ACRES) |
| SITE AREA (NET) | 209,687 SQ. FT.<br>(4.81 ACRES) |
| R/W DEDICATION | 10,033 SQ. FT.<br>(0.23 ACRES) |

## BUILDING AREAS:

### PHASE 2

| | | |
|---|---|---|
| BUILDING 'A' | - | SQ. FT. (OFFICE) |
| BUILDING 'B' | 98,400 | SQ. FT. (3-STORY) |
| BUILDING 'C' | 38,800 | SQ. FT. (2-STORY) |
| PHASE 2 TOTAL | 137,200 | SQ. FT. |

## SITE COVERAGE:

| | |
|---|---|
| BUILDING FOOTPRINTS | 86,150 SQ. FT. (41.0%) |
| DRIVEWAYS / PARKING | 91,025 SQ. FT. (43.6%) |
| WALKWAYS | 880 SQ. FT. (0.4%) |
| LANDSCAPED AREA | 26,087 SQ. FT. (12.4%) |
| UNDISTURBED AREA | 0.0 SQ. FT. (0.0%) |
| RETENTION AREA | 5,545 SQ. FT. (2.6%) |
| TOTAL | 209,687 SQ. FT. (100%) |

## PARKING TABULATION:

| | |
|---|---|
| REQUIRED | 1 / 5,000 SQ. FT. = 34.23 SPACES |
| PROVIDED | 35.00 SPACES |
| RV PARKING | 1 - 12'x30'<br>36 - 12'x40' |
| TOTAL | 37 SPACES |

## OWNER / DEVELOPER:

CAMERON BROTHERS CONSTRUCTION CO., L.P.
10580 PROSPECT AVENUE -SUITE 200
SANTEE, CA 92071

CONTACT: CHRIS COOK
PHONE: 619.562.3050
EMAIL: CHRIS@CAMERONBROS.NET

## ARCHITECT:

VIALLI ARCHITECTURAL GROUP
12 JOURNEY - SUITE 270
ALISO VIEJO, CA 92656

CONTACT: ARIEL L. VALLI
PHONE: 949.349.1777
EMAIL: ARIEL@VIALLIARCH.COM

## CIVIL ENGINEER:

OMEGA ENGINEERING CONSULTANTS, INC.
4340 VIEWRIDGE AVENUE - SUITE B
SAN DIEGO, CA 92123

CONTACT: SEAN SAVAGE
PHONE: 858.634.8620
EMAIL: SEAN@OMEGA-CONSULTANTS.COM

## SETBACKS:

| | | |
|---|---|---|
| PARKING/LANDSCAPE: | FRONT | 10 FT |
| | SIDE | 10 FT |
| | REAR | 10 FT |
| BUILDING: | FRONT | 10 FT |
| | SIDE | 20 FT |
| | READ | 20 FT |

## FAA NOTES:

BASED ON FAA LETTER DATED 9/28/2022, BLDG C SHALL NOT EXCEED 27 FT. HEIGHT (FROM 426 MSL)

PLANS PREPARED BY:

**OMEGA ENGINEERING CONSULTANTS, INC.**
4320 Viewridge Avenue, Suite C, San Diego, CA 92123
T:858.634.8620 | F:858.634.8627 [ OEC Project Number 0654.20 ]

REGISTERED PROFESSIONAL ENGINEER
SEAN M. SAVAGE
No. 75677
CIVIL
STATE OF CALIFORNIA

SEAN M. SAVAGE R.C.E. 75677 — 3/27/2023 DATE

CITY OF SANTEE

**PERMIT NO:**

APPLICANT: CAMERON BROTHERS CONSTRUCTION CO, L.P.
ASSESSORS PARCEL NO(S): 387-061-11-00 & 387-061-12-00
REQUEST:

PC RESOLUTION NO:
CC RESOLUTION NO:
ORDINANCE NO:

C-2

# ATTACHMENT F

Project Facility Availability Form – Water

# CITY OF SANTEE

## PROJECT FACILITY AVAILABILITY FORM, Water

*Please type or use pen*

Cameron Brothers Construction Co., L.P. (619) 562-3050
Owner's Name / Phone

10580 Prospect Avenue - Suite 200
Owner's Mailing Address / Street

Santee / CA / 92071
City / State / Zip

ORG
ACCT
ACT
TASK
DATE
AMT $

*DISTRICT CASHIER'S USE ONLY*

**W**

**SECTION 1. PROJECT DESCRIPTION** — **TO BE COMPLETED BY APPLICANT**

A. ☐ Major Subdivision (TM) ☐ Specific Plan or Specific Plan Amendment
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance:
☐ Boundary Adjustment
☐ Rezone (Reclassification) from ______ to ______ zone.
☒ Major Use Permit (MUP), purpose: RV Storage Facility
☐ Time Extension?Case No.
☐ Expired Map?Case No.
☐ Other

Assessor's Parcel Number(s)
(Add extra if necessary)

| | |
|---|---|
| 387-061-11 | 387-061-12 |
| | |
| | |
| | |

B. ☐ Residential...... Total number of dwelling units
☒ Commercial...... Gross floor area 219, 918sqft.
☐ Industrial ....... Gross floor area
☐ Other .......... Gross floor area

C. ☒ Total Project acreage 5.04 Total number of lots 2

D. Is the project proposing the use of groundwater? ☐ Yes ☒ No
Is the project proposing the use of reclaimed water? ☐ Yes ☒ No

Thomas Bros. Page 1251 Grid F1

8355 Graves Avenue
Project address / Street

Santee 92071
Community Planning Area/Subregion / Zip

Owner/Applicant agrees to pay all necessary construction costs, dedicate all district required easements to extend service to the project and COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: [signature] Date: 3-17-2023

Address: 10580 Prospect Ave, Suite 200, Santee, CA 92071 Phone: 619-562-3050

**(On completion of above, present to the district that provides water protection to complete Section 2 below.)**

**SECTION 2: FACILITY AVAILABILITY** — **TO BE COMPLETED BY DISTRICT**

*****LETTER EXPIRES**

District Name: HELIX ~~PADRE DAM MUNICIPAL~~ WATER DISTRICT Service area WEST EL CAJON GRAVITY, HGL=656'

A. ☑ Project is in the district.
☐ Project is not in the district but is within its Sphere of Influence boundary, owner must apply for annexation.
☐ Project is not in the district and is not within its Sphere of Influence boundary.
☐ The project is not located entirely within the district and a potential boundary issue exists with the ______ District.

B. ☑ Facilities to serve the project ☑ ARE ☐ ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached ______. (Number of sheets)
☐ Project will not be served for the following reason(s):

C. ☑ District conditions are attached. Number of sheets attached: 3
☐ District has specific water reclamation conditions which are attached. Number of sheets attached:
☐ District will submit conditions at a later date.
☐ Additional District conditions:

D. ☑ How far will the pipeline(s) have to be extended to serve the project? TO BE DETERMINED AT A LATER DATE.

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized signature: [signature] Print name ANELD ANUB

Print title ASSOCIATE ENGINEER Phone 619-667-6273 Date 4-11-23

**NOTE: THIS DOCUMENT IS NOT A COMMITMENT OF SERVICE OR FACILITIES BY THE DISTRICT**
On completion of Section 2 by the district, applicant is to submit this form with application to:
**Department of Development Services, 10601 Magnolia Avenue, Santee, CA 92071**

**STANDARD WATER DISTRICT'S**
**CONDITIONS BEFORE APPROVAL OF A PROJECT**

W01 ☒ The plans and specifications for the installation of a water system to serve each lot independently with public water must be approved by the serving water district.

W02 ☒ The developer shall install the water system according to the serving water district standards, and dedicate to the serving water district the portion of the water system which is to be public water.

W03 ☒ The developer shall comply with the County and serving water district standards and policies, and conditions contained in a secured agreement to install the water system concurrent with project need.

W04 ☒ The developer shall dedicate to the serving water district all necessary easements for that portion of the water system which is to be public water.

W05 ☒ Adequate water service shall be committed for this project prior to final approval/map recordation of the subdivision map and shall be available concurrent with project need.

W06 ☒ All buildings in this project shall be connected to public water according to the water permit and approval process of the serving water district.

W07 ☐ The developer shall apply for and pay the costs of annexing all the land within the project to the serving water district for operation and maintenance of the public water system.

W08 ☒ Water and sewer lines shall not be laid in the same trench in any part of this project development.

W09 ☒ Water and sewer lines must have 10-foot horizontal separation in this project.

W10 ☒ 8" PVC water main required and _____ -6" fire hydrants with 2 -2 1/2" and 1 -4" outlets as required by the ~~El Cajon~~ SANTEE Fire Department.

W11 ☐ Upgrade existing fire hydrant with new head with _____ -2 1/2" and _____ -4" outlets as required by the __________.

W12 ☒ Install _____ -6" fire hydrant(s) with 2 -2 1/2" and 1 -4" outlets as required by the SANTEE ~~El Cajon~~ Fire Department.

W13 ☒ Backflow prevention will be required on all water meters, properties with fire sprinkler systems, properties served by a well, and/or on landscape irrigation water meters.

## SECTION 4.11 WATER CONSERVATION AND DEVELOPMENT/REDEVELOPMENT PROCEDURE FOR WATER EFFICIENCY

### 4.11-1 GENERAL

Helix Water District hereby establishes a comprehensive water conservation and water efficiency program for new development or redevelopment within the district.

The district finds that water conservation and water efficiency in all new residential or commercial development or redevelopment is essential to the district's continued ability to provide water to new and redeveloped areas and to avoid or minimize the effects of any future shortage.

### 4.11-2 REQUIREMENTS

All new commercial and residential developments or redevelopments shall install only high-efficiency appliances, use only high-efficiency watering technologies and landscape using water-wise principles as follows:

**A.** Install the following indoor fixtures in all residential (houses, condominiums, apartments) and commercial areas (if applicable):

1. High-efficiency toilets (1.28 gallons or less per flush).

2. High-efficiency dishwashers (Energy Star, WaterSense or equivalent).

3. High-efficiency clothes washers (meets or exceeds the CEE Tier 1 standard).

4. Low-flow shower heads (1.8 gallons per minute or less).

**B.** Design and install landscaping in all parks, common areas, commercial, industrial, multi-family and residential landscapes in compliance with the most recent Department of Water Resources model ordinance or the water efficient landscape ordinance and the Maximum Applied Water Allowance set forth by the local land use agency, as applicable.

**C.** Install dedicated meters for outdoor water use:

1. In single-family residences with one or more acre(s) of irrigated landscape.

2. In all parks and common areas.

3. In commercial/government/multi-family sites with 5,000 square feet or more of irrigated landscape.

**D.** Enroll all new irrigation meters (except those at single-family residences) in the district's water budget program and provide documentation of irrigated landscape area at the time of meter purchase.

**E.** Install automatic irrigation controllers with automatic rain delay that utilize either evapotranspiration (weather-based) or soil moisture data at all homes (residential areas), common areas, parks and commercial landscapes.

**F.** If using overhead spray to irrigate, high-efficiency, matched-precipitation rate sprinkler nozzles are required at all homes (residential landscapes), common areas, parks and commercial landscapes.

Any project that requires a permit, plan check or design review by local planning agencies is considered a redevelopment.

## 4.11-3 PROCEDURE

Executive Order B-29-15 required the Department of Water Resources to update the existing model water efficient landscape ordinance established pursuant to the Water Conservation in Landscaping Act (California Government Code Section 65591 and following) and AB 1881. The updated Department of Water Resources model ordinance serves as a model ordinance for all cities and counties to adopt mandatory water efficient landscape ordinances for new and rehabilitated landscaping projects. EB B-29-15 makes the DWR model ordinance automatically applicable within the jurisdiction of each city and county that has not adopted its own water efficient landscape ordinance or the DWR model ordinance. Effective December 1, 2015, new and rehabilitated landscape projects shall comply with the provisions of the most recent DWR model ordinance or the water efficient landscape ordinance as adopted or implemented by the applicable local land use agency.

# ATTACHMENT G

Sustainable Santee Action Plan Consistency and Implementation Tracking Checklist

# Sustainable Santee Action Plan Consistency and Implementation Tracking Checklist

The Sustainable Santee Action Plan Project Consistency Checklist (Checklist) is intended to be a tool for development projects to demonstrate consistency with Santee's (City's) Sustainable Santee Action Plan, which is a qualified greenhouse gas (GHG) emissions reduction plan in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15183.5. This Checklist has been developed as part of the Sustainable Santee Action Plan implementation and monitoring process and will support the achievement of individual GHG reduction measures as well as the City's overall GHG reduction goals. In addition, this Checklist will further the City's sustainability goals and policies that encourage sustainable development and aim to conserve and reduce the consumption of resources, such as energy and water, among others.

CEQA Guidelines Section 15183.5 allows lead agencies to analyze the impacts associated with GHG emissions at a programmatic level in plan-level documents such as Climate Action Plans or sustainability plans, so that project-level environmental documents may tier from the programmatic review. Projects that meet the requirements of this Checklist will be deemed to be consistent with the Sustainable Santee Action Plan and will be found to have a less than significant contribution to cumulative GHG (i.e., the project's incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b). Projects that do not meet the requirements in this Checklist will be deemed to be inconsistent with the Sustainable Santee Action Plan and must prepare a project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible. This GHG Checklist can be updated to reflect adoption of new GHG reduction strategies or to comply with any changes and updates in the Plan or local, State or federal regulations.

## 1. Project Information

| | |
|---|---|
| **Contact Information** | |
| **Project No./Name:** | 8355 Graves Avenue RV and Self-Storage Project |
| **Address:** | 8355 Graves Avenue, Santee, CA 92071 |
| **Applicant Name:** | Cameron Brothers Company, LLC |
| **Contact Information:** | Jim Moxham |
| | 10580 Prospect Avenue, Suite 200 |
| | Santee, CA 92071 |
| **Project Description Characteristics** | |
| **1. What is the size of the Project (acres)?** | 4.85 acres |
| **2. Identify all Applicable Proposed Land uses:** | |
| **a. Residential-Single Family (Indicate number of single-family units)** | |
| **b. Residential-Multifamily (Indicate number of multifamily units)** | |
| **c. Commercial (total square footage)** | 136,000 square feet |
| **d. Industrial (total square footage)** | |
| **e. Other (describe)** | |
| **3. Provide a brief description of the project proposed:** | See below. |

The project site is located at 8355 Graves Avenue (Assessor Parcel Numbers 387-061-11 and -12) in the city of Santee, California. The 4.85-acre project site is currently undeveloped. The project would be constructed in two phases. Phase 1 would construct a 178-space recreational vehicle (RV) storage facility with associated parking, landscaping, and retention areas. Phase 2 would remove 97 of the RV parking spaces to construct two self-storage buildings totaling 136,600 square feet. Building A would be a 90,600-square-foot, three-story building and Building B would be a 46,000-square-foot, two-story building.

| 2. Determining Land Use Consistency | | |
|---|---|---|
| **Checklist Item** | | |
| **As the first step in determining the consistency with the Sustainable Santee Action Plan for the discretionary development projects, this section allows the City to determine the project's consistency with the land use assumptions used in the Plan.** | | |
| | **Yes** | **No** |
| **1. Is the proposed project consistent with the existing General Plan and land use zoning designations? OR** | ✔ See attached for additional explanation | |
| **2. If the proposed project is not consistent with the existing land use plan and zoning designations, does the project include a land use plan and/or zoning designation amendment that is identified in the Sustainable Santee Action Plan Land Use Buffer (see Appendix A, Table 11)?** | | |
| **3. If the proposed project is not consistent with the existing land use plan, zoning designations, or Land Use Buffer, does the project include a land use plan and/or zoning designation ammendment that will result in an equivalent or less GHG-intensive project when compared to the existing designations?** | | |

Notes:

For questions 1, if the answer is **Yes**, proceed to the Sustainable Santee Action Plan Consistency Checklist. If the answer is **No**, procced to question 2.

For question 2, if the answer is **Yes**, proceed to the Sustainable Santee Action Plan Consistency Checklist. If the answer is **No**, proceed to question 3.

For question 3, if the answer is **Yes** provide estimated project emissions under both existing and proposed designation (s) for comparison. Compare the maximum buildout of the existing designation and the maximum buildout of the proposed designation. If the answer of question 3 is **No** then, in accordance with the City's Significance Determination Thresholds, the project's GHG impact may be significant. The project must nonetheless incorporate each of the applicable measures identified in the Checklist to mitigate cumulative GHG emissions impacts unless the decision maker finds that a measure is infeasible in accordance with CEQA Guidelines Section 15091.

| Sustainable Santee Action Plan CEQA Project Consistency Checklist | | | | | Notes |
|---|---|---|---|---|---|
| **Greenhouse Gas Reduction Measure** | **Measure Applicability** | | | | This checklist is to be filled out by the applicant |
| | **Yes** | **No** | **N/A** | **Description** | |
| **Emissions Measures Category: Energy Efficiency** | | | | | Measure 1.1 is not on checklist because it focuses on minor residental alterations not subject to CEQA |
| **Land Use Sector-Residential** | | | | | |
| **Goal 1. Increase Energy Efficiency in Existing Residential Units** | | | | | |
| Measure 1.2. For existing Residential Unit Permit for Major Modifications (more than 30% of dwelling unit size, including bathroom and kitchen) that is considered a Project under CEQA must implement energy efficiency retrofits recommended from City Energy Audit and explain the energy efficiency retrofits implemented. | | | ✔ | The project does not include existing residential uses. | Measure 1.2 only applies if alteration is subject to CEQA |
| **Goal 2. Increase Energy Efficiency in the New Residential Units** | | | | | |
| Measure 2.1. New residential construction meet or exceed California Green Building Standards Tier 2 Voluntary Measures, such as obtaining green building ratings including LEED, Build it Green, or Energy Star Certified building certifications in scoring development and explain the measures implemented. | | | ✔ | The project does not include existing residential uses. | |
| **Land Use Sector-Commercial** | | | | | Measure 3.1 is not on checklist because it focuses on minor alterations which are not subject to CEQA |
| **Goal 3. Increase Energy Efficiency in Existing Commercial Units** | | | | | |
| Measure 3.2. For existing commercial units of 10,000 sq. ft. or more seeking building permits for modifications representing 30% or more sq. ft, and considered a Project under CEQA must implement energy efficiency retrofits recommended by the City to meet California Green Building Standards Tier 1 Voluntary Measures and explain the retrofits implemented. | | | ✔ | The project does not include existing commercial or industrial uses. | Measure 3.2 only applies if alteration is subject to CEQA |
| **Goal 4. Increase Energy Efficiency in New Commercial Units** | | | | | |
| Measure 4.1. New commercial units meet or exceed California Green Building Standards Tier 2 Voluntary Measures such as obtain green building ratings including: LEED, Build it Green, or Energy Star Certified buildings certifications in scoring development and explain the measures implemented. | ✔ | | | The project would implement all mandatory CalGreen measures in addition to all feasible voluntary CalGreen measures. Solar PV will be installed on-site to reduce energy usage, drought-tolerant landscaping will be planted to reduce water usage, and the building will include a cool roof to reduce the urban heat island effect. | |
| | | | | | |
| **Emissions Measures Category: Advanced Goals Measures** | | | | | |
| **Land Use Sector-Commercial** | | | | | |
| **Goal 5. Decrease Energy Demand through Reducing Urban Heat Island Effect** | | | | | |
| Measure 5.1. Project utilizes tree planting for shade and energy efficiency such as tree planting in parking lots and streetscapes. | ✔ | | | The project would include landscaping along project frontages and throughout the project site to provide shade. | |
| Measure 5.2. Project uses light-reflecting surfaces such as enhanced cool roofs on commercial buildings. | ✔ | | | All buildings would include TPO (thermoplastic polyolefin) compliant roofs. | |
| | | | | | |
| **Emissions Measures Category: Transportation** | | | | | |
| **Land Use Sector-Residential and Commercial** | | | | | |
| **Goal 6. Decrease GHG Emissions through a Reduction in VMT** | | | | | |
| Measure 6.1. Proposed project streets include sidewalks, crosswalks, and other infrastructure that promotes non-motorized transportation options. | ✔ | | | See attached. | |
| Measure 6.2. Proposed project installs bike paths to improve bike transit. | ✔ | | | See attached. | |

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| **Land Use Sector-Residential and Commercial** | | | | | |
| **Goal 7: Increase Use of Electric Vehicles** | | | | | |
| Measure 7.1. Install electric vehicle chargers in all new residential and commercial developments. | | | | | |
| a. For new Single-Family Residential, install complete 40 Amp electrical service and one e-charger. | | | ✔ | The project does not include residential uses. | |
| b. For new Multifamily Residential, install e-chargers for 13 percent of total parking. | | | ✔ | The project does not include residential uses. | |
| c. For new Office Space, Regional Shopping Centers, and Movie Theaters, install e-chargers for 5 percent of total parking spaces. | | | ✔ | The project does not include office uses, regional shopping centers, or movie theaters. | |
| d. For new Industrial and other Land Uses employing 200 or more employees, install e-charges for 5 percent of total parking spaces. | | | ✔ | The project would not include more that 200 employees. | |
| **Land Use Sector-Residential and Commercial** | | | | | |
| **Goal 8. Improve Traffic Flow** | | | | | |
| Measure 8.1. Implement traffic flow improvement program. | | | | | Projects that include traffic controls need to show consistency with one of these |
| a. Install smart traffic signals at intersections warranting a traffic signal, OR | | | ✔ | The project would not require the installation of new traffic signals. | |
| b. Install roundabout. | | | ✔ | The project would not require the installation of a roundabout. | |
| **Emissions Measures Category: Solid Waste** | | | | | |
| **Land Use Sector-Residential and Commercial** | | | | | |
| **Goal 9: Decrease GHG Emissions through Reducing Solid Waste Generation** | | | | | |
| Measure 9.1. Reduce waste at landfills. | ✔ | | | The project would provide exterior recycling storage space in accordance with CalGreen and the Municipal Code. | |
| waste. | | | | | |
| **Emissions Measures Category: Clean Energy** | | | | | |
| **Land Use Sector-Residential and Commercial** | | | | | |
| **Goal 10. Decrease GHG Emissions through Increased Clean Energy Use** | | | | | |
| Measure 10.1. Increase distributed energy generation within City of Santee by implementing the following applicable photovoltaic solar systems: | | | | | |
| a. Single-family residential to install at least 2kW per unit of PV solar systems, unless the installation is infeasible due to poor solar resources established in a solar feasibility study prepared by a qualified solar consultant submitted with an application | | | ✔ | The project does not include residential uses. | |
| b. Multifamily residential to install at least 1kW per unit of PV solar systems, unless the installation is infeasible due to poor solar resources established in a solar feasibility study prepared by a qualified solar consultant submitted with an applicant's formal project submittal to City. | | | ✔ | The project does not include residential uses. | |
| c. On commercial buildings, install at least 2 kW per square foot of building area (e.g., 2,000 sq. ft. = 3 kW) unless the installation is infeasible due to poor solar resources. | ✔ | | | The project would install solar PV systems in accordance with the Santee Sustainable Plan. | |

Supplemental Information

## 2. Determining Land Use Consistency

The project site is currently designated and zoned General Commercial (GC). The project would be consistent with the existing land use designation and zoning. However, the project was designated and zoned as R-14 (Medium Density Residential) when the Sustainable Santee Plan (SSP) was prepared. Therefore, a residential land use was assumed in the SSP. The project site was evaluated as a part of the City's Housing Element Rezone Program Implementation Environmental Impact Report (EIR) (City of Santee 2022). The project site is not identified as a housing site in the Housing Element; however, it was included in the analysis because it was designated as R-14 (Medium Density Residential) and was redesignated as General Commercial (GC) as a part of the Rezone Program. This is because the project site was previously identified as a housing site, but due to airport constraints it would be difficult for future residential development. With a designation of R-14 (Medium Density Residential), the project site could have been developed with 70 residential units. Using an ITE trip generation rate of 5.44 trips per unit, a hypothetical residential project would have generated 381 daily trips. Phase 1 would generate 32 daily trips and Phase 2 would generate 213 daily trips which is well less than the trips that would have been generated by a residential project. Therefore, the project would be less GHG-intensive when compared to the land use designation that was in place at the time the SSP was prepared.

## Goal 6. Decrease GHG Emissions through a Reduction in VMT

Measure 6.1. Proposed project streets include sidewalks, crosswalks, and other infrastructure that promotes non-motorized transportation options.

Access to the project site would be provided via Graves Avenue. The nearest bus stops are located along Graves Avenue, approximately 54 feet to the south and 556 feet to the north of the project site. The nearest light rail trolley stop is Santee Trolley Square, located approximately 1.7 miles northwest of the project site. The project would widen Graves Avenue and construct a curb and gutter along Graves Avenue. The project would improve pedestrian connectivity by constructing sidewalks along the western side of the project site along Graves Avenue. The bus stop is served by the San Diego Metropolitan Transit System bus route 833 that runs along Graves Avenue, Magnolia Avenue, and Mission Gorge Road to the Santee Town Center, and is served by the Sycuan Green Line Trolley.

Measure 6.2. Proposed project installs bike paths to improve bike transit.

Review of Figure 7-2 of the General Plan Mobility Element determined that Graves Avenue does not include any existing or proposed bicycle facilities. The installation of bike paths is not applicable to the project; however, a bike lane would be included along Graves Avenue with the off-site improvements.

## References

1. City of Santee Housing Element Rezone Program Environmental Impact Report (EIR). 2022.

2. City of Santee General Plan Mobility Element. 2017.
http://sntbberry.cityofsanteeca.gov/sites/FanitaRanch/Public/Remainder%20of%20the%20Record/(10)%20Planning%20Documents%20Adopted%20by%20City%20of%20Santee/Tab%2006%20-%202017-10-25%20General%20Plan%20Mobility%20Element%202017.pdf