CITY OF MORGAN HILL
Development Services Center – Planning Division
17575 Peak Avenue Morgan Hill CA 95037

DRAFT MITIGATED NEGATIVE DECLARATION

Serene Hills Residential Project (SR2023-0019/EA2023-0008/SD2023-0003)
2275 East Dunne Avenue

File Number/Project Name: Serene Hills Residential Project (SR2023-0019/ EA2023-0008/SD2023-0003)

Project Location and Surrounding Land Uses: The approximately 8.37-acre project site, identified by Assessor's Parcel Numbers (APNs) 728-02-002 and -003, is located at 2275 East Dunne Avenue, north of the terminus of Saddleback Drive in Morgan Hill, California. The project site consists primarily of disced grassland and contains two existing Pacific Gas and Electric Co. (PG&E) easements, an existing well and well tank, and 18 trees, located primarily on the eastern half of the site. A drainage swale crosses the project site from the northeast to the southwest. Surrounding land uses include large-lot single-family residences to the north, a single-family residential subdivision to the south, and undeveloped land to the north, east, and west (see Figure 1 and Figure 2).

Existing Plan Designations and Zoning: The City of Morgan Hill General Plan designates the site as Residential Estate. The site is zoned as Residential Estate one acre (RE-1).

Project Background: In June 2018, an IS/MND was prepared for the 2275 East Dunne Avenue General Plan Amendment and Rezone Project (2018 IS/MND). The 2018 IS/MND analyzed the environmental effects of changing the land use designation of the project site from Residential Estate to Residential Detached Low (RDL) through a General Plan Amendment, as well as a Rezone to change the zoning of the project site from RE-1 to Residential Detached Low 12,000-square foot lot (RDL-12,000). Because a project-specific development application was not filed, the IS/MND included a programmatic evaluation of the project site with development of up to 22 dwelling units, and any future development at the project site was anticipated to require a project-level analysis. The requested General Plan Amendment and Rezone were not approved and the 2018 IS/MND was not adopted by the City Council; however, the 2018 IS/MND has been used to prepare this IS/MND for the new proposed project.

Project Description: The proposed project would include the subdivision of the project site into seven single-family residential lots ranging from approximately 43,571 square feet (sf) to 51,890 sf (see Figure 3). Within the seven lots, three 3,463-sf four-bedroom residences would be developed, as well as four five-bedroom residences ranging from 4,631 sf to 5,300 sf. Six of the on-site trees would be removed. Each single-family residential lot would contain a drainage management area (DMA) that would convey treated runoff to a bioswale located along the western property line of each lot. The seven bioswales would collect runoff and provide preliminary treatment. From each bioswale, treated runoff would be conveyed to the existing on-site swale, which would be channelized as part of the proposed project, and then flow to the proposed bioretention/detention pond located at the lowest point on the site at the southwest corner. Outflow from the pond would then be directed through a proposed 30-inch stormwater line that would extend off-site and outfall into an existing 36-inch storm drain across East Dunne Avenue, which eventually discharges into Tennant Creek near Old Hill Road (see **Figure *4***).

In addition, as part of the proposed project, the termini of Sorrel Way at the southwest corner of the project site and Saddleback Drive at the center of the southern project site boundary would extend north through the project site and connect to a new roadway known as Kole Court. The new internal roadways would provide access to four of the proposed single-family residences, whereas a new 25-foot-wide private driveway extending from Saddleback Drive would provide access to the three remaining single-family residences.

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

The City of Morgan Hill, California, a municipal corporation, does hereby prepare, make, declare, and publish the Initial Study/Mitigated Negative Declaration (IS/MND) for the following described project:

Project Name and Number: Serene Hills Residential Project (SR2023-0019/EA2023-0008/SD2023-0003)

Original Project: 2275 East Dunne Avenue General Plan Amendment and Rezone Project (GPA2018-0001/ZA2018-0001/EA2018-0001)

The City of Morgan Hill, Development Services Department, has reviewed the proposed project and on the basis of the whole record before it, has determined that pursuant to CEQA Guidelines Section 15162, no substantial changes have occurred with respect to the circumstances under which the IS/MND was previously considered, and there is no new available information, which was not known and could not have been known at the time that the IS/MND was considered. The project, as identified in this document, would not have a significant effect on the environment beyond that which was evaluated in the 2275 East Dunne Avenue General Plan Amendment and Rezone IS/MND (2018 IS/MND). This document demonstrates that further environmental review is not required given that the proposed modifications to the approved project would not trigger the applicable criteria set forth in the CEQA Guidelines Section 15162.

This revised IS/MND to the previously considered 2018 IS/MND has been prepared pursuant to Title 14, Section 15164 of the California Code of Regulations and City of Morgan Hill environmental standards.

A copy of this document and all supportive documentation may be reviewed or obtained at the City of Morgan Hill, Development Services Department, 17575 Peak Avenue, Morgan Hill, California, 95037.

Development Service Director, City of Morgan Hill,
California, a municipal corporation

By: ____

Date: ____

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Figure 1
Regional Vicinity Map

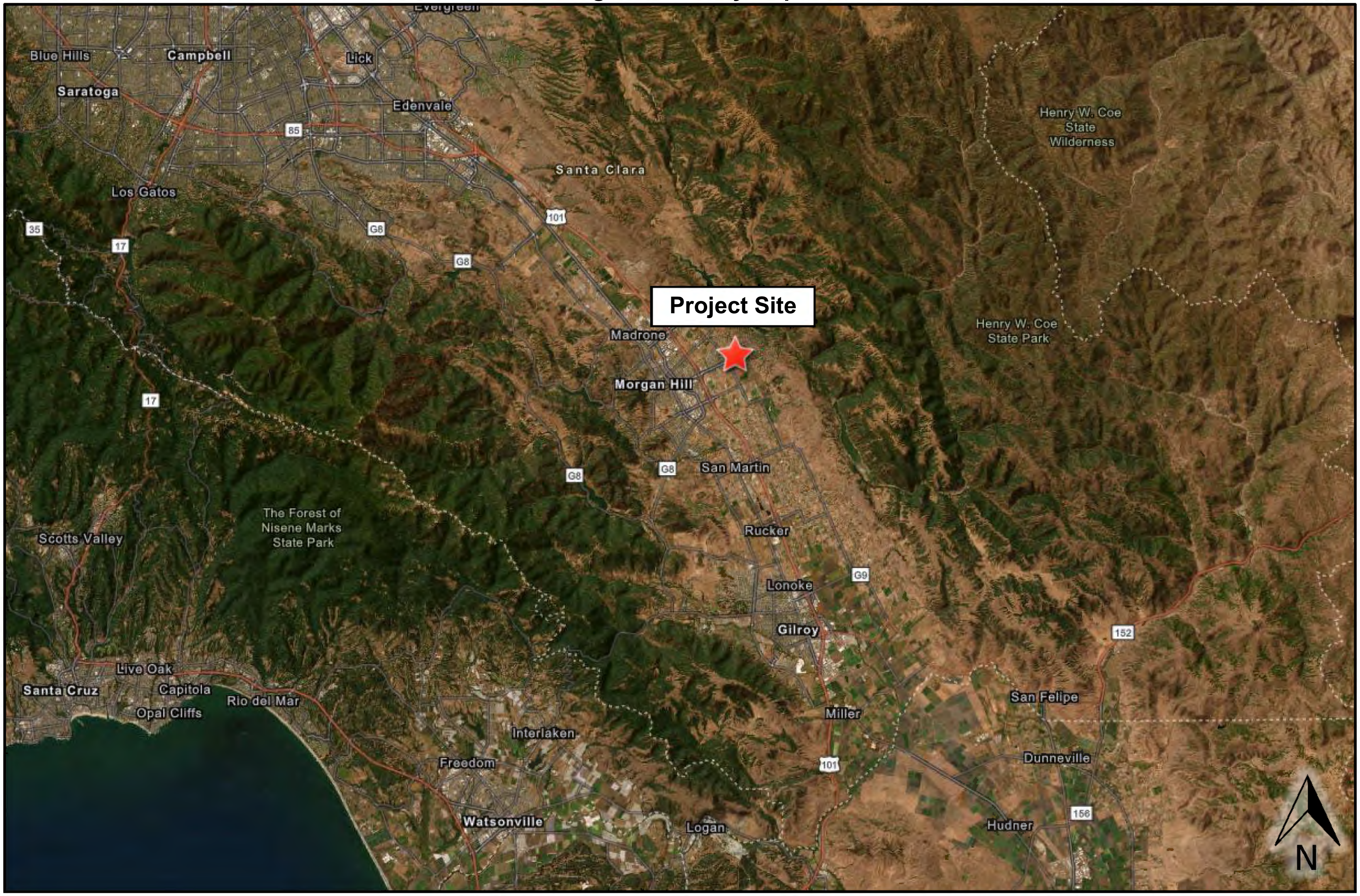
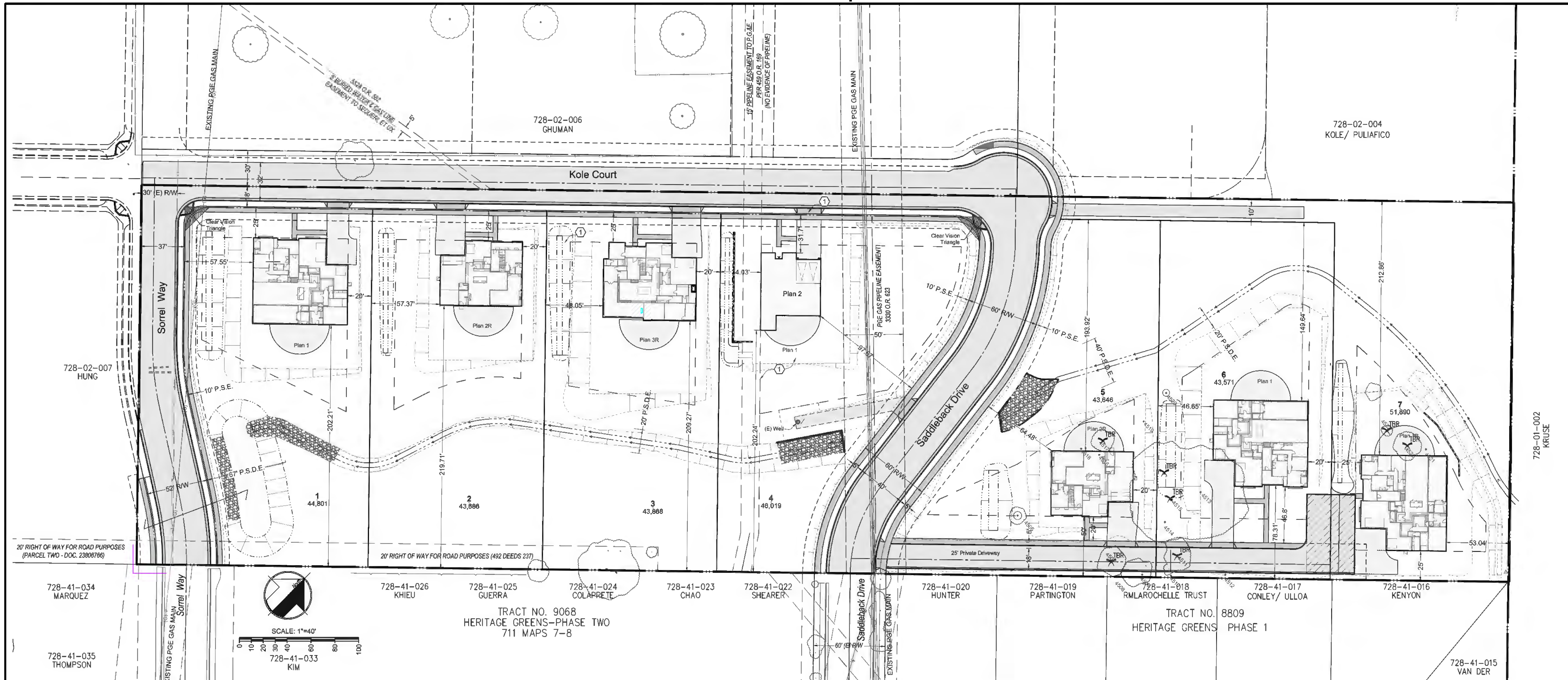


Figure 2
Project Site Boundaries

Figure 3
Serene Hills Site Development Plan



	Building Coverage Calculations		
Lot #	Lot Area (SF)	Building Area (SF)	Building Coverage (%)
1	44,801	5300	11.83%
2	43,686	3463	7.93%
3	43,688	4631	10.60%
4	46,019	5300	11.52%
5	43,646	3463	7.93%
6	43,571	5300	12.16%
7	51,890	5300	10.21%

Applicant/Owner:
Serene Hills LLC
22561 Poppy Drive
Cupertino, CA 95014
(408) 396-2706

Engineer:
William J. McClintock RCE 24893
MH Engineering
16075 Vineyard Blvd.
Morgan Hill, CA 95037
(408) 779-7381
billm@mhengineering.com

Planner:
Vince Burgos
2424Calle Gelicia
Santa Barbara, CA 93109
(408) 421-2695

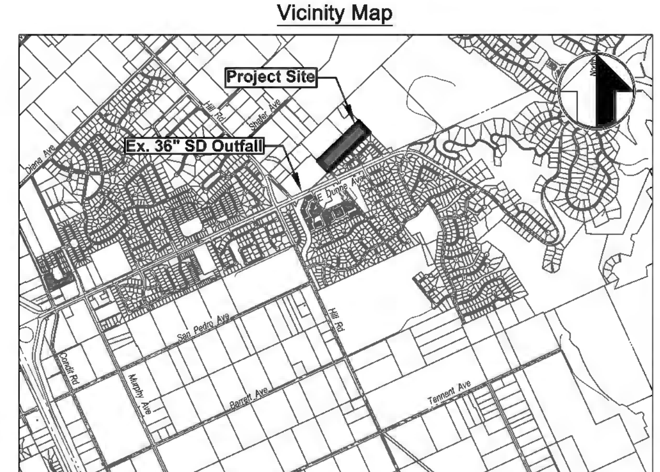
Project Information:

APN:	728-02-003
Present Use:	Residential / Open
Proposed Use:	Residential
Present Zoning:	Residential Estate (RE 1)
Proposed Zoning:	Residential (RE 1)
Sanitary Sewer:	City of Morgan Hill
Gas and Electric:	PG&E
Water:	City of Morga Hill
Telephone:	Verizon
Existing Improvements:	As Shown
Area:	8.37 ac

Legend:

TBR — Existing tree to be removed
Building Setback Line
1 — Relocate (E) Water Lines and Easements

Vicinity Map



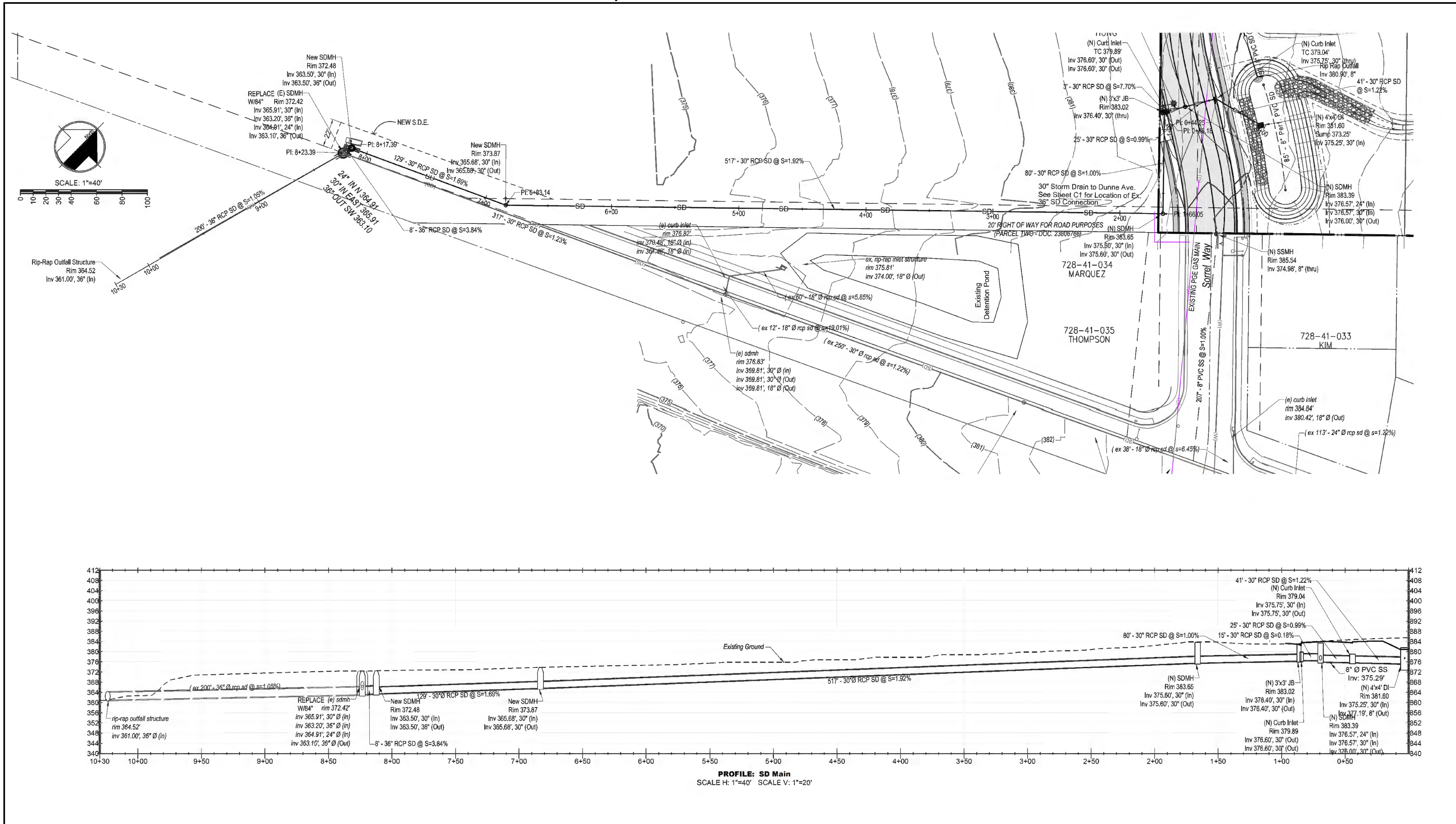
Sheet Index

#	Sheet Title
1	Site Development Plan
2	Tentative Map
3	Preliminary Grading Plan
4	Preliminary Grading Cross Sections
5	Preliminary Utility Plan
6	Preliminary Stormwater Control Plan

Sheet

Serene Hills

Figure 4
Proposed Off-Site Storm Drain Extension



Project Approvals

The proposed project would require the following entitlements from the City of Morgan Hill:

- Approval of a Tentative Subdivision Map; and
- Design Permit.

Use of a Prior Environmental Document:

The California Supreme Court has held that a lead agency has the responsibility of initially deciding whether an original environmental document retains "some relevance" to the ongoing decision-making process. The City of Morgan Hill has determined that the 2018 IS/MND is relevant and has prepared an revised IS/MND document to evaluate the proposed project.

The requested General Plan Amendment and Rezone were not approved, and the 2018 IS/MND was not adopted. As such, the project site remains designated Residential Estate and zoned RE-1. In addition, a project-specific development application was not filed when the City considered the 2018 IS/MND. Instead, the 2018 IS/MND analyzed the conceptual development of a maximum of 22 on-site dwelling units. The proposed project represents a filed application for development consistent with the current land use and zoning designations and features specific project plans.

Discussion

The following sections provide discussions of any potential impacts associated with the proposed project beyond those previously identified in the 2018 IS/MND. Given the limited scope of changes that would occur as a result of the proposed project in comparison to the former 2275 East Dunne Avenue General Plan Amendment and Rezone Project, this document provides a detailed evaluation of select CEQA topics potentially affected by the changes, including Air Quality, Greenhouse Gas Emissions, Biological Resources, Cultural Resources, and Hydrology and Water Quality. The remaining CEQA topics are appropriately discussed at a lesser level of detail.

Air Quality

The City of Morgan Hill is located in the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The SFBAAB area is currently designated as a nonattainment area for State and federal ozone, State and federal fine particulate matter 2.5 microns in diameter ($PM_{2.5}$), and State respirable particulate matter 10 microns in diameter (PM_{10}) ambient air quality standards (AAQS). The SFBAAB is designated attainment or unclassified for all other AAQS. It should be noted that on January 9, 2013, the U.S. Environmental Protection Agency (USEPA) issued a final rule to determine that the Bay Area has attained the 24-hour $PM_{2.5}$ federal AAQS. Nonetheless, the Bay Area must continue to be designated as nonattainment for the federal $PM_{2.5}$ AAQS until such time as the BAAQMD submits a redesignation request and a maintenance plan to the USEPA, and the USEPA approves the proposed redesignation. The USEPA has not yet approved a request for redesignation of the SFBAAB; therefore, the SFBAAB remains in nonattainment for 24-hour $PM_{2.5}$.

In compliance with regulations, due to the nonattainment designations of the area, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions through regulations, incentive programs, public education, and partnerships with other agencies.

The current air quality plans are prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). The most recent State ozone plan is the 2017 Clean Air Plan, adopted on April 19, 2017. Adopted BAAQMD rules and regulations, as well as the thresholds of significance, have been developed with the intent to ensure continued attainment of AAQS, or to work towards attainment of AAQS for which the area is currently designated nonattainment, consistent with the applicable air quality plan. Thus, by exceeding the BAAQMD's emission thresholds for construction or operational emissions, a project would be considered to conflict with or obstruct implementation of the BAAQMD's air quality planning efforts.

Under Section 4.3, Air Quality, the 2018 IS/MND determined that buildout of the project site would result in air quality emissions that would not exceed the BAAQMD's thresholds of significance. Specifically, the 2018 IS/MND compared the 2275 East Dunne Avenue Project to the BAAQMD Screening Criteria in place at the time the IS/MND was drafted, and determined that development of 22 units would be below the construction and operational criteria pollutant screening thresholds of 114 units and 325 units, respectively. As such, potential impacts were determined to be less than significant. Nonetheless, the 2018 IS/MND included Mitigation Measure (MM) AIR-1, which requires that any future development projects implement BMPs during ground-disturbing activities associated with project construction. In addition, the 2018 IS/MND determined that all other impacts related to air quality, including impacts associated with toxic air contaminants (TACs) and odors, would be less than significant.

Since the adoption of the 2018 IS/MND, BAAQMD has updated its screening criteria to aid in determining if emissions from development projects would exceed the applicable thresholds of significance and result in potentially significant air quality impacts. According to the BAAQMD 2022 CEQA Guidelines, if a project is below the screening level identified for the applicable land use type, emissions from construction and operation of the project would have a less-than-significant impact on air quality. The screening criterion for criteria pollutant emissions associated with single-family housing is 254 units during construction and 421 units for operations. The proposed project involves the development of seven single-family residential units, which would be below the screening criteria during construction and operations. Therefore, based on the BAAQMD's screening criteria, the proposed project's emissions would not be expected to exceed BAAQMD thresholds of significance.

Nonetheless, to confirm this conclusion, and to determine the change in criteria pollutant emissions that would occur with implementation of the proposed project, air quality emissions were estimated using the California Emissions Estimator Model (CalEEMod) version 2022 software for both the previously evaluated project and the currently proposed project. Table 1 presents the maximum unmitigated construction emissions associated with the previously evaluated project in comparison to the maximum unmitigated construction emissions associated with the currently proposed project.

As presented in Table 1, the proposed project would result in a net increase in construction related emissions as compared to the previously evaluated project. The net increase in construction-related emissions associated with the proposed project is due to the additional construction activities that would occur as a result of the proposed 30-inch off-site stormwater line that would be required as part of the proposed project. Nonetheless, the net increase in construction-related emissions associated with the proposed project, as well as overall project construction emissions, would be below the applicable thresholds of significance for all criteria pollutants. Therefore, the proposed project would not result in any new or more severe significant impacts related to construction criteria pollutant emissions from what was previously analyzed in the 2018 IS/MND.

Table 1
Maximum Unmitigated Construction Emissions (lbs/day)

	ROG	NO_X	PM_{10}*	$PM_{2.5}$*
Previously Evaluated Project	4.0	36.0	1.60	1.47
Proposed Project	4.85	44.9	1.96	1.81
Net Increase	*+0.85*	*+8.90*	*+0.36*	*+0.34*
Threshold of Significance	**54**	**54**	**82**	**54**
Exceeds Threshold?	**NO**	**NO**	**NO**	**NO**

* Denotes emissions from exhaust only. BAAQMD has not yet adopted PM thresholds for fugitive emissions.

Source: CalEEMod, February 2024 (see Attachment 2).

In addition, all projects under the jurisdiction of the BAAQMD are required to implement all of the BAAQMD's Basic Construction Mitigation Measures (BCMMs), which include the following:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
7. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
8. Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a six- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.
9. Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

In addition to the BCMMs, projects are strongly encouraged to implement enhanced best management practices to control fugitive dust emissions. The enhanced measures are especially important when schools, residential areas, or other sensitive land uses are located near the construction site. BAAQMD recommended enhanced best management practices (BMPs) include the following:

1. Limit the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities.
2. Install wind breaks (e.g., trees, fences) on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
3. Plant vegetative ground cover (e.g., fast-germinating native grass seed) in disturbed areas as soon as possible and watered appropriately until vegetation is established.

4. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.
5. Minimize the amount of excavated material or waste materials stored at the site.
6. Hydroseed or apply non-toxic soil stabilizers to construction areas, including previously graded areas, that are inactive for at least 10 calendar days.

Although BAAQMD requires that all construction activity within the SFBAAB implement the above listed BCMMs, both the previously evaluated project and the proposed project were modeled without the inclusion of such measures to provide a conservative, worst-case emissions estimate. As presented in Table 1, even under the conservative assumptions used for this analysis, emissions of $PM_{2.5}$ and PM_{10} would remain below the BAAQMD's thresholds of significance. Implementation of the BCMMs provided herein would ensure the project's compliance with SM AIR-1 as set forth in the 2018 IS/MND. However, it should be noted that the BCMMs have been updated since the 2018 IS/MND was prepared. Therefore, the BCMMs presented above are the most currently adopted BAAQMD BCMMs and supersede the measures included in SM AIR-1.

Table 2 presents the maximum unmitigated operational emissions associated with the previously evaluated project in comparison to the maximum unmitigated operational emissions associated with the currently proposed project.

Table 2
Maximum Unmitigated Operational Emissions

	ROG		**NO_X**		**PM_{10}***		**$PM_{2.5}$***	
	lbs/day	**tons/yr**	**lbs/day**	**tons/yr**	**lbs/day**	**tons/yr**	**lbs/day**	**tons/yr**
Previously Evaluated Project	1.94	0.33	1.01	0.16	0.04	0.01	0.04	0.01
Proposed Project	1.08	0.19	0.27	0.05	0.01	< 0.005	0.01	< 0.005
Net Increase	*-0.86*	*-0.14*	*-0.74*	*-0.11*	*-0.03*	*-0.005*	*-0.03*	*-0.005*
Threshold of Significance	**54**	**10**	**54**	**10**	**82**	**15**	**54**	**10**
Exceeds Threshold?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Note:
* Denotes emissions from exhaust only. BAAQMD has not yet adopted PM thresholds for fugitive emissions.

Source: CalEEMod, February 2024 (see Attachment 2).

As presented in Table 2, the proposed project would result in a net decrease in all criteria pollutant emissions as compared to the previously evaluated project. Therefore, the proposed project would not result in any new or more severe significant impacts related to operational criteria pollutant emissions from what was previously analyzed in the 2018 IS/MND.

Based on the information presented above, the proposed project would not result in any new impacts or substantially more severe impacts related to air quality relative to what was analyzed in the 2018 IS/MND.

<u>Prior Mitigation Measures</u>
None applicable.

<u>Modified Mitigation Measures</u>
None required.

<u>New Mitigation Measures</u>
None required.

Greenhouse Gas Emissions

The 2018 IS/MND evaluated potential impacts related to greenhouse gas (GHG) emissions under Section 4.7 and concluded that a less-than-significant impact would occur. Specifically, the 2018 IS/MND compared the 2275 East Dunne Avenue Project to the BAAQMD Screening Criteria in place at the time the IS/MND was drafted, and determined that development of 22 units would be below the screening threshold of 56 units. As such, potential impacts associated with GHG emissions were determined to be less than significant.

Since preparation of the 2018 IS/MND, the BAAQMD adopted new thresholds of significance for GHG emissions. The applicable BAAQMD thresholds of significance for GHG emissions are now qualitative and require that a project either include specific project design elements or be consistent with a local GHG reduction strategy that meets the criteria pursuant to State CEQA Guidelines Section 15183.5(b).[1] In December of 2021, the City of Morgan Hill adopted a Climate Action Plan (CAP); however, the City's CAP does not qualify as a local GHG reduction strategy under CEQA Guidelines Section 15183.5(b). Therefore, the City has determined that the BAAQMD thresholds of significance are appropriate for the analysis of the proposed project, and the following analysis focuses on the BAAQMD GHG thresholds related to specific project design elements.

According to the BAAQMD's thresholds of significance, in order to find a less-than-significant GHG impact, projects must include, at a minimum, the following project design elements:

- The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development);
- The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines;
- The project will achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current California Climate Change Scoping Plan (15 percent) or meet a locally adopted SB 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research (OPR's) Technical Advisory on Evaluating Transportation Impacts in CEQA; and
- The project will achieve compliance with off-street electric vehicle (EV) requirements in the most recently adopted version of CALGreen Tier 2.

In order to be consistent with the first criterion, the proposed project is required to include all electric appliances and plumbing. Natural gas is prohibited in all new construction within the City pursuant to City Ordinance No. 2306, effective March 1, 2020. Therefore, the proposed project would not include the use of natural gas appliances or natural gas plumbing and, thus, would comply with the first BAAQMD GHG criterion.

Regarding the second criterion, the proposed project would comply with all applicable federal, State, and local regulations regarding energy use during both project construction and project operations, such as the California Green Building Standards Code (CALGreen Code) and the Building Energy Efficiency Standards. Requirements of the CALGreen Code that would be applicable to the proposed project include, but are not limited to, the following measures:

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1 Bay Area Air Quality Management District. *CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans.* April 2022.

- Compliance with relevant regulations related to future installation of EV charging infrastructure;
- Indoor water use consumption is reduced through the establishment of maximum fixture water use rates;
- Outdoor landscaping must comply with the California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), or a local ordinance, whichever is more stringent, to reduce outdoor water use;
- Diversion of 65 percent of construction and demolition waste from landfills; and
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

Adherence to the most recent CALGreen Code and the Building Energy Efficiency Standards would ensure that the proposed structures would consume energy efficiently through the incorporation of such features as efficient water heating systems, high performance attics and walls, and high efficacy lighting. In addition, all construction equipment and operation thereof would be regulated by the CARB In-Use Off-Road Diesel Vehicle Regulation. The In-Use Off-Road Diesel Vehicle Regulation is intended to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing limits on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. Required compliance with applicable standards and regulations would ensure that energy use associated with the proposed project would not be wasteful, inefficient, or unnecessary. Therefore, the proposed project would comply with the second BAAQMD GHG criterion.

With respect to the third criterion, the Governor's OPR released The Technical Advisory on Evaluating Transportation Impacts in CEQA, which includes screening thresholds to identify when a lead agency may screen out VMT impacts.[2] For example, OPR recommends that projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant impact related to VMT. The anticipated trip generation for the proposed project was estimated using standard rates published in the 10th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual (2017). A trip rate of 9.44 average daily trips (ADT) per residential unit, based on the ITE "Single-Family Residential" land use (ITE Land Use Category #210), was applied to the seven proposed single-family residences for an average of 66 trips per day. Therefore, the proposed project would meet the OPR screening criteria for projects that generate or attract fewer than 110 trips per day, and the project would not result in impacts related to VMT. As such, the proposed project would comply with the third BAAQMD GHG criterion.

With respect to the fourth criterion, the CALGreen Code requires all single-family residential projects to install a listed raceway to accommodate a dedicated 208/240-volt branch circuit for each unit, which would be suitable for EV charging. For single-family residences, such as the residences included as part of the proposed project, compliance with the CALGreen Code would satisfy the fourth BAAQMD criterion.

It should also be noted that, as previously discussed, the change in GHG emissions that would occur with implementation of the proposed project was estimated using CalEEMod version 2023 software for both the proposed project and the previously evaluated project, and is presented herein for informational purposes. Table 3 presents the maximum unmitigated GHG emissions

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2 Governor's Office of Planning and Research. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. December 2018.

associated with the previously evaluated project in comparison to the maximum unmitigated GHG emissions associated with the proposed project.

Table 3 Maximum Unmitigated GHG Emissions (tons/yr)		
	Construction	**Operations**
Previously Evaluated Project	208	321
Proposed Project	462	101
Net Increase	*+254*	*-220*
Source: CalEEMod, February 2024 (see Attachment 2).		

Based on the above, the proposed project would not conflict with the BAAQMD's GHG thresholds of significance and, thus, would not conflict with the State's latest climate legislation. Therefore, the proposed project would not result in any additional significant impacts or more severe significant impacts related to GHG emissions as compared to the 2018 IS/MND.

<u>Prior Mitigation Measures</u>
None applicable.

<u>Modified Mitigation Measures</u>
None required.

<u>New Mitigation Measures</u>
None required.

Biological Resources

The 2018 IS/MND evaluated potential impacts to biological resources, including special-status wildlife and aquatic resources, under Section 4.4 and concluded that a less-than-significant impact would occur with implementation of SMs BIO-1, BIO-2, and BIO-3. Specifically, based on the presence of on-site trees and drainage features, SMs BIO-1, BIO-2, and BIO-3 require a preconstruction survey for nesting birds, compliance with the Santa Clara Valley Habitat Plan (SCVHP) policies concerned with watercourses and streams, and obtainment of a tree removal permit from the City, respectively.

With respect to the currently proposed project, a project-specific Technical Biological Report was prepared by Live Oak Associates, Inc. in January 2024 (see Attachment 3).[3] The Technical Biological Report included queries of databases including the California Natural Diversity Database (CNDDB) and California Native Plant Society (CNPS) Inventory of Rare Plants, as well as research on biological resources native to the Santa Clara Valley region. Local policies and ordinances from the City of Morgan Hill were used as sources of information, as well as the SCVHP. In addition, a field survey of the project site was conducted in December 2023. At the time of the field survey, the project site had been fully disced and consisted mainly of grassland with trees and swales, with a well and well tank located in the center of the site.

According to the Technical Biological Report, the project site is regularly disturbed through consistent discing, and therefore does not provide habitat for special-status plant species. In addition, the project site does not contain the specialized features required to support special-status plant species known to occur in the region, such as serpentine soils, vernal pools,

3 Live Oak Associates, Inc. *Serene Hills Project Site Technical Biological Report*. January 22, 2024.

chaparral, and/or because the site is substantially below the elevations at which these species occur. As such, the Technical Biological Report concluded that impacts to special-status plants would not occur.

The Technical Biological Report concluded that nine special-status wildlife species have the potential to occur on-site, or use the site as foraging habitat. The special-status species identified by the Technical Biological Report include the following: Townsend's big-eared bat; pallid bat; northern harrier; white-tailed kite; golden eagle; loggerhead shrike; grasshopper sparrow; burrowing owl; and American badger. Of the foregoing species, only the burrowing owl is covered by the SCVHP.

Based on the December 2023 survey, the Technical Biological Report concluded that on-site trees would not provide suitable roosting habitat for the Townsend's big-eared bat or pallid bat. While protected bat species may forage in the air over the project site, foraging habitat is not protected. Therefore, impacts to bats would not occur as a result of the proposed project. However, the trees could support nesting birds and raptors protected by the Migratory Bird Treaty Act (MBTA), including the special-status bird species identified by the Technical Biological Report (i.e., the northern harrier, white-tailed kite, loggerhead shrike, and grasshopper sparrow). Construction activities conducted during the nesting period for migratory birds (i.e., between February 1 to August 31) could pose a risk of nest abandonment and death of any eggs or young in nests within or near the site, which would constitute a significant impact. To reduce impacts to protected bird species to a less-than-significant level, the 2018 IS/MND required SM BIO-1. A modified version of SM BIO-1 was included in the Technical Biological Report, which is provided below.

With respect to the potential for burrowing owls to occur within the project site, the Technical Biological Report identified suitable habitat in the form of California ground squirrel burrows at the southern boundary of the project site, as well as in the adjacent fields. Because burrowing owls are protected under State and federal law, as well as the SCVHP, ground-disturbing activities associated with project construction could result in a potentially significant impact if such activities resulted in the destruction of burrows or death of owls. As such, Mitigation Measure BIO-4 is included below to ensure impacts to burrowing owls would not occur as a result of the proposed project.

In addition, the Technical Biological Report identifies American badgers as a California Species of Special Concern known to occur in the hills east of the project site. As previously noted, the American badger is not covered under the SCVHP. The closest recorded occurrence is approximately two miles to the west of the site along State Route (SR) 101. Badger burrows and American badgers were not observed during the December 2023 survey; however, based on the proximity of the previous sighting to the project site, American badgers have the potential to occur within the project site. As such, ground-disturbing activities associated with project construction could result in a potentially significant impact to American badgers. Mitigation Measure BIO-5 is included below to ensure impacts to American badgers would not occur as a result of the proposed project.

The Technical Biological Report identifies several swales on-site, including a swale that historically connected to the Santa Clara Conduit. According to the Technical Biological Report, the connection has not remained clearly active, but the connectivity of the on-site swales could not be determined. Regardless of the connectivity status, the swales and any other on-site aquatic resources would be significantly altered and likely channelized by the proposed project. As such, the Technical Biological Report recommends preparation of an aquatic resources delineation report for submittal to the U.S. Army Corps of Engineers (USACE) for verification as to whether any on-site aquatic features are subject to USACE's jurisdiction. The aquatic resources delineation report would also provide a foundation to determine if waters of the State occur on-site and whether the California Department of Fish and Wildlife (CDFW) and/or Regional Water Quality Control Board (RWQCB) have jurisdiction over any of the delineated areas. If waters of the U.S. and State are identified in areas proposed for disturbance, the currently proposed project would be subject to the additional provisions set forth by Mitigation Measure BIO-6.

In addition to the Technical Biological Report prepared for the proposed project, a project-specific arborist report was prepared by Smith Tree Specialists, Inc. on August 27, 2022 (see Attachment 4).[4] Pursuant to the arborist report, protected or heritage trees are not located within the project site. However, one ordinance-sized eucalyptus tree is located on-site. The eucalyptus tree is therefore recommended for retention and protection according to proper tree protection zone (TPZ) guidelines contained therein. Additionally, five other trees have been recommended for retention and protection. The 12 other trees identified on-site were recommended for removal due to poor health, proximity to grading, or because the trees are dead. Compliance with the recommendations and TPZ guidelines included in the arborist report, as required by SM BIO-3, would ensure that the proposed project would not conflict with any local policies or ordinances protecting biological resources.

Finally, the project site is located within the SCVHP, which was developed through a partnership between Santa Clara County, the cities of San José, Morgan Hill, and Gilroy, the Santa Clara Valley Water District (SCVWD), the Santa Clara Valley Transportation Authority (VTA), the USFWS, and the CDFW. The SCVHP is intended to promote the recovery of endangered species and enhance ecological diversity and function, while accommodating planned growth in approximately 500,000 acres of southern Santa Clara County. The SCVHP provides take authorization for 18 covered species and includes conservation measures to protect the species covered by the SCVHP, as well as a conservation strategy designed to mitigate impacts on covered species and contribute to the recovery of the species in the study area.

As set forth by Morgan Hill Municipal Code Section 18.132.050, compliance with the SCVHP requires payment of fees according to the Fee Zone designation of the property, payment of nitrogen deposition fees related to the number of anticipated car trips resulting from the development, and any surcharge fees that are required based on site-specific impacts to sensitive habitats or sensitive species. According to the Habitat Agency Geobrowser, the project site is designated entirely by the SCVHP as Rural Residential and is located within Fee Zone B (Agricultural and Valley Floor Lands). The Habitat Agency Geobrowser does not identify Category 1 Streams or Stream Buffers within or adjacent to the project site. According to the SCVHP, the Rural Residential land cover includes land comprised of low-density residential development with a density of less than one dwelling unit per 2.5 to 20 acres. Land cover fees for Zone B are assessed at a rate of $11,806 per acre. Based on the project site's 8.37 acres of Rural Residential land cover, the project's Zone B land cover fees would total $98,816.22. According to the Habitat Agency Geobrowser, the project site is not subject to the burrowing owl fee, but the proposed project would be subject to nitrogen deposition fees, which assess a fee rate of $37.57 per new residence. As the proposed project would include seven units, the project's nitrogen deposition fees would total $262.99. Under Section 18.132.050 of the Morgan Hill Municipal Code, the proposed project would be required to pay such fees, which would help ensure that the project does not conflict with the provisions of the adopted Habitat Conservation Plan (HCP).

4 Smith Tree Specialists. *Arborist Report.* August 27, 2022.

Additionally, in order to mitigate potential impacts to covered species, the proposed project would be subject to all applicable SCVHP conditions, including, as determined by the Technical Biological Report, Conditions 1, 3, 12, and 15. Condition 1 requires compliance with existing laws protecting special-status plant and wildlife species, including nesting birds and raptors protected by the MBTA. SMs BIO-1, BIO-4, and BIO-5 ensure compliance with this condition. Additionally, in order to comply with Condition 1, the proposed project must also comply with SCVHP Condition 15, which requires preconstruction surveys for burrowing owls. Compliance with Condition 15 would be accomplished through SM BIO-1. Condition 3 requires implementation of all applicable measures from Table 6-2 of the SCVHP in order to minimize indirect and direct effects to covered species and any on-site aquatic habitat. The City of Morgan Hill would require that all applicable measures from Table 6-2 of the SCVHP are implemented as part of the City's approval of the project engineering plans and Stormwater Pollution Prevention Plan (SWPPP). Condition 12, related to wetland and pond avoidance and minimization, would only apply if seasonal swales occur on the project site, which would be identified through Mitigation Measure BIO-6.

Overall, implementation of the mitigation measures listed below would ensure the proposed project would not result in any additional significant impacts or more severe significant impacts to biological resources as compared to the 2018 IS/MND.

Prior Mitigation Measures
None applicable.

Mitigation Measures
MM BIO-1 from the 2018 IS/MND requires a preconstruction survey for nesting migratory birds and raptors. SM BIO-3 from the 2018 IS/MND required obtaining a tree removal permit for any on-site trees that need to be removed. Thus, the mitigation measures are still applicable to the proposed project. Minor modifications to MM BIO-1 , which clarify the timing of the survey, as well as establish specific requirements for the preconstruction survey ~~area, are~~ shown in strikethrough and double-underline. Minor modifications to MM BIO-3, including recommendations from the project-specific Arborist Report, are also shown. Implementation of the following mitigation measure would reduce the potential impact to nesting and migrating birds to a *less-than-significant* level.

MM BIO-1 If project staging and construction is anticipated to take place during the avian nesting season (February 1st through August 31st), a nesting bird preconstruction survey shall be conducted by a qualified biologist to insure that nesting birds are not located within or adjacent to the project site. Specifically, the survey for nesting migratory birds shall cover the project site and off-site improvement areas, and the survey for nesting raptors ~~would~~ shall encompass the site, off-site improvement areas, and surrounding lands within 250 feet, where accessible. ~~This~~ The preconstruction survey shall be completed ~~not more than 14 days prior to the start~~ within 7 days prior to the onset of any staging or construction activity. If nesting activity is observed during the preconstruction survey, the qualified biologist ~~will~~ shall ~~coordinate with the California Department of Fish and Wildlife (CDFW) to~~ establish appropriate buffers, monitoring, and/or construction phasing measures to avoid any impacts to nesting birds. The buffers shall consist of a minimum width of 100 feet for passerines and 500 feet for raptors. After the nesting is completed, as determined by the biologist, the buffer shall no longer be required. The results of the preconstruction survey should be valid for 14 days and shall be submitted to the City of Morgan Hill Development Services Department.

MM BIO-3 As required by the City's Tree Removal Controls, a tree removal permit is required from the Community Development Director, which includes the description of the tree replacement program and identification of any conditions imposed by the City.

For the Ordinance Sized Trees to be preserved as part of the project, the project applicant shall implement the Tree Preservation Recommendations included in the Arborist Report prepared for the proposed project by Smith Tree Specialists, including, but not limited to, avoidance of tree driplines, construction of temporary fencing around protected trees, fertilization of trees after construction, and periodic inspection of the trees' condition.

The above measures shall be included in the notes on construction drawings, subject to review and approval by the City of Morgan Hill Development Services Department, prior to initiation of construction.

New Mitigation Measures

Implementation of the following mitigation measure would reduce the potential impact to burrowing owl to a *less-than-significant* level.

Burrowing Owl

MM BIO-4 Prior to construction activities, a minimum of two surveys shall be conducted by a qualified biologist to ascertain whether or not burrowing owls occupy burrows on or adjacent to the project site and/or off-site improvement areas, with the first survey conducted within 14 days to initial construction activities (i.e. vegetation removal, grading, excavation, etc.) and the second survey conducted within two days prior to initial construction activities. Results of the surveys shall be submitted to the City of Morgan Hill Development Services Department. If burrowing owls or fresh sign of burrowing owls are not observed during preconstruction surveys, construction may proceed. If burrowing owls or recent signs of burrowing owls are observed during the surveys, occupied burrows shall be identified by the monitoring biologist and appropriate buffers, as described below, shall be established.

- A 250-foot non-disturbance buffer shall be established around all active burrowing owl burrows or nest sites as identified and defined by a qualified biologist. If the biologist determines that a nest is vacant, the non-disturbance buffer zone around that nest may be removed. The SCVHP specifies that a vacation from the site for a week or more by a burrowing owl, as determined by a qualified biologist, would constitute a voluntary relocation by the owl, and the qualified biologist could then take measures to collapse suitable burrows of the site to discourage reoccupation. The biologist shall supervise hand excavation of the burrow to prevent reoccupation only after receiving approval from the wildlife agencies.
    - For permission to encroach within 250 feet of such burrows during the nesting season (February 1 through August 31), an Avoidance, Minimization, and Monitoring Plan shall be prepared and approved by the City of Morgan Hill and the Wildlife Agencies prior to such encroachment (see Chapter 6, pages 6-64 & 6-65 of the SCVHP for further detail).
- Should a burrowing owl be located on-site in the non-breeding season (September through January), construction activities shall not be allowed

within the 250-foot buffer of the active burrow(s) used by any burrowing owl unless the following avoidance measures are adhered to:
   - A qualified biologist monitors the owls for at least three days prior to construction to determine baseline foraging behavior (i.e., behavior without construction).
   - The same qualified biologist monitors the owls during construction does not find a change in owl foraging behavior in response to construction activities.
   - If any change in owl nesting and foraging behavior as a result of construction activities occurs, such activities shall cease within the 250-foot buffer.
   - If the owls are gone for at least one week, the project proponent may request approval from the City of Morgan Hill that a qualified biologist excavate usable burrows to prevent owls from reoccupying the site. After all usable burrows are excavated, the buffer zone shall be removed, and construction may continue.
- The SCVHP stipulates that passive relocation or exclusion of burrowing owls shall not be allowed until a positive regional growth trend is achieved as defined in Section 5.4.6 of the SCVHP; however, a project may qualify for an exception to this prohibition. Permission to engage in passive relocation during the non-breeding season would need to be requested through the standard application process (see Section 6.8 of the SCVHP). Application for an exception would require additional information, including a relocation plan/schedule and documentation by a qualified biologist that owls have occupied the site for the full year without vacating the site for 10 or more consecutive days. The application would need to be submitted to the City of Morgan Hill, and the Wildlife Agencies would then evaluate the application and make a determination for granting the exception. If passive relocation is granted, additional measures may be required by the City.

American Badger

MM BIO-5 During the course of the preconstruction surveys for other species, a qualified biologist shall also determine the presence or absence of badgers prior to the start of construction. The results of the preconstruction survey shall be submitted to the City of Morgan Hill Development Services Department. If badgers are found to be absent, other mitigations for the protection of badgers shall not be warranted.

If an active badger den is identified during preconstruction surveys within or immediately adjacent to an area subject to construction, a construction-free buffer of up to 300 feet shall be established around the den. Once the biologist has determined that badger has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the burrow be determined to be a natal or reproductive den, and because badgers are known to use multiple burrows in a breeding burrow complex, a biological monitor shall be present onsite during construction activities in the vicinity of the burrows to ensure the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor shall be required to be present until the young are determined to be of an independent age and construction activities would not harm individual badgers.

Waters of the State/U.S.

MM BIO-6 Prior to initiation of any ground disturbance, a formal wetland delineation shall be conducted on the site to ascertain whether any waters of the U.S. or state occur on-site; the report shall be submitted to the USACE for verification to determine the extent of all hydrological features as it relates to Waters of the U.S. The report shall also provide a foundation to determine if waters of the State occur on-site and whether CDFW and/or RWQCB have jurisdiction over any of the areas. Once the extent of waters of the U.S. and State are known, the potential for and extent to which any of the features could be impacted can be determined.

If waters of the U.S. and/or State would be impacted by the proposed project, the following mitigations shall be implemented:

- The project shall avoid all waters of the U.S. and/or State. Avoiding impacts to any jurisdictional wetland swales may include re-designing the project to avoid the wetlands to the extent possible. If a redesign is not feasible, then the following mitigations would need to be implemented to reduce impacts to a less than significant level.
- If full avoidance of wetland swale habitat is not possible under the currently proposed project, actions shall be taken to minimize impacts to such habitats. Measures taken during construction activities shall include placing construction fencing around any preserved wetland features to ensure that construction activities do not inadvertently impact such areas.
- To compensate for the permanent loss of any wetland swale habitat, three options are available: 1) Credits through an approved mitigation bank; 2) On- or off-site creation/restoration with accompanying mitigation and monitoring plan; and 3) Payment of Seasonal Wetland Fees to the SCVHP. The USACE and CDFW are participants in the SCVHP; although the Habitat Agency (with the SCVHP) is currently in talks with the RWQCB, the RWQCB is currently not a participant in the SCVHP. Therefore, mitigation for any impacts to wetland swales on-site shall include either #1 and #3, or #2 and #3, as mitigation per the RWQCB would likely be a separate mitigation consisting of on- or off-site restoration with an appropriate Habitat Monitoring Plan or payment for mitigation credits to a mitigation bank (#1 or #2 below). The RWQCB may also require a Waste Discharge Permit under the Porter-Cologne Water Quality Act. Should the RWQCB become a participant in the SCVHP, only #3 would be required. The foregoing mitigations are outlined below.

    1. Several mitigation banks exist for wetlands and payment for wetland credits at an approved mitigation bank shall be a minimum of 1:1 creation:loss ratio. The applicant would not be required to conduct follow-up monitoring once fees are paid.
    2. If on- or off-site mitigation is preferred, a mitigation and monitoring plan (MMP) shall be prepared. The plan shall identify on-site and/or off-site preserve areas having a sufficient water budget (as determined by a hydrologist) for the creation of wetland habitat that is of equal or greater quality to the habitats being impacted at a minimum 1:1 creation:loss ratio. Any off-site creation would preferably occur within the same watershed.
       At a minimum, the MMP shall:

- Define the location of all created wetlands;
- Provide evidence of a suitable water budget to support any created wetland and channel habitats, as determined by a qualified hydrologist;
- Identify the species, size, number and location of plants to be installed;
- Identify the time of year for planting and any methods for supplemental watering during the establishment period;
- Identify the monitoring period which shall be no less than 5 years;
- Identify measures that shall be monitored, and define incremental and final success criteria that shall be required for the wetland mitigation to be deemed a success;
- Identify adaptive management procedures that accommodate the uncertainty that comes with wetland creation projects. These include (but are not limited to) measures to address colonization by invasive species, unexpected lack of water, excessive foraging of installed wetland plants by wildlife, erosion of channel banks, etc.;
- Define management and maintenance activities (weeding, repair of water delivery systems and browsing protection, etc.); and
- Provide for surety in funding for MMP and for in-perpetuity preservation and management of created wetland and channel habitats.

3. Wetland swales shall be mitigated for under the SCVHP, which would consist of a fee for "seasonal wetlands" of $503,724 per acre, paid prior to initiation of any ground disturbance. In addition, the applicant shall implement Condition 12 of the SCVHP to the satisfaction of the City of Morgan Hill.

Cultural Resources

The 2018 IS/MND concluded that if cultural resources were to be found during project ground-disturbing activities, a potentially significant impact could occur. As such, MM CUL-1, which establishes avoidance measures in the event of encountering historical resources, cultural resources, and/or human remains, was included in the 2018 IS/MND to ensure impacts would be less than significant.

In order to ensure impacts related to cultural resources would not be more severe than what was analyzed in the 2018 IS/MND, a project-specific Cultural Resource Assessment Report (Cultural Report) was prepared by PaleoWest in April 2023.[5] The Cultural Report included a search of cultural resource records from the Northwest Information Center (NWIC) and archival records including topographic maps and historical aerial images, as well as coordination with the Native American Heritage Commission (NAHC) in order to search the Sacred Lands File (SLF) and coordination with local tribal representatives. In addition, an intensive pedestrian survey was

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5 PaleoWest. *Cultural Resource Assessment Report for the Serene Hills Housing Project, City of Morgan Hill, Santa Clara County, California.* April 2023.

conducted on April 3, 2023, using parallel transects at 10-meter intervals to examine the project site for historic and pre-contact period site indicators.

The records search at the NWIC included a review of previously conducted cultural resource studies and previously recorded cultural resources within the project site and within a one-mile radius surrounding the site. The geographic areas of 21 previous cultural resource investigations from years ranging between 1950 to 2012 intersected with or included the project site, and 19 previous studies from between 1979 to 2018 intersected with or included the one-mile radius. Based on the results of the records search, while one previously recorded cultural resource is located within the one-mile radius, over 1,000 feet northeast of the project site, previously recorded cultural resources are not located within the project site.

In addition to the NWIC records search, historical maps of the project site were examined as part of the Cultural Report to identify the potential for cultural resources older than 45 years to occur within the project site. Topographic maps show the area as relatively unchanged between 1917 and 1939, during which the project site featured one structure (presumed to be a farmhouse due to surrounding agricultural uses). Historical aerial imagery from 1963 showed that the farm on the property had expanded to at least five buildings, and the construction of East Dunne Avenue was complete. By 1980, the area south of East Dunne Avenue had begun to infill with residential development. Parcels adjacent to the project site remained relatively unchanged until the mid-1990s, when single-family residences were constructed on Magnolia Way, immediately adjacent to the southern project site boundary. The farmhouse structures in the project site were demolished between 2014 and 2016, and the site has since remained unchanged. Therefore, the Cultural Report concluded that a moderate potential exists for the project site to contain historical resources older than 45 years, such as trash pits or building foundations.

In addition, according to the Cultural Report, watercourses served as focal points for pre-contact period occupants of the Santa Clara Valley. As such, the project site is located in a potentially sensitive archaeological area due to the presence of Coyote Creek, Llagas Creek, and Little Llagas Creek. Previous cultural studies relevant to the area have found that pre-contact period occupation sites were likely occupied due to the accessibility of the sites, protection from seasonal flooding, and the availability of resources. The project site is also located within 1.5 miles of the historical El Camino Real (now SR 101), an important travel route since the time the California missions were active. Based on the project site's proximity to watercourses and known historical travel corridors, the prior existence of a historic-era farmhouse, and previous records on the archaeologically sensitive nature of the area, previously undocumented pre-contact and historic-period archaeological resources could be encountered during construction of the proposed project. It should be noted that the off-site storm drain line would be installed within an existing private gravel drive, which would have been previously disturbed during construction, and thus, cultural resources are not anticipated to be encountered.

As previously mentioned, an intensive pedestrian survey of the project site was conducted on April 3, 2023, using parallel transects at 10-meter intervals. All exposed and accessible ground surface within the project site boundaries was examined for the presence of historic and pre-contact period site indicators. Historic period site indicators include fence lines, ditches, standing buildings, objects or structures such as sheds, or concentrations of materials at least 50 years in age, such as domestic refuse, refuse from other pursuits (such as agriculture), or structural materials. Pre-contact period site indicators include areas of darker soil with concentrations of ash, charcoal, bone, shell, flaked stone, ground stone, and pottery. Fragments from a fence and an abandoned well were the only cultural materials observed during the field survey. According to the Cultural Report, the remains of the fence may be from the old ranch, but are not diagnostic, and the well is modern.

Finally, the Cultural Report requested a search of the SLF and a list of Native American representatives with traditional affiliations to the area from the NAHC to determine previous records of Native American cultural resources within the project site and/or the surrounding area. The results of the SLF search were negative.

Although the Cultural Report did not identify any pre-contact archaeological materials within or in the vicinity of the project site, archival research suggests the possibility of encountering buried pre-contact and historic period cultural resources during project construction. Additionally, the project site's location in the foothills and near an intermittent stream suggests a historically viable location for pre-contact settlement and resource exploitation. Finally, a ranch occupied the project site since at least 1940, and associated historic period remains may be encountered as more ground surface is exposed. The 2018 IS/MND included MM CUL-1 to ensure that, in the event that archaeological materials are found, impacts would not occur. Since preparation of the 2018 IS/MND, the City of Morgan Hill has adopted following standard Conditions of Approval related to the protection of historical and archaeological resources, consistent with Section 18.60.090 of the Morgan Hill Municipal Code:

A. The developer shall enter into written contracts with an archaeologist and the Tamien Nation Tribe, and pay all fees associated with the activities required by this condition. The following policies and procedures for treatment and disposition of inadvertently discovered human remains or archaeological materials shall apply:

1. Prior to start of grading or earthmoving activity (includes demolition and moving of heavy equipment on site) on the "first day of construction", the archaeologist and Tamien Nation Tribal Monitor shall hold a preconstruction meeting for the purposes of "cultural sensitivity training" with the general contractor and subcontractors.

2. An archaeologist and a Tamien Nation Tribal Monitor shall be present on-site to monitor all ground disturbing activities and an archaeologist shall be on-call. Where historical or archaeological artifacts are found, work in areas where remains or artifacts are found will be restricted or stopped until proper protocols are met, as described below:

    a) Work at the location of the find will halt immediately within fifty feet of the find. If an archaeologist is not present at the time of the discovery, the applicant shall contact an archaeologist for evaluation of the find to determine whether it qualifies as a unique archaeological resource as defined by this chapter.

    b) If the find is determined not to be a Unique Archaeological Resource, construction can continue. The archaeologist will prepare a brief informal memo/letter in collaboration with a tribal representative that describes and assesses the significance of the resource, including a discussion of the methods used to determine significance for the find;

    c) If the find appears significant and to qualify as a unique archaeological resource, the archaeologist will determine if the resource can be avoided and will detail avoidance procedures in a formal memo/letter; and

d) If the resource cannot be avoided, the archaeologist in collaboration with a tribal representative shall develop within forty-eight hours an action plan to avoid or minimize impacts. The field crew shall not proceed until the action plan is approved by the Development Services Director. The action plan shall be in conformance with California Public Resources Code 21083.2.

3. The following policies and procedures for treatment and disposition of inadvertently discovered human remains or archaeological materials shall apply. If human remains are discovered, it is probable they are the remains of Native Americans,

   a) If human remains are encountered, they shall be treated with dignity and respect as due to them. Discovery of Native American remains is a very sensitive issue and serious concern. Information about such a discovery shall be held in confidence by all project personnel on a need-to-know basis. The rights of Native Americans to practice ceremonial observances on sites, in labs and around artifacts shall be upheld.
   b) Remains should not be held by human hands. Surgical gloves should be worn if remains need to be handled.
   c) Surgical mask should also be worn to prevent exposure to pathogens that may be associated with the remains.

4. In the event that known or suspected Native American remains are encountered, or significant historic or archaeological materials are discovered, ground-disturbing activities shall be immediately stopped. Examples of significant historic or archaeological materials include, but are not limited to, concentrations of historic artifacts (e.g., bottles, ceramics) or prehistoric artifacts (chipped chert or obsidian, arrow points, ground stone mortars and pestles), culturally altered ash stained midden soils associated with pre-contact Native American habitation sites, concentrations of fire-altered rock and/or burned or charred organic materials and historic structure remains such as stone lined building foundations, wells or privy pits. Ground-disturbing project activities may continue in other areas that are outside the exclusion zone as defined below.

5. An "exclusion zone" where unauthorized equipment and personnel are not permitted shall be established (e.g., taped off) around the discovery area plus a reasonable buffer zone by the contractor foreman or authorized representative, or party who made the discovery and initiated these protocols, or if on-site at the time or discovery, by the monitoring archaeologist and tribal representative (typically twenty-five to fifty feet for single burial or archaeological find).

6. The discovery locale shall be secured (e.g., 24-hour surveillance) as directed by the City or County if considered prudent to avoid further disturbances.

7. The Contractor Foreman or authorized representative, or party who made the discovery and initiated these protocols shall be responsible for immediately contacting by telephone the parties listed below to report the find and initiate the consultation process for treatment and disposition:

   - The City of Morgan Hill Development Services Director (408) 779-7247
   - The Contractor's Point(s) of Contact
   - The Coroner of the County of Santa Clara (if human remains found) (408) 793-1900
   - The Native American Heritage Commission (NAHC) in Sacramento (916) 653-4082
   - The Amah Mutsun Tribal Band (916) 481-5785 (H) or (916) 743-5833 (C)
   - The Tamien Nation (707) 295-4011 (office) and (925) 336-5359 (THPO)

8. The Coroner has two working days to examine the remains after being notified of the discovery. If the remains are Native American the Coroner has 24 hours to notify the NAHC.

9. The NAHC is responsible for identifying and immediately notifying the Most Likely Descendant (MLD). (Note: NAHC policy holds that the Native American Monitor will not be designated the MLD.)

10. Within 24 hours of their notification by the NAHC, the MLD will be granted permission to inspect the discovery site if they so choose.

11. Within 24 hours of their notification by the NAHC, the MLD may recommend to the City's Development Services Director the recommended means for treating or disposing, with appropriate dignity, the human remains and any associated grave goods. The recommendation may include the scientific removal and non-destructive or destructive analysis of human remains and items associated with Native American burials. Only those osteological analyses or DNA analyses recommended by the appropriate tribe may be considered and carried out.

12. If the MLD recommendation is rejected by the City of Morgan Hill the parties will attempt to mediate the disagreement with the NAHC. If mediation fails then the remains and all associated grave offerings shall be reburied with appropriate dignity on the property in a location not subject to further subsurface disturbance.

Such requirements would ensure that impacts to cultural resources would not occur as a result of the proposed project, and would supersede the requirements of MM CUL-1 included in the 2018 IS/MND.

Prior Mitigation Measures
None applicable.

Modified Mitigation Measures
None required.

New Mitigation Measures
None required.

Hydrology and Water Quality

The 2018 IS/MND evaluated potential impacts to hydrology and water quality under Section 4.9 and concluded that the only potentially impact would be related to water quality standards, waste discharge requirements, or otherwise degraded water quality during project construction. In order to reduce the foregoing impact to a less than significant level, the 2018 IS/MND included MM HYD-1, which requires the proposed project to prepare a SWPPP and Erosion Control Plan (ECP) in accordance with the City of Morgan Hill Standard Conditions of Approval and the General National Pollutant Discharge Elimination System (NPDES). All other impacts related to hydrology and water quality were determined to be less than significant.

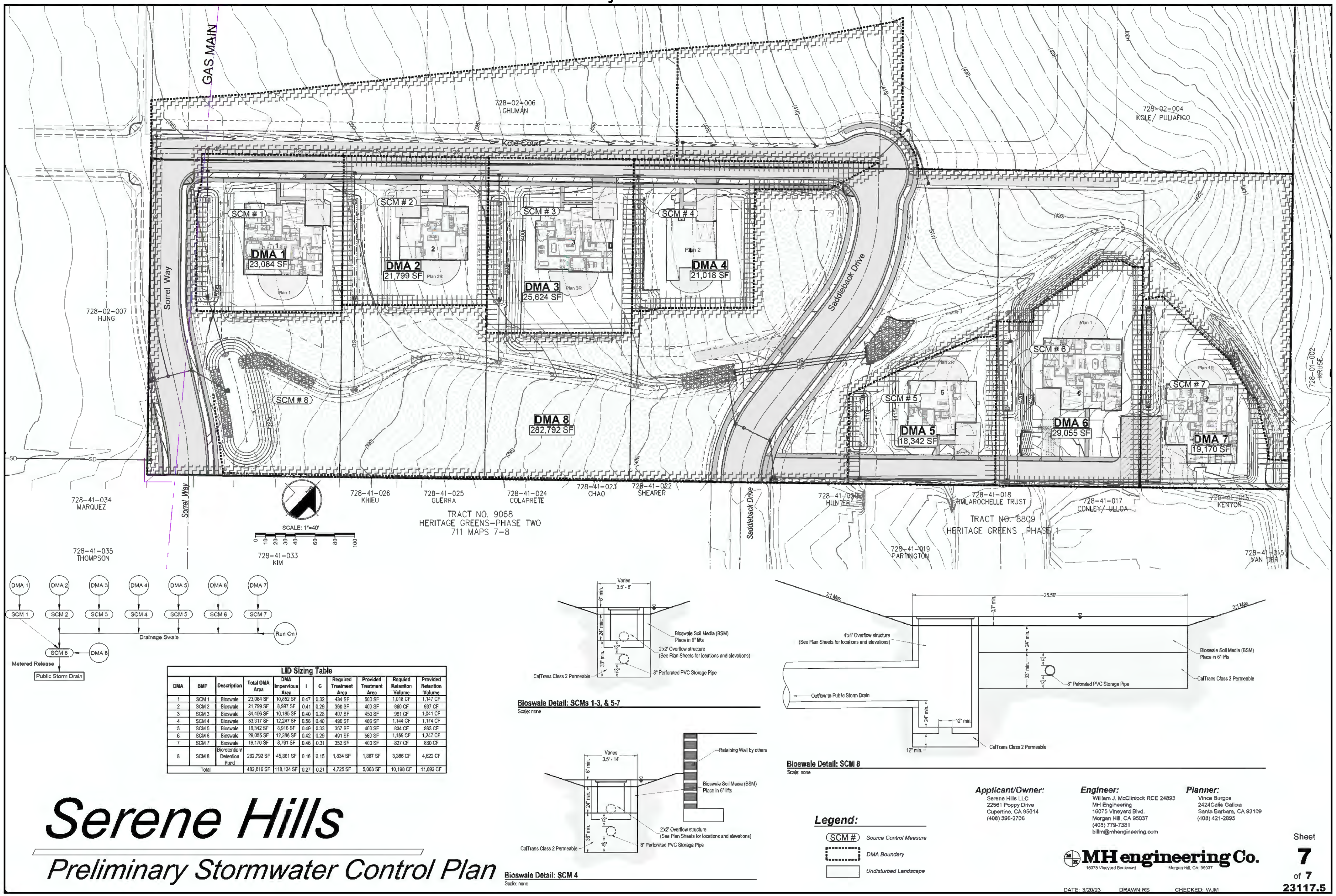
In order to ensure that the proposed project would not result in any additional or more severe significant impacts related to hydrology and water as compared to the 2018 IS/MND, a project-specific Preliminary Stormwater Control Plan (SWCP) was prepared by MH Engineering Co. on July 24, 2023 (see Attachment 5).[6] The Preliminary SWCP included an evaluation of the proposed performance requirements, drainage design, and source control measures. According to the Preliminary SWCP, the project site currently experiences significant run-on from the hillside northeast of the project site. Run-on drains into an existing drainage swale that crosses the project site from the northeast to the southwest. Stormwater retained within the existing channel typically drains from the project site within 48 hours after the storm event, which creates adequate storage capacity for follow-up rain events.

During project construction, grading activities could result in an increase in erosion-related pollutants in stormwater runoff. Similar to the 2018 IS/MND, construction activities associated with the proposed project could therefore result in significant impacts to water quality standards, waste discharge requirements, or otherwise degraded water quality. However, the proposed project would still be required to develop an ECP and SWPPP to demonstrate elimination or reduction strategies associated with non-stormwater discharges into the stormwater system, how discharges into the stormwater system would be monitored, and what BMPs would be implemented by the project to avoid water quality impacts during construction and operational periods. As such, SM HYD-1 would still be required to reduce the potential for substantial adverse impacts to water quality during construction.

Development of the proposed project would create new impervious surfaces on-site, which would increase urban runoff as compared to the current project site conditions. To manage stormwater flows created by the proposed project, the project site's stormwater facilities would be developed within eight DMAs located throughout the entirety of the project site (see Figure 5).

6 MH Engineering Co. *Preliminary Stormwater Control Plan.* July 24, 2023.

Figure 5
Preliminary Stormwater Control Plan



LID Sizing Table

DMA	BMP	Description	Total DMA Area	DMA Impervious Area	i	C	Required Treatment Area	Provided Treatment Area	Requied Retention Volume	Provided Retention Volume
1	SCM 1	Bioswale	23,084 SF	10,852 SF	0.47	0.32	434 SF	500 SF	1,018 CF	1,147 CF
2	SCM 2	Bioswale	21,799 SF	8,997 SF	0.41	0.29	360 SF	400 SF	860 CF	937 CF
3	SCM 3	Bioswale	34,456 SF	10,185 SF	0.40	0.28	407 SF	450 SF	981 CF	1,041 CF
4	SCM 4	Bioswale	53,317 SF	12,247 SF	0.58	0.40	490 SF	486 SF	1,144 CF	1,174 CF
5	SCM 5	Bioswale	18,342 SF	8,916 SF	0.49	0.33	357 SF	400 SF	834 CF	893 CF
6	SCM 6	Bioswale	29,055 SF	12,286 SF	0.42	0.29	491 SF	560 SF	1,169 CF	1,247 CF
7	SCM 7	Bioswale	19,170 SF	8,791 SF	0.46	0.31	352 SF	400 SF	827 CF	830 CF
8	SCM 8	Bioretention/ Detention Pond	282,792 SF	45,861 SF	0.16	0.15	1,834 SF	1,867 SF	3,366 CF	4,622 CF
Total			482,016 SF	118,134 SF	0.27	0.21	4,725 SF	5,063 SF	10,198 CF	11,892 CF

DMA 1 through DMA 7 would be associated with each of the seven single-family residential lots, and stormwater from each lot would be conveyed to a bioswale located along the western property line of each lot. The seven bioswales would collect stormwater runoff from DMAs 1 through 7 and provide preliminary treatment.

From each bioswale, treated runoff would be conveyed through a 24-inch by 24-inch drainage inlet to the existing on-site swale, which would be channelized as part of the proposed project. DMA 8, located east of the proposed extension to Saddleback Drive, would also drain into the channelized swale. Stormwater runoff would then flow through the existing swale to the proposed bioretention/detention pond located at the lowest point on the site at the southwest corner. Outflow from the proposed bioretention/detention pond would then be directed through a proposed 30-inch stormwater line that would extend off-site and outfall into an existing 36-inch storm drain across East Dunne Avenue, which eventually discharges into Tennant Creek near Old Hill Road. Consistent with State requirements, the off- and on-site stormwater systems would be designed sufficient to adequately handle the project's stormwater runoff, which would ensure that the proposed project would not have the potential to violate any storm water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality in excess of what was previously anticipated for the site by the 2018 IS/MND.

In addition, the majority of the development associated with the proposed project would be located within the disturbance area analyzed in the 2018 IS/MND, and would result in the development of seven on-site residences, as compared to the 22 units considered in the 2018 IS/MND. Because the proposed project would result in the development of the same land use as compared to what was anticipated in the 2018 IS/MND, albeit at a lower density, the proposed project would result in similar, or less, impervious surface area than what was analyzed in the 2018 IS/MND. Furthermore, the proposed project would implement all requirements of the NPDES permitting process, as well as all other applicable State and local requirements. Finally, although the proposed project includes off-site improvements, the 30-inch stormwater line that would extend west from the project site would be constructed within an existing private gravel drive, and would not result in the construction of new impervious surfaces.

Overall, the proposed project would not result in more severe significant impacts related to hydrology and water quality as compared to the 2018 IS/MND.

<u>Prior Mitigation Measures</u>

MM HYD-1 In accordance with the City of Morgan Hill Standard Conditions of Approval and the NPDES Storm Water Permit for Construction Activities, future development projects will prepare a SWPPP and an ECP. The plans will be submitted to the Director of Public Works and Central Coast RWQCB for review and approval, prior to issuance of a building permit. The ECP and SWPPP will demonstrate how the project will eliminate or reduce non-stormwater discharges into the stormwater system, how discharges into the stormwater system will be monitored, and what BMPs will be implemented by the project to avoid water quality impacts during construction (e.g., street sweeping, fiber rolls, temporary cover and/or permanent cover) and post-construction periods. In conformance with existing policies, programs, and with implementation of BMPs, the project will not result in significant impacts to water quality or water discharge requirements.

<u>Modified Mitigation Measures</u>

None required.

New Mitigation Measures
None required.

Remaining Environmental Resource Areas

The 2018 IS/MND previously considered development of the project site with 22 dwelling units. The proposed project would consist of seven single-family residences located on the same project site. As such, the area of disturbance associated with the development of seven single-family residences, with the exception of the proposed off-site stormwater line, which would be located in an existing private gravel drive north of East Dunne Avenue, would remain the same as what was anticipated in the 2018 IS/MND. Therefore, impacts related to agriculture and forestry resources, as well as mineral resources, would be the same as what was previously analyzed in the 2018 IS/MND.

Wildfire is an environmental issue area that was included in CEQA Guidelines Appendix G subsequent to the approval of the 2018 IS/MND. As such, the 2018 IS/MND did not include an analysis specifically dedicated to wildfire; however, the 2018 IS/MND analyzed the potential impacts related to wildfires within Section 4.8.2, under the Hazards and Hazardous Materials section. As noted therein, the project site is not in the City's Fire Hazard Severity Zone (FHSZ); however, the area immediately to the east of the project site is located within the City's High FHSZ.[7] Similar to the 2018 IS/MND, the proposed project would be constructed in conformance with current building and fire codes, including features that would reduce potential fire hazards. In addition, the proposed project would be served by the City's existing water distribution system, and would be designed with safe access for emergency response vehicles. Therefore, impacts related to wildfire would be the same as what was previously analyzed in the 2018 IS/MND.

In addition, a number of environmental impact areas are a function of population, including public services, utilities and service systems, recreation, and population and housing. For example, if fewer individuals occupy a project site, the project is expected to exert less demand on utilities such as water and sewer. Given that the proposed project would involve the development of seven single-family residences, any increase in population would be less than what was anticipated in the 2018 IS/MND, and therefore would not be considered significant in the context of the City or as compared to the 2275 East Dunne Avenue Project. Thus, impacts to the aforementioned areas would be within the scope of what was previously analyzed in the 2018 IS/MND.

With respect to geology and soils, an Initial Geotechnical Investigation was prepared on April 23, 2018 (see Attachment 6).[8] The Initial Geotechnical Investigation included a review of published sources and historic aerial photos, as well as an in-person reconnaissance of the project site. In order to comply with the findings of the Initial Geotechnical Investigation, the 2018 IS/MND required compliance with MMs GEO-1, GEO-2, and GEO-3, which require preparation of a design-level geotechnical investigation and specifies the measures to be included therein. The proposed project would be subject to the aforementioned MMs; as such, impacts related to geology and soils would not be more severe than what was previously analyzed in the 2018 IS/MND.

With respect to hazards and hazardous materials, the 2018 IS/MND identified a potentially significant impact associated with elevated levels of organochlorine pesticides (OCPs) associated with the historic agricultural use of the site. Mitigation Measure HAZ-1 required preparation of a

[7] City of Morgan Hill. *City of Morgan Hill Wildland Urban Interface*. March 18, 2009.
[8] Cornerstone Earth Group. *Initial Geotechnical Investigation.* April 23, 2018.

Phase I Environmental Site Assessment (ESA) to determine the potential hazards, and preparation of a Phase II ESA if the Phase I ESA recommends soil testing. The Phase I ESA recommended soil testing in order to define contamination. As such, in compliance with Mitigation Measure HAZ-1, a Limited Phase II Subsurface Investigation Report (Phase II Report) was prepared on January 19, 2023, to document the concentrations of any hazardous contaminants in the soil (see Attachment 7).[9] The Phase II Report included the collection of 18 evenly-spaced shallow soil samples across the project site and concluded that the proposed project would not result in potentially significant impacts associated with the OCPs originating from the site's former agricultural uses. Therefore, impacts related to hazards and hazardous materials would not be more severe than what was previously analyzed in the 2018 IS/MND.

With respect to transportation, the City of Morgan Hill is in the process of preparing Citywide VMT guidelines. Until such guidelines are adopted, the City uses OPR guidance to evaluate potential significant impacts to transportation. As discussed above, based on the ITE "Single-Family Residential" land use (ITE Land Use Category #210), the seven proposed single-family residences would result in an average of 66 trips per day. Therefore, the proposed project would meet the OPR screening criteria for projects that generate or attract fewer than 110 trips per day, and the project would not result in impacts related to VMT. As such, impacts related to transportation would not be more severe than what was previously analyzed in the 2018 IS/MND.

Furthermore, a project-specific Noise Assessment Study[10] (see Attachment 8) evaluated potential noise impacts associated with project construction and increased traffic during operations. The Noise Assessment Study evaluated the potential noise created by construction and operation of the proposed project against the noise standards set forth within the City of Morgan Hill Noise Element and estimated future traffic noise levels. According to the Noise Assessment Study, existing traffic noise levels in the general area are anticipated to increase by 1.0 dB or less due to the proposed project, and noise levels would not exceed applicable local standards. Therefore, the Noise Assessment Study concluded that the proposed project would have a less-than-significant impact associated with noise during project operations. With respect to project construction, SM NOI-1 included in the 2018 IS/MND requires standard construction noise suppression measures, and would still be applicable to the proposed project. Thus, project related noise impacts would be within the scope of what was previously analyzed in the 2018 IS/MND.

Additionally, the project site was analyzed as being developed with residential uses in the 2018 IS/MND, which concluded that impacts associated with aesthetics, energy, and land use and planning would be less-than-significant. It should be noted that the proposed project would be subject to all relevant provisions of the most recent update of the California Building Standards Code (CBSC), which would include the 2022 Building Energy Efficiency Standards. Compliance with the requirements of the Building Energy Efficiency Standards would ensure that the proposed residences would consume energy efficiently, and impacts related to energy would not be more severe than what was previously analyzed in the 2018 IS/MND. Finally, because the proposed project would be located on the same project site as the 2018 IS/MND and would develop the site with fewer residences than was originally analyzed therein, the proposed project would have similar, if not less severe, impacts associated with aesthetics and land use and planning.

9 AEI Consultants. *Limited Phase II Subsurface Investigation Report.* January 19, 2023.

10 Edward L. Pack Associates, Inc. *Noise Assessment Study for the Planned "Serene Hills" Single-Family Subdivision, Sorrel Way, Morgan Hill.* January 30, 2023.

Overall, with implementation of the MMs included in the 2018 IS/MND, as listed below, the proposed project would not result in any additional significant impacts or more severe significant as compared to the 2018 IS/MND.

Prior Mitigation Measures

MM GEO-1 As required pursuant to General Plan Policy SSI-1.1, SSI-1.2, and SSI-2.1, future residential development shall prepare a design-level geotechnical investigation which shall include trenching in order to locate the fault zone and establish a "no build" zone. The study shall be completed and submitted to the City for review as part of the tentative subdivision map review process. All recommendations in the design level geotechnical investigation shall be implemented by the project, which shall include standard engineering and seismic safety design techniques. Future development shall also meet the requirements of applicable Building and Fire Code.

MM GEO-2 As part of the design-level geotechnical investigation required for future development onsite, the investigation shall include a debris flow analysis to evaluate the potential for debris flow. In the event debris flow hazard is identified, engineering measures would be implemented to reduce the hazard. Examples of engineering measures could include a combination of walls (deflection wall or catchment wall) and/or catchment basin and debris grate/catch basin.

MM GEO-3 Future development shall implement recommendations in the design-level geotechnical report prepared for the project, which shall include design and engineering measures to avoid and reduce adverse effects of expansive soils to future development onsite. Recommendations to address the undocumented fills shall also be implemented, which shall include removing all fills identified within the building areas and to a lateral distance of at least five feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater.

MM HAZ-1 As required by General Plan Policy SSI-4.16, a Phase I Environmental Site Assessment (ESA) has been prepared for the site in order to determine whether there are potential hazards associated with the historic agricultural use of the site. If the Phase I ESA recommends soil testing in order to define contamination, Phase II soil investigations shall be completed to document the concentrations of any hazardous contaminants in the soil. Recommendations of the Phase II for any required soil remediation shall be implemented by the project.

MM NOI-1 The following standard construction noise suppression measures would be implemented during the construction activities to reduce noise levels:

- Construction activities shall be limited to the hours between 7:00 a.m. and 8:00 p.m., Monday through Friday, and between the hours of 9:00 a.m. and 6:00 p.m. on Saturdays. No construction activities should occur on Sundays or federal holidays (Consistent with Section 8.28.040 of the Morgan Hill Municipal Code).
- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Locate stationary noise generating equipment (e.g. rock crushers, compressors) as far as possible from adjacent residential receptors.
- Acoustically shield stationary equipment located near residential receptors with temporary noise barriers or recycled demolition materials.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with adjacent residential land uses so that construction activities can be scheduled to minimize noise disturbance.
- Designate a "disturbance coordinator" who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to correct the problem.

<u>Modified Mitigation Measures</u>
None required.

<u>New Mitigation Measures</u>
None required.

Conclusion

As established in the discussions above regarding the potential effects of the proposed project, the proposed project would not result in any new significant information of substantial importance, new significant impacts, a substantial increase in the severity of previously identified significant impacts, or new mitigation measures, from what was analyzed in 2018 IS/MND.

Consistent with Section 15065(a)(4) of the CEQA Guidelines, a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has the potential to cause substantial adverse effects on human beings, either directly or indirectly. Pursuant to this standard, a change to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to effects on particular individuals.

While changes to the environment that could indirectly affect human beings would be represented by all of the designated CEQA issue areas, those that could directly affect human beings include air quality, hazardous materials, and noise. Implementation of the Standard Permit Conditions and mitigation measures, and adherence to General Plan, City Code, and state and federal regulations described in these sections of the report, would avoid significant impacts. No other direct or indirect adverse effects on human beings have been identified. **(Less than Significant Impact with Mitigation Incorporated)**

Based on the above analysis, this revised Mitigated Negative Declaration using the previously considered 2018 IS/MND has been prepared.

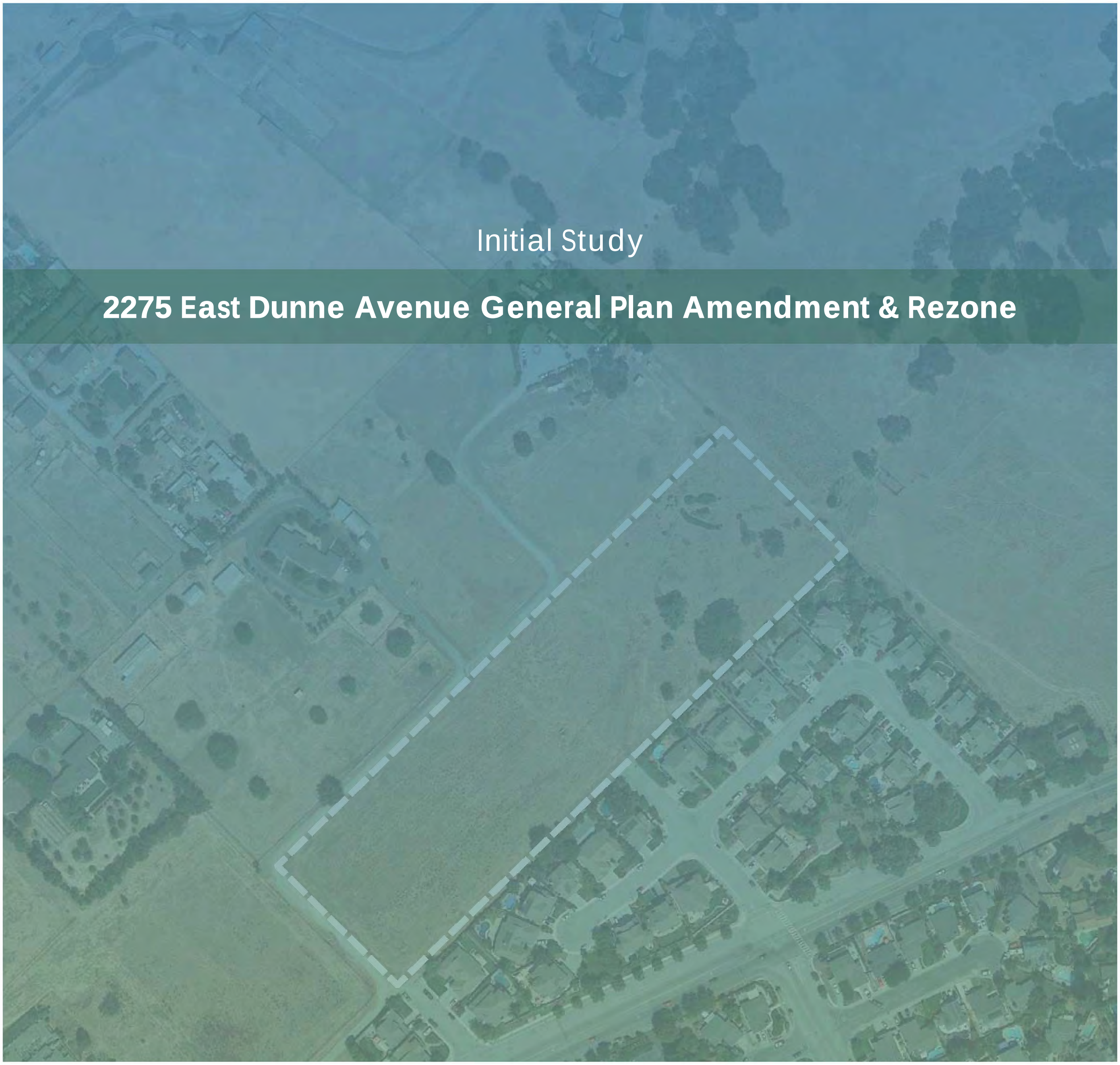
ATTACHMENT 1

2275 EAST DUNNE AVENUE PROJECT

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

Initial Study

2275 East Dunne Avenue General Plan Amendment & Rezone



CITY OF MORGAN HILL

June 2018

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ACRONYMS AND ABBREVIATIONS

ABAG	Association of Bay Area Governments
AB 52	Assembly Bill 52
ADT	average daily trips
ADWF	average dry weather flow
ALUC	Airport Land Use Commission
BAAQMD	Bay Area Air Quality Management District
BMPs	Best Management Practices
CalFire	California Department of Forestry and Fire Protection
CARB	California Air Resource Board
CCR	California Code of Regulations
CCTF	Coyote Creek Thrust Fault
CDFW	California Department of Fish and Wildlife
CNEL	community noise equivalent level
CEQA	California Environmental Quality Act
CO_2e	carbon dioxide
dBA	A-weighted decibel
Du/ac	Dwelling units per acre
ECP	Erosion Control Plan
EIR	Environmental Impact Report
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
GHG	greenhouse gases
GPA	General Plan Amendment
L_{dn}	day-night average sound level
mgd	million gallons per day
MHFD	Morgan Hill Fire Department
MHPD	Morgan Hill Police Department
MLD	Most Likely Descendant
MND	Mitigated Negative Declaration
NPDES	National Pollutant Discharge Elimination System
MT	metric tons
NOD	Notice of Determination

Pdf	debris flow hazard zone
$PM_{2.5}$	fine particulate matter
PM_{10}	Particulate matter
RDCS	Residential Development Control System
RFTF	Range Front Thrust Fault
RWQCB	Regional Water Quality Control Board
SB 32	Senate Bill 32
SCRWA	South County Regional Wastewater Authority
SCVHP	Santa Clara Valley Habitat Plan
SCVWD	Santa Clara Valley Water District
SWMP	Storm Water Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TACs	toxic air contaminants
USFWS	United States Fish and Wildlife Service
2017 CAP	Bay Area 2017 Clean Air Plan

SECTION 1.0 INTRODUCTION AND PURPOSE

1.1 PURPOSE OF THE INITIAL STUDY

The City of Morgan Hill as the Lead Agency, has prepared this Initial Study for the 2275 E. Dunne Avenue General Plan Amendment and Rezoning Project in compliance with the California Environmental Quality Act (CEQA), the CEQA Guidelines (California Code of Regulations §15000 et. seq.) and the regulations and policies of the City of Morgan Hill, California.

The project proposes to amend the General Plan land use designation and rezone the 8.34-acre project site located on 2275 East Dunne Avenue in the City of Morgan Hill. This Initial Study evaluates the environmental impacts that might reasonably be anticipated to result from implementation of the proposed project.

1.2 PUBLIC REVIEW PERIOD

Publication of this Initial Study marks the beginning of a 30-day public review and comment period. During this period, the Initial Study will be available to local, state, and federal agencies and to interested organizations and individuals for review. Written comments concerning the environmental review contained in this Initial Study during the 30-day public review period should be sent to:

Tiffany Brown, Associate Planner
17575 Peak Avenue
Morgan Hill, CA 95037
Tiffany.Brown@morganhill.ca.gov

1.3 CONSIDERATION OF THE INITIAL STUDY AND PROJECT

Following the conclusion of the public review period, the City of Morgan Hill will consider the adoption of the Initial Study/Mitigated Negative Declaration (MND) for the project at a regularly scheduled meeting. The City shall consider the Initial Study/MND together with any comments received during the public review process. Upon adoption of the MND, the City may proceed with project approval actions.

1.4 NOTICE OF DETERMINATION

If the project is approved, the City of Morgan Hill will file a Notice of Determination (NOD), which will be available for public inspection and posted within 24 hours of receipt at the County Clerk's Office for 30 days. The filing of the NOD starts a 30-day statute of limitations on court challenges to the approval pursuant to CEQA (CEQA Guidelines Section 15075(g)).

SECTION 2.0 PROJECT INFORMATION

2.1 PROJECT TITLE

2275 E. Dunne Avenue General Plan Amendment and Rezone Project

2.2 LEAD AGENCY CONTACT

Tiffany Brown, Associate Planner
17575 Peak Avenue
Morgan Hill, CA 95037
Tiffany.Brown@morganhill.ca.gov

2.3 PROJECT APPLICANT

Alex Ross
Pillars Architecture Design
12 S. 1st Street, #808
San José 95113
alex@pillarsarchitecture.com

2.4 PROJECT LOCATION

The 8.34-acre project site is located at the base of the eastern foothills of Morgan Hill on 2275 E. Dunne Avenue, north of Sorrel Way, in the City of Morgan Hill. The project site and relationship to the general area are shown in Figures 2.4-1 to 2.4-3.

2.5 ASSESSOR'S PARCEL NUMBER

728-02-002 and -003

2.6 GENERAL PLAN DESIGNATION AND ZONING DISTRICT

General Plan designation: *Residential Estate* (one dwelling unit/acre [du/ac]) to *Residential Detached Low* (four du/ac)

Zoning: This project is subject to the transition provisions of the City's newly adopted Zoning Code (Section 18.04.080). Upon the effective date of the Zoning Code, land that is zoned with a zoning district classification from the previous Zoning Code shall be re-classified or translated to one of the zoning districts as established in Chapter 18.04.080 Transitional Provisions.

Prior Zone District	Re-Classified Zone District	Proposed Zone District
Residential Estate - 40,000-square foot	*Residential Estate - 1 acre*	*Residential Detached Low Density 12,000-square foot*

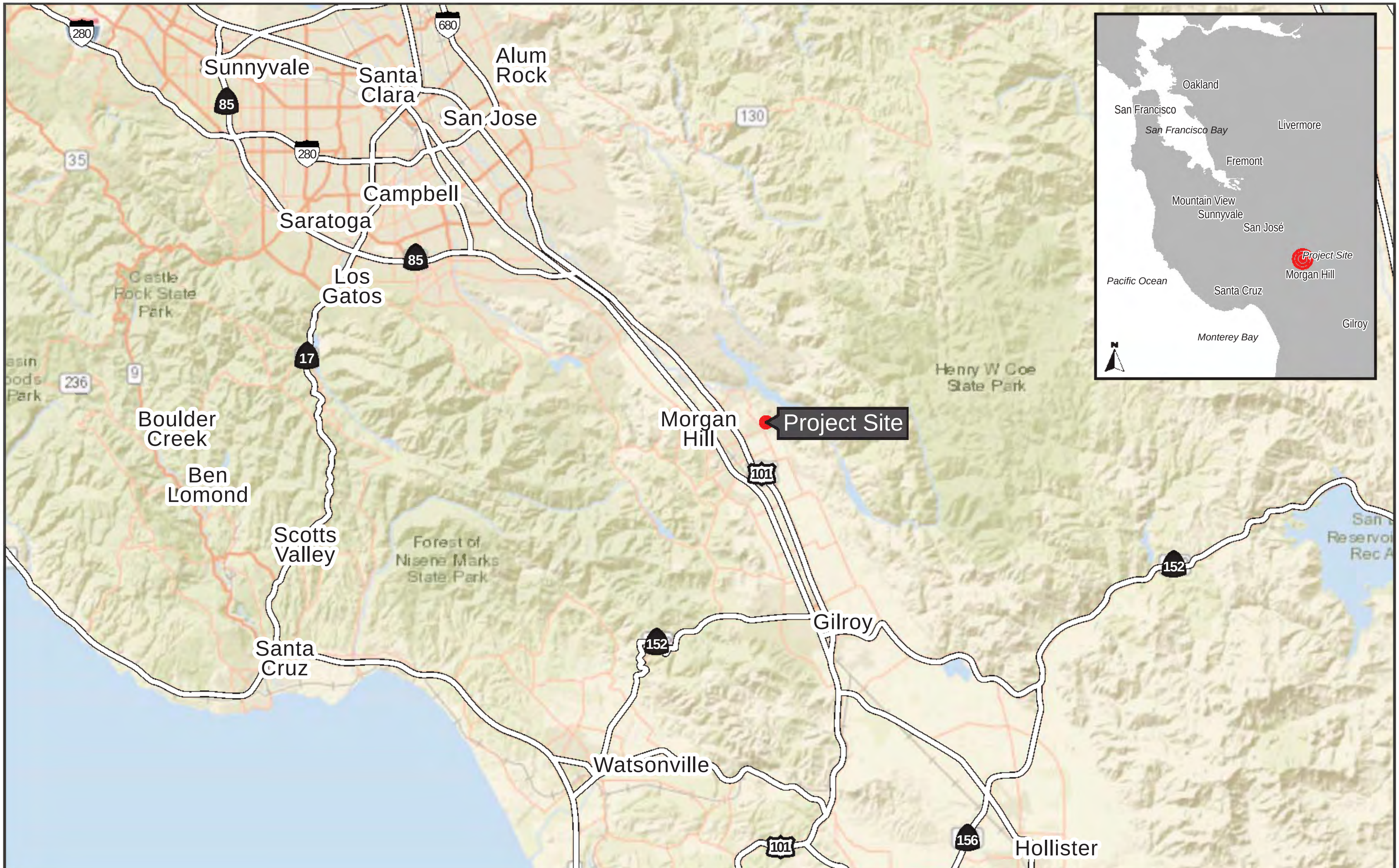
2.7 HABITAT PLAN DESIGNATION

<u>Santa Clara Valley Habitat Conservation Plan</u>

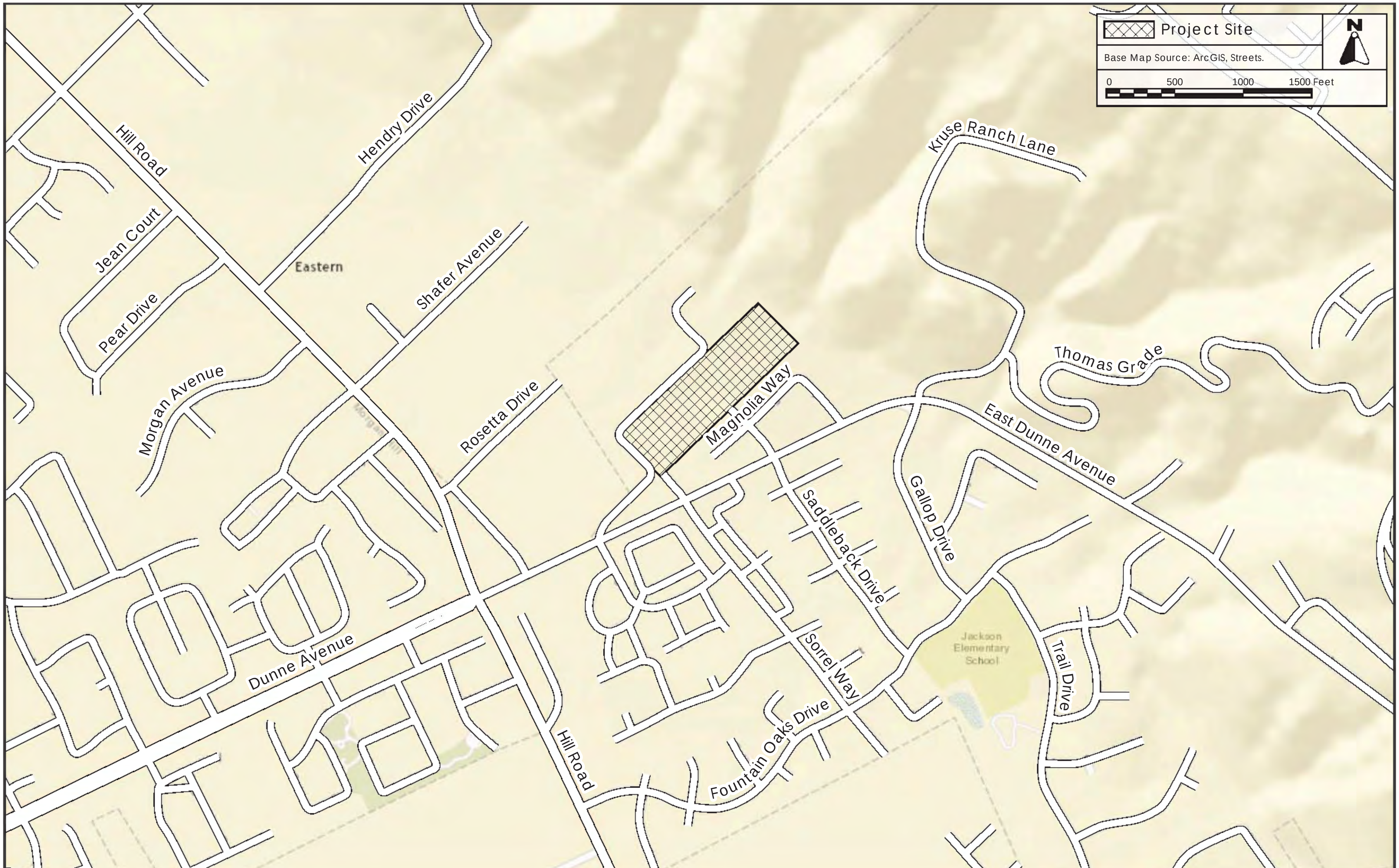
Private Development Areas: *Urban Development Equal to or Greater Than two Acres Covered*
Land Cover Designation: *Rural Residential*
Land Cover Fee Zone: *Agricultural and Valley Floor Lands*

2.8 PROJECT-RELATED APPROVALS, AGREEMENTS, AND PERMITS

- General Plan Amendment
- Zoning Amendment

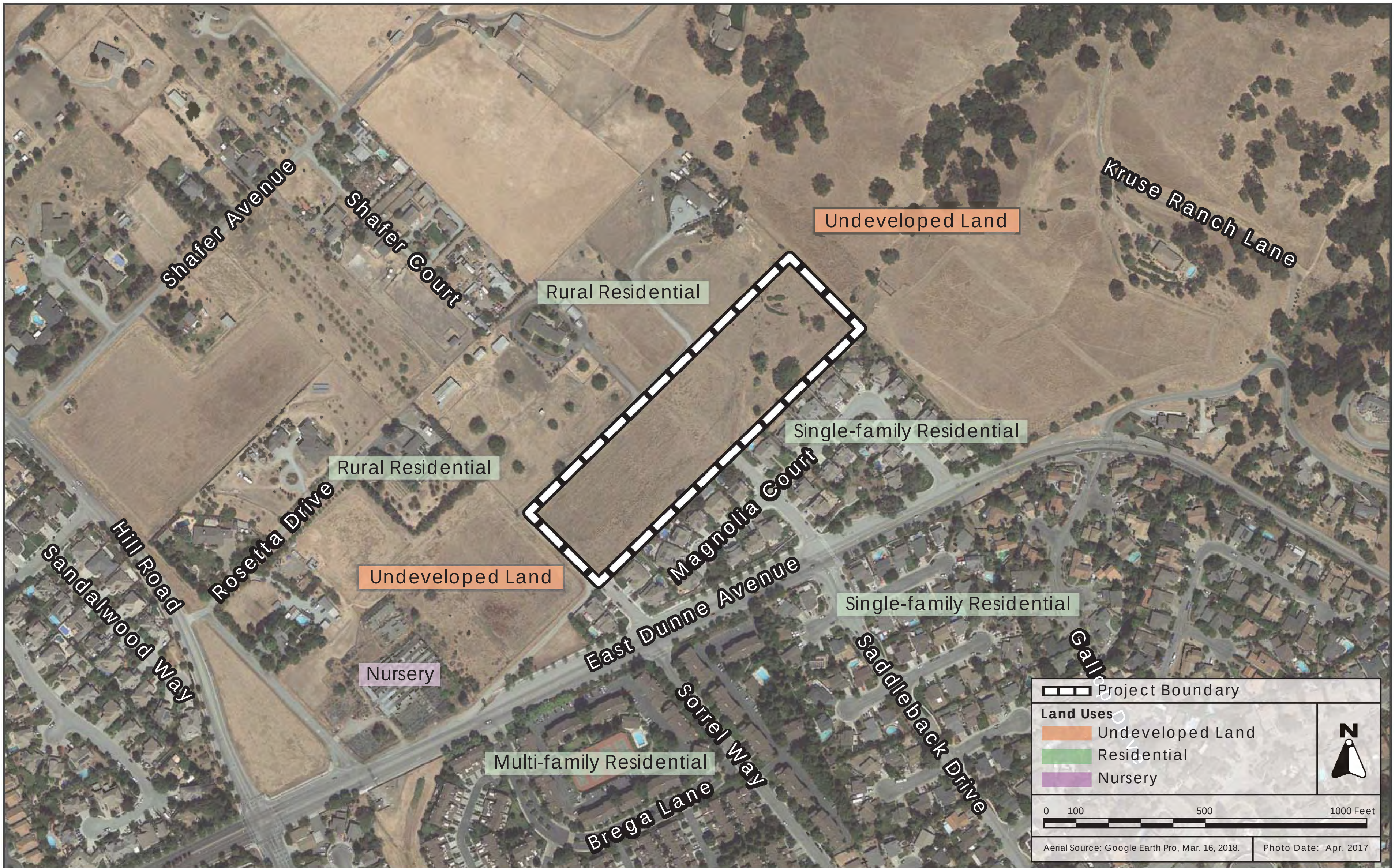


REGIONAL MAP FIGURE 2.4-1



VICINITY MAP

FIGURE 2.4-2



AERIAL PHOTOGRAPH AND SURROUNDING LAND USES

FIGURE 2.4-3

SECTION 3.0 PROJECT DESCRIPTION

3.1 OVERVIEW

The 8.34-acre project site is located on 2275 E. Dunne Avenue, north of Sorrel Way in the City of Morgan Hill. The project proposes a General Plan Amendment (GPA) to change the land use designation from *Residential Estate* to *Residential Detached Low*, and a rezoning from *Residential Estate one acre* (RE-1) to *Residential Detached Low Density 12,000-square foot lot* (RDL-12,000) in order to allow future subdivision(s) and residential uses on minimum 12,000-square foot lots.

3.2 EXISTING USE AND GENERAL PLAN DESIGNATION

The 8.34-acre (approximately 363,290 square foot) project site (APNs 728-02-002 and -003) is located on 2275 E. Dunne Avenue, north of Sorrel Way in the City of Morgan Hill. The project site is currently undeveloped and has a General Plan designation of *Residential Estate* with a zoning of RE-1. The existing General Plan designation and zoning district are defined as the following:

Existing General Plan Designation

> *Residential Estate*: This designation is intended to promote and encourage a suitable environment for families living on relatively large parcels of land. Concentrated along the western and southern City borders, the Residential Estate designation allows single-family homes, secondary dwelling units, appropriate agricultural uses, and associated community services and facilities. The maximum allowable density is one dwelling unit per acre (du/ac).

Re-Classified Zoning District

> *Residential Estate-One acre*: The purpose of the RE-1 zoning district is to provide locations for detached single-family homes on large lots in a semi-rural setting. The RE zoning district is divided into three subzones allowing for a range of permitted residential densities. The minimum lot size is one acre.

3.3 SURROUNDING LAND USES

The project is located in the east foothills of Morgan Hill, and is surrounded by rural residential and undeveloped land to the north and west, single-family residential to the south, and undeveloped land to the east. The General Plan designation and zoning for the surrounding properties are summarized in Table 3.0-1.

Table 3.0-1: Land Uses Surrounding the Project Site			
Direction	**General Plan Designation**	**Zoning District**	**Existing Use**
North	*Residential Estate*	RE-1	Rural residential
South	*Single Family Medium*	*Residential Detached Medium Density 9,000 square foot lot* (R1-9,000)	Single-family residential
East	*Open Space*	*Open Space* (OS)	Undeveloped land
West	*Residential Estate*	*Residential Detached Medium Density 7,000-square foot lot* (R1-7,000 RPD)	Rural residential

3.4 PROPOSED GENERAL PLAN DESIGNATION AND ZONING

The project proposes to change the General Plan land use designation from *Residential Estate* to *Residential Detached Low* and a rezoning from RE-1 to RDL-12,000.

Proposed General Plan Designation

> *Residential Detached Low*: This designation is intended to accommodate families in suburban single-family homes, including manufactured homes on medium-sized parcels. Secondary dwelling units are allowed within this designation. The maximum allowable density is four dwelling units per acre.

Proposed Zoning District

> *Residential Detached Low Density 12,000-square foot lot*: The purpose of the RDL zoning district is to provide locations for detached single-family homes in low-density single-family neighborhoods. The RDL-12,000 zoning district requires a minimum lot size of 12,000 square feet.

3.5 DEVELOPMENT ASSUMPTIONS FOR THE ENVIRONMENTAL REVIEW

No project specific development application is filed with the City at this time. In order to evaluate an appropriate development potential for the proposed General Plan Amendment to *Residential Detached Low* and a rezone to RDL-12,000, a unit count representing approximately 75 percent of the maximum theoretical development allowed is used. A maximum of 30 residential units/lots (363,290-square foot site divided by 12,000-square foot lots) could be considered. However, this density is unlikely due to the requirements for roads, right-of-way, and setbacks, etc. For the purpose of this analysis, development of 75 percent of the maximum development is used to derive the reasonably foreseeable development potential of the proposed project site. This would allow development of up to 22 dwelling units onsite for the proposal. No specific development is proposed for the project site at this time, and therefore the analysis in this Initial Study is conceptual or programmatic in nature given the lack of detail about how the property would be developed. Future development of specific projects on the proposed site will require subsequent environmental review to provide project-level analysis of any proposed subdivision(s) that would occur based on the proposed General Plan Amendment and rezone. This subsequent environmental review would evaluate the impacts of future development based on the precise location of proposed lots and house building pads, proposed streets and driveways, utilities, grading, tree removal(s), etc.

3.6 FUTURE IMPROVEMENTS NEEDED

Future development would require connections to the existing utility system, however, no utility improvements or upgrades are currently envisioned as part of the proposed General Plan Amendment and rezone. Utility improvements or upgrade requirements will be analyzed as part of the project-level analysis for future development. Future development would require additional right-of-way for future site access and circulation, and may include the following:

- Extend either Sorel Way or Saddleback Drive to the north;
- Connect dead ends of Sorel Way and Saddleback Drive to form a loop; and
- Widen right-of-way width of Sorel Way and/or Saddleback Drive to 60 feet to allow for detached sidewalk with a 5-foot landscape strip.

SECTION 4.0 ENVIRONMENTAL CHECKLIST AND IMPACT DISCUSSION

This section presents the discussion of impacts related to the following environmental subjects in their respective subsections:

4.1	Aesthetics	4.10	Land Use and Planning
4.2	Agricultural and Forestry Resources	4.11	Mineral Resources
4.3	Air Quality	4.12	Noise and Vibration
4.4	Biological Resources	4.13	Population and Housing
4.5	Cultural Resources	4.14	Public Services
4.6	Geology and Soils	4.15	Recreation
4.7	Greenhouse Gas Emissions	4.16	Transportation/Traffic
4.8	Hazards and Hazardous Materials	4.17	Utilities and Service Systems
4.9	Hydrology and Water Quality	4.18	Mandatory Findings of Significance

The discussion for each environmental subject includes the following subsections:

- **Environmental Checklist –** The environmental checklist, as recommended by CEQA, identifies environmental impacts that could occur if the proposed project is implemented. The right-hand column of the checklist lists the source(s) for the answer to each question. The sources are identified at the end of this section.
- **Impact Discussion –** This subsection discusses the project's impact as it relates to the environmental checklist questions. For significant impacts, feasible mitigation measures are identified. "Mitigation measures" are measures that will minimize, avoid, or eliminate a significant impact (CEQA Guidelines Section15370). Each impact is numbered using an alphanumeric system that identifies the environmental issue. For example, **Impact HAZ-1** denotes the first potentially significant impact discussed in the Hazards and Hazardous Materials section. Mitigation measures are also numbered to correspond to the impact they address. For example, **MM NOI-2.3** refers to the third mitigation measure for the second impact in the Noise section.

<u>Important Note to the Reader</u>

The California Supreme Court in a December 2015 opinion [*California Building Industry Association v. Bay Area Air Quality Management District,* 62 Cal. 4th 369 (No. S 213478)] confirmed that CEQA, with several specific exceptions, is concerned with the impacts of a project on the environment, not the effects the existing environment may have on a project. Therefore, the evaluation of the significance of project impacts pursuant to CEQA in the following sections focuses on impacts of the project on the environment, including whether a project may exacerbate existing environmental hazards.

The City of Morgan Hill currently has policies that address existing conditions (e.g., air quality, noise, and hazards) affecting a proposed project, which are also addressed in this section. This is consistent with one of the primary objectives of CEQA and this document, which is to provide objective information to decision-makers and the public regarding a project as a whole. The CEQA Guidelines and the courts are clear that a CEQA document (e.g., EIR or Initial Study) can include information of interest even if such information is not an “environmental impact” as defined by CEQA.

Therefore, where applicable, in addition to describing the impacts of the project on the environment, this chapter will discuss Planning Considerations that relate to policies pertaining to existing conditions. Such examples include, but are not limited to, locating a project near sources of air emissions that can pose a health risk, in a floodplain, in a geologic hazard zone, in a high noise environment, or on/adjacent to sites involving hazardous substances.

4.1 AESTHETICS

4.1.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐	1,2,3
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐	1,2,3
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐	1,2,3
d) Create a new source of substantial light or glare which will adversely affect day or nighttime views in the area?	☐	☐	☒	☐	1,2,3

4.1.2 Impact Discussion

a,b) Have a substantial adverse effect on a scenic vista? Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The project site is located in the Morgan Hill eastern foothills. The project site sits on the bottom of the foothills, and is surrounded by rural/suburban residential development and vacant lands (see Photo 1). Views from the project site are limited to its surrounding area. The project site is not located near a scenic vista, nor along a state scenic highway. For these reasons, the proposed General Plan Amendment and rezone would not have a significant impact on scenic vistas or scenic highways. **(Less Than Significant Impact)**

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

The project site is surrounded by rural residential with large lots to the north, east and west, and a one- to two-story single-family subdivision to the south/southeast (see Photos 2 and 3). The existing visual character of the area is suburban. As described in *Section 3.0 Project Description*, the proposed General Plan Amendment and rezone would allow approximately 22 single-family dwelling units. Once a specific development is proposed upon approval of the General Plan Amendment and rezone, the project would be subject to review and approval by the City to ensure it meets local design and aesthetic standards. For these reasons, the General Plan Amendment and rezone, would not degrade the existing visual character of its surrounding site. **(Less than Significant Impact)**

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

While there is no specific development proposed at this time, it is anticipated that lighting from future development (up to 22 dwelling units) would not generate significant lighting to the project area. It can be assumed that all lights would be constructed of conventional, low-glare materials. For these reasons, the proposed General Plan Amendment and rezone would not result in significant adverse visual or aesthetic impact. **(Less Than Significant Impact)**


Photo 1- View of the project site and surrounding sites looking southwest.


Photo 2- View of the adjacent site to the northeast looking southeast.

PHOTOS | 1 AND 2

Photo 3- View of the northeast corner of project site looking northeast.

PHOTO 3

4.2 AGRICULTURAL AND FORESTRY RESOURCES

4.2.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐	1,2,3,4
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒	1,2,3,4
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒	1,2,3,5
d) Result in a loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒	1,2,3,5
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒	1,2,3,5

4.2.2 Impact Discussion

a,b) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use? Conflict with existing zoning for agricultural use, or a Williamson Act contract?

The California Department of Conservation manages the Farmland Mapping and Monitoring Program (FMMP) to assess and record how suitable a particular tract of land is for agricultural purposes. In each county, the land is analyzed for soil and irrigation quality and the highest quality land is designated as Prime Farmland.

The project site is not designated as farmland nor is it restricted by a Williamson Act Contract. The Santa Clara County Important Farmland 2014 Map designates the project site as *Other Land*, which is land not included in any other mapping category. [1] As defined by the map, common examples

[1] California Department of Conservation, Division of Land Resource Protection. *Santa Clara County Important Farmland 2014*. October 2016.

include low density rural developments, brush, timber, wetland, and riparian areas not suitable for livestock grazing. A review of historic aerial photographs indicate past agricultural uses onsite, however, the project site is not designated in the General Plan for such use, or zoned for agricultural purposes. For these reasons, the General Plan Amendment and rezone would not result in impacts to agricultural resources. **(Less Than Significant Impact)**

c,d) Conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production? Result in a loss of forest land or conversion of forest land to non-forest use?

The project site is not zoned as forest land or timberland. As described in *Section 4.4 Biological Resources*, the Santa Clara Valley Habitat Plan (SCVHP) identifies the land cover onsite as *Rural Residential*.[2] The surrounding area is developed with rural development and does not contain forest land or timberland. For these reasons, the General Plan Amendment and rezone would not impact forest land or timberland. **(No Impact)**

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

According to the Santa Clara County Important Farmland Map 2014, the project surrounding contains *Urban and Built-Up Land* and *Grazing Land*. Neither of these designation is defined as farmland, therefore, the proposed General Plan Amendment and rezoning would not result in conversion of nearby farmland to non-agricultural uses.

The project surrounding contains vacant grassland and rural/low-density residential development and zoned as forest land, therefore, the proposed General Plan Amendment and rezone would not result in conversion of nearby forestland. **(No Impact)**

[2] Santa Clara Valley Habitat Agency. "Geobrowser." Accessed: April 10, 2018. Available at: http://www.hcpmaps.com/habitat/.

4.3 AIR QUALITY

4.3.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐	1,2,6,7
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐	1,2,7
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is classified as non-attainment under an applicable federal or state ambient air quality standard including releasing emissions which exceed quantitative thresholds for ozone precursors?	☐	☐	☒	☐	1,2,7
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐	1,2,7
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐	1

As previously discussed in *Section 3.0*, in December 2015, the California Supreme Court issued an opinion in "CBIA vs. BAAQMD" holding that CEQA is primarily concerned with the impacts of a project on the environment and generally does not require agencies to analyze the impact of existing conditions on a project's future users or residents unless the project risks exacerbate those environmental hazards or risks that already exist. Nevertheless, the City has General Plan policies (including Policy NRE-11.1 which requires developments to prepare a project-specific air quality modeling and analysis to identify measures that can reduce exposure risks from freeways and industrial uses) that address existing conditions affecting a proposed project, which are discussed below as non-CEQA related effects.

4.3.2 Impact Discussion

a) Conflict with or obstruct implementation of the applicable air quality plan?

The most recent clean air plan is the Bay Area 2017 Clean Air Plan (2017 CAP), which was adopted by BAAQMD in April, 2017. Determining consistency with the 2017 CAP (i.e., protecting public health and protecting the climate) or prevent implementation of Control Measures contained in the 2017 CAP.

The proposed General Plan Amendment and rezone would allow for the construction of approximately 22 dwelling units and its associated improvements such as road widening, and utility connections. While the proposed General Plan Amendment would allow more single-family residential units onsite than current land use regulations allow, the development of approximately 22 dwelling units in Morgan Hill would not result in substantial increase in vehicle miles traveled by residential in Morgan Hill.

The project is not proposing a specific development that could be compared to control measures for stationary, area, or mobile sources or energy control measures. Future development would be required to develop consist with applicable General Plan polices and the City's Environmental Agenda that correspond with Control Measures in the 2017 CAP during the development and permit review phase.

Exposure of sensitive receptors to toxic air contaminants (TACs) and fine particulate matter ($PM_{2.5}$) emissions would be associated with construction of a future project. Future projects would be required to implement BAAQMD's *Basic Construction Mitigation Measure* (further discussed in checklist question b below) for dust and diesel exhaust control. Implementation of *Basic Construction Mitigation Measure* during construction for future developments would reduce impacts and would not conflict with control measures in the 2017 CAP to reduce air pollutant emissions or goals of protecting public health or the climate. For these reasons, the project would not conflict with implementation of the 2017 CAP. **(Less Than Significant Impact)**

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

The project site is within the San Francisco Bay Area Air Basin. The Bay Area Air Quality Management District (BAAQMD) is the regional government agency that monitors and regulates air pollution within the air basin. The San Francisco Bay Area meets all State and Federal ambient air quality standards except for three regional pollutants known at times to exceed the state and federal standards in the project area. These pollutants include ground-level ozone, particulates (PM_{10}), and $PM_{2.5}$.

Table 3-1 in the 2017 BAAQMD CEQA Air Quality Guidelines contains screening level sizes for various land use types/development. The screening levels were developed to provide a conservative indication of whether a proposed project could result in potentially significant air quality impacts. If all of the screening criteria are met by a proposed project, then a detailed air quality assessment of a project's air pollutant emissions does not need to be prepared and the project's air quality impacts are considered less than significant. As described in *Section 3.0 Project Description*, future development of the 8.34-acre site would consist of approximately 22 dwelling units, assuming the development of a standard subdivision. As summarized in Table 4.3-2 below, the single-family screening level for construction and operational criteria pollutants are 114 dwelling units and 325 dwelling units, respectively.

Table 4.3-1: Criteria Air Pollutants and Precursor Screening Level Sizes		
Land Use Type	**Operational Criteria Pollutant Screening Size**	**Construction Criteria Pollutant Screening Size**
Single-Family	325	114
Below screening Threshold?		
22-Unit Single-Family Subdivision	Yes	Yes

Future redevelopment of the project site would not exceed the screening levels for construction and operational criteria pollutants. As defined by BAAQMD, a project screening threshold is said to have a less than significant impact if all *Basic Construction Mitigation Measures* listed in Table 8-2 of the *BAAQMD CEQA Air Quality Guidelines* would be included in the project design and during construction. Future development resulting from the proposed project would be required to implement the following basic construction mitigation measures as part of the overall development review process.

Standard Measure to be Considered at the Time of Future Development

SM AIR-1: The following *Basic Construction Mitigation Measures* listed in Table 8-2 of the *BAAQMD CEQA Air Quality Guidelines* will be implemented during construction to reduce dust and other particulate matter impacts:

- During any construction period ground disturbance, the project contractor shall implement the following Best Management Practices (BMPs):
    - Exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
    - Haul trucks transporting soil, sand, or other loose material off-site shall be covered.
    - Visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
    - Vehicle speeds on unpaved roads shall be limited to 15 mph.
    - Roadways, driveways, and sidewalks to be paved shall be completed as soon as possible after grading to minimize dirt and soil exposure. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
    - Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
    - Construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
    - Post a publicly visible sign with the telephone numbers and contact information for the project construction manager and the Lead Agency regarding dust complaints. This construction manager shall respond and take corrective action within 48 hours.

- o The BAAQMD phone number shall also be visible to ensure compliance with applicable regulations.

With implementation of SM AIR-1 during construction of future development onsite, the proposed General Plan Amendment and rezone would not result in a significant operational or construction criteria pollutant impact **(Less Than Significant Impact)**

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

As discussed above, non-attainment pollutants of concern for the San Francisco Bay Area Air Basins are ozone, PM_{10} and $PM_{2.5}$. According to BAAQMD, if a project exceeds the significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. As discussed within checklist question b, future development of the site (approximately 22 dwelling units would not exceed the screening levels for construction and operational criteria pollutants. Implementation of BAAQMD's *Basic Construction Mitigation Measures* listed above for dust control would reduce construction impacts to a less than significant level. For these reasons the proposed General Plan Amendment and rezone would not result in a cumulatively considerable net increase of a criteria pollutant for which the project region is classified as non-attainment within an applicable federal or state ambient air quality standard, including releasing emissions that exceed quantitative thresholds for ozone precursors. **(Less Than Significant Impact)**

d) Expose sensitive receptors to substantial pollutant concentrations?

The nearest sensitive receptors are residential uses adjacent to the project site. Future residential development is not expected to emit significant levels of TACs. Residential uses are not stationary sources of TACs, and do not involve use of significant diesel-powered vehicles that generate mobile TAC emissions.

Future construction would result in development of approximately 22 dwelling units. Construction of the future subdivision would require use of diesel equipment (e.g., generators, excavators, dozers, graders, etc.) The exhaust from diesel equipment contains diesel particulate matter, which is a known TAC. Depending on proximity and duration of use, the operation of diesel equipment onsite during future construction activities has the potential to expose occupants of surrounding residences to substantial TAC emissions. Since no specific development is proposed at this time, construction related impacts would be addressed during future project-level environmental review. General Plan Policy NRE-11-3 requires proposed developments that emit toxic air contaminants to prepare health risk assessments in accordance with BAAQMD procedures as part of environmental review and implement effective mitigation measures (e.g., use of alternative fuel construction equipment) to reduce potential health risks to a less than significant level, if necessary. Once construction is complete, residents driving to/from their homes would not be a source of TAC emissions, therefore, would not expose sensitive receptors to substantial pollutant concentrations. (**Less Than Significant Impact)**

e) Create objectionable odors affecting a substantial number of people?

The proposed General Plan Amendment and rezone would allow residential development onsite. Residential use is not considered an odor generating sources, such as food processing uses. While construction activities can generate odors associated with construction equipment and materials, this odor source would be temporary and would not affect a substantial number of people. For these reasons, the proposed General Plan Amendment and rezone would not significantly and permanently create objectionable odors affecting a substantial number of people. (**Less Than Significant Impact)**

4.3.2.1 *Air Quality Effects to the Project (Non-CEQA Related Effects)*

The proposed General Plan Amendment and rezoning would allow approximately 22 residential units onsite. The project area is located in the Morgan Hill foothills and consists of vacant open space and rural/suburban residential development. There are no stationary sources within 1,000 feet of the project site such as a busy roadway with over 10,000 average daily trips (ADT). General Plan Policy NRE-11.1, which requires modeling for sensitive land uses, such as residential development, proposed near sources of pollution such as freeways and industrial uses, and incorporate effective design measures to avoid health and safety risks. Since no development is proposed at this time, future development would be required to include an air quality evaluation that considers the presence of stationary TACs sources and the site's proximity to high volume roadways, and implement all measures identified to reduce health risks to future residences.

4.4 BIOLOGICAL RESOURCES

4.4.1 Environmental Checklist

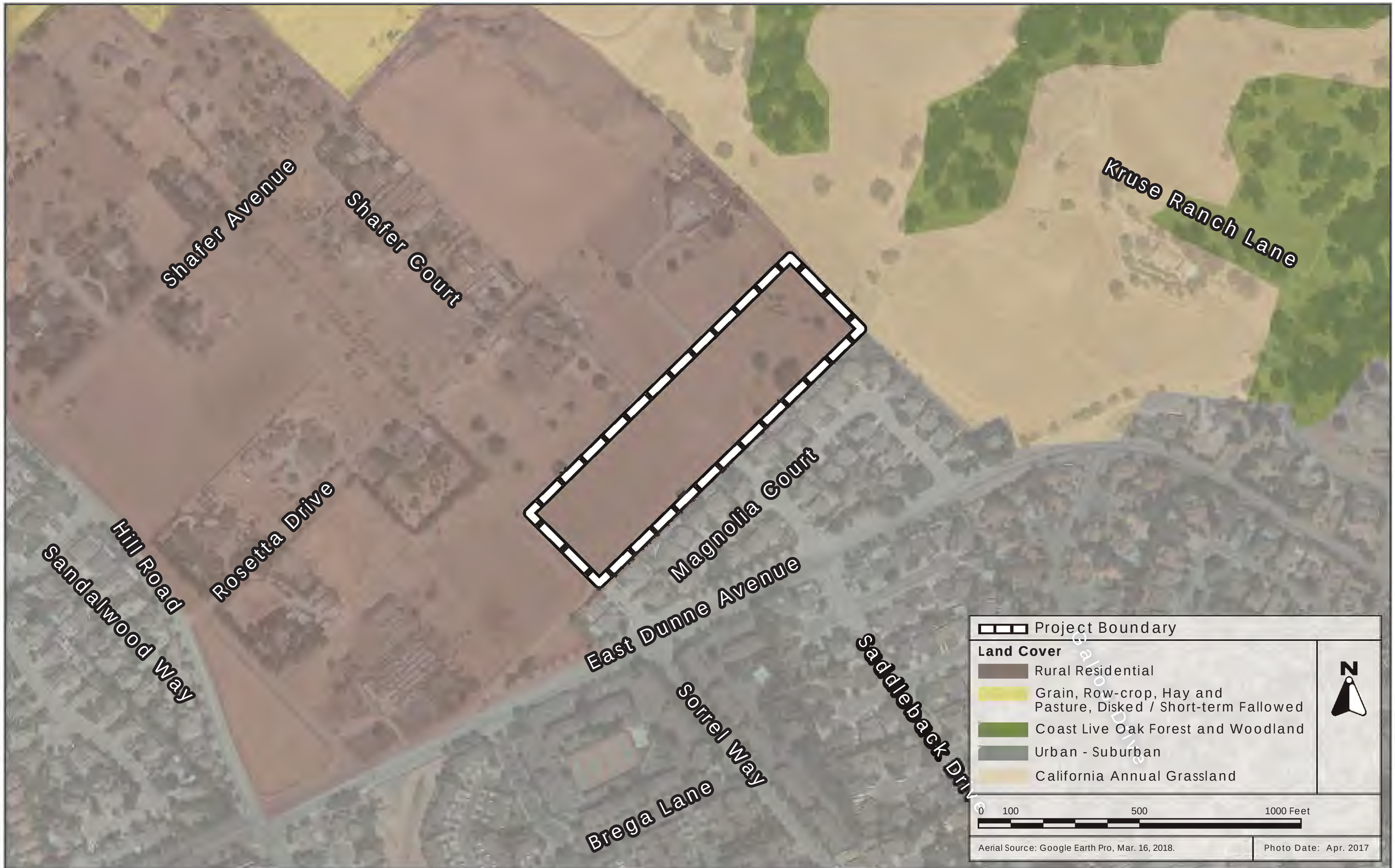
	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFWS)?	☐	☐	☒	☐	1,5,8
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS?	☐	☐	☒	☐	1,5,8,9
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐	1,5,8,9
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, impede the use of native wildlife nursery sites?	☐	☐	☒	☐	1,5,9
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐	1,2,3
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒	☐	*1,5,8*

4.4.2 Setting

4.4.2.1 *Existing Conditions*

The proposed project site is located in the Santa Clara Valley Habitat Plan (SCVHP) study area. SCVHP is a habitat conservation program intended to promote the recovery of endangered species and enhance ecological diversity and function, while accommodating planned growth in approximately 500,000 acres of southern Santa Clara County. The Habitat Plan identifies and preserves land that provides important habitat for endangered and threatened species. The land preservation is intended to provide mitigation for the environmental impacts of planned development, public infrastructure operations, and maintenance activities, as well as to enhance the long-term viability of endangered species.

Review of the Habitat Agency Geobrowser indicates the 8.34-acre site is mapped as *Rural Residential* land cover. Existing SCVHP land cover types are shown in Figure 4.4-1. The project site is currently undeveloped with some remaining man-made materials, disturbed soils and localized fills from a previous residence onsite. The site is covered in ruderal vegetation with approximately six trees onsite. There is a drainage feature that passes through the site from the northeast to the southeast of the site. Photos of the project site are shown in Photos 1 to 3 in *Section 4.1 Aesthetics*. The existing drainage pattern is shown in Figure 4.6-1 of *Section 4.6 Geology and Soils.*



EXISTING SCVHP LAND COVER TYPES

FIGURE 4.4-1

4.4.3 Impact Discussion

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

The project site is surrounded by single-family residences and rural residences in large lots. The adjacent site to the northeast is mapped as *California Annual Grassland* at its southern portion with a drainage feature crossing the proposed project site. The adjacent site however, is not mapped with any Wildlife or Plant Survey Area of the SCVHP. No special status plant or wildlife species are recorded in the project area. The project site has a *Rural Residential* land cover and does not contain sensitive habitats or habitats suitable for special-status plants or wildlife species to occur onsite.

The trees on and adjacent to the project site could provide nesting habitat for birds, including migratory birds and raptors. Nesting birds are among the species protected within the provisions of the Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3503.5, and 2800. Future redevelopment of the site during the nesting season (i.e., February 1 to August 31) could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes abandonment and/or loss of reproductive effort is considered a taking by the CDFW. Any loss of fertile eggs, nesting raptors, or any activities resulting in nest abandonment would constitute an impact. Future construction activities such as tree removal and site grading that disturb a nesting bird or raptor on-site or immediately adjacent to the construction zone would also constitute an impact. Since residential development is considered a covered activity pursuant to the SCVHP, future development onsite would be required to comply with conditions in SCVHP, including Condition 1: *Avoid Direct Impacts on Protected Plant and Wildlife Species*.

<u>Standard Measure to be Considered at the Time of Future Development</u>

SM BIO-1: If project staging and construction is anticipated to take place during the avian nesting season (February 1st – August 31st), a nesting bird preconstruction survey shall be conducted by a qualified biologist to insure that nesting birds are not located within or adjacent to the project site. This survey shall be completed not more than 14 days prior to the start of any staging or construction activity. If nesting activity is observed during the preconstruction survey, the qualified biologist will coordinate with the California Department of Fish and Wildlife (CDFW) to establish appropriate buffers, monitoring, and/or construction n phasing measures to avoid any impacts to nesting birds. The results of the preconstruction survey should be valid for 14 days.

Implementation of SM BIO-1 would reduce potential impacts from future development that may be allowed with the proposed General Plan Amendment and rezone to a less than significant level. **(Less Than Significant Impact)**

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS?

There is a drainage feature emulating from the foothill that passes through the site from the northeast of the property line to the southwest. The drainage feature is identified as a creek feature on the 2009 Santa Clara Valley Water District Creek and Watershed Map and terminates on the central portion of the site.[3] Potential watercourses or drainage features are required to be field verified using criteria set by the SCVHP. SCVHP requires projects to determine if a potential watercourse or drainage feature located on the project site qualifies as a Category 2 stream.[4] The drainage onsite is generally less than five-foot deep in northeast and less than three-foot deep to the southwest of the site. A review of aerial maps indicates the site was previously occupied by a single-family residence near the drainage feature. The drainage feature was filled and redirected to divert runoff from the hillside from the previous residence. The shallow drainage does not contain riparian vegetation or appear as a sensitive habitat for a sensitive natural community. As discussed above, the project site is identified as *Rural Residential* in accordance with SCVHP, and it is unlikely the drainage feature onsite would be subject to SCVHP setback requirements from creeks and streams. As required by SCVHP, when future project-level development is proposed, it would be required to submit an application form to SCVHP, which would include a field verification to confirm the land cover onsite, and if deemed necessary by the Director of the Community Development Department, identify if the drainage feature onsite is considered a Category 2 stream, or riparian habitat. Since the proposed project is a covered activity, payment of applicable fair share impact fees and/or incorporation of covered activity avoidance and minimization, would reduce potential riparian impacts to a less than significant level**. (Less Than Significant Impact)**

<u>Standard Measure to be Considered at the Time of Future Development</u>

SM BIO-2: Future development onsite shall submit a SCVHP application form and retain a qualified biologist to field verify the project site's land cover type and potential watercourses or drainage features using the *Criteria to Verify or Identify a Watercourse as a Stream* method as outlined in the Habitat Plan.

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

The project site has a *Rural Residential* land cover. The drainage feature onsite is where the drainage from the foothill terminates. The project site does not appear to contain wetlands, marshes, or vernal pools onsite. As described above, future development is a covered activity and would be required to submit a formal application form to SCVHP. The SCVHP application would require a qualified biologist to conduct a field verification to verify existing land cover onsite. Although unlikely, in the event the drainage onsite is identified as a Category 2 stream, or as a wetland, the project would be

[3] Santa Clara Valley Water District. *Creek and Watershed Map of Morgan Hill and Gilroy*. 2009.
[4] Category 2 stream is a stream type that may not have sufficient flow to support covered and riparian habitat. These streams include all ephemeral streams and some intermittent stream reaches. These reaches provide minimum support of water-quality functions and primary breeding habitat for covered species. Source: Santa Clara Valley Habitat Agency. *Santa Clara Valley Habitat Plan*. August 2012.

required to pay all applicable fair share impact fees and/or incorporation of covered activity avoidance and minimization to reduce impacts tot a less than significant level. **(Less Than Significant Impact)**

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, impede the use of native wildlife nursery sites?

The project site is surrounded by rural/suburban residential development. The project site is mapped as *Rural Residential* in accordance with SCVHP, and is not designated or known to support movement of any wildlife species, therefore, the proposed General Plan Amendment and rezone would not significantly interfere with movement of any wildlife. **(Less Than Significant Impact)**

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

There are approximately six existing trees onsite, some of which appear to be Eucalyptus and Oak trees, and may be "protected trees" pursuant to Section 12.32.020 (G) of the City's Municipal Code. A future development application would be required to prepare a tree survey to document existing trees onsite and comply with the City's Tree Removal Controls to replace removed trees at the ratio determined by the trees species and size. Compliance with the City's Tree Removal Controls would reduce tree impacts to a less than significant level. **(Less Than Significant Impact)**

<u>Standard Measure to be Considered at the Time of Future Development</u>

SM BIO-3: As required by the City's Tree Removal Controls, a tree removal permit is required from the Community Development Director, which includes the description of the tree replacement program and identification of any conditions imposed by the City.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project site is mapped as *Rural Residential* in the SCVHP study area. The project site is within Fee Zone B "Agricultural and Valley Floor Lands". The 2018 SCVHP fees for development of Zone B are $13,982 per acre.

Nitrogen deposition from vehicular exhaust is known to have damaging effects on many of the serpentine plants in the Habitat Plan area, as well as the host plants that support the federally endangered Bay checkerspot butterfly. Mitigation for impacts of nitrogen deposition upon serpentine habitat and the Bay checkerspot butterfly can be correlated to the amount of new vehicle trips that a project is expected to generate. Fees collected in accordance with the SCVHP for new vehicle trips can be used to purchase conservation land for the Bay checkerspot butterfly. The project would be required to provide a nitrogen deposition fee of $4.70 per new daily vehicle trips. With payment of all applicable SCVHP fees, the project would not conflict with the adopted SCVHP. **(Less Than Significant Impact)**

4.5 CULTURAL RESOURCES

The following discussion is based, in part, on a cultural resources assessment prepared by *Basin Research Associates* in March 2018. This report is on file at the City of Morgan Hill and can be viewed during regular business hours.

4.5.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Cause a substantial adverse change in the significance of an historical resource as defined in CEQA Guidelines Section 15064.5?	☐	☐	☐	☒	1,10
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in CEQA Guidelines Section 15064.5?	☐	☐	☒	☐	1,2,10,11
c) Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature?	☐	☐	☒	☐	1,2,10,12
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐	1,2,10,11
e) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
1. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or	☐	☐	☒	☐	1,2,10,11
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying this criteria, the significance of the resource to a California Native American tribe shall be considered.	☐	☐	☒	☐	1,2,10,11

4.5.2 Impact Discussion

a) Cause a substantial adverse change in the significance of an historical resource?

The project site is currently undeveloped. The surrounding development consists of rural residential to the north, east, and west, and relatively new (approximately 20 years old) single-family residential neighborhood to the south. A review of the City's list of historic properties and the Santa Clara County Historic Resources inventory indicates there are no structures in the project vicinity that are considered historical.[5] **(No Impact)**

b,c,d,e) Cause a substantial adverse change in the significance of an archaeological resource? Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature? Disturb any human remains, including those interred outside of dedicated cemeteries? Cause a substantial adverse change in the significance of a tribal cultural resource that is: 1) listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources, 2) determined to be a significant resource to a California Native American tribe.

The project site does not contain evidence of Native American use and/or occupation. Pursuant to Assembly Bill 52 (AB 52), there are no known resources to tribal cultural resources within the project site. Development of the project site will have no effect on identified prehistoric, historic archaeological, and/or tribal resources. According to the consulting archaeologist, a program of archaeological subsurface presence/absence testing is not necessary and no archaeological monitoring is required during construction of the project.

Future development would involve surface disturbance to create building pads for approximately 22 dwelling units, trenches for utilities, and would involve additional right-of-way widening on Sorrel Way and or Saddleback Drive. Potential impacts to unknown archaeological and tribal cultural resources will be further reduced by implementation of the following standard guidelines during construction, as required by state law:

Standard Measure to be Considered at the Time of Future Development

SM CUL-1: The following standard permit condition would apply to future development of the project site to reduce and avoid impacts to unknown subsurface cultural resources.

- In the event any prehistoric or significant historic era cultural materials[6] are encountered during subsurface construction, all construction within a radius of 50 feet of the find shall be halted, the Director of the Community Development Department would be notified, and an archaeologist shall be retained to examine the find to make appropriate recommendations.

[5] City of Morgan Hill. *Morgan Hill 2035 General Plan Draft Environmental Impact Report*. January 13, 2016. Table 4.5-1.

[6] Significant cultural materials includes but are not limited to: aboriginal human remains, chipped stone; ground stone; shell and bone artifacts; concentrations of fire-cracked rock; ash and charcoal; shell; bone; and historic features such as privies or building foundations.

- If human remains are discovered, the Santa Clara County Coroner shall be notified. The Coroner shall determine whether or not the remains were Native American. If the Coroner determines that the remains are not subject to his authority, he shall notify the Native American Heritage Commission, who shall identify the Most Likely Descendant (MLD) of the deceased Native American.

- If the Director of the Community Development Department finds that the cultural resource find is not a significant resource, work shall resume only after the submittal of a preliminary report and after provisions for reburial and ongoing monitoring are accepted. Provisions for identifying descendants of a deceased Native American and for reburial shall follow the protocol set forth in the CEQA Guidelines. If the site is found to be a significant archaeological site, a mitigation program shall be prepared and submitted to the Director of the Community Development Department for consideration and approval, in conformance with the protocol set forth in the CEQA Guidelines. **(Less than Significant Impact)**

4.6 GEOLOGY AND SOILS

The following discussion is based, in part on an Initial Geotechnical Investigation prepared by *Cornerstone Earth Group* on April 23, 2018. A copy of this report is provided in Appendix A of this Initial Study

4.6.1 <u>Environmental Checklist</u>

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
1. Rupture of a known earthquake fault, as described on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42)?	☐	☐	☒	☐	1,2,12
2. Strong seismic ground shaking?	☐	☐	☒	☐	1,2,12
3. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐	1,2,12
4. Landslides?	☐	☐	☒	☐	1,2,12
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐	1,2,3,12
c) Be located on a geologic unit or soil that is unstable, or that will become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐	1,2,12
d) Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2016), creating substantial risks to life or property?	☐	☐	☒	☐	1,2,12
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒	1

As previously discussed in *Section 3.0*, in December 2015, the California Supreme Court issued an opinion in "CBIA vs. BAAQMD" holding that CEQA is primarily concerned with the impacts of a project on the environment and generally does not require agencies to analyze the impact of existing conditions on a project's future users or residents unless the project risks exacerbating those environmental hazards or risks that already exist. Nevertheless, the City has General Plan policies (including Policy SSI-1.1, SSI-1.2, and SSI-1.3 that prohibit development on sites with hazardous geologic conditions unless low intensity uses are proposed and measures are implemented to reduce risks to an acceptable level) that address existing conditions affecting a proposed project, which are discussed below as non-CEQA related effects.

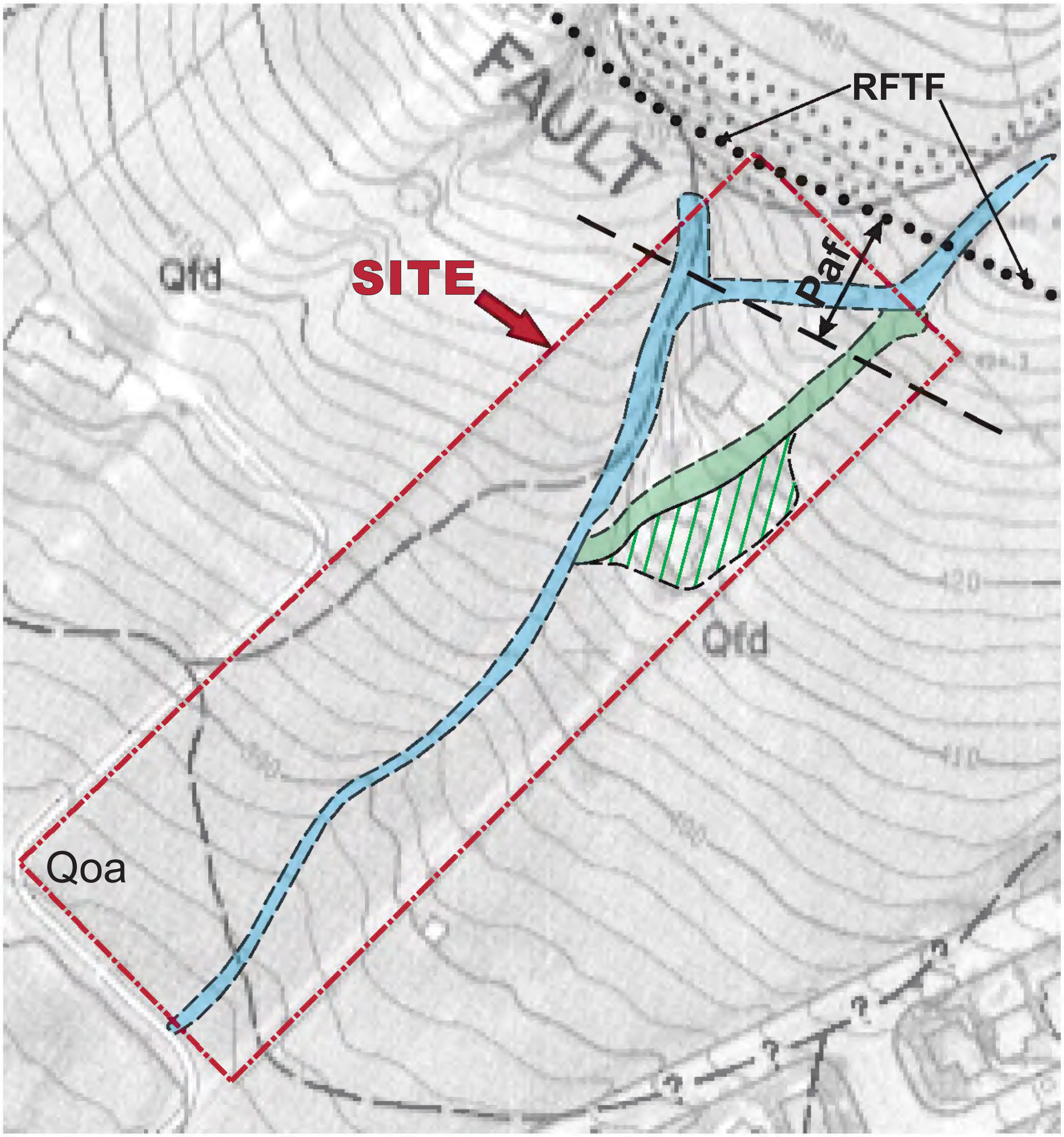
4.6.2 Impact Discussion

a,c) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: 1) rupture of a known earthquake fault, 2) strong seismic ground shaking, 3) seismic-related ground failure, or 4) landslides? Be located on a geologic unit or soil that is unstable, or that will become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Seismic Hazards

Faults local to Morgan Hill are the Coyote Creek Thrust Fault (CCTF) and the Range Front Thrust Fault (RFTF). The RFTF is projected as intersecting the northeast property corner of the project site and, for this reason, the northeast portion of the site is located within a county-designated Fault Rupture Hazard Zone as well as a City of Morgan Hill Fault Rupture Hazard Zone "Paf" zone, as shown in Figure 4.6-1. The Paf zone is characterized as a Zone of potential permanent ground displacement due to horizontal or vertical movement along the trace of an active or potentially active fault. In general, surface fault rupture involves shearing, differential movement, and ground breakage along the trace of the fault during moderate to strong earthquakes. The resulting movement can severely damage structures and utilities that are located across the fault trace.

Based on review of published sources, historic aerial photos, and a site reconnaissance prepared by *Cornerstone Earth Group*, dated April 23, 2018, there is compelling evidence (i.e., topographic, geologic, as well as soil moisture patterns) of the fault zone trending along the base of the range front. Since the fault zone is concealed beneath colluvial accumulations and alluvial fans along the base of the range front, its precise location cannot be determined without subsurface investigation. Therefore, future development could potentially place structures on a fault. Without knowing the actual location of the fault, building exclusion zones cannot be established for the project site. To place residential units within the Paf zone (refer to Figure 4.6-1), that portion of the site shall be trenched in order to locate the fault zone. This potential geologic hazard is an existing condition that could affect future residents of the site, and as referenced above, this planning issue is outside the ordinary purview of CEQA



Geologic Units

Qfd Alluvial Fan Deposits (Holocene)

Qoa Old Alluvium (Late Pleistocene)

RFTF Range Front Thrust Fault (concealed beneath alluvial fan deposits). Per PGE, 1991

Paf Regulatory Zone: Zone of potential permanent ground displacement

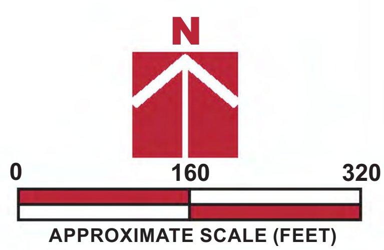
Explanation

Active drainage swale

Infilled (with fill) former drainage swale

Area of previous ground disturbance and surficial fills

Base: Geology, Geologic, and Geotechnical Hazards, City of Morgan Hill, dated December 1991.



Existing Site Geological Conditions | FIGURE 4.6-1

Standard Measure to be Considered at the Time of Future Development

SM GEO-1: As required pursuant to General Plan Policy SSI-1.1, SSI-1.2, and SSI-2.1, future residential development shall prepare a design-level geotechnical investigation which shall include trenching in order to locate the fault zone and establish a "no build" zone. The study shall be completed and submitted to the City for review as part of the tentative subdivision map review process. All recommendations in the design-level geotechnical investigation shall be implemented by the project, which shall include standard engineering and seismic safety design techniques. Future development shall also meet the requirements of applicable Building and Fire Code.

Implementation of all standard measures required during the tentative subdivision stage would reduce potential earthquake hazards to future residential structures to a less than significant level.

Existing seismic conditions discussed above would not be exacerbated by the proposed General Plan Amendment and rezone, such that it would impact (or worsen) off-site seismic conditions. **(Less Than Significant Impact)**

Soil Hazards

The project site is not located within a State-Designated Liquefaction Hazard Zone, therefore the potential for liquefaction is low. There are no open faces with a distance considered susceptible to lateral spreading. Since the project's potential for liquefaction is low, its potential for lateral spreading is low as well.

The project site itself is not within a regulatory landslide hazard zone. Portions of the adjacent site to the northeast are contained within a county-designated and City-designated landslide hazard zone. Based on the field visit conducted by the geotechnical consultant, no evidence of earthflow or slump type landfills on the adjacent site was observed, and the potential for slope instability on the adjacent site is low.

The drainage on the adjacent property is located within a debris flow hazard zone (Pdf). Though the project site itself is not located in a pdf zone, the runout area emanating from the drainage on the adjacent site is projected toward the project site. For these reasons, it is recommended that a debris flow analysis be performed as part of the future design-level geotechnical study to evaluate the effects of potential debris flow hazard that could affect the future subdivision.

Standard Measure to be Considered at the Time of Future Development

SM GEO-2: As part of the design-level geotechnical investigation required for future development onsite, the investigation shall include a debris flow analysis to evaluate the potential for debris flow. In the event debris flow hazard is identified, engineering measures would be implemented to reduce the hazard. Examples of engineering measures could include a combination of walls (deflection wall or catchment wall) and/or catchment basin and debris grate/catch basin.

Potential engineering measures listed above would not result in improvements offsite that would change the existing geologic conditions offsite, such as grading and/or installing walls uphill from the site. These engineering measures, if recommended during future development, would occur onsite and be constructed with standard engineering techniques.

Existing site conditions described above would not be exacerbated by the proposed General Plan Amendment and rezone such that it would impact (or worsen) offsite landslide conditions. **(Less Than Significant Impact)**

b) Result in substantial soil erosion or the loss of topsoil?

Construction

Future development would disturb the ground, including the drainage feature onsite. The disturbance during construction would expose soils, thereby increasing the potential for wind- or water-related erosion and sedimentation at the site until the completion of construction. As discussed in *Section 4.9 Hydrology and Water Quality*, future development shall be required to implement SM HYD-1.1, which requires preparation of a Stormwater Pollution Prevention Plan (SWPPP) and Erosion Control Plan (ECP) that demonstrates how the project would avoid water quality impacts during construction. For these reasons, the proposed General Plan Amendment and rezone would not result in substantial soil erosion or loss of topsoil during construction period. **(Less Than Significant Impact)**

Post-Construction

As discussed above, the drainage from the northeast property passes through the site and delivers runoff to the northeast property line. In addition, future development onsite would increase impervious surfaces onsite, such as roofs, sidewalks, and pavement, which would increase stormwater runoff onsite. As required by the City, SM HYD-1 shall be implemented, which requires future development to prepare and submit a Storm Drainage Study to the Director of Public Works for review and approval. The study shall determine if the existing drainage facility is adequate to convey runoff volumes. If determined by the project engineer that additional drainage facilities are required to convey stormwater runoff from the adjacent site, measures would be included such as installation of catch basins, and culverts. In addition to a Storm Drainage Study, SM GEO-2 requires a debris flow analysis be prepared to investigate potential engineering measures needed to prevent debris flow hazards. With implementation of these standard measures, the proposed General Plan Amendment and rezone would not result in substantial soil erosion or loss of topsoil. **(Less Than Significant Impact)**

d) Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2007), creating substantial risks to life or property?

Based on soil conditions in the project area, the project is likely to contain highly expansive surficial soils. Expansive soils can undergo significant volume change with changes in moisture content. They shrink and harden when dried and expand and soften when wetted. In addition, the project site may contain undocumented fill from the previous structures onsite.

Standard Measure to be Considered at the Time of Future Development

SM GEO-3: Future development shall implement recommendations in the design-level geotechnical report prepared for the project, which shall include design and engineering measures to avoid and reduce adverse effects of expansive soils to future development onsite. Recommendations to address the undocumented fills shall also be implemented, which shall include removing all fills identified within the building areas and to a lateral distance of at least five feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater.

The existing soil conditions onsite discussed above would not be exacerbated by the project such that it would impact (or worsen) off-site conditions **(Less Than Significant Impact)**

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater

Future development would connect to existing utilities servicing the area and would not require the use of septic tanks. **(No Impact)**

4.7 GREENHOUSE GAS EMISSIONS

4.7.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	1,7,13
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐	1,7,13

4.7.2 Impact Discussion

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction Emissions

Future development would result in minor increases in greenhouse gases (GHGs) associated with construction activities including operation of construction equipment and emissions from construction workers' personal vehicles traveling to and from the construction site. Construction-related GHG emissions vary depending on the level of activity, length of construction period, types of equipment, etc. Neither the City nor BAAQMD has established a quantitative threshold or standard for determining whether the project's construction-related GHG emissions are significant. Because project construction would be temporary, and would not result in permanent increase in GHG emissions that would interfere with the implementation of Senate Bill 32 (SB 32), the increase in emissions would be less than significant.

Operational Emissions

According to BAAQMD, a project in operation by 2020 would result in significant greenhouse gas impacts if it generates more than 1,100 metric tons (MT) of carbon dioxide (CO_2e) per year, or 4.6 MT CO_2e per capita. BAAQMD sets guidelines and screening levels to determine if a project would contribute to a significant level of GHG emissions. Based on screening levels for the year 2020, the operational GHG screening size for a single-family development project is 56 units, which is a conservative indication whether a project's GHG emissions would be significant. SB 32, requires the California Air Resource Board (CARB) to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030. Although BAAQMD has yet to publish a threshold for 2030, for the purpose of this Initial Study, the metric of 660 MT per year (40% reduction of 2020 threshold) is used to gauge the project's GHG impacts in comparison with the adopted 2020 screening threshold of 56 units.

Compared with the screening threshold of 56 units, the proposed project would be have a screening level below the 2020 established target. Future development would be less than half of the screening threshold. In addition, it is estimated the project would generate approximately 296 MT of CO_2e per year (refer to Appendix B for GHG emissions model), which is below 660 MT per year to meet the state's 2030 emission target. For these reasons, it is reasonable to assume the proposed General Plan Amendment and rezone would not result in significant GHG impacts. **(Less Than Significant Impact)**

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

GHG emissions of future development would be well below BAAQMD's 2020 thresholds and estimated 2030 thresholds. The City of Morgan Hill does not currently have a Climate Action Plan or Greenhouse Gas Reduction Strategy that would be applicable to the project. For these reasons, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. **(Less Than Significant Impact)**

4.8 HAZARDS AND HAZARDOUS MATERIALS

4.8.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	1
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒	1,12,14
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒	1
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, will it create a significant hazard to the public or the environment?	☐	☐	☐	☒	1,14
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, will the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒	1
f) For a project within the vicinity of a private airstrip, will the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒	1
g) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒	1
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐	15

As previously discussed in *Section 3.0*, in December 2015, the California Supreme Court issued an opinion in "CBIA vs. BAAQMD" holding that CEQA is primarily concerned with the impacts of a project on the environment and generally does not require agencies to analyze the impact of existing conditions on a project's future users or residents unless the project risks exacerbate those environmental hazards or risks that already exist. Nevertheless, the City has General Plan policies (including Policy SSI-4.16 which regulates new development projects to mitigate previous environmental contaminations onsite) that address existing conditions affecting a proposed project, which are discussed below as non-CEQA related effects.

4.8.2 Impact Discussion

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Future residential development would not include any on-site use of hazardous materials other than small amounts of cleaning supplies. The proper storage and use of these materials would not create a significant hazard to the public. **(Less Than Significant Impact)**

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

On-Site Soils

The project site is currently undeveloped, however, a review of aerial map shows past agricultural uses onsite and an abandoned water well. As discussed in checklist question d, the project site is not listed has a hazardous materials site pursuant to Government Section Code 65962.5, therefore, the water well was not used to monitor levels of hazardous materials and was most likely associated with the agricultural use of the site. Removal of the abandoned well would be permitted though the Santa Clara Valley Water District (SCVWD). The past agricultural use of the site, however, could have the potential to contain elevated concentrations of metal and organochlorine pesticide residues within the surficial soil onsite. Soil disturbance during construction of future residential development onsite could result in health hazards to construction workers, or to future residence onsite.

Mitigation Measure to be Considered at the Time of Future Development

Impact HAZ-1: The surficial soil onsite may contain elevated levels of organochlorine pesticide. **(Significant Impact)**

Mitigation Measure: Implementation of the following mitigation measures to reduce impacts from contaminated soil (if present) would reduce potentially significant human health hazards to a less than significant level.

MM HAZ-1: As required by General Plan Policy SSI-4.16, during future environmental review when a development project is proposed, a Phase I Environmental Site Assessment (ESA) shall be prepared for the site in order to determine whether there are potential hazards associated with the historic agricultural use of the site. If the Phase I ESA recommends soil testing in order to define contamination, Phase II soil investigations shall be completed to document the concentrations of any hazardous contaminants in the soil.

Recommendations of the Phase II for any required soil remediation shall be implemented by the project. **(Less Than Significant Impact with Mitigation)**

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The project site is not located within a quarter mile of an existing or proposed school, therefore, future development would not result in hazardous impacts to schools. **(No Impact)**

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, will it create a significant hazard to the public or the environment?

The project site is undeveloped and has no previous uses of concern (e.g. gas station, dry cleaners, former industrial use involving storage and handling of hazardous materials, etc.). The project is not included on a list of hazardous materials site, therefore, the proposed General Plan Amendment and rezone would not place future residential development on a hazardous materials site as defined by Government Section Code Section 65962.5. **(No Impact)**

e,f,g) Result in a nearby airport-related safety hazard for people residing or working in the project area? Result in a private airstrip-related safety hazard for people residing or working in the project area? Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?

The project site is not located within the Santa Clara County Airport Land Use Commission (ALUC) jurisdiction, nor is it near a private airstrip. The project site is not on one of the City's designated evacuation routes. **(No Impact)**

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The project site is not in the City's fire hazard zone.[7] The site adjacent to the northeast, however, is located within the City's high fire hazard severity zone.[8] Future development would be constructed in conformance with current building and fire codes, including features that would reduce potential fire hazards. In addition, future development onsite would be served by the City's water distribution system, and would be designed with safe access for emergency response vehicles. For these reasons, the proposed General Plan Amendment and rezone would not significantly expose structures onsite or offsite to wildland fires. **(Less Than Significant Impact)**

[7] City of Morgan Hill. *City of Morgan Hill Wildland Urban Interface.* March 2009.
[8] Ibid.

4.9 HYDROLOGY AND WATER QUALITY

4.9.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐	1,2,3,16
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells will drop to a level which will not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐	1,2,17
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on-or off-site?	☐	☐	☒	☐	1,2,3,9, 12
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which will result in flooding on-or off-site?	☐	☐	☒	☐	1,2,3,9, 12
e) Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐	1,2,3,9, 12
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐	1,2,3,16
g) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒	1,12,18
h) Place within a 100-year flood hazard area structures which will impede or redirect flood flows?	☐	☐	☐	☒	1,12,18
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒	1,19
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒	1,20

4.9.2 Impact Discussion

a,f) Violate any water quality standards or waste discharge requirements? Otherwise substantially degrade water quality?

Construction

Future construction activities would increase the amount of debris onsite and grading activities, which could increase pollutant loads of eroded material in stormwater runoff. Future development would be required to implement standard measures to reduce the potential for substantial adverse impacts to water quality during construction.

Standard Measure to be Considered at the Time of Future Development

SM HYD-1: In accordance with the City of Morgan Hill Standard Conditions of Approval and the General National Pollutant Discharge Elimination System (NPDES) Storm Water Permit for Construction Activities, future development projects will prepare a SWPPP and an ECP. The plans will be submitted to the Director of Public Works and Central Coast Regional Water Quality Control Board (RWQCB) for review and approval, prior to issuance of a building permit. The ECP and SWPPP will demonstrate how the project will eliminate or reduce non-stormwater discharges into the stormwater system, how discharges into the stormwater system will be monitored, and what BMPs will be implemented by the project to avoid water quality impacts during construction (e.g., street sweeping, fiber rolls, temporary cover and/or permanent cover) and post-construction periods. In conformance with existing policies, programs, and with implementation of BMPs, the project will not result in significant impacts to water quality or water discharge requirements. **(Less Than Significant Impact)**

Post-Construction

Future residential development onsite shall conform to the City's Storm Water Management Plan (SWMP) to reduce the discharge of pollutants into waterways and to protect local water quality that could be degraded by stormwater and urban runoff within the corporate limits of Morgan Hill. In order to meet SWMP requirements, the future development would be designed to direct all runoff to on-site landscape areas, which would function as bioretention areas. As discussed in *Section 4.4 Biological Resources* and *4.6 Geology and Soils*, there is an existing drainage feature that passes through the site from the northeastern to southwest. Runoff delivered from the adjacent site shall also be directed properly to be treated onsite before discharge to the storm drain system. Potential drainage features to adequately convey runoff could include catch basins, or culverts, and would be identified and reviewed by the City as part of future tentative subdivision map application for the site. Conformance with the SWMP would minimize the potential for the project to result in post-construction water quality impacts. **(Less Than Significant Impact)**

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

The project site is situated over the Llagas Groundwater Subbasin, which drains to the south toward the Pajaro River and eventually Monterey Bay.[9] The operational groundwater storage capacity for the Llagas groundwater sub-basin ranges from 152,000 to 165,000 acre-feet.[10] The project site is relatively small (approximately 8.34-acres) and does not contribute to substantial groundwater recharge to the Llagas Basin, therefore, future development and a decrease in pervious surfaces would have negligible decrease in groundwater recharge. In addition, groundwater levels in the project area are approximately 50 and 60 feet below ground surface, which is deep enough that future residential development and would not interfere with groundwater flow or expose any aquifers. **(Less Than Significant Impact)**

c,d,e) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on-or off-site? Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which will result in flooding on-or off-site? Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

The project site is currently undeveloped. As discussed above, there is a drainage feature that passes through the site. Runoff from the site currently drains to the drainage feature onsite, which drains offsite to Tennant Creek, and eventually drains to Llagas Creek. A review of historic aerial photographs shows the site was previously developed with a single-family residence. The building was located near the central portion of the site near the drainage. Evidence shows the drainage was previous diverted for the development of the previous single-family residence. The diversion required in-filling of the central portion of the site and diverted the drainage around the previous building structure. The drainage extends from the top of the hill offsite to the east and terminates on the project site. As described in *Section 4.4 Biological Resources*, the portion of the drainage passing through the site does not appear as a potential Category 2 stream but will be evaluated at a project level during project level environmental review. Future development shall conform to the City's SWMP to provide control for stormwater runoff. In addition, the City's Municipal Code Chapter 18.71 also requires projects that create impervious surfaces of 10,000 square feet or more to incorporate permanent stormwater pollution prevention measures. A future subdivision shall be required to provide adequate drainage facilities, such as catch basins and culverts to direct and treat stormwater onsite before discharge to the storm drain system. Conformance with the SWMP and the City's Municipal Code requirements would minimize the potential for the project to result in impacts to soil erosion or siltation and flooding. **(Less Than Significant Impact)**

[9] Santa Clara Valley Water District. *2016 Groundwater Management Plan*. November 2016.
[10] Ibid.

g,h) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? Place within a 100-year flood hazard area structures which will impede or redirect flood flows?

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) designates the project site as Zone X, which is defined as a 500-year flood zone (0.2 percent annual chance of flood). [11] For this reasons, the proposed General Plan Amendment and rezone would not place housing within a flood-hazard area, nor would it impede or redirect 100-year flows. **(No Impact)**

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Dams located near Morgan Hill include Anderson Dam and Chesbro Dam. According to the Anderson Inundation Maps prepared by SCVWD, the project site is not within a dam failure inundation hazard zone.[12] **(No Impact)**

j) Result in inundation by seiche, tsunami, or mudflow?

Due to the inland location of the project site, it is not located near an enclosed body of water. For these reasons, the project site is not subject to seiche or tsunami.[13] **(No Impact)**

[11] Federal Emergency Management Agency (FEMA). *Flood Insurance Rate Map. Map Number 06085C0463H.* May 2009.
[12] Santa Clara Valley Water District. *Leroy Anderson Dam Flood Inundation Maps*. 2016. Sheet 9.
[13] Association of Bay Area Governments. "Resilience Program." Accessed: April 13, 2018. Available at: http://gis.abag.ca.gov/website/Hazards/?hlyr=tsunami.

4.10 LAND USE AND PLANNING

4.10.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Physically divide an established community?	☐	☐	☒	☐	1,2,3
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐	1,2,3,5,8
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐	1,2,3,5,8

4.10.2 Impact Discussion

a) Physically divide an established community?

The project site is surrounded by rural residential development with large lots to the north, east, and west. A single-family subdivision is located adjacent to the south/southeast property line. The project site is currently undeveloped and unkempt with weeds.

As further discussed below, the proposed General Plan Amendment and rezone would increase the density onsite and allow a subdivision with approximately 22 dwelling units. Future development of a single-family subdivision would be similar in character to the single-family subdivisions to the south/southeast. Future development may be required to extend either Sorel Way or Saddleback Drive to the north and connect dead ends of the two streets to form a loop. Future rights-of-way on either street would also be required to install sidewalks and landscape strips. These road improvements would improve the connectivity of residential development in the area. For these reasons, the proposed General Plan Amendment and rezone would not divide an established community. **(Less Than Significant Impact)**

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?

The project site is currently designated as *Residential Estate* (one du/ac) with a zoning of RE- 1 acre. Both the *Residential Estate* designation and RE-1 acre zoning are intended to promote and encourage a suitable environment for families living on relatively large parcels of land.

The proposed General Plan Amendment and rezone would change the General Plan land use designation and zoning onsite to Residential Detached Low (four du/ac) and RDL-12,000 (12,000 square-foot lots), respectively.

As described in *Section 3.0 Project Description*, the density proposed would allow a maximum of 30 dwelling units, however, given the roads, right-of-way, and setback requirements for a typical subdivision, it is unlikely future development would be developed at the maximum density allowed. Since development is not proposed at this time, this Initial Study assumes development of 75 percent of the site, which results in approximately 22 dwelling units. Future use onsite would continue to be residential. The potential environmental effects of the proposed General Plan Amendment and rezone are analyzed throughout this Initial Study. Future development would comply with City and other applicable land use policies (e.g., SCVHP), and would not conflict with regulations adopted for avoiding or mitigating an environmental effect. **(Less Than Significant Impact)**

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

The project site is located within an area designated as *Urban-Suburban* in accordance with the SCVHP. No sensitive species or habitat types are known to be present on the project site, and the project would not directly impact any of the covered species in the Habitat Plan. As discussed in *Section 4.4, Biological Resources*, future development would be subject to all applicable SCVHP conditions and fees required to mitigate its impacts to a less than significant level. **(Less Than Significant Impact)**

4.11 MINERAL RESOURCES

4.11.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Result in the loss of availability of a known mineral resource that will be of value to the region and the residents of the state?	☐	☐	☐	☒	1,2
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒	1,2

4.11.2 Impact Discussion

a.b) Result in the loss of availability of a known mineral resource that will be of value to the region and the residents of the state? Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

The project site is located in a suburban area in the City of Morgan Hill. There are no known mineral resources on or adjacent to the project site, and no mineral recovery sites are present in the project vicinity. For these reasons, the proposed project would not result in impacts to known mineral resources. **(No Impact)**

4.12 NOISE AND VIBRATION

4.12.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project result in:					
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐	1,2,3
b) Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐	1,2,3
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐	1,2,3,21
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐	1,2,3
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, will the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒	1
f) For a project within the vicinity of a private airstrip, will the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒	1

As previously discussed in *Section 3.0*, in December 2015, the California Supreme Court issued an opinion in "CBIA vs. BAAQMD" holding that CEQA is primarily concerned with the impacts of a project on the environment and generally does not require agencies to analyze the impact of existing conditions on a project's future users or residents unless the project risks exacerbate those environmental hazards or risks that already exist. Nevertheless, the City has General Plan policies (including Policy SSI-8.1 that requires new development projects to be designed and constructed to meet acceptable exterior and interior noise levels) that address existing conditions affecting a proposed project, which are discussed below as non-CEQA related effects.

4.12.2 Impact Discussion

a) Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Impacts from the Project

Based on the General Plan land use compatibility guidelines for community noise environments, low density single-family residential development is allowed in areas with ambient noise levels up to 60 A-weighted decibel (dBA) community noise equivalent level (CNEL), and is conditionally allowed in areas with noise levels up to 70 dBA CNEL. Noise levels in the project area are expected to be at or below 60 dBA CNEL in year 2035.[14] Daily trips estimated for the development of approximately 22 dwelling units would be 208 trips. The increase in 208 daily trips would not be substantial and would not result in a substantial (i.e., three dBA) increase in ambient noise levels in the project area. **(Less Than Significant Impact)**

Impacts to the Project (Non-CEQA Related Effects)

As discussed above, the California Supreme Court in a December 2015 opinion (*BIA v. BAAQMD*) confirmed CEQA is concerned with the impacts of a project on the environment, not the effects the existing environment may have on a project; nevertheless the City has policies that address existing conditions (e.g. noise) affecting a proposed project.

The City of Morgan Hill requires interior noise levels within new residential units not to exceed 45 dBA day-night average sound level (L_{dn}). Typically, standard residential construction provides approximately 15 dBA of exterior to interior noise reduction, assuming the windows are partially open for ventilation. Since the future noise level would not exceed 60 dBA CNEL, standard construction techniques would ensure that noise levels within future residences are below 45 dBA L_{dn}.

b) Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?

Future construction, including grading and excavation, would require use of vibration-generating heavy equipment. Future development onsite would be subject to all City construction standards and requirements to ensure construction-related vibration is not substantial. In addition, future residential use is not considered a source of groundborne vibration. For these reasons, the proposed General Plan Amendment and rezone would not expose persons to excessive groundborne vibration and groundborne noise levels. **(Less Than Significant Impact)**

[14] City of Morgan Hill. *Morgan Hill 2035 General Plan*. July 27, 2016. Figure SSI-7.

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

Ambient noise levels in the project area are primarily due to vehicular traffic on surrounding local roadways. The noise level in the project area is estimated to be less than 60 dBA CNEL. Future development of approximately 22 dwelling units would result in additional vehicle trips in the project area. As discussed Section 4.16 Traffic/Transportation, it is estimated the future development would generate about 208 daily trips. The slight increase in vehicle trips compared to current daily volumes surrounding streets would not significantly increase ambient noise level in the area.

Mechanical equipment, such as air conditioning units of future dwelling units, would be appropriately sited and designed to meet the City's noise requirements of 60 dBA L_dn for residential exterior noise level. Prior to issuance of a building permit for future mechanical equipment onsite, an acoustical study would be required to demonstrate that noise generation from stationary equipment would conform to the City's requirements. **(Less Than Significant Impact)**

d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Typically, small residential, commercial, or office construction projects do not generate significant noise and vibration when standard construction noise control measures are enforced at the project site and when the duration of the noise generating construction period is limited to one construction season (typically one year) or less.

Standard Measure to be Considered at the Time of Future Development

SM NOI-1: The following standard construction noise suppression measures would be implemented during the construction activities to reduce noise levels:

- Construction activities shall be limited to the hours between 7:00 a.m. and 8:00 p.m., Monday through Friday, and between the hours of 9:00 a.m. and 6:00 p.m. on Saturdays. No construction activities should occur on Sundays or federal holidays (Consistent with Section 8.28.040 of the Morgan Hill Municipal Code).
- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Locate stationary noise generating equipment (e.g. rock crushers, compressors) as far as possible from adjacent residential receptors.
- Acoustically shield stationary equipment located near residential receptors with temporary noise barriers or recycled demolition materials.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for

coordination with adjacent residential land uses so that construction activities can be scheduled to minimize noise disturbance.

- Designate a "disturbance coordinator" who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to correct the problem.

Since construction activities are temporary, implementation of these measures would reduce construction noise levels, and would not result in a significant construction noise impact to nearby receptors. **(Less than Significant Impact)**

e,f) Expose people residing or working in the project area to excessive noise levels? Expose people residing or working in the project area to excessive noise levels?

The project is located approximately six miles north of the South County Airport. There are no private airstrips in the site vicinity. The project site is not within the noise contours of the airport, therefore there would be no noise impacts to future residents resulting from airport-related noise. **(No Impact)**

4.13 POPULATION AND HOUSING

4.13.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐	1,2,3,10, 22,33
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	1
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	1

4.13.2 Setting

Based on California Department of Finance population estimates, Morgan Hill's total population for 2018 was 44,513 in January 2018 and the average persons per household was an estimated 3.15.[15,]. The Association of Bay Area Governments (ABAG) projects the population for Morgan Hill to be 46,100 in 2030.[16] .

As part of the General Plan, residential development within the City of Morgan Hill is controlled by the Residential Development Control System (RDCS). Morgan Hill's RDCS process meters the amount of residential development occurring within the City in any given year, typically up to 215 units annually, to ensure the rate of development does not outstrip the availability of public services and infrastructure to serve the City's residents. RDCS establishes a population ceiling of 58,200 for the City as of January 1, 2035.

4.13.3 Impact Discussion

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The proposed General Plan Amendment and rezone would allow development of approximately 22 dwelling units, assuming development of a typical single-family subdivision on 12,000-square foot lots. Assuming 3.15 persons per household for each residential unit, the project would generate approximately 69 new residents. Future development would require an award of RDCS allotments

[15] California Department of Finance. "E-5: City/County Population and Housing Estimates – January 1, 2018." Accessed: May 29, 2018. Available at: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.
[16] Association of Bay Area Governments. *Projections 2013*. 2013.

prior to processing entitlements for a project at the site. Since the purpose of the RDSC is to control population growth in the area, the proposed General Plan Amendment and rezone would not result in population growth that has not been accounted for in the City's General Plan. **(Less than Significant Impact)**

b,c) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

The project site is currently undeveloped, therefore, the proposed General Plan Amendment and rezone would not displace existing housing or people. **(No Impact)**

4.14 PUBLIC SERVICES

4.14.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project					
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
- Fire Protection?	☐	☐	☒	☐	1,2,10,15,23
- Police Protection?	☐	☐	☒	☐	1,2,10,24,25
- Schools?	☐	☐	☒	☐	1,2,10,26,27
- Parks?	☐	☐	☒	☐	1,2,3,10,22
- Other Public Facilities?	☐	☐	☒	☐	1,2,10

4.14.2 Impact Discussion

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for public services?

Fire and Police Protection Services

The City of Morgan Hill Fire Department (MHFD) provides fire prevention, fire suppression, and emergency medical services. The MHFD contracts with the California Department of Forestry and Fire Protection (CalFire) for additional personnel to manage the MHFD and provide fire and emergency medical services. The City is served by three stations. The nearest is the Dunne Hill Fire Station, located at 2100 East Dunne Avenue (approximately 0.8 mile southwest of the site). In general, the response time meets the current standard of eight minutes 95 percent of the time. The response times are typically within one to two percent of this standard.[17]

[17] Dwight Good, Fire Marshal, Cal Fire. E-mail: RE: Fire Department Response Times. November 10, 2014.

Police service is provided to the project site by the City of Morgan Hill Police Department (MHPD). The MHPD facility is located at 16200 Vineyard Boulevard, approximately 3.8 miles southwest of the project site. The MHPD employs 39 sworn officers.[18] The Police Department's goal is to respond to Priority One calls within five minutes and Priority Two calls within eight minutes.[19] Priority One calls are reports of a crime in progress or where an injury has occurred and Priority Two calls are reports of felonies and other major calls.

As discussed in *Section 4.8 Hazards and Hazardous Materials*, the project site is not located within a fire hazard zone, however, is adjacent to a City-designated high fire hazard zone to the northeast. Future development onsite would incrementally increase the demand for fire and police protection services, however, would be constructed in accordance with current building and fire codes, served by the City's water distribution system, and designed with safe access for emergency response vehicles. Future development onsite would not by itself preclude MHFD or MHPD from meeting their service goals and would not require the construction of new or expanded fire or police facilities. For these reasons, the proposed project would not result in significant impacts to fire and police protection services. **(Less Than Significant Impact)**

Schools

The project site is located within the Morgan Hill Unified School District. The District has eight elementary schools, two middle schools, two comprehensive high schools, one continuation high school, and a community adult school, as well as a home schooling program. Future residents of the project site would be served by Jackson Academy (grades k-8 approximately, 0.6 miles south of the site), Martin Murphy Middle School (grades 6-8, approximately 13 miles north of the site), and Live Oak High School (grades 9-12, approximately 2.4 miles northwest of the site).[20]

Future development would not result in a substantial increase in students for the Morgan Hill Unified School District. Using the Morgan Hill Unified School District's student generation rates per unit for housing, the addition of 22 single family residences would generate approximately 11 students.[21] Future development onsite would be required to pay a school impact fee prior to issuance of a building permit, in accordance with state law (California Government Code Section 65996). Fees are assessed based upon the proposed square footage of the new development., therefore, implementation of the proposed project would not substantially degrade existing school facilities nor result in the need for new permanent facilities to be constructed, and impacts from the project would be less than significant. **(Less Than Significant Impact)**

Parks

The City owns 70 acres of developed park land (including the Civic Center, assessment district parks and city owned trails) and 59 acres of recreation facilities. Included within this inventory, the City maintains two community parks, five neighborhood parks, two neighborhood/school parks, and 15

[18] City of Morgan Hill. "Police." Available at: http://www.morgan-hill.ca.gov/index.aspx?nid=129. Accessed February 28, 2017.
[19] City of Morgan Hill. *Operating and CIP Budget, FY 13-14*. *Police Field Operations, Performance Measures.* 2013.
[20] Morgan Hill Unified School District. "Schools." Accessed: April 18, 2018. Available at: http://www.schoolworksgis.com/SL/MHUSD/schoollocator.html.
[21] Morgan Hill Unified School District. *Demographic Study 2014-2015*. March 2015
The estimated student generation rate of 0.465 for new residences within the Morgan Hill Unified School District.

mini-parks, in addition to its public trail system and open space. The City also owns and operates special use facilities for recreational purposes. These facilities include the Morgan Hill Aquatics Center, Community and Cultural Center, the Centennial Recreation Center, the 38-acre Outdoor Sports Center, and Skateboard/BMX park.

General Plan Policies HC-3.3 and HC-3.29 and a park land dedication/park land in-lieu fee ordinance (Municipal Code Chapter 17.28) requires park land dedication or in-lieu fees for residential developments. Future development could generate approximately 69 additional park users, and would not result in the need for additional parklands in the City. Future development would be subject to the City's in-lieu fees requirement for residential developments, which would avoid significant impacts to the City's park facilities. **(Less Than Significant Impact)**

4.15 RECREATION

4.15.1 Environmental Checklist

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated?	☐	☐	☒	☐	1,2,3,10, 22
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐	1,2,3,10, 22

4.15.2 Impact Discussion

a,b) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated? Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

As discussed in *Section 4.14 Public Services* the number of residents using area parks would be increase by approximately 69 residents. A fee paid in-lieu of parkland dedication would be appropriate to mitigate the impact on the City's parks and recreational facilities and to provide for the necessary parkland to serve the increased population. The in-lieu fees paid by a future project would be used by the City to acquire and/or develop new parkland and/or amenities, and would therefore mitigate the impacts from the new residential development. **(Less than Significant Impact)**

4.16 TRANSPORTATION/TRAFFIC

4.16.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐	1,2,3,21, 28
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐	1,2,21,28
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒	1
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible land uses (e.g., farm equipment)?	☐	☐	☐	☒	1,2,3
e) Result in inadequate emergency access?	☐	☐	☐	☒	1,2,3
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐	1,2

4.16.2 Impact Discussion

a,b) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

According to the City of Morgan Hill and Santa Clara Valley Transportation Authority Transportation Impact Analysis Guidelines, a transportation impact analysis is needed when a project generates 100 or more new peak hour (AM and/or PM peak hour) trips. Based on the trip generation rates for single-family units, 22 dwelling units would generate approximately 17 AM peak hour trips (four inbound, 13 outbound) and 22 PM peak hour trips (14 inbound, eight outbound).[22] The proposed General Plan Amendment and rezone would not be in conflict with an adopted plan, ordinance, or policy related to the effectiveness of the circulation system. **(Less Than Significant Impact)**

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

The proposed site is not within an airport safety zone. The proposed General Plan Amendment and rezone would not result in any hazards to air traffic or changes to air traffic patterns. **(No Impact)**

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible land uses (e.g., farm equipment)?

There is no development proposed at this time. Future development would be reviewed for consistency with the City's design standards during the planning permitting phase, including pedestrian, bicycle, and vehicular access, circulation and safety. The proposed General Plan Amendment and rezone would not increase hazards or create incompatible land uses. **(Less Than Significant Impact)**

e) Result in inadequate emergency access?

Future development onsite would be reviewed and approved by the MHFD and Department of Public Works to ensure adequate emergency access. **(Less Than Significant Impact)**

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

There is no development proposed at this time. Future development would be reviewed for consistency with City's General Plan policies and design guidelines during the planning permit phase. The proposed General Plan Amendment and rezone would not conflict with existing or planned multimodal transportation facilities. **(Less Than Significant Impact)**

[22] Institute of Transportation Engineers. *Trip Generation Manual, 10th Edition*. Land Use (210). September 2017.

4.17 UTILITIES AND SERVICE SYSTEMS

4.17.1 Environmental Checklist

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
Would the project:					
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐	1,2,10,16
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐	1,2,10,29,20
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐	1,2,12
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐	1,2,10,30
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐	1,2,10
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐	1,2,10,31,32
g) Comply with federal, state, and local statutes and regulations related to solid waste.	☐	☐	☒	☐	1,2,10,31,32

4.17.2 Impact Discussion

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

The South County Regional Wastewater Authority (SCRWA) Wastewater Treatment Plant provides service to the cities of Morgan Hill and Gilroy. Wastewater from the project site would be transported through existing sanitary sewer pipelines in the vicinity to the SCRWA for treatment. The treatment plant has capacity to treat an average dry weather flow (ADWF) of 8.5 million gallons per day (mgd) and is currently permitted by the RWQCB, Central Coast Region to treat up to 8.5

mgd.[23] The project site is currently undeveloped. Development of approximately 22 single-family units onsite would generate approximately 1.98 million gallons per year, or 0.005 mgd.[24] While future residential development would increase wastewater generation onsite, the proposed General Plan Amendment and rezone would not cause an exceedance of the RWQCB treatment requirements. **(Less Than Significant Impact)**

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Both the cities of Gilroy and Morgan Hill have growth control systems in place which limit unexpected increases in sewage generation. Development of approximately 22 single-family units onsite would generate approximately 2.3 million gallons per year, or 0.006 mgd.[25] It is anticipated the addition of 22 new single-family units would not substantially increase water or wastewater volumes such that new or expanded facilities would be required.[26] The proposed General Plan Amendment and rezone would not have a significant impact related to the provision of water and sewer service for the project. **(Less Than Significant Impact)**

c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

As discussed in *Section 4.6 Geology and Soils* and *Section 4.9 Hydrology and Water Quality*, there is an existing drainage feature from uphill that passes through the site from the northeast to the southwest. Future development of the site would be subject to the City's SWMP and be designed to direct all runoff onsite to a bioretention area. Measures to direct stormwater runoff could include catch basins, or culverts. These stormwater facilities would be constructed onsite and in accordance with City's SWMP requirement, which would not cause significant environmental effects. **(Less Than Significant Impact)**

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

As discussed in Section *4.13 Population and Housing*, the RDCS regulates population growth through the provision of residential building allotments. By metering residential growth, the RDCS is a tool for the City to ensure infrastructure, including new water supply facilities have adequate capacity before development is approved. RDCS competition standards give points to projects that do not require off-site extension of utility lines and/or for projects that do not require water improvements beyond minimum requirements. Future development of approximately 22 dwelling units onsite, if is granted the allotments by RDCS, would not substantially increase water demand

[23] California Regional Water Quality Control Board. *Waste Discharge Requirements, South County Regional Wastewater Authority Wastewater Treatment and Reclamation Facility, Santa Clara County (NPDES Permit No. CA0049964) – Order No. R3-2010-0009*. April 2010.
[24] Wastewater generation is approximately equal to 85 percent of a project's water demand.
[25] California Air Pollution Control Officers Association (CAPCOA). *California Emissions Estimator Model User's Guide, Version 2016.2*. September 2016. Appendix D, Table 9.1. Residential: 65,154 gallons/unit/year (indoor) and 41,075 gallons/unit/year (outdoor)
[26] Ha, Charlie. Supervising Civil Engineer, City of Morgan Hill Community Development – Engineering Division. Personal Communication.

onsite, and would not result in significant impacts to water supplies. **(Less Than Significant Impact)**

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

As discussed above, the RDCS is a tool used to determine if the City's existing infrastructure, including wastewater treatment, has the capacity to support a proposed development. The project site must be awarded allotments through the RDCS process prior to receiving project entitlements. The SCRWA would determine adequate capacity to serve the development during the entitlement stage of the project. **(Less Than Significant Impact)**

f,g) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? Complies with federal, state, and local statutes and regulations related to solid waste?

The City of Morgan Hill has contracted with Recology South Valley to provide solid waste disposal and recycling service within the City. Recology South Valley will dispose of solid waste from the City at Johnson Canyon Sanitary Landfill which has a projected permitted capacity of approximately 13,800,000 cubic yards and is expected to remain open through 2040.[27] It is estimated the addition of 22 new single-family dwelling units would generate an additional 132 pounds (or 0.26 cubic yards) of solid waste per day.[28] Future development would be served by a landfill with adequate capacity to serve the project site. **(Less Than Significant Impact)**

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[27] California Integrated Waste Management Board. "Facility/Site Summary Details: Johnson Canyon Sanitary Landfill." 2008. Accessed April 25, 2018. Available at: http://www.calrecycle.ca.gov/SWFacilities/Directory/27-AA-0005/Detail/.

[28] Sources: 1) CalRecycle. "California's 2016 Per Capita Disposal Rate Estimate." Accessed April 25, 2018. Available at: http://www.calrecycle.ca.gov/LGCentral/GoalMeasure/DisposalRate/MostRecent/default.htm. Per resident disposal rate of 6.0 pounds/residents/day. 2) A common conversion factor used for municipal solid waste as it is collected and transported in compaction vehicles is 500 pounds/cubic yard (Lacaze, Skip. Personal communication with City of San José, Department of Environmental Services. June 3, 2013.

4.18 MANDATORY FINDINGS OF SIGNIFICANCE

4.18.1 Environmental Checklist

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact	Checklist Source(s)
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐	1-33
b)	Does the project have impacts that are individually limited, but cumulatively considerable ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐	1-33
c)	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐	1-33

4.18.2 Impact Discussion

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

As discussed in the individual sections, there is no development proposed with the General Plan Amendment and rezone; therefore, the project would not degrade the quality of the environment with the implementation of measures in accordance with the City's General Plan and Municipal Code and other applicable plans, policies, regulation, and ordinances. Subsequent project specific environmental review will be required for future development; however, this Initial Study does contemplate a maximum site development of 22 units.

As discussed in *Section 4.4 Biological Resources*, the project is located in an environment with rural and suburban development. The project site is located within the Habitat Plan study area and has a land cover type *Rural Residential*. The project site contains a drainage feature that does not appear as a Category Two Stream, or habitat that sustains sensitive species. Future development would be subject to all applicable Habitat Plan conditions and fees to mitigate its impacts to biological resources to a less than significant level.

As discussed in *Section 4.5 Cultural Resources*, the project site has low potential for buried prehistoric archaeological resources and paleontological onsite. The project site is undeveloped and does not contain historic resources. Implementation of standard measures in accordance with the City's requirement would ensure future development impacts to cultural resources would be less than significant.

As discussed in *Section 4.6 Geology and Soils*, the site is located in a seismically active region with geologic conditions such as presence of a potential fault, expansive soils, undocumented fill, and potential debris flow hazard. Future development would be required to prepare a design-specific geotechnical study and implement all recommendations required to reduce all potential geologic hazards.

As discussed in *Section 4.8 Hazards and Hazardous Materials*, pesticides may be present in shallow soils onsite from previous agricultural uses. Site investigation prior to tentative subdivision map approval and remediation, if any required, in accordance with applicable state and local regulations would ensure less than significant hazardous materials impacts.

As discussed in *Section 4.9 Hydrology and Water Quality*, there is an existing drainage feature that passes through the site. Construction activities during development onsite could result in temporary impacts to surface water quality. Development of the site would include grading and permanently change the drainage feature onsite. Future development would be subject to the City's SWMP and Municipal Code requirements to control stormwater runoff during the construction period and incorporate permanent post-construction stormwater pollution prevention measures.

As discussed in *Section 4.12 Noise and Vibration*, the project site is surrounded by rural and suburban residential development, and year 2035 noise levels in the project area are estimated to be at or below 60 dBA CNEL. Future development would not create significant operational noise levels (from mechanical equipment and traffic noise) in the area that would exceed the noise level standard of 60 dBA CNEL for surrounding residential development. Construction levels could substantially increase short term ambient noise levels in the project area. Implementation of standard measures in accordance with the City's General Plan policies and Municipal Code would ensure noise impacts related to future development onsite would be less than significant.

As discussed in *Section 4.14 Public Services*, development of the site would incrementally increase demand on local fire and police protection services, schools, and parks in the project area. Implementation of standard measures in accordance with the General Plan and Government Code would reduce the impacts to public services to a less than significant level. **(Less Than Significant Impact with Mitigation Incorporated)**

b) Does the project have impacts that are individually limited, but cumulatively considerable?

Pursuant to Section 15065(a)(3) of the CEQA Guidelines, a lead agency shall find that a project may have a significant impact on the environment where there is substantial evidence that the project has potential environmental effects "that are individually limited, but cumulatively considerable." As defined in Section 15065(a)(3) of the CEQA Guidelines, cumulatively considerable means “that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.”

Because criteria air pollutant and GHG gas emissions would contribute to regional and global emissions of such pollutants, the identified thresholds developed by BAAQMD was designed such that a project-level impact would also be a cumulatively considerable impact. The proposed General Plan Amendment and rezone would not result in significant emissions of criteria air pollutants and GHG emissions and, therefore, would not make a substantial contribution to cumulative air quality or GHG emissions impacts.

As discussed in *Section 4.3 Air Quality*, no development is proposed with the General Plan Amendment and rezone; therefore, the project would not generate significant dust and other particulate matter emissions with the implementation of BAAQMD standard measures. Future development, i.e. residential subdivision, would be required to prepare an air quality assessment to identify and mitigate any air quality impacts from Toxic Air Contaminants (TAC) emitted during construction. Implementation of mitigation measures recommended in the air quality assessment would reduce short-term construction impacts from TACs to a less than significant level, including any potential cumulative TAC impacts when considering the combined effect of the project with surrounding TAC sources.

As discussed in *Section 4.16 Transportation/Traffic*, future development onsite would generate fewer than 100 AM and/or PM peak hour trips and there are no other developments in the vicinity that would generate substantial vehicle trips, therefore, no cumulative impact on the roadway network is anticipated.

With implementation of mitigation measures and standard measures in accordance with the City’s General Plan and Municipal Code, and other applicable plans, policies, regulation, and ordinances, future development allowed with the General Plan Amendment and rezone would not result in significant geology and soils, hazards and hazardous materials, hydrology and water quality, or public services impacts and would not contribute to cumulative impacts to these resources. The project would not impact agricultural and forestry resources or mineral resources, therefore, it would not contribute to a significant cumulative impact on these resources.

The project site is in a rural/suburban area and, given its limited size, development at the site would not contribute to a cumulative impact on aesthetics, and population and housing with the implementation of General Plan policies, Municipal Code requirements, residential design guidelines, and unit allotments from RDCS.

The adjacent property to the northeast (Kruse Ranch property) submitted an application to the City to subdivide and construct up to three single-family residences. Due to the limited number and size of developments proposed in the vicinity of the site, in the event development of the adjacent site coincides with future development allowed with the proposed General Plan Amendment and rezone, implementation of mitigation measures and standard measures in conformance with applicable City’s General Plan policies and Municipal Code requirements, and other applicable plans, policies, regulation, and ordinances would not result in cumulative impacts to the environment.

Another property in proximity with an application submitted to the City is located at 17200 Kruse Ranch Lane (located adjacent above the Kruse Ranch property). This project is the transfer of residential development credits in order to create three open space easements to the site. This project if approved, would keep the site undeveloped as is, and would not result in any new development or cumulative impacts, when combined with the proposed project. The development credit would be transferred to another site in the City, the location of which is unknown at this time. **(Less Than Significant Cumulative Impact with Mitigation Incorporated)**

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Consistent with Section 15065(a)(4) of the CEQA Guidelines, a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has the potential to cause substantial adverse effects on human beings, either directly or indirectly. Pursuant to this standard, a change to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to effects on particular individuals. While changes to the environment that could indirectly affect human beings would be represented by all of the designated CEQA issue areas, those that could directly affect human beings include air quality, hazardous materials, and noise. Implementation of the Standard Permit Conditions and mitigation measures, and adherence to General Plan, City Code, and state and federal regulations described in these sections of the report, would avoid significant impacts. No other direct or indirect adverse effects on human beings have been identified. **(Less than Significant Impact with Mitigation Incorporated)**

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SECTION 6.0 LEAD AGENCY AND CONSULTANTS

6.1 LEAD AGENCY

City of Morgan Hill
Community Development Department
Tiffany Brown, Associate Planner

6.2 CONSULTANTS

David J. Powers & Associates, Inc.
Environmental Consultants and Planners
Akoni Danielsen, Principal Project Manager
Amy Wang, Associate Project Manager

Cornerstone Earth Group
Geotechnical Consultants
Barry Butler, Senior Principal Engineer
Andre E. Ashour, Project Engineer
Craig Harwood, Project Engineering Geologist

Basin Research Associates
Archaeological Consultants
Colin I. Busby, Principal

ATTACHMENT 2

CALEEMOD MODELING RESULTS

Serene Hills Residential Project Custom Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Serene Hills Residential Project
Construction Start Date	8/1/2024
Operational Year	2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	1.80
Precipitation (days)	32.8
Location	37.141826655043374, -121.61061255115244
County	Santa Clara
City	Morgan Hill
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1935
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

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

Single Family Housing	7.00	Dwelling Unit	8.37	32,757	319,857	—	21.0	—
Road Widening	0.15	Mile	2.30	0.00	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.	5.78	4.85	44.9	46.0	0.07	1.96	20.0	22.0	1.81	10.2	12.0	—	7,596	7,596	0.34	0.19	2.47	7,664
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.40	3.70	36.0	33.6	0.05	1.60	19.8	21.4	1.47	10.1	11.6	—	5,438	5,438	0.22	0.05	0.02	5,458
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.74	1.85	13.5	14.5	0.03	0.56	5.93	6.41	0.52	3.04	3.48	—	2,776	2,776	0.11	0.04	0.17	2,790
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.32	0.34	2.47	2.65	< 0.005	0.10	1.08	1.17	0.09	0.55	0.63	—	460	460	0.02	0.01	0.03	462

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	5.78	4.85	44.9	46.0	0.07	1.96	20.0	22.0	1.81	10.2	12.0	—	7,353	7,353	0.29	0.08	1.74	7,387
2025	4.00	3.37	31.7	30.9	0.07	1.37	19.8	21.2	1.26	10.1	11.4	—	7,596	7,596	0.34	0.19	2.47	7,664
2026	1.44	2.16	10.7	14.2	0.03	0.40	0.03	0.43	0.37	0.01	0.38	—	2,576	2,576	0.10	0.02	0.14	2,586
2027	1.38	2.11	10.3	14.2	0.03	0.36	0.03	0.39	0.33	0.01	0.33	—	2,575	2,575	0.10	0.02	0.13	2,585
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.40	3.70	36.0	33.6	0.05	1.60	19.8	21.4	1.47	10.1	11.6	—	5,438	5,438	0.22	0.05	0.02	5,458
2025	4.00	3.37	31.7	30.8	0.05	1.37	19.8	21.2	1.26	10.1	11.4	—	5,434	5,434	0.22	0.05	0.02	5,454
2026	1.44	2.16	10.7	14.2	0.03	0.40	0.03	0.43	0.37	0.01	0.38	—	2,574	2,574	0.10	0.02	< 0.005	2,584
2027	1.38	2.11	10.3	14.2	0.03	0.36	0.03	0.39	0.33	0.01	0.33	—	2,573	2,573	0.10	0.02	< 0.005	2,583
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.33	1.12	10.8	10.1	0.01	0.48	5.93	6.41	0.44	3.04	3.48	—	1,639	1,639	0.07	0.01	0.09	1,645
2025	1.74	1.85	13.5	14.5	0.03	0.56	4.64	5.20	0.52	2.28	2.80	—	2,776	2,776	0.11	0.04	0.17	2,790
2026	1.03	1.54	7.67	10.1	0.02	0.29	0.02	0.31	0.26	0.01	0.27	—	1,839	1,839	0.07	0.02	0.04	1,846
2027	0.27	0.43	1.97	2.72	< 0.005	0.07	0.01	0.07	0.06	< 0.005	0.06	—	492	492	0.02	< 0.005	0.01	494
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.24	0.20	1.98	1.85	< 0.005	0.09	1.08	1.17	0.08	0.55	0.63	—	271	271	0.01	< 0.005	0.01	272
2025	0.32	0.34	2.47	2.65	< 0.005	0.10	0.85	0.95	0.09	0.42	0.51	—	460	460	0.02	0.01	0.03	462
2026	0.19	0.28	1.40	1.85	< 0.005	0.05	< 0.005	0.06	0.05	< 0.005	0.05	—	304	304	0.01	< 0.005	0.01	306
2027	0.05	0.08	0.36	0.50	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	—	81.5	81.5	< 0.005	< 0.005	< 0.005	81.8

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.	0.28	1.08	0.25	2.30	0.01	0.01	0.46	0.47	0.01	0.12	0.13	3.44	624	628	0.38	0.02	1.80	645
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.23	1.03	0.27	1.76	< 0.005	0.01	0.46	0.47	0.01	0.12	0.12	3.44	594	598	0.38	0.02	0.28	614
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.24	1.04	0.26	1.88	< 0.005	0.01	0.44	0.45	0.01	0.11	0.12	3.44	588	592	0.38	0.02	0.90	608
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.04	0.19	0.05	0.34	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	0.57	97.4	98.0	0.06	< 0.005	0.15	101

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	0.23	0.21	0.16	1.87	< 0.005	< 0.005	0.46	0.46	< 0.005	0.12	0.12	—	483	483	0.02	0.02	1.56	490
Area	0.04	0.86	< 0.005	0.40	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.06	1.06	< 0.005	< 0.005	—	1.07
Energy	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	128	128	0.01	< 0.005	—	128
Water	—	—	—	—	—	—	—	—	—	—	—	0.49	12.4	12.9	0.05	< 0.005	—	14.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.96	0.00	2.96	0.30	0.00	—	10.3
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	0.23
Total	0.28	1.08	0.25	2.30	0.01	0.01	0.46	0.47	0.01	0.12	0.13	3.44	624	628	0.38	0.02	1.80	645

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.22	0.20	0.19	1.72	< 0.005	< 0.005	0.46	0.46	< 0.005	0.12	0.12	—	454	454	0.02	0.02	0.04	460
Area	0.00	0.83	0.00	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	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	128	128	0.01	< 0.005	—	128
Water	—	—	—	—	—	—	—	—	—	—	—	0.49	12.4	12.9	0.05	< 0.005	—	14.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.96	0.00	2.96	0.30	0.00	—	10.3
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	0.23
Total	0.23	1.03	0.27	1.76	< 0.005	0.01	0.46	0.47	0.01	0.12	0.12	3.44	594	598	0.38	0.02	0.28	614
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.21	0.20	0.17	1.64	< 0.005	< 0.005	0.44	0.44	< 0.005	0.11	0.11	—	448	448	0.02	0.02	0.66	454
Area	0.02	0.84	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.52	0.52	< 0.005	< 0.005	—	0.53
Energy	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	128	128	0.01	< 0.005	—	128
Water	—	—	—	—	—	—	—	—	—	—	—	0.49	12.4	12.9	0.05	< 0.005	—	14.7
Waste	—	—	—	—	—	—	—	—	—	—	—	2.96	0.00	2.96	0.30	0.00	—	10.3
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	0.23
Total	0.24	1.04	0.26	1.88	< 0.005	0.01	0.44	0.45	0.01	0.11	0.12	3.44	588	592	0.38	0.02	0.90	608
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.04	0.04	0.03	0.30	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	74.1	74.1	< 0.005	< 0.005	0.11	75.2
Area	< 0.005	0.15	< 0.005	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.09	0.09	< 0.005	< 0.005	—	0.09
Energy	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.2	21.2	< 0.005	< 0.005	—	21.3
Water	—	—	—	—	—	—	—	—	—	—	—	0.08	2.06	2.14	0.01	< 0.005	—	2.43
Waste	—	—	—	—	—	—	—	—	—	—	—	0.49	0.00	0.49	0.05	0.00	—	1.71
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	0.04	0.19	0.05	0.34	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	0.57	97.4	98.0	0.06	< 0.005	0.15	101

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	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
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	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	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
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	1.30	1.09	10.8	9.86	0.01	0.48	—	0.48	0.44	—	0.44	—	1,586	1,586	0.06	0.01	—	1,591

Dust From Material Movement	—	—	—	—	—	—	5.89	5.89	—	3.02	3.02	—	—	—	—	—	—	—
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24	0.20	1.96	1.80	< 0.005	0.09	—	0.09	0.08	—	0.08	—	263	263	0.01	< 0.005	—	263
Dust From Material Movement	—	—	—	—	—	—	1.07	1.07	—	0.55	0.55	—	—	—	—	—	—	—
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	0.77	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	153	153	< 0.005	0.01	0.65	155
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	0.06	0.06	0.06	0.66	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	142	142	< 0.005	0.01	0.02	144
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	0.02	0.02	0.02	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	42.9	42.9	< 0.005	< 0.005	0.08	43.5
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	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.10	7.10	< 0.005	< 0.005	0.01	7.21
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. 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	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
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	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	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
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	0.76	0.64	6.13	5.85	0.01	0.26	—	0.26	0.24	—	0.24	—	1,026	1,026	0.04	0.01	—	1,029
Dust From Material Movement	—	—	—	—	—	—	3.81	3.81	—	1.96	1.96	—	—	—	—	—	—	—
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	0.14	0.12	1.12	1.07	< 0.005	0.05	—	0.05	0.04	—	0.04	—	170	170	0.01	< 0.005	—	170
Dust From Material Movement	—	—	—	—	—	—	0.70	0.70	—	0.36	0.36	—	—	—	—	—	—	—
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	0.06	0.04	0.72	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	150	150	< 0.005	0.01	0.59	152
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	0.06	0.06	0.05	0.61	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	139	139	< 0.005	0.01	0.02	141
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	0.01	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	27.2	27.2	< 0.005	< 0.005	0.05	27.6

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	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.50	4.50	< 0.005	< 0.005	0.01	4.57
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

3.5. Grading (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	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.21	9.21	—	3.65	3.65	—	—	—	—	—	—	—
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	0.31	0.26	2.44	2.33	0.01	0.10	—	0.10	0.09	—	0.09	—	542	542	0.02	< 0.005	—	544

Dust From Material Movement	—	—	—	—	—	—	0.76	0.76	—	0.30	0.30	—	—	—	—	—	—	—
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	0.06	0.05	0.45	0.42	< 0.005	0.02	—	0.02	0.02	—	0.02	—	89.8	89.8	< 0.005	< 0.005	—	90.1
Dust From Material Movement	—	—	—	—	—	—	0.14	0.14	—	0.05	0.05	—	—	—	—	—	—	—
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	0.07	0.05	0.82	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	171	171	< 0.005	0.01	0.68	174
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	0.09	0.02	1.03	0.50	0.01	0.02	0.21	0.23	0.01	0.06	0.07	—	826	826	0.07	0.13	1.80	868
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.2	13.2	< 0.005	< 0.005	0.02	13.4
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	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	67.9	67.9	0.01	0.01	0.06	71.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.18	2.18	< 0.005	< 0.005	< 0.005	2.22
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	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.2	11.2	< 0.005	< 0.005	0.01	11.8

3.7. 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	0.55	0.46	4.29	5.36	0.01	0.18	—	0.18	0.16	—	0.16	—	985	985	0.04	0.01	—	989
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	0.10	0.08	0.78	0.98	< 0.005	0.03	—	0.03	0.03	—	0.03	—	163	163	0.01	< 0.005	—	164
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	0.01	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	21.6	21.6	< 0.005	< 0.005	0.09	21.9
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.2	20.2	< 0.005	< 0.005	0.05	21.1
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	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	20.0	20.0	< 0.005	< 0.005	< 0.005	20.3
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.2	20.2	< 0.005	< 0.005	< 0.005	21.1
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	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.31	8.31	< 0.005	< 0.005	0.02	8.43
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.30	8.30	< 0.005	< 0.005	0.01	8.68
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	—	1.38	1.38	< 0.005	< 0.005	< 0.005	1.40
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.37	1.37	< 0.005	< 0.005	< 0.005	1.44
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. 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	0.91	0.77	7.04	9.26	0.02	0.27	—	0.27	0.25	—	0.25	—	1,712	1,712	0.07	0.01	—	1,718
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	0.17	0.14	1.28	1.69	< 0.005	0.05	—	0.05	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
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	0.01	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	21.2	21.2	< 0.005	< 0.005	0.08	21.5
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.8	19.8	< 0.005	< 0.005	0.05	20.8
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	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.6	19.6	< 0.005	< 0.005	< 0.005	19.9

Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.9	19.9	< 0.005	< 0.005	< 0.005	20.7
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	0.01	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.2	14.2	< 0.005	< 0.005	0.02	14.4
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.2	14.2	< 0.005	< 0.005	0.01	14.8
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	—	2.35	2.35	< 0.005	< 0.005	< 0.005	2.38
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.35	2.35	< 0.005	< 0.005	< 0.005	2.45
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

3.11. Building Construction (2027) - 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	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	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	1.23	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	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	0.23	0.20	1.78	2.46	< 0.005	0.06	—	0.06	0.06	—	0.06	—	455	455	0.02	< 0.005	—	457
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	0.04	0.04	0.33	0.45	< 0.005	0.01	—	0.01	0.01	—	0.01	—	75.3	75.3	< 0.005	< 0.005	—	75.6
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	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	20.8	20.8	< 0.005	< 0.005	0.07	21.1
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.4	19.4	< 0.005	< 0.005	0.04	20.4
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	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.3	19.3	< 0.005	< 0.005	< 0.005	19.5
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.4	19.4	< 0.005	< 0.005	< 0.005	20.3
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.70	3.70	< 0.005	< 0.005	0.01	3.75
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.69	3.69	< 0.005	< 0.005	< 0.005	3.86
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	—	0.61	0.61	< 0.005	< 0.005	< 0.005	0.62

Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.61	0.61	< 0.005	< 0.005	< 0.005	0.64
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

3.13. Paving (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	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.03	0.02	0.20	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	41.4	41.4	< 0.005	< 0.005	—	41.6
Paving	—	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.86	6.86	< 0.005	< 0.005	—	6.88
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.05	0.04	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	129	129	< 0.005	< 0.005	0.51	131
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	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.30	3.30	< 0.005	< 0.005	0.01	3.35
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	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.55
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

3.15. Architectural Coating (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	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134

Architectural	—	0.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	0.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.06	0.05	0.34	0.44	< 0.005	0.01	—	0.01	0.01	—	0.01	—	51.2	51.2	< 0.005	< 0.005	—	51.4
Architectural Coatings	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.06	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.48	8.48	< 0.005	< 0.005	—	8.51
Architectural Coatings	—	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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.32	4.32	< 0.005	< 0.005	0.02	4.39
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.00	4.00	< 0.005	< 0.005	< 0.005	4.06
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	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.55	1.55	< 0.005	< 0.005	< 0.005	1.57
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	—	0.26	0.26	< 0.005	< 0.005	< 0.005	0.26
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

3.17. 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	—	0.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.15	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	—	0.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.10	0.09	0.61	0.81	< 0.005	0.02	—	0.02	0.02	—	0.02	—	95.4	95.4	< 0.005	< 0.005	—	95.7
Architectural Coatings	—	0.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.11	0.15	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.8	15.8	< 0.005	< 0.005	—	15.8
Architectural Coatings	—	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.24	4.24	< 0.005	< 0.005	0.02	4.30
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	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.93	3.93	< 0.005	< 0.005	< 0.005	3.98
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	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.83	2.83	< 0.005	< 0.005	< 0.005	2.88
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	—	0.47	0.47	< 0.005	< 0.005	< 0.005	0.48
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

3.19. Architectural Coating (2027) - 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	0.14	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	0.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.14	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	0.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.03	0.02	0.18	0.24	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	29.0	29.0	< 0.005	< 0.005	—	29.1
Architectural Coatings	—	0.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.80	4.80	< 0.005	< 0.005	—	4.82
Architectural Coatings	—	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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.16	4.16	< 0.005	< 0.005	0.01	4.22
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.85	3.85	< 0.005	< 0.005	< 0.005	3.91
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	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.86
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	—	0.14	0.14	< 0.005	< 0.005	< 0.005	0.14
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

3.21. Linear, Grubbing & Land Clearing (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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

3.23. Linear, Grading & Excavation (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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
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	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.4	27.4	< 0.005	< 0.005	0.07	28.7
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	0.00	0.00	0.00	0.00	0.00	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	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.15	0.15	< 0.005	< 0.005	< 0.005	0.16
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	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.02	0.02	< 0.005	< 0.005	< 0.005	0.03
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

3.25. Linear, Drainage, Utilities, & Sub-Grade (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	1.27	1.06	8.71	11.2	0.02	0.36	—	0.36	0.33	—	0.33	—	1,613	1,613	0.07	0.01	—	1,618
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
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	—	8.84	8.84	< 0.005	< 0.005	—	8.87
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
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	—	1.46	1.46	< 0.005	< 0.005	—	1.47
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
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	0.10	0.09	0.07	1.10	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	219	219	< 0.005	0.01	0.93	222
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	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	73.0	73.0	0.01	0.01	0.16	76.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.14
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	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.40	0.40	< 0.005	< 0.005	< 0.005	0.42
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.19
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	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.07	0.07	< 0.005	< 0.005	< 0.005	0.07

3.27. Linear, 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.23	0.21	0.16	1.87	< 0.005	< 0.005	0.46	0.46	< 0.005	0.12	0.12	—	483	483	0.02	0.02	1.56	490
Total	0.23	0.21	0.16	1.87	< 0.005	< 0.005	0.46	0.46	< 0.005	0.12	0.12	—	483	483	0.02	0.02	1.56	490
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.22	0.20	0.19	1.72	< 0.005	< 0.005	0.46	0.46	< 0.005	0.12	0.12	—	454	454	0.02	0.02	0.04	460
Total	0.22	0.20	0.19	1.72	< 0.005	< 0.005	0.46	0.46	< 0.005	0.12	0.12	—	454	454	0.02	0.02	0.04	460
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.04	0.03	0.30	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	74.1	74.1	< 0.005	< 0.005	0.11	75.2
Total	0.04	0.04	0.03	0.30	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	74.1	74.1	< 0.005	< 0.005	0.11	75.2

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	24.2	24.2	< 0.005	< 0.005	—	24.4
Total	—	—	—	—	—	—	—	—	—	—	—	—	24.2	24.2	< 0.005	< 0.005	—	24.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	24.2	24.2	< 0.005	< 0.005	—	24.4
Total	—	—	—	—	—	—	—	—	—	—	—	—	24.2	24.2	< 0.005	< 0.005	—	24.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	4.01	4.01	< 0.005	< 0.005	—	4.05
Total	—	—	—	—	—	—	—	—	—	—	—	—	4.01	4.01	< 0.005	< 0.005	—	4.05

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	104	104	0.01	< 0.005	—	104

Total	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	104	104	0.01	< 0.005	—	104
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	104	104	0.01	< 0.005	—	104
Total	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	104	104	0.01	< 0.005	—	104
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	17.2	17.2	< 0.005	< 0.005	—	17.2
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	17.2	17.2	< 0.005	< 0.005	—	17.2

4.3. Area Emissions by Source

4.3.1. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	—	0.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.04	0.03	< 0.005	0.40	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.06	1.06	< 0.005	< 0.005	—	1.07

Total	0.04	0.86	< 0.005	0.40	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.06	1.06	< 0.005	< 0.005	—	1.07
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	—	0.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.00	0.83	0.00	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	—	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	< 0.005	< 0.005	< 0.005	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.09	0.09	< 0.005	< 0.005	—	0.09
Total	< 0.005	0.15	< 0.005	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.09	0.09	< 0.005	< 0.005	—	0.09

4.4. Water Emissions by Land Use

4.4.1. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.49	12.4	12.9	0.05	< 0.005	—	14.7
Total	—	—	—	—	—	—	—	—	—	—	—	0.49	12.4	12.9	0.05	< 0.005	—	14.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.49	12.4	12.9	0.05	< 0.005	—	14.7
Total	—	—	—	—	—	—	—	—	—	—	—	0.49	12.4	12.9	0.05	< 0.005	—	14.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.08	2.06	2.14	0.01	< 0.005	—	2.43
Total	—	—	—	—	—	—	—	—	—	—	—	0.08	2.06	2.14	0.01	< 0.005	—	2.43

4.5. Waste Emissions by Land Use

4.5.1. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2.96	0.00	2.96	0.30	0.00	—	10.3
Total	—	—	—	—	—	—	—	—	—	—	—	2.96	0.00	2.96	0.30	0.00	—	10.3

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2.96	0.00	2.96	0.30	0.00	—	10.3
Total	—	—	—	—	—	—	—	—	—	—	—	2.96	0.00	2.96	0.30	0.00	—	10.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.49	0.00	0.49	0.05	0.00	—	1.71
Total	—	—	—	—	—	—	—	—	—	—	—	0.49	0.00	0.49	0.05	0.00	—	1.71

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	0.23
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	0.23
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	0.23
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	0.23

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	8/1/2024	4/9/2025	5.00	180	—
Grading	Grading	4/10/2025	5/21/2025	5.00	30.0	—
Building Construction	Building Construction	6/5/2025	4/7/2027	5.00	480	—
Paving	Paving	5/22/2025	6/4/2025	5.00	10.0	—
Architectural Coating	Architectural Coating	6/19/2025	4/21/2027	5.00	480	—
Linear, Grubbing & Land Clearing	Linear, Grubbing & Land Clearing	8/1/2024	8/2/2024	5.00	1.00	—
Linear, Grading & Excavation	Linear, Grading & Excavation	8/3/2024	8/5/2024	5.00	2.00	—
Linear, Drainage, Utilities, & Sub-Grade	Linear, Drainage, Utilities, & Sub-Grade	8/6/2024	8/8/2024	5.00	2.00	—
Linear, Paving	Linear, Paving	8/9/2024	8/10/2024	5.00	1.00	—

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	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
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	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
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
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Signal Boards	Electric	Average	3.00	8.00	6.00	0.82
Linear, Drainage, Utilities, & Sub-Grade	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48
Linear, Drainage, Utilities, & Sub-Grade	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Linear, Drainage, Utilities, & Sub-Grade	Trenchers	Diesel	Average	1.00	8.00	40.0	0.50

Linear, Drainage, Utilities, & Sub-Grade	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36

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	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	11.5	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	2.52	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	0.75	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—

Architectural Coating	Worker	0.50	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	0.00	11.7	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	0.00	8.40	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	0.00	20.0	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	0.00	11.7	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	1.00	8.40	HHDT,MHDT
Linear, Grading & Excavation	Hauling	0.00	20.0	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	25.0	11.7	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	8.40	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	1.00	20.0	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	0.00	11.7	LDA,LDT1,LDT2
Linear, Paving	Vendor	0.00	8.40	HHDT,MHDT
Linear, Paving	Hauling	0.00	20.0	HHDT
Linear, Paving	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	66,333	22,111	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	270	0.00	—
Grading	2,764	—	90.0	0.00	—
Paving	0.00	0.00	0.00	0.00	2.38
Linear, Grubbing & Land Clearing	—	—	2.30	0.00	—
Linear, Grading & Excavation	—	—	2.30	0.00	—
Linear, Drainage, Utilities, & Sub-Grade	—	15.6	2.30	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	0.08	0%
Road Widening	2.30	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	88.1	204	0.03	< 0.005
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005
2027	0.00	204	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
Single Family Housing	66.1	66.8	59.9	23,831	640	647	580	230,775

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	7

Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

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)
66332.925	22,111	0.00	0.00	—

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)
Single Family Housing	43,294	204	0.0330	0.0040	323,553

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	253,865	4,179,277

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	5.48	—

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
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

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)

8. User Changes to Default Data

Screen	Justification
Land Use	Changes based on applicant provided information

Construction: Construction Phases	No demolition required. Changes made based on applicant provided information. Based on typical construction practices, architectural coating assumed to start two weeks after the start of building construction and last for the same number of days
Operations: Hearths	Fireplaces are not proposed as part of the project.
Construction: Off-Road Equipment	Linear equipment adjusted based on typical equipment usage for utility line construction.

East Dunne Ave Approved Project Custom Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	East Dunne Ave Approved Project
Construction Start Date	8/1/2024
Operational Year	2025
Lead Agency	City of Morgan Hill
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	1.80
Precipitation (days)	32.8
Location	37.141826655043374, -121.61061255115244
County	Santa Clara
City	Morgan Hill
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1935
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

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

Single Family Housing	22.0	Dwelling Unit	8.34	42,900	257,683	—	66.0	—

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.	4.41	3.92	36.0	33.7	0.05	1.60	19.8	21.4	1.47	10.1	11.6	—	5,449	5,449	0.22	0.05	0.65	5,469
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.64	4.00	12.3	14.7	0.03	0.53	0.12	0.63	0.49	0.03	0.51	—	2,673	2,673	0.11	0.03	0.01	2,685
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.72	1.91	5.37	6.84	0.01	0.22	0.96	1.15	0.20	0.47	0.65	—	1,253	1,253	0.05	0.02	0.10	1,259
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.13	0.35	0.98	1.25	< 0.005	0.04	0.17	0.21	0.04	0.09	0.12	—	207	207	0.01	< 0.005	0.02	208

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	4.41	3.71	36.0	33.7	0.05	1.60	19.8	21.4	1.47	10.1	11.6	—	5,449	5,449	0.22	0.05	0.65	5,469
2025	1.54	3.92	11.4	14.6	0.03	0.46	0.10	0.56	0.42	0.02	0.45	—	2,676	2,676	0.11	0.03	0.49	2,689
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.64	4.00	12.3	14.7	0.03	0.53	0.12	0.63	0.49	0.03	0.51	—	2,673	2,673	0.11	0.03	0.01	2,685
2025	1.54	3.91	11.4	14.6	0.03	0.46	0.10	0.56	0.42	0.02	0.45	—	2,670	2,670	0.11	0.03	0.01	2,683
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.57	0.83	4.38	4.91	0.01	0.20	0.96	1.15	0.18	0.47	0.65	—	838	838	0.03	0.01	0.07	841
2025	0.72	1.91	5.37	6.84	0.01	0.22	0.04	0.26	0.20	0.01	0.21	—	1,253	1,253	0.05	0.02	0.10	1,259
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.10	0.15	0.80	0.90	< 0.005	0.04	0.17	0.21	0.03	0.09	0.12	—	139	139	0.01	< 0.005	0.01	139
2025	0.13	0.35	0.98	1.25	< 0.005	0.04	0.01	0.05	0.04	< 0.005	0.04	—	207	207	0.01	< 0.005	0.02	208

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.	0.95	1.94	0.92	7.87	0.02	0.04	1.43	1.47	0.04	0.36	0.40	10.8	2,085	2,096	1.19	0.07	6.48	2,152
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.80	1.80	1.01	6.12	0.02	0.04	1.43	1.47	0.04	0.36	0.40	10.8	1,987	1,998	1.20	0.07	0.47	2,050

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.82	1.83	0.89	6.43	0.02	0.03	1.37	1.40	0.03	0.35	0.38	10.8	1,878	1,889	1.19	0.07	2.92	1,942
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.15	0.33	0.16	1.17	< 0.005	0.01	0.25	0.26	0.01	0.06	0.07	1.79	311	313	0.20	0.01	0.48	321

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	0.79	0.73	0.58	6.49	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,575	1,575	0.06	0.06	6.18	1,601
Area	0.13	1.20	0.09	1.28	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	96.0	96.0	< 0.005	< 0.005	—	96.1
Energy	0.03	0.02	0.26	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	402	402	0.04	< 0.005	—	404
Water	—	—	—	—	—	—	—	—	—	—	—	1.53	12.2	13.7	0.16	< 0.005	—	18.8
Waste	—	—	—	—	—	—	—	—	—	—	—	9.29	0.00	9.29	0.93	0.00	—	32.5
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31	0.31
Total	0.95	1.94	0.92	7.87	0.02	0.04	1.43	1.47	0.04	0.36	0.40	10.8	2,085	2,096	1.19	0.07	6.48	2,152
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.76	0.69	0.68	5.98	0.01	0.01	1.43	1.44	0.01	0.36	0.37	—	1,480	1,480	0.07	0.07	0.16	1,502
Area	0.01	1.09	0.07	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	92.6	92.6	< 0.005	< 0.005	—	92.7
Energy	0.03	0.02	0.26	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	402	402	0.04	< 0.005	—	404
Water	—	—	—	—	—	—	—	—	—	—	—	1.53	12.2	13.7	0.16	< 0.005	—	18.8
Waste	—	—	—	—	—	—	—	—	—	—	—	9.29	0.00	9.29	0.93	0.00	—	32.5
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31	0.31

Total	0.80	1.80	1.01	6.12	0.02	0.04	1.43	1.47	0.04	0.36	0.40	10.8	1,987	1,998	1.20	0.07	0.47	2,050
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.73	0.67	0.62	5.70	0.01	0.01	1.37	1.38	0.01	0.35	0.36	—	1,460	1,460	0.06	0.06	2.61	1,482
Area	0.06	1.14	0.01	0.61	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	3.93	3.93	< 0.005	< 0.005	—	3.94
Energy	0.03	0.02	0.26	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	402	402	0.04	< 0.005	—	404
Water	—	—	—	—	—	—	—	—	—	—	—	1.53	12.2	13.7	0.16	< 0.005	—	18.8
Waste	—	—	—	—	—	—	—	—	—	—	—	9.29	0.00	9.29	0.93	0.00	—	32.5
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31	0.31
Total	0.82	1.83	0.89	6.43	0.02	0.03	1.37	1.40	0.03	0.35	0.38	10.8	1,878	1,889	1.19	0.07	2.92	1,942
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.13	0.12	0.11	1.04	< 0.005	< 0.005	0.25	0.25	< 0.005	0.06	0.07	—	242	242	0.01	0.01	0.43	245
Area	0.01	0.21	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.65	0.65	< 0.005	< 0.005	—	0.65
Energy	0.01	< 0.005	0.05	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	66.5	66.5	0.01	< 0.005	—	66.8
Water	—	—	—	—	—	—	—	—	—	—	—	0.25	2.02	2.27	0.03	< 0.005	—	3.12
Waste	—	—	—	—	—	—	—	—	—	—	—	1.54	0.00	1.54	0.15	0.00	—	5.38
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05
Total	0.15	0.33	0.16	1.17	< 0.005	0.01	0.25	0.26	0.01	0.06	0.07	1.79	311	313	0.20	0.01	0.48	321

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	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
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	—	—	—	—	—	—	0.54	0.54	—	0.28	0.28	—	—	—	—	—	—	—
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	—	—	—	—	—	—	0.10	0.10	—	0.05	0.05	—	—	—	—	—	—	—
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	0.77	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	153	153	< 0.005	0.01	0.65	155

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	—	3.92	3.92	< 0.005	< 0.005	0.01	3.98
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	—	0.65	0.65	< 0.005	< 0.005	< 0.005	0.66
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	—	—	—	—	—	—	7.08	7.08	—	3.42	3.42	—	—	—	—	—	—	—
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	—	—	—	—	—	—	0.39	0.39	—	0.19	0.19	—	—	—	—	—	—	—
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	—	—	—	—	—	—	0.07	0.07	—	0.03	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	0.06	0.05	0.04	0.66	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	131	131	< 0.005	< 0.005	0.56	133
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	—	6.73	6.73	< 0.005	< 0.005	0.01	6.83
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	—	1.11	1.11	< 0.005	< 0.005	< 0.005	1.13
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

3.5. Building Construction (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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	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	0.23	0.20	1.82	2.13	< 0.005	0.08	—	0.08	0.07	—	0.07	—	389	389	0.02	< 0.005	—	391
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	0.04	0.04	0.33	0.39	< 0.005	0.01	—	0.01	0.01	—	0.01	—	64.5	64.5	< 0.005	< 0.005	—	64.7

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.30	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	64.1	64.1	< 0.005	< 0.005	0.01	65.0
Vendor	0.01	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	64.5	64.5	< 0.005	0.01	< 0.005	67.5
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	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.5	10.5	< 0.005	< 0.005	0.02	10.7
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.5	10.5	< 0.005	< 0.005	0.01	11.0
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	—	1.74	1.74	< 0.005	< 0.005	< 0.005	1.77
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.73	1.73	< 0.005	< 0.005	< 0.005	1.82
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. 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	0.63	0.53	4.88	6.10	0.01	0.20	—	0.20	0.19	—	0.19	—	1,121	1,121	0.05	0.01	—	1,125
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	0.11	0.10	0.89	1.11	< 0.005	0.04	—	0.04	0.03	—	0.03	—	186	186	0.01	< 0.005	—	186
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	0.03	0.03	0.02	0.32	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	67.9	67.9	< 0.005	< 0.005	0.27	68.9
Vendor	0.01	< 0.005	0.08	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	63.5	63.5	< 0.005	0.01	0.17	66.4
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	0.03	0.03	0.02	0.28	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	62.9	62.9	< 0.005	< 0.005	0.01	63.7

Vendor	0.01	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	63.5	63.5	< 0.005	0.01	< 0.005	66.3
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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.13	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.7	29.7	< 0.005	< 0.005	0.05	30.2
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.7	29.7	< 0.005	< 0.005	0.03	31.0
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	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.92	4.92	< 0.005	< 0.005	0.01	4.99
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.91	4.91	< 0.005	< 0.005	0.01	5.14
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. 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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	1.01	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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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	0.06	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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.66	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	131	131	< 0.005	< 0.005	0.56	133
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	0.06	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	121	121	< 0.005	0.01	0.01	123
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	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.73	6.73	< 0.005	< 0.005	0.01	6.83
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	—	1.11	1.11	< 0.005	< 0.005	< 0.005	1.13
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

3.11. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	2.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.02	0.02	0.12	0.15	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	18.0	18.0	< 0.005	< 0.005	—	18.1
Architectural Coatings	—	0.35	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.98	2.98	< 0.005	< 0.005	—	3.00
Architectural Coatings	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.8	12.8	< 0.005	< 0.005	< 0.005	13.0
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	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.75	1.75	< 0.005	< 0.005	< 0.005	1.78
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	—	0.29	0.29	< 0.005	< 0.005	< 0.005	0.29
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

3.13. Architectural Coating (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	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	2.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	2.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.08	0.06	0.44	0.56	< 0.005	0.01	—	0.01	0.01	—	0.01	—	66.1	66.1	< 0.005	< 0.005	—	66.3
Architectural Coatings	—	1.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	10.9	10.9	< 0.005	< 0.005	—	11.0

Architect Coatings	—	0.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.6	13.6	< 0.005	< 0.005	0.05	13.8
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	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.6	12.6	< 0.005	< 0.005	< 0.005	12.7
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	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.29	6.29	< 0.005	< 0.005	0.01	6.38
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	—	1.04	1.04	< 0.005	< 0.005	< 0.005	1.06
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.79	0.73	0.58	6.49	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,575	1,575	0.06	0.06	6.18	1,601
Total	0.79	0.73	0.58	6.49	0.02	0.01	1.43	1.44	0.01	0.36	0.37	—	1,575	1,575	0.06	0.06	6.18	1,601
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.76	0.69	0.68	5.98	0.01	0.01	1.43	1.44	0.01	0.36	0.37	—	1,480	1,480	0.07	0.07	0.16	1,502
Total	0.76	0.69	0.68	5.98	0.01	0.01	1.43	1.44	0.01	0.36	0.37	—	1,480	1,480	0.07	0.07	0.16	1,502
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.13	0.12	0.11	1.04	< 0.005	< 0.005	0.25	0.25	< 0.005	0.06	0.07	—	242	242	0.01	0.01	0.43	245
Total	0.13	0.12	0.11	1.04	< 0.005	< 0.005	0.25	0.25	< 0.005	0.06	0.07	—	242	242	0.01	0.01	0.43	245

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	76.0	76.0	0.01	< 0.005	—	76.8
Total	—	—	—	—	—	—	—	—	—	—	—	—	76.0	76.0	0.01	< 0.005	—	76.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	76.0	76.0	0.01	< 0.005	—	76.8
Total	—	—	—	—	—	—	—	—	—	—	—	—	76.0	76.0	0.01	< 0.005	—	76.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	12.6	12.6	< 0.005	< 0.005	—	12.7
Total	—	—	—	—	—	—	—	—	—	—	—	—	12.6	12.6	< 0.005	< 0.005	—	12.7

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.03	0.02	0.26	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	326	326	0.03	< 0.005	—	327
Total	0.03	0.02	0.26	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	326	326	0.03	< 0.005	—	327
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	0.03	0.02	0.26	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	326	326	0.03	< 0.005	—	327
Total	0.03	0.02	0.26	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	326	326	0.03	< 0.005	—	327
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.01	< 0.005	0.05	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	54.0	54.0	< 0.005	< 0.005	—	54.1
Total	0.01	< 0.005	0.05	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	54.0	54.0	< 0.005	< 0.005	—	54.1

4.3. Area Emissions by Source

4.3.1. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.01	< 0.005	0.07	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	92.6	92.6	< 0.005	< 0.005	—	92.7
Consumer Products	—	0.92	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.12	0.11	0.01	1.25	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.34	3.34	< 0.005	< 0.005	—	3.35
Total	0.13	1.20	0.09	1.28	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	96.0	96.0	< 0.005	< 0.005	—	96.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Hearths	0.01	< 0.005	0.07	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	92.6	92.6	< 0.005	< 0.005	—	92.7
Consumer Products	—	0.92	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.01	1.09	0.07	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	92.6	92.6	< 0.005	< 0.005	—	92.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.38	0.38	< 0.005	< 0.005	—	0.38
Consumer Products	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.01	0.01	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.27	0.27	< 0.005	< 0.005	—	0.27
Total	0.01	0.21	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	0.65	0.65	< 0.005	< 0.005	—	0.65

4.4. Water Emissions by Land Use

4.4.1. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.53	12.2	13.7	0.16	< 0.005	—	18.8
Total	—	—	—	—	—	—	—	—	—	—	—	1.53	12.2	13.7	0.16	< 0.005	—	18.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.53	12.2	13.7	0.16	< 0.005	—	18.8
Total	—	—	—	—	—	—	—	—	—	—	—	1.53	12.2	13.7	0.16	< 0.005	—	18.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.25	2.02	2.27	0.03	< 0.005	—	3.12
Total	—	—	—	—	—	—	—	—	—	—	—	0.25	2.02	2.27	0.03	< 0.005	—	3.12

4.5. Waste Emissions by Land Use

4.5.1. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	9.29	0.00	9.29	0.93	0.00	—	32.5
Total	—	—	—	—	—	—	—	—	—	—	—	9.29	0.00	9.29	0.93	0.00	—	32.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	9.29	0.00	9.29	0.93	0.00	—	32.5
Total	—	—	—	—	—	—	—	—	—	—	—	9.29	0.00	9.29	0.93	0.00	—	32.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.54	0.00	1.54	0.15	0.00	—	5.38
Total	—	—	—	—	—	—	—	—	—	—	—	1.54	0.00	1.54	0.15	0.00	—	5.38

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31	0.31
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31	0.31
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31	0.31
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31	0.31
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	8/1/2024	8/14/2024	5.00	10.0	—
Grading	Grading	8/15/2024	9/11/2024	5.00	20.0	—
Building Construction	Building Construction	10/10/2024	8/27/2025	5.00	230	—
Paving	Paving	9/12/2024	10/9/2024	5.00	20.0	—
Architectural Coating	Architectural Coating	10/24/2024	9/10/2025	5.00	230	—

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	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40

Grading	Tractors/Loaders/Backh	Diesel	Average	3.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
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	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
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	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	7.92	11.7	LDA,LDT1,LDT2

Building Construction	Vendor	2.35	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	1.58	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	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	86,873	28,958	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)

Site Preparation	—	—	15.0	0.00	—
Grading	—	—	20.0	0.00	—
Paving	0.00	0.00	0.00	0.00	0.24

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	0.24	0%

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	204	0.03	< 0.005
2025	0.00	204	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
Single Family Housing	208	210	188	74,897	2,011	2,032	1,822	725,292

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	4
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	18
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

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)
86872.5	28,958	0.00	0.00	—

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)
Single Family Housing	136,067	204	0.0330	0.0040	1,016,882

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	797,861	3,366,907

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	17.2	—

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
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

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)

8. User Changes to Default Data

Screen	Justification
Land Use	Changes based on information contained within the approved 2275 East Dunne Avenue IS/MND
Construction: Construction Phases	No demolition required. Based on typical construction practices, architectural coating assumed to start two weeks after the start of building construction and last for the same number of days
Operations: Hearths	Fireplaces are not proposed as part of the project.

ATTACHMENT 3

TECHNICAL BIOLOGICAL REPORT

LIVE OAK

ASSOCIATES, INC.

SERENE HILLS PROJECT SITE
TECHNICAL BIOLOGICAL REPORT
CITY OF MORGAN HILL, SANTA CLARA COUNTY, CALIFORNIA

Prepared by

LIVE OAK ASSOCIATES, INC.

Rick Hopkins, Ph.D., Principal/Senior Wildlife Ecologist
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Prepared for

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January 22, 2024 PN 2842-01

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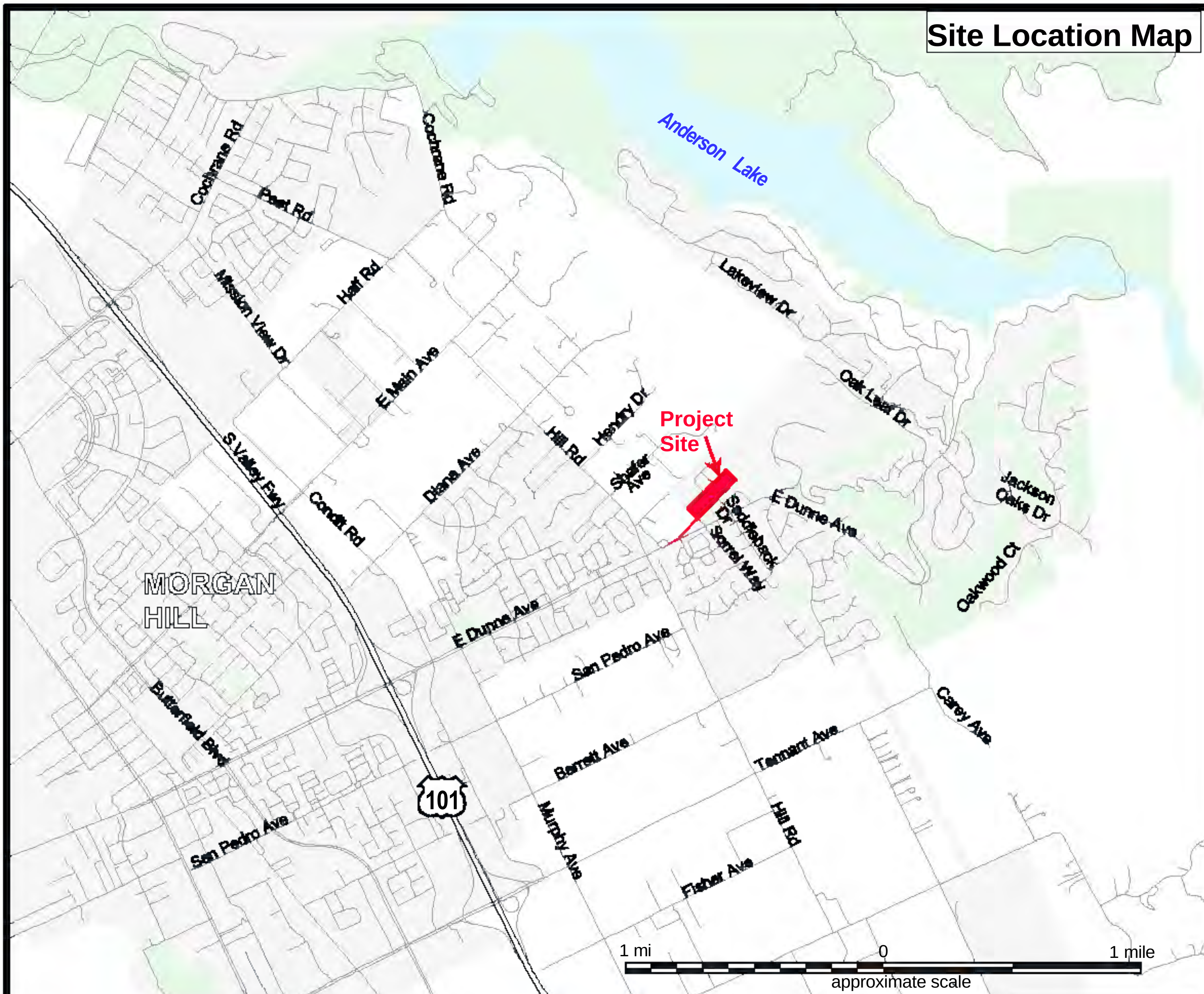
1 INTRODUCTION

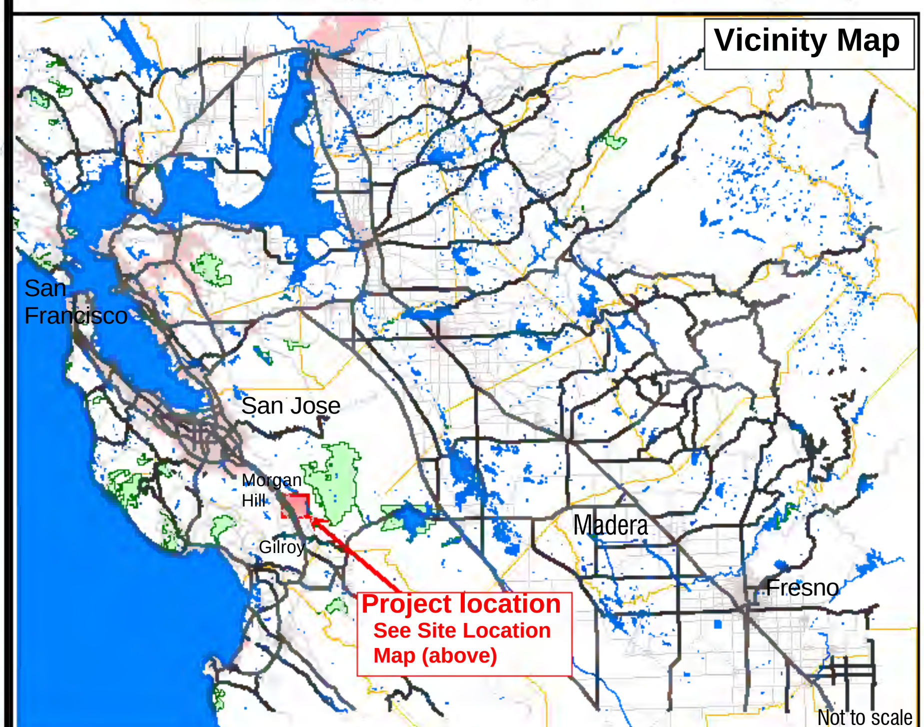
The Serene Hills Property ("project site") was evaluated by Live Oak Associates, Inc. (LOA) to ascertain whether build-out of a residential neighborhood ("project") would have a significant impact, as defined by the California Environmental Quality Act (CEQA), on the biological resources of the site and region. This report describes the biotic resources of the approximately 8.37-acre project site and evaluates potential impacts to these biotic resources resulting from the proposed project. The site is located on Forest Street (APN 728-02-002 and -003) in Morgan Hill, Santa Clara County, California (Figure 1). The site can be found on the Mt. Sizer U.S.G.S. 7.5' quadrangle in Section 23 of Township 9 south, Range 3 east.

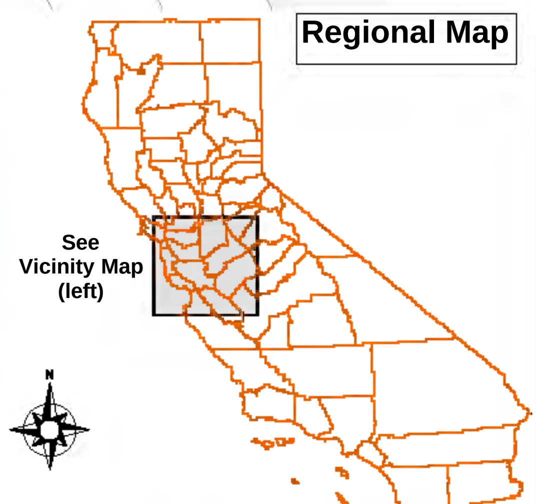
In general, the development of parcels can damage or modify biotic habitats used by sensitive plant and wildlife species. In such cases, site development may be regulated by state or federal agencies, subject to provisions of CEQA, and/or covered by local policies and ordinances. Therefore, this report addresses: 1) sensitive biotic resources potentially occurring in the project site; 2) the federal, state, and local laws regulating such resources, 3) possible significant impacts to these resources that could result from the project; and 4) mitigation measures that would reduce these impacts to a less-than-significant level as defined by CEQA.

The analysis of impacts, as discussed in Section 3.0 of this report, was based on the known and potential biotic resources of the project site discussed in Section 2.0. Sources of information used in the preparation of this analysis included: 1) the *California Natural Diversity Data Base* (RareFind 5; CDFW 2023); 2) the *California Rare Plant Rank* (CNPS 2023); 3) manuals and references related to plants and animals of the Santa Clara Valley region; 4) policies and ordinances of the City of Morgan Hill that relate to biotic resources; and 5) the Santa Clara Valley Habitat Plan (SCVHP; 2012).

A field survey of the project site was conducted on December 12, 2023, by LOA ecologist Katrina Krakow.







LIVE OAK
ASSOCIATES, INC.

Serene Hills BE

Vicinity Map

Date	Project #	Figure #
12/14/2023	**2842-01**	**1**

1.1 PROJECT DESCRIPTION

The 8.37-acre property is planned for the development of seven single-family residences. A channelized drainage ditch with outfalls and basins is also planned for this site.

2 EXISTING CONDITIONS

At the time of the field survey, the project site had been fully disked and consists mainly of California annual grassland with some trees and some swales with a well and well tank in the center of the site. The site is bounded by residential development to the southeast, sparse residential development to the northwest, and undeveloped land to the southwest and northeast. The site has a relatively flat topography with slight slopes in the northern portion of the site with elevations ranging from a low of approximately 425 feet (129 meters) National Geodetic Vertical Datum (NGVD) in the northeastern portion of the site to 373 feet NGVD (114 meters) at the junction of the site with E. Dunne Avenue.

Annual precipitation in the general vicinity of the project site is about 15-20 inches, almost 85% of which falls between the months of October and March. Virtually all precipitation falls in the form of rain.

Two soil map units occur on the site (NRCS 2023): Cropley clay, 0 to 2 percent slopes, MLRA 14 and Cropley clay, 2 to 9 percent slopes, MLRA 14. These soils are not alkaline or serpentine; therefore, special status plants adapted to alkaline and serpentine soils are not expected to occur on the site. All soils on the site are hydric. Hydric soils are soils are defined as saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions they support hydrophytic vegetation. These soils are moderately well and well drained with medium to very high runoff and slow permeability.

2.1 BIOTIC HABITATS

Two land cover types, California annual grassland, Northern Coast Scrub/Diablan Sage Scrub, Developed: (Urban-Suburban), and potential seasonal wetland are present on the Serene Hills Property. These are named consistent with nomenclature for land cover types contained in the Santa Clara Valley Habitat Plan (SCVHP) (Figure 2). These land cover types are described in greater detail below.

LEGEND

CrA CROPLEY CLAY, 0 TO 2% slopes

CrC CROPLEY CLAY, 2 TO 9% slopes

200' 0 200 feet

approximate scale

Source:
U.S. Dept. of Agriculture, Natural Resources Conservation Service

LIVE OAK ASSOCIATES, INC.

Serene Hills BE

Soils

Date	Project #	Figure #
12/14/2023	**2842-01**	**2**

2.1.1 California Annual Grassland

The majority of the site supports California annual grassland. This habitat is ruderal in nature and had been entirely disked at the time of the December 2023 site survey and is dominated by non-native plants. Vegetation in this habitat includes, but is not limited to, narrow-leaf milkweed (*Asclepias fascicularis*), wild oats (*Avena* sp.), beet (*Beta vulgaris*), black mustard (*Brassica nigra*), yellow-star thistle (*Centaurea solstitialis*), fireweed (*Chamaenerion angustifolium*), chenopod (*Chenopodium sp.*), chicory (*Cichorium intybus*), doveweed (*Croton setiger*), artichoke (*Cynara cardunculus*), bristly ox-tongue (*Helminthotheca echioides*), prickly lettuce (*Lactuca serriola*), mallow (*Malva* sp.), canary grass (*Phalaris* sp.), and English plantain (*Plantago lanceolata*). Trees onsite are mainly concentrated in the northeastern portion of the site with a few around the edges of the site and includes acacia (*Acacia* sp.), eucalyptus (*Eucalyptus* sp.), prickly pear (*Opuntia* sp.), coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), blue elderberry (*Sambucus nigra*), and fan palm (*Washingtonia* sp.). A variety of planted trees dot the end of the driveway within the California annual grassland, including, but not limited to the Peruvian pepper tree (*Schinus molle6*), fan palm, and landscaped hedges. Four swales exist on the site within the California annual grassland habitat, most of which appear to be non-wetland swales supporting plants consistent with the surrounding California annual grassland, however, see the Potential Seasonal Wetland section below for further information regarding the potential for wetland swales to occur on the site.

Wildlife observed within or flying over the site during the December 2023 survey included the turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), northern flicker (*Colaptes auratus*), killdeer (*Charadrius vociferus*), California scrub jay (*Aphelocoma californica*), American crow (*Corvus brachyrhynchos*), Bewick’s wren (*Thryomanes bewickii*), Anna’s hummingbird (*Calypte anna*), California towhee (*Melozone crissalis*), song sparrow (*Melospiza melodia*), a few California ground squirrel (*Otospermophilus beecheyi*) burrows exist in the southern corner of the site; Botta’s pocket gopher (*Thomomys bottae*) sign exists throughout the site and black-tailed jackrabbit (*Lepus californicus*) and striped skunk (*Mephitis mephitis*) diggings were also observed.

2.1.2 Northern Coast Scrub/Diablan Sage Scrub

This habitat exists in the northern portion of the site and consists of 10-12-foot-high coyote brush (*Baccharis pilularis*), with understory consistent with the adjacent California annual grassland.

2.1.3 Developed: Urban-Suburban

The site supports an older paved driveway shared with other residences past the site as well as a well and well tank in the center of the site. Two 12-inch culverts exist within approximately six feet of each other at the southwestern edge of the southern-most swale.

2.1.4 Potential Seasonal Wetland

The site supports a network of four swales. Portions of the swales support hydrophilic vegetation, which are generally mapped in Figure 3. Until a wetland delineation is completed, the full extent of these areas are undefined and a delineation will more precisely define them. "Wetland swale" is not a term used in the SCVHP, therefore, as "seasonal wetland" is the closest habitat type identified by the SCVHP, these areas are identified as potential seasonal wetlands on Figure 3. Although no blue lines exist on the site, the flow lines from the USGS are roughly consistent with the swale locations in the northern portion of the site. In the southern portion of the site, a poorly defined swale occurs roughly in the same location where historical photography shows a swale channel that historically had connectivity to the Santa Clara Conduit. Although this no longer appears to be connected, additional surveys are necessary to determine the full current extent of this swale. The vegetation within the swales is consistent with the California annual grassland habitat except for a small patch of cocklebur (*Xanthium* sp.) in one of the swales in the northern portion of the site and the presence of curly dock (*Rumex crispus*) along the southernmost swale.

2.2 MOVEMENT CORRIDORS

General Discussion- Habitat corridors are vital to terrestrial animals for connectivity between core habitat areas (i.e., larger intact habitat areas where species make their living). Connections between two or more core habitat areas help ensure that genetic diversity is maintained, thereby diminishing the probability of inbreeding depression and geographic extinctions.

The quality of habitat within the corridors is important. In general, "better" habitat has less human interference (e.g., roads, homes, etc.) and is more desirable to more species than areas with sparse vegetation and high-density roads. Movement corridors in California are typically associated with valleys, rivers and creeks supporting riparian vegetation, and ridgelines. With increasing encroachment of humans on wildlife habitats, it has become important to establish and maintain linkages, or movement corridors, for animals to be able to access locations containing different biotic resources that are essential to maintaining their life cycles.

Healthy riparian areas (supporting structural diversity, i.e., understory species to saplings to mature riparian trees) not only support a rich and diverse wildlife community but have also been shown to facilitate regional wildlife movement. Riparian areas can vary from tributaries winding through scrubland to densely vegetated riparian forests.

Site-specific Discussion- The site is located along the edge of the developed portion of the City of Morgan Hill. Although fences exist along the northeastern and southwestern edge, the majority of wildlife would be able to move freely through the site. Fences along the southeastern edge abut current residential development, so generally, wildlife would not be expected to move between the site and the residential development. There is a drainage off-site and uphill from the site which appears to support a ponded area, which may support wildlife and further wildlife movement between the site and this feature. Therefore, localized movements throughout the site are currently unimpeded.

Per the above discussion, local animals can be expected to move through the site in their ordinary day-to-day movement, and the site is not likely to support regional movement.

2.3 SPECIAL STATUS PLANTS AND ANIMALS

Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered “rare” and are vulnerable to extirpation as the state’s human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.2, state and federal laws have provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as threatened or endangered under state and federal endangered species legislation. Others have been designated as "candidates" for such listing. Still others have been designated as "species of special concern" by the CDFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered (CNPS 2001). Collectively, these plants and animals are referred to as "special status species."

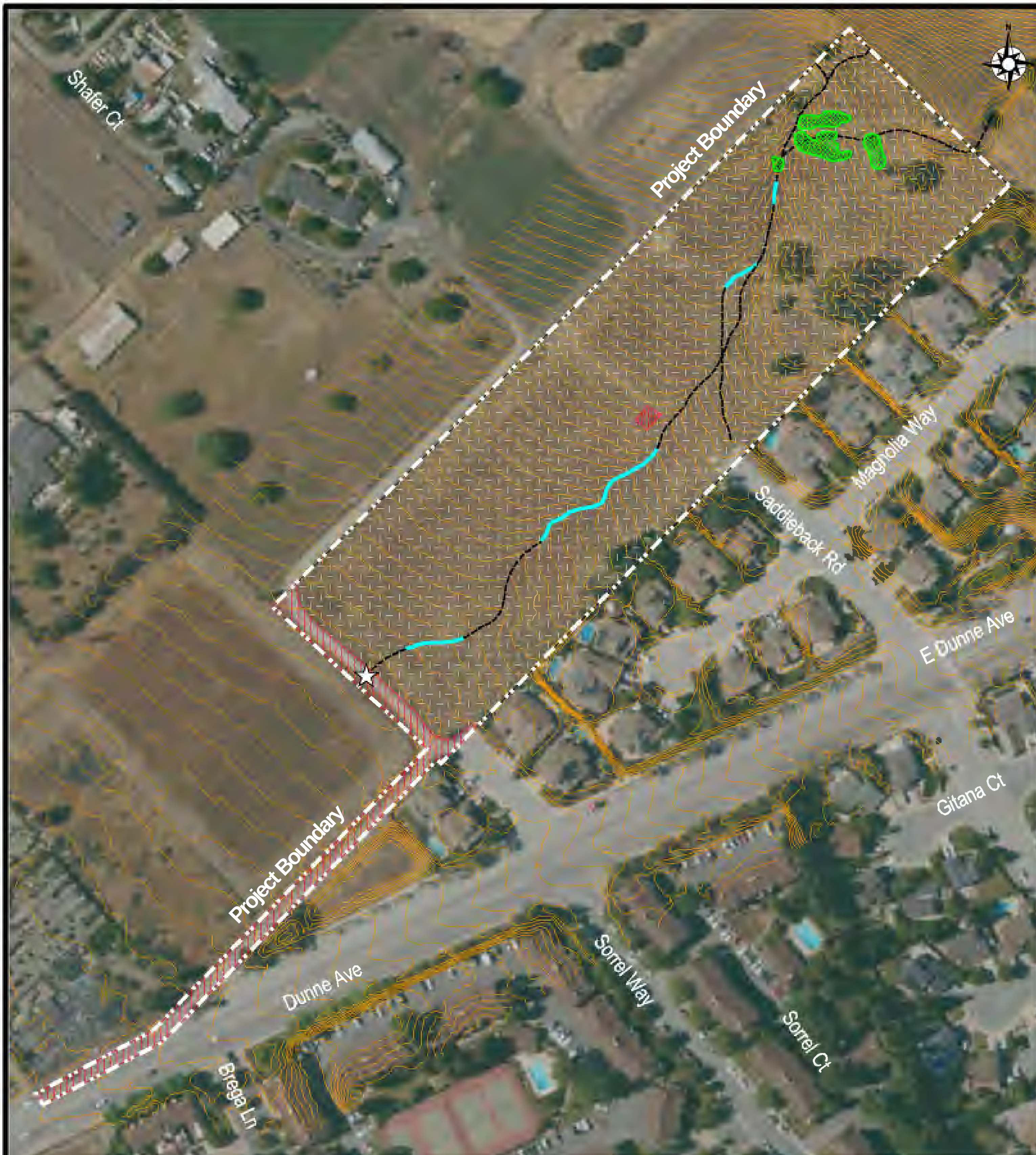
A number of special status plants and animals occur in the vicinity of the project site. These species, and their potential to occur in the project site, are listed in Table 1. Sources of information for this table included *California Natural Diversity Data Base* (CDFW 2023), *Listed Plants* and *Listed Animals* (USFWS 2023), *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2023), *The California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2023), *California Bird Species of Special Concern* (Shuford and Gardall 2008), and *California Amphibian and Reptile Species of Special Concern* (Thompson et al. 2016). This information was used to evaluate the potential for special status plant and animal species that occur on the site.

A search of published accounts for all of the relevant special status plant and animal species was conducted for the Mt. Sizer USGS 7.5-minute quadrangle in which the project site occurs, and for the eight surrounding quadrangles (Lick Observatory, Isabel Valley, Mt. Stakes, Morgan Hill, Mississippi Creek, Mt. Madonna, Gilroy, and Gilroy Hot Springs) using the CNDDB Rarefind5. All species listed as occurring in these quadrangles on CNPS Lists 1A, 1B, 2, or 4 were also reviewed (See Figure 3).

Serpentine soils are absent from the site; as such, those species that are uniquely adapted to serpentine conditions in the project's vicinity are considered absent from the site. These species include the Bay checkerspot butterfly (*Euphydryas editha bayensis*), big-scale balsamroot (*Balsamorhiza macrolepis* var*. macrolepis*), Santa Cruz Mountain pussypaws (*Calyptridium parryi* var. *hesseae*), Tiburon Indian paintbrush (*Castilleja affinis* ssp. *neglecta*), pink creamsacs (*Castilleja rubicundula ssp. rubicundula*), coyote ceanothus (*Ceanothus ferrisae*), dwarf soaproot (*Chlorogalum pomeridianum* var. *minus*), Mt. Hamilton fountain thistle (*Cirsium fontinale* var. *campylon*), San Francisco collinsia (*Collinsia multicolor*), Santa Clara Valley dudleya (*Dudleya* *abramsii ssp. setchellii*), smooth lessingia (*Lessingia micradenia* ssp. *glabrata*), woodland woollythreads (*Monolopia gracilens*), Metcalf Canyon jewel-flower (*Streptanthus albidus ssp. albidus*), and most beautiful jewel-flower (*Streptanthus albidus* ssp. *peramoenus*).

Several other special status plant species have been ruled out on the site as they occur in habitats not present in the project site (e.g., vernal pool, chaparral, broad leafed forest, coastal prairie, coastal scrub, etc.) or at elevations significantly below or above elevations of the site (approximately 114 to 129 meters NGVD). These species include the Anderson's manzanita (*Arctostaphylos andersonii*), Santa Clara red ribbons (*Clarkia concinna ssp. automixa*), Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*), Tracy's eriastrum (*Eriastrum tracyi*), Hoover's button-celery (*Eryngium aristulatum var. hooveri*), fragrant fritillary (*Fritillaria liliacea*), Loma Prieta hoita (*Hoita strobilina*), legenere (*Legenere limosa*), Mt. Hamilton coreopsis (*Leptosyne hamiltonii*), Mt. Hamilton lomatium (*Lomatium observatorium*), arcuate bush-mallow (*Malacothamnus arcuatus*), Hall's bush-mallow (*Malacothamnus hallii*), Oregon meconella (*Meconella oregana*), Santa Cruz Mountains beardtongue (*Penstemon rattanii* var. *kleei*), San Benito pentachaeta (*Pentachaeta exilis* ssp*. aeolica*), Mt. Diablo phacelia (*Phacelia phacelioides*), warty popcornflower (*Plagiobothrys verrucosus*), Chaparral harebell (*Ravenella exigua*), rock sanicle (*Sanicula saxatilis*), Mt. Hamilton jewelflower (*Streptanthus callistus*), and Santa Cruz clover (*Trifolium buckwestiorum*).

Additionally, fish are absent from the site, as streams and other waters sufficient to support fish are absent from the site. Special status plant and animal species having potential to occur on the project site or immediate vicinity because suitable habitats are present are discussed further below.



LEGEND

- California Annual Grassland
- Developed: Urban / Suburban
- Northern Coastal Scrub / Diablan Sage Scrub
- Swale
- Potential Seasonal Wetland
- Culvert

200' 0 200 feet
approximate scale

Aerial Photo courtesy of
U.S.D.A. National Agriculture Imagery Program (NAIP) 9-28-2022

LIVE OAK
ASSOCIATES, INC.

Serene Hills BE
Habitats / Land Cover

Date	Project #	Figure #
1/02/2024	**2842-01**	**3**

TABLE 1: SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

PLANTS (adapted from CDFW 2023 and CNPS 2023)

Other plant species listed by CNPS

Common and scientific names	Status	General habitat description	*Occurrence in the study area
Bent-flowered fiddleneck *Amsinckia lunaris*	CNPS 1B	Habitat: Coastal bluff scrub, cismontane woodland, and valley and foothill grasslands. Elevation: 3-500 meters. Blooms: March–June.	**Unlikely.** The site provides poor habitat for this species. The closest record for this species is more than three miles from the site as well (CDFW 2023).

TABLE 1: SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

ANIMALS (adapted from CDFW 2023 and USFWS 2023)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts

Common and scientific name	Status	General habitat description	*Occurrence in the study area
Western bumble bee *Bombus occidentalis*	CCE	In California, mainly occurring within the coastal and Sierra Nevada ranges within meadows and grasslands and some natural areas within urban environments. Indication of recent population potentially being restricted to high elevation and coastal areas. Historically occurred from the Channel Islands to the northern California border. Flight period is February to late November, peaking in late June and late September. Tends to construct nest underground in animal burrows on west and south-west facing slopes. Overwintering sites are likely in friable soils or in debris or leaf litter.	**Unlikely.** Suitable nesting sites for this species is unlikely as the entire site is regularly disked; there are only a few ground squirrel burrows onsite. While this species may rarely to occasionally forage on the site, it is unlikely to nest on the site. The closest recorded observation of this species is centered approximately 2.5 miles to the southwest of the site (CDFW 2023).

TABLE 1: SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

ANIMALS (adapted from CDFW 2023 and USFWS 2023)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts

Common and scientific name	Status	General habitat description	*Occurrence in the study area
Crotch bumble bee *Bombus crotchii*	CCE	In California, inhabits open grassland and scrub habitats of the southern 2/3 of California. Historically in, but largely extirpated from the Central Valley. Flight period for queens is late February to late October peaking in April and July; flight period for males and workers is March through September peaking in early July. Constructs nests underground in animal burrows. Overwintering sites are likely in soft soils or in debris or leaf litter.	**Unlikely.** Suitable nesting sites for this species are unlikely as the entire site is regularly disked; there are only a few ground squirrel burrows onsite. While this species may rarely to occasionally forage on the site, it is unlikely to nest on the site. The closest recorded observation of this species is centered more than 3 miles to the south of the site (CDFW 2023).
California tiger salamander (CTS) *Ambystoma californiense*	FT, CT, SCVHP Focal Species	Breeds in vernal pools and stock ponds of central California; adults aestivate in grassland habitats adjacent to the breeding sites.	**Unlikely.** Suitable breeding habitat for this species is absent from the site, and burrows are largely absent from the site due to regular disking. However, aerial imagery shows a ponded area just upslope from the site and the closest recorded observation of this species is centered approximately 1 mile to the east of the site (CDFW 2023), therefore, while possible, it is unlikely this species may occasionally move across the site.
Foothill yellow-legged frog (FYLF) *Rana boylii*	FE, CE, SCVHP Focal Species	Occurs in swiftly flowing streams and rivers with rocky substrate with open, sunny banks in forest, chaparral, and woodland habitats, and can sometimes be found in isolated pools.	**Absent.** Suitable habitat for the FYLF is absent from the site.
California Red-legged Frog (CRLF) *Rana aurora draytonii*	FT, CSC, SCVHP Focal Species	Rivers, creeks and stock ponds of the Sierra foothills and Bay Area, preferring pools with overhanging vegetation.	**Absent.** Suitable habitat for the CRLF is absent from the site.
Western pond turtle (WPT) Actinemys marmorata	CCT, SCVHP Focal Species	Intermittent and permanent waterways including streams, marshes, rivers, ponds, and lakes. Open slow-moving water of rivers and creeks of central California with rocks and logs for basking.	**Absent.** Suitable habitat for WPT is absent from the site.
Tricolored Blackbird *Agelaius tricolor*	CT, SCVHP Focal Species	Breeds near fresh water in dense emergent vegetation.	**Absent.** Suitable nesting habitat for this species is absent from the site.

TABLE 1: SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY. ANIMALS (adapted from CDFW 2023 and USFWS 2023) *Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts*			
Common and scientific name	**Status**	**General habitat description**	***Occurrence in the study area**
Least Bell's vireo (LBV) *Vireo bellii pusillus*	FE, CE, SCVHP Focal Species	Occurs in southern California and southern Santa Clara County during the breeding season March, migrates out of the state July through September. Early successional riparian vegetation including dense brush, mesquite, or cottonwood-willow forests in riparian areas.	**Absent.** Suitable nesting habitat for this species is absent for the site.
Swainson's hawk (SWHA) *Buteo swainsoni*	CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands or alfalfa fields supporting rodent populations.	**Unlikely.** The SWHA is only known in the region from one pair which breeds each year in Coyote Valley. The past several years, they have nested immediately south of Bailey Avenue north of Morgan Hill. There are no other recent records of this species in Santa Clara County.
San Joaquin kit fox *Vulpes macrotis mutica*	FE, CT	Frequents desert alkali scrub and annual grasslands and may forage in adjacent agricultural habitats. Utilizes enlarged (4 to 10 inches in diameter) ground squirrel burrows as denning habitat.	**Absent.** The site is outside of the range for San Joaquin kit fox.

TABLE 1: SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY. ANIMALS (adapted from CDFW 2023 and USFWS 2023) *Species Listed as Species of Special Concern*			
Common and scientific names	**Status**	**General habitat description**	***Occurrence in the study area**
Santa Cruz black salamander *Aneides niger*	CSC	Occurs in deciduous woodland, coniferous forests, and coastal grasslands around the Santa Cruz Mountains and foothills. This species is also known to occur on the developed flats in pockets within older developments. They can be found under rocks near streams, in talus, under damp logs, rotting wood, and other objects.	**Absent.** Suitable habitat for the Santa Cruz black salamander is absent from the project site.

TABLE 1: SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

ANIMALS (adapted from CDFW 2023 and USFWS 2023)

Species Listed as Species of Special Concern

Common and scientific names	Status	General habitat description	*Occurrence in the study area
Coast horned lizard *Phrynosoma blainvillii*	CSC	Occurs in grasslands, scrublands, oak woodlands, etc. of central California. Common in sandy washes with scattered shrubs.	**Absent.** Habitats required by coast horned lizards are absent from the site.
California glossy snake *(Arizona elegans occidentallis)*	CSC	Occurs in arid areas with grassland, scrub, chaparral, and rocky washes. This species is nocturnal and spends the day in burrows.	**Unlikely.** Suitable habitat for this species is poor on this site, as nearly the entire site has been disked and is adjacent to fully developed land.
Northern harrier *Circus cyaneus*	CSC	Frequents meadows, grasslands, open rangelands, freshwater emergent wetlands; uncommon in wooded habitats.	**Possible.** Although the nearest documented observation of this species is more than three miles from the site (CDFW 2023), the site provides suitable breeding and foraging habitat for this species.
White-tailed Kite (WTK) *Elanus leucurus*	CP	Open grasslands and agricultural areas throughout central California.	**Possible.** Although the nearest documented observation of this species is more than three miles from the site (CDFW 2023), the site provides moderately suitable breeding and foraging habitat for this species.
Golden Eagle (GE) *Aquila chrysaetos*	CP	Typically frequents rolling foothills, mountain areas, sage-juniper flats, and desert.	**Possible.** Although suitable breeding habitat for the golden eagle is absent from the site, foraging habitat exists onsite.
Burrowing Owl (BUOW) *Athene cunicularia*	CSC, SCVHP Focal Species	Found in open, dry grasslands, deserts, and ruderal areas. Requires suitable burrows. This species is often associated with California ground squirrels.	**Possible.** Moderately suitable habitat is present onsite with a few ground squirrel burrows on the site. The nearest documented occurrence of BUOW is approximately two miles from the site (CDFW 2023).
Loggerhead Shrike (LOSH) *Lanius ludovicianus*	CSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. Nests in tall shrubs and dense trees. Forages in grasslands, marshes, and ruderal habitats. Can often be found in cropland.	**Possible.** Suitable breeding and foraging habitat exist onsite.
Yellow-breasted chat (YBC) *Icteria virens*	CSC	Frequently breeds in dense shrubs and blackberry thickets and uses areas of dense vegetation during migration.	**Absent.** Dense vegetation suitable for nesting is absent from the site.

TABLE 1: SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

ANIMALS (adapted from CDFW 2023 and USFWS 2023)

Species Listed as Species of Special Concern

Common and scientific names	Status	General habitat description	*Occurrence in the study area
California Yellow Warbler *Dendroica petechia brewsteri*	CSC	Migrants move through many habitats of Sierra and its foothills. This species breeds in riparian thickets of alder, willow, and cottonwoods.	**Absent.** Suitable breeding habitat is absent from the site.
Grasshopper sparrow *Ammodramus savannarum*	CSC	Occurs in California during spring and summer in open grasslands with scattered shrubs.	**Possible.** Suitable breeding habitat is present for this species on the site.
Townsend's Big-eared bat *Corynorhinus townsendii*	CSC	Primarily a cave-dwelling bat that may also roost in buildings. Occurs in a variety of habitats.	**Possible.** Although suitable foraging habitat occurs onsite, suitable roosting habitat is absent from the site. The nearest documented occurrence of this species is more than three miles from the site (CDFW 2023).
Pallid Bat *Antrozous pallidus*	CSC	Grasslands, chaparral, woodlands, and forests; most common in dry rocky open areas providing roosting opportunities.	**Possible.** Although suitable foraging habitat occurs onsite, suitable roosting habitat is absent from the site. The nearest documented occurrence of this species is more than three miles to the south of the site (CDFW 2023).
San Francisco Dusky-Footed Woodrat *Neotoma fuscipes annectens*	CSC	Found in hardwood forests, oak riparian, and shrub habitats.	**Absent.** Woodrat nests are absent from the site, and they are not expected to move onto the site.
American Badger *Taxidea taxus*	CSC	Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soils, specifically grassland environments. Natal dens occur on slopes.	**Possible.** The site is suitable for badgers, and suitable habitat exists adjacent on three sides of the site, however, it is unlikely a badger would have a reproductive den onsite. The nearest documented occurrence of a badger is approximately two miles from the site (CDFW 2023).

*Explanation of Occurrence Designations and Status Codes
Present: Species observed on the site at time of field surveys or during recent past.
Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the site, but it could occur there from time to time.
Unlikely: Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient.
Absent: Species not observed on the site and precluded from occurring there because habitat requirements not met.

STATUS CODES

FE	Federally Endangered	CSC	California Species of Special Concern
FT	Federally Threatened	CE	California Endangered
CT	California Threatened	CR	California Rare
FPE	Federally Endangered (Proposed)	CP	California Protected
FPT	Federally Threatened (Proposed)	CCE	California Candidate Endangered
FC	Federal Candidate	CCT	California Candidate Threatened

CRPR	California Native Plant Society Listing		
1A	Plants Presumed Extinct in California	3	Plants about which we need more information – a review list
1B	Plants Rare, Threatened, or Endangered in California and elsewhere	4	Plants of limited distribution – a watch list

2 Plants Rare, Threatened, or Endangered in California, but more common elsewhere

2.4 JURISDICTIONAL WATERS

Jurisdictional waters include rivers, creeks, and drainages that have a defined bed and bank and which, at the very least, carry ephemeral flows. Jurisdictional waters also include lakes, ponds, reservoirs, and wetlands. Such waters may be subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE), CDFW, and the Regional Water Quality Control Board (RWQCB). See Section 3.2.5 of this report for additional information.

Several swales exist on the site, including one that, per historical aerial photos show a swale channel that historically had connectivity to the Santa Clara Conduit. Although this no longer appears to be connected, additional surveys are necessary to determine the full current extent of this swale to determine current connectivity. Although the site does not likely support any waters under the jurisdiction of the USACE, the CDFW and/or RWQCB may claim jurisdiction over the onsite swales. Therefore, a wetland delineation is recommended for this project site to determine extent and connectivity of swales on the site.

3 IMPACTS AND MITIGATIONS

3.1 SIGNIFICANCE CRITERIA

General plans, area plans, and specific projects are subject to the provisions of the California Environmental Quality Act. The purpose of CEQA is to assess the impacts of proposed projects on the environment before they are constructed. For example, site development may require the removal of some or all of its existing vegetation. Animals associated with this vegetation could be destroyed or displaced. Animals adapted to humans, roads, buildings, pets, etc., may replace those species formerly occurring on a site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed. These impacts may be considered significant. According to *2023 CEQA Status and Guidelines* (2023), "Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered "significant" if they will:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3.2 RELEVANT GOALS, POLICIES, AND LAWS

3.2.1 Threatened and Endangered Species

State and federal "endangered species" legislation has provided the CDFW and USFWS with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal Endangered Species Acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as "species of special status." Permits may be required from both the CDFW and USFWS if activities associated with a proposed project will result in the take of a listed species. To "take" a listed species, as defined by the state of California, is "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" said species (California Fish and Game Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" of a listed species (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFW and the USFWS are responding agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

3.2.2 Migratory Birds

State and federal laws also protect most bird species. The State of California signed Assembly Bill 454 into law in 2019, which clarifies native bird protection and increases protections where California law previously deferred to Federal law. The Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., scc. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

3.2.3 Birds of Prey

Birds of prey are protected in California under provisions of the State Fish and Game Code, Section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFW.

Additionally, the Bald and Golden Eagle Protection Act (16 U.S.C., scc. 668-668c) prohibits anyone from taking bald or golden eagles, including their parts, nests, or eggs, unless authorized under a federal permit. The act prohibits any disturbance that directly affects an eagle or an active eagle nest as well as any disturbance caused by humans around a previously used nest site during a time when eagles are not present such that it agitates or bothers an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

3.2.4 Bats

Section 2000 and 4150 of the California Fish and Game Code states that it is unlawful to take or possess a number of species, including bats, without a license or permit, as required by Section 3007. Additionally, Title 14 of the California Code of Regulations states it is unlawful to harass, herd, or drive a number of species, including bats. To harass is defined as "an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering." For these reasons, bat colonies in particular are considered to be sensitive and therefore, disturbances that cause harm to bat colonies are unlawful.

3.2.5 Wetlands and Other "Jurisdictional Waters"

Jurisdictional waters include waters of the United States subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE) and waters of the State of California subject to the regulatory authority of the California Department of Fish and Wildlife (CDFW) and the California Regional Water Quality Control Board (RWQCB).

Clean Water Act, Section 404. The USACE regulates the filling or grading of Waters of the U.S. under the authority of Section 404 of the Clean Water Act. Drainage channels and adjacent wetlands may be considered “waters of the United States” or “jurisdictional waters” subject to the jurisdiction of the USACE. The extent of jurisdiction has been defined in the Code of Federal Regulations and clarified in federal courts.

The definition of waters of the U.S. have changed several times in recent years. In January 2020, the Environmental Protection Agency (EPA) and USACE jointly issued the Navigable Waters Protection Rule. The new rule was published in the Federal Register on April 21, 2020 and became effective on June 22, 2020.

The Navigable Waters Protection Rule (33 CFR §328.3(a)) defines waters of the U.S. as:

Territorial Seas and Traditional Navigable Waters (TNWs)

- The territorial seas and traditional navigable waters include large rivers and lakes and tidally influenced waterbodies used in interstate or foreign commerce.

Tributaries

- Tributaries include perennial and intermittent rivers and streams that contribute surface flow to traditional navigable waters in a typical year. These naturally occurring surface water channels must flow more often than just after a single precipitation event—that is, tributaries must be perennial or intermittent.
    - Tributaries can connect to a traditional navigable water or territorial sea in a typical year either directly or through other “waters of the United States,” through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).
    - Ditches are to be considered tributaries only where they satisfy the flow conditions of the perennial and intermittent tributary definition, and either were constructed in or relocate a tributary or were constructed in an adjacent wetland and contribute perennial or intermittent flow to a traditional navigable water in a typical year.

Lakes, Ponds, and Impoundments of Jurisdictional Waters

- Lakes, ponds, and impoundments of jurisdictional waters are jurisdictional where they contribute surface water flow to a traditional navigable water or territorial sea in a typical year either directly or through other waters of the United States, through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).
- Lakes, ponds, and impoundments of jurisdictional waters are also jurisdictional where they are flooded by a water of the United States in a typical year, such as certain oxbow lakes that lie along the Mississippi River.

Adjacent Wetlands

- Wetlands that physically touch other jurisdictional waters are "adjacent wetlands."
- Wetlands separated from a water of the United States by only a natural berm, bank or dune are also "adjacent."
- Wetlands inundated by flooding from a water of the United States in a typical year are "adjacent."
- Wetlands that are physically separated from a jurisdictional water by an artificial dike, barrier, or similar artificial structure are "adjacent" so long as that structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature.
- An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

The Navigable Waters Protection Rule also outlines what do not constitute waters of the United States. The following waters/features are not jurisdictional under the rule:

- Waterbodies that are not included in the four categories of waters of the United States listed above.
- Groundwater, including groundwater drained through subsurface drainage systems, such as drains in agricultural lands.
- Ephemeral features, including ephemeral streams, swales, gullies, rills, and pools.
- Diffuse stormwater run-off and directional sheet flow over upland.
- Many farm and roadside ditches.
- Prior converted cropland retains its longstanding exclusion but is defined for the first time in the final rule. The agencies are clarifying that this exclusion will cease to apply when cropland is abandoned (i.e., not used for, or in support of, agricultural purposes in the immediately preceding five years) and has reverted to wetlands.
- Artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease.
- Artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters.
- Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel.
- Stormwater control features excavated or constructed in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off.
- Groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention and infiltration basins and ponds, that are constructed in upland or in non-jurisdictional waters.

- Waste treatment systems have been excluded from the definition of waters of the United States since 1979 and will continue to be excluded under the final rule. Waste treatment systems include all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater or stormwater prior to discharge (or eliminating any such discharge).

All activities that involve the discharge of dredge or fill material into waters of the U.S. are subject to the permit requirements of the USACE under Section 404 of the Clean Water Act. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued without a CWA Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards (Section 3.6.2).

- *Porter-Cologne Water Quality Act/Clean Water Act, Section 401*. There are nine Regional Water Quality Control Boards statewide; collectively, they oversee regional and local water quality in California. The RWQCB administers Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. The RWQCB for a given region regulates discharges of fill or pollutants into waters of the State through the issuance of various permits and orders.

Pursuant to Section 401 of the Clean Water Act, the RWQCB regulates waters of the State that are also waters of the U.S. Discharges into such waters require a Section 401 Water Quality Certification from the RWQCB as a condition to obtaining certain federal permits, such as a Clean Water Act Section 404 permit (Section 3.6.1). Discharges into all Waters of the State, even those that are not also Waters of the U.S., require Waste Discharge Requirements (WDRs), or a waiver of WDRs, from the RWQCB.

The Porter-Cologne Water Quality Control Act, Water Code Section 13260, requires that "any person discharging waste, or proposing to discharge waste, within any region that could affect the 'waters of the State' to file a report of discharge" with the RWQCB. Waters of the State as defined in the Porter-Cologne Act (Water Code Section 13050[e]) are "any surface water or groundwater, including saline waters, within the boundaries of the state." This gives the RWQCB authority to regulate a broader set of waters than the Clean Water Act alone; specifically, in addition to regulating waters of the U.S. through the Section 401 Water Quality Certification process, the RWQCB also claims jurisdiction and exercises discretionary authority over "isolated waters," or waters that are not themselves waters of the U.S. and are not hydrologically connected to waters of the U.S.

The RWQCB also administers the Construction Stormwater Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one or more acres of soil must obtain a Construction General Permit under the Construction Stormwater Program. A prerequisite for this permit is the development of a Stormwater Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, stormwater, or other pollutants into a Water of the U.S. may require a NPDES permit.

- *California Department of Fish and Game Code, Section 1602*. The CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a Notification of Lake or Streambed Alteration. If the CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

3.2.6 City Tree Ordinance

The City of Morgan Hill has a Tree Ordinance (Section 12.32 of the Municipal Code), which regulates the removal of trees. The City's Tree Ordinance requires a permit to remove Community, Ordinance-Sized, and Indigenous Trees and includes the following definitions:

"Community of trees" means a group of trees of any size which are ecologically or aesthetically related to each other such that loss of several of them would cause a significant ecological, aesthetic, or environmental impact in the immediate area.

"Ordinance Sized Tree" means any live woody plant rising above the ground with a single stem or trunk of a circumference of forty inches or more for nonindigenous species and eighteen inches or more for indigenous species measured at four and one-half feet vertically above the ground or immediately below the lowest branch, whichever is lower, and having the inherent capacity of naturally producing one main axis continuing to grow more vigorously than the lateral axes. All commercial tree farms, nonindigenous tree species in residential zones and orchards (including individual fruit trees) are exempted from the definition of tree for the purpose of this chapter.

"Street Tree" is a tree, of any size, situated within the public street right-of-way or publicly accessible private street (e.g., trees within a landscape park strip), or within five feet of a publicly accessible sidewalk adjacent to a public or private street in the case of a street without a landscape park strip.

"Indigenous tree" means any tree which is native to the Morgan Hill region. Such trees include oaks (all types), California Bays, Madrones, Sycamore, and Alder.

“Any person desiring to cut down, remove, destroy, or cause to be removed any tree regulated in this chapter shall apply to the community development department for a tree cutting permit on forms provided by the department. The application shall be accompanied by such drawings, written material, photographs, and other information as are necessary to provide necessary data concerning trees within the affected area and which shall include:

A. The diameter and height of the tree;

B. The type of trees (e.g. coniferous, evergreen hardwood and deciduous hardwood);

C. A map or accurate sketch of location and trees proposed to be cut (showing other significant trees, shrubs, buildings or proposed buildings; photographs may be used to show the area);

D. Method for marking the tree proposed to be cut down, removed, or destroyed;

E. Description of method to be used in removing the tree;

F. Description of tree planting or replacement program;

G. Reasons for proposing removal of the tree;

H. Address where tree is located;

I. General health of tree to be cut down or removed; and

J. Other pertinent information which the community development director may require.”

3.2.7 Santa Clara Valley Habitat Plan

Six local partners (i.e., County of Santa Clara, Santa Clara Valley Transportation Authority; Santa Clara Valley Water District; and the Cities of San Jose, Gilroy, and Morgan Hill) and two wildlife agencies (CDFW and USFWS) prepared and adopted this multi-species habitat conservation plan, which primarily covers southern Santa Clara County, as well as the City of San Jose except for the bayland areas. The SCVHP addresses listed species and species that are likely to become listed during the plan's 50-year permit term. The eighteen covered species include nine plants and nine animals. The animal species covered include, but are not limited to, the California tiger salamander, California red-legged frog, western pond turtle, and western burrowing owl. The SCVHP requires that the agencies comment on reportable interim projects and recommend mitigation measures or project alternatives that would help achieve the preliminary conservation objectives and not preclude important conservation planning options or connectivity between areas of high habitat value. Funding sources for the SCVHP include development fees based on land cover types (natural, agricultural, or small vacant sites surrounded by urban development). Additional fees are charged based on the occurrence of certain sensitive habitat types such as serpentine and wetlands.

The project is considered a covered project under the SCVHP. As a result, the project would be subject to conditions and fees of the SCVHP.

3.2.7.1 SCVHP Fees

Chapter 9 of the SCVHP identifies fees that would be required by this project. Fees are calculated at the time the project submits the SCVHP application, which corresponds to application timing of grading and/or building permits. Temporary impact fees, such as for leach fields and utility trenching, are assessed at a fraction of these fees.

3.2.7.2 Conditions on Covered Activities

The SCVHP provides several conditions for covered activities under the SCVHP. These conditions can be found in Chapter 6 of the SCVHP and are summarized below.

- **Condition 1 (page 6-7). Avoid Direct Impacts on Legally Protected Plant and Wildlife Species-** Condition 1 instructs developers to avoid direct impacts on legally protected plant and wildlife species, including federally endangered Contra Costa goldfields and fully protected wildlife species including the golden eagle, bald eagle, American peregrine falcon, southern bald eagle, white-tailed kite, California condor, and ring-tailed cat. Several of these species are likely to occur on or forage over the site (golden eagle, white-tailed kite, and ringtail). Condition 1 also protects bird species and their nests that are protected under the Migratory Bird Treaty Act (MBTA); additionally, golden eagles and bald eagles are protected under the Bald and Golden Eagle Protection Act. Additionally, page 6-94 and Table 6-8 identify required surveys for breeding habitat of select covered wildlife species.
- **Condition 2 (page 6-9). Incorporate Urban-Reserve System Interface Design Requirements-** Condition 2 provides design requirements for the urban-reserve system interface. Some of the design requirements included in Condition 2 are installing non-permeable fences between urban and reserve areas, fencing public roads that run adjacent to reserve areas, minimizing the length of shared boundaries between urban and reserve areas, outdoor lighting limitations, and landscaping requirements.
- **Condition 3 (page 6-12). Maintain Hydrologic Conditions and Protect Water Quality- (Condition applies to project)-** Condition 3 applies to all projects due to the fact that implementation of projects could result in impacts on watershed health, including impacts to aquatic habitat for species, through changes in hydrology and water quality. This condition

incorporates all of the most important measures for water quality protection of the National Pollutant Discharge Elimination System (NPDES) Program of the Clean Water Act. Required measures of Condition 3 are located in Table 6-2 of the SCVHP; these measures relate to water quality and habitat protection during and after project construction. They include measures typically included in a SWPPP but may include measures that are in addition to such plans.

- **Condition 4 (page 6-14). Avoidance and Minimization for In-Stream Projects-** Condition 4 minimizes impacts on riparian and aquatic habitat through appropriate design requirements and construction practices and provides avoidance and minimization measures for in-stream projects that may impact stream morphology, aquatic and riparian habitat, flow conditions, covered species, natural communities, and wildlife movement.
- **Condition 5 (page 6-18). Avoidance and Minimization Measures for In-Stream Operations and Maintenance-** Condition 5 provides avoidance and minimization measures for in-stream operations and maintenance activities, which includes, but is not limited to trail, bridge, road, and culvert maintenance, bank stabilization, removal of debris, and vegetation management.
- **Condition 6 (Page 6-21). Design and Construction Requirements for Covered Transportation Projects-** Condition 6 provides requirements for rural development design, construction, and post-construction. Types of projects covered by Condition 6 include highway projects, mass transit projects, roadway projects and interchange upgrades, road safety and operational improvements, and dirt road construction.
- **Condition 7 (page 6-28). Rural Development Design and Construction Requirements-** Condition 7 provides requirements for development design and construction of new development outside of the urban service area including requirements relating to site hydrology, vineyards, private rural roads, vegetation management, soils, and lighting.
- **Condition 8 (page 6-35). Implement Avoidance and Minimization Measures for Rural Road Maintenance-** Condition 8 provides requirements for rural roads, road median, and barrier maintenance including requirements regarding riparian setbacks, erosion measures, herbicide and pesticide use, seasonal restrictions, mower cleaning, revegetation, ground-disturbing road maintenance, and flow lines.

- **Condition 9 (page 6-37). Prepare and Implement a Recreation Plan-** Condition 9 requires providing public access to all reserve lands owned by a public entity; each reserve land must provide a recreation plan.
- **Condition 10 (page 6-42). Fuel Buffer-** Condition 10 provides requirements for fuel buffers between 30 and 100 feet of structures. Requirements include measures relating to fuel buffers near structures and on reserve lands; the most notable measure is the requirement for nesting bird surveys prior to any fuel buffer maintenance during the nesting season.
- **Condition 11 (page 6-44). Stream and Riparian Setbacks-** Condition 11 provides requirements for stream and riparian setbacks; as the development area is outside the Urban Service Area, stream setbacks measured from the top of the stream bank should be 35 to 200 feet depending on the category rating of the stream and the slope class. Setbacks for Category 1 streams with 0-30% slopes should be at least 150 feet, and with >30% slopes should be at least 200 feet. The setback would be more if the edge-of-riparian line plus 35 feet is greater than the stream setback. Category 2 streams should have a setback of 35 feet.
- **Condition 12 (page 6-56). Wetland and Pond Avoidance and Minimization-** Condition 12 provides measures to protect wetlands and ponds, including planning actions, design, and construction actions.
- **Condition 13 (page 6-58). Serpentine and Associated Covered Species Avoidance and Minimization-** Condition 13 requires surveys for special status plants and the Bay checkerspot butterfly as well as its larval host plant in areas that support serpentine bunchgrass grassland, serpentine rock outcrops, serpentine seeps, and serpentine chaparral. Fees apply for impacts to serpentine habitat.
- **Condition 14 (page 6-60). Valley Oak and Blue Oak Woodland Avoidance and Minimization-** Condition 14 provides requirements for project planning and project construction, including avoidance of large oaks, guidance on irrigation near oak trees, and a buffer around the root protection zone, roads, and pathways within 25 feet of the dripline of an oak tree, trenching, and pruning activities.
- **Condition 15 (page 6-62). Western Burrowing Owl-** Condition 15 requires preconstruction surveys for burrowing owls in appropriate habitat prior to construction activities, provides

avoidance measures for owls and nests in the breeding season and owls in the non-breeding season, and requirements for construction monitoring.

- **Condition 16 (page 6-68) Least Bell's Vireo-** Condition 16 requires preconstruction surveys in appropriate habitat for the least Bell's vireo prior to construction activities and provides avoidance and construction monitoring measures.
- **Condition 17 (page 6-69) Tricolored Blackbird-** Condition 17 requires preconstruction surveys in appropriate habitat for the tricolored blackbird prior to construction activities and provides avoidance and construction monitoring measures.
- **Condition 18 (page 6-71) San Joaquin Kit Fox-** Condition 18 requires preconstruction surveys in appropriate habitat for the San Joaquin kit fox prior to construction activities and provides avoidance and construction monitoring measures.
- **Condition 19 (page 6-74). Plant Salvage when Impacts are Unavoidable-** Condition 19 provides salvage guidance and requirements for covered plants.

Condition 20 (page 6-76). Avoid and Minimize Impacts to Covered Plant Occurrences- Condition 20 provides requirements for preconstruction surveys for appropriate covered plants (per habitat).

3.3 IMPACTS SPECIFIC TO THE PROJECT

The approximately 8.37-acre property is planned for the development of a low-density residential neighborhood consisting of seven single-family residences. As discussed above, activities resulting in impacts to biotic resources may be regulated by local, state, and federal laws. The natural resource issues specific to this project are discussed in detail below.

3.3.1 Potential Project Impacts to Special Status Plants

Potential Impact. The grassland habitat of the site does not provide habitat for special status plants due to on-going and long-term disturbance and disking. In addition, special status plant species known to occur, or to once have occurred, in the project region are considered absent from the site due to an absence of potential habitat for these species (i.e. an absence of serpentine soils, vernal pools, chaparral, and/or because the site is substantially below the elevations at which these species occur, etc.). As such, the project as proposed is expected to have no impact on special status plants.

Mitigation. None warranted.

3.3.2 Loss of Habitat for Special Status Animals

Potential Impact. Twenty-five special status animal species occur, or once occurred, regionally (see Table 1). Of these, 16 species would be absent or unlikely to occur on the site due to a lack of suitable habitat for these species. The species that would be absent or unlikely to occur include the western bumble bee, Crotch bumble bee, California tiger salamander, foothill yellow-legged frog, California red-legged frog, Santa Cruz black salamander, coast horned lizard, California glossy snake, western pond turtle, Swainson's hawk, yellow-breasted chat, California yellow warbler, least Bell's vireo, tricolored blackbird, San Francisco dusky-footed woodrat, and San Joaquin kit fox.

The remaining nine special status animal species from Table 1 potentially occur more frequently as potential foragers or transients, may be resident to the site, or may occur within areas adjacent to the site. These include northern harrier, white-tailed kite, golden eagle, burrowing owl, loggerhead shrike, grasshopper sparrow, Townsend's big-eared bat, pallid bat, and American badger.

Suitable roosting habitat was not observed during the December 2023 survey. Although roosting habitat is not available onsite for the Townsend's big-eared bat and pallid bat, these species are expected to forage within the site from time to time.

The loss of grassland habitat, which does not contain regionally important habitat for northern harrier, white-tailed kite, golden eagle, burrowing owl, loggerhead shrike, grasshopper sparrow, Townsend's big-eared bat, pallid bat, and American badger, will not result in a significant loss of habitat for the species listed in Table 1.

The project does have the potential to result in an impact to individuals such as construction-related injury or mortality of nesting migratory birds and raptors, northern harrier, white-tailed kite, golden eagle, burrowing owl, loggerhead shrike, grasshopper sparrow, Townsend's big-eared bat, pallid bat, and American badger, as discussed below in Sections 3.3.5 through 3.3.7.

Mitigation. No mitigation warranted for loss of habitat for special status animal species.

3.3.3 Loss of Habitat for Native Wildlife

Potential Impact. The habitats of the site comprise only a small portion of the regionally available habitat for plant and animal species that are expected to use the habitat. The proposed project would result in the loss of California annual grassland habitat. This is not expected to result in a significant loss of habitat for local wildlife. Therefore, impacts due to the loss of habitats for native wildlife resulting from the proposed project are considered less-than-significant.

Mitigation. No mitigation would be warranted for the loss of habitat for native wildlife.

3.3.4 Interference with the Movement of Native Wildlife

Potential Impact. The site does is not within a regional movement corridor or landscape linkage, therefore, native wildlife that currently move across the site are expected to continue to move across the site after the site is built out.

Mitigation. No mitigation would be warranted for the loss of a wildlife movement corridor.

3.3.5 Impacts to Nesting Migratory Birds Including Northern Harrier, White-tailed Kite, Golden Eagle, Loggerhead Shrike, Grasshopper Sparrow, and other Nesting Raptors and Protected Birds

Potential Impacts. Trees, shrubs, and grassland habitat of the project site may support nesting birds and raptors. Buildout of the project during the nesting period for migratory birds (i.e., typically between February 1 to August 31), including initial site grading, soil excavation, and/or tree and vegetation removal, poses a risk of nest abandonment and death of any live eggs or young that may be present in nests within or near the site. Such an effect would be considered a significant impact. To ensure that any active nests will not be disturbed, and individual birds will not be harmed by construction activities, the following measures should be followed.

Mitigation. The following measures will ensure active migratory bird and raptor nests will not be disturbed, and individual birds will not be harmed by construction activities and will reduce the project's potential impacts to nesting migratory birds to a less-than-significant level.

Mitigation Measure 3.3.5a. If initial site disturbance activities, including, tree, shrub, or vegetation removal, are to occur during the breeding season (typically February 1 to August 31), a qualified biologist would conduct pre-construction surveys for nesting migratory birds and raptors. The survey for nesting migratory birds would cover the project site itself, and the survey for nesting raptors would encompass the site and surrounding lands within 250 feet, where accessible. The survey should occur within 7 days prior to the onset of ground disturbance. If a nesting migratory bird were to be detected, an appropriate construction-free buffer would be established. Actual size of buffer, which would be determined by the project biologist, would depend on species, topography, and type of activity that would occur in the vicinity of the nest. The project buffer would be monitored periodically by the project biologist to ensure compliance. After the nesting is completed, as determined by the biologist, the buffer would no longer be required.

3.3.6 Impacts to Western Burrowing Owls

Potential Impacts. The site is outside of the burrowing owl fee area for the SCVHP; however, the site provides overwintering habitat for burrowing owls in the form of some California ground squirrel burrows on the southern edge of the site and foraging habitat, and suitable habitat for this species is also present in adjacent fields. As burrowing owls are protected under Condition 1 of the SCVHP, following measures within Condition 15 of the SCVHP is required, and the project shall conduct pre-construction surveys in accordance with the Condition 15 of the SCVHP. Measures to ensure compliance with this condition are included below as Mitigation Measure 3.3.6.

Should site demolition or grading occur during the nesting season for this species (February 1 through August 31), nests and nestlings that may be present would likely be destroyed. Overwintering burrowing owls may also be buried in their roost burrows outside of the nesting season (September 1 through January 31). Any actions related to site development that result in the mortality of burrowing owls would constitute a violation of the federal Migratory Bird Treaty Act and provisions of the California Fish and Game Code. Therefore, the mortality of burrowing owls would constitute a significant impact under CEQA.

Mitigation. The following measures will ensure that burrowing owls will not be harmed by construction activities. Implementation of the following measures will reduce the project's potential impacts to burrowing owls to a less-than-significant level under CEQA and will ensure compliance with the SCVHP and state and federal laws.

Mitigation Measure 3.3.6a: Preconstruction surveys are required to ascertain whether or not burrowing owls occupy burrows on or adjacent to the site. These surveys consist of a minimum of two surveys, with the first survey no more than 14 days prior to initial construction activities (i.e. vegetation removal, grading, excavation, etc.) and the second survey conducted no more than 2 days prior to initial construction activities. If no burrowing owls or fresh sign of burrowing owls are observed during pre-construction surveys, construction may proceed. If burrowing owls or their recent sign are observed during these surveys, occupied burrows will be identified by the monitoring biologist and appropriate buffers, as described below, will be established.

- A 250-foot non-disturbance buffer will be established around all active burrowing owl burrows or nest sites as identified and defined by a qualified biologist. If the biologist determines that a nest is vacant, the non-disturbance buffer zone around that nest may be removed. The SCVHP specifies that a vacation from the site for a week or more by a burrowing owl, as determined by a qualified biologist, would constitute a voluntary relocation by the owl, and the qualified biologist could then take measures to collapse suitable burrows of the site to discourage reoccupation. The biologist will supervise hand excavation of the burrow to prevent reoccupation only after receiving approval from the wildlife agencies (SCVHP, Chapter 6, Condition 15).
    - For permission to encroach within 250 feet of such burrows during the nesting season (February 1 through August 31), an Avoidance, Minimization, and Monitoring Plan would need to be prepared and approved by the Implementing

Entity and the Wildlife Agencies prior to such encroachment (review Chapter 6, pp. 6-64 & 6-65 of the SCVHP for further detail).

- Should a burrowing owl be located onsite in the non-breeding season (September through January), construction activities would not be allowed within this 250-foot buffer of the active burrow(s) used by any burrowing owl unless the following avoidance measures are adhered to:
    - A qualified biologist monitors the owls for at least 3 days prior to construction to determine baseline foraging behavior (i.e., behavior without construction).
    - The same qualified biologist monitors the owls during construction and finds no change in owl foraging behavior in response to construction activities.
    - If there is any change in owl nesting and foraging behavior as a result of construction activities, these activities will cease within the 250-foot buffer.
    - If the owls are gone for at least one week, the project proponent may request approval from the Implementing Entity that a qualified biologist excavate usable burrows to prevent owls from reoccupying the site. After all usable burrows are excavated, the buffer zone will be removed, and construction may continue.

Mitigation Measure 3.3.6b: The SCVHP stipulates that passive relocation or exclusion of burrowing owls would not be allowed until a positive regional growth trend is achieved as defined in Section 5.4.6 of the SCVHP; however, a project may qualify for an exception to this prohibition. Permission to engage in passive relocation during the non-breeding season would need to be requested through the standard application process (Section 6.8 of the SCVHP). Application for an exception would require additional information including a relocation plan/schedule and documentation by a qualified biologist that owls have occupied the site for the full year without vacating the site for 10 or more consecutive days. The application would need to be submitted to the Implementing Entity, and the Wildlife Agencies would then evaluate the application and make a determination for granting the exception. If passive relocation is granted, additional measures may be required by the Implementing Entity.

3.3.7 Impacts to American Badgers

Potential Impacts. American badgers, a California Species of Special Concern, are known to occur in the hills east of the site with the closest recorded observation being approximately 2 miles to the west of the site along Highway 101. Therefore, American badgers may occur within the Project Site. No badgers or badger burrows were observed in the area during the survey of the Project Site; however, the project is adjacent to contiguous badger habitat, therefore, the project has the potential to result in a significant impact to American badgers.

Mitigations. Implementation of the following measures prior to the construction of the project will reduce impacts to American badgers from direct mortality to a less-than-significant level.

Mitigation Measure 3.3.5a (Pre-construction Surveys). During the course of the preconstruction surveys for other species, a qualified biologist shall also determine the presence or absence of badgers prior to the start of construction. If badgers are found to be absent, a report shall be written to the applicant so stating and no other mitigations for the protection of badgers shall be warranted.

Mitigation Measure 3.3.5b (Avoidance and Monitoring). If an active badger den is identified during pre-construction surveys within or immediately adjacent to an area subject to construction, a construction-free buffer of up to 300 feet shall be established around the den. Once the biologist has determined that badger has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the burrow be determined to be a natal or reproductive den, and because badgers are known to use multiple burrows in a breeding burrow complex, a biological monitor shall be present onsite during construction activities in the vicinity of the burrows to ensure the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor will be required to be present until it is determined that young are of an independent age and construction activities would not harm individual badgers.

Implementation of the above measures would reduce potential impacts to the American badger to a less-than-significant level.

3.3.8 Potential Impacts to Riparian Habitat and Other Sensitive Natural Communities, Including Federally and State Protected Wetlands

Potential Impacts. Riparian habitat does not exist onsite. Several swales exist on the site, including one that, per historical aerial photos show a swale channel that historically had connectivity to the Santa Clara Conduit. Although this no longer appears to be connected, additional surveys are necessary to determine the full current extent of this swale to determine current connectivity. The project plans to alter this swale as well as others onsite, including rip rap and outfalls, and will likely channelize some swales onsite. Although the site does not likely support any waters under the jurisdiction of the USACE, the CDFW and/or RWQCB may claim jurisdiction over the onsite swales. Therefore, a wetland delineation is recommended for this project site to determine extent and connectivity of swales on the site.

Mitigation. The following mitigation measures when implemented would reduce potentially significant impacts to riparian habitat, and to waters of the U.S. and state to a less than significant level.

Wetland Delineation. A formal wetland delineation should be conducted on the site to ascertain whether any waters of the U.S. or state occur on site; the Definition Report should be submitted to the USACE for verification to determine the extent of all hydrological features as it relates to Waters of the U.S. This report will also provide a foundation to determine if waters of the state occur onsite and whether CDFW and/or RWQCB have jurisdiction over any of these areas. Once the extent of waters of the U.S. and state are known, it can be determined whether and to what extent any of these features will be impacted.

If waters of the U.S. and/or state are to be impacted this would constitute a significant adverse impact. The following mitigations if fully implemented would reduce the impact to a less than significant impact.

Avoidance. The project as designed, does not avoid impacts to swales and until a delineation if completed and verified, it is not possible to evaluate the ability of the project to avoid these sensitive resources. Nonetheless, the preferred method of mitigation would be avoidance of all waters of the U.S. and. Avoiding impacts to any jurisdictional wetland swales may include re-designing the project to avoid the wetlands to the extent possible. If a redesign is not feasible, then the following mitigations would need to be implemented to reduce impacts to a less than significant level.

Minimization. If full avoidance of wetland swale habitat is not possible under the currently proposed project, actions should be taken to minimize impacts to these habitats. Measures taken during construction activities should include placing construction fencing around any preserved wetland features to ensure that construction activities do not inadvertently impact these areas.

Compensation. To compensate for the permanent loss of any wetland swale habitat, there are three options: 1) Credits via an approved mitigation bank; 2) On- or off-site creation/restoration with accompanying mitigation and monitoring plan; and 3) Payment of Seasonal Wetland Fees to the SCVHP. The USACE and CDFW are participants in the SCVHP; although the Habitat Agency (with the SCVHP) is currently in talks with the RWQCB, the RWQCB is currently not a participant in the SCVHP. Therefore, it is likely mitigation for any impacts to wetland swales onsite will include either #1 and #3 or #2 and #3 above, as mitigation per the RWQCB would likely be a separate mitigation consisting of on- or off-site restoration with an appropriate Habitat Monitoring Plan or payment for mitigation credits to a mitigation bank (#1 or #2 below). The RWQCB may also require a Waste Discharge Permit under the Porter-Cologne Water Quality Act. Should the RWQCB become a participant in the SCVHP, it is possible only #3 would be required. These mitigations are outlined below.

1. Several mitigation banks exist for wetlands and payment for wetland credits at an approved mitigation bank would be a minimum of 1:1 creation:loss ratio. This option does not require the applicant to conduct follow-up monitoring once fees are paid.

2. If on- or off-site mitigation is preferred, a mitigation and monitoring plan (MMP) will be prepared. The plan should identify on-site and/or off-site preserve areas having a sufficient water budget (as determined by a hydrologist) for the creation of wetland habitat that is of equal or greater quality to the habitats being impacted at a minimum 1:1 creation:loss ratio. Any off-site creation would preferably occur within the same watershed.

At a minimum, the MMP will:

- Define the location of all created wetlands;

- Provide evidence of a suitable water budget to support any created wetland and channel habitats, as determined by a qualified hydrologist;

- Identify the species, size, number and location of plants to be installed;

- Identify the time of year for planting and any methods for supplemental watering during the establishment period;

- Identify the monitoring period which should be no less than 5 years;

- Identify measures that will be monitored, and define incremental and final success criteria that will be required for the wetland mitigation to be deemed a success;

- Identify adaptive management procedures that accommodate the uncertainty that comes with wetland creation projects. These include (but are not limited to) measures to address colonization by invasive species, unexpected lack of water, excessive foraging of installed wetland plants by wildlife, erosion of channel banks, etc.;

- Define management and maintenance activities (weeding, repair of water delivery systems and browsing protection, etc.); and

- Provide for surety in funding for MMP and for in-perpetuity preservation and management of created wetland and channel habitats.

3. Wetland swales would be mitigated for under the SCVHP (see Section 3.3.12 below) which would consist of a fee for "seasonal wetlands" of ($503,724 per acre; 2023-2024 rates) as well as to follow measures in Condition 12 of the SCVHP.

3.3.9 Degradation of Water Quality in Seasonal Drainages, Stock Ponds and Downstream Waters

Potential Impact. Eventual site development and construction may require grading that leaves the soil of construction zones barren of vegetation and, therefore, vulnerable to sheet, rill, or gully erosion. Eroded soil is generally carried as sediment in surface runoff to be deposited in natural creek beds, canals, and adjacent wetlands. Furthermore, urban runoff is often polluted with grease, oil, pesticide and herbicide residues, heavy metals, etc. These pollutants may eventually be carried to sensitive wetland habitats used by a diversity of native wildlife species. The deposition of pollutants and sediments in sensitive riparian and wetland habitats would be considered a potentially significant adverse environmental impact. The project would comply with the City's grading requirements. Therefore, the project buildout would result in a less-than-significant impact to water quality.

Mitigation. No mitigation is warranted.

3.3.10 Conflict with Local Policies and Ordinances: City of Morgan Hill Tree Ordinance

Potential Impacts. The site likely supports trees protected under the City of Morgan Hill's Tree Ordinance. Therefore, a tree inventory and Arborist report should be conducted to identify any protected trees onsite. The Arborist report will determine how many ordinance-sized and indigenous trees exist onsite. Onsite trees could be directly impacted in the form of removal, while off-site trees could be severely impacted in the form of root damage during grading efforts. The loss of ordinance-sized trees without further compliance with the City's tree policies would constitute a significant adverse impact of the project.

Mitigation. Ordinance-sized trees will require mitigation for removal and the permittee shall follow the City's tree ordinance requirements.

3.3.11 Conflict with Local Policies and Ordinances: Santa Clara Valley Habitat Conservation Plan

Proposed development of the approximately 8.37-acre site would be considered a covered project under the SCVHP and, as such, would be subject to conditions and fees of the SCVHP. Failure to comply with the SCVHP would constitute a significant impact under CEQA.

3.3.11.1 Fees

Compliance with the SCVHP includes payment of fees according to the "Fee Zone" designation of the property, payment of nitrogen deposition fees related to the number of residential units and/or anticipated car trips (for non-residential projects) resulting from the development, and any surcharge fees that are required based on site-specific impacts to sensitive habitats or sensitive species. The onsite portion of the proposed project would be subject to Zone B fees, which are currently $17,698 per acre seasonal wetland ($503,724 per acre) fees, nitrogen deposition fees, which are currently $6.33 for each new vehicle trip and $59.86 per each new single-family residence (2023-2024 rates). For any temporary impacts, all the same fees are applied, but at a fraction of the total cost depending on how long the project expects the temporary impact to last.

3.3.11.2 Conditions on Covered Activities

In addition to fees, the project would be required to comply with applicable conditions of the SCVHP. Conditions of the SCVHP, summarized above (Section 3.2.7), that would apply to the project include Conditions 1, 3, 12, and 15 (Table 3).

TABLE 3. APPLICABLE SANTA CLARA VALLEY HABITAT PLAN (SCVHP) CONDITIONS OF THE PROPOSED PROJECT, LOCATED IN THE CITY OF MORGAN HILL, CALIFORNIA

Condition (page references ICF International 2012)	Applicable to project	Comments/Requirements
Condition 1 (page 6-7). Avoid Direct Impacts on Legally Protected Plant and Wildlife Species	Applies	This condition requires actions conducted under the SCVHP to comply with existing laws protecting plant and wildlife species including those species not covered as part of the SCVHP. This requires compliance with the Migratory Bird Treaty Act, which prohibits killing or possessing covered migratory birds, their young, nests, feathers, or eggs. Nearly all species of nesting bird that could use the project site are protected by the MBTA. Project mitigations for pre-construction surveys for migratory birds, including for burrowing owls, ensures compliance with this condition.
Condition 2 (page 6-9). Incorporate Urban-Reserve System Interface Design Requirements	N/A	The project is not interfacing with the reserve system.
Condition 3 (page 6-12). Maintain Hydrologic Conditions and Protect Water Quality	Applies	This condition requires all projects to incorporate appropriate measures itemized in the SCVHP's Table 6-2 (refer to ICF International 2012) to minimize indirect and direct effects to covered species and their aquatic habitat. This condition also requires the local jurisdiction (i.e. the City of Morgan Hill) to verify that all appropriate measures from Table 6-2 are implemented. Measures from Table 6-2 shall be incorporated into project engineering and SWPPP plans.
Condition 4 (page 6-14). Avoidance and Minimization for In-Stream Projects	N/A	The project will not impact streams.

TABLE 3. APPLICABLE SANTA CLARA VALLEY HABITAT PLAN (SCVHP) CONDITIONS OF THE PROPOSED PROJECT, LOCATED IN THE CITY OF MORGAN HILL, CALIFORNIA		
Condition (page references ICF International 2012)	**Applicable to project**	**Comments/Requirements**
Condition 5 (page 6-18). Avoidance and Minimization Measures for In-Stream Operations and Maintenance	N/A	The project will not impact streams.
Condition 6 (Page 6-21). Design and Construction Requirements for Covered Transportation Projects	N/A	The project is not a transportation project.
Condition 7 (page 6-28). Rural Development Design and Construction Requirements	N/A	The project is within the urban service area and is not a rural development.
Condition 8 (page 6-35). Implement Avoidance and Minimization Measures for Rural Road Maintenance	N/A	The project does not involve rural road maintenance.
Condition 9 (page 6-37). Prepare and Implement a Recreation Plan	N/A	The project is not part of the Reserve System.
Condition 10 (page 6-42). Fuel Buffer	N/A	A fuel buffer is not required for this project.
Condition 11 (page 6-44). Stream and Riparian Setbacks	N/A	The project will not impact streams or riparian habitat.
Condition 12 (page 6-56). Wetland and Pond Avoidance and Minimization	Applies	Potential seasonal wetlands in the form of swales occur on the project site, therefore, this condition may apply to the project.
Condition 13 (page 6-58). Serpentine and Associated Covered Species Avoidance and Minimization	N/A	The project does not support serpentine soils and suitable habitat for Covered Plants are absent from the site.
Condition 14 (page 6-60). Valley Oak and Blue Oak Woodland Avoidance and Minimization	N/A	Valley and blue oak woodlands are absent.
Condition 15 (page 6-62). Western Burrowing Owl	Applies	Although the site is outside the burrowing owl fee zone, burrowing owls may occur onsite, and therefore, to comply with Condition 1, this project must also comply with Condition 15, including preconstruction surveys and avoidance measures for owls and nests, and requirements for construction monitoring. Measure 3.3.6 (above) defines the required actions for compliance with this condition.
Condition 16 (page 6-68) Least Bell's Vireo	N/A	Potentially suitable habitat for this species does not exist on the site or within 250 feet of the site.

TABLE 3. APPLICABLE SANTA CLARA VALLEY HABITAT PLAN (SCVHP) CONDITIONS OF THE PROPOSED PROJECT, LOCATED IN THE CITY OF MORGAN HILL, CALIFORNIA		
Condition (page references ICF International 2012)	**Applicable to project**	**Comments/Requirements**
Condition 17 (page 6-69) Tricolored Blackbird	N/A	Potentially suitable habitat for this species does not exist on the site or within 250 feet of the site.
Condition 18 (page 6-71) San Joaquin Kit Fox	N/A	Project is outside of modeled habitat for the San Joaquin kit fox.
Condition 19 (page 6-74). Plant Salvage when Impacts are Unavoidable	N/A	The project does not support serpentine soils and suitable habitat for Covered Plants are absent from the site.
Condition 20 (page 6-76). Avoid and Minimize Impacts to Covered Plant Occurrences	N/A	The project does not support serpentine soils and suitable habitat for Covered Plants are absent from the site.

Implementation of the measures listed and described above, including payment of Land Zone B and nitrogen deposition fees and compliance with Conditions 1, 3, 12, and 15, would ensure that the project does not conflict with the SCVHP. The project would follow the required measures of the SCVHP; therefore, the project would not conflict with this local policy. To ensure compliance, it is recommended that the project proponent thoroughly review the identified sections of the SCVHP, including Table 6-2.

Mitigation. No mitigation is warranted.

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ATTACHMENT 4

ARBORIST REPORT

Moki Smith Tree Specialists, Inc

Fully Licensed, Insured and Certified

License WE-13625A ~ Arborist #WE-6620A ~ Insured PL/PD ~ Workers Compensation ~ 408-722-8942 ~ arborist@garlic.com ~ moki@smithtreespecialists.com

MH Engineering
22561 Poppy Drive
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August 27, 2022

As per your request we visited the site located at APN #728-02-003 Morgan Hill, CA near Dunne X Hill Av on August 26, 2022 to make observations and recommendations regarding the trees located there.

The trees listed in the tree inventory on page 2 are listed for removal or retention based upon level of impediment to proposed construction, size, health, and value within the property.

There are no protected or heritage trees located within the construction zone. There is one Ordinance size Eucalyptus tree on site.

Proper TPZ (Tree Protection Zone) guidelines are listed on page 3.

We appreciate the opportunity to provide this inventory and comments and look forward to working with you further on this project.

Please feel free to call for further clarification.

Respectfully submitted,

William Smith

William Smith
Arborist #WE-13625A
Smith Tree Specialists, Inc

Inventory:

Tree Id #	Common Name	Species	D.B.H.	Height	Canopy	Condition
4506	Black Oak	*Quercus kelloggii*	15"	34'	20'	Fair
Recommendations: Retain tree and protect according to proper TPZ guidelines.						
4507	Modesto Ash	*Fraxinus velutina*	18"	26'	20'	Dead
Recommendations: Remove tree because it is dead.						
4508	Modesto Ash	*Fraxinus velutina*	10"	20'	15'	Dead
Recommendations: Remove tree because it is dead.						
4509	Modesto Ash	*Fraxinus velutina*	4"	12'	12'	Dead
Recommendations: Remove tree because it is dead.						
4510	Black Oak	*Quercus kelloggii*	7"	22'	10'	Poor
Recommendations: Remove tree due to poor health and proximity to proposed grading.						
4511	Black Oak	*Quercus kelloggii*	20"	35'	50'	Fair
Recommendations: Retain tree and protect according to proper TPZ guidelines.						
4512	Live Oak	*Quercus chrysolepis*	5"	20'	15'	Fair
Recommendations: Retain tree and protect according to proper TPZ guidelines.						
4513	Blue Gum Eucalyptus	*Eucalyptus globulus*	50"	80'	65'	Good
Recommendations: Retain tree and protect according to proper TPZ guidelines.						

4514	Black Oak	*Quercus kelloggii*	34"	50'	45'	Fair
Recommendations: Retain tree and protect according to proper TPZ guidelines.						
4515	Blue Gum Eucalyptus	*Eucalyptus globulus*	27"	45'	20'	Dead
Recommendations: Remove tree because it is dead.						
4516	Pine	*Pinus species*	10"	24'	10'	Dead
Recommendations: Remove tree because it is dead.						
4517	Pine	*Pinus species*	10"	26'	25'	Dead
Recommendations: Remove tree due to poor health and proximity to proposed grading.						
4518	Live Oak	*Quercus chrysolepis*	6"	16'	6'	Fair
Recommendations: Remove tree due to poor health and proximity to proposed grading.						

4519	Modesto Ash	*Fraxinus velutina*	32"	50'	45'	Fair
Recommendations: Remove tree due to poor health and proximity to proposed grading.						
4520	Modesto Ash	*Fraxinus velutina*	27"	40'	30'	Poor
Recommendations: Remove tree due to poor health and proximity to proposed grading.						
4521	Black Oak	*Quercus kelloggii*	22"	45'	40'	Fair
Recommendations: Retain tree and protect according to proper TPZ guidelines.						

4522	Mimosa	*Albizia julibrissin*	10"	20'	10'	Poor
Recommendations: Remove tree due to poor health and proximity to proposed grading.						
4523	Mimosa	*Albizia julibrissin*	11"	30'	20'	Dead
Recommendations: Remove tree due to poor health and proximity to proposed grading.						

Construction Site - Tree Preservation

• Locate structures, grade changes, etc. as far as feasible from the `dripline' area of the tree.

• Avoid root damage through grading, trenching, compaction, etc., at least within an area 1.5 times the `dripline' area of trees. Where root damage cannot be avoided, roots encountered (over 1" diameter) should be exposed approximately 12" beyond the area to be disturbed (towards tree stem), by hand excavation, or with specialized hydraulic or pneumatic
equipment, cut cleanly with hand pruners or power saw, and immediately back-filled with soil. Avoid tearing, or otherwise disturbing that portion of the root(s) to remain.

• Construct a temporary fence as far from the tree stem (trunk) as possible, completely surrounding the tree, and 6-8 feet in height. Post no parking or storage signs outside / on fencing. Do not attach posting to the mainstem of the tree.

• Do not allow vehicles, equipment, pedestrian traffic; building materials or debris storage; or disposal of toxic <u>or other</u> materials inside of the fenced off area.

• Avoid pruning immediately before, during, or immediately after construction impact. Perform only that pruning which is unavoidable due to conflicts with proposed development. Aesthetic pruning should not be performed for at least 1-2 years following completion of construction.

• Trees that will be impacted by construction may benefit from fertilization, ideally performed in the fall, and preferably prior to any construction activities, with not more than 6 lbs. of actual nitrogen per 1,000 square feet of accessible `drip line' area or beyond.

• Mulch `rooting' area with an acidic, organic compost or mulch.

• Arrange for periodic (Biannual/Quarterly) inspection of tree's condition, and treatment of damaging conditions (insects, diseases, nutrient deficiencies, etc.) as they occur, or as appropriate.

• Individual trees likely to suffer significant impacts may require specific, more extensive efforts and/or a more detailed specification than those contained within these general guidelines.

ATTACHMENT 5

PRELIMINARY STORMWATER CONTROL PLAN

Preliminary Stormwater Control Plan

for
Serene Hills, LLC
Tract Number: TBD
East Dunne Ave.
Morgan Hill, California 95037

July 24, 2023

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I. Project Data

I.A. Purpose of the Report

The general purpose of this Stormwater Control Plan (SWCP) is to demonstrate compliance with the Central Coast Regional Water Quality Control Board's (CCRWQCB) Post-Construction Stormwater Compliance Resolution R3-2013-0032 and the Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara.

All new construction and redevelopment projects are required to comply with these regulations if they create and/or replace at least 2,500 square feet of impervious area. The requirements are designed preserve the health of watersheds that may be impacted by the improvement of the subject property. Developments are encouraged to maximize the use of Low Impact Development (LID) techniques and incorporate as many Stormwater Control Measures (SCM) and Best Management Practices (BMP) as possible to reduce contaminants leaving the site and affecting downstream water bodies. A Stormwater Control Plan prepared by, or under the direction of, a Professional Civil Engineer is required to detail the potential impacts and mitigation measures implemented by the project.

Table 1: Project Data Summary

Project Name/Number	23117.5
Application Submittal Date	7/24/2023
Project Location	Northerly terminus of Saddleback Drive and Sorrel Way. Northwest of East Dunne Avenue.
Project Phase	N/A
Project Type and Description	Residential - 1 acre lots
Total Project Area	440,884 SF
Total New Impervious Area	121,027 SF
Total Replaced Impervious Area	0 SF
Total Pre-Project Impervious Area	0 SF
Total Post-Project Impervious Area	121,027 SF
Net Impervious Area	121,027 SF
Watershed Management Zone	1
Design Storm Frequency	95th Percentile
Design Storm Depth	1.65

II. Setting

II.A. Project Location and Description:

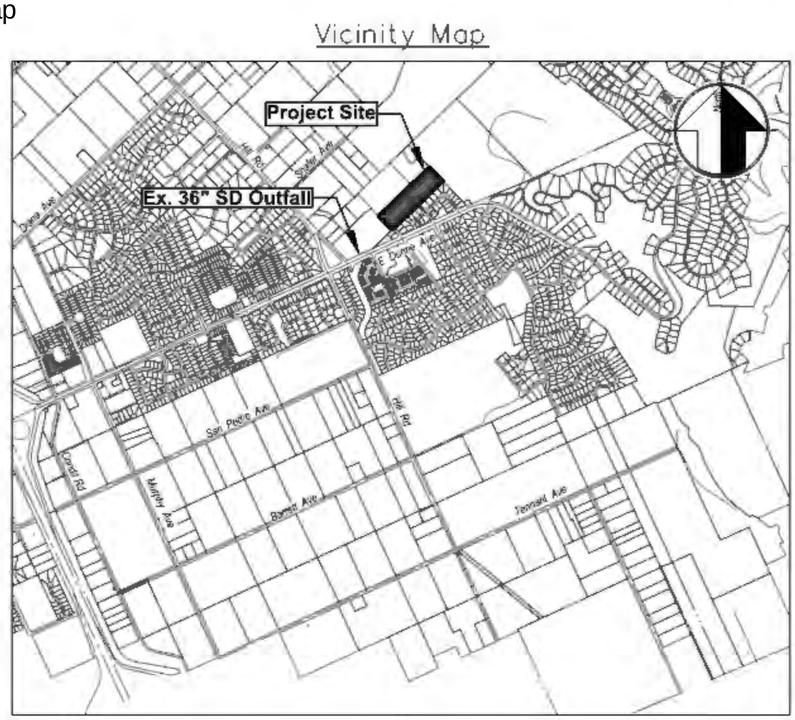
This 8.35 acre development is located in the watershed of Tennant Creek to East Little Llagas Creek. There is an existing drainage swale that traverses through this project flowing from the northeast to the southwest. The inflow watershed area to the east is 66.54 acres which extends up the hill to the Holiday Lake Estates development. The terrain is steep, and oak studded for 3,408 feet horizontally and 548 feet vertically. This watershed produces 33 cubic feet per second (cfs) in a ten-year frequency storm and 41 cfs for a 25-year storm.

There is an adjacent watershed located to the southeast that was developed for 7,000 square foot (SF) lots along Saddleback Drive, Sorrel Way and Dunne Avenue. This development has installed storm drains in Dunne Avenue and a stormwater detention facility along the southside of the project. These storm drains outfall into a 36" storm drain which crosses Dunne Avenue into Tennant Creek near Old Hill Road. This will be the same outfall for our project.

The 8.35 acre project site itself has a natural slope of 6%-7%. These 1 acre lots will be developed with pad grading on approximately one-third acre and the balance of the 1-acre lot will be undisturbed, natural vegetation. Each lot will have bioswale stormwater treatment that treats the street frontage and the impervious surfaces on the 1/3 of an acre graded pad. That treated runoff will be directed to the swale that flows through the development. The existing drainage swale will be graded slightly to create a defined drainage conveyance system. Saddleback Drive will have culverts under the roadway to convey the water from the east side to the west side. Near Sorrel Way, the low side of the development project, the project proposes to install a storm water detention facility to mitigate the increased flows from development. The outflow of the stormwater detention pond will be conveyed to Dunne Avenue in a 30-inch reinforced concrete pipe to be located in an existing 20 foot wide right of way for roadway purposes to connect to the existing 36" pipe crossing Dunne Avenue to the south.

Hydrographic runoff calculations have also been performed that show the developed runoff rate will not exceed the pre-development runoff rates for the 2-year,5-year, 10-year, 25-year, 50-year, and 100-year frequency storm.

Figure 1: Vicinity Map



II.B. Existing Site Features and Conditions

The site is located at Saddleback Drive near East Dunne Avenue. Zoning is Residential Estate [RE up to 1 du/ac]. The site is surrounded by rural residential developments to the North, East, and West with medium-density single family residential to the South.

This site is located at the base of a hill with significant tributary area that runs on to the site into an existing drainage swale. Approximately 66.54 acres of steep, oak-studded terrain drains through the site generating up to 41 cfs in a 25-year event. This run-on enters the public storm drainage system via a 36" culvert that crosses Dunne Avenue into Tennant Creek near Old Hill Road.

An existing 18-inch storm drain stub is provided for future development in Saddleback Drive. Due to the significant run on and the requirement to treat all stormwater runoff, the bioretention pond needed to be located at the lowest end of the site near Sorrel Drive. This presented a problem for connecting to the stub in Saddleback Drive as we would have to plumb the pipe back up the hill to connect in Saddleback Drive.

In addition to the elevation problem, the significant run-on tributary to this site required a larger capacity than the 18-inch stub could provide.

The existing segment of Sorrel Way presents an opportunity for the storm drain to connect to the public storm drainage infrastructure located in Dunne Avenue located south of the project; however, the project's run-on from the hillside east of the development poses a problem for connecting to the infrastructure in Dunne Avenue as the existing drainage of this run-on is routed along the driveway located in the 20' easement for roadway purposes and joins the flow from Dunne Avenue west of the existing detention facility along Dunne Avenue. The existing detention facility and storm drainage infrastructure located in Dunne Avenue was not designed with the run-on from this hillside and would need to be upsized to accommodate the increase in flow through the system, causing significant cost impact to the project. The existing detention facility would require additional volume and analysis due to the increased flow through the pond, potentially exceeding the allotted space for this facility. For these reasons, the development has proposed to install a new 30-inch storm drain line to be installed within the 20' easement for roadway purposes directly across the proposed Sorrel Drive and connect to the existing storm drainage infrastructure west of the existing detention facility where the two flows meet in pre-development conditions.

In addition to this significant existing run-on, the terrain has a natural slope of 6%-7% across the site. This creates a challenge to provide significant retention/detention systems while not creating large, unsightly berms. This also presents an opportunity to create a centralized detention pond for areas that are not easily directed into the bioswales proposed on site. Portions of the site can be directed into the natural drainage swale and into a proposed bioretention pond for mitigation without extraordinary deep systems.

II.C.Opportunities and Constraints for Stormwater Control

II.C.1. Opportunities.

Opportunities for stormwater control include measures such as limiting disturbance of natural drainage features, permeable soils, or native vegetation; minimizing impervious areas; routing runoff through vegetation; and use of permeable surfaces such as pavers. Opportunities presented and implemented by this site include:

This site has an existing drainage swale that accepts run-off from approximately 66.54 acres. This presents an opportunity to allow for natural consolidation of run-off into a proposed bioretention pond for treatment of areas that are not able to be drained into the individual bioswales as well as a common detention facility to mitigate the increased run-off generated by the site's development. This drainage swale has been preserved in the proposed design to maintain existing drainage features and patterns through development.

The soil present on site has a percolation rate of approximately 1.4 inches per hour. This allows for retained water to drain within 48 hours after the storm and have adequate storage capacity for follow-up rain events.

The proposed design has minimized the development area to allow for only approximately one-third of each one-acre lot to be disturbed by the development, preserving natural landscape and vegetation, consistent with Performance Requirement 1.

II.C.2. Constraints

Stormwater Control Constraints include site conditions such as impermeable soils, high groundwater, groundwater and/or soil contamination, geotechnical hazards, project density, or high-intensity land use. Constraints presented by this project include:

In addition to being a site opportunity, the existing drainage swale presents the development with a constraint as natural drainage patterns and facilities should be maintained in the proposed development. This drainage swale has been maintained and enhanced through this development, to increase capacity and limit the spread of the run-on flows.

The natural slope of the site is approximately 6%-7%, preventing common facilities for treatment and retention/detention without large visual impacts to the terrain. To conform to the natural landscape as much as possible, smaller treatment and retention measures have been put on each lot to capture, treat, and infiltrate run-off, thus, minimizing the impact of the central detention pond at the low end of the site.

As mentioned in the project description above, the run-on and existing storm drain infrastructure located in Dunne Avenue poses a significant cost impact to the site as well as changing the existing drainage pattern. The project has significant run-on from the hillside east of the proposed development that joins the existing storm drain near Hill Road. This has been maintained with the proposal of a new 30" storm drain line that is located within a 20' easement for roadway purposes on the neighboring property.

III. Low Impact Development Design Strategies

III.A. Performance Requirements

The CCRWQCB Resolution R3-2013-0032 as well as the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* describe levels of Post-Construction Requirements based upon the amount of impervious area created/replaced. Below is a discussion of each of the performance requirements and mitigation measures intended to comply with each Performance Requirement Tier.

III.A.1. Performance Requirement No. 1 (PR-1): Site Design and Runoff Reduction

Development projects that create and/or replace at least 2,500 square feet of impervious areas are subject to PR-1. PR-1 requires the following:

- Limit Disturbance of creeks and natural drainage features
- Limit disturbance of highly permeable soils
- Limit disturbance of native vegetation
- Minimize creation and/or replacement of impervious areas
- Minimize runoff using:
  - Cisterns or rain barrels for reuse
  - Route runoff through vegetation
  - Use of permeable pavements

The proposed site development has maintained and enhanced the existing drainage swale on site to accommodate existing run-on through the site. The enhancements of the drainage swale allow for more of the run-on to be contained within the drainage swale and not spread into the proposed lots in higher intensity storm events.

The site has also minimized its impact to native vegetation by consolidating improvements to be in the third of the lot closest to the proposed public roadways. This allows for less disturbance of native soils and maintains natural vegetation and drainage patterns.

The site has also routed all run-off through vegetation and bioswales before being routed to into the public storm drainage system. Each proposed residence routes its roof run-off through vegetation utilizing disconnected downspouts directed to the bioswales on each lot. Roadway runoff is directed into the bioswales using a shallow pipe out of a catch basin that filters and retains runoff.

III.A.2. Performance Requirement No. 2 (PR-2): Water Quality Treatment

Development projects that create and/or replace at least 5,000 square feet (15,000 square feet for Single-Family Detached Homes) Net Impervious Area are subject to PR-2 in addition to PR-1. Net Impervious Area credits apply when the Post-Development Impervious Area is less than Pre-Development Conditions and is calculated below:

Net Impervious Area=(Total Post Development Impervious Area)-(Reduced Impervious Area Credit)

Where

Reduced Impervious Area Credit =
(Total Pre-Development Impervious Area) – (Total Post-Development Impervious Area)

Projects subject to the requirements of PR-2 are responsible for treating any contaminants that are created by the development. Table 2 below corresponds to Table 4 in *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* and is listed in order of preference according to said manual.

Table 2: Water Quality Treatment Measures Design Criteria (Guidance Manual Table 4)

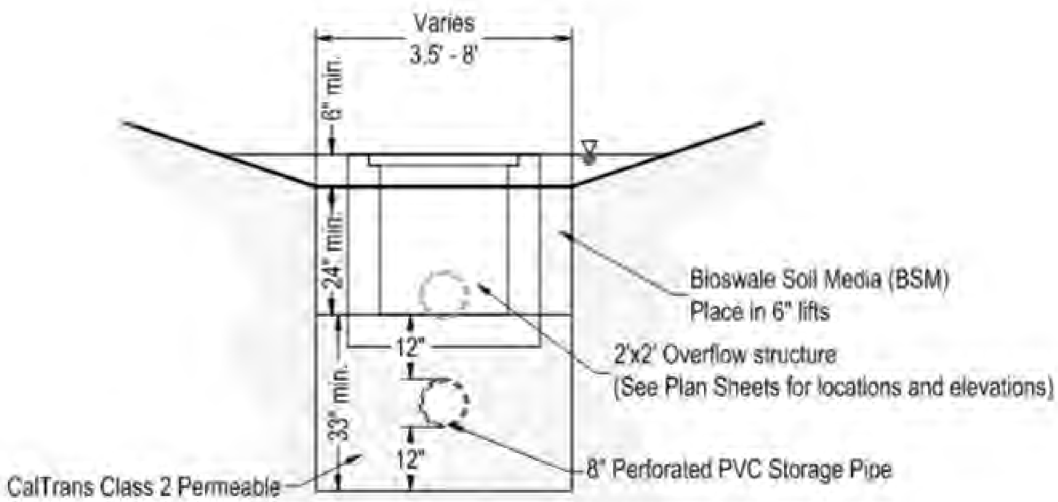
Water Quality Treatment Measure*	Design Criteria
LID Treatment System – *Harvesting and use, infiltration, evapotranspiration, and bioretention (without an underdrain) SCMs*	Retain stormwater from the 85th Percentile 24-hour storm event (based on local rainfall data)
Biofiltration Treatment System – *Bioretention with raised underdrain, or other facilities at least as effective as a system with the specified design criteria.*	Design of rain event of 0.2 in/hr intensity or 2 x 85th percentile hourly rainfall intensity or other specified design criteria include: • Maximum surface loading rate of 5 in/hr • Minimum surface reservoir depth (6”) • Minimum planting minimum depth (24”) • Proper plant selection • Subsurface gravel layer (minimum depth of 12”) • Underdrain placement near the top of the gravel layer • No compaction of soils beneath the facility • No liners preventing infiltration
Non-Retention Based Treatment Systems – *Lined bioretention, flow-through planters, and high rate tree well filters and media filters*	<u>Volume Hydraulic Design Basis:</u> 85th Percentile 24-hour storm event <u>Flow Hydraulic Design Basis:</u> 0.2 in/hr intensity OR 2 x 85th Percentile hourly rainfall intensity
*Multiple SCMs may be used to collectively achieve the design criteria.	

This project utilizes the LID Treatment system using a bioswale with disconnected perforated pipe to retain the 85th Percentile and 95th Percentile 24-hour storm event. Each lot has a bioswale located along the property line that has been designed to accept the runoff from the developed portion of the lot as well as the street frontage for that lot. The street frontage is captured via a City standard curb inlet with a shallow outflow pipe that is directed to release on the surface of the bioswale. DMAs 1-3 and 5-7 utilize a bioswale with six (6) inches of ponding with 3-to-1 side slopes, 24 inches of biomedia sand/compost composite mix, and 33 inches of 1”-2” clean drain rock surrounding an 8-inch perforated pipe for additional storage capacity (See Figure 2 below for detail). DMA 4 utilizes a similar design to the bioswale, however 36 inches of drain rock has been provided for extra storage capacity required (see Figure 3 below for detail). DMA 8 consists of roadway improvements that cannot be directed into the bioswales located on each lot. The bioswales release via a 24” by 24” drainage inlet with the rim elevation set 6 inches above the bottom of the bioswale to allow for the minimum required 6” of ponding. The 8-inch perforated pipe has cleanouts installed at each end of the pipe for routine maintenance, but is not connected to the 24” square outflow box, allowing for full utilization of the storage volume. DMA 8 consists of roadway improvements, drainage swale improvements, and undisturbed land that cannot be directed into the bioswales located on each lot. These areas are directed to a bioretention pond located at the low end of the site that is designed to retain the 85th and 95th Percentile 24-hour storm event using the simplified sizing method per Appendix D of the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* (See Attachment D of this report for detailed calculations). This bioretention pond has been designed with twelve (12) inches of ponding with 3-to-1 side slopes, 24 inches of biomedia sand/compost mix, and 33 inches of 1”-2” clean drain rock surrounding an 8” perforated pipe for additional storage (see Figure 4 below for detail). The bioretention pond releases via a 48” by 48” drainage inlet with the rim elevation set 0.70 feet above the bottom of the pond that outlets via a 30 inch reinforced concrete pipe that drains across Sorrel Way and down to the existing culvert under Dunne Avenue under Old Hill Road.

Similar to the bioswales on each lot, the 8-inch perforated storage pipe located in the bioretention pond is not connected to the outlet structure to allow for maximum usage of the retention volume provided. See Appendix B for location and details.

In addition to the LID Treatment System, the City of Morgan Hill requires flow-based Biofiltration Treatment Systems. This system uses biofiltration media and special plant selection to break down contaminants in the water before infiltrating into the ground. Figures 2-4 below shows a typical detail for each bioswale and the bioretention pond. The simplified sizing method (also known as the 4% sizing method) was used to size these biofiltration systems. Figure 5 below shows simplified sizing methodology per the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* and Table 3 below show the sizing of each of the biofiltration SCMs.

Figure 2: Bioswale Detail SCM 1-3 & 5-7



Bioswale Detail: SCMs 1-3, & 5-7
Scale: none

Figure 3: Bioswale Detail SCM 4

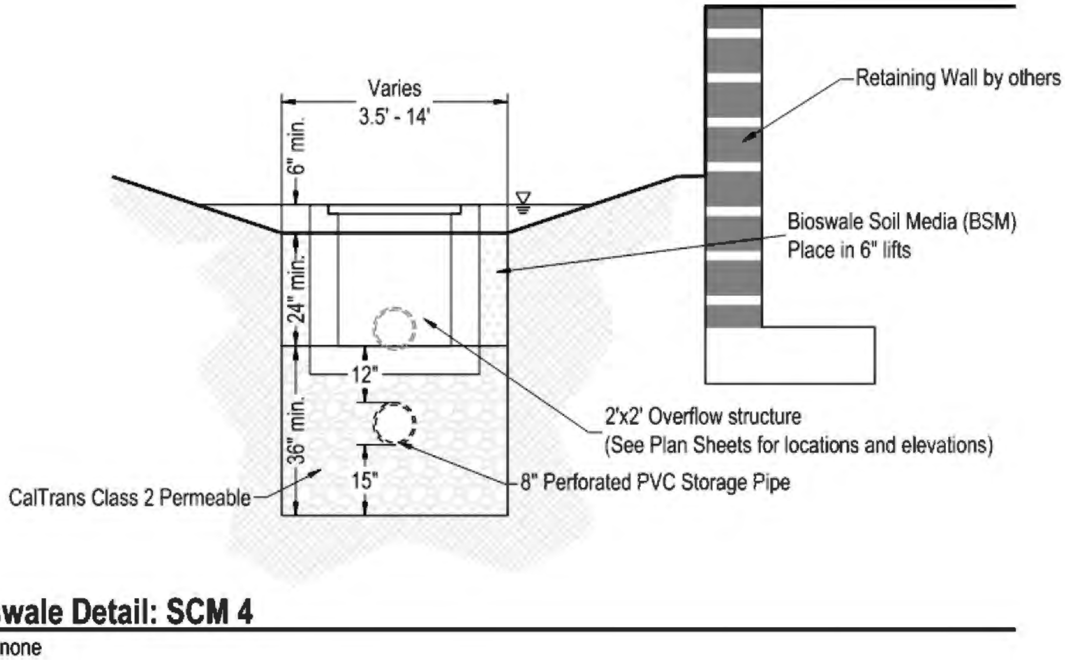


Figure 4: Bioretention Pond Detail SCM 8

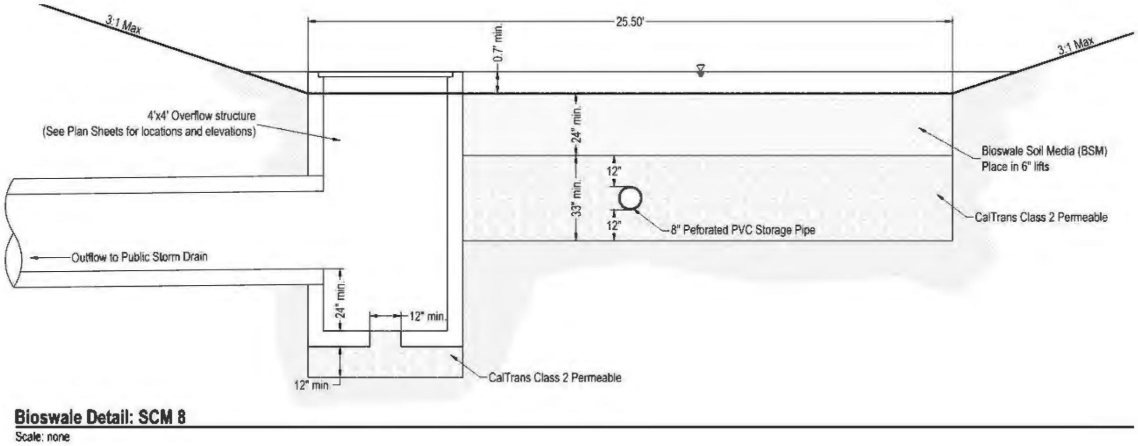


Figure 5: Simplified Treatment Sizing Methodology

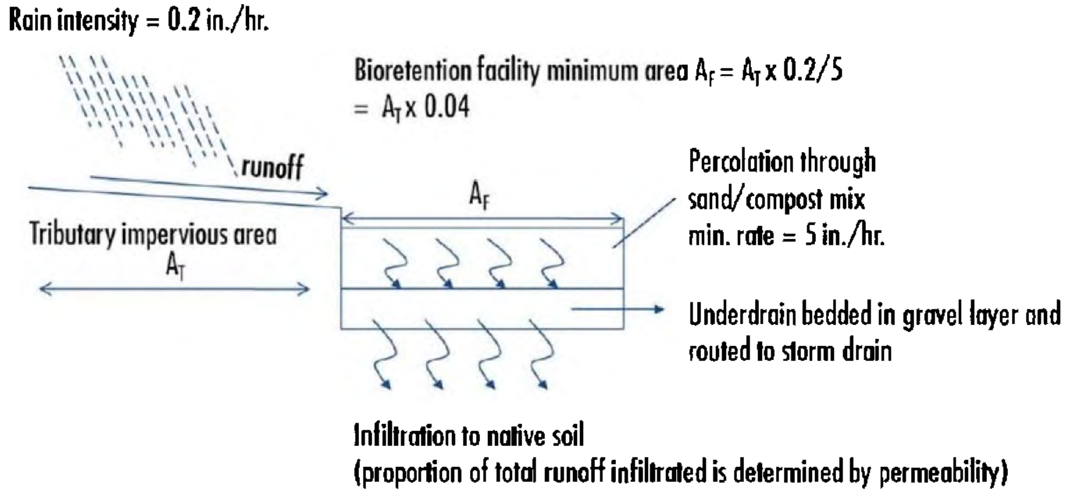


Table 3: LID Treatment Summary

LID Treatment Sizing Table					
DMA	BMP	Total DMA Area	DMA Impervious Area	Required Treatment Area	Provided Treatment Area
1	SCM 1	23,084 SF	10,852 SF	483 SF	500 SF
2	SCM 2	21,799 SF	8,997 SF	411 SF	400 SF
3	SCM 3	25,624 SF	10,185 SF	469 SF	450 SF
4	SCM 4	21,018 SF	12,247 SF	525 SF	486 SF
5	SCM 5	18,342 SF	8,916 SF	394 SF	400 SF
6	SCM 6	29,055 SF	12,286 SF	559 SF	560 SF
7	SCM 7	19,170 SF	8,791 SF	393 SF	400 SF
8	SCM 8	282,792 SF	48,753 SF	2,414 SF	2,487 SF
Total		440,884 SF	121,027 SF	5,648 SF	5,683 SF

III.A.3. Performance Requirement No. 3 (PR-3): Runoff Retention

Development projects that create and/or replace 15,000 square feet of impervious area (Single Family Detached Homes are allowed to use Net Impervious Area as defined in PR-2) and are located within Watershed Management Zones 1, 2, 5, 6, 8, 9, and portions of Watershed Management Zones 4, 7, and 10 that lie in designated Groundwater Basins are subject to Performance Requirement 3 as we well as PR-1 and PR-2. PR-3 requires the retention of the volume of runoff that could contain contaminants and that would naturally infiltrate in pre-development conditions. Appendix D of the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara* details the calculations for the required retention volume. Attachment E has detailed calculations for this project following the calculations in Appendix D of said Guidance Manual and is summarized below in Table 4 below.

Table 4: LID Volume Sizing Summary

LID Volume Sizing Table							
DMA	**BMP**	**Total DMA Area**	**DMA Impervious Area**	**i**	**C**	**Required Retention Volume**	**Provided Retention Volume**
1	SCM 1	23,084 SF	10,852 SF	0.47	0.32	1,018 CF	1,147 CF
2	SCM 2	21,799 SF	8,997 SF	0.41	0.29	860 CF	937 CF
3	SCM 3	25,624 SF	10,185 SF	0.40	0.28	981 CF	1,041 CF
4	SCM 4	21,018 SF	12,247 SF	0.58	0.40	1,144 CF	1,174 CF
5	SCM 5	18,342 SF	8,916 SF	0.49	0.33	834 CF	893 CF
6	SCM 6	29,055 SF	12,286 SF	0.42	0.29	1,169 CF	1,247 CF
7	SCM 7	19,170 SF	8,791 SF	0.46	0.31	827 CF	830 CF
8	SCM 8	282,792 SF	48,753 SF	0.17	0.15	3,502 CF	5,327 CF
Total		440,884 SF	121,027 SF	0.27	0.21	9,384 CF	12,597 CF

This project utilizes the simplified retention sizing method as described in Appendix D of the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara.* This approach provides a conservative volume calculation of volume that would have infiltrated into the ground in pre-development conditions. This volume is known as the 95th Percentile Volume. This project meets this simplified volume calculation using bioretention facilities to comply with Performance Requirement 3. Drainage Management Areas (DMAs) 1 through 7 utilize the bioswales on each lot to retain the required retention volume for each of these DMAs. The DMAs consist of roadway improvements along the property frontage, roofs of the proposed residence, and any site flatwork contained within the developed third of the parcel. The bioswales for DMAs 1-3 and 5-7 consist of six (6) inches of ponding with 3-to-1 side slopes, 24 inches of biomedia sand/compost composite mix, and 33 inches of 1”-2” clean drain rock surrounding an 8-inch perforated pipe for additional storage capacity (See Figure 2 below for detail). DMA 4 utilizes a similar design to the bioswale, however 36 inches of drain rock has been provided for extra storage capacity required (see Figure 3 above for detail). The bioretention pond for DMA 8 has been designed with 0.70 feet of ponding with 3-to-1 side slopes, 24 inches of biomedia sand/compost mix, and 33 inches of 1”-2” clean drain rock surrounding an 8” perforated pipe for additional storage (see Figure 4 above for detail). The biomedia storage has been calculated using a 25% void ratio and the drain rock storage has been calculated utilizing a 40% void ratio. See Attachment D for Retention Volume Calculations.

On-Site percolation testing was performed by Earth Systems Pacific at the approximate location and depth of each bioretention pond. Each bioswale has a design infiltration rate based upon the stabilized testing infiltration rate divided by a factor of safety of two (2) as required by the City of Morgan Hill, see Table 5 below for a summary of design infiltration rates.

Table 5: Design Infiltration Rate Summary

SCM	Percolation Test Hole	Test Rate	Factor of Safety	Design Infiltration Rate
1	3	0.2 in/hr	2	0.1 in/hr
2	4	0.5 in/hr	2	0.25 in/hr
3	5	0.5 in/hr	2	0.25 in/hr
4	6	0.2 in/hr	2	0.1 in/hr
5	7	0.5 in/hr	2	0.25 in/hr
6	8	0.5 in/hr	2	0.25 in/hr
7	9	0.5 in/hr	2	0.25 in/hr
8	1 & 2	1.4 in/hr	2	0.7 in/hr

SCMs 1-7 have a low infiltration rate present in at the depth and location of the proposed bioswales. Drawdown time calculations have been provided in Attachment D of this report and Table 6 below shows a summary of the drawdown times as calculated based upon the design infiltration rates. SCM 8 resulted in a drawdown time of 37 hours based upon the design infiltration rate and infiltration area available. SCMs 1-7 have a longer drawdown time due to their lower infiltration rates; however, since these bioswales are designed using the simplified sizing design criteria (i.e. using Appendix D) and not the routing method, an additional 20% increase in retention volume is not required for this system.

Since these systems have longer drawdown times, an HydroCAD modeling was used to determine when the surface storage would be infiltrated, leaving no standing surface water for potential mosquito breeding. SCMs 2, 3, 5, 6, and 7 all showed water surface elevations below the surface storage by hour 49 of the HydroCAD model, just 35 hours after the end of the storm. SCMs 1 and 4 had a lower infiltration rate, thus a longer drawdown time. HydroCAD models of SCMs 1 and 4 show a water surface elevation below the surface storage by hour 85 of the model, just 61 hours after the end of the storm. Santa Clara County Vector Control requires all surface standing water to be drained in 72 hours after the storm event. All SCMs have been determined to be incompliance with this requirement.

Table 6: SCM Drawdown Time Summary

SCM Drawdown Time Summary				
SCM	**Design Infiltration Rate**	**Infiltration Area**	**Total Retention Volume**	**Drawdown Time**
1	0.1 in/hr	500 SF	1,147 CF	275 hours
2	0.25 in/hr	400 SF	937 CF	112 hours
3	0.25 in/hr	450 SF	1,041 CF	111 hours
4	0.1 in/hr	486 SF	1,174 CF	290 hours
5	0.25 in/hr	400 SF	893 CF	107 hours
6	0.25 in/hr	560 SF	1,247 CF	107 hours
7	0.25 in/hr	350 SF	830 CF	114 hours
8	0.7 in/hr	2,487 SF	5,327 CF	37 hours

III.A.4. Performance Requirement No. 4 (PR-4): Peak Management

Development Projects that create and/or replace at least 22,500 square feet of impervious areas and within Watershed Management Zones 1, 2, 3, 6, and 9 are required to comply with Performance Requirement 4 in addition to previously discussed performance requirements. PR-4 is intended to mitigate the increased runoff created by the project's increase in impervious areas, thus preventing any adverse flooding conditions downstream of the project. PR-4 requires developments to detain increased runoff from the 2-, 5-, and 10-year events such that they release at rates at, or below, pre-development conditions.

The project is required to mitigate its increased runoff due to site development. Increased peak-flow is mitigated through two methods: decrease in SCS Routing curve number (CN) and the bioretention pond located at the low end of the site.

The exiting farrow hillside with soil that is hydrologic soil group D is present through this project has a SCS routing method curve number of 94. This project will disturb and vegetate the existing soil to a point where the curve number is reduced to a value of 85, the standard for 1-acre residential development per the SCS routing methodology. This will inherently reduce the runoff on the site through more infiltration of the soil as the rain falls upon it. Using this reduced curve number creates a weighted curve number that is less than the existing curve number on the site.

In addition to lowering the curve number through disturbance and development, a bioretention pond is being proposed at the lowest point on the site. Due to Performance Requirement 3, this pond is required to retain as well as detain, providing 5,103 cubic feet of storage before releasing. The bioretention pond has been designed to pond 6 inches before any runoff is to be released from the site. Once the ponding is achieved, the runoff is allowed to leave via a 4 foot by 4 foot drainage inlet located in the pond and out through the 30 -inch reinforced concrete pipe that runs south to Dunne Avenue and Old Hill Road. The outfall elevation and size has been designed to meter the outflow from the project at, or below, pre-development conditions up to the 100-year event. See Section IV below for detailed description of model and results.

III.A.5. Performance Requirement No. 5 (PR-5): Special Circumstances
This Performance Requirement applies to projects that are exempt from the runoff retention and/or peak flow mitigation requirements described in previous performance requirements because they discharge to highly altered channels, flow control facilities, or historic lake and wetland areas.

This project does not fall under this performance requirement.

IV. Documentation of Drainage Design

IV.A. Drainage Management Area Characterization

The Drainage Management Areas (DMAs) shown on Attachment G have been delineated based upon the tributary areas to each Source Control Measure (SCM). The site has been divided into eight (8) DMAs as shown on the Preliminary Stormwater Control Plan, Sheet 6 of the plans. DMAs 1 through 7 direct runoff from the developed portion of each lot and the corresponding street frontage into a bioswale located along the property line. Each bioswale is sized to treat runoff based up on the simplified treatment sizing (4%) methodology and retain the 95% percentile volume based upon the simplified sizing method described in Appendix D of the *Stormwater Management Guidance Manual for Low Impact Development & Post Construction Requirements, June 2015, City of Gilroy, City of Morgan Hill and County of Santa Clara*. SCMs 1-3 and 5-7 consist of 6 inches of surface ponding with 3-to-1 side slopes on 24 inches of biomedia sand/compost mix on 33 inches of 1”-2” clean drain rock surrounding an 8-inch perforated storage pipe. SCM 4 is of similar design to SCMs 1-3 and 5-7; however, the drain rock layer has been deepened to 36 inches to provide additional volume required for the DMA. Each storage pipe is hydraulically disconnected from the outflow structure to maximize the retention volume provided. DMA 8 drains to the bioretention pond located at the lowest point on the site. This bioretention pond treats and retains the runoff generated by the roadways and disturbed areas not captured by SCMs 1-7. SCM 8 consists of 0.70 feet of ponding with 3-to-1 side slopes on 24 inches of biomedia sand/compost mix on 33 inches of 1”-2” clean drain rock surrounding an 8-inch perforated storage pipe. Table 7 below shows a summary of each of the DMAs. See Attachment G for details.

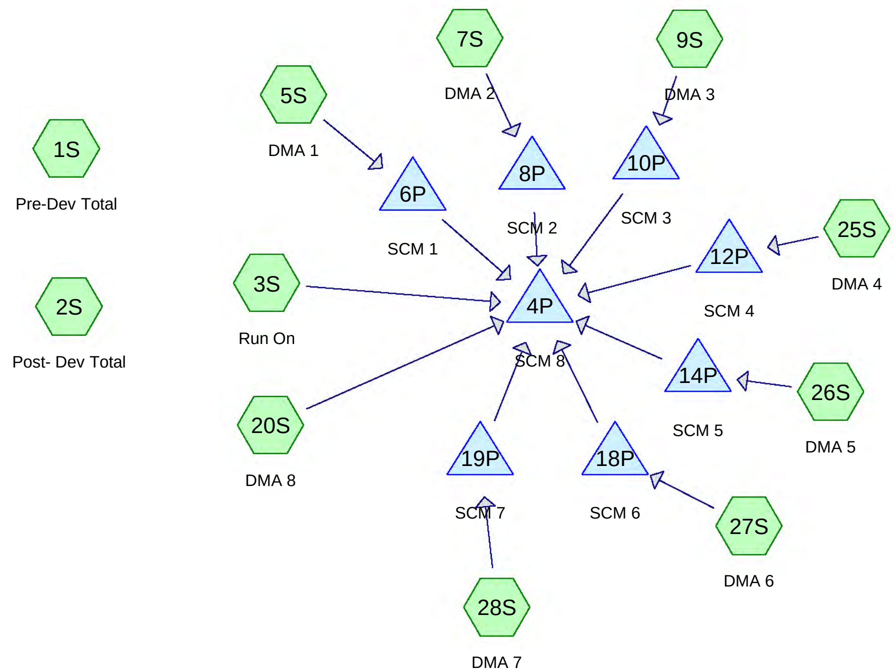
Table 7: DMA Summary Table

DMA Summary Table						
DMA	**BMP**	**Total DMA Area**	**Existing Impervious Area**	**Post-Development Impervious Area**		
				Replaced	New	**Total**
1	SCM 1	23,084 SF	0 SF	0 SF	10,852 SF	10,852 SF
2	SCM 2	21,799 SF	0 SF	0 SF	8,997 SF	8,997 SF
3	SCM 3	25,624 SF	0 SF	0 SF	10,185 SF	10,185 SF
4	SCM 4	21,018 SF	0 SF	0 SF	12,247 SF	12,247 SF
5	SCM 5	18,342 SF	0 SF	0 SF	8,916 SF	8,916 SF
6	SCM 6	29,055 SF	0 SF	0 SF	12,286 SF	12,286 SF
7	SCM 7	19,170 SF	0 SF	0 SF	8,791 SF	8,791 SF
8	SCM 8	282,792 SF	0 SF	0 SF	45,861 SF	45,861 SF

IV.B. Hydrologic Modeling

Hydrologic modeling has been completed for the project utilizing Hydraflow Hydrographs, an extension for Autodesk Civil 3D. This program uses the SCS Unit Hydrograph method to route the design storms through the proposed SCMs to determine the runoff impact generated by the project. The model utilizes a unit hydrograph of Valley Water's Santa Clara Valley 1956 design storm combined with rainfall depths determined by the National Oceanic and Atmospheric Administration (NOAA). This rainfall data has been determined to be more conservative and provide the worst-case scenario when determining hydrologic impact of the development. Figure 4 below shows a schematic of the model created in HydroCAD. Each DMA has been routed through each of the SCMs before being routed to SCM 8 depicted as Pond 4P in the center of the schematic. This allows for each of the bioswales to stagger the times of concentration at the proposed bioretention pond and lower the peak run-off on the site.

Figure 6: HydroCAD Model Schematic



The maximum water surface elevation in the system for the event has been determined to be 382.73 for the 100-year event. The system is designed to detain the 100-year event; however overland release has been provided over the sidewalk of Sorrel Way and out towards Dunne Avenue via street conveyance. This system would only be used in the event of failure of the outfall system of collection pipes. Table 8 below shows a summary of each event. See Attachment D for detailed model input and output data.

Table 8:Hydraflow Output Summary

Events for Pond 4P: SCM 8

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	17.53	17.51	0.06	17.45	**0.00**	382.08	7,715
2 year	23.33	23.31	0.06	23.25	0.00	382.18	8,083
5 year	31.28	31.25	0.06	31.20	0.00	382.31	8,538
10 year	37.94	37.91	0.06	37.85	0.00	382.41	8,906
25 year	47.58	47.55	0.06	47.48	0.00	382.54	9,401
50 year	55.29	55.25	0.06	55.19	0.00	382.64	9,783
100 year	**63.45**	**63.41**	**0.06**	**63.35**	0.00	**382.73**	**10,174**

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

Common sources of potential pollutants in residential projects include pesticides/herbicides from landscape maintenance, fertilizers, oil/fuel leaking from poor vehicle maintenance, and airborne contaminants settling on the site.

V.B. Source Control Table

Table 9: Potential Pollutants and Source Control BMPs

	Pollutants Associated with Activity						
Potential Pollutant Source	Sediment/ Litter/ Debris	Nutrients/ Organic Matter	Bacteria	Hydro-carbons	Toxics/ Chemicals/ Paint	Other	Source Control BMP Proposed
Pets		X	X				Good housekeeping/ Illicit Discharge Control/Pet Waste Station
Parked Vehicles	X			X			Vehicle Maintenance, Fueling and Storage
Roads, Fertilizers, Pesticides, Storm Drains, Etc.	X	X	X	X			Plant Selection and integrated pest management

Table 10: Source Control Measures

Source Control Measure	Description
Storm Drain Inlets	Structural: Inlets clearly marked with “No Dumping” or similar message Operational: Inlets will have routine inspection and cleaning.
Pesticides	Structural: Pest-resistant plans will be selected when possible near impervious surfaces Operational: Landscape maintenance to utilize integrated pest management methods.
Bioswales	Operational: Bi-annual inspections required by the City to assess performance of the filtration media.
Underground Retention System	Structural: Installed sumps for sedimentation and ADS Envirohood for floating contaminants. Operational: Routine inspection and maintenance of sumps.

V.C. Features, Materials, and Methods of Construction of Source Control BMPs

Structural Control Measures are facilities designed and implemented to contain and remove contaminants found in stormwater runoff generated from development. These facilities break down and remove contaminants using filtration, infiltration, sedimentation, and evapotranspiration on the site before releasing runoff from the site.

This project has installed biofiltration facilities for each DMA that will break down contaminants in runoff using special sand and compost material that will filter contaminants in the runoff. These biofiltration facilities feature a special selection of plants that will break down contaminants such as oils and metals that enter the facility. Runoff will pass through the filtration media and enter the storm drain system via an underdrain and be routed to the retention facility to promote infiltration and further treatment of the runoff.

VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

Projects that trigger Performance Requirements 2, 3, or 4, are required to record a *Stormwater Best Management Practices, Operation, and Maintenance Agreement* with the City and incorporate language into the CC&Rs accepting responsibility for inspection, operation and maintenance of facilities. Contact City staff for the Agreement. Include the executed Stormwater Agreement as an attachment. A Homeowner's Association (HOA) will be established at final permitting to own and maintain the proposed bioretention pond. The HOA will ensure that all bioswales are inspected and maintained in accordance with the BMP Operations and Maintenance Agreement that will be executed at final permitting. Each individual lot owner will be responsible for maintaining the bioswales located on their respective lots.

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

The Home Owners Associations will be responsible for all drainage and common facilities on a regular basis. See appropriate *BMP RAM Field Protocols* as listed in this document specific to this project. BMP RAM Field Protocol forms will be provided at final permitting stage.

As stated in the *Stormwater Best Management Practices, Operation, and Maintenance Agreement*, the project shall submit two (2) annual inspections per year in perpetuity. One inspection is due every June and shall follow the instructions outlined in the *BMP RAM Field Protocols* (added as attachment). The second inspection shall be submitted every November and will include a certification from the Engineer or QSP verifying all SCM(s) are in working conditions. Maintenance shall be performed whenever the SCM(s) are in poor conditions as per the annual inspections, or regular maintenance.

VII. Construction Checklist

Table 11: Construction Checklist

SWCP Page No.	Structural Control Measure SCMs	Plan Sheet No.
6	1-8	6

VIII. Certifications

The design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the Post-Construction Stormwater Management Resolution R3-2013-0032 and the current edition of the City's LID and Post-Construction Requirements Handbook.

See Attachment A for Performance Requirement Certifications

Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

Attachment A:
Performance Requirement Checklists

LOW IMPACT DEVELOPMENT

AND

POST-CONSTRUCTION

STORMWATER MANAGEMENT REQUIREMENTS

APPLICANT PACKET

FOR PROJECTS IN SOUTH SANTA CLARA COUNTY

COUNTY OF SANTA CLARA

REV 6/11/15

PROJECT INFORMATION

County File No: ----

Project Name: **Serene Hills**

APN#: **728-02-003**

Project Address: **Northerly Terminus Of Saddleback Drive And Sorrel Way - 728-02-003**

Cross Streets: **Saddleback Drive And Magnolia Way**

Applicant/Developer Name: **Serene Hills, LLC**

Project Phase(s): 1 of 1 Engineer: **Kristian Wallace, PE**

Project Type (Check all that apply): ☐ New Development ☐ Redevelopment
☒ Residential ☐ Commercial ☐ Industrial ☐ Mixed Use ☐ Public ☐ Institutional
☐ Restaurant ☐ Uncovered Parking ☐ Retail Gas Outlet ☐ Auto Service (SIC code)_____
☐ Other ________________________________

Project Description: **7 Lot custom single-family detached 1-acre lots.**

Project Watershed/Receiving Water (creek, river): **Tennant Creek to West Little Llagas Creek**

1. Total Project Area	**440,884**	ft^2
2. Pre-Project		
(a) Impervious Area	**0**	ft^2
(b) Pervious Area	**440,884**	ft^2
3. Post-Project		
(a) Replaced Impervious Area	**0**	ft^2
(b) New Impervious Area	**121, 027**	ft^2
(c) Total Post-Project Impervious Area (*sum of Line 3a and Line 3b*)	**121,027**	ft^2
(d) Post-Project Pervious Area	**121,027**	ft^2
Net Impervious Area		
4. Reduced Impervious Area Credit *(Line 2a minus Line 3c)*	**0**	ft^2
5. Net Impervious Area *(Line 3c minus Line 4)*	**121,027**	ft^2

6. Is Line 3c greater than or equal to 2,500 sq. ft?

☐ No, the project does not need to meet Post-Construction Stormwater Management Requirements **- STOP HERE**.

☒ Yes, the project is subject to Performance Requirement No. 1: Site Design and Runoff Reduction. Complete the **Site Design and Runoff Reduction Checklist** on **Page 4**. Continue to #7.

7. Is the Project a detached single-family home?

☐ No, go to #8.

☒ Yes, continue to #7.a. below.

7a. Is Line #5, Net Impervious Area greater than or equal to 15,000 sq ft?

☐ No, the project does not have any additional requirements – **STOP HERE**.

☒ Yes, this project is subject to Performance Requirement No. 2: Water Quality Treatment. Complete the **Water Quality Treatment Checklist** on **Page 6**. Continue to #7.b.

☒ Yes, this project is subject to Performance Requirement No. 3: Runoff Retention. Complete the **Runoff Retention Checklists** on **Pages 8-11**. Continue to #7.b.

7b. Is Line #3.c, amount of impervious surface created and/or replaced, greater than or equal to 22,500 sq ft?

☐ No, go to #12.

☒ Yes, this project is subject to Performance Requirement No. 4: Peak Management (refer to the Stormwater Management Guidance Manual for instructions). Go to #12.

8. For projects that are not detached single family homes, is Line #5, Net Impervious Area, greater than or equal to 5,000 sq ft?

☐ No, the project does not have any additional requirements – **STOP HERE**.

☐ Yes, this project is subject to Performance Requirement No. 2 Water Quality Treatment. Complete the **Water Quality Treatment Checklist** on **Page 6**. Continue to #9.

9. Is Line #3.c, amount of impervious surface created and/or replaced, greater than or equal to 15,000 sq ft?

☐ No, go to #11.

☒ Yes, this project is subject to Performance Requirement No. 3 Runoff Retention. Complete all **Runoff Retention Checklists** on **Pages 8-11**, as applicable. Continue to #10.

10. Is Line #3.c, amount of impervious surface created and/or replaced, greater than or equal to 22,500 sq ft?

☒ No. Continue to #11.

☐ Yes, this project is subject to Performance Requirement No. 4: Peak Management (refer to the Stormwater Management Guidance Manual for instructions). Continue to #11.

11. Is there a pollutant generating activity or source included in the project (e.g., restaurants, grocery stores, food service operations, outdoor storage, vehicle service facilities, retail gas outlets, outdoor parking lots, loading docks, pools, spas, or fountains)?

☒ No, go to #12.

☐ Yes, your Project is required to implement structural or operational source control measures. Complete the **Source Control Checklist** on **page 5**. Continue to #12.

12. **Operation and Maintenance Information**

a) Property Owner's Name **Serene Hills, LLC**

b) Responsible Party for Stormwater Treatment/Hydromodification Control O&M:

i. Name: **Serene Hills, LLC**

ii. Address: **22561 Poppy Drive, Cupertino, CA 95014**

iii. Phone/E-mail: **408.396.2706 / manisviji@yahoo.com**

13. Submit a Stormwater Control Plan with the required information, and complete the **Stormwater Control Plan Checklist** on **page 12**.

☒ Yes **See Improvement Plan Sheets 6**

☐ No

PERFORMANCE REQUIREMENT NO. 1: SITE DESIGN AND RUNOFF REDUCTION

Certification

DESIGN STRATEGY		INCORPORATED INTO PROJECT?
1.	Limit disturbance of creeks and natural drainage features. *Existing drainge swale has been maintained and enhanced to better convey run-on from developments east of the development*	yes
2.	Minimize compaction of highly permeable soils.	yes
3.	Limit clearing and grading of native vegetation at the site to the minimum area needed to build the project, allow access, and provide fire protection.	yes
4.	Minimize impervious surfaces by concentrating improvements on the least sensitive areas of the site, while leaving the remaining land in a natural undisturbed state.	yes
5.	Minimize stormwater runoff by implementing one or more of the following design measures:	yes
	a) Direct roof runoff into cisterns or rain barrels for reuse.	no
	b) Direct roof runoff onto vegetated areas safely away from building foundations and footings. *yes, runoff is routed through vegetated areas and vegetated swales to bioswales wherever possible.*	yes
	c) Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas safely away from building foundations and footings. *yes, sidewalk, driveway, walkway and patio runoff is directed over adjacent vegetation and routed to bioswales and/or bioretention pond.*	yes
	d) Direct runoff from driveways and/or uncovered parking lots onto vegetated areas safely away from building foundations and footings. *yes, driveway and parking area runoff is directed for collection through vegetated swales wherever possible.*	yes
	e) Construct bike lanes, driveways, uncovered parking lots, sidewalks, walkways, and patios with permeable surfaces.	no

I, Kristian Wallace, PE, acting as the Project Engineer for Serene Hills, LLC project, located at Northerly Terminus Of Saddleback Drive And Sorrel Way, hereby state that the Site Design and Runoff Reduction design strategies indicated above have been incorporated into the design of the project.

[signature] Signature

REGISTERED PROFESSIONAL ENGINEER
KRISTIAN A. WALLACE
No. 93207
EXP. 03-31-2024
CIVIL
STATE OF CALIFORNIA

7/24/2023 Date

SOURCE CONTROL CHECKLIST

On-site Source Control Measures	**Incorporated Into Project?**
Wash area/racks, drain to sanitary sewer or septic system[1]	☐ **N/A**
Covered dumpster area, drain to sanitary sewer/septic system[1] or landscaped area	☐ **n/a**
Accessible cleanout for draining swimming pool/spa/fountain	☐ **N/A**
Parking garage floor drains plumbed to sanitary sewer[1]	☐ **n/a**
Fire sprinkler test water/condensate drain lines drain to sanitary sewer/septic system[1] or landscaped area	☐ **yes**
Interior floor drains/boiler drain lines plumbed to sanitary sewer	☐ **yes**
Beneficial landscaping/IPM (minimize irrigation, runoff, pesticides and fertilizers; promotes treatment)	☐ **yes**
Outdoor material storage protection	☐ **n/a**
Covers, drains for loading docks, maintenance bays, fueling areas	☐ **n/a**
Maintenance (pavement sweeping, catch basin cleaning, good housekeeping)	☐ **yes**
Storm drain labeling	☐ **yes**
Other[2] **all proposed runoff routed through vegetated areas**	☐ **yes**

Notes:

[1] Subject to sanitary sewer authority and/or Department of Environmental Health requirements.

[2] See CASQA Stormwater BMP Handbook for New Development and Redevelopment for additional BMPs for vehicle service repair facilities, fuel dispensing areas, industrial processes, rooftop equipment and other pollutant generating activities and sources.
https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook

PERFORMANCE REQUIREMENT NO. 2: WATER QUALITY TREATMENT

Certification

ON-SITE WATER QUALITY TREATMENT MEASURES	INCORPORATED?
1. Low Impact Development (LID) Treatment Systems designed to retain stormwater runoff generated by the 85th percentile 24-hour storm. Stormwater Control Measures Implement (check all that apply, design documentation is required)	
a) Harvesting and Use,	☐ No
b) Infiltration,	☐ Yes
c) Evapotranspiration	☐ Yes
2. Biofiltration Treatment Systems[1] – with the following design parameters:	
a) Maximum surface loading rate appropriate to prevent erosion, scour and channeling within the biofiltration treatment system itself and equal to 5 inches per hour, based on the flow of runoff produced from a rain event equal to or at least: (a) 0.2 inches per hour intensity; or (b) Two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depth	☐ yes
b) Minimum surface reservoir volume equal to the biofiltration treatment system surface area times a depth of 6 inches	☐ Yes
c) Minimum planting medium depth of 24 inches. The planting medium must sustain a minimum infiltration rate of 5 inches per hour throughout the life of the project and must maximize runoff retention and pollutant removal. A mixture of sand (60%-70%) meeting the specifications of American Society for Testing and Materials (ASTM) C33 and compost (30%-40%) may be used. A Project may utilize an alternative planting medium if it demonstrates its planting medium is equal to or more effective at attenuating pollutants than the specified planting medium mixture.	☐ Yes
d) Proper plant selection[2]	☐ Yes
e) Subsurface drainage/storage (gravel) layer with an area equal to the biofiltration treatment system surface area and having a minimum depth of 12 inches	☐ Yes
f) Underdrain with discharge elevation at top of gravel layer	☐ No - Perforated pipe not connected to outflow structure
g) No compaction of soils beneath the biofiltration facility (ripping/loosening of soils required if compacted)	☐ Yes

h) No liners or other barriers interfering with infiltration, except for situations where lateral infiltration is not technically feasible ☐ Yes

3. Non-Retention Based Treatment Systems – designed to meet at least one of the following hydraulic sizing criteria:

   (a) Volume Hydraulic Design Basis – Treatment systems whose primary mode of action depends on volume capacity shall be designed to treat stormwater runoff equal to the volume of runoff generated by the 85th percentile 24-hour storm event, based on local rainfall data. ☐ Yes

   (b) Flow Hydraulic Design Basis – Treatment systems whose primary mode of action depends on flow capacity shall be sized to treat: ☐ Yes
      (i) The flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or
      (ii) The flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

I, Kristian Wallace, PE, acting as the Project Engineer for Serene Hills, LLC project, located at Northerly Terminus Of Saddleback Drive And Sorrel Way, hereby state that the Water Quality Treatment Measures indicated above have been incorporated into the design of the project.

REGISTERED PROFESSIONAL ENGINEER
KRISTIAN A. WALLACE
No. 93207
EXP. 03-31-2024
CIVIL
STATE OF CALIFORNIA

Signature

Date 7/24/2023

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[1] Facilities or a combination of facilities, of a different design than in Item #2 may be permitted if all of the following measures of equivalent effectiveness are demonstrated: 1) equal or greater amount of runoff infiltrated or evapotranspired; 2) equal or lower pollutant concentrations in runoff that is discharged after biofiltration; 3) equal or greater protection against shock loading and spills; and 4) equal or greater accessibility and ease of inspection and maintenance.

[2] Technical guidance for designing bioretention facilities is available from the Central Coast LID Initiative. The guidance includes design specifications and plant lists appropriate for the Central Coast climate. (http://www.centralcoastlidi.org/Central_Coast_LIDI/LID_Structural_BMPs.html)

PERFORMANCE REQUIREMENT NO. 3 – RUNOFF RETENTION

Design Rainfall Events & Treatment Requirements for Watershed Management Zones (WMZs)[1]

WMZ[2]	Treatment Options & Design Rainfall	Check Applicable WMZs
WMZ 1	Via optimized infiltration[3], prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.	☒
WMZ 2	Via storage, rainwater harvesting, infiltration, and/or evapotranspiration, prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WM 4 *	Via optimized infiltration[2], prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WMZ 5	Via optimized infiltration[2] prevent offsite discharge from events up to the 85th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WMZ 6	Via storage, rainwater harvesting, infiltration, and/or evapotranspiration, prevent offsite discharge from events up to the 85th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WMZ 9	Via storage, rainwater harvesting, infiltration, and/or evapotranspiration, prevent offsite discharge from events up to the 85th percentile 24-hour rainfall event as determined from local rainfall data.	☐
WMZ 10 *	Via optimized infiltration[2], prevent offsite discharge from events up to the 95th percentile 24-hour rainfall event as determined from local rainfall data	☐

1. Includes only those WMZs located in Santa Clara County.
2. Use the Santa Clara County Department of Planning and Development Online Property Profile database to determine the WMZ in which your project is located: http://www.sccplanning.org/gisprofile/

   Search for your project site by APN or Address to retrieve the Property Profile. At the bottom of the property profile page, under Special Resources/Hazards/Constraints Areas, look for the "Central Coast Watershed Management Zone Value".
3. Storage, rainwater harvesting, and/or evapotranspiration may be used when infiltration is optimized.

* Applicable only to those areas that overlay designated Groundwater Basins.

PERFORMANCE REQUIREMENT NO. 3 – RUNOFF RETENTION

LID Site Assessment Checklist

ITEMS TO DOCUMENT:	INCLUDED IN PROJECT DOCUMENTS?
1. Site topography	☐ Yes
2. Hydrologic features including contiguous natural areas, wetlands, watercourses, seeps, or springs	☐ Yes
3. Depth to seasonal high groundwater	☐ Yes
4. Locations of groundwater wells used for drinking water	☐ Yes
5. Depth to an impervious layer such as bedrock	☐ N/A
6. Presence of unique geology (e.g., karst)	☐ N/A
7. Geotechnical hazards	☐ N/A
8. Documented soil and/or groundwater contamination	☐ N/A
9. Soil types and hydrologic soil groups	☐ Yes
10. Vegetative cover/trees	☐ Yes
11. Run-on characteristics (source and estimated runoff from offsite which discharges to the project area)	☐ Yes
12. Existing drainage infrastructure for the site and nearby areas including the location of municipal storm drains	☐ Yes
13. Structures including retaining walls	☐ Yes
14. Utilities	☐ Yes
15. Easements	☐ Yes
16. Covenants	☐ No
17. Zoning/Land Use	☐ Yes
18. Setbacks	☐ Yes
19. Open space requirements	☐ N/A
20. Other pertinent overlay(s)	☐ N/A

PERFORMANCE REQUIREMENT NO. 3 – RUNOFF RETENTION
LID Site Design Measures

The Project Engineer shall certify the Project design optimizes the use of the following design measures to augment the design strategies required by Performance Requirement No. 1. Initial each runoff retention measure that has been incorporated and optimized into the design or mark NA if not applicable.

PERFORMANCE REQUIREMENT NO. 3 CERTIFICATION OF LID SITE DESIGN MEASURES

	DESIGN MEASURE	INCORPORATED/ OPTIMIZED
1.	Defining the development envelope, identifying the protected areas, and identifying areas that are most suitable for development and areas to be left undisturbed	Incorporated
2.	Identifying conserved natural areas, including existing trees, other vegetation, and soils (shown on the plans)	Incorporated
3.	Limit the overall impervious footprint of the project	Incorporated
4.	Design of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety or mobility uses are not compromised	Incorporated
5.	Set back development from creeks, wetlands, and riparian habitats	N/A
6.	Design conforms the site layout along natural landforms	Optimized
7.	Design avoids excessive grading and disturbance of vegetation and soils	Optimized

I, Kristian Wallace, PE, acting as the Project Engineer for Serene Hills, LLC project, located at Northerly Terminus Of Saddleback Drive And Sorrel Way, hereby state that LID Site Design Measures initialed have been incorporated into the design of the project.

Signature

REGISTERED PROFESSIONAL ENGINEER
KRISTIAN A. WALLACE
No. 93207
EXP. 03-31-2024
CIVIL
STATE OF CALIFORNIA

7/24/2023
Date

PERFORMANCE REQUIREMENT NO. 3 – RUNOFF RETENTION

TECHNICAL INFEASIBILITY CHECKLIST

	Site Conditions	Check Applicable
1.	Depth to seasonal high groundwater limits infiltration and/or prevents construction of subgrade stormwater control measures[3]	☐ N/A
2.	Depth to an impervious layer such as bedrock limits infiltration	☐ N/A
3.	Sites where soil types significantly limit infiltration	☐ N/A
4.	Sites where pollutant mobilization in the soil or groundwater is a documented concern	☐ N/A
5.	Space constraints (e.g., infill projects, some redevelopment projects, high density development)	☐ N/A
6.	Geotechnical hazards	☐ N/A
7.	Stormwater Control Measures located within 100 feet of a groundwater well used for drinking water	☐ N/A
8.	Incompatibility with surrounding drainage system (e.g., project drains to an existing stormwater collection system whose elevation or location precludes connection to a properly functioning treatment or flow control facility)	☐ N/A

[3] According to the CASQA Frequently Asked Questions about LID, "some MS4 permits and BMP guidance manuals require anywhere from 3-10 feet of separation from the groundwater level for infiltration practices. This distance depends on the soil type, pollutants of concern, and groundwater use. In some cases, however, where there may be groundwater or soil contamination, LID infiltrative practices may be restricted completely. (p. 7 in https://www.casqa.org/Portals/0/LID/CA_LID_FAQ_06-28-2011.pdf)

STORMWATER CONTROL PLAN CHECKLIST

Stormwater Control Plan Required Contents	PR Level	Done?
1. Project Information	All	
• Project name		☑
• Application number		☑
• Address and assessor's parcel number		☑
• Name of Applicant		☑
• Project Phase number (if project is being constructed in phases)		☑
• Project Type (e.g., commercial, industrial, multi-unit residential, mixed-use, public), and description		☑
2. Project Areas	All	
• Total project site area		☑
• Total new impervious surface area		☑
• Total replaced impervious surface area		☑
• Total new pervious area		☑
• Calculation of Net Impervious Area		☑
3. Statement of Performance Requirements that apply to the project:	All	
• Performance Requirement No.1 – Site Design and Runoff Reduction		☑
• Performance Requirement No.2 – Water Quality Treatment		☑
• Performance Requirement No. 3 – Runoff Retention		☑
• Performance Requirement No. 4 – Peak Management		☑
4. Delineation of Drainage Management Areas (DMAs)	All	☑
5. Summary of Site Design and Runoff Reduction Performance Requirement measures selected for the project (see PR-1 checklist)	PR-1	☑
6. Description of Runoff Reduction Measures and Structural Stormwater Control Measures, by Drainage Management Area and for entire site	PR-2, 3, and 4	☑
7. Water quality treatment calculations used to comply with the Water Quality Treatment Performance Requirement and any analysis to support infeasibility determination	PR-2	☑
8. Documentation certifying that the selection, sizing, and design of the Stormwater Control Measures meet the full or partial Water Quality Treatment Performance Requirements (see PR-2 checklist)	PR-2	☑

Stormwater Control Plan Required Contents	PR Level	Done?
9. Statement that Water Quality Treatment Performance Requirement has been met on-site, or, if not achievable: • Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance requirements • Statement of intent to comply with Water Quality Treatment Performance Requirement through Alternative Compliance	PR-2	☑
10. LID Site Assessment Summary (see PR-3 checklist)	PR-3	☑
11. LID Site Design Measures Used (see PR-3 checklist)	PR-3	☑
12. Supporting calculations used to comply with the applicable Runoff Retention Performance Requirements	PR-3	☑
13. Documentation demonstrating infeasibility where Site Design and Runoff Reduction measures and retention-based Stormwater Control Measures cannot retain required runoff volume	PR-3	☑
14. Documentation demonstrating percentage of the project's Equivalent Impervious Surface Area dedicated to retention-based Stormwater Control Measures	PR-3	☑
15. Statement that Runoff Reduction Performance Requirement has been met on-site, or, if not achievable: • Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance requirements • Statement of intent to comply with Runoff Retention Performance Requirements through an Alternative Compliance agreement	PR-3	☑
16. Supporting calculations used to comply with the applicable Peak Management Performance Requirements	PR-4	☑
17. Documentation demonstrating infeasibility where on-site compliance with Peak Management Performance Requirements cannot be achieved	PR-4	☑
18. Statement that Peak Management Performance Requirement has been met on-site, or, if not achievable: • Documentation of the volume of runoff for which compliance cannot be achieved on-site and the associated off-site compliance requirements • Statement of intent to comply with Peak Management Requirements through an Alternative Compliance agreement		☑
19. O&M Plan for all structural SCMs to ensure long-term performance	PR-2, 3, and 4	☑
20. Owner of facilities and responsible party for conducting O&M	PR-2, 3, and 4	☑

Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

Attachment B:
Percolation Test Results

November 3, 2022 File No.: 301138-003

Serene Hills, LLC
Attn. Ms. Viji Mani
22561 Poppy Drive
Cupertino, CA 95014

PROJECT: SERENE HILLS PERCOLATION TESTING
1275B EAST DUNNE AVENUE
MORGAN HILL, CALIFORNIA

SUBJECT: Results of Soil Percolation Rate Testing

Dear Ms. Mani:

Earth Systems Pacific (Earth Systems) conducted soil percolation rate testing of proposed storm water facilities for the planned Serene Hills residential subdivision in Morgan Hill, California. A storm water detention basin is planned on the south corner of the subdivision. The proposed subdivision and Earth Systems' percolation test locations are shown on attached Figures 1 and 2.

A soil profile boring and two percolation rate tests were drilled using a Mobile B-24 drill rig equipped with a 6-inch diameter auger at the proposed detention basin location shown on the attached Boring Location Map. The profile boring was drilled to a depth of 45 feet and no groundwater was encountered. The test holes were drilled to nominal depths of 7½ and 10 feet. Copies of the profile boring log and percolation test results are attached.

The percolation tests were conducted in general accordance with the Shallow Quick Infiltration Testing Methodology, as detailed in the document *Native Soil Assessment for Small Infiltration-Based Stormwater Control Measures* prepared by Earth Systems Pacific for the Central Coast Low Impact Initiative (2013). Perforated PVC pipes were placed in the open borings, and the annular space was backfilled with gravel. The lower four feet of the test holes were then filled with water, and the water level was maintained for approximately 30 minutes (i.e. kept at a constant head). From that point on, the tests were conducted as a falling head test, and measurements were taken as the water level dropped. Copies of the percolation test results are attached.

These test results only indicate the percolation rates at the specific locations and under specific conditions. Sound engineering judgment should be exercised in extrapolating the test results for other conditions or locations. Please note that the test results incorporate both downward and horizontal fluxes of water. Therefore, the test results will need to be adjusted to estimate the downward percolation rates for assessment of the storm water facilities. Technical design references vary in methods they present for using these types of test results. However, most references include reduction and/or correction factors for several parameters including, but not limited to, the size of the storm water percolation system relative to the test volume, the number of tests conducted, the variability in the soil profile, anticipated silt loading, anticipated biological buildup, anticipated long-term maintenance, and other factors. These considerations should be incorporated into the selection of appropriate reduction and/or correction factors during the design and assessment of the subdivisions' stormwater percolation system

Closure

Our intent was to perform soil percolation testing in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. Please do not hesitate to contact this office if you have any questions regarding this report.

Sincerely,

Earth Systems Pacific

Brett Faust
Engineering Geologist

Attachments: Site Vicinity Map
Soil Boring Location Map
Boring Log
Percolation Test Results

FIGURE 1

BASE: Google Earth Pro. 2021. Morgan Hill, Calif. Sept 27

EXPLANATION

● **Project Site: Serene Hills**
1275B East Dunne Ave
Morgan Hill, Calif.

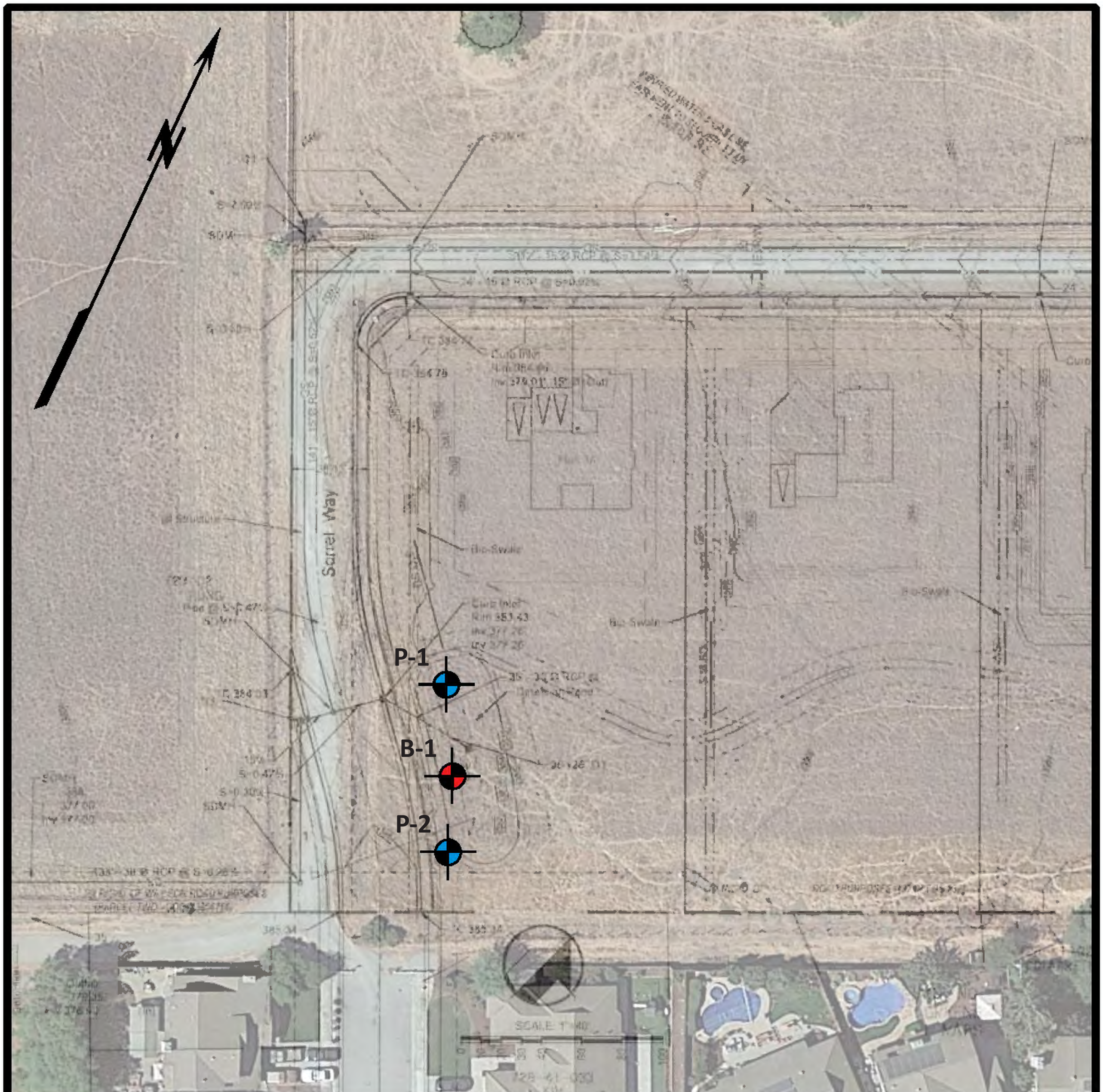
0 250 500

Approximate Scale in Feet

NOTE: All features presented are approximated at this scale.

Earth Systems Pacific	Serene Hills Percolation Testing 1275B East Dunne Ave Morgan Hill, California	SITE VICINITY MAP 301138-003

FIGURE 2



BASE: Google Earth Pro. 2021. Morgan Hill, Calif. Sept 27; MH Engineering Co. 2022. Serene Hills Preliminary Grading Plan, Sheet 3 of 3. Aug

EXPLANATION

B-1 **Boring Location**

P-2 **Percolation Test Location**

80 0 80

Approximate Scale in Feet

NOTE: All features presented are approximated at this scale.

Earth Systems **Pacific**	**Serene Hills Percolation Testing** **1275B East Dunne Ave** **Morgan Hill, California**	**BORING LOCATION MAP** **301138-003**

Earth Systems Pacific

LOGGED BY: J. Woodard
RIG TYPE: B-24 Drill Rig
AUGER TYPE: 6" Solid Stem Auger

Boring No. 1

FILE NO.: 301138-003
DATE: 10/25/2022

Serene Hills Percolation Testing
Morgan Hill, California

SOIL DESCRIPTION

DEPTH (feet)	USCS CLASS	SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.	POCKET PEN (t.s.f)
0	CH	SANDY FAT CLAY; brown, moist, stiff, fine to medium grained sand, trace rootlets							
4.5		- hard, fine sand, trace coarse sand							
5.0			5.0 - 6.5	1-1	SPT			6 12 24	
7	SC	CLAYEY SAND; brown, moist, medium dense, fine grained sand, trace med and coarse grained sand							
10.0			10.0 - 11.5	1-2	SPT			6 11 18	
15.0		- very dense, some medium to coarse sand	15.0 - 16.5	1-3	SPT			13 22 39	
18.5		- cobble fragments observed in cuttings							
20	SP	POORLY-GRADED SAND with GRAVEL; brown, moist, very dense, fine sand, fine and coarse gravel	15.0 - 16.5	1-4	SPT			15 27 34	
22		- some two-inch gravel and cobble fragments observed in cuttings							
25.0		- SPT sampler refusal, grab sample collected from cuttings	25.0 - 26.5	1-5	Bulk Sample				

LEGEND: 2.5" Mod Cal Sample, Shelby, SPT, Bulk Sample, Groundwater

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 1

FILE NO.: 301138-003
DATE: 10/25/2022

LOGGED BY: J. Woodard
RIG TYPE: B-24 Drill Rig
AUGER TYPE: 6" Solid Stem Auger

Serene Hills Percolation Testing
Morgan Hill, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE NUMBER	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.	POCKET PEN (t.s.f)
27	SP		- some cobble fragments observed in cuttings							
28	GP		POORLY-GRADED GRAVEL; gray-brown, moist, coarse gravel							
30			- hard drilling							
32			- sample collected from cuttings	31.0 - 33.0	1-6	Bulk				
35			- sample collected from cuttings	35.0 - 36.5	1-7	Bulk				
40			- no sampling at 40 ft due to risk of borehole collapse							
41	CH		SANDY FAT CLAY with GRAVEL; brown, moist, medium to coarse sand, fine and coarse gravel							
42			- sample collected from cuttings	41.0 - 44.0	1-8	Bulk				
45			Bottom of boring at 45.0' No groundwater encountered Backfilled with drilling spoils and cement							

LEGEND: 2.5" Mod Cal Sample, Shelby, SPT, Bulk Sample, Groundwater

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-1

TEST HOLE DIAMETER: 6 inches

DATE DRILLED: 10/25/22

CASING DIAMETER: 3 inches

DATE TESTED: 10/26/22

TEST HOLE DEPTH : 10.17 feet

TECHNICIAN: JW

RISER HEIGHT: 2.67 feet

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

TEST DURATION: 5 hours

Reference of Measurement: Top of Riser

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	6.17	---	---	---
20	5.95	6.21	6.4	9.4
20	6.21	6.42	7.9	7.6
20	6.42	6.51	18.5	3.2
20	6.51	6.60	18.5	3.2
20	6.60	6.64	41.7	1.4
20	6.64	6.69	33.3	1.8
20	6.69	6.76	23.8	2.5
20	6.76	6.80	41.7	1.4
20	6.80	6.84	41.7	1.4
20	6.84	6.88	41.7	1.4
20	6.88	6.93	33.3	1.8
20	6.93	6.98	33.3	1.8
20	6.98	7.02	41.7	1.4
20	7.02	7.06	41.7	1.4
20	7.06	7.10	41.7	1.4

Project: Hollister IWTP

File No. 302609-001

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-2

TEST HOLE DIAMETER: 6 inches

DATE DRILLED: 10/25/22

CASING DIAMETER: 3 inches

DATE TESTED: 10/26/22

TEST HOLE DEPTH : 10.21 feet

TECHNICIAN: JW

RISER HEIGHT: 0.40 feet

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

TEST DURATION: 5 hours

Reference of Measurement: Top of Riser

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	5.81	---	---	---
20	5.38	5.49	15.2	4.0
20	5.49	6.17	2.5	24.5
20	6.17	6.48	5.4	11.2
20	6.48	6.59	15.2	4.0
20	6.59	6.82	7.2	8.3
20	6.82	6.89	23.8	2.5
20	6.89	6.97	20.8	2.9
20	6.97	7.09	13.9	4.3
20	7.09	7.19	16.7	3.6
20	7.19	7.22	55.6	1.1
20	7.22	7.31	18.5	3.2
20	7.31	7.37	27.8	2.2
20	7.37	7.43	27.8	2.2
20	7.43	7.49	27.8	2.2
20	7.49	7.55	27.8	2.2

March 1, 2023 File No.: 301138-003

Serene Hills, LLC
Attn. Ms. Viji Mani
22561 Poppy Drive
Cupertino, CA 95014

PROJECT: SERENE HILLS PERCOLATION TESTING
2275B EAST DUNNE AVENUE
MORGAN HILL, CALIFORNIA

SUBJECT: Results of Additional Soil Percolation Rate Testing

REFS: Plan Sheet 1: Serene Hills Site Development Plan, #23117.5 by MH Engineering Co., dated December 5, 2022

Revised Results of Soil Percolation Testing, Serene Hills Percolation Testing, 2275B East Dunne Avenue, Morgan Hill, California, Doc. No. 2211-003.RPT.REV1, dated November 3, 2022

Dear Ms. Mani:

In accordance with your authorization, Earth Systems Pacific (Earth Systems) conducted soil percolation rate testing of proposed stormwater facilities for the planned Serene Hills residential subdivision in Morgan Hill, California. The percolation testing was completed in two stages. The first stage consisted of two tests in the planned detention basin at the south corner of the subdivision. These results were presented in Earth Systems' revised report referenced above. The second stage consisted of testing the seven lot-specific bio-swales for each of the planned parcels. The project site and our percolation test locations are shown on the attached Site Vicinity Map (Figure 1) and Percolation Test Location Map (Figure 2). It should be noted that the second stage of testing was performed during an extended period of rain and the ground surface was saturated and surface ponding of water was locally present throughout the site.

On January 31, 2023, Earth System drilled and installed seven percolation test holes (P-3 through P-9) to nominal depths of approximately 5-6 feet at the bio-swale locations identified and marked in the field by MH Engineering.

On February 6, 2023, Earth Systems performed percolation rate testing. The percolation tests were conducted in general accordance with our Shallow Quick Infiltration Testing Methodology, as detailed in the document *Native Soil Assessment for Small Infiltration-Based Stormwater Control Measures* prepared by Earth Systems Pacific for the Central Coast Low Impact Initiative (2013). Perforated PVC pipes were placed in the open borings, and the annular space was backfilled with gravel. The test holes were then filled to surface with water, and the water level was maintained for approximately 30 minutes (i.e. kept at a constant head). From that point on, the tests were conducted as a falling head test, and measurements were taken as the water level dropped. Copies of the percolation test results are attached.

These test results only indicate the percolation rates at the specific locations and under specific conditions. Sound engineering judgment should be exercised in extrapolating the test results for other conditions or locations. Please note that the test results incorporate both downward and horizontal fluxes of water. Therefore, the test results will need to be adjusted to estimate the downward percolation rates for assessment of the storm water facilities. Technical design references vary in methods they present for using these types of test results. However, most references include reduction and/or correction factors for several parameters including, but not limited to, the size of the storm water percolation system relative to the test volume, the number of tests conducted, the variability in the soil profile, anticipated silt loading, anticipated biological buildup, anticipated long-term maintenance, and other factors. These considerations should be incorporated into the selection of appropriate reduction and/or correction factors during the design and assessment of the subdivisions' stormwater percolation system

Closure

Our intent was to perform soil percolation testing in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. Please do not hesitate to contact this office if you have any questions regarding this report.

Sincerely,

Earth Systems Pacific

PROFESSIONAL GEOLOGIST
BRETT D. FAUST
No. 2386
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Brett Faust, CEG 2386
Engineering Geologist

Jim Woodard, GIT 1498
Staff Geologist

Attachments: Figure 1 -Site Vicinity Map
Figure 2 – Percolation Test Location Map
Percolation Test Results: P-3 to P-9

EXPLANATION

Project Site: Serene Hills Subdivision
1275B East Dunne Ave
Morgan Hill, Calif.

0 250 500
Approximate Scale in Feet

NOTE: All features presented are approximated at this scale.

Earth Systems Pacific	Serene Hills Percolation Testing 2275B East Dunne Ave Morgan Hill, California	SITE VICINITY MAP 301138-003

Figure 2

BASE: Google Earth Pro. 2021. Morgan Hill, Calif. Sept 27; MH Engineering Co. 2022. Serene Hills Site Development Plan. Dec. 5

EXPLANATION

B-1 Boring Location *(10/26/22)*
P-1 Percolation Test Location *(10/26/22)*
P-3 Percolation Test Location *(02/06/23)*

50 0 50 100
APPROX. SCALE (FT)
1 inch = 100 feet

NOTE: All features presented are approximated at this scale.

Earth Systems Pacific	**Serene Hills Percolation Testing** **2275B East Dunne Avenue** **Morgan Hill, California**	**PERCOLATION TEST LOCATION MAP** **301138-003**

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-3 **TEST HOLE DIAMETER: 6 inches**

DATE DRILLED: 01/31/23 **CASING DIAMETER: 3 inches**

DATE TESTED: 02/06/23 **TEST HOLE DEPTH: 5.44 feet**

TECHNICIAN: JW **RISER HEIGHT: 2.52 feet**

CONSTANT HEAD DATA **TEST DURATION: 4 hours**

Time of Constant Head: 30 minutes **Reference of Measurement: Top of Riser**

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	2.52	---	---	---
35	2.58	0.06	49	1.2
26	2.73	0.15	14	4.2
29	2.77	0.04	60	1.0
32	2.80	0.03	89	0.7
28	2.81	0.01	233	0.3
30	2.82	0.01	250	0.2
29	2.83	0.01	242	0.2
31	2.84	0.01	258	0.2

Project: Serene Hills

File No. 301138-003

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-4

TEST HOLE DIAMETER: 6 inches

DATE DRILLED: 01/31/23

CASING DIAMETER: 3 inches

DATE TESTED: 02/06/23

TEST HOLE DEPTH: 5.68 feet

TECHNICIAN: JW

RISER HEIGHT: 2.48 feet

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

TEST DURATION: 4 hours

Reference of Measurement: Top of Riser

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	2.50	---	---	---
33	2.72	0.22	13	4.8
27	2.74	0.02	113	0.5
28	2.77	0.03	78	0.8
32	2.78	0.01	267	0.2
29	2.80	0.02	121	0.5
30	2.82	0.02	125	0.5
28	2.84	0.02	117	0.5
31	2.86	0.02	129	0.5

Project: Serene Hills

File No. 301138-003

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-5

TEST HOLE DIAMETER: 6 inches

DATE DRILLED: 01/31/23

CASING DIAMETER: 3 inches

DATE TESTED: 02/06/23

TEST HOLE DEPTH: 5.18 feet

TECHNICIAN: JW

RISER HEIGHT: 2.96 feet

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

TEST DURATION: 4 hours

Reference of Measurement: Top of Riser

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	2.96	---	---	---
32	3.06	0.10	26.7	2.3
26	3.09	0.03	72.2	0.8
29	3.11	0.02	120.8	0.5
31	3.12	0.01	258.3	0.2
29	3.14	0.02	120.8	0.5
30	3.16	0.02	125.0	0.5
29	3.18	0.02	120.8	0.5
31	3.20	0.02	129.2	0.5

Project: Serene Hills

File No. 301138-003

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-6

TEST HOLE DIAMETER: 6 inches

DATE DRILLED: 01/31/23

CASING DIAMETER: 3 inches

DATE TESTED: 02/06/23

TEST HOLE DEPTH: 5.78 feet

TECHNICIAN: JW

RISER HEIGHT: 2.35 feet

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

TEST DURATION: 4 hours

Reference of Measurement: Top of Riser

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	2.35	---	---	---
28	2.72	0.37	6.3	9.5
27	2.79	0.07	32.1	1.9
29	2.80	0.01	241.7	0.2
31	2.81	0.01	258.3	0.2
29	2.83	0.02	120.8	0.5
30	2.84	0.01	250.0	0.2
31	2.85	0.01	258.3	0.2
30	2.86	0.01	250.0	0.2

Project: Serene Hills File No. 301138-003

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-7 **TEST HOLE DIAMETER: 6 inches**

DATE DRILLED: 01/31/23 **CASING DIAMETER: 3 inches**

DATE TESTED: 02/06/23 **TEST HOLE DEPTH: 5.56 feet**

TECHNICIAN: JW **RISER HEIGHT: 2.53 feet**

CONSTANT HEAD DATA **TEST DURATION: 4 hours**

Time of Constant Head: 30 minutes **Reference of Measurement: Top of Riser**

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	2.68	---	---	---
28	3.52	0.84	2.8	21.6
27	3.58	0.06	37.5	1.6
28	3.62	0.04	58.3	1.0
32	3.64	0.02	133.3	0.5
28	3.66	0.02	116.7	0.5
30	3.68	0.02	125.0	0.5
30	3.70	0.02	125.0	0.5
31	3.72	0.02	129.2	0.5

Project: Serene Hills

File No. 301138-003

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-8

TEST HOLE DIAMETER: 6 inches

DATE DRILLED: 01/31/23

CASING DIAMETER: 3 inches

DATE TESTED: 02/06/23

TEST HOLE DEPTH: 5.27 feet

TECHNICIAN: JW

RISER HEIGHT: 2.86 feet

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

TEST DURATION: 4 hours

Reference of Measurement: Top of Riser

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	3.01	---	---	---
25	3.45	0.44	4.7	12.7
27	3.50	0.05	45.0	1.3
30	3.54	0.04	62.5	1.0
30	3.60	0.06	41.7	1.4
31	3.61	0.01	258.3	0.2
31	3.63	0.02	129.2	0.5
30	3.65	0.02	125.0	0.5
32	3.67	0.02	133.3	0.5

Project: Serene Hills

File No. 301138-003

PERCOLATION TEST RESULTS

PERCOLATION TEST: P-9

TEST HOLE DIAMETER: 6 inches

DATE DRILLED: 01/31/23

CASING DIAMETER: 3 inches

DATE TESTED: 02/06/23

TEST HOLE DEPTH: 5.59 feet

TECHNICIAN: JW

RISER HEIGHT: 2.40 feet

CONSTANT HEAD DATA

Time of Constant Head: 30 minutes

TEST DURATION: 4 hours

Reference of Measurement: Top of Riser

FALLING HEAD DATA

INTERVAL (Minutes)	READING (Feet)	INCREMENTAL FALL (Feet)	PERCOLATION RATE (Minutes / Inch)	PERCOLATION RATE (Inches / Hour)
Constant Head	2.40	---	---	---
26	2.91	0.51	4.2	14.1
26	2.92	0.01	216.7	0.3
33	2.94	0.02	137.5	0.4
30	2.96	0.02	125.0	0.5
29	2.98	0.02	120.8	0.5
29	3.00	0.02	120.8	0.5
29	3.02	0.02	120.8	0.5
32	3.04	0.02	133.3	0.5

A summary has been provided below of all test results, factors of safety used, and design infiltration rates for each SCM location

SCM	Percolation Test Hole	Test Rate	Factor of Safety	Design Infiltration Rate
1	3	0.2 in/hr	2	0.1 in/hr
2	4	0.5 in/hr	2	0.25 in/hr
3	5	0.5 in/hr	2	0.25 in/hr
4	6	0.2 in/hr	2	0.1 in/hr
5	7	0.5 in/hr	2	0.25 in/hr
6	8	0.5 in/hr	2	0.25 in/hr
7	9	0.5 in/hr	2	0.25 in/hr
8	1 & 2	1.4 in/hr	2	0.7 in/hr

Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

Attachment C:
NOAA Rainfall Data

Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

Rainfall Data

a) Select location
Move crosshair or double click
b) Click on station icon
Show stations on map

Location information:
Name: Morgan Hill, California, USA*
Latitude: 37.1421°
Longitude: -121.6100°
Elevation: 416.6 ft **

* Source: ESRI Maps
** Source: USGS

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 6, Version 2

PF tabular | PF graphical | Supplementary information | Print page

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.120** (0.105-0.138)	**0.153** (0.134-0.177)	**0.199** (0.173-0.231)	**0.237** (0.204-0.278)	**0.291** (0.239-0.356)	**0.333** (0.267-0.420)	**0.377** (0.293-0.492)	**0.424** (0.317-0.574)	**0.490** (0.347-0.699)	**0.543** (0.368-0.809)
10-min	**0.171** (0.150-0.198)	**0.220** (0.192-0.254)	**0.285** (0.248-0.331)	**0.340** (0.292-0.399)	**0.416** (0.343-0.511)	**0.477** (0.382-0.602)	**0.541** (0.419-0.705)	**0.608** (0.454-0.822)	**0.702** (0.497-1.00)	**0.778** (0.527-1.16)
15-min	**0.207** (0.181-0.239)	**0.266** (0.232-0.307)	**0.345** (0.300-0.400)	**0.411** (0.354-0.482)	**0.504** (0.415-0.618)	**0.577** (0.462-0.728)	**0.654** (0.507-0.852)	**0.735** (0.550-0.994)	**0.849** (0.601-1.21)	**0.941** (0.637-1.40)
30-min	**0.289** (0.253-0.334)	**0.370** (0.324-0.428)	**0.480** (0.418-0.557)	**0.573** (0.493-0.672)	**0.702** (0.578-0.861)	**0.804** (0.644-1.01)	**0.912** (0.707-1.19)	**1.02** (0.766-1.39)	**1.18** (0.838-1.69)	**1.31** (0.888-1.96)
60-min	**0.435** (0.381-0.502)	**0.558** (0.487-0.645)	**0.723** (0.629-0.839)	**0.862** (0.742-1.01)	**1.06** (0.870-1.30)	**1.21** (0.970-1.53)	**1.37** (1.06-1.79)	**1.54** (1.15-2.09)	**1.78** (1.26-2.54)	**1.97** (1.34-2.94)
2-hr	**0.668** (0.585-0.771)	**0.858** (0.749-0.992)	**1.11** (0.969-1.29)	**1.33** (1.14-1.56)	**1.63** (1.34-2.00)	**1.86** (1.49-2.35)	**2.11** (1.64-2.75)	**2.37** (1.77-3.20)	**2.73** (1.94-3.90)	**3.03** (2.05-4.51)
3-hr	**0.840** (0.735-0.969)	**1.08** (0.941-1.25)	**1.40** (1.22-1.62)	**1.67** (1.44-1.96)	**2.04** (1.68-2.51)	**2.34** (1.87-2.95)	**2.65** (2.06-3.45)	**2.98** (2.23-4.03)	**3.44** (2.43-4.90)	**3.80** (2.58-5.67)
6-hr	**1.20** (1.05-1.38)	**1.54** (1.34-1.78)	**1.99** (1.74-2.31)	**2.38** (2.05-2.79)	**2.92** (2.40-3.58)	**3.35** (2.68-4.23)	**3.80** (2.95-4.95)	**4.28** (3.20-5.78)	**4.95** (3.50-7.06)	**5.48** (3.72-8.18)
12-hr	**1.62** [illegible]	**2.07** [illegible]	**2.70** [illegible]	**3.24** [illegible]	**3.99** [illegible]	**4.61** [illegible]	**5.25** [illegible]	**5.94** [illegible]	**6.93** [illegible]	**7.73** [illegible]
24-hr	**2.11** (1.90-2.38)	**2.71** (2.44-3.07)	**3.54** (3.18-4.02)	**4.24** (3.78-4.86)	**5.26** (4.53-6.22)	**6.08** (5.13-7.35)	**6.95** (5.73-8.61)	**7.89** (6.32-10.0)	**9.23** (7.09-12.2)	**10.3** (7.66-14.2)

Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

Attachment D:
Retention Volume Calculations

Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

Retention Volume Calculations

Post Construction Storm Water Management Calculations
Per Resolution No. R3-2013-0032

1.) Determination of the Retention Tributary Area

a.)

Impervious Areas									
				Post-Development					
	Pre-Development			Replaced			New		
DMA	Roof	PCC	AC	Roof	PCC	AC	Roof	PCC	AC
1	0	0	0	0	0	0	5,300	3,266	2,287
2	0	0	0	0	0	0	3,463	3,197	2,337
3	0	0	0	0	0	0	4,631	3,217	2,337
4	0	0	0	0	0	0	4,631	3,866	3,750
5	0	0	0	0	0	0	3,464	2,937	2,516
6	0	0	0	0	0	0	5,300	3,522	3,463
7	0	0	0	0	0	0	5,300	2,191	1,300
8	0	0	0	0	0	0	0	9,874	38,879

Pervious vs Impervious Areas									
		Pre-Development		Post-Development					
					Impervious				
DMA	Total Area	Pervious	Impervious	Pervious	Replaced	New	Total	i	C
1	23,084	23,084	0	12,232	0	10,852	10,852	0.47	0.32
2	21,799	21,799	0	12,803	0	8,997	8,997	0.41	0.29
3	25,624	25,624	0	15,439	0	10,185	10,185	0.40	0.28
4	21,018	21,018	0	8,771	0	12,247	12,247	0.58	0.40
5	18,342	18,342	0	9,425	0	8,916	8,916	0.49	0.33
6	29,055	29,055	0	16,769	0	12,286	12,286	0.42	0.29
7	19,170	19,170	0	10,380	0	8,791	8,791	0.46	0.31
8	282,792	282,792	0	234,038	0	48,753	48,753	0.17	0.15
Total	440,884	440,884	0	319,858	0	121,027	121,027	0.27	0.21

A_{total} = drainage area (sf)
A_{roofs} = roof areas (sf)
$A_{pcc\text{-}walks/parking}$ = area of pcc walks & parking lot
$A_{pcc\text{ -}streets}$ = area of pcc walks and curbs (sf)
$A_{AC\text{-}streets}$ = Street pavement areas (sf)
$A_{pervious}$ = Planted & Open Areas (sf)
$A_{impervious}$ = total impervious roof areas, PCC areas & AC areas (sf)

i = fraction of the tributary area that is impervious = $A_{impervious}$ / A_{area}

$C_{area\#}$ = Area runoff coefficient=C = $0.858i^3 - 0.78i^2 + 0.774i + 0.04$

b.)adjustments for redevelopment project

DMA	DMA Area	A_{PA}	A_{other}	$A_{replaced}$	$A_{retention}$
1	23,084	0	0	0	23,084
2	21,799	0	0	0	21,799
3	25,624	0	0	0	25,624
4	21,018	0	0	0	21,018
5	18,342	0	0	0	18,342
6	29,055	0	0	0	29,055
7	19,170	0	0	0	19,170
8	282,792	118,120	0	0	164,672
Total	440,884	118,120	0	0	322,765

A_{PA} = Undisturbed or Self-Retaining Planted or Open Areas
A_{other} = Impervious Areas that discharge to independent infiltrating Areas
$A_{replaced}$ = Replaced Impervious Areas
$A_{retention}$ = Retention Tributary Area = DMA Area - A_{PA} - A_{other} - (0.5 x $A_{replaced}$)

2.) Determination of Retention Volume

a.) retention requirement

1 = WMZ = watershed management zone per WMZ map Hollister,

b.) WMZ 1 Runoff Retention Requirement = Retain 95th percentile 24-hour rainfall event

1.05 = D_{85} = 85^{th} Percentile Rainfall Depth
1.65 = D_{95} = 95^{th} Percentile Rainfall Depth

c.) compute the runoff coefficient

DMA	DMA Area	Impervious Area	i	C
1	23,084	10,852	0.47	0.32
2	21,799	8,997	0.41	0.29
3	25,624	10,185	0.40	0.28
4	21,018	12,247	0.58	0.40
5	18,342	8,916	0.49	0.33
6	29,055	12,286	0.42	0.29
7	19,170	8,791	0.46	0.31
8	282,792	48,753	0.17	0.15
Total	440,884	121,027	0.27	0.21

C = $0.858i^3 - 0.78i^2 + 0.774i + 0.04$
i = fraction of the tributary area that is impervious = $A_{impervious}$ / $A_{project}$

d.) Project Type

Residential

e.) Compute Retention Volume required

DMA	$A_{retention}$	i	C	D_{85}	V_{85}	D_{95}	V_{95}
1	23,084	0.47	0.32	1.05	648	1.65	1,018
2	21,799	0.41	0.29	1.05	547	1.65	860
3	25,624	0.40	0.28	1.05	624	1.65	981
4	21,018	0.58	0.40	1.05	728	1.65	1,144
5	18,342	0.49	0.33	1.05	530	1.65	834
6	29,055	0.42	0.29	1.05	744	1.65	1,169
7	19,170	0.46	0.31	1.05	526	1.65	827
8	164,672	0.17	0.15	1.05	2,228	1.65	3,502
Total	**322,765**	0.27	0.21	1.05	5,972	1.65	9,384

$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$

i = fraction of the tributary area that is impervious = $A_{impervious} / A_{project}$

$V_{retention}$ = Required Retention Volume = $A_{retention} \times C \times (D_{95}/12)$

3.) Retention Volume Provided

3a.) Provided Retention Volume SCM #1

Surface Volume Calculations			
Elevation	Surface Area	Incremental Volume	Cumulative Volume
382.25	500.00 SF	0.00 CF	0.00 CF
382.75	822.07 SF	330.52 SF	330.52 SF

Bioretention Volume				
Material	Area	Depth	% Voids	Volume
Biomedia	500.00 SF	24 in.	25%	250.00 CF

Pipe and Rock Volume

Pipe Diameter = D_{pipe} =	8 in.	Rock Width	5 Ft.
Pipe Outer Diameter = OD =	9 in.	Rock Length	100 Ft.
No. of Rows = n_{rows} =	1	Rock Depth	33 in.
Pipe Length = L_{rows} =	98 Ft.	Rock Voids	40%

Pipe Volume = $V_{pipe} = (D_{pipe}/2)^2 \times \pi \times n_{rows} \times L_{rows}$ = 34 CF

Rock Volume = $V_{rock} = [(W_{rock} \times H_{rock} \times L_{rock}) - V_{pipe}] \times Voids$ = 533 CF

$V_{pipe+rock} = V_{pipe} + V_{rock}$ = 567 CF

Total Volume Provided SCM 1

Total Volume: $V_{total} = V_{surface} + V_{biomedia} + V_{pipe+rock} =$ 1,147 CF

1,147 CF ≥ 648 CF; therefore complies with PC-2

1,147 CF ≥ 1,018 CF; therefore complies with PC-3

3a.) Provided Retention Volume SCM #2

Surface Volume Calculations			
Elevation	Surface Area	Incremental Volume	Cumulative Volume
388.50	400.00 SF	0.00 CF	0.00 CF
389.00	719.07 SF	279.77 SF	279.77 SF

Bioretention Volume				
Material	Area	Depth	% Voids	Volume
Biomedia	400.00 SF	24 in.	25%	200.00 CF

Pipe and Rock Volume

Pipe Diameter = D_{pipe} = 8 in.
Pipe Outer Diameter = OD = 9 in.
No. of Rows = n_{rows} = 1
Pipe Length = L_{rows} = 98 Ft.

Rock Width 4 Ft.
Rock Length 100 Ft.
Rock Depth 33 in.
Rock Voids 40%

Pipe Volume = $V_{pipe} = (D_{pipe}/2)^2 \times \pi \times n_{rows} \times L_{rows}$ = 34 CF
Rock Volume = $V_{rock} = [(W_{rock} \times H_{rock} \times L_{rock}) - V_{pipe}] \times \text{Voids}$ = 423 CF
$V_{pipe+rock} = V_{pipe} + V_{rock}$ = 457 CF

Total Volume Provided SCM 2

Total Volume: $V_{total} = V_{surface} + V_{biomedia} + V_{pipe+rock} =$ 937 CF

937 CF ≥ 547 CF; therefore complies with PC-2

937 CF ≥ 860 CF; therefore complies with PC-3

3a.) Provided Retention Volume SCM #3

Surface Volume Calculations			
Elevation	Surface Area	Incremental Volume	Cumulative Volume
393.00	450.00 SF	0.00 CF	0.00 CF
393.50	770.57 SF	305.14 SF	305.14 SF

Bioretention Volume				
Material	Area	Depth	% Voids	Volume
Biomedia	450.00 SF	24 in.	25%	225.00 CF

Pipe and Rock Volume

Pipe Diameter = D_{pipe} =	8 in.	Rock Width	4.5 Ft.
Pipe Outer Diameter = OD =	9 in.	Rock Length	100 Ft.
No. of Rows = n_{rows} =	1	Rock Depth	33 in.
Pipe Length = L_{rows} =	93 Ft.	Rock Voids	40%

Pipe Volume = $V_{pipe} = (D_{pipe}/2)^2 \times \pi \times n_{rows} \times L_{rows}$ = 32 CF
Rock Volume = $V_{rock} = [(W_{rock} \times H_{rock} \times L_{rock}) - V_{pipe}] \times Voids$ = 479 CF
$V_{pipe+rock} = V_{pipe} + V_{rock}$ = 511 CF

Total Volume Provided SCM 3

Total Volume: $V_{total} = V_{surface} + V_{biomedia} + V_{pipe+rock}$ = 1,041 CF
1,041 CF ≥ 624 CF; therefore complies with PC-2
1,041 CF ≥ 981 CF; therefore complies with PC-3

3a.) Provided Retention Volume SCM #4

Surface Volume Calculations			
Elevation	Surface Area	Incremental Volume	Cumulative Volume
400.11	486.00 SF	0.00 CF	0.00 CF
400.61	839.00 SF	331.25 SF	331.25 SF

Bioretention Volume				
Material	Area	Depth	% Voids	Volume
Biomedia	486.21 SF	24 in.	25%	243.10 CF

Pipe and Rock Volume

Pipe Diameter = D_{pipe} =	8 in.	Rock Bottom Area	486.00 SF
Pipe Outer Diameter = OD =	9 in.	Rock Depth	36 in.
No. of Rows = n_{rows} =	1	Rock Voids	40%
Pipe Length = L_{rows} =	98 Ft.		

Pipe Volume = $V_{pipe} = (D_{pipe}/2)^2 \times \pi \times n_{rows} \times L_{rows}$ = 34 CF
Rock Volume = $V_{rock} = [(W_{rock} \times H_{rock} \times L_{rock}) - V_{pipe}] \times Voids$ = 566 CF
$V_{pipe+rock} = V_{pipe} + V_{rock}$ = 600 CF

Total Volume Provided SCM 4

Total Volume: $V_{total} = V_{surface} + V_{biomedia} + V_{pipe+rock}$ = 1,174 CF
1,174 CF ≥ 728 CF; therefore complies with PC-2
1,174 CF ≥ 1,144 CF; therefore complies with PC-3

3a.) Provided Retention Volume SCM #5

Surface Volume Calculations			
Elevation	Surface Area	Incremental Volume	Cumulative Volume
408.90	400.00 SF	0.00 CF	0.00 CF
409.40	581.07 SF	245.27 SF	245.27 SF

Bioretention Volume				
Material	Area	Depth	% Voids	Volume
Biomedia	400.00 SF	24 in.	25%	200.00 CF

Pipe and Rock Volume

Pipe Diameter = D_{pipe} =	8 in.	Rock Width	8 Ft.
Pipe Outer Diameter = OD =	9 in.	Rock Length	50 Ft.
No. of Rows = n_{rows} =	1	Rock Depth	33 in.
Pipe Length = L_{rows} =	46 Ft.	Rock Voids	40%

Pipe Volume = $V_{pipe} = (D_{pipe}/2)^2 \times \pi \times n_{rows} \times L_{rows}$ = 16 CF

Rock Volume = $V_{rock} = [(W_{rock} \times H_{rock} \times L_{rock}) - V_{pipe}] \times Voids$ = 432 CF

$V_{pipe+rock} = V_{pipe} + V_{rock}$ = 448 CF

Total Volume Provided SCM 5

Total Volume: $V_{total} = V_{surface} + V_{biomedia} + V_{pipe+rock}$ = 893 CF

893 CF ≥ 530 CF; therefore complies with PC-2

893 CF ≥ 834 CF; therefore complies with PC-3

3a.) Provided Retention Volume SCM #6

Surface Volume Calculations			
Elevation	Surface Area	Incremental Volume	Cumulative Volume
416.65	560.00 SF	0.00 CF	0.00 CF
417.15	801.07 SF	340.27 SF	340.27 SF

Bioretention Volume				
Material	Area	Depth	% Voids	Volume
Biomedia	560.00 SF	24 in.	25%	280.00 CF

Pipe and Rock Volume

Pipe Diameter = D_{pipe} =	8 in.	Rock Width	8 Ft.
Pipe Outer Diameter = OD =	9 in.	Rock Length	70 Ft.
No. of Rows = n_{rows} =	1	Rock Depth	33 in.
Pipe Length = L_{rows} =	63 Ft.	Rock Voids	40%

Pipe Volume = $V_{pipe} = (D_{pipe}/2)^2 \times \pi \times n_{rows} \times L_{rows}$ = 22 CF
Rock Volume = $V_{rock} = [(W_{rock} \times H_{rock} \times L_{rock}) - V_{pipe}] \times Voids$ = 605 CF
$\mathbf{V_{pipe+rock} = V_{pipe} + V_{rock}}$ = **627 CF**

Total Volume Provided SCM 6

Total Volume: $V_{total} = V_{surface} + V_{biomedia} + V_{pipe+rock}$ = 1,247 CF

1,247 CF ≥ 744 CF; therefore complies with PC-2

1,247 CF ≥ 1,169 CF; therefore complies with PC-3

3a.) Provided Retention Volume SCM #7

Surface Volume Calculations			
Elevation	Surface Area	Incremental Volume	Cumulative Volume
424.80	350.00 SF	0.00 CF	0.00 CF
425.30	667.57 SF	254.39 SF	254.39 SF

Bioretention Volume				
Material	Area	Depth	% Voids	Volume
Biomedia	350.00 SF	24 in.	25%	175.00 CF

Pipe and Rock Volume

Pipe Diameter = D_{pipe} = 8 in.
Pipe Outer Diameter = OD = 9 in.
No. of Rows = n_{rows} = 1
Pipe Length = L_{rows} = 92 Ft.

Rock Width 3.5 Ft.
Rock Length 100 Ft.
Rock Depth 33 in.
Rock Voids 40%

Pipe Volume = $V_{pipe} = (D_{pipe}/2)^2 \times \pi \times n_{rows} \times L_{rows}$ = 32 CF
Rock Volume = $V_{rock} = [(W_{rock} \times H_{rock} \times L_{rock}) - V_{pipe}] \times Voids$ = 369 CF
$\mathbf{V_{pipe+rock} = V_{pipe} + V_{rock}}$ = **401 CF**

Total Volume Provided SCM 7

Total Volume: $V_{total} = V_{surface} + V_{biomedia} + V_{pipe+rock}$ = 830 CF

830CF ≥ 827; therefore ok

3a.) Provided Retention Volume SCM #8

Surface Volume Calculations			
Elevation	Surface Area	Incremental Volume	Cumulative Volume
380.90	2,486.89 SF	0.00 CF	0.00 CF
381.40	2,846.62 SF	1,333.38 CF	1,333.38 CF

Bioretention Volume				
Material	Area	Depth	% Voids	Volume
Biomedia	2,486.89 SF	24 in.	25%	1,243.45 CF

Pipe and Rock Volume

Pipe Diameter = D_{pipe} = 8 in.
Pipe Outer Diameter = OD = 9 in.
No. of Rows = n_{rows} = 1
Pipe Length = L_{rows} = 84 Ft.

Rock Bottom Area 2,486.89 SF
Rock Depth 33 in.
Rock Voids 40%

Pipe Volume = $V_{pipe} = (D_{pipe}/2)^2 \times \pi \times n_{rows} \times L_{rows}$ = 29 CF
Rock Volume = $V_{rock} = [(W_{rock} \times H_{rock} \times L_{rock}) - V_{pipe}] \times \text{Voids}$ = 2,721 CF
$V_{pipe+rock} = V_{pipe} + V_{rock}$ = 2,750 CF

Total Volume Provided SCM 8

Total Volume: $V_{total} = V_{surface} + V_{biomedia} + V_{rock}$ = 5,327 CF
5,327 CF ≥ 2,228 CF; therefore complies with PC-2
5,327 CF ≥ 3,502 CF; therefore complies with PC-3

4.) Summary of Hydraflow Hydrographs Output

0.7 in/hr = Exfiltration Rate (See Attachment B for details)

Return	Pre Dev. (cfs)	Post Dev. (cfs)	Out from SCM 8 (cfs)
2 year	23.42	23.31	23.25
5 year	31.36	31.25	31.20
10 year	38.02	37.91	37.85
25 year	47.65	47.55	47.48
100 year	63.52	63.41	63.35

see detailed Output on following sheets

5.) Drawdown Time Calculations
5a.) SCM 1

Retention Volume = 1,147 CF
Infiltration Area = 500.00 SF
Design Infiltration Rate = 0.1 in/hr

Infiltration Flow Rate = Infiltration Area x Design Infiltration Rate x (1 ft./12 in) = 4.17 CF/Hour

Drawdown Time = (Storage Volume/Infiltration Flow Rate) = 275 hours

Due to low infiltration rates, this SCM does not fully drain within 48 hours; however, since this SCM has been sized using the simplified method, additional volume is not requried.

HydroCAD modeling shows a watersurface elevation below the bottom of the surface storage is achieved by hour 85 in the model, 61 hours after the end of the storm. This removes the potential vector control issue within 72 hours after the end of the storm.

5b.) SCM 2

Retention Volume = 937 CF
Infiltration Area = 400.00 SF
Design Infiltration Rate = 0.25 in/hr

Infiltration Flow Rate = Infiltration Area x Design Infiltration Rate x (1 ft./12 in) = 8.33 CF/Hour

Drawdown Time = (Storage Volume/Infiltration Flow Rate) = 112 hours

Due to low infiltration rates, this SCM does not fully drain within 48 hours; however, since this SCM has been sized using the simplified method, additional volume is not requried.

HydroCAD modeling shows a watersurface elevation below the bottom of the surface storage is achieved by hour 49 in the model, 35 hours after the end of the storm. This removes the potential vector control issue within 72 hours after the end of the storm.

5c.) SCM 3

Retention Volume = 1,041 CF
Infiltration Area = 450.00 SF
Design Infiltration Rate = 0.25 in/hr

Infiltration Flow Rate = Infiltration Area x Design Infiltration Rate x (1 ft./12 in) = 9.38 CF/Hour

Drawdown Time = (Storage Volume/Infiltration Flow Rate) = 111 hours

Due to low infiltration rates, this SCM does not fully drain within 48 hours; however, since this SCM has been sized using the simplified method, additional volume is not requried.

HydroCAD modeling shows a watersurface elevation below the bottom of the surface storage is achieved by hour 49 in the model, 35 hours after the end of the storm. This removes the potential vector control issue within 72 hours after the end of the storm.

5d.) SCM 4

Retention Volume = 1,174 CF
Infiltration Area = 486.21 SF
Design Infiltration Rate = 0.1 in/hr

Infiltration Flow Rate = Infiltration Area x Design Infiltration Rate x (1 ft./12 in) = 4.05 CF/Hour

Drawdown Time = (Storage Volume/Infiltration Flow Rate) = 290 hours

Due to low infiltration rates, this SCM does not fully drain within 48 hours; however, since this SCM has been sized using the simplified method, additional volume is not requried.

HydroCAD modeling shows a watersurface elevation below the bottom of the surface storage is achieved by hour 85 in the model, 61 hours after the end of the storm. This removes the potential vector control issue within 72 hours after the end of the storm.

5e.) SCM 5

Retention Volume = 893 CF
Infiltration Area = 400.00 SF
Design Infiltration Rate = 0.25 in/hr

Infiltration Flow Rate = Infiltration Area x Design Infiltration Rate x (1 ft./12 in) = 8.33 CF/Hour

Drawdown Time = (Storage Volume/Infiltration Flow Rate) = 107 hours

Due to low infiltration rates, this SCM does not fully drain within 48 hours; however, since this SCM has been sized using the simplified method, additional volume is not requried.

HydroCAD modeling shows a watersurface elevation below the bottom of the surface storage is achieved by hour 49 in the model, 35 hours after the end of the storm. This removes the potential vector control issue within 72 hours after the end of the storm.

5f.) SCM 6

Retention Volume = 1,247 CF
Infiltration Area = 560.00 SF
Design Infiltration Rate = 0.25 in/hr

Infiltration Flow Rate = Infiltration Area x Design Infiltration Rate x (1 ft./12 in) = 11.67 CF/Hour

Drawdown Time = (Storage Volume/Infiltration Flow Rate) = 107 hours

Due to low infiltration rates, this SCM does not fully drain within 48 hours; however, since this SCM has been sized using the simplified method, additional volume is not requried.

HydroCAD modeling shows a watersurface elevation below the bottom of the surface storage is achieved by hour 49 in the model, 35 hours after the end of the storm. This removes the potential vector control issue within 72 hours after the end of the storm.

5g.) SCM 7

Retention Volume = 830 CF
Infiltration Area = 350.00 SF
Design Infiltration Rate = 0.25 in/hr

Infiltration Flow Rate = Infiltration Area x Design Infiltration Rate x (1 ft./12 in) = 7.29 CF/Hour

Drawdown Time = (Storage Volume/Infiltration Flow Rate) = 114 hours

Due to low infiltration rates, this SCM does not fully drain within 48 hours; however, since this SCM has been sized using the simplified method, additional volume is not requried.

HydroCAD modeling shows a watersurface elevation below the bottom of the surface storage is achieved by hour 49 in the model, 35 hours after the end of the storm. This removes the potential vector control issue within 72 hours after the end of the storm.

5h.) SCM 8

Retention Volume = 5,327 CF
Infiltration Area = 2,486.89 SF
Design Infiltration Rate = 0.7 in/hr

Infiltration Flow Rate = Infiltration Area x Design Infiltration Rate x (1 ft./12 in) = 145.07 CF/Hour

Drawdown Time = (Storage Volume/Infiltration Flow Rate) = 37 hours

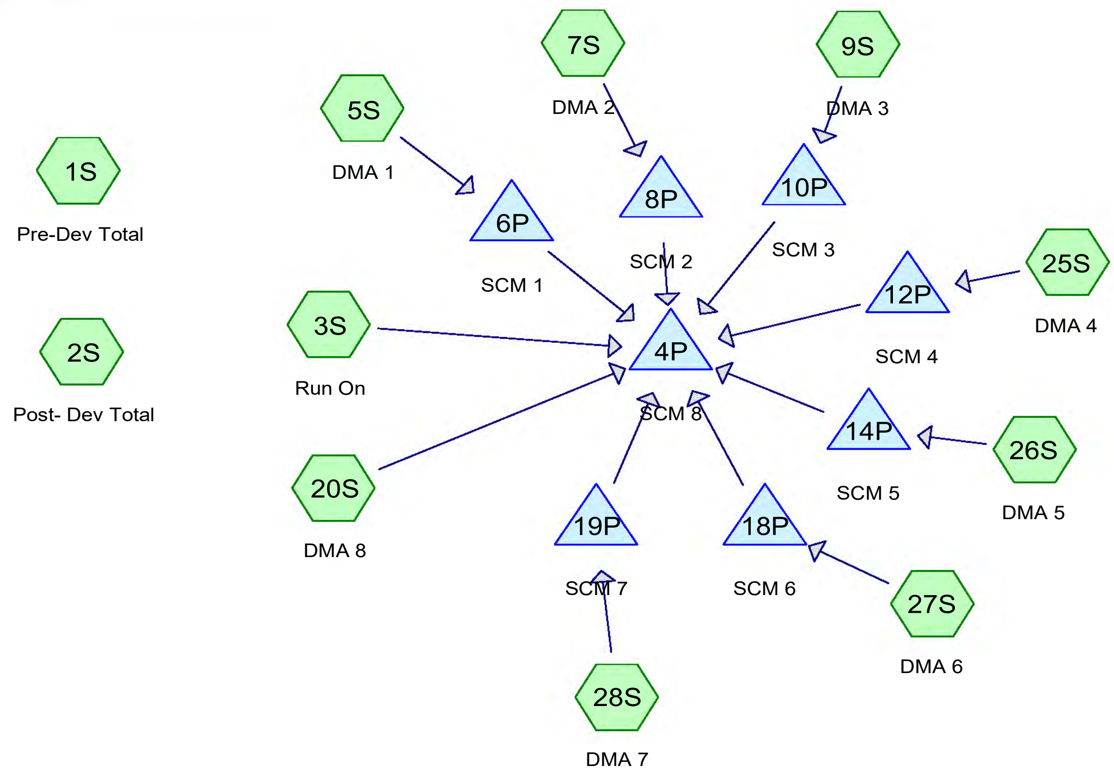
Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

Attachment E:
HydroCAD SCS Modeling Output

Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

SCS Routing

Event Summary



Events for Subcatchment 1S: Pre-Dev Total

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	17.61	9.381	1.50
2 year	2.71	23.42	12.954	2.07
5 year	3.54	31.36	17.984	2.87
10 year	4.24	38.02	22.271	3.56
25 year	5.26	47.65	28.557	4.56
50 year	6.08	55.36	33.633	5.38
100 year	**6.95**	**63.52**	**39.030**	**6.24**

Events for Subcatchment 2S: Post- Dev Total

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	17.61	9.381	1.50
2 year	2.71	23.42	12.954	2.07
5 year	3.54	31.36	17.984	2.87
10 year	4.24	38.02	22.271	3.56
25 year	5.26	47.65	28.557	4.56
50 year	6.08	55.36	33.633	5.38
100 year	**6.95**	**63.52**	**39.030**	**6.24**

Events for Pond 4P: SCM 8

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	17.53	17.51	0.06	17.45	**0.00**	382.08	7,715
2 year	23.33	23.31	0.06	23.25	0.00	382.18	8,083
5 year	31.28	31.25	0.06	31.20	0.00	382.31	8,538
10 year	37.94	37.91	0.06	37.85	0.00	382.41	8,906
25 year	47.58	47.55	0.06	47.48	0.00	382.54	9,401
50 year	55.29	55.25	0.06	55.19	0.00	382.64	9,783
100 year	**63.45**	**63.41**	**0.06**	**63.35**	0.00	**382.73**	**10,174**

Event = rainfall event
Inflow = total inflow into storm water control
Outflow = total outflow from storm water control (discarded+primary+tertiary)
Discarded = flow via infiltration
Primary = Flow released into the City Storm Drain at Saddleback Drive. (occurs above elevation 381.60)
Tertiary = Overflow over the back of sidewalk at Saddleback Drive. (occurs above elevation 384.10)

Pre-Development Summary

Summary for Subcatchment 1S: Pre-Dev Total

Runoff = 63.52 cfs @ 18.12 hrs, Volume= 39.030 af, Depth= 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

Area (sf)	CN	Description
3,270,256	94	Fallow, bare soil, HSG D
3,270,256		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Total Summary

Summary for Subcatchment 2S: Post- Dev Total

Runoff = 63.52 cfs @ 18.12 hrs, Volume= 39.030 af, Depth= 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
*	2,829,371	94	Run On
	204,631	84	1 acre lots, 20% imp, HSG D
*	118,134	98	New Impervious
*	118,120	94	Undisturbed

3,270,256	94	Weighted Average
3,111,196		95.14% Pervious Area
159,060		4.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

DMA 1 Summary

Summary for Subcatchment 5S: DMA 1

Runoff = 0.44 cfs @ 18.14 hrs, Volume= 0.260 af, Depth= 5.89"
Routed to Pond 6P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
	12,232	84	1 acre lots, 20% imp, HSG D
*	5,300	98	Roof
*	3,266	98	PCC
*	2,287	98	AC
	23,085	91	Weighted Average
	9,786		42.39% Pervious Area
	13,299		57.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For DMA 1

Events for Subcatchment 5S: DMA 1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	0.11	0.056	1.26
2 year	2.71	0.15	0.080	1.80
5 year	3.54	0.21	0.114	2.58
10 year	4.24	0.26	0.143	3.25
25 year	5.26	0.33	0.187	4.23
50 year	6.08	0.38	0.222	5.04
100 year	**6.95**	**0.44**	**0.260**	**5.89**

SCM 1 Summary

Summary for Pond 6P: SCM 1

Inflow Area = 0.530 ac, 57.61% Impervious, Inflow Depth = 5.89" for 100 year event
Inflow = 0.44 cfs @ 18.14 hrs, Volume= 0.260 af
Outflow = 0.44 cfs @ 18.16 hrs, Volume= 0.243 af, Atten= 0%, Lag= 1.1 min
Discarded = 0.00 cfs @ 18.16 hrs, Volume= 0.012 af
Primary = 0.44 cfs @ 18.16 hrs, Volume= 0.231 af
Routed to Pond 4P : SCM8

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 382.81' @ 18.16 hrs Surf.Area= 863 sf Storage= 1,186 cf

Plug-Flow detention time= 189.4 min calculated for 0.243 af (93% of inflow)
Center-of-Mass det. time= 154.5 min (1,064.5 - 910.0)

Volume	Invert	Avail.Storage	Storage Description
#1	377.50'	3,141 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.50	500	0.0	0	0
377.51	500	40.0	2	2
380.25	500	40.0	548	550
380.26	500	25.0	1	551
382.24	500	25.0	248	799
382.25	500	100.0	5	804
382.75	822	100.0	331	1,134
383.25	1,158	100.0	495	1,629
383.75	1,509	100.0	667	2,296
384.25	1,873	100.0	846	3,141

Device	Routing	Invert	Outlet Devices
#1	Primary	382.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	377.50'	**0.100 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 18.16 hrs HW=382.81' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.39 cfs @ 18.16 hrs HW=382.81' (Free Discharge)
1=Orifice/Grate (Weir Controls 0.39 cfs @ 0.81 fps)

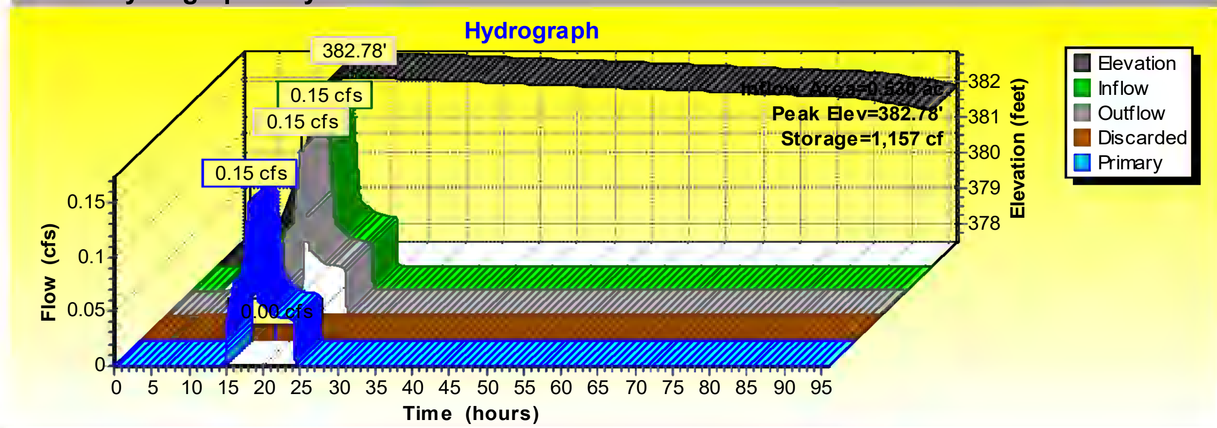
Post-Development Event Summary For SCM 1

Events for Pond 6P: SCM 1

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	0.11	0.11	0.00	0.11	382.77	1,153
2 year	0.15	0.15	0.00	0.15	382.78	1,157
5 year	0.21	0.21	0.00	0.21	382.78	1,163
10 year	0.26	0.26	0.00	0.26	382.79	1,167
25 year	0.33	0.33	0.00	0.33	382.80	1,174

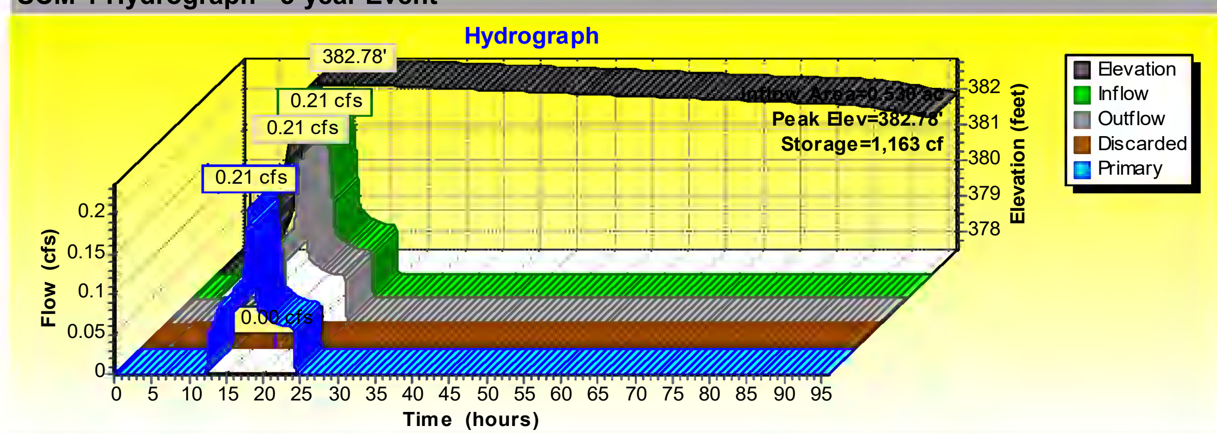
50 year	0.38	0.38	0.00	0.38	382.80	1,180
100 year	**0.44**	**0.44**	**0.00**	**0.44**	**382.81**	**1,186**

SCM 1 Hydrograph - 2-year Event



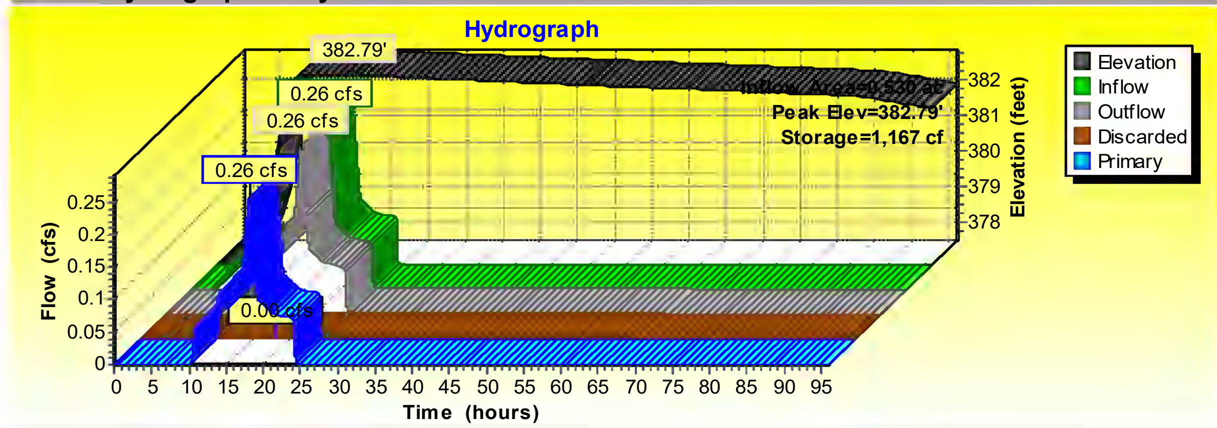
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 382.75)
Note: Infiltration of the surface storage occurs at hour 85.

SCM 1 Hydrograph - 5-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 382.75)
Note: Infiltration of the surface storage occurs at hour 85.

SCM 1 Hydrograph - 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

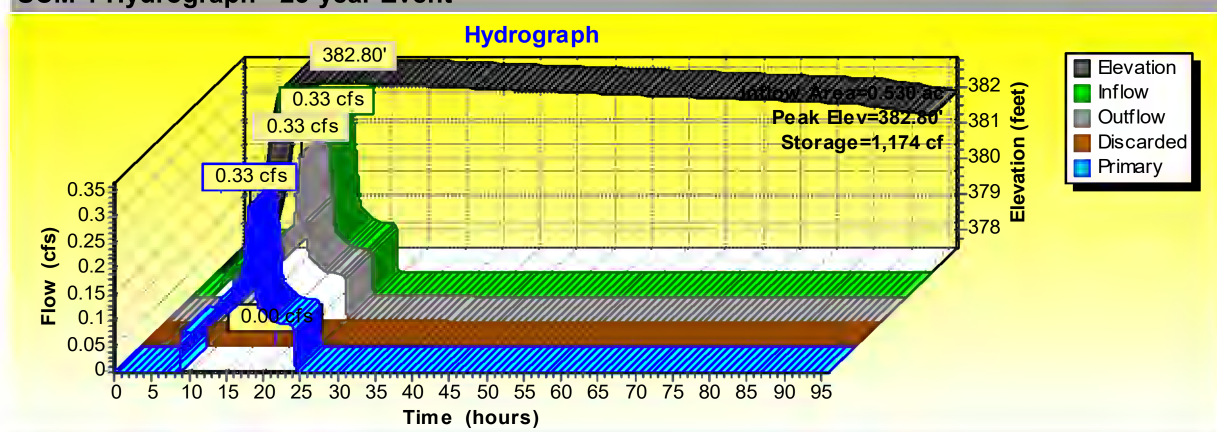
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 382.75)

Note: Infiltration of the surface storage occurs at hour 85.

SCM 1 Hydrograph - 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

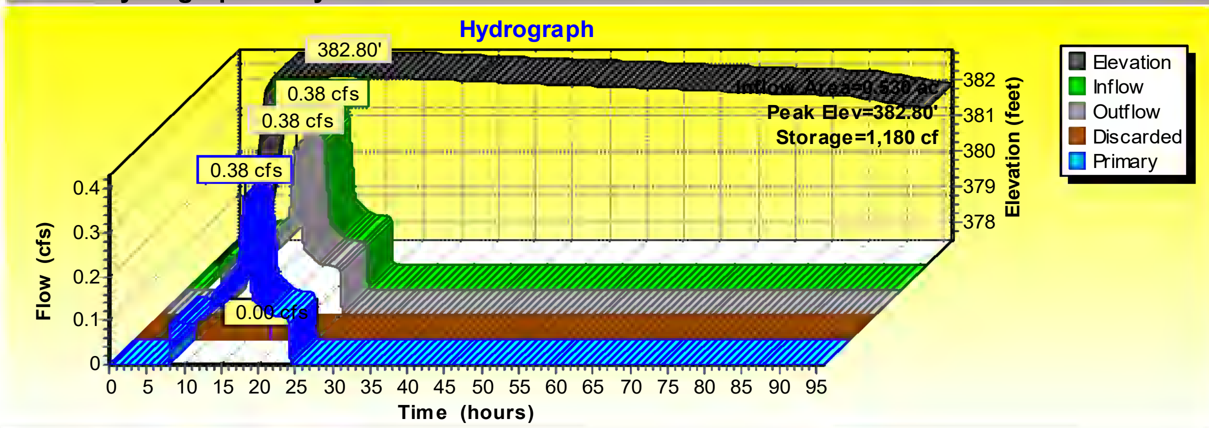
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 382.75)

Note: Infiltration of the surface storage occurs at hour 85.

SCM 1 Hydrograph - 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

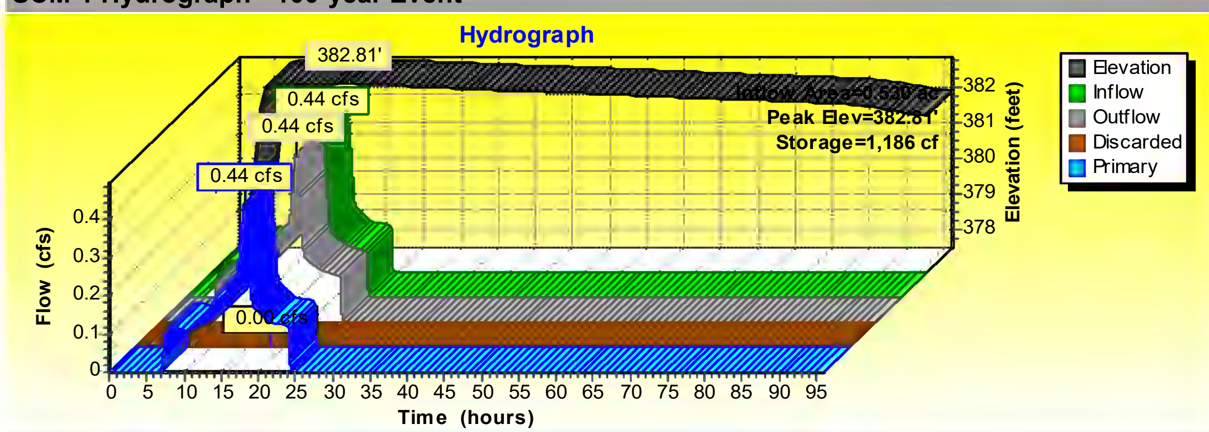
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 382.75)

Note: Infiltration of the surface storage occurs at hour 85.

SCM 1 Hydrograph - 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 382.75)

Note: Infiltration of the surface storage occurs at hour 85.

DMA 2 Summary

Summary for Subcatchment 7S: DMA 2

Runoff = 0.41 cfs @ 18.14 hrs, Volume= 0.241 af, Depth= 5.77"
Routed to Pond 8P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
	12,803	84	1 acre lots, 20% imp, HSG D
*	3,463	98	Roof
*	3,197	98	PCC
*	2,337	98	AC
	21,800	90	Weighted Average
	10,242		46.98% Pervious Area
	11,558		53.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For DMA 2

Events for Subcatchment 7S: DMA 2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	0.10	0.050	1.19
2 year	2.71	0.14	0.072	1.72
5 year	3.54	0.20	0.104	2.49
10 year	4.24	0.24	0.131	3.15
25 year	5.26	0.31	0.172	4.13
50 year	6.08	0.36	0.205	4.92
100 year	**6.95**	**0.41**	**0.241**	**5.77**

SCM 2 Summary

Summary for Pond 8P: SCM 2

Inflow Area = 0.500 ac, 53.02% Impervious, Inflow Depth = 5.77" for 100 year event
Inflow = 0.41 cfs @ 18.14 hrs, Volume= 0.241 af
Outflow = 0.41 cfs @ 18.15 hrs, Volume= 0.235 af, Atten= 0%, Lag= 0.7 min
Discarded = 0.00 cfs @ 18.15 hrs, Volume= 0.023 af
Primary = 0.41 cfs @ 18.15 hrs, Volume= 0.213 af
Routed to Pond 4P : SCM 8

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 389.06' @ 18.15 hrs Surf.Area= 759 sf Storage= 967 cf

Plug-Flow detention time= 232.0 min calculated for 0.235 af (98% of inflow)
Center-of-Mass det. time= 220.1 min (1,136.8 - 916.7)

Volume	Invert	Avail.Storage	Storage Description
#1	383.75'	1,365 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
383.75	400	0.0	0	0
383.76	400	40.0	2	2
386.50	400	40.0	438	440
386.51	400	25.0	1	441
388.49	400	25.0	198	639
388.50	400	100.0	4	643
389.00	719	100.0	280	923
389.50	1,052	100.0	443	1,365

Device	Routing	Invert	Outlet Devices
#1	Primary	389.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	383.75'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 18.15 hrs HW=389.06' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

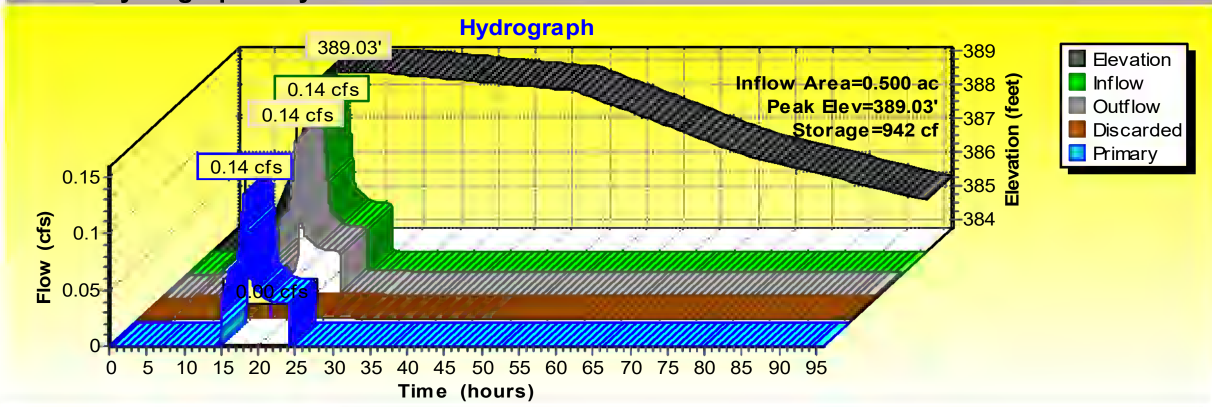
Primary OutFlow Max=0.38 cfs @ 18.15 hrs HW=389.06' (Free Discharge)
└─**1=Orifice/Grate** (Weir Controls 0.38 cfs @ 0.80 fps)

Post-Development Event Summary For SCM 2

Events for Pond 8P: SCM 2

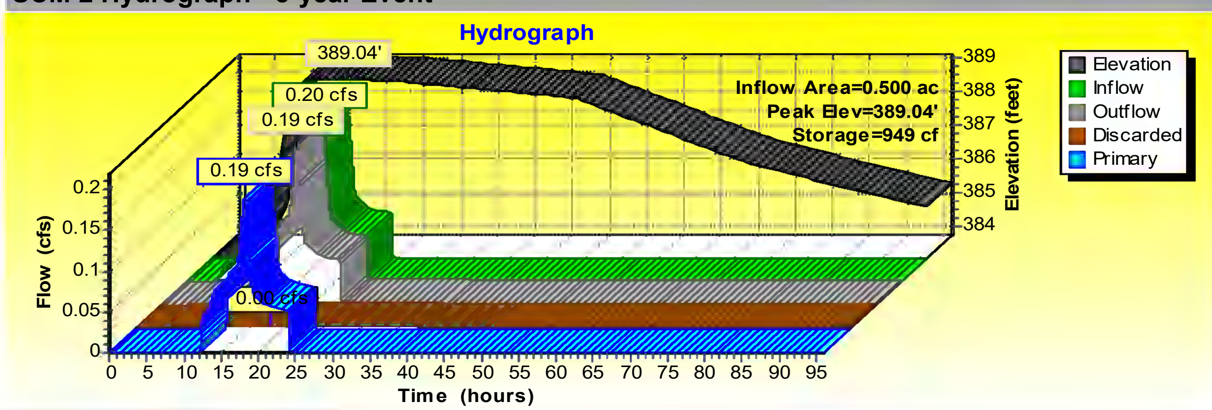
Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	0.10	0.10	0.00	0.10	389.02	936
2 year	0.14	0.14	0.00	0.14	389.03	942
5 year	0.20	0.19	0.00	0.19	389.04	949
10 year	0.24	0.24	0.00	0.24	389.04	954
25 year	0.31	0.31	0.00	0.30	389.05	959
50 year	0.36	0.36	0.00	0.35	389.05	963
100 year	**0.41**	**0.41**	**0.00**	**0.41**	**389.06**	**967**

SCM 2 Hydrograph - 2-year Event



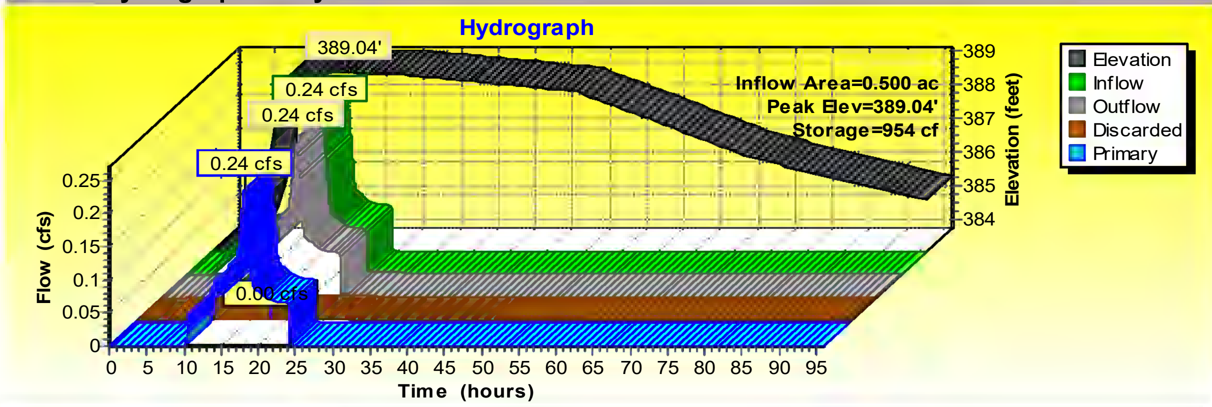
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 389.00)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 2 Hydrograph - 5-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 389.00)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 2 Hydrograph - 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

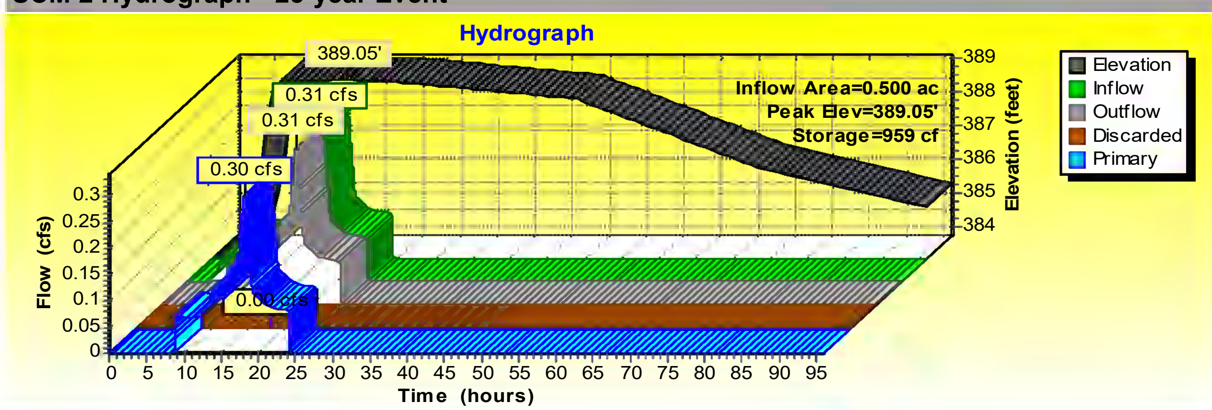
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 389.00)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 2 Hydrograph - 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

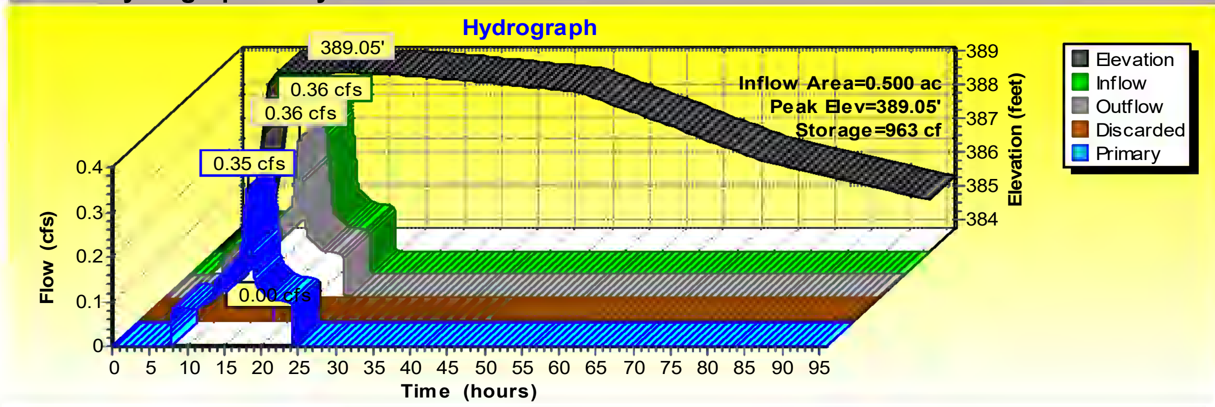
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 389.00)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 2 Hydrograph - 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

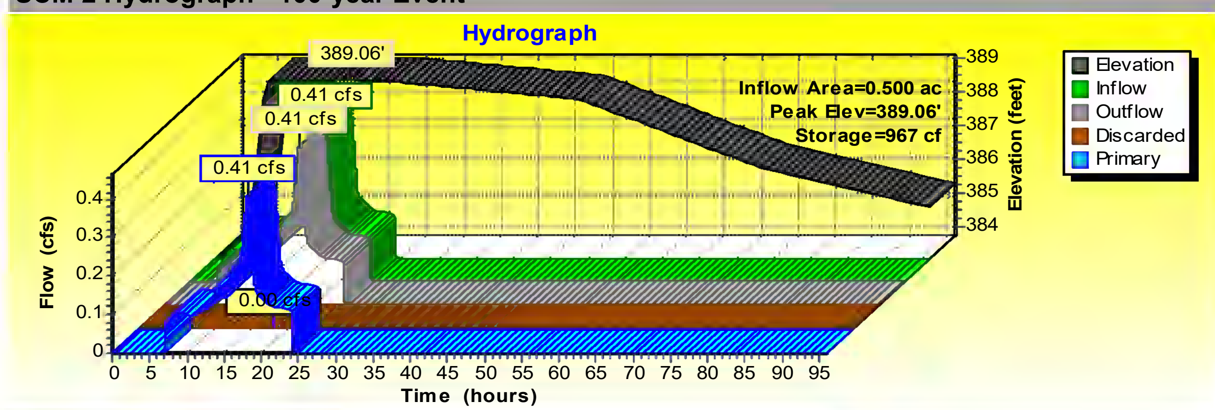
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 389.00)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 2 Hydrograph - 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 389.00)

Note: Infiltration of the surface storage occurs at hour 49.

DMA 3 Summary

Summary for Subcatchment 9S: DMA 3

Runoff = 0.49 cfs @ 18.14 hrs, Volume= 0.283 af, Depth= 5.77"
Routed to Pond 10P : SCM 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
	15,439	84	1 acre lots, 20% imp, HSG D
*	4,631	98	Roof
*	3,217	98	PCC
*	2,337	98	AC
	25,624	90	Weighted Average
	12,351		48.20% Pervious Area
	13,273		51.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For DMA 3

Events for Subcatchment 9S: DMA 3

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	0.12	0.058	1.19
2 year	2.71	0.17	0.084	1.72
5 year	3.54	0.23	0.122	2.49
10 year	4.24	0.28	0.154	3.15
25 year	5.26	0.36	0.202	4.13
50 year	6.08	0.42	0.241	4.92
100 year	**6.95**	**0.49**	**0.283**	**5.77**

SCM 3 Summary

Summary for Pond 10P: SCM 3

Inflow Area = 0.588 ac, 51.80% Impervious, Inflow Depth = 5.77" for 100 year event
Inflow = 0.49 cfs @ 18.14 hrs, Volume= 0.283 af
Outflow = 0.49 cfs @ 18.15 hrs, Volume= 0.277 af, Atten= 0%, Lag= 0.8 min
Discarded = 0.00 cfs @ 18.15 hrs, Volume= 0.025 af
Primary = 0.48 cfs @ 18.15 hrs, Volume= 0.252 af
Routed to Pond 4P : SCM 8

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 393.57' @ 18.15 hrs Surf.Area= 815 sf Storage= 1,081 cf

Plug-Flow detention time= 221.3 min calculated for 0.277 af (98% of inflow)
Center-of-Mass det. time= 209.8 min (1,126.6 - 916.7)

Volume	Invert	Avail.Storage	Storage Description
#1	388.25'	1,498 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
388.25	450	0.0	0	0
388.26	450	40.0	2	2
391.00	450	40.0	493	495
391.01	450	25.0	1	496
392.99	450	25.0	223	719
393.00	450	100.0	4	723
393.50	771	100.0	305	1,029
394.00	1,105	100.0	469	1,498

Device	Routing	Invert	Outlet Devices
#1	Primary	393.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	388.25'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 18.15 hrs HW=393.57' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

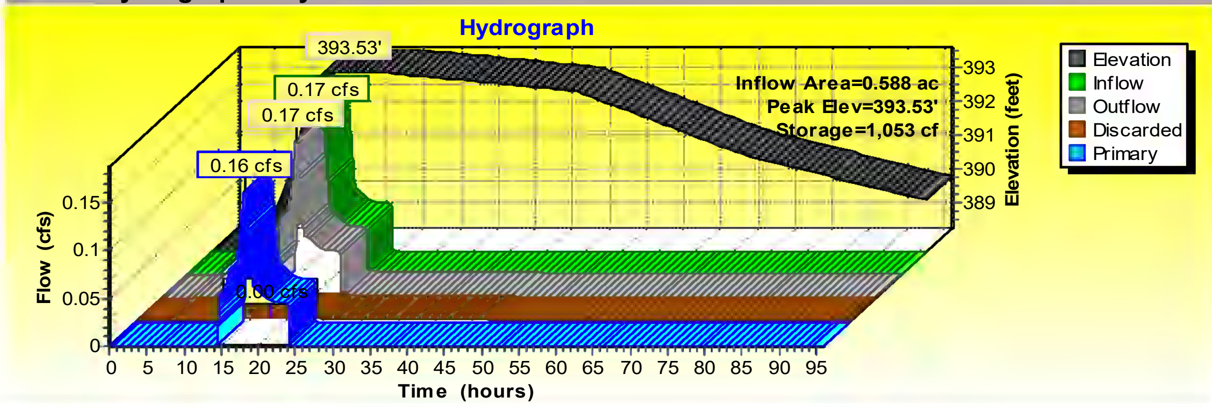
Primary OutFlow Max=0.45 cfs @ 18.15 hrs HW=393.57' (Free Discharge)
└─**1=Orifice/Grate** (Weir Controls 0.45 cfs @ 0.84 fps)

Post-Development Event Summary For SCM 3

Events for Pond 10P: SCM 3

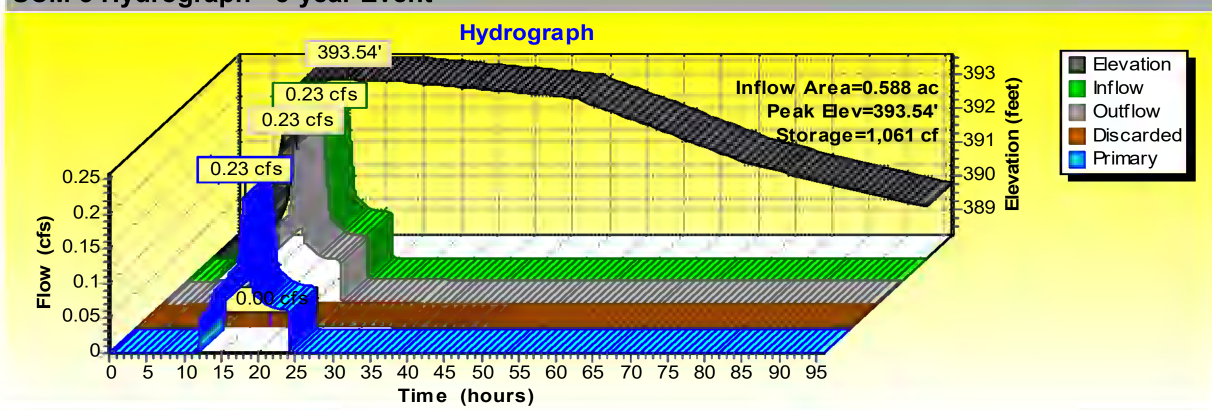
Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	0.12	0.12	0.00	0.12	393.52	1,046
2 year	0.17	0.17	0.00	0.16	393.53	1,053
5 year	0.23	0.23	0.00	0.23	393.54	1,061
10 year	0.28	0.28	0.00	0.28	393.55	1,065
25 year	0.36	0.36	0.00	0.35	393.55	1,071
50 year	0.42	0.42	0.00	0.42	393.56	1,076
100 year	**0.49**	**0.49**	**0.00**	**0.48**	**393.57**	**1,081**

SCM 3 Hydrograph - 2-year Event



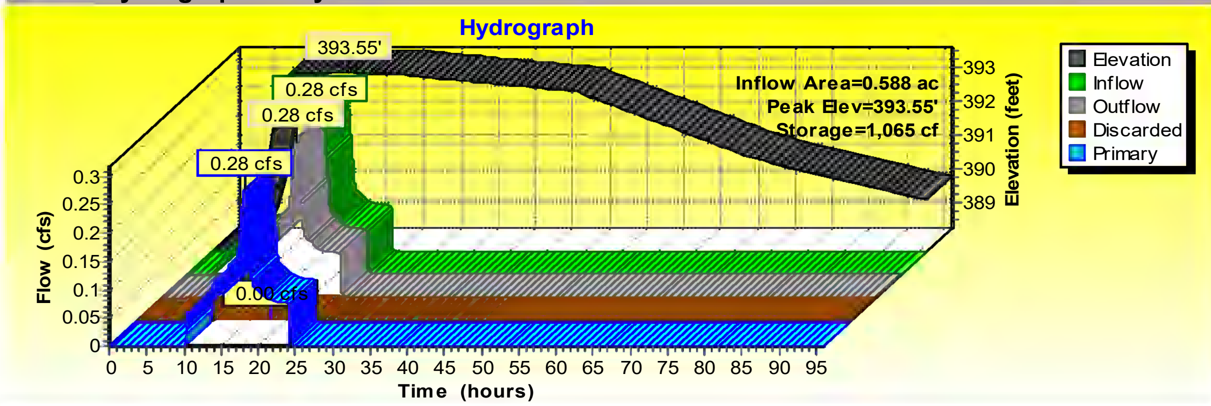
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 393.50)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 3 Hydrograph - 5-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 393.50)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 3 Hydrograph - 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

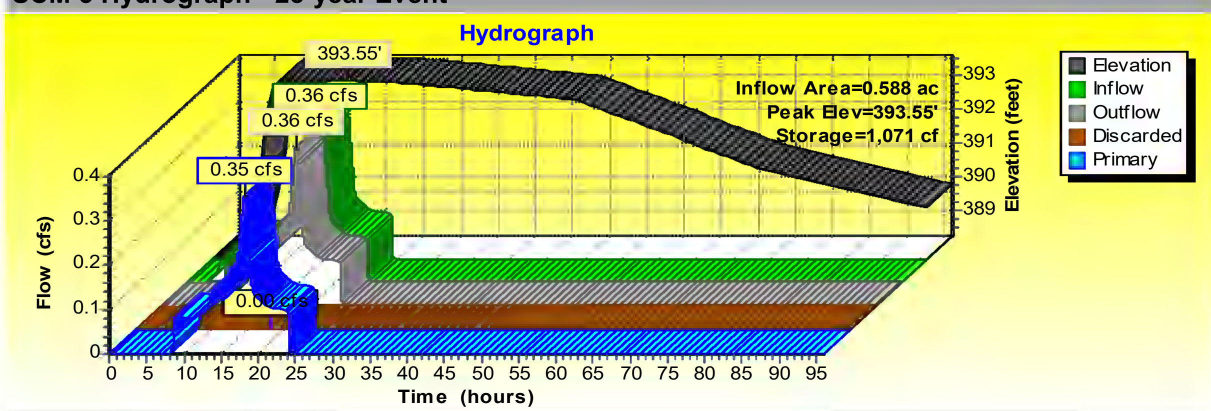
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 393.50)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 3 Hydrograph - 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

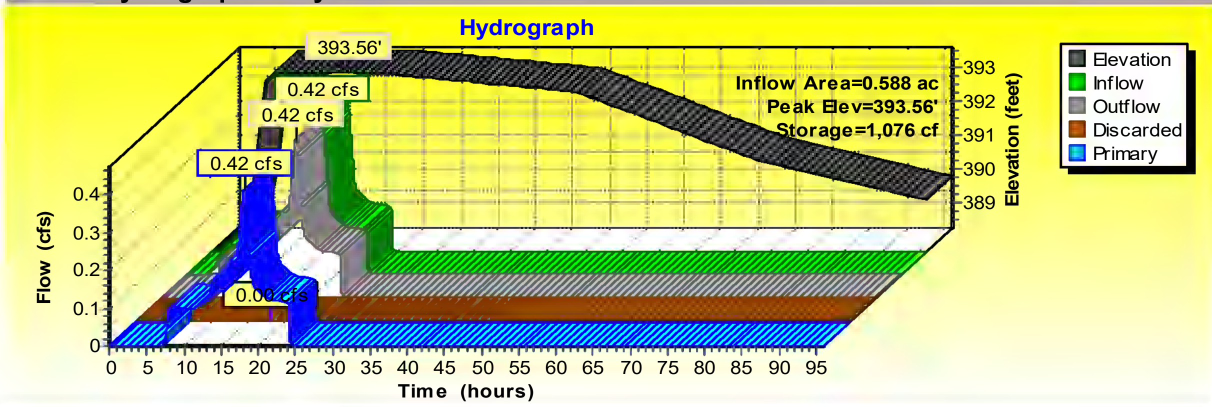
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 393.50)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 3 Hydrograph - 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

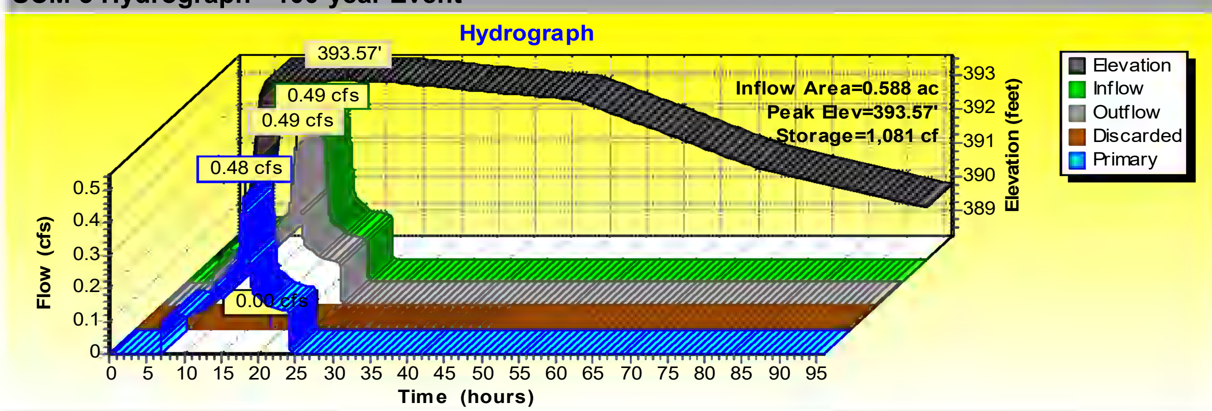
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 393.50)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 3 Hydrograph - 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 393.50)

Note: Infiltration of the surface storage occurs at hour 49.

DMA 4 Summary

Summary for Subcatchment 25S: DMA 4

Runoff = 0.40 cfs @ 18.14 hrs, Volume= 0.241 af, Depth= 6.01"
Routed to Pond 12P : SCM4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
	8,771	84	1 acre lots, 20% imp, HSG D
*	4,631	98	Roof
*	3,866	98	PCC
*	3,750	98	AC
	21,018	92	Weighted Average
	7,017		33.38% Pervious Area
	14,001		66.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For DMA 4

Events for Subcatchment 25S: DMA 4

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	0.11	0.054	1.34
2 year	2.71	0.14	0.076	1.89
5 year	3.54	0.20	0.108	2.68
10 year	4.24	0.24	0.135	3.35
25 year	5.26	0.30	0.175	4.34
50 year	6.08	0.35	0.207	5.15
100 year	**6.95**	**0.40**	**0.241**	**6.01**

SCM 4 Summary

Summary for Pond 12P: SCM 4

Inflow Area = 0.483 ac, 66.62% Impervious, Inflow Depth = 6.01" for 100 year event
Inflow = 0.40 cfs @ 18.14 hrs, Volume= 0.241 af
Outflow = 0.40 cfs @ 18.15 hrs, Volume= 0.225 af, Atten= 0%, Lag= 0.9 min
Discarded = 0.00 cfs @ 18.15 hrs, Volume= 0.012 af
Primary = 0.40 cfs @ 18.15 hrs, Volume= 0.213 af
Routed to Pond 4P : SCM8

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 400.67' @ 18.15 hrs Surf.Area= 882 sf Storage= 1,163 cf

Plug-Flow detention time= 201.8 min calculated for 0.225 af (93% of inflow)
Center-of-Mass det. time= 164.8 min (1,067.8 - 903.0)

Volume	Invert	Avail.Storage	Storage Description
#1	395.36'	1,624 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
395.36	486	0.0	0	0
395.37	486	40.0	2	2
398.11	486	40.0	533	535
398.12	486	25.0	1	536
400.10	486	25.0	241	776
400.11	486	100.0	5	781
400.61	839	100.0	331	1,112
401.11	1,206	100.0	511	1,624

Device	Routing	Invert	Outlet Devices
#1	Primary	400.61'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	395.36'	**0.100 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 18.15 hrs HW=400.67' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

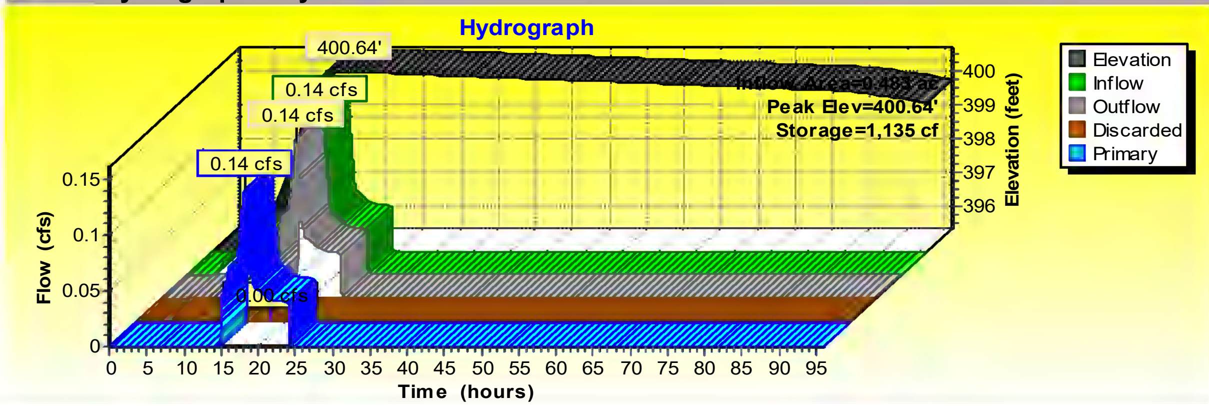
Primary OutFlow Max=0.37 cfs @ 18.15 hrs HW=400.67' (Free Discharge)
└─**1=Orifice/Grate** (Weir Controls 0.37 cfs @ 0.79 fps)

Post-Development Event Summary For SCM 4

Events for Pond 12P: SCM 4

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	0.11	0.11	0.00	0.10	400.63	1,129
2 year	0.14	0.14	0.00	0.14	400.64	1,135
5 year	0.20	0.19	0.00	0.19	400.65	1,144
10 year	0.24	0.24	0.00	0.24	400.65	1,149
25 year	0.30	0.30	0.00	0.30	400.66	1,154
50 year	0.35	0.35	0.00	0.35	400.66	1,159
100 year	**0.40**	**0.40**	**0.00**	**0.40**	**400.67**	**1,163**

SCM 4 Hydrograph - 2-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

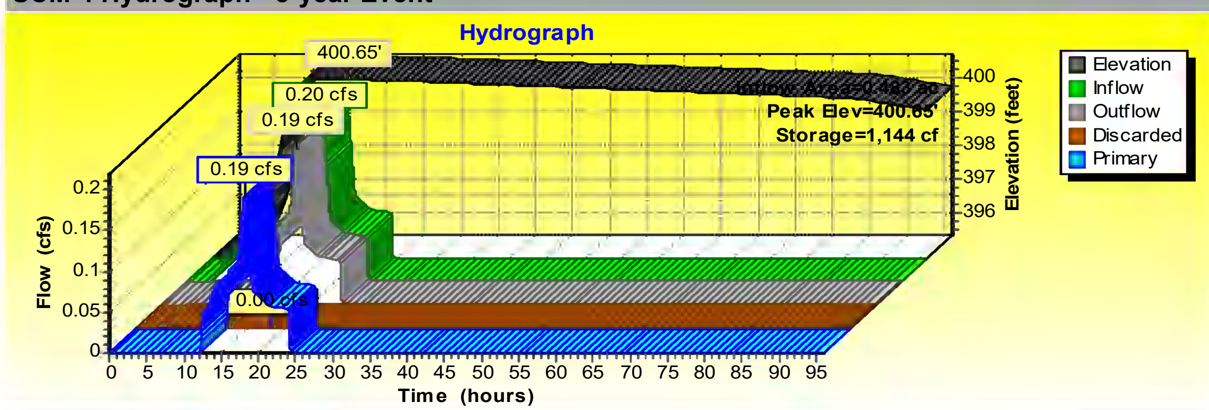
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 400.61)

Note: Infiltration of the surface storage occurs at hour 85.

SCM 4 Hydrograph - 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

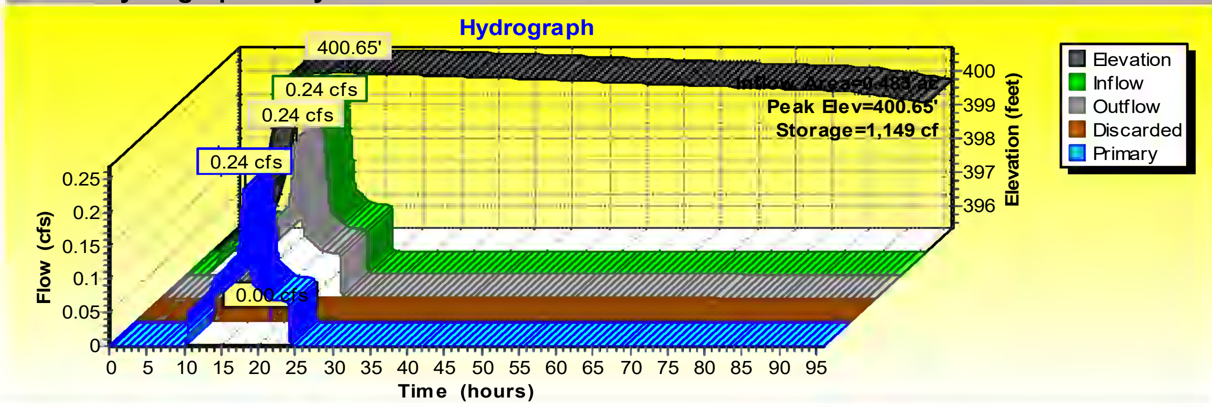
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 400.61)

Note: Infiltration of the surface storage occurs at hour 85.

SCM 4 Hydrograph - 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

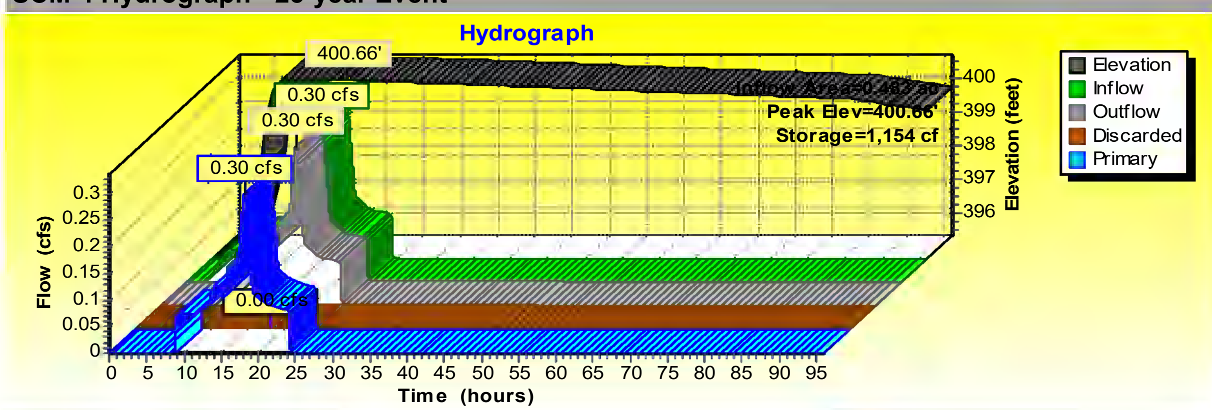
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 400.61)

Note: Infiltration of the surface storage occurs at hour 85.

SCM 4 Hydrograph - 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

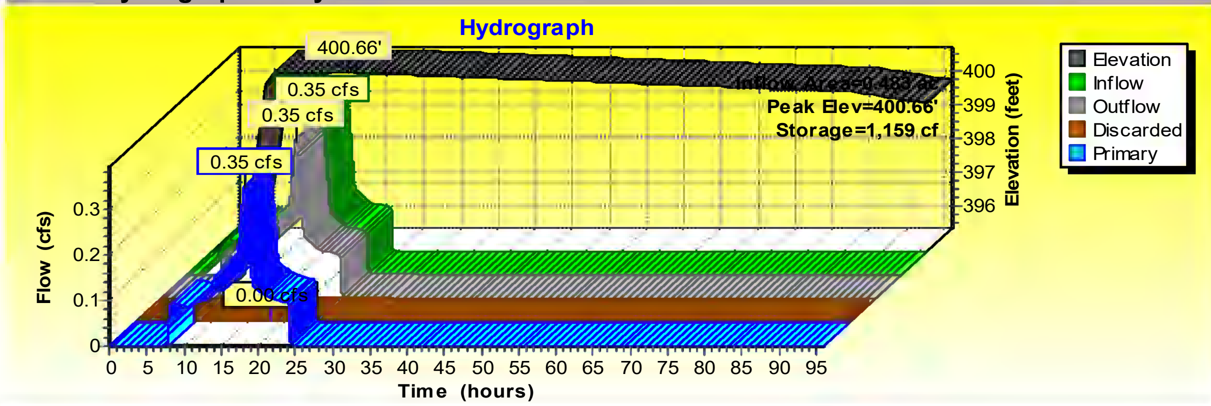
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 400.61)

Note: Infiltration of the surface storage occurs at hour 85.

SCM 4 Hydrograph - 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

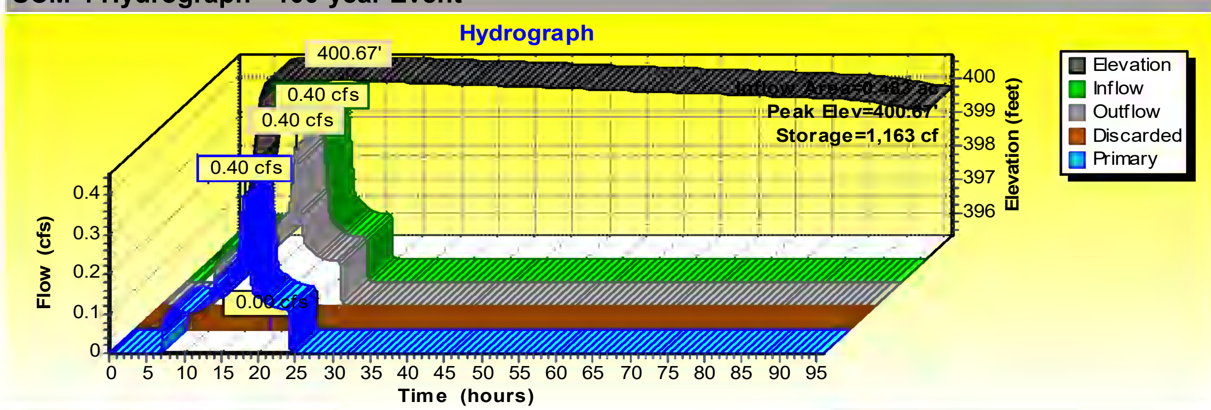
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 400.61)

Note: Infiltration of the surface storage occurs at hour 85.

SCM 4 Hydrograph - 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 400.61)

Note: Infiltration of the surface storage occurs at hour 85.

DMA 5 Summary

Summary for Subcatchment 26S: DMA 5

Runoff = 0.35 cfs @ 18.14 hrs, Volume= 0.207 af, Depth= 5.89"
Routed to Pond 14P : SCM 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
	9,425	84	1 acre lots, 20% imp, HSG D
*	3,464	98	Roof
*	2,937	98	PCC
*	2,516	98	AC
	18,342	91	Weighted Average
	7,540		41.11% Pervious Area
	10,802		58.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For DMA 5

Events for Subcatchment 26S: DMA 5

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	0.09	0.044	1.26
2 year	2.71	0.12	0.063	1.80
5 year	3.54	0.17	0.090	2.58
10 year	4.24	0.21	0.114	3.25
25 year	5.26	0.26	0.149	4.23
50 year	6.08	0.30	0.177	5.04
100 year	**6.95**	**0.35**	**0.207**	**5.89**

SCM 5 Summary

Summary for Pond 14P: SCM 5

Inflow Area = 0.421 ac, 58.89% Impervious, Inflow Depth = 5.89" for 100 year event
Inflow = 0.35 cfs @ 18.14 hrs, Volume= 0.207 af
Outflow = 0.35 cfs @ 18.15 hrs, Volume= 0.201 af, Atten= 0%, Lag= 0.5 min
Discarded = 0.00 cfs @ 18.15 hrs, Volume= 0.021 af
Primary = 0.35 cfs @ 18.15 hrs, Volume= 0.180 af
Routed to Pond 4P : SCM 8

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 409.45' @ 18.15 hrs Surf.Area= 602 sf Storage= 920 cf

Plug-Flow detention time= 264.6 min calculated for 0.201 af (97% of inflow)
Center-of-Mass det. time= 250.0 min (1,160.0 - 910.0)

Volume	Invert	Avail.Storage	Storage Description
#1	404.15'	1,227 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
404.15	400	0.0	0	0
404.16	400	40.0	2	2
406.90	400	40.0	438	440
406.91	400	25.0	1	441
408.89	400	25.0	198	639
408.90	400	100.0	4	643
409.40	581	100.0	245	888
409.90	776	100.0	339	1,227

Device	Routing	Invert	Outlet Devices
#1	Primary	409.40'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	404.15'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 18.15 hrs HW=409.45' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.00 cfs)

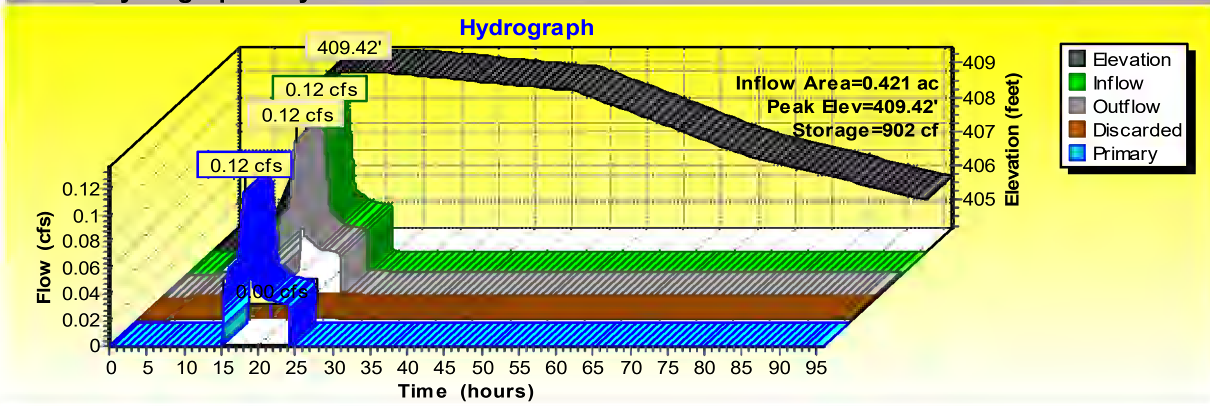
Primary OutFlow Max=0.32 cfs @ 18.15 hrs HW=409.45' (Free Discharge)
1=Orifice/Grate (Weir Controls 0.32 cfs @ 0.76 fps)

Post-Development Event Summary For SCM 5

Events for Pond 14P: SCM 5

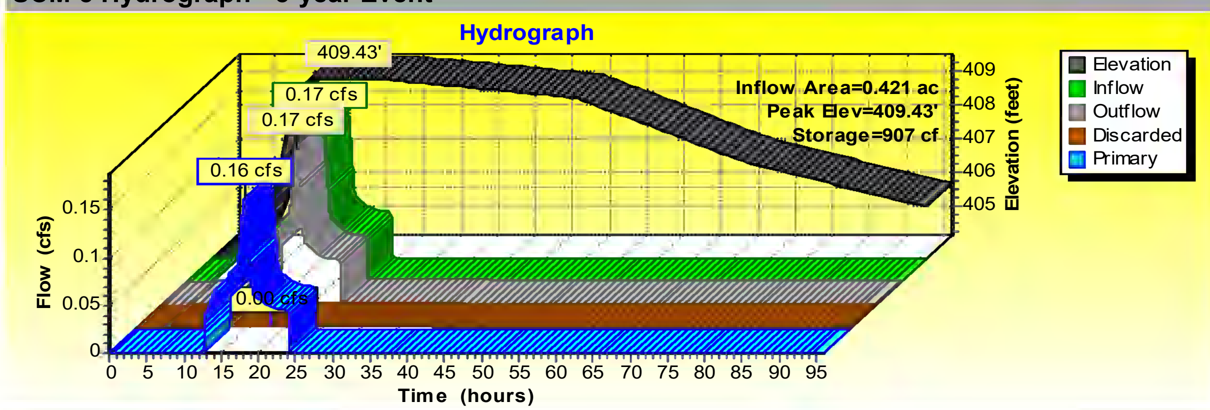
Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	0.09	0.09	0.00	0.09	409.42	898
2 year	0.12	0.12	0.00	0.12	409.42	902
5 year	0.17	0.17	0.00	0.16	409.43	907
10 year	0.21	0.21	0.00	0.20	409.44	911
25 year	0.26	0.26	0.00	0.26	409.44	915
50 year	0.30	0.30	0.00	0.30	409.45	917
100 year	**0.35**	**0.35**	**0.00**	**0.35**	**409.45**	**920**

SCM 5 Hydrograph - 2-year Event



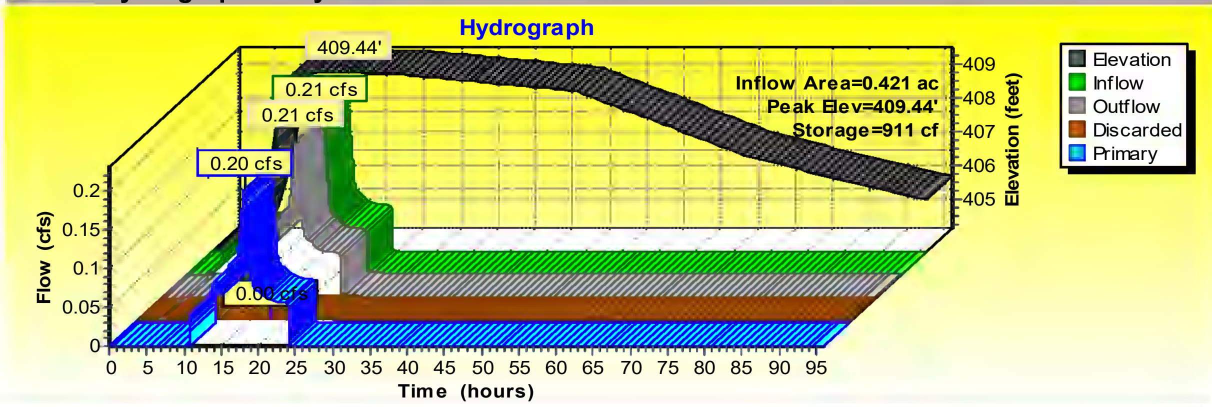
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 409.40)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 5 Hydrograph - 5-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 409.40)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 5 Hydrograph - 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

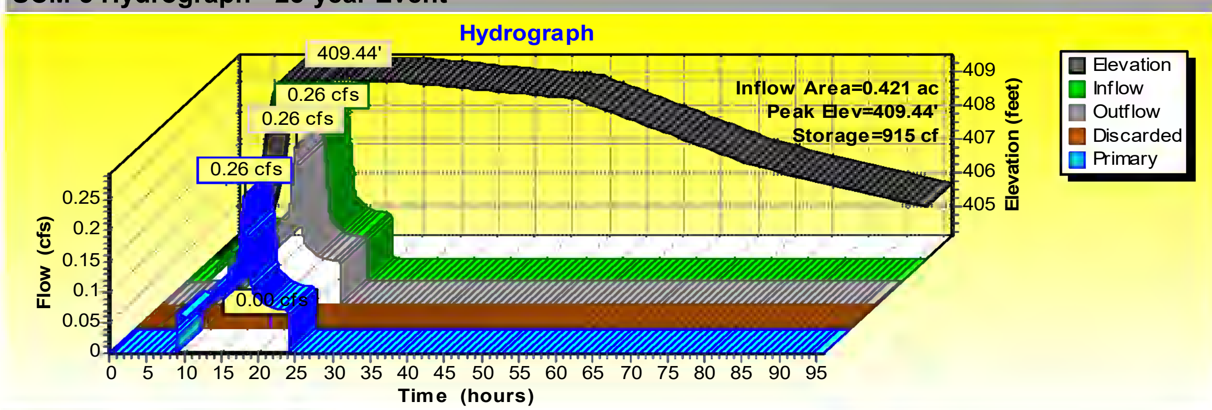
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 409.40)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 5 Hydrograph - 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

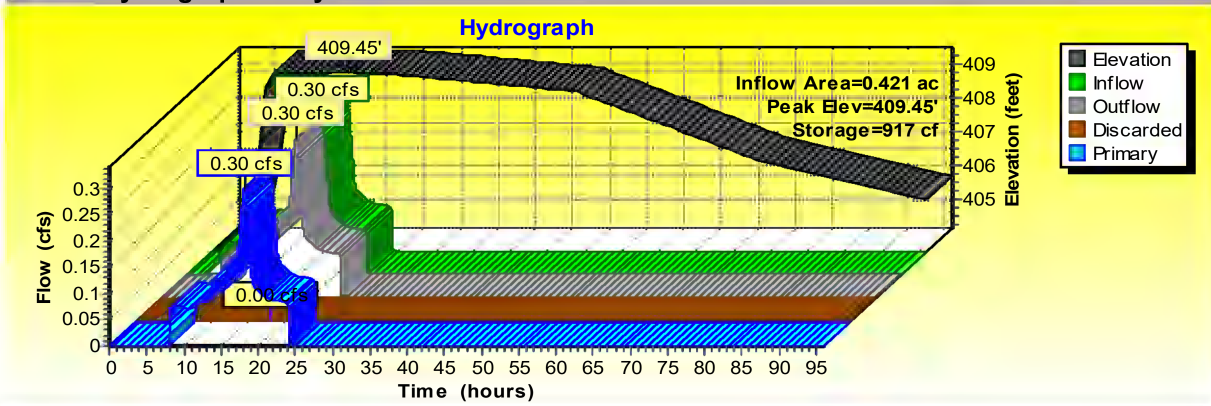
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 409.40)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 5 Hydrograph - 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

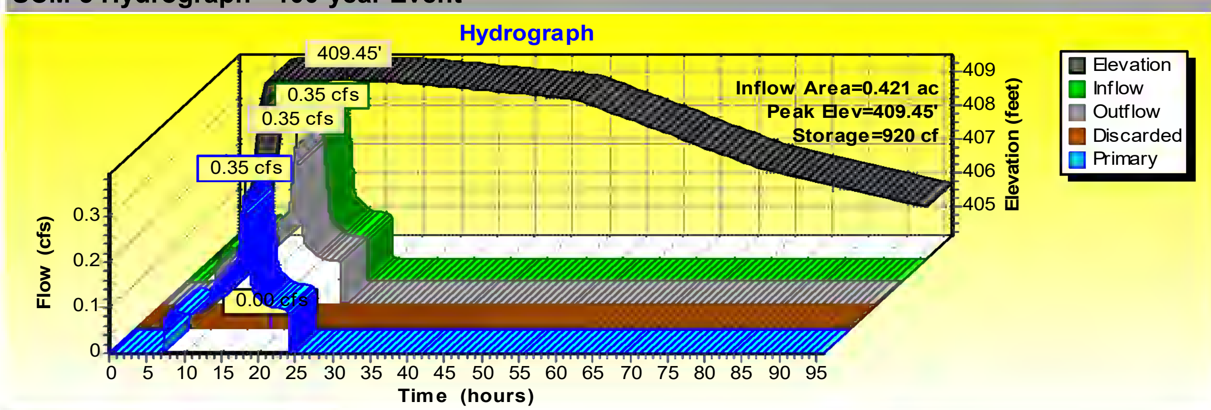
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 409.40)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 5 Hydrograph - 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 409.40)

Note: Infiltration of the surface storage occurs at hour 49.

DMA 6 Summary

Summary for Subcatchment 27S: DMA 6

Runoff = 0.55 cfs @ 18.14 hrs, Volume= 0.321 af, Depth= 5.77"
Routed to Pond 18P : SCM6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
	16,769	84	1 acre lots, 20% imp, HSG D
*	5,300	98	Roof
*	3,522	98	PCC
*	3,463	98	AC
	29,054	90	Weighted Average
	13,415		46.17% Pervious Area
	15,639		53.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For DMA 6

Events for Subcatchment 27S: DMA 6

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	0.14	0.066	1.19
2 year	2.71	0.19	0.096	1.72
5 year	3.54	0.26	0.138	2.49
10 year	4.24	0.32	0.175	3.15
25 year	5.26	0.41	0.229	4.13
50 year	6.08	0.48	0.274	4.92
100 year	**6.95**	**0.55**	**0.321**	**5.77**

SCM 6 Summary

Summary for Pond 18P: SCM 6

Inflow Area = 0.667 ac, 53.83% Impervious, Inflow Depth = 5.77" for 100 year event
Inflow = 0.55 cfs @ 18.14 hrs, Volume= 0.321 af
Outflow = 0.55 cfs @ 18.15 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.8 min
Discarded = 0.00 cfs @ 18.15 hrs, Volume= 0.028 af
Primary = 0.55 cfs @ 18.15 hrs, Volume= 0.285 af
Routed to Pond 4P : SCM8

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 417.22' @ 18.15 hrs Surf.Area= 817 sf Storage= 1,292 cf

Plug-Flow detention time= 237.1 min calculated for 0.313 af (98% of inflow)
Center-of-Mass det. time= 224.6 min (1,141.3 - 916.7)

Volume	Invert	Avail.Storage	Storage Description
#1	411.90'	1,692 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
411.90	560	0.0	0	0
411.91	560	40.0	2	2
414.65	560	40.0	614	616
414.66	560	25.0	1	617
416.64	560	25.0	277	895
416.65	560	100.0	6	900
417.15	776	100.0	334	1,234
417.65	1,056	100.0	458	1,692

Device	Routing	Invert	Outlet Devices
#1	Primary	417.15'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	411.90'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 18.15 hrs HW=417.22' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

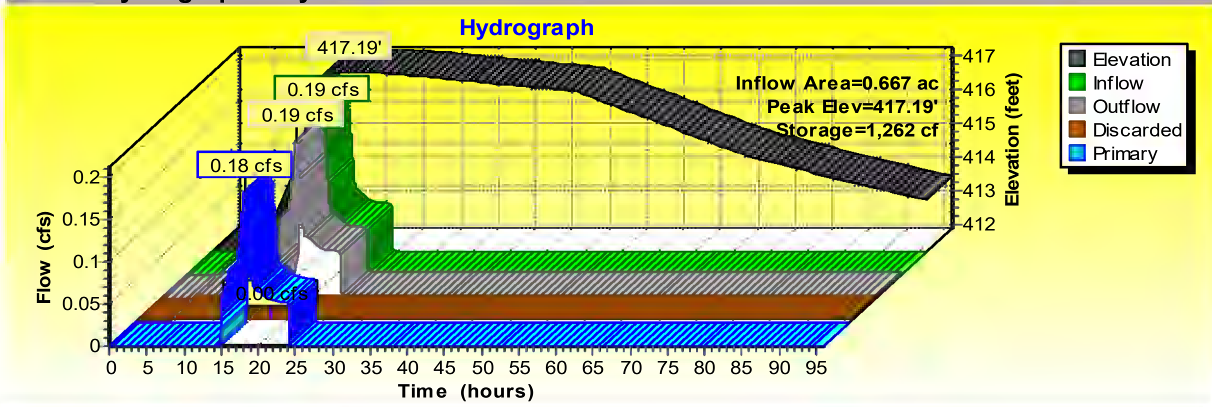
Primary OutFlow Max=0.52 cfs @ 18.15 hrs HW=417.22' (Free Discharge)
└─**1=Orifice/Grate** (Weir Controls 0.52 cfs @ 0.88 fps)

Post-Development Event Summary For SCM 6

Events for Pond 18P: SCM 6

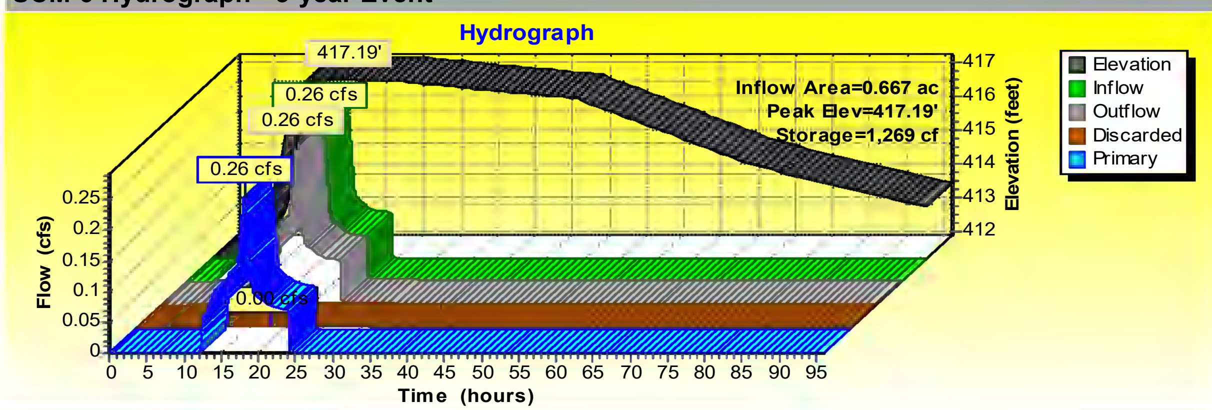
Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	0.14	0.14	0.00	0.13	417.18	1,254
2 year	0.19	0.19	0.00	0.18	417.19	1,262
5 year	0.26	0.26	0.00	0.26	417.19	1,269
10 year	0.32	0.32	0.00	0.32	417.20	1,274
25 year	0.41	0.41	0.00	0.40	417.21	1,281
50 year	0.48	0.48	0.00	0.47	417.22	1,286
100 year	**0.55**	**0.55**	**0.00**	**0.55**	**417.22**	**1,292**

SCM 6 Hydrograph - 2-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 417.15)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 6 Hydrograph - 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

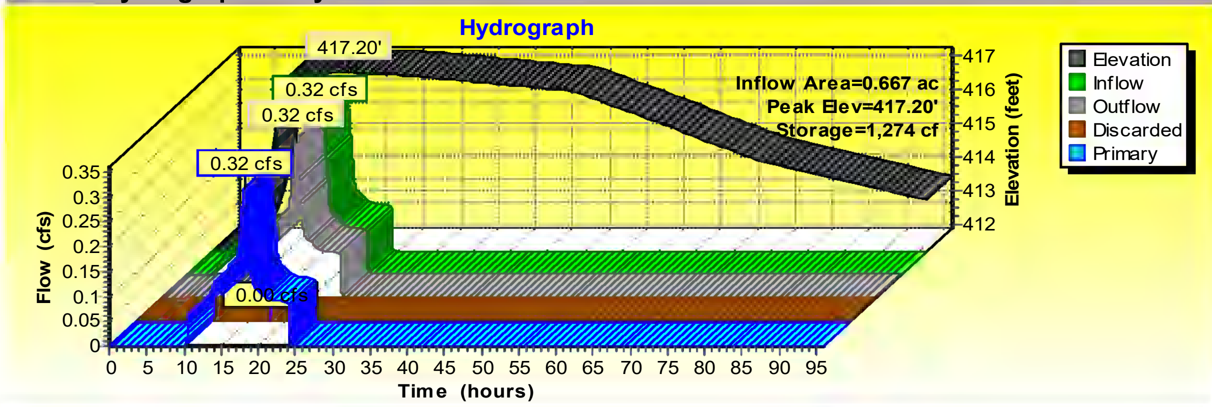
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 417.15)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 6 Hydrograph - 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

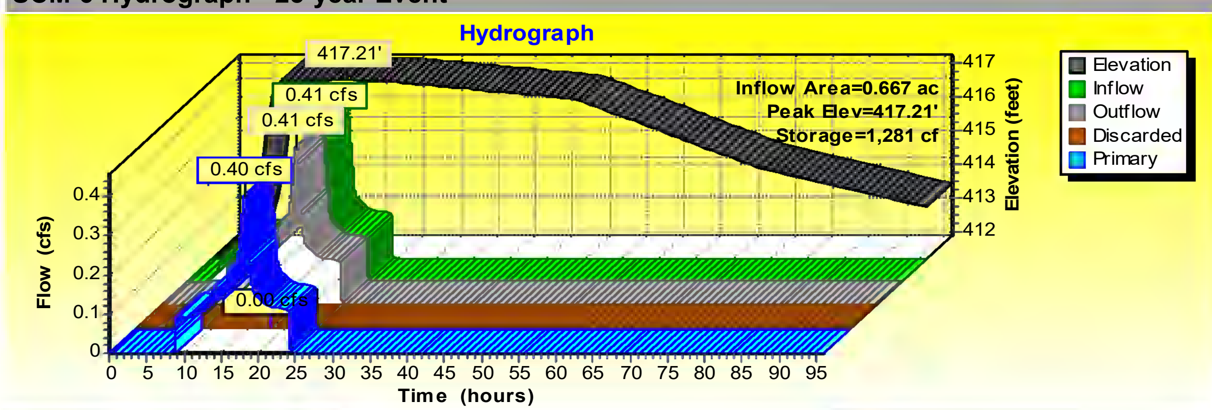
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 417.15)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 6 Hydrograph - 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

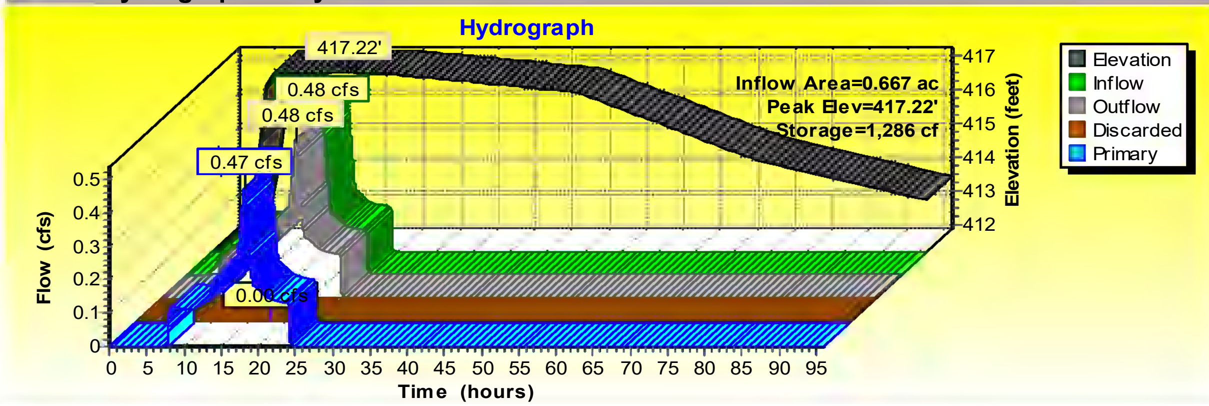
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 417.15)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 6 Hydrograph - 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

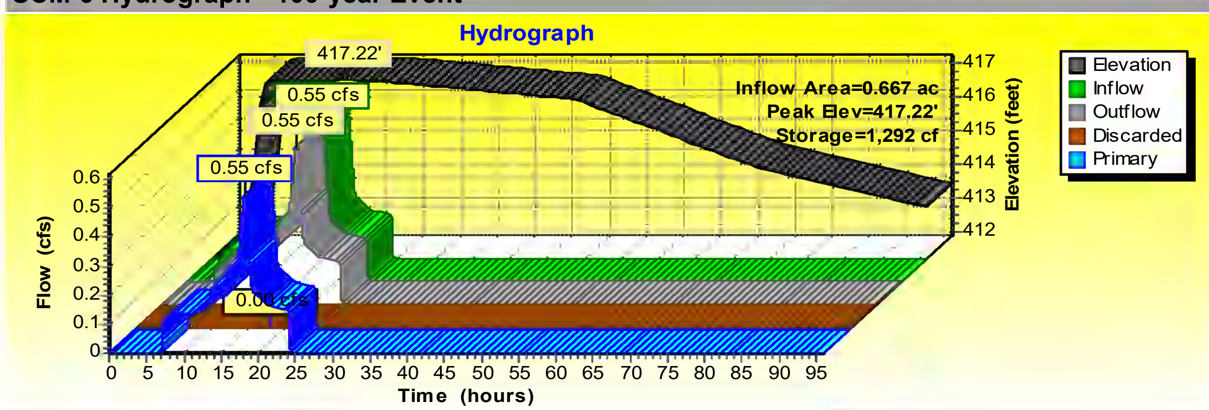
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 417.15)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 6 Hydrograph - 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 417.15)

Note: Infiltration of the surface storage occurs at hour 49.

DMA 7 Summary

Summary for Subcatchment 28S: DMA 7

Runoff = 0.36 cfs @ 18.14 hrs, Volume= 0.212 af, Depth= 5.77"
Routed to Pond 19P : SCM 7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
	10,380	84	1 acre lots, 20% imp, HSG D
*	5,300	98	Roof
*	2,191	98	PCC
*	1,300	98	AC
	19,171	90	Weighted Average
	8,304		43.32% Pervious Area
	10,867		56.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For DMA 7

Events for Subcatchment 28S: DMA 7

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	0.09	0.044	1.19
2 year	2.71	0.12	0.063	1.72
5 year	3.54	0.17	0.091	2.49
10 year	4.24	0.21	0.115	3.15
25 year	5.26	0.27	0.151	4.13
50 year	6.08	0.32	0.181	4.92
100 year	**6.95**	**0.36**	**0.212**	**5.77**

SCM 7 Summary

Summary for Pond 19P: SCM 7

Inflow Area = 0.440 ac, 56.68% Impervious, Inflow Depth = 5.77" for 100 year event
Inflow = 0.36 cfs @ 18.14 hrs, Volume= 0.212 af
Outflow = 0.36 cfs @ 18.15 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.7 min
Discarded = 0.00 cfs @ 18.15 hrs, Volume= 0.020 af
Primary = 0.36 cfs @ 18.15 hrs, Volume= 0.187 af
Routed to Pond 4P : SCM 8

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 425.35' @ 18.15 hrs Surf.Area= 704 sf Storage= 855 cf

Plug-Flow detention time= 232.8 min calculated for 0.207 af (98% of inflow)
Center-of-Mass det. time= 220.5 min (1,137.3 - 916.7)

Volume	Invert	Avail.Storage	Storage Description
#1	420.05'	1,234 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
420.05	350	0.0	0	0
420.06	350	40.0	1	1
422.80	350	40.0	384	385
422.81	350	25.0	1	386
424.79	350	25.0	173	559
424.80	350	100.0	3	563
425.30	668	100.0	255	817
425.80	999	100.0	417	1,234

Device	Routing	Invert	Outlet Devices
#1	Primary	425.30'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	420.05'	**0.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 18.15 hrs HW=425.35' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

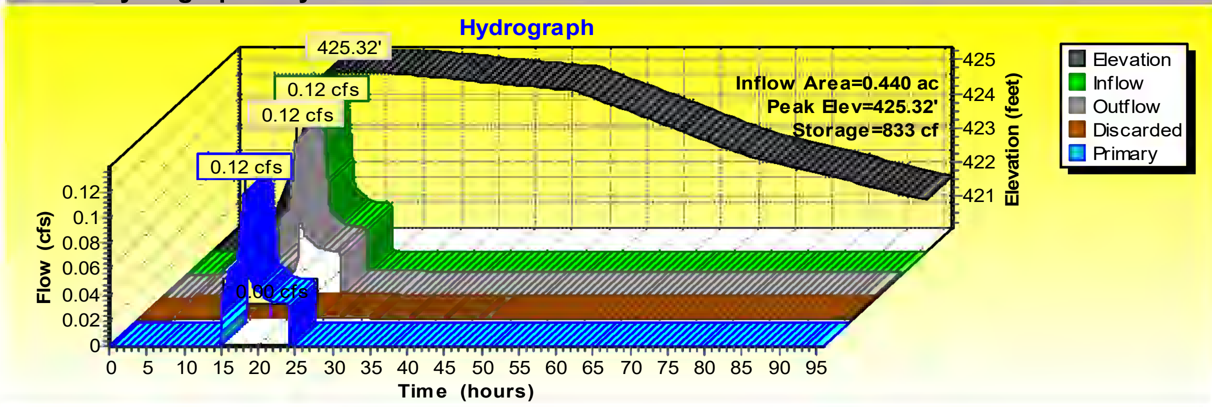
Primary OutFlow Max=0.33 cfs @ 18.15 hrs HW=425.35' (Free Discharge)
└─**1=Orifice/Grate** (Weir Controls 0.33 cfs @ 0.76 fps)

Post-Development Event Summary For SCM 7

Events for Pond 19P: SCM 7

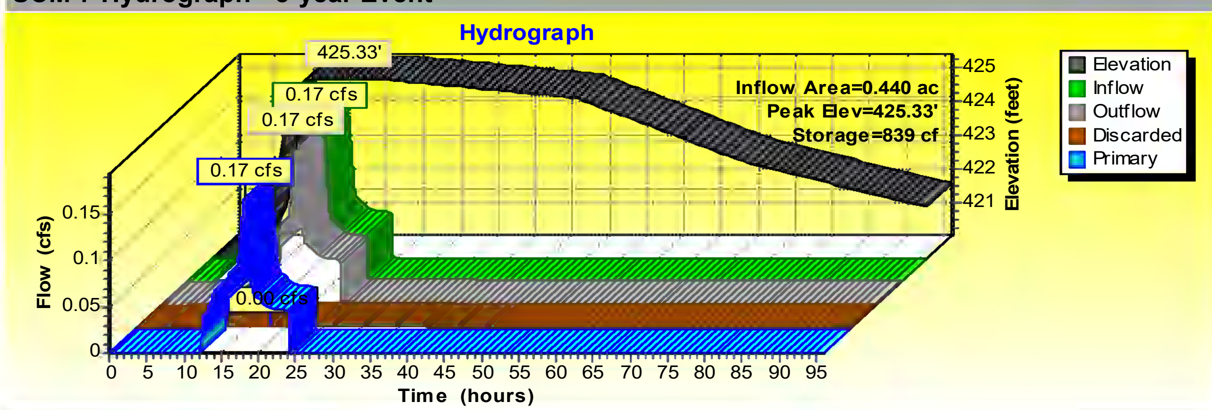
Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	0.09	0.09	0.00	0.09	425.32	828
2 year	0.12	0.12	0.00	0.12	425.32	833
5 year	0.17	0.17	0.00	0.17	425.33	839
10 year	0.21	0.21	0.00	0.21	425.34	844
25 year	0.27	0.27	0.00	0.27	425.35	848
50 year	0.32	0.32	0.00	0.31	425.35	851
100 year	**0.36**	**0.36**	**0.00**	**0.36**	**425.35**	**855**

SCM 7 Hydrograph - 2-year Event



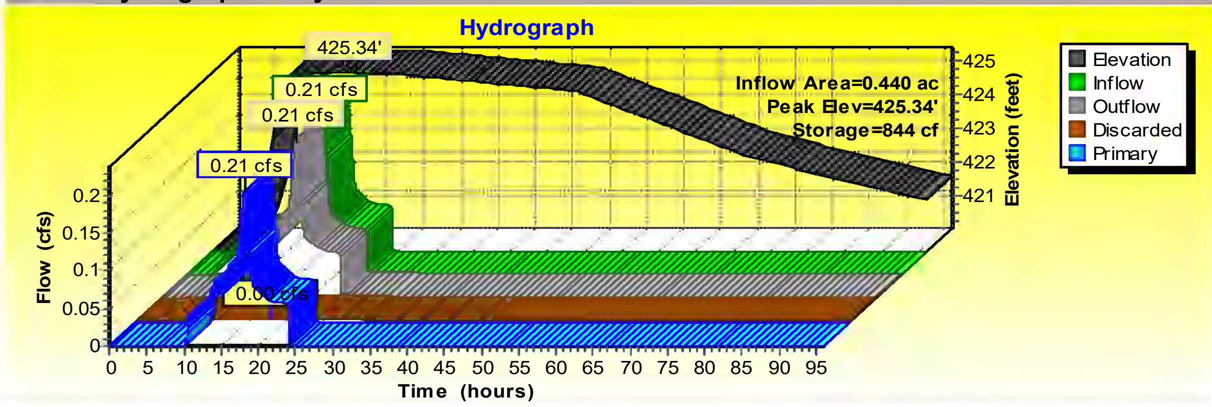
Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 425.30)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 7 Hydrograph - 5-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 425.30)
Note: Infiltration of the surface storage occurs at hour 49.

SCM 7 Hydrograph - 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

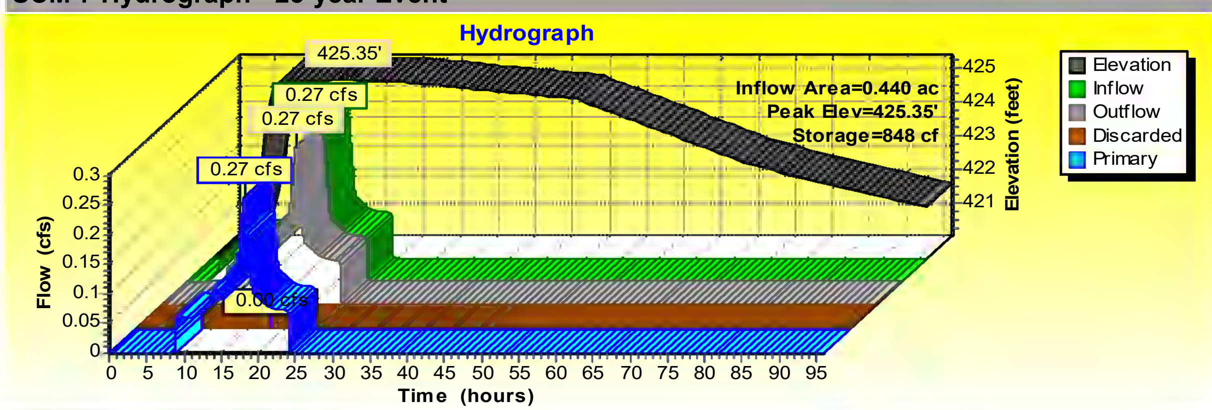
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 425.30)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 7 Hydrograph - 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

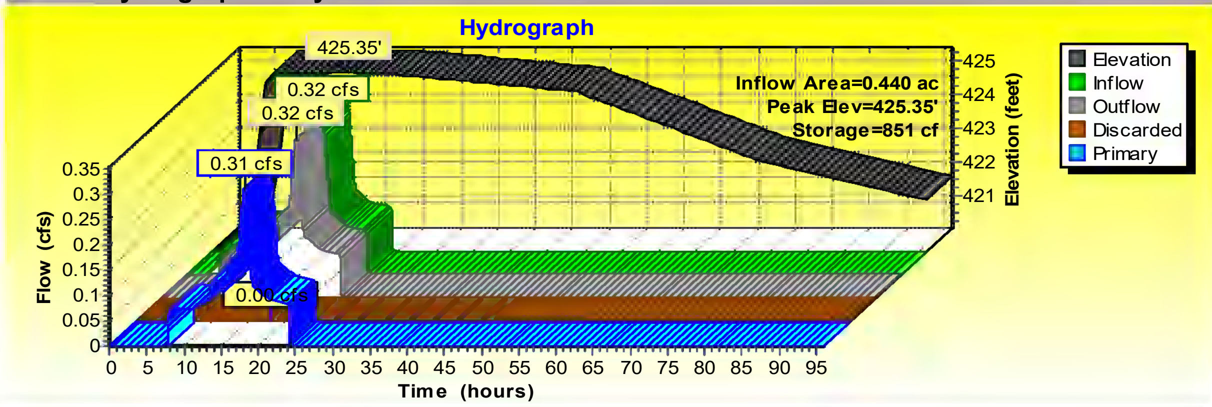
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 425.30)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 7 Hydrograph - 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

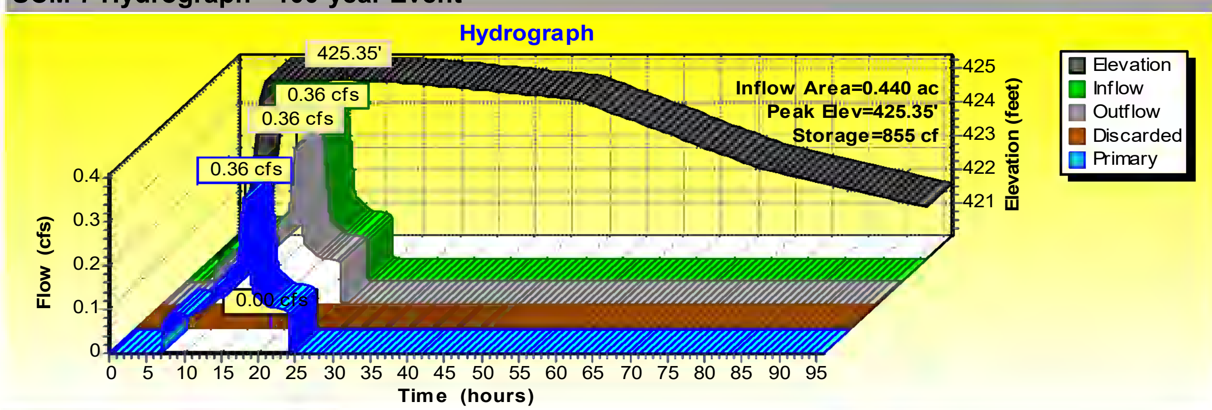
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 425.30)

Note: Infiltration of the surface storage occurs at hour 49.

SCM 7 Hydrograph - 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 24" square inlet grate. (occurs when water surface elevation exceeds 425.30)

Note: Infiltration of the surface storage occurs at hour 49.

Run-On Summary

Summary for Subcatchment 3S: Run On

Runoff = 54.96 cfs @ 18.12 hrs, Volume= 33.768 af, Depth= 6.24"
Routed to Pond 4P : SCM 8

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

Area (sf)	CN	Description
2,829,371	94	Fallow, bare soil, HSG D
2,829,371		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For Run-On

Events for Subcatchment 3S: Run On

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	15.24	8.117	1.50
2 year	2.71	20.26	11.207	2.07
5 year	3.54	27.14	15.560	2.87
10 year	4.24	32.89	19.268	3.56
25 year	5.26	41.23	24.707	4.56
50 year	6.08	47.90	29.098	5.38
100 year	**6.95**	**54.96**	**33.768**	**6.24**

DMA 8 Summary

Summary for Subcatchment 20S: DMA 8

Runoff = 5.52 cfs @ 18.12 hrs, Volume= 3.439 af, Depth= 6.36"
Routed to Pond 4P : SCM 8

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
SCVWD 1956 Storm 100 year Rainfall=6.95"

	Area (sf)	CN	Description
*	236,931	94	Undisturbed Areas
*	9,862	98	PCC
*	35,999	98	AC
	282,792	95	Weighted Average
	236,931		83.78% Pervious Area
	45,861		16.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Post-Development Event Summary For DMA 8

Events for Subcatchment 20S: DMA 8

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1 year	2.11	1.57	0.859	1.59
2 year	2.71	2.06	1.172	2.17
5 year	3.54	2.75	1.611	2.98
10 year	4.24	3.32	1.984	3.67
25 year	5.26	4.15	2.530	4.68
50 year	6.08	4.81	2.971	5.49
100 year	**6.95**	**5.52**	**3.439**	**6.36**

SCM 8 Summary

Summary for Pond 4P: SCM 8

Inflow Area = 75.075 ac, 4.14% Impervious, Inflow Depth = 6.20" for 100 year event
Inflow = 63.45 cfs @ 18.14 hrs, Volume= 38.766 af
Outflow = 63.41 cfs @ 18.15 hrs, Volume= 38.767 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.06 cfs @ 18.15 hrs, Volume= 0.248 af
Primary = 63.35 cfs @ 18.15 hrs, Volume= 38.518 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 382.73' @ 18.15 hrs Surf.Area= 3,967 sf Storage= 10,174 cf

Plug-Flow detention time= 10.1 min calculated for 38.762 af (100% of inflow)
Center-of-Mass det. time= 10.3 min (901.4 - 891.1)

Volume	Invert	Avail.Storage	Storage Description
#1	376.15'	16,251 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
376.15	2,487	0.0	0	0
376.16	2,487	40.0	10	10
378.90	2,487	40.0	2,726	2,736
378.91	2,487	25.0	6	2,742
380.89	2,487	25.0	1,231	3,973
380.90	2,786	100.0	26	3,999
381.40	3,094	100.0	1,470	5,469
381.90	3,413	100.0	1,627	7,096
382.40	3,741	100.0	1,789	8,885
382.90	4,079	100.0	1,955	10,840
383.40	4,427	100.0	2,127	12,966
383.90	4,785	100.0	2,303	15,269
384.10	5,033	100.0	982	16,251

Device	Routing	Invert	Outlet Devices
#0	Tertiary	384.10'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	381.60'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	376.15'	**0.700 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 18.15 hrs HW=382.73' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=63.23 cfs @ 18.15 hrs HW=382.73' (Free Discharge)
└**1=Orifice/Grate** (Weir Controls 63.23 cfs @ 3.48 fps)

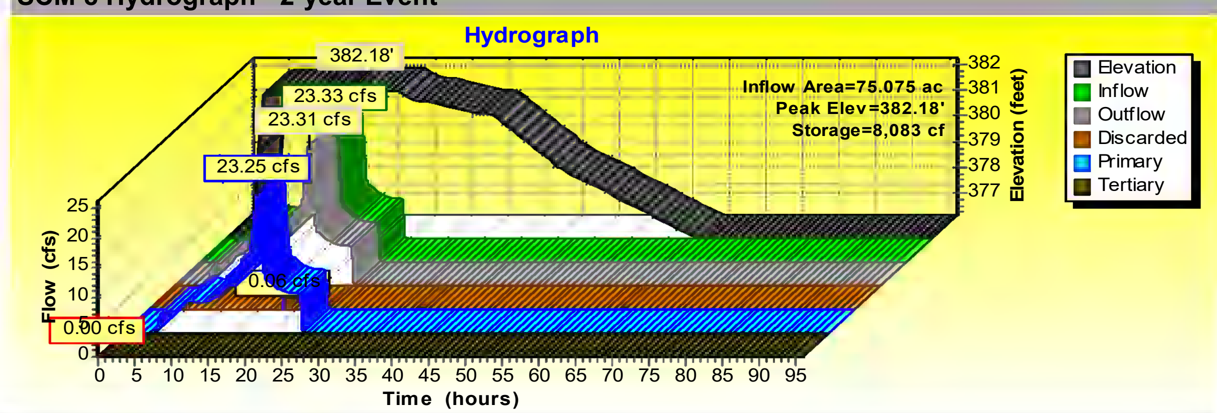
Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=376.15' (Free Discharge)

Post-Development Event Summary For SCM 8

Events for Pond 4P: SCM 8

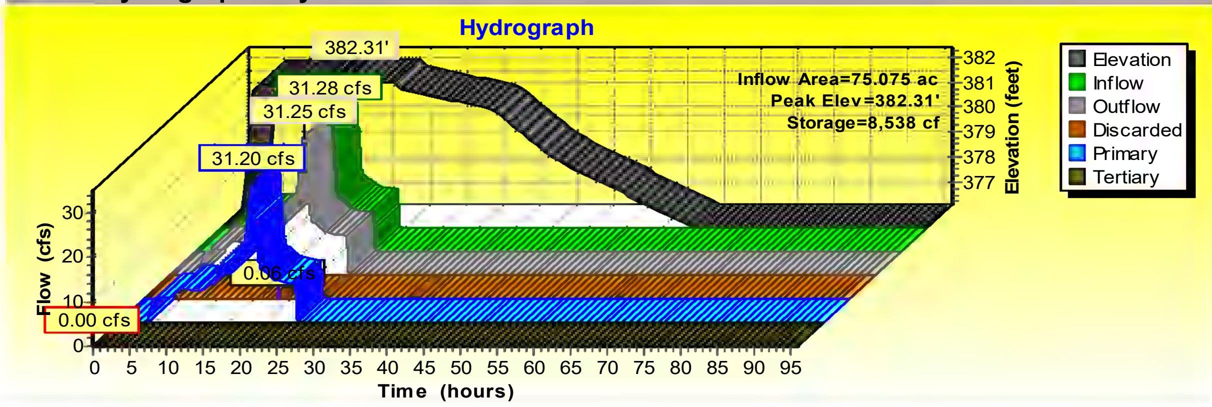
Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Tertiary (cfs)	Elevation (feet)	Storage (cubic-feet)
1 year	17.53	17.51	0.06	17.45	**0.00**	382.08	7,715
2 year	23.33	23.31	0.06	23.25	0.00	382.18	8,083
5 year	31.28	31.25	0.06	31.20	0.00	382.31	8,538
10 year	37.94	37.91	0.06	37.85	0.00	382.41	8,906
25 year	47.58	47.55	0.06	47.48	0.00	382.54	9,401
50 year	55.29	55.25	0.06	55.19	0.00	382.64	9,783
100 year	**63.45**	**63.41**	**0.06**	**63.35**	0.00	**382.73**	**10,174**

SCM 8 Hydrograph - 2-year Event



Elevation = water surface elevation
Inflow = all inflow into the storm water control
Outflow = sum of all outflow (discarded+primary+tertiary)
Discarded = flow out via infiltration
Primary = flow out via 48" square inlet grate. (occurs when water surface elevation exceeds 381.60)
Note: Full dewatering of the pond occurs by hour 65

SCM 8 Hydrograph - 5-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

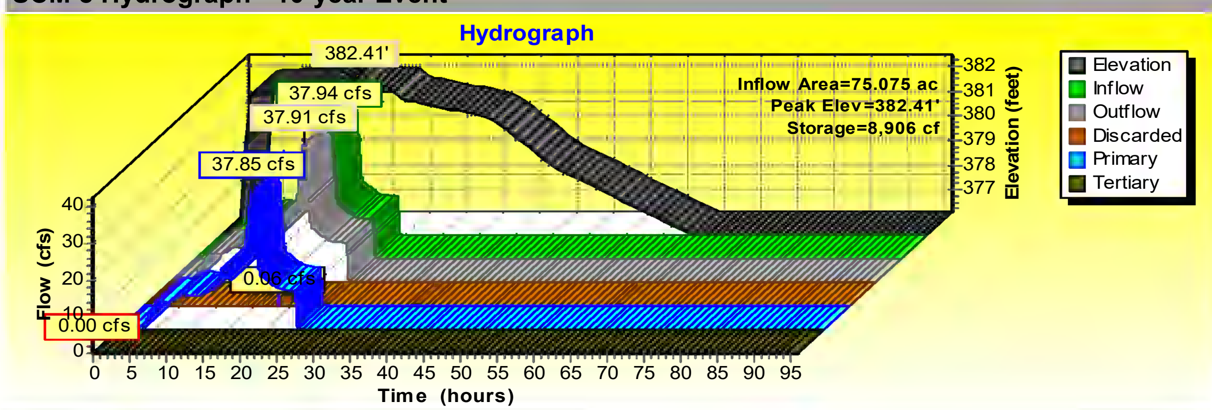
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 48" square inlet grate. (occurs when water surface elevation exceeds 381.60)

Note: Full dewatering of the pond occurs by hour 65

SCM 8 Hydrograph - 10-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

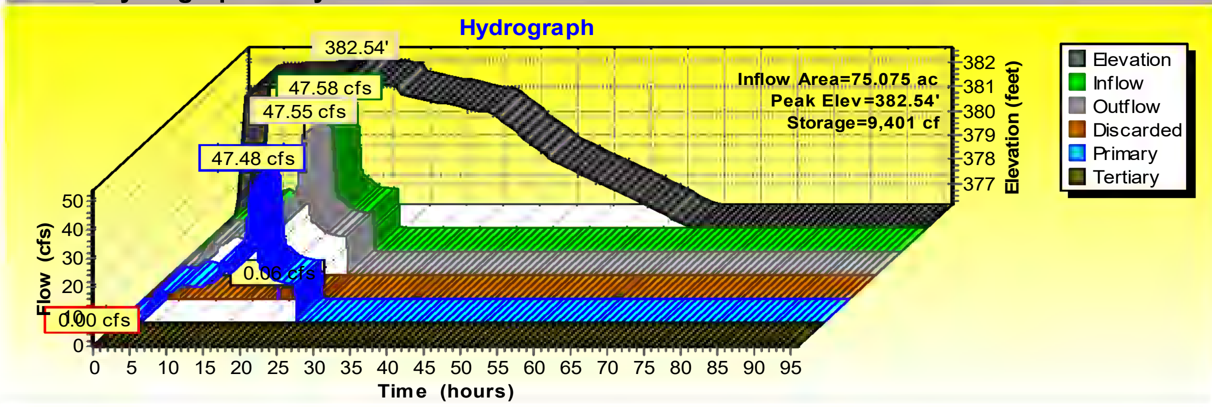
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 48" square inlet grate. (occurs when water surface elevation exceeds 381.60)

Note: Full dewatering of the pond occurs by hour 65

SCM 8 Hydrograph - 25-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

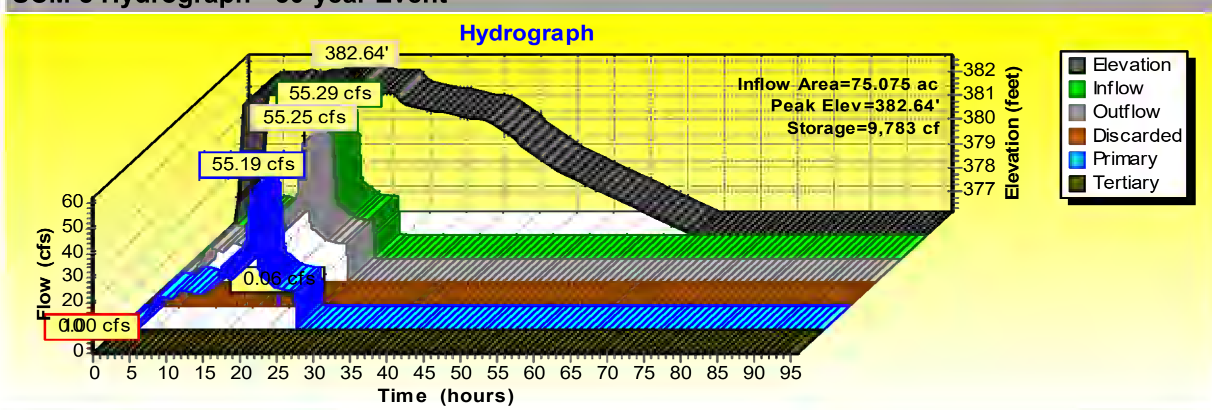
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 48" square inlet grate. (occurs when water surface elevation exceeds 381.60)

Note: Full dewatering of the pond occurs by hour 65

SCM 8 Hydrograph - 50-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

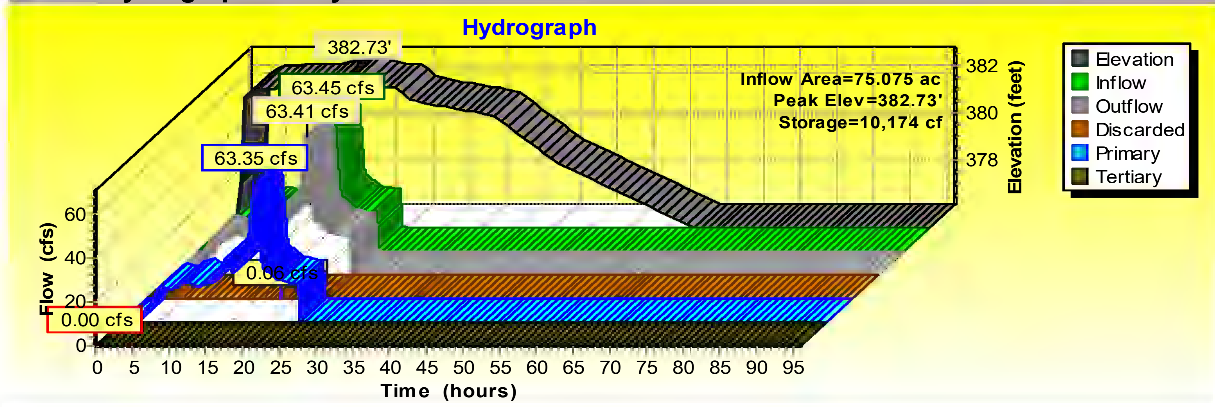
Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 48" square inlet grate. (occurs when water surface elevation exceeds 381.60)

Note: Full dewatering of the pond occurs by hour 65

SCM 8 Hydrograph - 100-year Event



Elevation = water surface elevation

Inflow = all inflow into the storm water control

Outflow = sum of all outflow (discarded+primary+tertiary)

Discarded = flow out via infiltration

Primary = flow out via 48" square inlet grate. (occurs when water surface elevation exceeds 381.60)

Note: Full dewatering of the pond occurs by hour 65

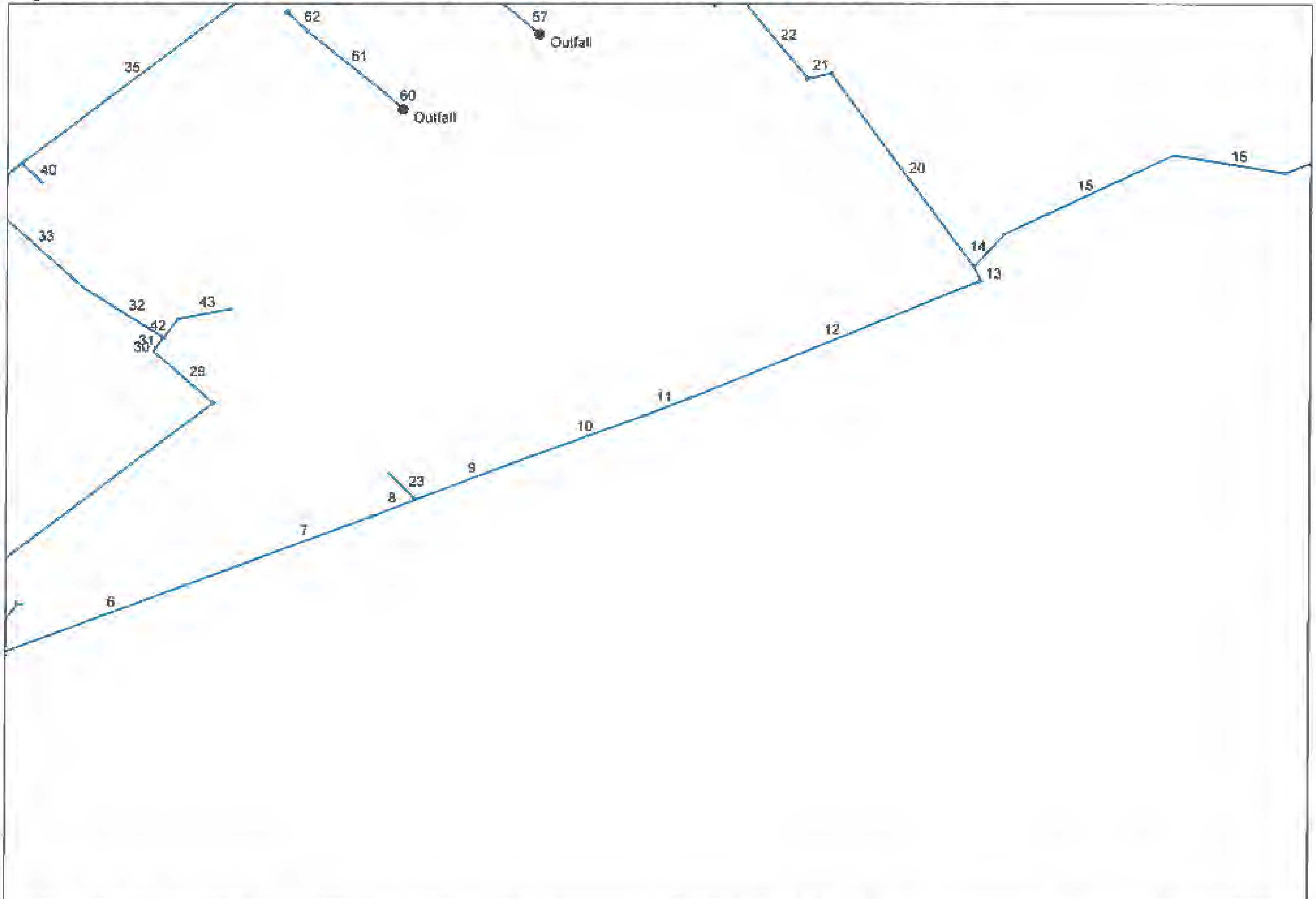
Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

Attachment F:
Pipe Sizing Calculations

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan

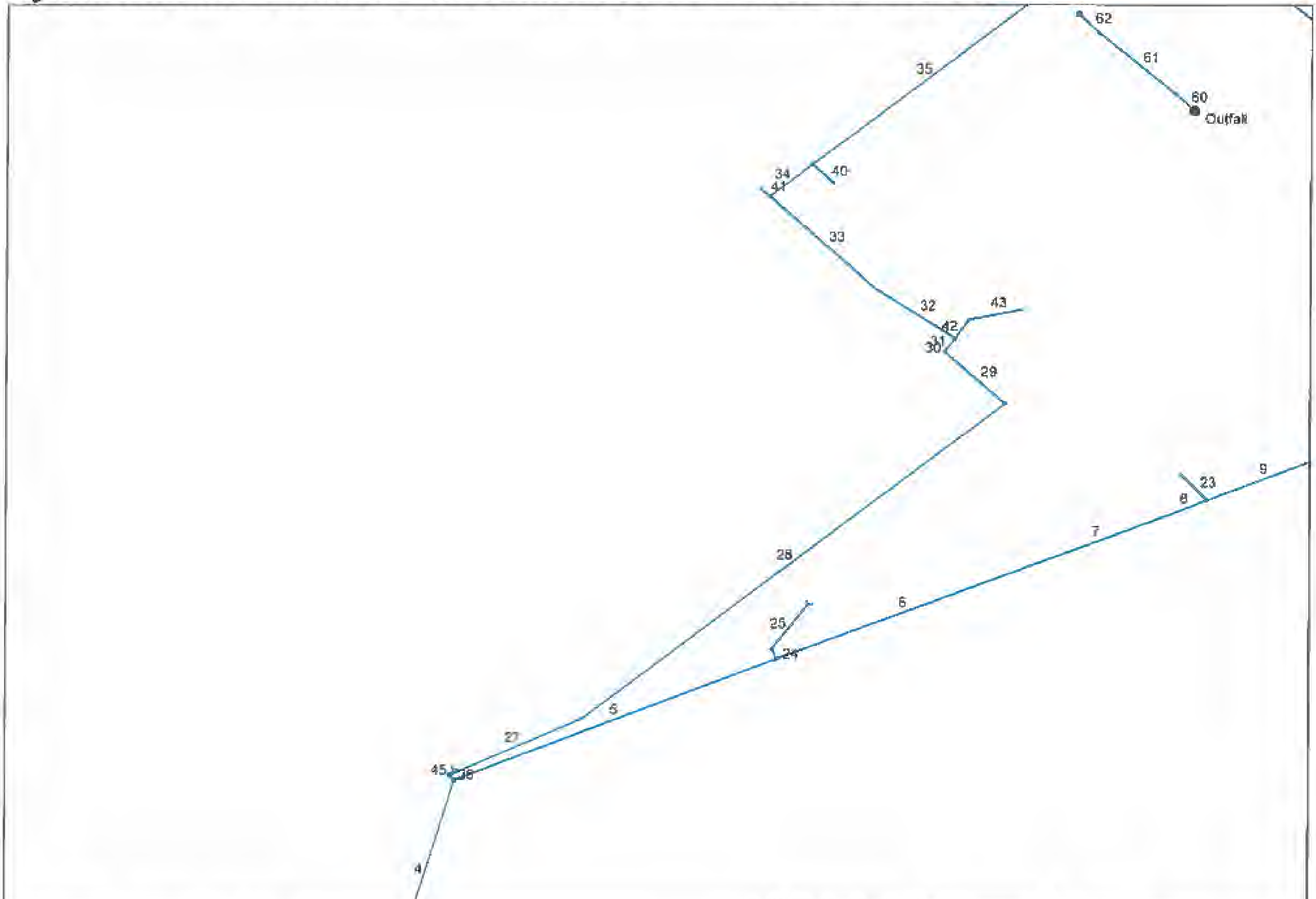
Project File: 23117.5 Storm Oaks New.stm	Number of lines: 68	Date: 11/18/2022

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 23117.5 Storm Calcs New.stm	Number of lines: 62	Date: 11/15/2022

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 23117.5 Storm Calcs New.stm	Number of lines: 62	Date: 11/15/2022

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
62		0.12	8	Cir	28.000	393.20	393.48	1.000	393.33	393.64	n/a	393.64	61	Curb-
61	Pipe - (49)	0.35	8	Cir	97.310	389.91	391.98	2.107	390.23	392.23	n/a	392.23 j	60	DropGrate
60	Pipe - (50)	0.36	8	Cir	24.806	388.09	389.91	7.337	390.18	390.18	0.05	390.23	End	DropGrate
59		0.18	8	Cir	28.000	399.43	399.71	1.000	399.60	399.90	n/a	399.90	58	Curb-
58	Pipe - (47)	0.38	8	Cir	98.000	396.46	398.05	1.622	396.81	398.34	n/a	398.34 j	57	DropGrate
57	Pipe - (48)	0.38	8	Cir	34.254	395.43	396.46	3.007	396.75	396.77	0.04	396.81	End	DropGrate
56	Pipe - (42)	32.69	24	Cir	142.764	397.86	404.99	4.994	399.04	406.89	n/a	406.89	End	OpenHeadwall
55	Pipe - (43)	0.06	15	Cir	36.711	401.14	401.62	1.307	401.36	401.72	n/a	401.72 j	54	DropCurb
54	Pipe - (44)	0.32	15	Cir	30.000	400.02	401.14	3.733	400.21	401.36	0.10	401.36	53	DropCurb
53	Pipe - (45)	0.32	24	Cir	8.550	399.61	400.02	4.795	399.87	400.21	n/a	400.21 j	52	DropCurb
52	Pipe - (46)	0.57	24	Cir	48.596	398.78	399.61	1.708	399.87	399.87	n/a	399.87 j	End	DropCurb
51	Pipe - (39)	0.29	6	Cir	27.481	406.56	406.83	0.983	406.91	407.06	n/a	407.06 j	50	DropCurb
50	Pipe - (40)	0.29	8	Cir	48.302	406.08	406.56	0.994	406.87	406.89	0.02	406.91	49	DropGrate
49	Pipe - (41)	0.29	8	Cir	41.818	405.68	406.08	1.004	406.84*	406.86*	0.01	406.87	End	DropGrate
48	Pipe - (36)	0.46	8	Cir	89.967	414.06	415.89	2.034	414.38	416.21	n/a	416.21	47	DropCurb
47	Pipe - (37)	0.46	8	Cir	48.431	413.57	414.06	1.012	413.98	414.38	n/a	414.38 j	46	DropGrate
46	Pipe - (38)	0.46	8	Cir	30.683	411.58	413.57	6.486	413.89	413.90	0.05	413.96	End	DropGrate
45		1.99	30	Cir	8.062	363.02	365.50	43.164	369.36*	369.36*	0.00	369.38	26	OpenHeadwall
44		0.41	15	Cir	22.443	397.51	398.54	4.589	397.65	398.79	0.09	398.79	35	Curb-
43	Pipe - (58)	36.82	30	Cir	46.822	374.18	374.67	1.004	381.41*	381.80*	0.87	382.68	42	DropGrate
42	Pipe - (59)	37.34	30	Cir	25.052	373.84	374.18	0.958	380.19*	380.40*	1.01	381.41	31	DropCurb
41	Pipe - (57)	0.53	15	Cir	12.695	379.36	380.00	5.041	380.21	380.28	n/a	380.28 j	33	DropGrate
40	Pipe - (56)	0.01	15	Cir	28.000	379.68	380.00	1.143	380.17	380.04	n/a	380.04	34	DropCurb

Project File: 23117.5 Storm Calcs New.stm	Number of lines: 62	Run Date: 11/15/2022

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
39	Pipe - (21)	0.49	18	Cir	57.000	410.56	411.07	0.895	410.86	411.33	n/a	411.33 j	38	DropGrate
38	Pipe - (22)	0.57	18	Cir	40.124	409.29	410.56	3.165	409.48	410.86	0.16	410.86	37	DropGrate
37	Pipe - (23)(2)	0.66	24	Cir	138.000	397.18	400.36	2.304	397.49	400.64	n/a	400.64 j	36	Manhole
36	Pipe - (23)	0.69	24	Cir	60.000	397.00	397.18	0.300	397.30	397.48	0.01	397.49	35	Manhole
35	Pipe - (24)	0.66	24	Cir	292.000	379.88	388.44	2.932	380.17	388.76	n/a	388.76	34	Manhole
34	Pipe - (25)	0.72	24	Cir	52.432	379.36	379.88	0.992	380.21	380.17	n/a	380.17	33	Manhole
33	Pipe - (26)	1.08	24	Cir	140.838	377.47	379.36	1.342	380.19	380.20	0.01	380.21	32	Manhole
32	Pipe - (27)	1.09	24	Cir	89.869	376.57	377.47	1.001	380.19*	380.19*	0.00	380.19	31	None
31	Pipe - (28)	37.56	30	Cir	13.488	376.43	376.57	1.038	379.17*	379.28*	0.91	380.19	30	Manhole
30	Pipe - (29)	37.56	30	Cir	4.018	376.40	376.43	0.747	378.62	378.65	0.52	379.17	29	DropCurb
29	Pipe - (30)	37.56	30	Cir	79.746	375.60	376.40	1.003	377.67	378.47	1.12	378.47	28	Manhole
28	Pipe - (31)	37.56	30	Cir	517.000	365.68	375.60	1.918	370.60	377.67	n/a	377.67 j	27	Manhole
27		37.56	30	Cir	134.000	363.00	365.68	2.000	369.38*	370.32*	0.28	370.60	26	Manhole
26		40.04	36	Cir	7.064	362.91	363.02	1.557	368.84*	368.86*	0.50	369.36	4	Manhole
25	Pipe - (60)	38.42	18	Cir	60.097	369.93	370.53	0.998	387.24*	395.29*	7.35	402.64	24	OpenHeadwall
24	Pipe - (61)	38.42	18	Cir	12.240	369.81	369.93	0.980	376.12*	377.76*	9.48	387.24	5	DropCurb
23	Pipe - (20)	1.38	18	Cir	37.714	380.03	380.42	1.034	380.39	380.86	0.16	380.86	8	DropCurb
22	Pipe - (17)	0.01	18	Cir	109.943	387.97	389.89	1.746	399.47	399.92	n/a	399.93 j	21	DropCurb
21	Pipe - (18)	0.00	18	Cir	21.646	397.75	397.97	1.016	397.99	399.47	0.00	399.47	20	DropCurb
20	Pipe - (19)	0.42	18	Cir	251.000	395.30	397.75	0.976	395.51	397.99	0.12	397.99	13	DropCurb
19	Pipe - (16)	9.75	18	Cir	126.888	418.73	420.00	1.001	419.87	421.20	0.54	421.20	18	OpenHeadwall
18	Pipe - (1)	9.69	18	Cir	166.146	410.50	418.21	4.640	411.70	419.41	0.54	419.41	17	Manhole
17	Pipe - (2)	9.61	18	Cir	118.321	405.42	410.50	4.293	405.12	411.70	n/a	411.70	16	Manhole

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NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
16	Pipe - (3)	9.56	18	Cir	102.596	396.22	404.42	7.993	399.52	405.61	n/a	405.61 j	15	Manhole
15	Pipe - (4)	11.87	18	Cir	175.129	394.47	396.22	0.999	396.54*	398.78*	0.74	399.52	14	DropCurb
14	Pipe - (5)	11.79	18	Cir	45.623	394.01	394.47	1.004	395.51*	396.09*	0.46	396.54	13	DropCurb
13	Pipe - (6)	2.97	18	Cir	16.228	393.84	394.01	1.048	395.22	394.66	0.40	394.66	12	DropCurb
12	Pipe - (7)	14.74	24	Cir	291.693	385.53	393.84	2.849	387.38	395.22	n/a	395.22 j	11	Manhole
11	Pipe - (8)	14.74	18	Cir	46.157	384.81	385.53	1.560	386.31**	387.22*	0.16	387.38	10	Manhole
10	Pipe - (9)	14.75	24	Cir	112.134	379.81	384.81	4.459	380.67	386.19	n/a	386.19	9	Manhole
9	Pipe - (10)	14.75	24	Cir	112.903	374.94	376.37	1.267	377.19	377.75	n/a	377.75 j	8	Manhole
8	Pipe - (11)	15.03	24	Cir	44.346	374.44	374.94	1.128	376.65	376.81	0.38	377.19	7	Manhole
7	Pipe - (12)	15.12	30	Cir	130.269	372.86	374.44	1.213	376.48	376.62	0.03	376.65	6	Manhole
6	Pipe - (13)	15.12	30	Cir	250.463	369.81	372.86	1.218	376.12*	376.46*	0.02	376.48	5	Manhole
5	Pipe - (14)	53.45	30	Cir	319.794	362.91	369.81	2.158	368.84*	374.27*	1.84	376.12	4	Manhole
4	Pipe - (15)	90.59	36	Cir	197.815	359.76	362.91	1.592	363.12*	366.77*	2.07	368.84	End	Manhole
3	Pipe - (33)	0.29	6	Cir	109.825	422.79	423.88	0.992	423.03	424.13	0.09	424.13	2	DropCurb
2	Pipe - (34)	0.26	6	Cir	49.190	422.29	422.79	1.016	422.54	423.03	n/a	423.03	1	DropGrate
1	Pipe - (35)	0.28	8	Cir	72.463	420.36	422.29	2.663	420.61	422.54	n/a	422.54 j	End	DropGrate

Project File: 23117 S Storm Calcs New.stm | Number of lines: 62 | Run Date: 11/15/2022

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

MHE

Line No.	Line ID	Line Length (ft)	Line Size (in)	Line Type	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	Capac Full (cfs)	Flow Rate (cfs)	HGL Dn (ft)	HGL Up (ft)	Grnd/Rim El Up (ft)	Total Area (ac)
62		28.000	8	Cir	393.20	393.48	1.00	1.31	0.12	393.33	393.64	395.34	0.09
61	Pipe - (49)	97.310	8	Cir	389.91	391.96	2.11	1.90	0.36	390.23	392.23 j	393.50	0.43
60	Pipe - (50)	24.806	8	Cir	388.09	389.91	7.34	3.54	0.35	390.16	390.18	393.50	0.44
59		28.000	8	Cir	399.43	399.71	1.00	1.31	0.18	399.60	399.90	402.01	0.14
58	Pipe - (47)	98.000	8	Cir	396.46	398.05	1.62	1.67	0.38	396.81	398.34 j	399.50	0.43
57	Pipe - (48)	34.258	8	Cir	395.43	396.46	3.01	2.27	0.38	396.75	396.77	399.50	0.44
56	Pipe - (42)	142.764	24	Cir	397.86	404.99	4.99	50.55	32.99	399.04	406.89	407.42	66.59
55	Pipe - (43)	36.711	15	Cir	401.14	401.62	1.31	7.38	0.05	401.36	401.72 j	406.19	0.05
54	Pipe - (44)	30.000	15	Cir	400.02	401.14	3.73	12.48	0.32	400.21	401.36	405.97	0.30
53	Pipe - (45)	8.550	24	Cir	399.61	400.02	4.80	49.53	0.32	399.87	400.21 j	404.50	0.31
52	Pipe - (46)	48.595	24	Cir	398.78	399.61	1.71	29.56	0.57	399.87	399.87 j	404.11	0.56
51	Pipe - (39)	27.461	8	Cir	406.56	406.83	0.98	1.30	0.29	406.91	407.08 j	410.52	0.40
50	Pipe - (40)	48.302	8	Cir	406.08	406.56	0.99	1.30	0.29	406.87	406.89	410.50	0.41
49	Pipe - (41)	41.816	8	Cir	405.66	406.08	1.00	1.31	0.29	406.84	406.86	410.50	0.42
48	Pipe - (36)	89.967	8	Cir	414.06	415.89	2.03	1.87	0.46	414.38	416.21	419.58	0.65
47	Pipe - (37)	48.431	8	Cir	413.57	414.06	1.01	1.32	0.46	413.96	414.38 j	417.50	0.66
46	Pipe - (38)	30.683	8	Cir	411.58	413.57	6.49	3.33	0.46	413.69	413.90	417.50	0.67
45		8.062	30	Cir	363.02	366.50	43.16	291.90	1.99	369.36	369.36	366.62	3.10
44		22.443	15	Cir	397.51	398.54	4.59	14.99	0.41	397.65	398.79	404.02	0.64
43	Pipe - (58)	48.822	30	Cir	374.18	374.67	1.00	41.09	36.82	381.41	381.80	384.00	2.02
42	Pipe - (59)	25.062	30	Cir	373.84	374.18	0.96	40.13	37.34	380.19	380.40	383.50	2.43
41	Pipe - (57)	12.695	15	Cir	379.36	380.00	5.04	14.50	0.53	380.21	380.28 j	384.73	0.99

Project File: 23117.5 Storm Calcs New.stm	Number of lines: 62	Date: 11/15/2022
NOTES: ** Critical depth		

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Line No.	Line ID	Line Length (ft)	Line Size (in)	Line Type	Invert Dn (ft)	Invert Up (ft)	Line Slope (%)	Capac Full (cfs)	Flow Rate (cfs)	HGL Dn (ft)	HGL Up (ft)	Gnd/Rim El Up (ft)	Total Area (ac)
40	Pipe - (56)	28.000	15	Cir	379.68	380.00	1.14	6.90	0.01	380.17	380.04	384.38	0.01
39	Pipe - (21)	57.000	18	Cir	410.56	411.07	0.89	9.93	0.49	410.86	411.33 j	415.76	0.80
38	Pipe - (22)	40.124	18	Cir	409.29	410.56	3.17	18.68	0.67	409.46	410.86	416.00	1.17
37	Pipe - (23)(2)	138.000	24	Cir	397.18	400.36	2.30	34.33	0.66	397.49	400.64 j	413.68	1.18
36	Pipe - (23)	60.000	24	Cir	397.00	397.18	0.30	12.39	0.59	397.30	397.48	407.03	1.19
35	Pipe - (24)	292.000	24	Cir	379.88	388.44	2.93	38.73	0.86	380.17	388.76	396.34	1.84
34	Pipe - (25)	52.432	24	Cir	379.36	379.86	0.98	22.52	0.72	380.21	380.17	385.83	1.86
33	Pipe - (26)	140.838	24	Cir	377.47	379.36	1.34	26.20	1.08	380.19	380.20	385.03	2.86
32	Pipe - (27)	89.869	24	Cir	376.57	377.47	1.00	22.63	1.06	380.19	380.19	379.90	2.87
31	Pipe - (28)	13.488	30	Cir	376.43	376.57	1.04	41.79	37.55	379.17	379.28	383.44	5.31
30	Pipe - (29)	4.018	30	Cir	376.40	376.43	0.75	35.43	37.56	378.62	378.65	383.47	5.32
29	Pipe - (30)	79.748	30	Cir	375.60	376.40	1.00	41.08	37.66	377.67	378.47	383.06	5.33
28	Pipe - (31)	517.000	30	Cir	365.68	375.60	1.92	56.81	37.56	370.60	377.67 j	383.40	5.34
27		134.000	30	Cir	363.00	365.68	2.00	62.83	37.55	369.36	370.32	366.62	5.35
26		7.064	36	Cir	362.91	363.02	1.58	90.15	40.04	368.84	368.86	368.64	12.40
25	Pipe - (60)	60.097	18	Cir	369.93	370.53	1.00	10.49	38.42	387.24	395.29	375.01	0.25
24	Pipe - (61)	12.240	18	Cir	369.81	369.93	0.98	10.40	36.42	376.12	377.76	372.19	0.26
23	Pipe - (20)	37.714	18	Cir	380.03	380.42	1.03	10.68	1.38	380.39	380.86	385.13	2.00
22	Pipe - (17)	109.943	18	Cir	397.97	399.89	1.75	13.88	0.01	399.47	399.92 j	404.60	0.01
21	Pipe - (18)	21.646	18	Cir	397.75	397.97	1.02	10.59	0.00	397.99	399.47	403.27	0.02
20	Pipe - (19)	251.000	18	Cir	395.30	397.79	0.98	10.37	0.42	395.51	397.99	404.04	2.97
19	Pipe - (16)	126.868	18	Cir	416.73	420.00	1.00	10.51	9.75	419.87	421.20	422.21	15.81

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NOTES: ** Critical depth

MHE

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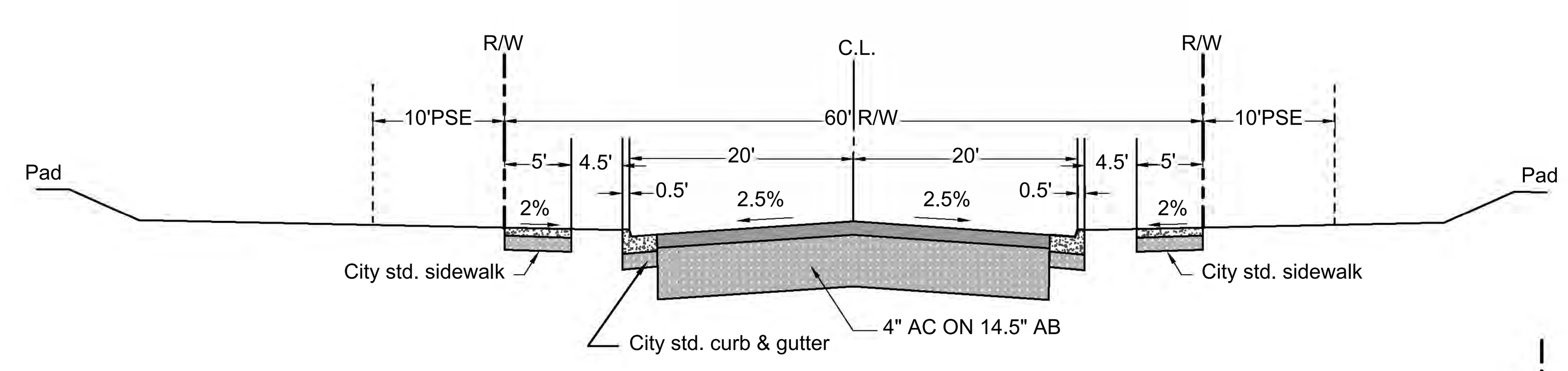
18	Pipe - (1)	166.146	18	Cir	410.50	418.21	4.64	22.62	9.69	411.70	419.41	422.92	15.82
17	Pipe - (2)	116.321	18	Cir	405.42	410.50	4.29	21.76	9.61	406.12	411.70	415.53	15.83
16	Pipe - (3)	102.695	18	Cir	396.22	404.42	7.99	29.69	9.56	399.52	405.61 j	410.14	15.84
15	Pipe - (4)	175.129	18	Cir	394.47	396.22	1.00	10.50	11.87	396.54	398.78	408.89	19.84
14	Pipe - (5)	45.823	18	Cir	394.01	394.47	1.00	10.52	11.79	395.51	396.09	403.46	19.85
13	Pipe - (6)	16.228	18	Cir	393.84	394.01	1.05	10.75	2.97	395.22	394.66	401.47	22.83
12	Pipe - (7)	291.693	24	Cir	385.53	393.84	2.85	38.18	14.74	387.38	395.22 j	400.73	22.84
11	Pipe - (8)	46.157	18	Cir	384.81	385.53	1.56	13.12	14.74	386.31	387.22	390.85	22.85
10	Pipe - (9)	112.134	24	Cir	379.81	384.81	4.46	47.76	14.75	380.57	386.19	389.52	22.86
9	Pipe - (10)	112.903	24	Cir	374.94	376.37	1.27	25.45	14.75	377.19	377.75 j	387.02	22.87
8	Pipe - (11)	44.345	24	Cir	374.44	374.94	1.13	24.02	15.03	375.65	376.81	384.85	24.88
7	Pipe - (12)	130.259	30	Cir	372.86	374.44	1.21	45.17	15.12	375.48	376.62	384.24	25.55
6	Pipe - (13)	250.463	30	Cir	369.81	372.86	1.22	45.26	15.12	376.12	376.46	380.85	25.56
5	Pipe - (14)	319.794	30	Cir	362.91	369.81	2.16	60.24	53.45	368.84	374.27	373.44	25.83
4	Pipe - (15)	197.815	36	Cir	359.76	362.91	1.59	84.16	90.59	363.12	366.77	366.54	38.29
3	Pipe - (33)	109.825	8	Cir	422.79	423.88	0.99	1.30	0.29	423.03	424.13	427.57	0.40
2	Pipe - (34)	49.190	8	Cir	422.29	422.79	1.02	1.32	0.28	422.54	423.03	426.00	0.41
1	Pipe - (35)	72.463	8	Cir	420.36	422.29	2.66	2.14	0.28	420.61	422.54 j	426.01	0.42

Project File: 23117.5 Storm Calcs New.stm	Number of lines: 62	Date: 11/15/2022

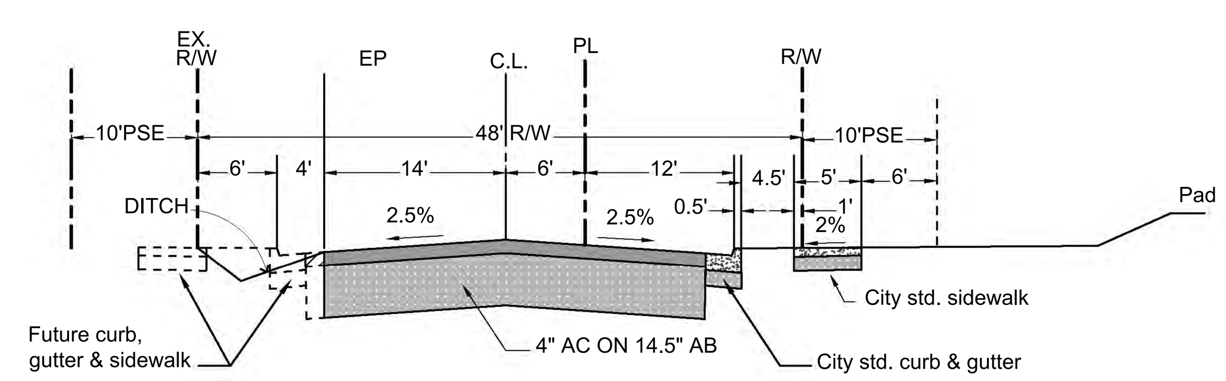
NOTES: ** Critical depth

Project: Viji Mana
Project No.: 23117.5
Date: 7/24/2023

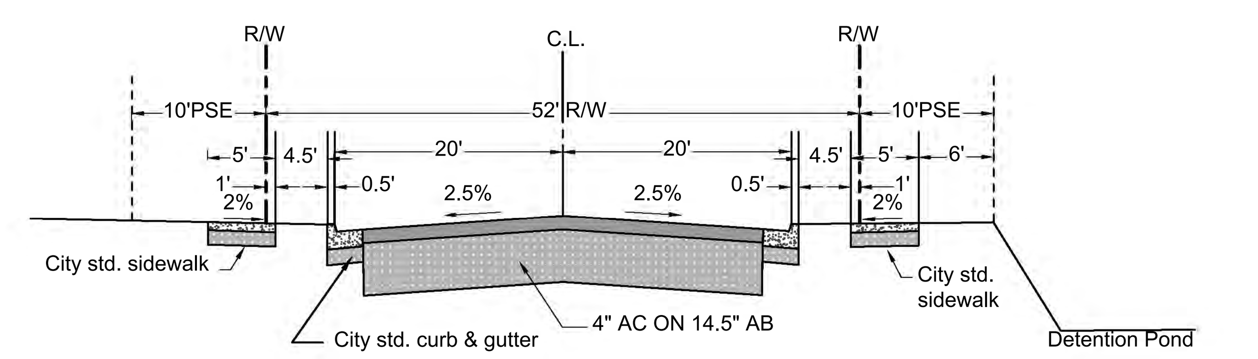
Attachment G:
Preliminary Stormwater Control Plan Sheet



Street Section- Saddleback Drive
Looking Northwest Scale: None

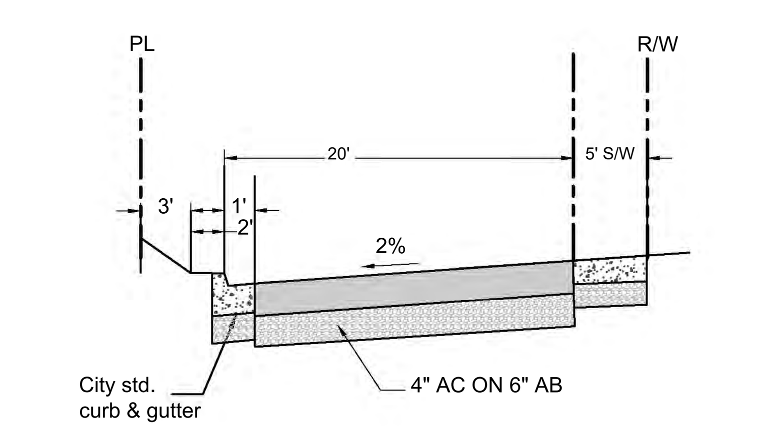


Street Section-Kole Court
Looking Northeast Scale: None

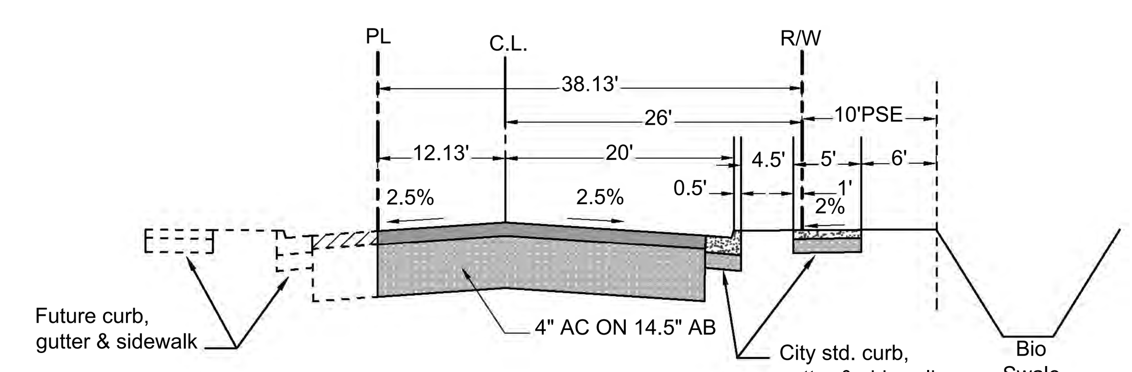


Street Section- Sorrel Drive
Looking Northwest Scale: None

Grading Quantities			
	Cut (CY)	Fill (CY)	Net (CY)
Rough Grading	4990	7754	2764
Import		2,764 CY	



Driveway Section
Scale: None



Street Section- Sorrel Drive
Looking Northwest Scale: None

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Serene Hills

Preliminary Grading Plan

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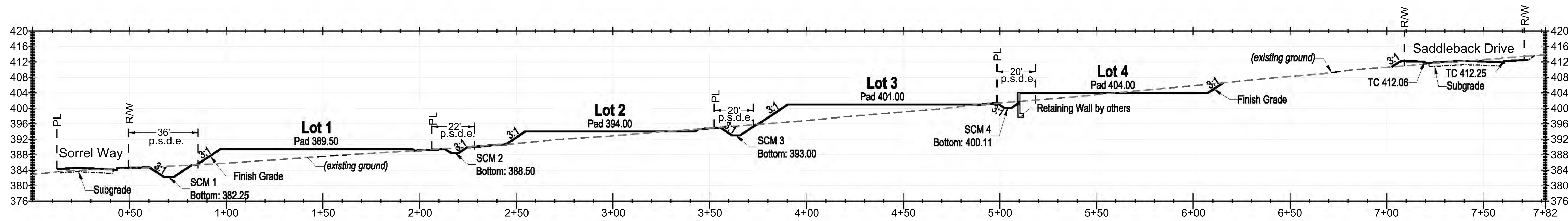
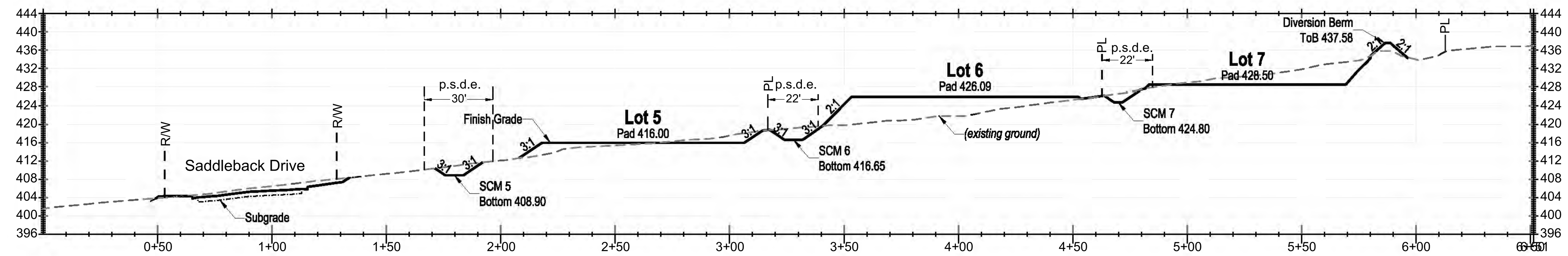


PROFILE: Section: A
SCALE H: 1"=40' SCALE V: 1"=20'



PROFILE: Section: B
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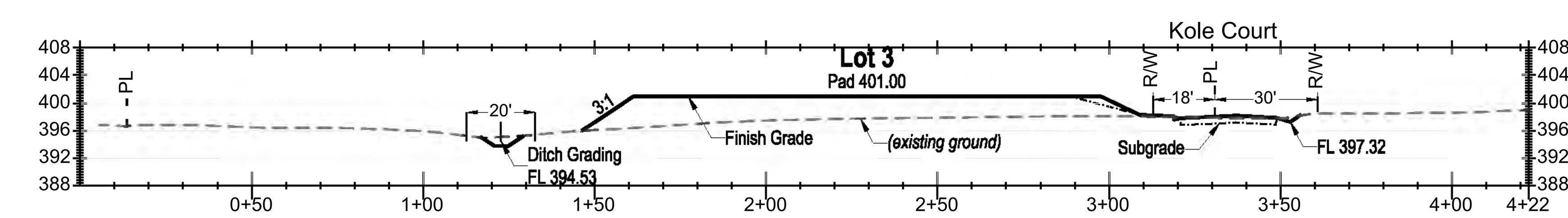


PROFILE: Section: C
SCALE H: 1"=40' SCALE V: 1"=20'

Broadband Standards

CITY OF MORGAN HILL

For Broadband connectivity, a project is required to install conduits in all the public rights-of-way fronting the project site to accommodate multiple broadband providers. The following standards apply:

A. Design Plans

1. The project is required to submit design plans to include an engineering plan and profile of each street showing the location of existing underground utilities in the proposed path of the broadband conduit installation.

2. The design plans shall also include the approximate locations and dimensions for surface restoration.

B. Broadband Conduit

1. Provide a minimum of two (2) conduits each with at least two pull cables. At least one conduit shall remain empty and reserved for use by a potential future broadband service provider.

2. Each conduit shall be a 4" diameter PVC pipe, non-pressure type but has adequate stiffness for direct burial usage without encasement in concrete. The type of pipe shall be consistent with industry standards and be orange in color.

3. Broadband system designers shall field-verify the locations of existing utilities and surface features along and adjacent to the proposed conduit alignment.

4. The preferred horizontal conduit alignment is at centerline of sidewalk or as approved by the City Engineer.

   a. For conduits allowed in the street: Locate new conduit 3' from face of curb. Conduits shall be located parallel to the street centerline, where practicable, and shall not meander along the street. Street crossings shall be perpendicular to the street centerline.

5. Horizontal Clearance:

   a. Minimum 1' horizontal clearance from new conduit to other existing utilities, excluding water mains, gas lines, and electric lines.

   b. Minimum 3' horizontal clearance from new conduit to existing water main.

   c. The applicant is responsible for checking with owners of adjacent non-City utilities (ex. gas and electric lines) to verify their required horizontal separation requirements.

6. All conduits shall be installed underground using directional boring method or open trench.

   a. For Directional Bore Design

      i. Plans shall include a layout plan and profile sheets for directional bores. All existing utilities must be shown to scale on the plan and profile views.

      ii. Vertical Clearance: Provide 3' minimum vertical clearance from all utilities. This includes minor services, such as water services and sewer laterals. For deep crossings, provide a minimum of 5' clearance from utilities and structures. The applicant is responsible for checking with owners of adjacent non-City utilities (ex. gas and electric lines) to verify their required vertical separation requirements.

      iii. Boring and Receiving Pits: Show the length, width, depth, and location of the boring and receiving pits on the plans and profiles. The pits are to be located to minimize the construction impact to the adjacent properties and streets. Pits should not be in front of existing driveways, restaurants, bus stops, fire hydrants, and within street intersections.

      iv. Conflicts with Trees: If trees are in the way of the directional bore, the conduit shall be bored 8' to 12' underneath the tree roots rather than around the tree.

   b. For Trench Design

      i. For open-trench construction in the street: Conduit shall have a minimum cover of 36" above the top of the conduit and allow at least 6" between the top of the conduit and the bottom of the street structural pavement section.

      ii. For a trench outside the street section: Conduit shall have a minimum cover of 30".

      iii. Open trenches deeper than 60" must comply with Cal/OSHA standards, requiring protective systems, such as shoring.

      iv. Vertical Clearance: Provide 12" minimum vertical clearance from all other utility lines and services, including other telecommunication lines.

7. Tracer Wire: The conduits shall be installed with a tracer wire.

   a. Install tracer wire in the trench or bore with all underground conduits. Ensure the tracer wire provides end-to-end electrical continuity for electronically locating the underground conduit system.

   b. In a trenching operation, install the tracer wire no more than 3" above the conduit.

   c. In a boring operation, install the tracer wire in an encasement.

8. Identification Tape: A 6" wide, orange magnetically detectable identification tape shall be installed 12 inches above the entire length of the conduit route. The tape shall be continuously imprinted with "BROADBAND CONDUIT".

C. Pullboxes

1. Indicate locations of all pullboxes, other service boxes and manholes on the design plans.

2. Pullboxes shall be a No. 8 pullbox per City of Morgan Hill Standard E-6.

3. Pullboxes and splice boxes shall be located within the park strip/planter strip or at the back of sidewalk unless the City Engineer approves an alternative location.

4. The maximum distance between any two pull boxes shall not exceed 1,200 feet. Within the 1,200-feet distance, provide pullboxes at locations wherever the cumulative change of direction of the conduit exceeds 180 degrees.

5. The minimum bending radius for conduit shall be 3 feet.

6. Pullboxes shall be located a minimum of 12 inches from all structures.

D. Manholes

1. A detail of the manhole must be shown on the plans.

2. Manholes for broadband conduit shall not be allowed in the street unless an exception is granted by the City Engineer.

3. Manholes allowed to be in the street must have cast iron frames and covers.

4. Manholes that are in sidewalks shall have a concrete polymer frame and cover that matches the color and texture of the sidewalk.

5. Manholes shall not be placed within a driveway approach or within the curb return at intersections.

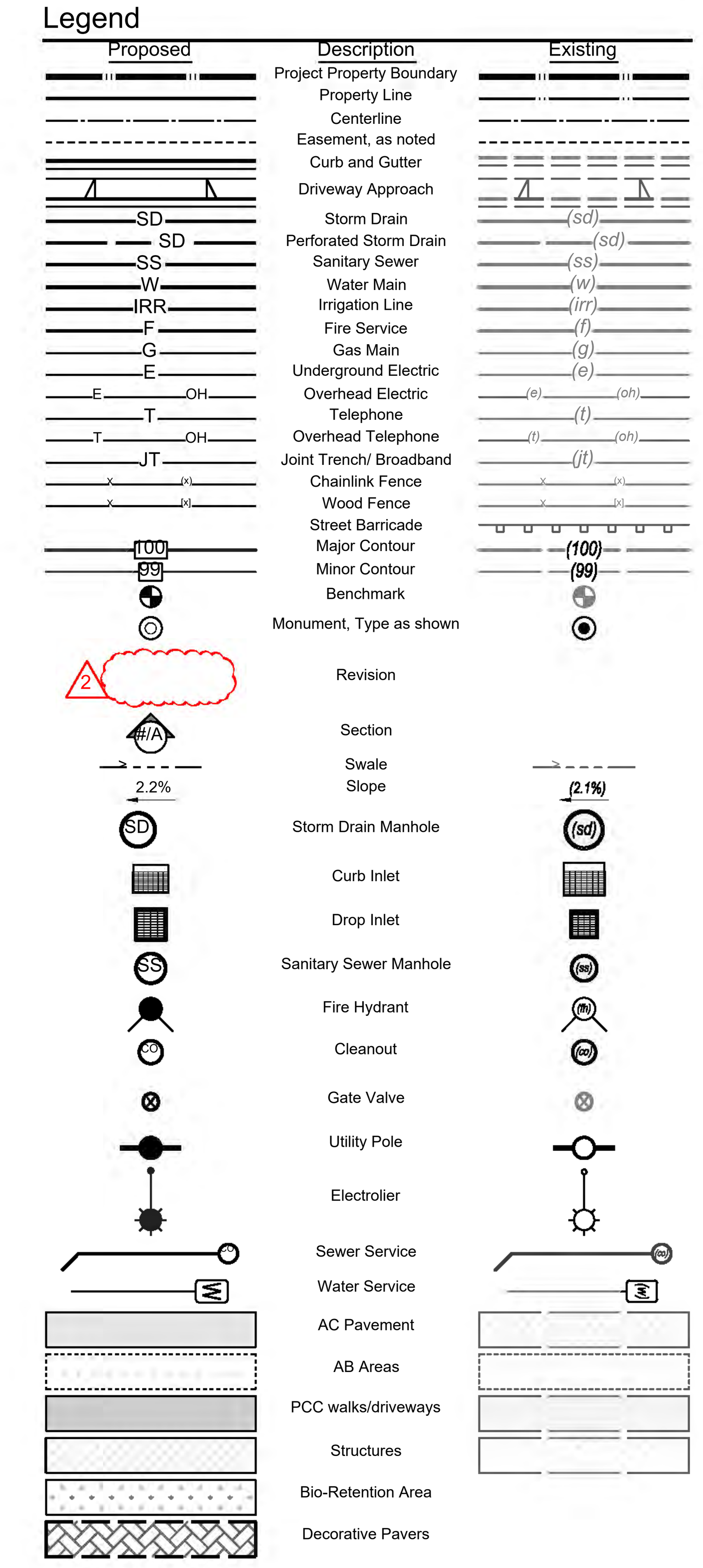
6. All manholes must be rated for a minimum H-20 wheel load.

7. The name "BROADBAND" shall be permanently cast into or engraved on the manhole covers.

E. Related Work

Refer to the City's Design Standards and Standard Details for Construction for pavement materials, trench limits of restoration, backfill for boring, and backfill for trenching.

Legend



Serene Hills

Preliminary Grading Cross Sections

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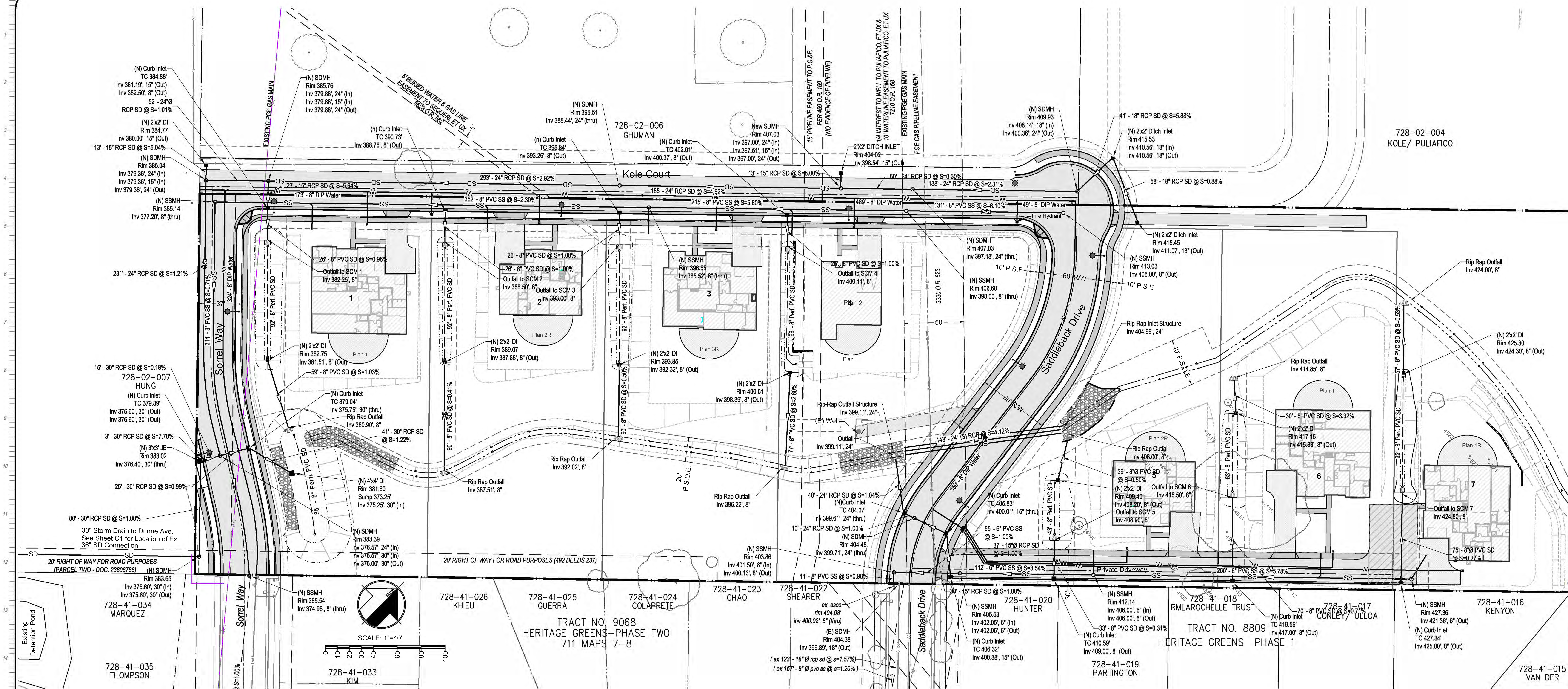

Fire Hydrant Location Identifier:
Prior to project final inspection, the general contractor shall ensure that an approved ("Blue Dot") fire hydrant location identifier has been placed in the roadway, as directed by the fire department

Utility Note:
Underground all existing overhead utilities along Kole Court and within the project boundary in accordance with city standards and affected utility company standards.

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Serene Hills

Preliminary Utility Plan

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DATE: 3/20/23 DRAWN:RS CHECKED: WJM

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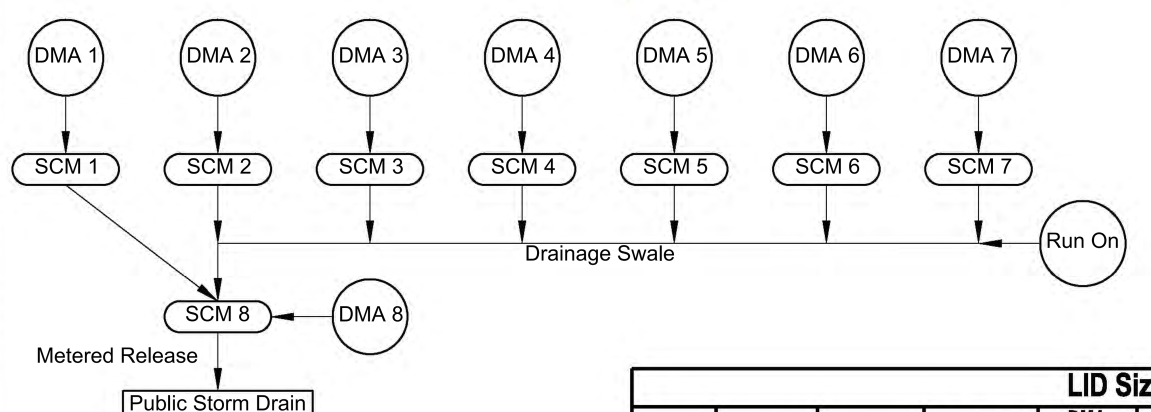
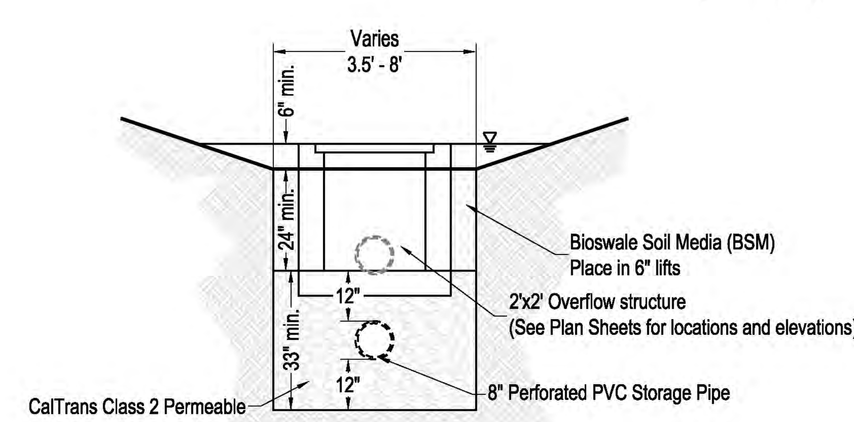
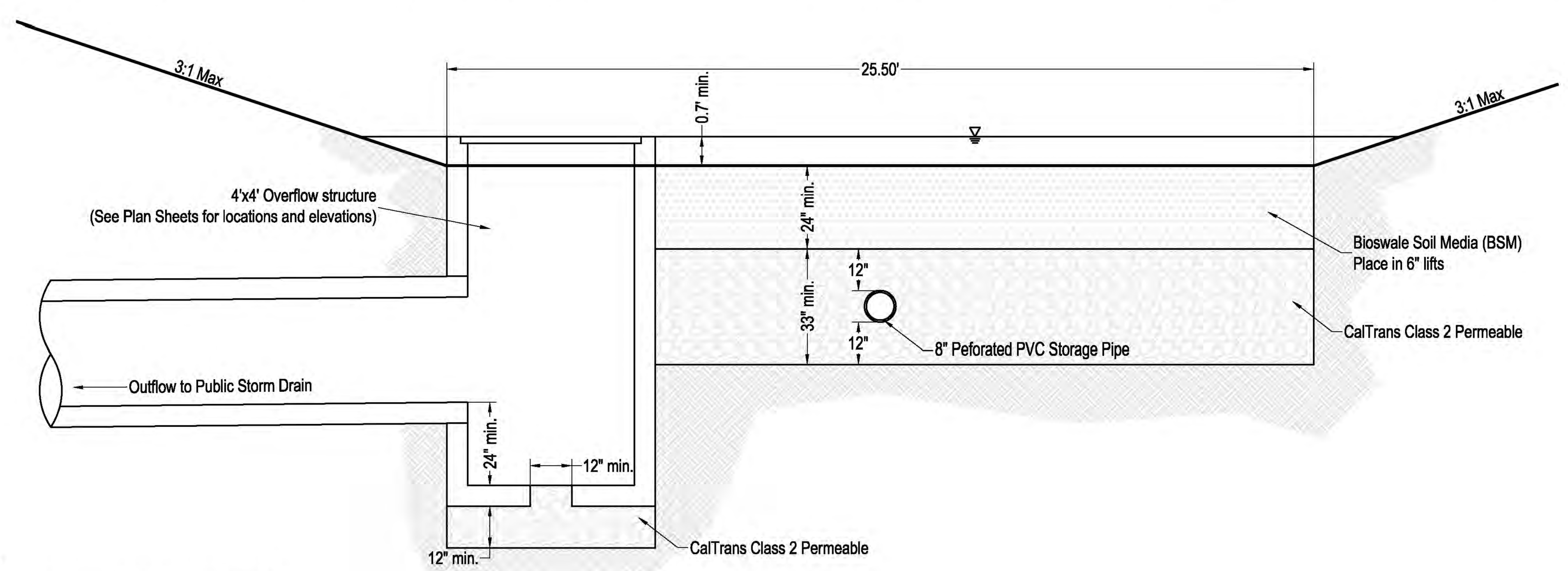


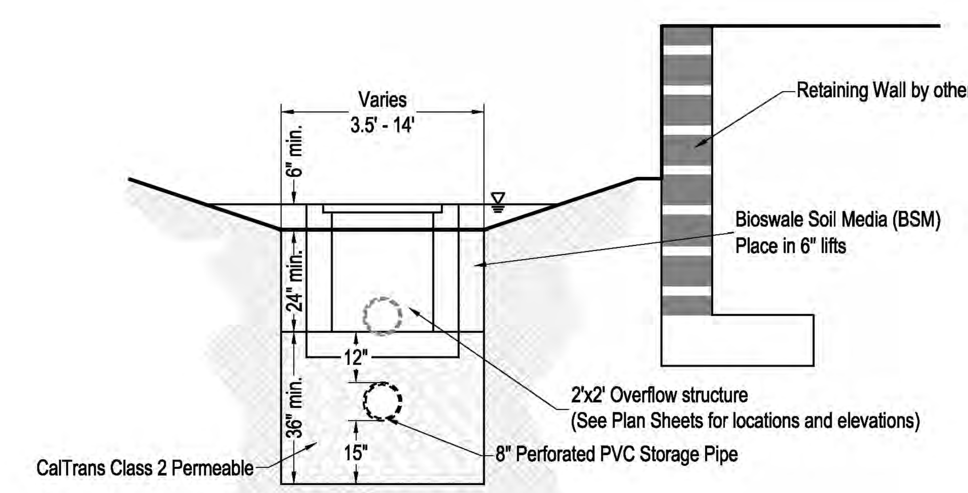
LID Sizing Table										
DMA	BMP	Description	Total DMA Area	DMA Impervious Area	i	C	Required Treatment Area	Provided Treatment Area	Requied Retention Volume	Provided Retention Volume
1	SCM 1	Bioswale	23,084 SF	10,852 SF	0.47	0.32	434 SF	500 SF	1,018 CF	1,147 CF
2	SCM 2	Bioswale	21,799 SF	8,997 SF	0.41	0.29	360 SF	400 SF	860 CF	937 CF
3	SCM 3	Bioswale	34,456 SF	10,185 SF	0.40	0.28	407 SF	450 SF	981 CF	1,041 CF
4	SCM 4	Bioswale	53,317 SF	12,247 SF	0.58	0.40	490 SF	486 SF	1,144 CF	1,174 CF
5	SCM 5	Bioswale	18,342 SF	8,916 SF	0.49	0.33	357 SF	400 SF	834 CF	893 CF
6	SCM 6	Bioswale	29,055 SF	12,286 SF	0.42	0.29	491 SF	560 SF	1,169 CF	1,247 CF
7	SCM 7	Bioswale	19,170 SF	8,791 SF	0.46	0.31	352 SF	400 SF	827 CF	830 CF
8	SCM 8	Bioretention/ Detention Pond	282,792 SF	45,861 SF	0.16	0.15	1,834 SF	1,867 SF	3,366 CF	4,622 CF
Total			482,016 SF	118,134 SF	0.27	0.21	4,725 SF	5,063 SF	10,198 CF	11,892 CF



Bioswale Detail: SCMs 1-3, & 5-7
Scale: none



Bioswale Detail: SCM 8
Scale: none

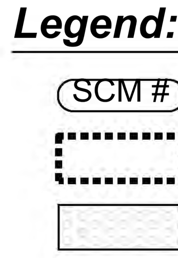


Bioswale Detail: SCM 4
Scale: none

Serene Hills

Preliminary Stormwater Control Plan

Legend:



Source Control Measure
DMA Boundary
Undisturbed Landscape

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DATE: 3/20/23 DRAWN:RS CHECKED: WJM

ATTACHMENT 6

INITIAL GEOTECHNICAL INVESTIGATION

CORNERSTONE
EARTH GROUP

TYPE OF SERVICES Initial Geotechnical Investigation

PROJECT NAME East Dunne Avenue Development

LOCATION 2275 East Dunne Avenue
Morgan Hill, California

CLIENT David J. Powers & Associates

PROJECT NUMBER 118-101-1

DATE April 23, 2018

CORNERSTONE
EARTH GROUP

Type of Services	**Initial Geotechnical Study**
Project Name	**East Dunne Avenue Development**
Location	**2275 East Dunne Avenue** **Morgan Hill, California**
Client	**David J. Powers & Associates**
Client Address	**1871 The Alameda, Suite 200** **San Jose, California**
Project Number	**118-101-1**
Date	**April 23, 2018**

Prepared by

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Project Engineer
Geotechnical Project Manager

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Craig Harwood, P.G., C.E.G.
Project Engineering Geologist

REGISTERED GEOLOGIST
CRAIG S. HARWOOD
exp 3/31/20
C.E.G. No. 2275
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Reviewed by

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Senior Principal Engineer
Quality Assurance Reviewer

CORNERSTONE EARTH GROUP

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CORNERSTONE EARTH GROUP

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FIGURE 4: REGIONAL FAULT MAP
FIGURE 5: GROUND MOVEMENT POTENTIAL MAP

Type of Services	**Initial Geotechnical Study**
Project Name	**East Dunne Avenue Development**
Location	**2275 East Dunne Avenue Morgan Hill, California**

SECTION 1: INTRODUCTION

This report has been prepared for the proposed future development at the above referenced property. The location of the site is shown on the Vicinity Map, Figure 1 and Site Plan and Site Geology, Figure 2.

For our use, we were provided with the following document:

- A Vicinity Map showing subject property prepared by Hanna- Brunetti, un-dated.

1.1 PROJECT DESCRIPTION

The project site is located at 2275 East Dunne Avenue in Morgan Hill, California. We have discussed the site with you, reviewed relatively recent aerial photographs of the site, and visited the site. The site is currently an open undeveloped area covered with grass. We understand that changing of the land use of about 8.5 acres (APN 728-02-002 &003) from residential estate to residential detached and rezoning is planned.

1.2 SCOPE OF SERVICES

Our scope of services was presented in our agreement dated February 27, 2018, and includes geologic research and consolidation of data, site reconnaissance, identification of potential geologic, seismic and geotechnical impacts, a discussion of potential mitigation measures, drafting and report preparation.

SECTION 2: REGIONAL SETTING

2.1 REGIONAL SEISMICITY

The San Andreas Fault is the dominant structural feature in the region and is a fundamental geologic boundary between two of the earth's tectonic plates. The fault system follows a northwest-trending path through most of California, arising in the south from a set of transform faults in the Gulf of California and joining, to the north, the Mendocino Fracture Zone offshore of the northern part of the state. The San Francisco Bay region is within a zone of distributed active deformation associated with the North America-Pacific plate boundary. The plate boundary zone has had a complex history that has involved, over time, plate subduction, and crustal extension and contraction in association with dextral (right-lateral) strike-slip movements along faults within the boundary zone. The present-day seismotectonic setting of the region is marked by high rates of earthquake occurrence, right-lateral shear deformation along the San Andreas Fault system, and components of contractional strain, both oblique and normal to the San Andreas Fault.

The San Francisco Bay area region is one of the most seismically active areas in the Country. While seismologists cannot predict earthquake events, geologists from the U.S. Geological Survey have recently updated earlier estimates from their 2014 Uniform California Earthquake Rupture Forecast (Version 3) publication. The estimated probability of one or more magnitude 6.7 earthquakes (the size of the destructive 1994 Northridge earthquake) expected to occur somewhere in the San Francisco Bay Area has been revised (increased) to 72 percent for the period 2014 to 2043 (Aagaard et al., 2016). The faults in the region with the highest estimated probability of generating damaging earthquakes between 2014 and 2043 are the Hayward (33%), Rodgers Creek (33%), Calaveras (26%), and San Andreas Faults (22%). During such an earthquake the danger of fault ground rupture at the sites is slight, but strong to very strong ground shaking would occur.

The faults considered capable of generating significant earthquakes are generally associated with the well-defined areas of crustal movement, which trend northwesterly. The table below presents the State-considered active faults within 25 kilometers of the site.

Table 1: Approximate Fault Distances

Fault Name	Distance (miles)	Distance (kilometers)
Calaveras (South)	2.3	3.7
Sargent	8.4	13.5
Hayward Fault(Southeast)	10.7	17.2
San Andreas	11.9	19.2
Monte Vista - Shannon	12.5	20.1
Zayante - Vergeles	14.5	23.4

*Distances are from estimated surface projection of each fault.

A regional fault map is presented as Figure 4, illustrating the relative distances from the site to significant fault zones.

Within relatively recent historical times, several earthquakes have resulted in damage in the Morgan Hill area including earthquakes in 1906, 1979, 1984 and in 1989. The M 5.9 1979 "Coyote Lake" earthquake on the Calaveras Fault just east of Morgan Hill, and the M 6.2 1984 Morgan Hill earthquake also struck along the Calaveras Fault about 16 miles northwest of downtown. Damage from the 1984 earthquake was reported to be about 7.5 million dollars, with most of that occurring in or near Morgan Hill (PGE, 1991). The October 17, 1989, magnitude 7.1 Loma Prieta earthquake caused widespread dame throughout the area but locally only a few houses were seriously damaged, and only a few chimneys fell. Although the epicenter of the earthquake was only about 15 miles from downtown, local shaking intensities were surprisingly low. Nevertheless, damaging earthquakes can be expected to occur during the design life of structures within the region.

2.2 REGIONAL GEOLOGICAL SETTING

The subject property is located in an area where the southern Santa Clara Valley abuts the Mt. Diablo Range (on the northeast). The interface between these two physiographic regions is defined by a band of front-range faults, along which the mountains have risen and been thrust over the valley over the past 5 to 10 million years. As already mentioned, within the region, the San Andreas Fault system, which distributes shearing across a complex assemblage of primarily right lateral, strike-slip, parallel and sub-parallel faults that includes the Hayward and Calaveras faults. Western traces of a segment of the Calaveras Fault occur within the Diablo Range in the northeastern corner of the quadrangle.

Several published maps cover the general south-central portion of the Santa Clara Valley region and, more locally, the Morgan Hill and Mt. Sizer 7.5' Quadrangles. These regional scale maps include: Dibblee (1973, 2005), Pacific Geotechnical Engineering (1991), Wentworth et al., (1999), Knudsen et al., (2000) and the California Geological Survey (CGS, 2006). Bedrock exposed in the Morgan Hill and Mt. Sizer Quadrangles consists of Franciscan Complex rocks that are structurally overlain by the Coast Range Ophiolite and Mezozoic marine deposits of the Great Valley Sequence (Wentworth and others, 1998). Wentworth and others (1998) divided this area into several distinct fault-bounded structural blocks, each with a contrasting geologic history. Relevant to the local vicinity, the Coyote Block is located between the San Jose Fault (of Hanna and Brabb, 1981) and the Calaveras Fault (on the northeast). The Coyote Block consists of Coast Range Ophiolite rocks overlain by Cretaceous strata of the Great Valley Sequence and Tertiary strata. The oldest rocks in the map area consist of Cretaceous sandstone, mudstone and conglomerate ("Kcusm") within the Great Valley Sequence.

2.3 SITE GEOLOGY

Of the published maps covering the area of the site, the mapping of Pacific Geotechnical (compiled at a scale of 1" = 200') is the most useful of the published maps in terms of scale and accuracy. The attached local geologic map (Figure 3) is a partial reproduction from Pacific Geotechnical Engineering (1991).

Quaternary alluvial deposits overlie the bedrock units on the floor of the Santa Clara Valley as well as along the transition along base of the western and eastern hillside areas. The relative ages of the Quaternary deposits are determined using: landform shape, relative geomorphic position, cross-cutting relationships, superposition, depth and degree of surface dissection, and relative degree of soil profile development. Further out into the valley bottom, the majority of which have been deposited by Coyote Creek and its tributaries. Much of the sediment in the Coyote Creek system within this portion of the Santa Clara Valley was derived from rocks in the hills to the east of Santa Clara Valley.

Along the mountain ranges bordering either side of the valley, alluvial fan complex is responsible for the majority of the quaternary alluvium in these areas. The mapping of PGE indicates the old alluvial surface ("Qoa") at the base of the range front is overlain locally by alluvial fans (Qfd") which emanate or extend southwesterly from steep-side drainages within the steep hills on the northeast. These fans dominate the geomorphology within the northeastern ¾ of the property whereas within the ground surface transitions into an essentially flat alluvial plain within the far southwestern portion of the property. The alluvial fans have formed in response to drainage events coming out of the two drainage canyons located just to the northeast of the site. CGS assigns a Holocene age to the alluvial fan deposits underling the area of the site (map symbol: "Qhf"), whereas the valley fill alluvium located stratigraphically beneath the Ofd fan deposits and further to the southwest of the site is assigned a "Late Pleistocene" age (CGS, 2006, Knudsen and others, 2000). The CGS has compiled 99 geotechnical laboratory tests conducted within this mapping unit. Their compilation indicates the Qhf unit within the quadrangle consists on average of: 38% lean clay; 22% lean silt, 15% well graded gravel, and 25% other soil constituents.

2.3.1 Review of Aerial Photographs

Six sets of black and white, stereo-paired aerial photographs were reviewed and one pair of color infrared photos were reviewed as a part of our study. These photographs were taken during the years from 1953 to 1981 and range in scale from 1:12,000 to 1:30,000. In addition to the stereoscopic pairs of aerial photographs, we also reviewed selected individual (non-stereoscopic) aerial photographs. A complete listing of the stereoscopic pairs of photographs reviewed is included in the "References" section. Additionally, we reviewed Google Earth® images spanning from 1998 through 2012. A summary of our observations is provided below.

At the time of the 1956 photos the site was essentially in agricultural mode with some cultivated row crops contained within the central portion of the property. A structure, potentially a residence, was located just beyond the southeast property corner on the adjacent Kruse Ranch property. These photos clearly show a seasonal creek or drainage that emanates from the foothill beyond the northeast of the site and into the site. This drainage delivers runoff from the steeper range front on the northeast onto the alluvial plain and the subject site to the southwest. It is confirmed by historical topographic published maps of the Morgan Hill Quadrangle (1917) as well as more modern topographic quadrangle maps. This drainage, which extends southwesterly through the site, is parallel with the southeast property line. The site is largely dominated by grasses and weeds but locally Oak and Eucalyptus trees are located along the path of this drainage. The 1963 photos show that a residential structure and detached building, most likely a garage, were constructed in the central portion of the site near the drainage channel. This development required in-filling of the central portion of the drainage channel and diverting it into an arcing path toward the north, and then southwesterly so that drainage was diverted around the central portion of the site. By 1965 the agricultural activity at the site appears restricted to the southwestern half of the site, which is in row crop. The drainage ditch continued to extend all the way to the far southwest property line, trending just north of the south property line. There are now two ancillary structures associated with the main developed area in the south-central portion of the property. Google Earth images indicate the residence was demolished and removed from the site sometime between August 2016 and December, 2016.

Subtle tonal patterns located just beyond the northeast property line suggest the presence of the Ranger front thrust fault extending through the area. A spring located in this same area may be at least partially due to the presence of the fault zone. No geomorphic or tonal patterns were noted in the aerial photography that would suggest evidence of landsliding was observed on the site or adjacent to it.

SECTION 3: SITE CONDITIONS

3.1 SURFACE CONDITIONS

The property is located at the base of the range front where coalescing alluvial fans drape onto the valley surface of the Santa Clara Valley. Onsite the land surface dips gently (2 to 3 degrees) toward the southwest and in the far southwestern portion of the site the land is essentially flat. A drainage that exists within the northeastern and the southwestern portions of the site is generally less than 5 feet deep in the northeast, and less than 3 feet deep in the southwest. The overall relief at the site is approximately 50 feet with the highest point at the northeast property line and the lowest point at the southwest property line.

The site is overgrown with grasses and various understory shrubs and localized clusters of Eucalyptus, Oak, and California Pepper trees. An abandoned paved road accesses the property from the southwest property line. The dirt road currently trends along a PG&E underground utility easement. Existing single-family residential properties are on the south and southeast. Rural residential and undeveloped land to the north, east, and west. The site of the former home and ancillary structures in the southeast-central portion of the property are associated with evidence of man-made materials, disturbed soils and localized fills placed to level the development area. As a result of this previous grading and development, the former drainage channel was in-filled and diverted around the development within that portion of the site.

According to the classification scheme presented on the City of Morgan Hill Ground Movement Potential Map series (Figure 5), the site is located within the "Sx" zone (PGE, 1991). This zone is characterized by PGE according to the following; "Moderately to highly expansive alluvial or colluvial soil on flat or nearly flat ground. Subject to seasonal shrinking and swelling, soil creep, and settlement. May include localized areas of non-expansive soil."

3.2 GROUND WATER

The CGS Seismic Hazard Zone Report for the Mt. Sizer Quadrangle (2006) shows historic ground water levels in the immediate area around the site as being between 50 and 60 feet below the ground surface. The CGS evaluation was based on; ground-water elevation contours in USGS Water Supply Papers (Clark 1917), ground-water information obtained from the Santa Clara Valley Water District (Reymers and Hemmeter, 2002), and from geotechnical borehole logs acquired from the City of Morgan Hill, Santa Clara County, and Pacific Geotechnical Engineering. Fluctuations in ground water levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors.

SECTION 4: GEOLOGIC HAZARDS

4.1 FAULT RUPTURE

The San Andreas Fault and related major branching faults dominate the geologic structural and geomorphological patterns of the San Francisco Bay Region and Santa Clara Valley. The Hayward Fault is farther west, near the base of the San Jose Foothills. Several smaller transpressive faults also are mapped within the quadrangle, primarily along the western portion of the Diablo Range where it meets the Santa Clara Valley. They include the Evergreen, Quimby Fault, Piercy Fault, and the Clayton Fault. More local to Morgan Hill are the Coyote Creek Thrust Fault and the Range Front Thrust Fault.

No significant historic earthquake has been attributed to either the Coyote Creek Thrust Fault ("CCTF") or the Range Front Thrust Fault ("RFTF"). Nevertheless, the structural position of both of these faults with respect to the Calaveras Fault suggests that it should be considered to be at least potentially active. The fault was originally recognized by Dibblee (1973) defined by (in the immediate area) on a juxtaposition of Holocene and Pleistocene alluvial fan deposits (on the southwest) against Santa Clara Formation (on the northeast) with the fault dipping steeply to moderately into the hillside. Dibblee shows the fault transitioning into an anticlinal fold axis just southeast of the site (Dibblee, 1973, 2005). That interpretation has been further modified by the more recent mapping by John Coyle for the work of Pacific Geotechnical Engineering. The Range Front Thrust Fault is mapped as trending along the base of the range front along a significant break in slope just beyond the northeast property line (PGE, 1991). PGE noted evidence for their inference for the presence of the fault zone: 1) Old Alluvium (Late Pleistocene) northeast of Maple Avenue [1.8 miles southeast of the site] is interpreted to be uplifted about 40 feet by the fault, and 2) the strikingly linear base of the Diablo Range (particularly when compared with the base of the Santa Cruz Mountains on the opposite side of the valley) is interpreted to represent uplift due to faulting. The RFTF appears to be the most western of the three thrust faults splaying to the west of the Calaveras fault. The mapping of PGE suggests the fault zone extends through the area with a trend that varies from N53°W to N67°W. The fault is projected as intersecting the northeast property corner of the subject site. For this reason, the northeast portion of the site is located within a county-designated Fault Rupture Hazard Zone as well as a City of Morgan Hill Fault Rupture Hazard Zone or "Paf "zone (PGE, 1991). The Paf zone is characterized as a "Zone of potential permanent ground displacement due to horizontal or vertical movement along the trace of an active or potentially active fault."

Our review of published sources, historic aerial photos and site reconnaissance indicates there is compelling evidence (i.e., topographic, geologic as well as soil moisture patterns) of the fault zone trending long the base of the range front, however, it is generally concealed beneath colluvial accumulations and alluvial fans along the base of the range front, and therefore, its precise location cannot be determined without subsurface investigation. Adding to the difficulty in discerning the actual trend of the fault surface trace is the possibility of localized scouring and erosion in the proximal areas of alluvial fans, which overlie the RFTF.

In general, surface fault rupture involves shearing, differential movement, and ground breakage along the trace of the fault during moderate to strong earthquakes. The resulting movement can severely damage structures and utilities that are located across the fault trace. Thus, studies are undertaken to identify the location of fault traces, and to determine the activity of the fault. Evaluation of surface fault rupture is based on the premise that future fault rupture will take place along previous ruptures. Consequently, accurate determination of the location and character of previous fault ruptures is required for surface fault hazard assessment. In terms of fault rupture hazard evaluations, faults are considered "active" if they display evidence of movement within Holocene time (the last 11,000 years), and "potentially active" if they display evidence of movement within Quaternary time (i.e., within the last 1.6 million years).

As part of their 2017 Addendum to their geologic hazards evaluation of the Kruse Ranch site located on the northeast, ES Geotechnologies, excavated and logged a continuous fault trench (T-3) on the gently inclined alluvial fan just beyond the northeast property line of the subject site. This trench was 83 feet long and varied in depth from 8 to 11 feet. The T-3 trench log characterized the stratigraphy as consisting of surficial soil and alluvium throughout the depth and length of the trench except at the southwestern end where Santa Clara Formation ("QTsc") is exposed locally (is positioned stratigraphically higher) within the basal portion of the trench. That is, the QTsc unit was apparently encountered at a depth of approximately 8 feet within the southwest portion of their trench and presumably would have been encountered throughout the trench if it were extended to a greater depth if the trenching depth had been extended. The T-3 log suggests that both the alluvial fans deposits and the underlying QTsc units are devoid of structure. Given that the alluvial fan deposits are Holocene, and the RFTF has not been known to disrupt Holocene deposits, and they did not discern or comment on stratigraphic detail or note variations in soil color or moisture, it is unclear how they were able to "clear the area" of faulting by virtue of this particular trench. A slightly deeper trench exposing QTsc throughout and noting stratigraphic/structural details would have sufficed to answer the question. The log of the previous trench located more southerly (T-6) was not available for our review but presumable they had interpreted that area to be devoid of evidence of faulting as well as the fault was plotted northeasterly of Trench T-6. The actual trend of the RFTF along the base of the hillside can only be projected and inferred.

4.2 LANDSLIDING

A review of available published maps indicates no landslides have been mapped as occurring or extending into the subject site. The subject site is not included in a state, county or city designated landslide hazard regulatory zone. The site slopes are within the "Sx" geotechnical zone: "Areas of relatively stable ground". This zone is described as; "Moderately to highly expansive alluvial or colluvial soil on flat or nearly flat ground (Figure 5). Subject to seasonal shrinking and swelling, soil creep, and settlement. May include localized areas of non-expansive soil."

The Lands of Kruse located immediately to the northeast is comprised of generally moderately inclined (west facing) to steep terrain and is incised by steep-sided, southwesterly flowing drainages. This particular area is located within a state-designated earthquake induced landslide zone, a county landslide hazard zone and a City of Morgan Hill landslide hazard zone. These steep-sided drainages and westerly facing slopes are located within the City of Morgan Hill "Pd" and "Ps" zones. These designations are not based on site-specific studies but are based on interpretation using remote sensing and applying generalized characteristics of bedrock conditions, structural trends and steepness of slopes. A few small-scale landslides (earth flow and debris flow scars) are mapped on the site just to the northeast (PGE, 1991; CGS, 2006; Delattre, 2006; CGS, 2015). This mapping is also based on remote sensing techniques. More local-based mapping by consultants [ES Geotechnology and Cornerstone Earth Group (2017)] confirms the presence of small-scale slumps within the drainage to the northeast of the site. However, these slope failures are very limited in physical extent and, based on the evaluations of ES Geotechnologies, are not considered a potential hazard for slope instability.

The steep slopes within the drainages emanating from the hillside on the northeast are classified on the City's GMP map as being within their "Pdf" zone. The Pdf zone is characterized as; "Hillside areas subject to fast-moving landslides; Includes flow path."

The CGS (2006) and the Landslide Inventory Map of the quadrangle (Delattre, 2006) shows two moderate sized landslides on the slope above the adjacent site (on the southeast) but neither of these slides potentially impact the subject site as they are topographically isolated from the subject site.

4.3 ESTIMATED GROUND SHAKING

Moderate to severe (design-level) earthquakes can cause strong ground shaking, which is the case for most sites within the Bay Area. A peak ground acceleration (PGA_M) was estimated for analysis using a value equal to FPGA x PGA, as allowed in the 2016 edition of the California Building Code. For our liquefaction screening we used a PGA_M of 0.764g.

4.4 LIQUEFACTION POTENTIAL

The site is not located within a State-designated Liquefaction Hazard Zone (CGS, Mt. Sizer Quadrangle, 2006). Based on historic ground water in the area by CGS (2006), a laterally continuous groundwater table in the area can vary between 50 and 60 feet beneath the ground surface. The presence of a seasonal drainage extending through the site and springing located adjacent to the upslope edge of the site can contribute to localized conditions such as limited perched groundwater. PGE indicates the site in an area within: "Valley floor terrain with a low potential for ground surface movement due to soil liquefaction." The PGE evaluation was based on review of geotechnical subsurface data from "logs of over 200 borings reviewed for the study indicate that, with very few exceptions, density and compositional characteristics of the subsurface soils suggest a very low potential for liquefaction." Additionally, PGE notes that there is no historical account of soil liquefaction occurring in the Morgan Hill area during the 1906, 1984, or 1989 earthquakes.

4.4.1 Liquefaction Associated Ground Rupture Potential

The methods used to estimate liquefaction settlements assume that there is a sufficient cap of non-liquefiable material to prevent ground rupture or sand boils. For ground rupture to occur, the pore water pressure within the liquefiable soil layer will need to be great enough to break through the overlying non-liquefiable layer, which could cause significant ground deformation and settlement. The work of Youd and Garris (1995) is typically used to estimate the potential for liquefaction associated ground rupture; however, the site does not appear to be susceptible to liquefaction, therefore, the potential for ground rupture appears low.

4.5 LATERAL SPREADING

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope.

There are no open faces within a distance considered susceptible to lateral spreading. Although there is a 4 to 6 foot deep drainage channel that traverses the site, since the potential for liquefaction is considered low. In our opinion, the potential for lateral spreading to affect the site is low.

SECTION 5: CONCLUSIONS

5.1 SUMMARY

From a geotechnical viewpoint, the project is feasible provided the concerns listed below are addressed and mitigated in a future design-level geologic and geotechnical investigation for the project. The preliminary conclusions regarding potential geologic hazards that follow are intended for conceptual planning and preliminary design. A design-level geotechnical investigation should be performed once site development plans are prepared indicating where proposed structures are planned. The design-level investigation findings will be used to confirm the preliminary conclusions of this report and to develop detailed recommendations for design and construction. Descriptions of each geologic/geotechnical concern with brief outlines of our preliminary recommendations follow the listed concerns.

- Fault Surface Rupture
- Landsliding/Debris Flows
- Presence of Highly Expansive Soils
- Naturally Occurring Asbestos
- Capture and Control/Conveyance of Runoff
- Presence of Undocumented Fill

5.1.1 Fault Surface Rupture

As already mentioned, the RFTF fault trends through the area but its precise trend is not known and can only be inferred through projection from distal points and interpretation of landforms. This uncertainty in the location of the fault has not been alleviated through the trenching on the adjacent parcel to the northeast. The northeast portion of the subject site is in a regulatory zone of potential ground deformation due to fault surface rupture (City of Morgan Hill; PGE, 1991). Without knowing the actual location of the fault, building exclusion zones cannot be established for the project site at this juncture. If habitable structures are proposed for the portion of the site located within the "Paf" zone, that portion of the site should be trenched in order to locate the fault zone.

5.1.2 Landsliding/Debris Flows

The site is not located within a regulatory landslide hazard zone (CGS, 2006; County of Santa Clara, 2002; City of Morgan Hill, 1991). Portions of the hillside located just northeast of the site are contained within a county-designated landslide hazard zone as well as the City designated landside hazard zone. The portion of drainage located on the adjacent property situated beyond the northeast of the property line is located at the State designated landslide hazard zone.

We noted no evidence for earthflow or slump type landslides just northeast of the site and the Santa Clara Formation materials appear to have performed relatively well over time in terms of gross stability. We agree with the previous findings of ES Geotechnologies regarding the relatively low potential for slope instability potential of those slopes. The drainage that emanates from the base of the hillside on the adjacent parcel beyond the northeastern property line of the site is located within a debris flow hazard zone ("Pdf"). Although the subject site is not located within a "pdf" zone the runout area emanating from the drainage on the adjacent site is projected toward the subject site. The City's consultant (Pacific Geotechnical Engineering) indicated, "In all Instances where a land use to be located within a 500-foot radius from and below the elevation of an arrow [indicated on GMP map] in a Pdf ground movement potential category, the use will not be permitted unless geologic data and/or engineering data will permit the use." We recommend that a debris flow analysis be performed as part of a future design level study of the site. Potential debris flow mitigation measures to be located onsite may include a combination of walls (deflection wall or catchment wall) and/or catchments basin and debris grate/catch basin. The actual recommended mitigation measures would be dependent on the debris flow analysis conducted as part of a future design level study of the subject project site.

5.1.3 Expansive Soils

Based on our experience in the vicinity and published sources, we anticipate the site to be blanketed by highly expansive surficial soils. Expansive soils can undergo significant volume change with changes in moisture content. They shrink and harden when dried and expand and soften when wetted. If structures are underlain by expansive soils it is important that foundation systems be capable of tolerating or resisting any potentially damaging soil movements. In addition, it is important to limit moisture changes in the surficial soils by using positive drainage away from buildings as well as limiting landscaping watering. Interior and exterior slabs will need to be underlain by a substantial section of non-expansive soil to mitigate the effect of expansive soils. Final design recommendations for mitigation will be included as part of a final design-level geotechnical investigation.

5.1.4 Naturally Occurring Asbestos

Greenstone can contain ultra-mafic rocks such as serpentine that contain Naturally Occurring Asbestos (NOA). The geologic setting of the site and immediately adjacent areas is such that these geologic formations are unlikely to contain serpentine or greenstone bedrock either inside or as a sedimentary component. The site lies within an area where depositional processes dominate the geologic setting and alluvium from upstream sources have deposited sediment. However, the general lack of bedrock types that could contain NOA up-drainage of the site makes it unlikely that the site would be potentially impacted by this particular hazard. There is a minimal probability NOA was deposited aerially. Therefore, NOA is not anticipated to be present at the site based on the site geology.

5.1.5 Capture and Control/Conveyance of Runoff

The drainage ditch that delivers runoff to the northeast property line should be evaluated by a civil engineer in order to determine if the existing facility is adequate to convey runoff volumes (based on the engineer's calculations). It is probable that hard measures (i.e. catch basins, culverts) would be required in this area in order to provide for adequate drainage facilities. Additionally, a debris flow analysis should be performed as part of a design level investigation in order to determine if mitigation measures are needed at the northeast property line.

5.1.6 Presence of Undocumented Fill

The establishment of a residence and associated structures at the site, and the demolition of those structures, may have resulted in the presence of undocumented fill. These accumulations of fill should be explored and its aerial extent delineated on an accurate base map as part of a future design level investigation of the site. All fills identified in a future investigation of the site should be completely removed from within building areas and to a lateral distance of at least 5 feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater.

SECTION 6: CLOSURE AND LIMITATIONS

We hope this report provides the information needed at this time. This report, an instrument of professional service, has been prepared for the sole use of David J. Powers & Associates and their representatives specifically to support their review of the 2275 East Dunne Avenue Development in Morgan Hill, California. The opinions and conclusions presented in this report have been formulated in accordance with accepted geotechnical engineering and engineering geology practices that exist in Northern California at the time this report was prepared. No warranty, expressed or implied, is made or should be inferred.

Recommendations in this report are based upon literature review and professional experience. No subsurface exploration of the project area was performed for this study. If variations or unsuitable conditions are encountered during construction, Cornerstone should be contacted to provide supplemental recommendations, as needed.

David J. Powers & Associates may have provided Cornerstone with plans, reports and other documents prepared by others. David J. Powers & Associates understands that Cornerstone reviewed and relied on the information presented in these documents and cannot be responsible for their accuracy.

Cornerstone prepared this report with the understanding that it is the responsibility of the owner or his representatives to see that the recommendations contained in this report are presented to other members of the design team and incorporated into the project plans and specifications, and that appropriate actions are taken to implement the geotechnical recommendations during construction.

Conclusions and recommendations presented in this report are valid as of the present time for the development as currently planned. Changes in the condition of the property or adjacent properties may occur with the passage of time, whether by natural processes or the acts of other persons. In addition, changes in applicable or appropriate standards may occur through legislation or the broadening of knowledge. Therefore, the conclusions and recommendations presented in this report may be invalidated, wholly or in part, by changes beyond Cornerstone's control. This report should be reviewed by Cornerstone after a period of three (3) years has elapsed from the date of this report. In addition, if the current project design is changed, then Cornerstone must review the proposed changes and provide supplemental recommendations, as needed.

An electronic transmission of this report may also have been issued. While Cornerstone has taken precautions to produce a complete and secure electronic transmission, please check the electronic transmission against the hard copy version for conformity.

Recommendations provided in this report are based on the assumption that Cornerstone will be retained to provide observation and testing services during construction to confirm that conditions are similar to that assumed for design, and to form an opinion as to whether the work has been performed in accordance with the project plans and specifications. If we are not retained for these services, Cornerstone cannot assume any responsibility for any potential claims that may arise during or after construction as a result of misuse or misinterpretation of Cornerstone's report by others. Furthermore, Cornerstone will cease to be the Geotechnical-Engineer-of-Record if we are not retained for these services.

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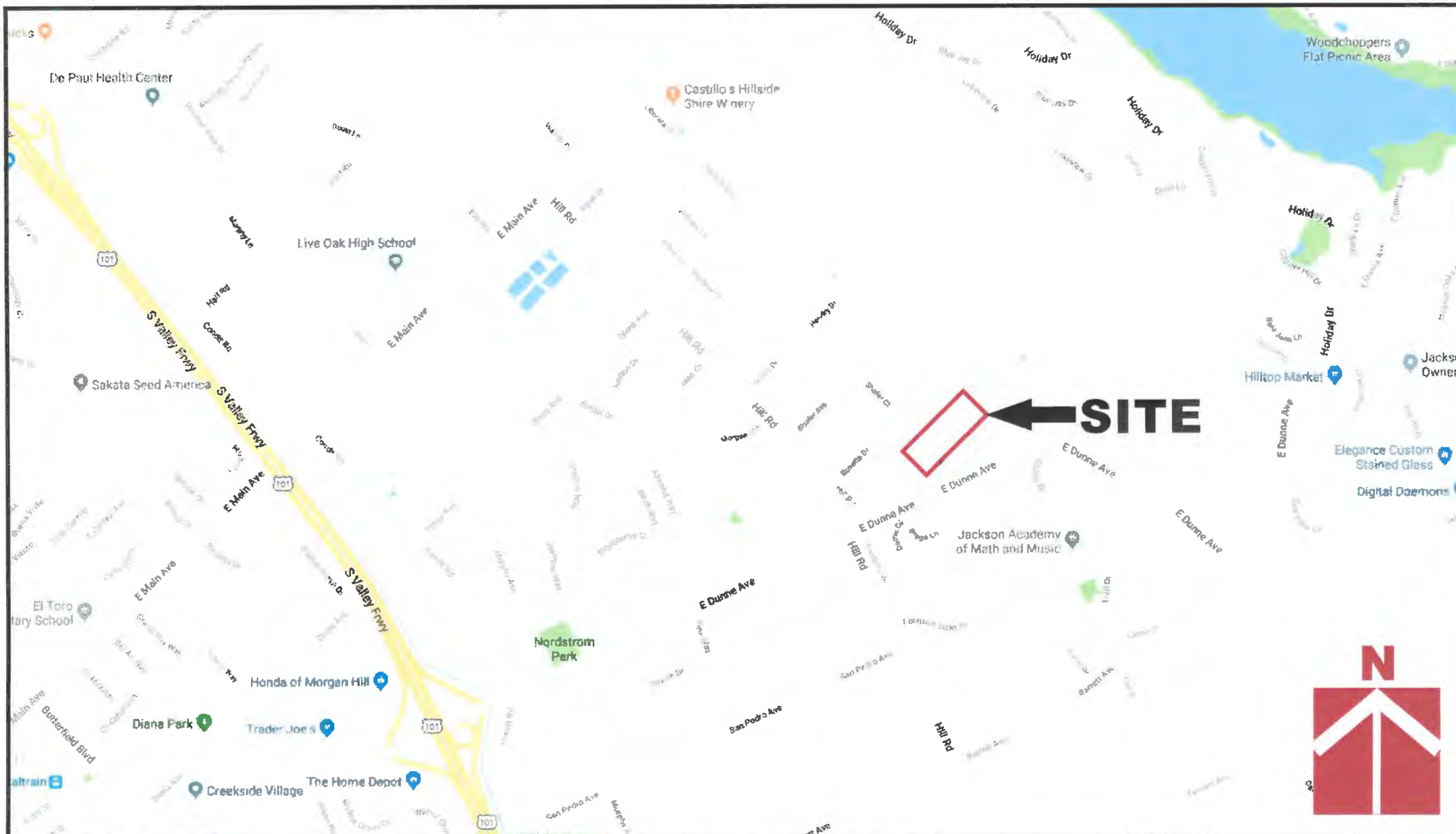
Stereoscopic Aerial Photographs

Date	Scale	Photo ID	Type	Source
08/10/1953	1:23,600	GS-YF-5-146, 147	B/W	USGS
9/28/1963	1:20,000	CIV-6DD-210, 211	BW	USGS
5/27/1965	1:12,000	SCL-24-51, 52	B/W	USGS
04/30/1981	1:24,000	GS-VEZR 4-274, 275	BW	USGS

Note: USGS refers to U.S. Geological Survey, Menlo Park, California

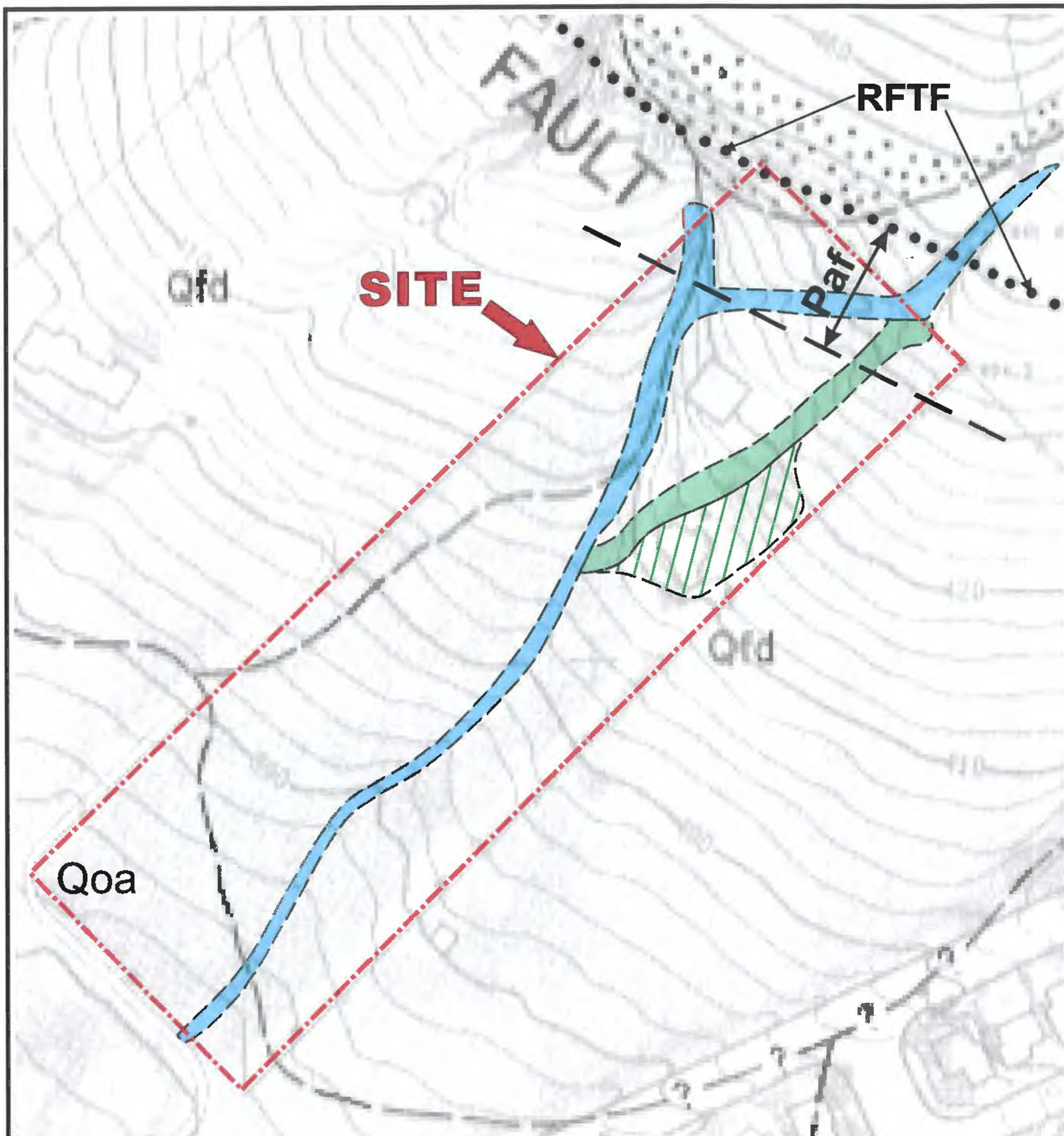


CORNERSTONE EARTH GROUP

Vicinity Map

2275 East Dunne Avenue Development
Morgan Hill, CA

Project Number	118-101-1
Figure Number	Figure 1
Date	March 2018
Drawn By	RRN



Geologic Units

Qfd	Alluvial Fan Deposits (Holocene)
Qoa	Old Alluvium (Late Pleistocene)
RFTF	Range Front Thrust Fault (concealed beneath alluvial fan deposits). Per PGE, 1991
Paf	Regulatory Zone: Zone of potential permanent ground displacement

Explanation

- Active drainage swale
- Infilled (with fill) former drainage swale
- Area of previous ground disturbance and surficial fills

N

0 160 320

APPROXIMATE SCALE (FEET)

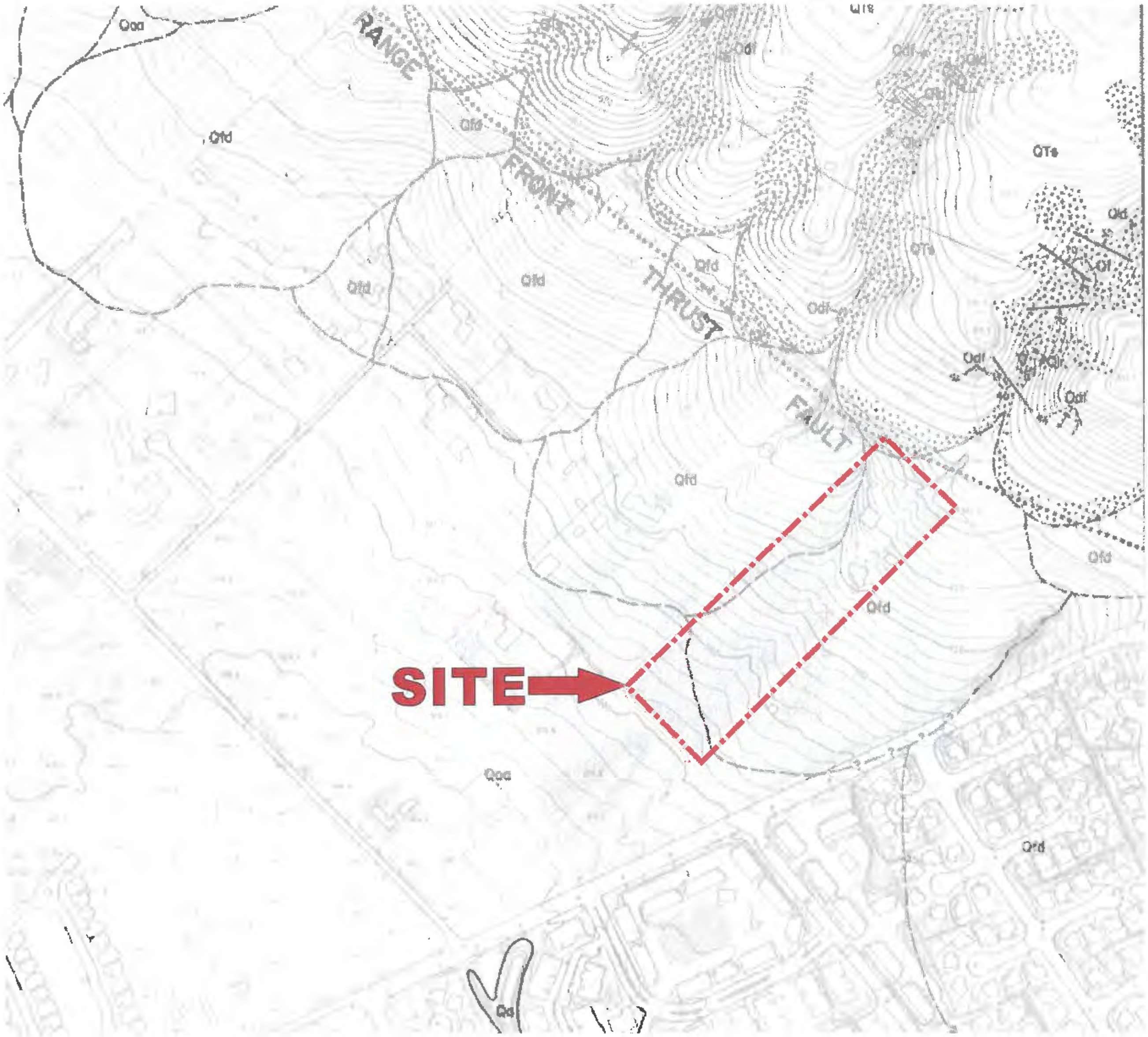
Base: Geology, Geologic, and Geotechnical Hazards, City of Morgan Hill, dated December 1991.

CORNERSTONE EARTH GROUP

Site Plan and Site Geology

2275 East Dunne Avenue Development
Morgan Hill, CA

Project Number	118-101-1
Figure Number	Figure 2
Date	March 2017
Drawn By	RRN



Geologic Units

Qf	Fill
	Colluvium
Qfd	Alluvial Fan Deposits (Holocene)
Qoa	Old Alluvium (Late Pleistocene)
Qlr	Recent Landslide
Qld	Dormant Landslide
Qdf	Old Debris Flow/Slide
QTs	Santa Clara Formation (Plio-Pleistocene)

Explanation

Contact- dashed where approximate, dotted where concealed

Range Front Thrust Fault, dotted where concealed

N

0 500 1000

APPROXIMATE SCALE (FEET)

Base: Geology, Geologic, and Geotechnical Hazards, City of Morgan Hill, dated December 1991.

CORNERSTONE EARTH GROUP

Local Geologic Map

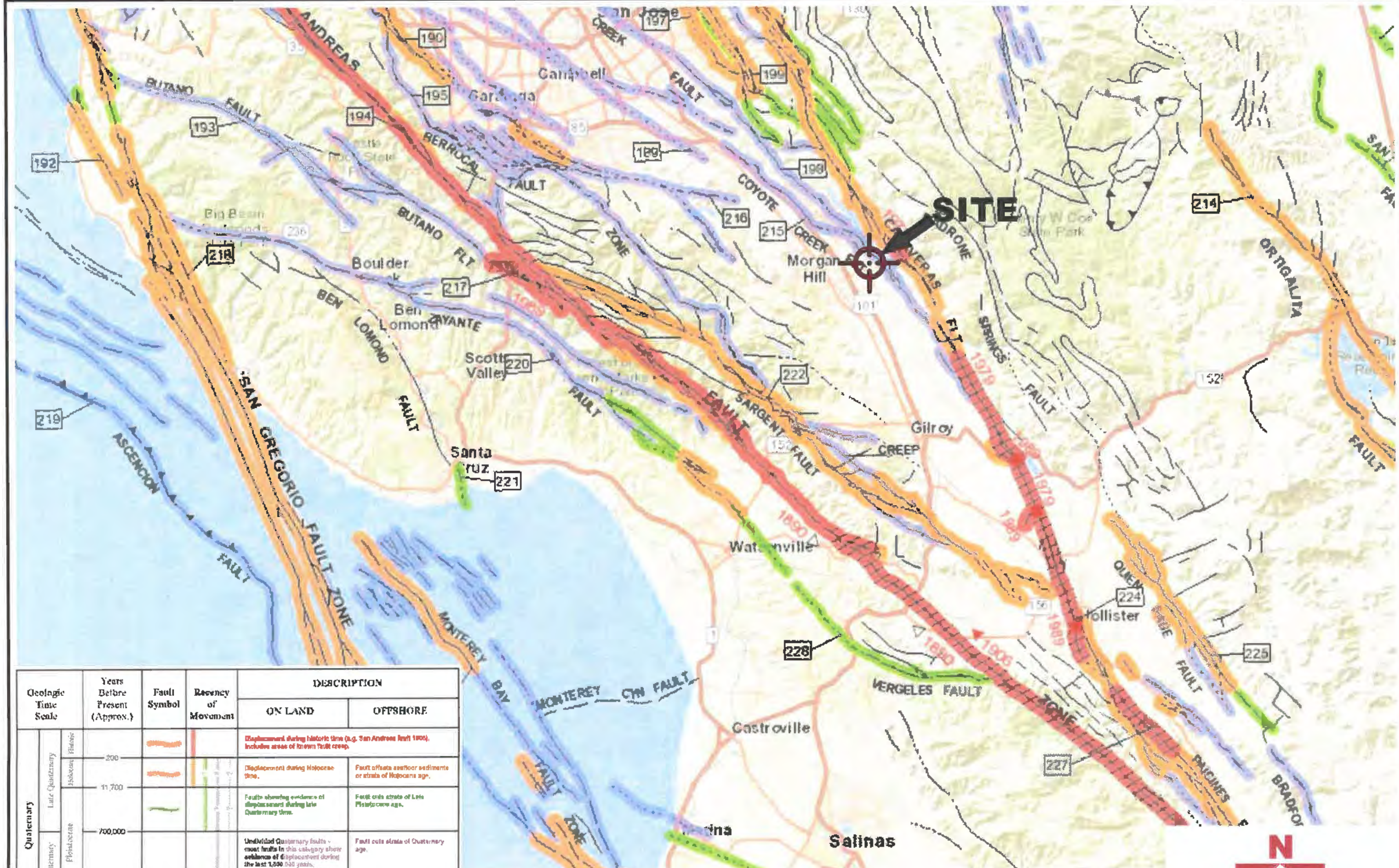
2275 East Dunne Avenue Development
Morgan Hill, CA

Project Number 118-101-1

Figure Number Figure 3

Date March 2017

Drawn By RRN



Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION: ON LAND	DESCRIPTION: OFFSHORE
Quaternary	Late Quaternary	Historic				Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	200			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	11,700			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		700,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			1,600,000 – 4.5 billion (Age of Earth)			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.

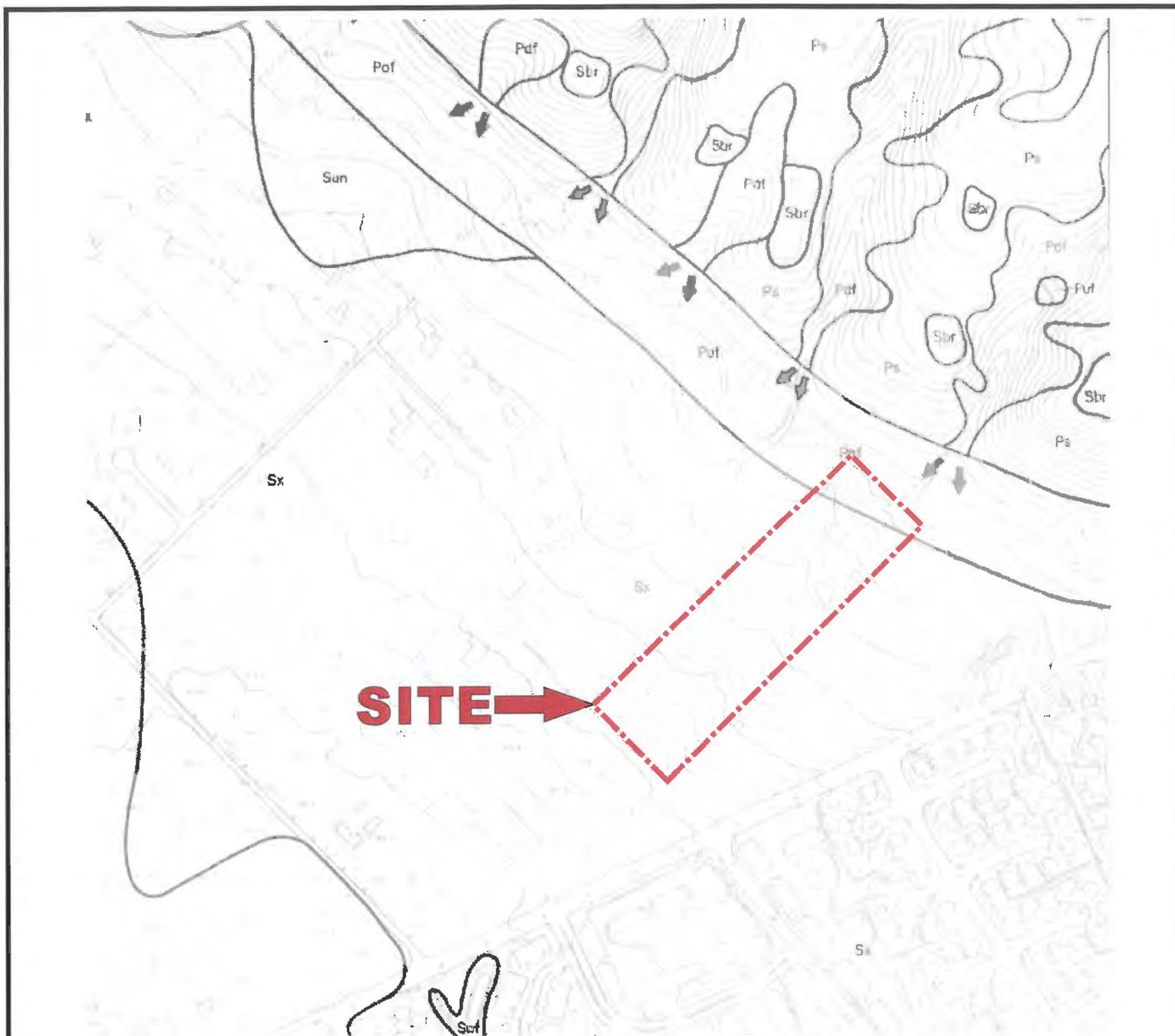
Base by California Geological Survey - 2010 Fault Activity Map of California (Jennings and Bryant, 2010)

Regional Fault Map

2275 East Dunne Avenue Development
Morgan Hill, CA

Project Number: 118-101-1
Figure Number: Figure 4
Date: March 2018
Drawn By: RRN

CORNERSTONE EARTH GROUP



AREAS OF RELATIVELY STABLE GROUND

Sbr Level ground to gently sloping ground underlain by bedrock within several feet of the ground surface. Colluvial and alluvial cover could be subject to shallow sliding, soil creep, or settlement.

Sun Unconsolidated colluvium, valley floor alluvium, or terrace deposits on flat or nearly flat ground. May be subject to vertical displacements under seismic or aseismic conditions.

Sx Moderately to highly expensive alluvium, or soil on flat or nearly flat ground. Subject to seasonal shrinking and swelling, soil creep, and settlement. May include localized areas of non-expansive soil; expansive soils may be present within other Ground Movement Potential categories.

Suf Naturally infilled stream channels and fill placed without geotechnical control that occupy flat or nearly flat ground. Subject to vertical settlement. Mapped man-made fill areas are generally greater than about 5 feet in thickness and greater than about ¼ acre in area. Naturally occuring alluvial deposits occupy active stream channels or channels that have been abandoned in the recent geologic past.

AREAS OF POTENTIALLY UNSTABLE GROUND

Puf Fill placed on sloping ground, without geotechnical control, that is subject to localized settlement, landsliding, and debris flow activity. Confined to fill that is about ¼ acre in area. Many areas of uncontrolled fill exist within the study area but are too small to be mapped.

Ps Relatively unstable surficial deposits or bedrock materials including landslide debris, colluvium, and weak bedrock, commonly less than about 10 feet thick on moderate to steep slopes. Subject to shallow, slow-moving landslides and soil creep.

Pdf Hillside areas subject to fast-moving debris flow/slide activity. Includes flow path where reasonably predictable. Solid arrow denotes general direction of runout area.

Paf Zone of potential permanent ground displacement due to horizontal and/or vertical movement along the trace of an active or potentially active fault.

DESCRIPTION OF MAP SYMBOLS

Boundary between Ground Movement Potential categories. These boundaries should not be considered exact, but instead are somewhat gradational.

Direction of potential debris flow runout. These arrows are intended to portray the general direction of runout; actual runout could deviate significantly from the directions indicated by the arrows, particularly at drainage mouths.

N

0 500 1000

APPROXIMATE SCALE (FEET)

Base: Ground Movement Potential Map, City of Morgan Hill.

CORNERSTONE EARTH GROUP	Ground Movement Potential Map	Project Number 118-101-1
	2275 East Dunne Avenue Development Morgan Hill, CA	Figure Number Figure 5
		Date March 2018 / Drawn By RRN

ATTACHMENT 7

LIMITED PHASE II SUBSURFACE INVESTIGATION REPORT

Limited Phase II Subsurface Investigation Report

REPORT DATE: January 19, 2023

SITE INFORMATION
2275 East Dunne Avenue
Morgan Hill, Santa Clara County, California 95037

PROJECT INFORMATION
AEI Project No. 473272

PREPARED FOR
Serene Hills LLC
22561 Poppy Drive
Cupertino, California 95014

PREPARED BY
AEI Consultants
2500 Camino Diablo
Walnut Creek, California 94597
925.746.6000

1.800.801.3224
www.aeiconsultants.com

AEI Consultants
2500 Camino Diablo
Walnut Creek, California 94597

January 19, 2023

Viji Mani
Serene Hills LLC
22561 Poppy Drive
Cupertino, California 95014

Subject: Limited Phase II Subsurface Investigation Report
2275 East Dunne Avenue
Morgan Hill, California 95037
AEI Project No. 473272

Dear Viji Mani,

This report presents the results of the Limited Phase II Subsurface Investigation Report (Phase II) conducted by AEI Consultants (AEI) at 2275 East Dunne Avenue, Morgan Hill, California ("the Site"). The investigation was performed in general accordance with the scope of services outlined in our proposal dated January 3, 2023 (AEI Proposal Number 88765), which was subsequently authorized on January 4, 2023.

AEI appreciates the opportunity to support this important project. If you have any questions, please do not hesitate to contact me.

Sincerely,

Tory Golino
Senior Vice President
AEI Consultants
408.559.7600
tgolino@aeiconsultants.com

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Figure 2 Site Map

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Appendix B Laboratory Analytical Report

1.0 PURPOSE

This investigation was performed in order to evaluate whether the subsurface conditions (i.e., shallow soil) at the Site have been significantly impacted by the recognized environmental condition (REC) identified in the December 29, 2022 *Draft Phase I Environmental Site Assessment* (ESA) report (AEI Project Number 473272). Information regarding the Site description, background, scope of work, findings, conclusions, and recommendations are provided in the following sections.

2.0 SITE DESCRIPTION AND BACKGROUND

Details on the Site description and background are presented below.

2.1 Site Description

The Site is located north of East Dunne Avenue at the northwest terminuses of Sorrel Way and Saddleback Drive in Morgan Hill, California. The Site consists of approximately 8.34 acres of vacant land and consists of one parcel, Assessor's Parcel Number (APN) 728-02-003. The location of the Site is shown on Figure 1. Figure 2 presents the Site Map.

The ground surface at the Site and nearby properties gently slopes toward the southwest and is situated between an elevation of approximately 385 and 435 feet above mean sea level. According to the information obtained from the State Water Resources Control Board's (SWRCB) Geotracker database for the surrounding area, groundwater is expected to be encountered from a depth of approximately 10 to 30 feet below ground surface (bgs). Groundwater flow direction beneath the Site is inferred to follow the topographic gradient and flows toward the southwest.

2.2 Background

Based on the Draft Phase I ESA, the Site was historically used for agricultural purposes. The potential that agricultural chemicals, such as pesticides, herbicides, and fertilizers were used on-Site, and that the Site has been impacted by the use of such agricultural chemicals represents a REC.

3.0 FIELD INVESTIGATION AND OBSERVATIONS

AEI was contracted to perform a Limited Phase II Subsurface Investigation to evaluate if the subsurface at the Site has been adversely impacted by the REC identified in the Draft Phase I ESA report referenced above. Investigation efforts included the collection of shallow soil samples spaced evenly throughout the Site. The locations of the soil samples are shown on Figure 2.

3.1 Health and Safety Plan

A Site-specific health and safety plan was prepared, reviewed by on-site personnel, and kept on the Site for the duration of the fieldwork.

3.2 Shallow Soil Sampling

On January 11, 2023, a shallow soil sampling program was completed which was consistent with the protocol outlined in the DTSC *Interim Guidance for Sampling Agricultural Properties (Third Revision)* dated August 7, 2008. For the shallow sampling program, eighteen separate sampling areas (S-1 through S-18) were evenly spaced across the Site.

Prior to sampling, a small hole was dug to a depth of approximately six inches, within first encountered native soil, with hand tools. A hand shovel was then used to scrape soil from the sides of the hole at a depth of between three and six inches and transfer the soil to clean, laboratory-supplied, 8-ounce glass jars. Upon collection, each sample was labeled with the project name, project number, and the sampling date and time. After labeling, each sample was placed into an insulated, chilled cooler containing ice for transport to the analytical laboratory. Chain-of-custody documentation was prepared and accompanied the samples to the analytical laboratory.

3.3 Headspace Testing

Headspace testing was performed with a photoionization detector (PID) equipped with an electrodeless 10.6 eV ultraviolet lamp or equivalent for detecting the presence of total volatile organic compounds (VOCs) in the soil samples. To initiate the headspace testing procedure, portions of the soil samples were placed into labeled, plastic bags, and sealed for conducting the tests. After sufficient time had elapsed for gas build-up inside the bag, each bag was punctured with the probe tip of the PID to allow for measurement of the headspace. Measurements of the headspace were obtained in the parts per million (ppm) range for total VOCs. The PID readings were recorded on the field notes presented in Appendix A.

3.4 Decontamination Procedures and Investigation-Derived Waste

The hand sampling equipment was decontaminated prior to and/or after collecting each soil sample. The equipment was cleaned using a triple-rinse method, which consisted of an initial wash containing an Alconox detergent and water solution, followed by two potable water rinses.

As the sample locations were backfilled with excavated soil, no investigation-derived waste was left at the Site.

3.5 Laboratory Analyses

Soil samples were submitted to a State of California certified laboratory, Torrent Laboratory, Inc. (Torrent) of Milpitas, California. Eighteen soil samples were collected and composited by the laboratory into five (5) 3 to 4-point composite samples for organochlorine pesticides (OCPs) using United States Environmental Protection Agency (US EPA) Testing Method 8081B. Additionally, five (5) discrete soil samples were analyzed for lead and arsenic using US EPA

Testing Method 6010B. Chain-of-custody documentation and the certified analytical report are provided in Appendix B.

4.0 FINDINGS

For the purpose of providing context to the data obtained during this investigation, analytical results were compared to available regulatory screening levels. The San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels (ESLs) (revised July 2019) were used for comparison values under a residential land use scenario as well as for direct exposure human health risk levels under any land use for construction workers. The ESLs are considered to be conservative. Under most circumstances, and within the limitations described in the ESLs, the presence of a chemical in soil at concentrations below the corresponding ESL does not pose an unacceptable risk to human health and the environment. Additional evaluation may be necessary at sites where a chemical is present at concentrations above the corresponding ESL or other appropriate screening level. The investigation findings are presented below.

4.1 Soil Sample Analytical Results

Table 1 presents a summary of the soil sample analytical results and comparison screening levels. Chain-of-custody documentation and the certified analytical report are provided in Appendix B. The analytical results can be summarized as follows:

- Arsenic was detected in each of the shallow soil samples collected and analyzed, observed at concentrations ranging between 1.57 milligrams per kilogram (mg/kg) in S-6 and 2.63 mg/kg in S-14. Each of the observed concentrations exceed the residential and the construction worker direct exposure ESLs of 0.067 mg/kg and 0.98 mg/kg, respectively. Although the detected concentrations of arsenic in soil are above the residential and construction worker ESLs, these concentrations of arsenic are likely representative of background conditions from naturally occurring sources. Background levels of arsenic are generally accepted as an appropriate screening criterion for naturally occurring metals. The concentrations detected are within the range to be expected of background conditions (background threshold of 11 mg/kg) as established in the San Francisco Bay Area, as established in the study *Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region* by Dylan Duverge.
- Lead was detected in each of the shallow soil samples collected and analyzed at concentrations ranging between 3.00 in S-1 and 88.0 mg/kg in S-14. The concentration of lead observed in S-14 exceeds the residential direct exposure ESL of 82 mg/kg, however, does not exceed the construction worker direct exposure ESL of 160 mg/kg or the generally accepted maximum background concentration of 97.1 mg/kg.
- Pesticides gamma-Chlordane, alpha-Chlordane, 4,4-DDE, and 4,4-DDT were detected in the laboratory composited sample Comp-4, however, do not exceed their respective residential or construction worker direct exposure ESLs, where applicable.

5.0 SUMMARY AND CONCLUSIONS

AEI was requested to perform a Phase II subsurface investigation, including the collection of soil samples to evaluate whether the Site has been impacted by former agricultural use. The scope of work included the collection of eighteen evenly spaced shallow soil samples across the Site. The investigation findings can be summarized as follows:

- Relatively low concentrations of pesticides were observed in the laboratory composited sample Comp-4, however, do not exceed their respective ESL values, where applicable. Based on this investigation, pesticide impacts from former agricultural use were not identified.

- Although arsenic was observed at concentrations that exceed its residential ESL, these concentrations of arsenic are below the California Maximum Background Concentration and likely representative of background conditions from naturally occurring sources.

- Shallow soil sample S-14 yielded a lead concentration slightly above the residential ESL, but below the construction worker ESL and the generally accepted maximum background concentration. Other detections of lead in soil were well below the residential ESL, therefore further investigation of lead in soil is not warranted at this time.

AEI understands that the Site is scheduled for future redevelopment and it is anticipated that during the planning process, a soil management plan (SMP) may be required to be approved by a regulatory agency prior to development. The SMP can be developed to address the potential to encounter lead-impacted soil.

6.0 REFERENCES

AEI, 2022. *Draft Phase I Environmental Site Assessment, 2275 East Dunne Avenue, Morgan Hill, California 95037,* (AEI Project No. 473272), dated December 29.

Bradford, G.R., et. al. 1996. *Background Concentrations of Trace and Major Elements in California Soils*. March.

Duvergé, D.J., 2011. *Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region*, San Francisco State University, MS Thesis. December.

San Francisco Bay Regional Water Quality Control Board. 2019. *User's Guide: Application and Derivation of Environmental Screening Levels (ESLs). Interim Final 2019*. Revision 2, July 2019.

7.0 REPORT LIMITATIONS AND RELIANCE

This report presents a summary of work completed by AEI Consultants. The completed work includes observations and descriptions of site conditions encountered. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide the requested information, subject to scope of work for which AEI was retained and limitations inherent in this type of work, but it cannot be assumed that they are representative of areas not sampled. This report should not be regarded as a guarantee that no further contamination beyond that which could have been detected within the scope of this investigation is present beneath the Site. Undocumented, unauthorized releases of hazardous material, the remains of which are not readily identifiable by visual inspection and are of different chemical constituents, are difficult and often impossible to detect within the scope of a chemical specific investigation.

Any conclusions and/or recommendations are based on these analyses and observations, and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document. These services were performed in accordance with generally accepted practices, in the environmental engineering and construction field, which existed at the time and location of the work. No other warranty, either expressed or implied, has been made.

This investigation was prepared for the sole use and benefit of Serene Hills LLC. Both verbal and written, whether in draft or final, are for the benefit of Serene Hills LLC. This report has no other purpose and may not be relied upon by any other person or entity without the written consent of AEI. Either verbally or in writing, third parties may come into possession of this report or all or part of the information generated as a result of this work. In the absence of a written agreement with AEI granting such rights, no third parties shall have rights of recourse or recovery whatsoever under any course of action against AEI, its officers, employees, vendors, successors or assigns. Reliance is provided in accordance with AEI's Proposal and Standard Terms & Conditions executed by Viji Mani. The limitation of liability defined in the Terms and Conditions is the aggregate limit of AEI's liability to the client and all relying parties.

8.0 SIGNATURES

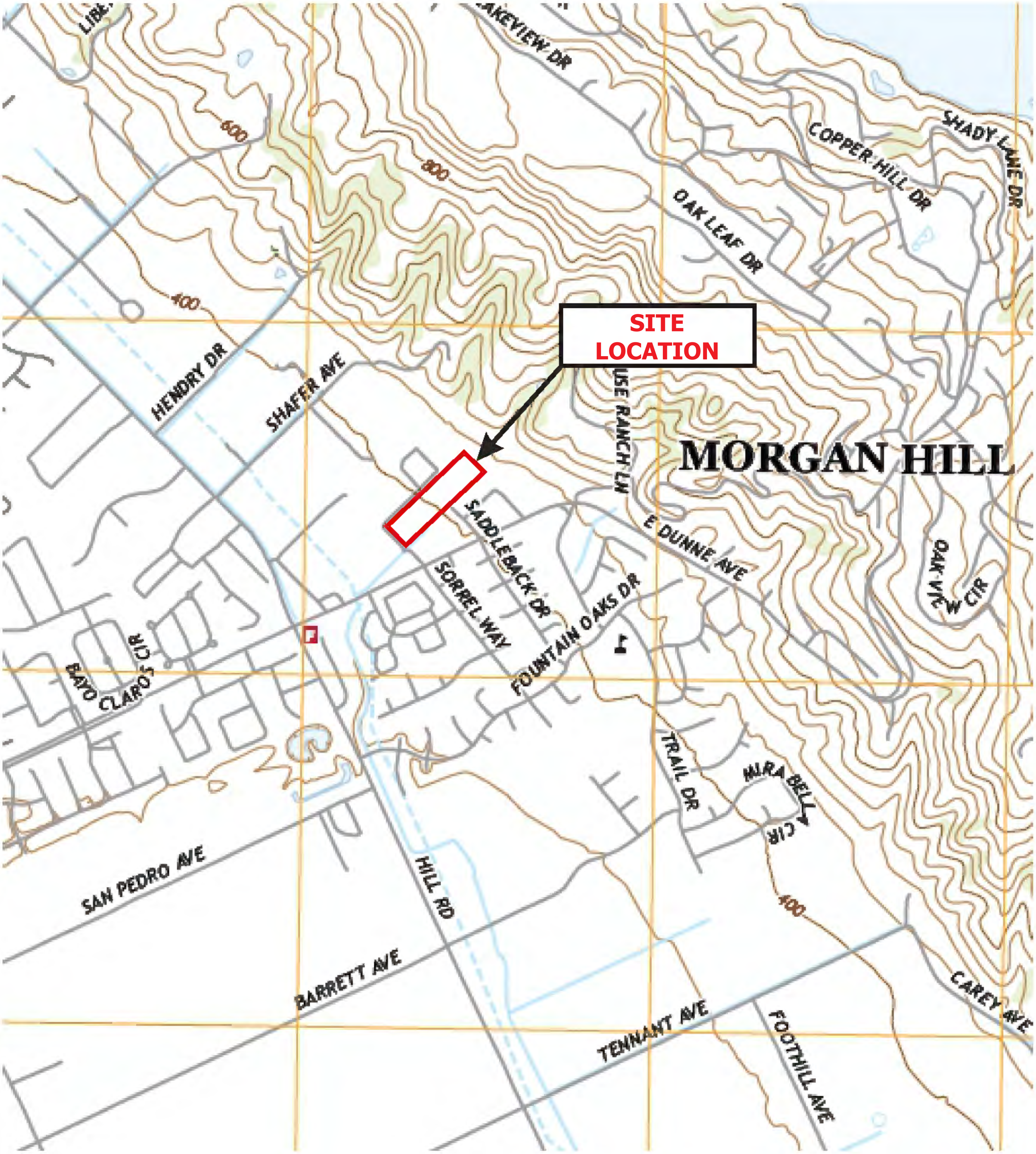
This document was prepared by, or under the direction of, the undersigned.

Jeff Stromberg
Staff Geologist

David Smith, P.G. 8817
Senior Geologist

PROFESSIONAL GEOLOGIST
DAVID WAYNE SMITH
NO. 8817
EXP. NOV. 30, 2024
STATE OF CALIFORNIA

FIGURES



LEGEND

Approximate Site Boundary

Map: Mount Sizer, California
Date: 2021
Source: USGS

N

0 600 1,200
SCALE: 1" = 1,200'
Scale is Approximate

SITE LOCATION MAP

AEI

2275 East Dunne Avenue
Morgan Hill, California 95037

FIGURE 1
Project No. 473272

LEGEND

Approximate Site Boundary

S-1 Shallow Soil Sampling Location

SITE MAP

AEI

2275 East Dunne Avenue
Morgan Hill, California 95037

FIGURE 2
Project No. 473272

TABLES

TABLE 1: SOIL SAMPLE DATA SUMMARY
2275 East Dunne Avenue, Morgan Hill, California

			U.S. EPA Method 8081B					U.S. EPA Method 6010B	
Location ID	Date	Depth (feet bgs)	gamma-Chlordane (mg/kg)	alpha-Chlordane (mg/kg)	4,4-DDE (mg/kg)	4,4-DDT (mg/kg)	Remaining OCPs (mg/kg)	Arsenic (mg/kg)	Lead (mg/kg)
Shallow Soil Sampling									
S-1	1/11/2023	0.5	--	--	--	--	--	1.95	3.00
S-6	1/11/2023	0.5	--	--	--	--	--	1.57	4.08
S-8	1/11/2023	0.5	--	--	--	--	--	2.30	3.00
S-14	1/11/2023	0.5	--	--	--	--	--	2.63	**88.0**
S-16	1/11/2023	0.5	--	--	--	--	--	1.97	13.0
Laboratory Composite Sample									
Comp-1	1/11/2023	0.5	<0.015	<0.0036	<0.0061	<0.0074	<MDL	--	--
Comp-2	1/11/2023	0.5	<0.015	<0.0036	<0.0061	<0.0074	<MDL	--	--
Comp-3	1/11/2023	0.5	<0.0030	<0.0020	<0.0020	<0.0020	<PQL	--	--
Comp-4	1/11/2023	0.5	0.0152 J	0.0168 J	0.00708 J	0.0143 J	<MDL	--	--
Comp-5	1/11/2023	0.5	<0.015	<0.0036	<0.0061	<0.0074	<MDL	--	--
Comparison Values:									
ESL Direct Exposure - R			NE	NE	1.8	1.9	Various	0.067 [1]	82
ESL Direct Exposure - CW			NE	NE	57	57	Various	0.98 [1]	160
Maximum Background Concentrations			NE	NE	NE	NE	NE	11.0	97.1

Notes:

mg/kg	milligrams per kilogram
<MDL	less than the laboratory method detection limit
<PQL	less than the laboratory practical quantitation limit
bgs	below ground surface
1	Arsenic concentrations from Establishing Background Arsenic in Soil of the San Francisco Bay Region, December 2011 study indicate background levels of arsenic in California Bay Area soil typically range between 1.2 and 11 mg/kg.
--	not analyzed
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
OCPs	Organochlorine pesticides
NE	not established
J	Indicates a value between the method MDL and PQL and that the reported concentration should be considered as estimated rather the quantitative
Bold	result exceeds a regulatory screening level

Comparison Values:

ESL Direct Exposure - R: Environmental Screening Levels (ESLs) showing Direct Exposure Human Health Residential (R) Use exposure risks from July 2019 (Rev. 2) ESL Summary Tables, prepared by the San Francisco Bay Regional Water Quality Control Board

ESL Direct Exposure - CW: Environmental Screening Levels (ESLs) showing Direct Exposure Human Health Construction Worker (CW) Use exposure risks from July 2019 (Rev. 2) ESL Summary Tables, prepared by the San Francisco Bay Regional Water Quality Control Board

Max. Background: Typical background concentrations provided here are based on "Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region" by Duvergé, D.J., dated December 2011 for arsenic and "Background Concentrations of Trace and Major Elements in California Soils", by Bradford, G.R., et. al., dated March 1996 for remaining metals.

APPENDIX A

FIELD NOTES

AEI CONSULTANTS
DAILY FIELD REPORT

Project Name:
Location: 2275 E Dunne Avenue, Morgan Hill, CA
Project No.: 473272   Date: 01/11/23
Field Person: JRS / GO
Project Manager: K. Lamb
Weather: Overcast

Daily Summary: Shallow Soil Sampling

Subcontractors: NA
Equipment: Hand Tools / PID
Materials:

TIME	SUMMARIZE FIELD ACTIVITIES	BREATHING ZONE Time	BREATHING ZONE PPM
0745	Mob to Site 1130 COC / offsite		
0845	AEI (Jeff) onsite / GO onsite		
	PID:		
0924	S-1 0.2 Pb/As		
0926	S-2 0.2		
0918	S-3 0.3		
0939	S-4 0.7		
0934	S-5 0.4		
~~03~~ 0932	S-6 0.3 Pb/As		
0944	S-7 0.8		
0951	S-8 0.6 Pb/As		
0940	S-9 0.5		
0945	S-10 0.9		
0958	S-11 0.2		
1001	S-12 0.3		
0948	S-13 0.7		
0953	S-14 0.4 Pb/As		
1005	S-15 0.5		
1010	S-16 1.1 Pb/As		
1004	S-17 0.7		
1009	S-18 0.6 ~~Pb/As~~		

Field Person Signature: ____________ Date: 1/11/23
Project Manager Signature: ____________ Date:

APPENDIX B
LABORATORY ANALYTICAL REPORT

AEI Consultants
2500 Camino Diablo
Walnut Creek, California 94597
Tel: 925-746-6048

RE:

Work Order No.: 2301087

Dear Kate Lamb:

Torrent Laboratory, Inc. received 18 sample(s) on January 11, 2023 for the analyses presented in the following Report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc. is certified by the State of California, ELAP #1991. If you have any questions regarding these test results, please feel free to contact the Project Management Team at (408)263-5258; ext 204.

Kathie Evans

Kathie Evans
Project Manager

January 16, 2023
Date

Torrent
LABORATORY, INC.

Date: 1/16/2023

Client: AEI Consultants

Project:

Work Order: 2301087

CASE NARRATIVE

Unless otherwise indicated in the following narrative, no issues encountered with the receiving, preparation, analysis or reporting of the results associated with this work order.

Unless otherwise indicated in the following narrative, no results have been method and/or field blank corrected.

Reported results relate only to the items/samples tested by the laboratory.

This report shall not be reproduced, except in full, without the written approval of Torrent Laboratory, Inc.

Torrent LABORATORY, INC.

Sample Result Summary

Report prepared for: Kate Lamb
AEI Consultants

Date Received: 01/11/23
Date Reported: 01/16/23

S-1 2301087-001

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
Arsenic	SW6010B	1	0.15	1.3	1.95	mg/Kg
Lead	SW6010B	1	0.12	3.0	3.00	mg/Kg

S-6 2301087-006

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
Arsenic	SW6010B	1	0.15	1.3	1.57	mg/Kg
Lead	SW6010B	1	0.12	3.0	4.08	mg/Kg

S-8 2301087-008

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
Arsenic	SW6010B	1	0.15	1.3	2.30	mg/Kg
Lead	SW6010B	1	0.12	3.0	3.00	mg/Kg

S-14 2301087-014

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
Arsenic	SW6010B	1	0.15	1.3	2.63	mg/Kg
Lead	SW6010B	1	0.12	3.0	88.0	mg/Kg

S-16 2301087-016

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
Arsenic	SW6010B	1	0.15	1.3	1.97	mg/Kg
Lead	SW6010B	1	0.12	3.0	13.0	mg/Kg

COMP-1 2301087-019

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit

All compounds were non-detectable for this sample.

COMP-2 2301087-020

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit

All compounds were non-detectable for this sample.

COMP-3 2301087-021

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit

All compounds were non-detectable for this sample.

Sample Result Summary

Report prepared for:	Kate Lamb	**Date Received:**	01/11/23
	AEI Consultants	**Date Reported:**	01/16/23

COMP-4 2301087-022

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit
gamma-Chlordane	SW8081B	10	15	30	15.2	ug/Kg
alpha-Chlordane	SW8081B	10	3.6	20	16.8	ug/Kg
4,4'-DDE	SW8081B	10	6.1	20	7.08	ug/Kg
4,4'-DDT	SW8081B	10	7.4	20	14.3	ug/Kg

COMP-5 2301087-023

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit

All compounds were non-detectable for this sample.

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	S-1	**Lab Sample ID:**	2301087-001A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 / 9:24		
SDG:			

Prep Method:	3050B	**Prep Batch Date/Time:**	1/11/23	7:00:00PM
Prep Batch ID:	1147893	**Prep Analyst:**	TNGO	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Arsenic	SW6010B	1	0.15	1.3	**1.95**		mg/Kg	01/12/23	14:57	AT	471873
Lead	SW6010B	1	0.12	3.0	**3.00**		mg/Kg	01/12/23	14:57	AT	471873

SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	S-6	**Lab Sample ID:**	2301087-006A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 / 9:32		
SDG:			

Prep Method:	3050B	**Prep Batch Date/Time:**	1/11/23	7:00:00PM
Prep Batch ID:	1147893	**Prep Analyst:**	TNGO	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Arsenic	SW6010B	1	0.15	1.3	**1.57**		mg/Kg	01/12/23	15:06	AT	471873
Lead	SW6010B	1	0.12	3.0	**4.08**		mg/Kg	01/12/23	15:06	AT	471873

SAMPLE RESULTS

Report prepared for:	Kate Lamb AEI Consultants	**Date/Time Received:**	01/11/23, 2:40 pm
		Date Reported:	01/16/23

Client Sample ID:	S-8	**Lab Sample ID:**	2301087-008A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 / 9:51		
SDG:			

Prep Method:	3050B	**Prep Batch Date/Time:**	1/11/23	7:00:00PM
Prep Batch ID:	1147893	**Prep Analyst:**	TNGO	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Arsenic	SW6010B	1	0.15	1.3	**2.30**		mg/Kg	01/12/23	15:07	AT	471873
Lead	SW6010B	1	0.12	3.0	**3.00**		mg/Kg	01/12/23	15:07	AT	471873

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SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	S-14	**Lab Sample ID:**	2301087-014A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 / 9:53		
SDG:			

Prep Method:	3050B	**Prep Batch Date/Time:**	1/11/23	7:00:00PM
Prep Batch ID:	1147893	**Prep Analyst:**	TNGO	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Arsenic	SW6010B	1	0.15	1.3	**2.63**		mg/Kg	01/12/23	15:09	AT	471873
Lead	SW6010B	1	0.12	3.0	**88.0**		mg/Kg	01/12/23	15:09	AT	471873

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	S-16	**Lab Sample ID:**	2301087-016A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 / 10:10		
SDG:			

Prep Method:	3050B	**Prep Batch Date/Time:**	1/11/23	7:00:00PM
Prep Batch ID:	1147893	**Prep Analyst:**	TNGO	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Arsenic	SW6010B	1	0.15	1.3	**1.97**		mg/Kg	01/12/23	15:11	AT	471873
Lead	SW6010B	1	0.12	3.0	**13.0**		mg/Kg	01/12/23	15:11	AT	471873

SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	COMP-1	**Lab Sample ID:**	2301087-019A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 /		
SDG:			

Prep Method:	3546_OCP	**Prep Batch Date/Time:**	1/11/23	9:51:00AM
Prep Batch ID:	1147867	**Prep Analyst:**	AKIZ	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
The results shown below are reported using their MDL.											
alpha-BHC	SW8081B	10	2.5	20	ND		ug/Kg	01/12/23	15:02	LA	471877
gamma-BHC (Lindane)	SW8081B	10	7.1	20	ND		ug/Kg	01/12/23	15:02	LA	471877
beta-BHC	SW8081B	10	4.4	20	ND		ug/Kg	01/12/23	15:02	LA	471877
delta-BHC	SW8081B	10	6.5	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Heptachlor	SW8081B	10	2.7	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Aldrin	SW8081B	10	2.9	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Heptachlor Epoxide	SW8081B	10	3.1	20	ND		ug/Kg	01/12/23	15:02	LA	471877
gamma-Chlordane	SW8081B	10	15	30	ND		ug/Kg	01/12/23	15:02	LA	471877
alpha-Chlordane	SW8081B	10	3.6	20	ND		ug/Kg	01/12/23	15:02	LA	471877
4,4'-DDE	SW8081B	10	6.1	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Endosulfan I	SW8081B	10	2.9	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Dieldrin	SW8081B	10	2.5	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Endrin	SW8081B	10	7.9	20	ND		ug/Kg	01/12/23	15:02	LA	471877
4,4'-DDD	SW8081B	10	6.4	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Endosulfan II	SW8081B	10	3.4	20	ND		ug/Kg	01/12/23	15:02	LA	471877
4,4'-DDT	SW8081B	10	7.4	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Endrin Aldehyde	SW8081B	10	5.1	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Methoxychlor	SW8081B	10	26	60	ND		ug/Kg	01/12/23	15:02	LA	471877
Endosulfan Sulfate	SW8081B	10	5.1	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Endrin Ketone	SW8081B	10	4.3	20	ND		ug/Kg	01/12/23	15:02	LA	471877
Chlordane, Technical	SW8081B	10	27	200	ND		ug/Kg	01/12/23	15:02	LA	471877
Toxaphene	SW8081B	10	220	500	ND		ug/Kg	01/12/23	15:02	LA	471877
			Acceptance Limits								
Tetrachloro-M-Xylene (S)	SW8081B		48 - 125		**55.6**		%	01/12/23	15:02	LA	471877
Decachlorobiphenyl (S)	SW8081B		38 - 135		**66.1**		%	01/12/23	15:02	LA	471877

NOTE: Sample diluted due to the nature of the sample matrix (dark colored extract)

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	COMP-2	**Lab Sample ID:**	2301087-020A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 /		
SDG:			

Prep Method:	3546_OCP	**Prep Batch Date/Time:**	1/11/23	9:51:00AM
Prep Batch ID:	1147867	**Prep Analyst:**	AKIZ	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
The results shown below are reported using their MDL.											
alpha-BHC	SW8081B	10	2.5	20	ND		ug/Kg	01/12/23	15:16	LA	471877
gamma-BHC (Lindane)	SW8081B	10	7.1	20	ND		ug/Kg	01/12/23	15:16	LA	471877
beta-BHC	SW8081B	10	4.4	20	ND		ug/Kg	01/12/23	15:16	LA	471877
delta-BHC	SW8081B	10	6.5	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Heptachlor	SW8081B	10	2.7	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Aldrin	SW8081B	10	2.9	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Heptachlor Epoxide	SW8081B	10	3.1	20	ND		ug/Kg	01/12/23	15:16	LA	471877
gamma-Chlordane	SW8081B	10	15	30	ND		ug/Kg	01/12/23	15:16	LA	471877
alpha-Chlordane	SW8081B	10	3.6	20	ND		ug/Kg	01/12/23	15:16	LA	471877
4,4'-DDE	SW8081B	10	6.1	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Endosulfan I	SW8081B	10	2.9	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Dieldrin	SW8081B	10	2.5	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Endrin	SW8081B	10	7.9	20	ND		ug/Kg	01/12/23	15:16	LA	471877
4,4'-DDD	SW8081B	10	6.4	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Endosulfan II	SW8081B	10	3.4	20	ND		ug/Kg	01/12/23	15:16	LA	471877
4,4'-DDT	SW8081B	10	7.4	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Endrin Aldehyde	SW8081B	10	5.1	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Methoxychlor	SW8081B	10	26	60	ND		ug/Kg	01/12/23	15:16	LA	471877
Endosulfan Sulfate	SW8081B	10	5.1	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Endrin Ketone	SW8081B	10	4.3	20	ND		ug/Kg	01/12/23	15:16	LA	471877
Chlordane, Technical	SW8081B	10	27	200	ND		ug/Kg	01/12/23	15:16	LA	471877
Toxaphene	SW8081B	10	220	500	ND		ug/Kg	01/12/23	15:16	LA	471877
			Acceptance Limits								
Tetrachloro-M-Xylene (S)	SW8081B		48 - 125		**61.3**		%	01/12/23	15:16	LA	471877
Decachlorobiphenyl (S)	SW8081B		38 - 135		**70.3**		%	01/12/23	15:16	LA	471877

NOTE: Sample diluted due to the nature of the sample matrix (dark colored extract)

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	COMP-3	**Lab Sample ID:**	2301087-021A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 /		
SDG:			

Prep Method: 3546_OCP		**Prep Batch Date/Time:**	1/11/23 9:51:00AM
Prep Batch ID: 1147867		**Prep Analyst:**	AKIZ

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
alpha-BHC	SW8081B	1	0.25	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
gamma-BHC (Lindane)	SW8081B	1	0.71	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
beta-BHC	SW8081B	1	0.44	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
delta-BHC	SW8081B	1	0.65	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Heptachlor	SW8081B	1	0.27	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Aldrin	SW8081B	1	0.29	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Heptachlor Epoxide	SW8081B	1	0.31	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
gamma-Chlordane	SW8081B	1	1.5	3.0	ND		ug/Kg	01/12/23	15:29	LA	471877
alpha-Chlordane	SW8081B	1	0.36	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
4,4'-DDE	SW8081B	1	0.61	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Endosulfan I	SW8081B	1	0.29	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Dieldrin	SW8081B	1	0.25	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Endrin	SW8081B	1	0.79	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
4,4'-DDD	SW8081B	1	0.64	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Endosulfan II	SW8081B	1	0.34	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
4,4'-DDT	SW8081B	1	0.74	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Endrin Aldehyde	SW8081B	1	0.51	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Methoxychlor	SW8081B	1	2.6	6.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Endosulfan Sulfate	SW8081B	1	0.51	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Endrin Ketone	SW8081B	1	0.43	2.0	ND		ug/Kg	01/12/23	15:29	LA	471877
Chlordane, Technical	SW8081B	1	2.7	20	ND		ug/Kg	01/12/23	15:29	LA	471877
Toxaphene	SW8081B	1	22	50	ND		ug/Kg	01/12/23	15:29	LA	471877
		Acceptance Limits									
Tetrachloro-M-Xylene (S)	SW8081B		48 - 125		**59.7**		%	01/12/23	15:29	LA	471877
Decachlorobiphenyl (S)	SW8081B		38 - 135		**65.4**		%	01/12/23	15:29	LA	471877

SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	COMP-4	**Lab Sample ID:**	2301087-022A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 /		
SDG:			

Prep Method:	3546_OCP	**Prep Batch Date/Time:**	1/11/23	9:51:00AM
Prep Batch ID:	1147867	**Prep Analyst:**	AKIZ	

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
The results shown below are reported using their MDL.											
alpha-BHC	SW8081B	10	2.5	20	ND		ug/Kg	01/12/23	15:41	LA	471877
gamma-BHC (Lindane)	SW8081B	10	7.1	20	ND		ug/Kg	01/12/23	15:41	LA	471877
beta-BHC	SW8081B	10	4.4	20	ND		ug/Kg	01/12/23	15:41	LA	471877
delta-BHC	SW8081B	10	6.5	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Heptachlor	SW8081B	10	2.7	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Aldrin	SW8081B	10	2.9	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Heptachlor Epoxide	SW8081B	10	3.1	20	ND		ug/Kg	01/12/23	15:41	LA	471877
gamma-Chlordane	SW8081B	10	15	30	**15.2**	J	ug/Kg	01/12/23	15:41	LA	471877
alpha-Chlordane	SW8081B	10	3.6	20	**16.8**	J	ug/Kg	01/12/23	15:41	LA	471877
4,4'-DDE	SW8081B	10	6.1	20	**7.08**	J	ug/Kg	01/12/23	15:41	LA	471877
Endosulfan I	SW8081B	10	2.9	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Dieldrin	SW8081B	10	2.5	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Endrin	SW8081B	10	7.9	20	ND		ug/Kg	01/12/23	15:41	LA	471877
4,4'-DDD	SW8081B	10	6.4	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Endosulfan II	SW8081B	10	3.4	20	ND		ug/Kg	01/12/23	15:41	LA	471877
4,4'-DDT	SW8081B	10	7.4	20	**14.3**	J	ug/Kg	01/12/23	15:41	LA	471877
Endrin Aldehyde	SW8081B	10	5.1	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Methoxychlor	SW8081B	10	26	60	ND		ug/Kg	01/12/23	15:41	LA	471877
Endosulfan Sulfate	SW8081B	10	5.1	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Endrin Ketone	SW8081B	10	4.3	20	ND		ug/Kg	01/12/23	15:41	LA	471877
Chlordane, Technical	SW8081B	10	27	200	ND		ug/Kg	01/12/23	15:41	LA	471877
Toxaphene	SW8081B	10	220	500	ND		ug/Kg	01/12/23	15:41	LA	471877
			Acceptance Limits								
Tetrachloro-M-Xylene (S)	SW8081B		48 - 125		**74.9**		%	01/12/23	15:41	LA	471877
Decachlorobiphenyl (S)	SW8081B		38 - 135		**81.2**		%	01/12/23	15:41	LA	471877

NOTE: Sample diluted due to the nature of the sample matrix (dark colored extract)

SAMPLE RESULTS

Report prepared for: Kate Lamb
AEI Consultants

Date/Time Received: 01/11/23, 2:40 pm
Date Reported: 01/16/23

Client Sample ID:	COMP-5	**Lab Sample ID:**	2301087-023A
Project Name/Location:		**Sample Matrix:**	Soil
Project Number:	473272		
Date/Time Sampled:	01/11/23 /		
SDG:			

Prep Method: 3546_OCP		**Prep Batch Date/Time:**	1/11/23 9:51:00AM
Prep Batch ID: 1147867		**Prep Analyst:**	AKIZ

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
The results shown below are reported using their MDL.											
alpha-BHC	SW8081B	10	2.5	20	ND		ug/Kg	01/12/23	15:56	LA	471877
gamma-BHC (Lindane)	SW8081B	10	7.1	20	ND		ug/Kg	01/12/23	15:56	LA	471877
beta-BHC	SW8081B	10	4.4	20	ND		ug/Kg	01/12/23	15:56	LA	471877
delta-BHC	SW8081B	10	6.5	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Heptachlor	SW8081B	10	2.7	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Aldrin	SW8081B	10	2.9	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Heptachlor Epoxide	SW8081B	10	3.1	20	ND		ug/Kg	01/12/23	15:56	LA	471877
gamma-Chlordane	SW8081B	10	15	30	ND		ug/Kg	01/12/23	15:56	LA	471877
alpha-Chlordane	SW8081B	10	3.6	20	ND		ug/Kg	01/12/23	15:56	LA	471877
4,4'-DDE	SW8081B	10	6.1	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Endosulfan I	SW8081B	10	2.9	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Dieldrin	SW8081B	10	2.5	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Endrin	SW8081B	10	7.9	20	ND		ug/Kg	01/12/23	15:56	LA	471877
4,4'-DDD	SW8081B	10	6.4	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Endosulfan II	SW8081B	10	3.4	20	ND		ug/Kg	01/12/23	15:56	LA	471877
4,4'-DDT	SW8081B	10	7.4	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Endrin Aldehyde	SW8081B	10	5.1	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Methoxychlor	SW8081B	10	26	60	ND		ug/Kg	01/12/23	15:56	LA	471877
Endosulfan Sulfate	SW8081B	10	5.1	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Endrin Ketone	SW8081B	10	4.3	20	ND		ug/Kg	01/12/23	15:56	LA	471877
Chlordane, Technical	SW8081B	10	27	200	ND		ug/Kg	01/12/23	15:56	LA	471877
Toxaphene	SW8081B	10	220	500	ND		ug/Kg	01/12/23	15:56	LA	471877
			Acceptance Limits								
Tetrachloro-M-Xylene (S)	SW8081B		48 - 125		**66.8**		%	01/12/23	15:56	LA	471877
Decachlorobiphenyl (S)	SW8081B		38 - 135		**69.9**		%	01/12/23	15:56	LA	471877

NOTE: Sample diluted due to the nature of the sample matrix (dark colored extract)

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2301087	**Prep Method:**	3546_OCP	**Prep Date:**	01/11/23	**Prep Batch:**	1147867
Matrix:	Soil	**Analytical Method:**	SW8081B	**Analyzed Date:**	1/11/2023	**Analytical Batch:**	471847
Units:	ug/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
alpha-BHC	0.25	2.0	ND	
gamma-BHC (Lindane)	0.71	2.0	ND	
beta-BHC	0.44	2.0	ND	
delta-BHC	0.65	2.0	ND	
Heptachlor	0.27	2.0	ND	
Aldrin	0.29	2.0	ND	
Heptachlor Epoxide	0.31	2.0	ND	
gamma-Chlordane	1.5	3.0	ND	
alpha-Chlordane	0.36	2.0	ND	
4,4'-DDE	0.61	2.0	ND	
Endosulfan I	0.29	2.0	ND	
Dieldrin	0.25	2.0	ND	
Endrin	0.79	2.0	ND	
4,4'-DDD	0.64	2.0	ND	
Endosulfan II	0.34	2.0	ND	
4,4'-DDT	0.74	2.0	ND	
Endrin Aldehyde	0.51	2.0	ND	
Methoxychlor	2.6	6.0	ND	
Endosulfan Sulfate	0.51	2.0	ND	
Endrin Ketone	0.43	2.0	ND	
Chlordane, Technical	2.7	20	ND	
Toxaphene	22	50	ND	
Tetrachloro-M-Xylene (S)			87.2	
Decachlorobiphenyl (S)			103	

Work Order:	2301087	**Prep Method:**	3050B	**Prep Date:**	01/11/23	**Prep Batch:**	1147893
Matrix:	Soil	**Analytical Method:**	SW6010B	**Analyzed Date:**	1/12/2023	**Analytical Batch:**	471873
Units:	mg/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Arsenic	0.15	1.30	ND	
Lead	0.10	3.00	ND	

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LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2301087	**Prep Method:**	3546_OCP	**Prep Date:**	01/11/23	**Prep Batch:**	1147867
Matrix:	Soil	**Analytical Method:**	SW8081B	**Analyzed Date:**	1/11/2023	**Analytical Batch:**	471847
Units:	ug/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
gamma-BHC (Lindane)	0.16	2.0	ND	40	97.9	92.1	6.32	25 - 135	30	
Heptachlor	0.11	2.0	ND	40	104	96.7	6.98	40 - 130	30	
Aldrin	0.20	2.0	ND	40	99.7	93.2	6.74	25 - 140	30	
delta-BHC	0.15	2.0	ND	40	100	94.4	6.42	60 - 130	30	
Heptachlor	0.19	2.0	ND	40	98.1	88.3	10.5	55 - 135	30	
4,4'-DDT	0.13	2.0	ND	40	103	96.9	5.76	45 - 140	30	
Tetrachloro-M-Xylene (S)				100	89.8	85.9		48 - 125		
Decachlorobiphenyl (S)				100	106	101		38 - 135		

Work Order:	2301087	**Prep Method:**	3050B	**Prep Date:**	01/11/23	**Prep Batch:**	1147893
Matrix:	Soil	**Analytical Method:**	SW6010B	**Analyzed Date:**	1/12/2023	**Analytical Batch:**	471873
Units:	mg/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Arsenic	0.15	1.30	ND	50	99.4	99.6	0.201	80 - 120	30	
Lead	0.10	3.00	ND	50	103	102	0.976	80 - 120	30	

MS/MSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2301087	**Prep Method:**	3050B	**Prep Date:**	01/11/23	**Prep Batch:**	1147893
Matrix:	**Soil**	**Analytical Method:**	SW6010B	**Analyzed Date:**	1/12/2023	**Analytical Batch:**	471873
Spiked Sample:	2301087-001A						
Units:	mg/Kg						

Parameters	MDL	PQL	Sample Conc.	Spike Conc.	MS % Recovery	MSD % Recovery	MS/MSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Arsenic	0.15	5.00	ND	50	86.5	86.0	0.443	71.0 - 121	30	
Lead	0.10	5.00	ND	50	90.0	88.7	1.26	67.9 - 118	30	

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Laboratory Qualifiers and Definitions

DEFINITIONS:

Accuracy/Bias (% Recovery) - The closeness of agreement between an observed value and an accepted reference value.
Blank (Method/Preparation Blank) -MB/PB - An analyte-free matrix to which all reagents are added in the same volumes/proportions as used in sample processing. The method blank is used to document contamination resulting from the analytical process.
Duplicate - a field sample and/or laboratory QC sample prepared in duplicate following all of the same processes and procedures used on the original sample (sample duplicate, LCSD, MSD)
Laboratory Control Sample (LCS ad LCSD) - A known matrix spiked with compounds representative of the target analyte(s). This is used to document laboratory performance.
Matrix - the component or substrate that contains the analyte of interest (e.g., - groundwater, sediment, soil, waste water, etc)
Matrix Spike (MS/MSD) - Client sample spiked with identical concentrations of target analyte (s). The spiking occurs prior to the sample preparation and analysis. They are used to document the precision and bias of a method in a given sample matrix.
Method Detection Limit (MDL) - the minimum concentration of a substance that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero
Practical Quantitation Limit/Reporting Limit/Limit of Quantitation (PQL/RL/LOQ) - a laboratory determined value at 2 to 5 times above the MDL that can be reproduced in a manner that results in a 99% confidence level that the result is both accurate and precise. PQLs/RLs/LODs reflect all preparation factors and/or dilution factors that have been applied to the sample during the preparation and/or analytical processes.
Precision (%RPD) - The agreement among a set of replicate/duplicate measurements without regard to known value of the replicates
Surrogate (S) or (Surr) - An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are used in most organic analysis to demonstrate matrix compatibility with the chosen method of analysis
Tentatively Identified Compound (TIC) - A compound not contained within the analytical calibration standards but present in the GCMS library of defined compounds. When the library is searched for an unknown compound, it can frequently give a tentative identification to the compound based on retention time and primary and secondary ion match. TICs are reported as estimates and are candidates for further investigation.
Units: the unit of measure used to express the reported result - **mg/L** and ***mg/Kg*** (equivalent to PPM - parts per million in **liquid** and ***solid***), **ug/L** and ***ug/Kg*** (equivalent to PPB - parts per billion in **liquid** and ***solid***), **ug/m3**, ***mg/m3***, **ppbv** and ***ppmv*** (all units of measure for reporting concentrations in air), **%** (equivalent to 10000 ppm or 1,000,000 ppb), **ug/Wipe** (concentration found on the surface of a single Wipe usually taken over a 100cm2 surface)

LABORATORY QUALIFIERS:

B - Indicates when the analyte is found in the associated method or preparation blank
D - Surrogate is not recoverable due to the necessary dilution of the sample
E - Indicates the reportable value is outside of the calibration range of the instrument but within the linear range of the instrument (unless otherwise noted) Values reported with an E qualifier should be considered as estimated.
H- Indicates that the recommended holding time for the analyte or compound has been exceeded
J- Indicates a value between the method MDL and PQL and that the reported concentration should be considered as estimated rather the quantitative
NA - Not Analyzed
N/A - Not Applicable
ND - Not Detected at a concentration greater than the PQL/RL or, if reported to the MDL, at greater than the MDL.
NR - Not recoverable - a matrix spike concentration is not recoverable due to a concentration within the original sample that is greater than four times the spike concentration added
R- The % RPD between a duplicate set of samples is outside of the absolute values established by laboratory control charts
S- Spike recovery is outside of established method and/or laboratory control limits. Further explanation of the use of this qualifier should be included within a case narrative
X -Used to indicate that a value based on pattern identification is within the pattern range but not typical of the pattern found in standards. Further explanation may or may not be provided within the sample footnote and/or the case narrative.

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Sample Receipt Checklist

Client Name: AEI Consultants

Project Name:

Work Order No.: 2301087

Date and Time Received: 1/11/2023 2:40:00PM

Received By: Lorna Imbat

Physically Logged By: Lorna Imbat

Checklist Completed By: Lorna Imbat

Carrier Name: Client Drop Off

Chain of Custody (COC) Information

Chain of custody present?	Yes
Chain of custody signed when relinquished and received?	Yes
Chain of custody agrees with sample labels?	Yes
Custody seals intact on sample bottles?	Not Present

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Not Present
Shipping Container/Cooler In Good Condition?	Yes
Samples in proper container/bottle?	Yes
Samples containers intact?	Yes
Sufficient sample volume for indicated test?	Yes

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes			
Container/Temp Blank temperature in compliance?	Yes	Temperature:	3.0	°C
Water-VOA vials have zero headspace?	No VOA vials submitted			
Water-pH acceptable upon receipt?	N/A			

pH Checked by: N/A

pH Adjusted by: N/A

Comments:

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Login Summary Report

Client ID: TL5781 AEI Consultants

QC Level: II

Project Name:

TAT Requested: 2 Day Rush:2

Project # : 473272

Date Received: 1/11/2023

Report Due Date: 1/16/2023

Time Received: 2:40 pm

Comments:

Work Order # : ***2301087***

WO Sample ID	Client Sample ID	Collection Date/Time	Matrix	Scheduled Disposal	Sample On Hold	Test On Hold	Requested Tests	Subbed
2301087-001A	S-1	01/11/23 9:24	Soil	07/10/23			Met_S_As Pb Composite	
2301087-002A	S-2	01/11/23 9:26	Soil	07/10/23			Composite	
2301087-003A	S-3	01/11/23 9:18	Soil	07/10/23			Composite	
2301087-004A	S-4	01/11/23 9:39	Soil	07/10/23			Composite	
2301087-005A	S-5	01/11/23 9:34	Soil	07/10/23			Composite	
2301087-006A	S-6	01/11/23 9:32	Soil	07/10/23			Met_S_As Pb Composite	
2301087-007A	S-7	01/11/23 9:44	Soil	07/10/23			Composite	
2301087-008A	S-8	01/11/23 9:51	Soil	07/10/23			Met_S_As Pb Composite	
2301087-009A	S-9	01/11/23 9:40	Soil	07/10/23			Composite	
2301087-010A	S-10	01/11/23 9:45	Soil	07/10/23			Composite	
2301087-011A	S-11	01/11/23 9:58	Soil	07/10/23			Composite	
2301087-012A	S-12	01/11/23 10:01	Soil	07/10/23			Composite	
2301087-013A	S-13	01/11/23 9:48	Soil	07/10/23			Composite	
2301087-014A	S-14	01/11/23 9:53	Soil	07/10/23			Met_S_As Pb Composite	
2301087-015A	S-15	01/11/23 10:05	Soil	07/10/23			Composite	
2301087-016A	S-16	01/11/23 10:10	Soil	07/10/23			Met_S_As Pb Composite	
2301087-017A	S-17	01/11/23 10:04	Soil	07/10/23				

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Login Summary Report

Client ID:	TL5781	AEI Consultants	**QC Level:**	II
Project Name:			**TAT Requested:**	2 Day Rush:2
Project # :	473272		**Date Received:**	1/11/2023
Report Due Date:	1/16/2023		**Time Received:**	2:40 pm

Comments:

Work Order # : ***2301087***

WO Sample ID	Client Sample ID	Collection Date/Time	Matrix	Scheduled Disposal	Sample On Hold	Test On Hold	Requested Tests	Subbed
							Composite	
2301087-018A	S-18	01/11/23 10:09	Soil	07/10/23				
							Composite	
2301087-019A	COMP-1	01/11/23	Soil	07/10/23				
							Pest_S_8081OCP	
2301087-020A	COMP-2	01/11/23	Soil	07/10/23				
							Pest_S_8081OCP	
2301087-021A	COMP-3	01/11/23	Soil	07/10/23				
							Pest_S_8081OCP	
2301087-022A	COMP-4	01/11/23	Soil	07/10/23				
							Pest_S_8081OCP	
2301087-023A	COMP-5	01/11/23	Soil	07/10/23				
							Pest_S_8081OCP	

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CHAIN OF CUSTODY

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

LAB WORK ORDER NO: 2301087

Company Name: AEI Consultants ☐ ☑ Env. ☐ Special	Project #: 473272 PO#: 327407
Address: 2500 Camino Diablo	Project Name:
City: Walnut Creek State: CA Zip Code: 94597	Comments:
Telephone: (925) 746-6000 Cell: (949) 939-5523	SAMPLER: Jeff Stromberg
REPORT TO: Kate Lamb BILL TO: AEI Consultants	EMAIL: klamb@aeiconsultants.com

TURNAROUND TIME: ☐ 10 Work Days ☐ 4 Work Days ☐ 1 Work Day ☐ 7 Work Days ☐ 3 Work Days ☐ Noon - Nxt Day ☑ ~~5 Work Days~~ ☒ 2 Work Days ☐ 2 - 8 Hours

SAMPLE TYPE: ☐ Storm Water ☐ Air ☐ Waste Water ☐ Wipe ☐ Ground Water ☐ Other ☑ Soil ☐ Product / Bulk

REPORT FORMAT: ☑ Level II - Std. ☐ Excel - EDD ☐ EDF ☐ Std.-EDD ☐ QC Level III ☐ QC Level IV

ANALYSIS REQUESTED

LAB ID	CANISTER I.D.	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	OCPs 8081A	Lead & Arsenic 6010B	Hold							REMARKS
-001A		S-1	1/11/23 / 0924	Soil	1	8oz. glass		X								
-002A		S-2	/ 0926		1											Comp-1
-003A		S-3	/ 0918		1											
-004A		S-4	/ 0939		1											
-005A		S-5	/ 0934		1											Comp-2
-006A		S-6	0932		1			X								
-007A		S-7	/ 0944		1											
-008A		S-8	/ 0951		1			X								Comp-3
-009A		S-9	/ 0940		1											
-010A		S-10	/ 0945		1											

RUSH
Date Due: ______
Time Due: ______

	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:
1	[signature]	Jeff Stromberg	1/11/23	1440	[signature]	L. D. Imlay	1-11-23	1440
2								

Were Samples Received in Good Condition? ☒ Yes ☐ NO Samples on Ice? ☒ Yes ☐ NO Method of Shipment D/D Sample seals intact? ☐ Yes ☐ NO ☐ N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Log In By: ______ Date: ______ Labeled By: ______ Date: ______ Temp 2.8 #3 °C Page 1 of 3 Rev. 3

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CHAIN OF CUSTODY

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

LAB WORK ORDER NO: 2301087

Company Name: AEI Consultants	☐ ☑ Env. ☐ Special	Project #: 473272 PO#: 327407
Address: 2500 Camino Diablo		Project Name:
City: Walnut Creek	State: CA Zip Code: 94597	Comments:
Telephone: (925) 746-6000	Cell: (949) 939-5523	SAMPLER: Jeff Stromberg
REPORT TO: Kate Lamb	BILL TO: AEI Consultants	EMAIL: klamb@aeiconsultants.com

TURNAROUND TIME: ☐ 10 Work Days ☐ 4 Work Days ☐ 1 Work Day ☐ 7 Work Days ☐ 3 Work Days ☐ Noon - Nxt Day ~~☑ 5 Work Days~~ ☒ 2 Work Days ☐ 2 - 8 Hours

SAMPLE TYPE: ☐ Storm Water ☐ Air ☐ Waste Water ☐ Wipe ☐ Ground Water ☐ Other ☑ Soil ☐ Product / Bulk

REPORT FORMAT: ☑ Level II - Std. ☐ Excel - EDD ☐ EDF ☐ Std.-EDD ☐ QC Level III ☐ QC Level IV

ANALYSIS REQUESTED

LAB ID	CANISTER I.D.	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	OCPs 8081A	Lead & Arsenic 6010B	Hold							REMARKS
-011A		S-11	1/11/23 / 0958	Soil	1	8oz glass										
-012A		S-12	/ 1001		1											Comp-4
-013A		S-13	/ 0948		1											
-014A		S-14	/ 0953		1			X								
-015A		S-15	/ 1005		1											
-016A		S-16	/ 1010		1			X								Comp-5
-017A		S-17	/ 1004		1											
-018A		S-18	/ 1009		1											
-019A		Comp-1					X									
-020A		Comp-2					X									

RUSH
Date Due:
Time Due:

	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:
1		Jeff Stromberg	1/11/23	1440		L-D. Trubat	1-11-23	1440
2								

Were Samples Received in Good Condition? ☒ Yes ☐ NO Samples on Ice? ☒ Yes ☐ NO Method of Shipment D/D Sample seals intact? ☐ Yes ☐ NO ☐ N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Log In By: ______ Date: ______ Labeled By: ______ Date: ______ Temp 2.8 #3 °C Page 2 of 3 Rev. 3

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CHAIN OF CUSTODY

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LAB WORK ORDER NO 2301087

Company Name: AEI Consultants ☐ ☑ Env. ☐ Special	Project #: 473272 PO#: 327407
Address: 2500 Camino Diablo	Project Name:
City: Walnut Creek State: CA Zip Code: 94597	Comments:
Telephone: (925) 746-6000 Cell: (949) 939-5523	SAMPLER: Jeff Stromberg
REPORT TO: Kate Lamb BILL TO: AEI Consultants	EMAIL: klamb@aeiconsultants.com

TURNAROUND TIME: ☐ 10 Work Days ☐ 4 Work Days ☐ 1 Work Day ☐ 7 Work Days ☐ 3 Work Days ☐ Noon - Nxt Day ☑ ~~5 Work Days~~ ☒ 2 Work Days ☐ 2 - 8 Hours

SAMPLE TYPE: ☐ Storm Water ☐ Air ☐ Waste Water ☐ Wipe ☐ Ground Water ☐ Other ☑ Soil ☐ Product / Bulk

REPORT FORMAT: ☑ Level II - Std. ☐ Excel - EDD ☐ EDF ☐ Std.-EDD ☐ QC Level III ☐ QC Level IV

ANALYSIS REQUESTED

LAB ID	CANISTER I.D.	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	OCPs 8081A	Lead & Arsenic 6010B	Hold						REMARKS
-021A		Comp-3					X								
-022A		Comp-4					X								
-023A		Comp.5					X								

RUSH
Date Due:
Time Due:

1 Relinquished By:	Print: Jeff Stromberg	Date: 1/11/23	Time: 1440	Received By:	Print: L-D Imbat	Date: 1-11-23	Time: 1440
2 Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:

Were Samples Received in Good Condition? ☒ Yes ☐ NO Samples on Ice? ☒ Yes ☐ NO Method of Shipment D/D Sample seals intact? ☐ Yes ☐ NO ☐ N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Log In By: Date: Labeled By: Date: Temp 2.8 #3 °C Page 3 of 3 Rev. 3

ATTACHMENT 8

NOISE ASSESSMENT STUDY

EDWARD L. PACK ASSOCIATES. INC.
1975 HAMILTON AVENUE
SUITE 26
SAN JOSE, CA 95125
Acoustical Consultants
TEL: 408-371-1195
MOB: 408-921-4886
www.packassociates.com

January 30, 2023
Project No. 55-005

Ms. Viji Mani
Serene Hills, LLC
22561 Poppy Drive
Cupertino, CA 95014

Subject: Noise Assessment Study for the Planned "Serene Hills" Single-Family Subdivision, Sorrel Way, Morgan Hill

Dear Ms. Mani:

This report presents the results of a noise assessment study for the planned "Serene Hills" single-family subdivision along Sorrel Way in Morgan Hill, as shown on the Site Development Plan, Ref. (a). The noise exposures at the site were evaluated against the standards of the City of Morgan Hill General Plan Noise Element, Ref. (b). An analysis of noise level measurements made for the nearby Dunne Hill Meadow residential development indicates that the noise environment at the site is created primarily by traffic sources on East Dunne Avenue. The results of the analysis reveal that exterior and interior noise exposures will be within the limits of the City of Morgan Hill Noise Element standards. As the exterior noise exposures are within the limits of the standards, the interior maximum noise level limits are not in effect. Noise mitigation measures for the project will not be required.

Sections I and II of this report contain a summary of our findings and recommendations, respectively. Subsequent sections contain site, traffic and project descriptions, analyses and evaluations. Appendices A, B and C, attached, contain the list of references, descriptions of the standards, definitions of the terminology, descriptions of the instrumentation used for the field survey, and the noise measurement data and calculation tables.

I. Summary of the Findings

A. Noise Standards

City of Morgan Hill Noise Element

The noise exposures presented herein were evaluated against the standards of the City of Morgan Hill Noise Element, which utilizes the Day-Night Level (DNL) 24-hour descriptor to define acceptable noise exposures for various land uses. The standards specify a limit of 60 decibels (dB) DNL at single-family exterior living areas.

A limit of 45 dB DNL is specified for interior living spaces. In addition, the Noise Element specifies that when the exterior noise exposure is greater than 60 dB DNL, the *maximum instantaneous* noise levels shall not exceed 50 dBA in bedrooms and 55 dBA in other living spaces.

B. Exterior Noise Exposures

The noise exposures shown below are without the application of mitigation measures and represent the noise environment for project conditions.

- The existing exterior noise exposure at the most impacted planned lot line closet to East Dunne Avenue, 233 ft. from the centerline of the road, is 56 dB DNL. This noise exposure includes a 2 decibel downward adjustment factor to account for the acoustical shielding provided by the existing interposed structures. Under future traffic conditions, the noise exposure is expected to increase to 57 dB DNL. Thus, the noise exposures will be within the limits of the City of Morgan Hill Noise Element standards.

- The existing exterior noise exposure at the most impacted planned building setback from East Dunne Avenue, 417 ft. from the centerline of the road, is 52 dB DNL. Under future traffic conditions, the noise exposure is expected to increase to 53 dB DNL. As the exterior noise exposures are below 60 dB DNL, the interior maximum noise limits are not applicable.

C. Interior Noise Exposures

- The interior noise exposures in the most impacted living spaces closest to East Dunne Avenue will be up to 27 and 28 dB DNL under existing and future traffic conditions, respectively. Thus, the noise exposures will be within the 45 dB DNL limit of the City of Morgan Hill Noise Element standards. Noise mitigation measures for the interior spaces will not be required.

II. Site, Traffic and Project Descriptions

The planned project site is a vacant and slightly sloping parcel located north of East Dunne Avenue between Sorrel Way and Magnolia Way in Morgan Hill. The site is setback 233 ft. to 590 ft. from the centerline of East Dunne Avenue. Surrounding land uses include vacant land adjacent to the west, large parcel rural residential adjacent to the north, vacant land adjacent to the east and single-family residential adjacent to the south.

The on-site noise environment is controlled primarily by traffic sources on East Dunne Avenue which carries an existing (2015) Average Daily Traffic (ADT) volume of 10,414 vehicles, as reported by the City of Morgan Hill, Ref. (c).

The planned project includes the construction of 7 single-family homes. Ingress and egress to the project will be by way of Sorrel Way and Saddleback Drive to the south. The Site Development Plan is shown on Figure 2 on page 4.

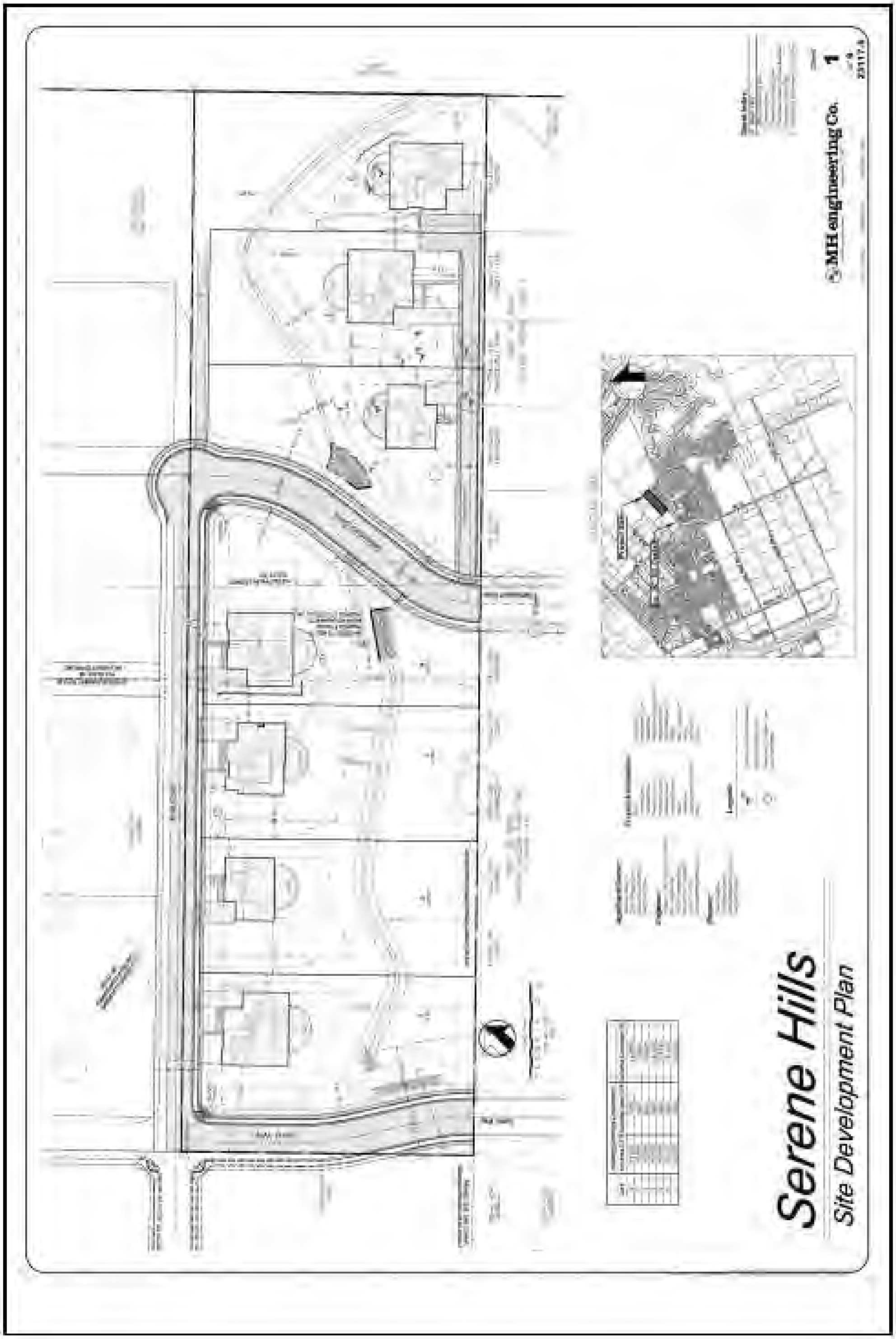

FIGURE 2 – Site Development Plan

III. Analysis of the Noise Levels

A. Existing Noise Levels

To determine the existing noise environment at the planned project site, continuous recordings of the sound levels were made at a location 65 ft. from the centerline of East Dunne Avenue at the Dunne Hill Meadow residential development site on August 3-4, 2015, Ref. (d). Due to time constraints and inclement weather conditions, current noise measurements on site were not feasible. The noise measurements were made using a Larson-Davis LDL 812 Precision Integrating Sound Level Meter. The meter yielded, by direct readout, a series of descriptors of the sound levels versus time, as described in Appendix B. The measured descriptors included the L_1, L_{10}, L_{50}, and L_{90}, i.e., those levels that are exceeded 1%, 10%, 50%, and 90% of the time. Also measured were the maximum and minimum levels, and the continuous equivalent-energy levels (L_{eq}), which are used to calculate the DNL. The measurement location and its relationship to the project site are shown on Figure 3 on page 6

The measurements were made for a total period of 24 hours and included recordings of the noise levels during representative hours of the daytime and nighttime periods of the DNL index. The results of the measurements are shown in data table in Appendix C.

As shown in the table, the L_{eq}'s at the measurement location 65 ft. from the centerline of East Dunne Avenue ranged from 56.5 to 63.4 dBA during the daytime and from 45.4 to 58.6 dBA at night.

B. Future Noise Levels

Future traffic volume data for East Dunne Avenue along the site are not available. However, the Condit-Evergreen General Plan Amendment Traffic Impact Analysis, Ref. (e), indicates that the 2014 traffic volume for East Dunne Avenue east of Murphy Avenue was 15,020 vehicles ADT, with a projected 2030 ADT of 19,000 vehicles. This is a 26.5% increase in the traffic volume. Applying this growth rate to the 2015 traffic volume along the site of 10,414 vehicles ADT, the future 2031 traffic volume is predicted to be 13,174 vehicles ADT. This increase is traffic volume yields a 1 dB increase in the traffic noise levels.

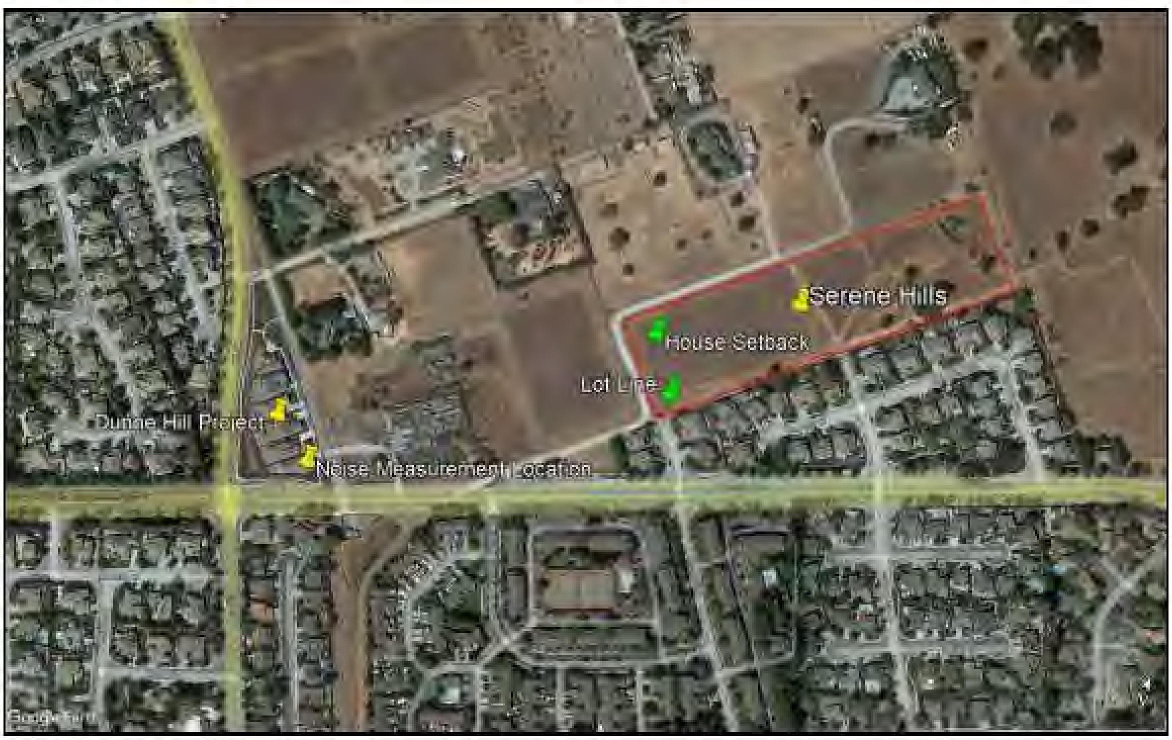

FIGURE 3 – Noise Measurement Location

Traffic noise dissipates at the rate of 3 to 6 dB for each doubling of the distance from the source to the receiver. Therefore, other locations on the site at greater distances from the roadway will have lower noise levels. Additional noise reduction is provided by interposed structures of the Heritage Greens of Morgan Hill residential development.

IV. Evaluation of the Noise Exposures

A. Exterior Noise Exposures

The DNL for the survey location was calculated by decibel averaging of the L_{eq}'s as they apply to the daily time periods of the DNL index. The DNL is a 24-hour noise descriptor that uses the measured L_{eq} values to calculate a 24-hour time-weighted average noise exposure. The formula used to calculate the DNL is described in Appendix B. Adjustments were applied to the measured noise levels to account for the various setback distances from the measurement location using methods established by the Highway Research Board, Ref. (f).

The results of the calculations reveal that the existing noise exposure at the measurement location 65 ft. from the centerline of East Dunne Avenue was calculated to be 66 dB DNL. At the lot line of the project nearest to East Dunne Avenue and with a line-of-sight down Sorrel Way at a distance of 233 ft. from the centerline, the traffic noise exposure reduces to 56 dB DNL, which includes a 2 decibel reduction factor for the partial acoustical shielding provided by the interposed residential structures. Under future traffic conditions, the noise exposure is predicted to increase to 57 dB DNL. Thus, the noise exposures will be within the 60 dB DNL limit of the City of Morgan Hill Noise Element standards.

At the minimum planned building setback of the project from East Dunne Avenue, 417 ft. from the centerline, the noise exposures reduce to 52 and 53 dB DNL under existing and future traffic conditions, respectively. As the noise exposures at the building setbacks will be within the 60 dB DNL limit of the City of Morgan Hill Noise Element standard, the interior maximum noise level limits are not in effect.

As the exterior noise exposures are within the limits of the standards, noise mitigation measures will not be required.

B. Interior Noise Exposures

To determine the interior noise exposures and noise levels in project living spaces, a 25 dB reduction was applied to the exterior noise exposures at the building setbacks to represent the attenuation provided by a typical building shell under a closed window condition. The closed window condition is used in this study as full-time ventilation will be provided that will allow the residents to keep their windows closed for noise control at all times without further specification. This condition also assumes the installation of standard dual-pane thermal insulating windows.

The interior noise exposures in the living spaces closest to East Dunne Avenue will be 27 and 28 dB DNL under existing and future traffic conditions, respectively. Thus, the noise exposures will be within the 45 dB DNL limit of the City of Morgan Hill Noise Element standards. Mitigation measures for the project interiors will not be required.

The above report presents a noise assessment study for the planned “Serene Hills” single-family development along Sorrel Way in Morgan Hill. The study findings for current present conditions are based on field measurements and other data and are correct to the best of our knowledge. Future noise exposures were based on information provided by the City of Morgan Hill. Significant deviations in the future traffic volumes or changes in motor vehicle technology, speed limits, noise regulations, or other future changes beyond our control may produce long-range noise results different from our estimates. If you need any additional information or would like an elaboration on this report, please call me.

Sincerely,

EDWARD L. PACK ASSOC., INC.

Jeffrey K. Pack

Jeffrey K. Pack
President

Attachment: Appendices A, B and C

APPENDIX A

References:

(a) Site Development Plan, Serene Hills, by MH Engineering, December 5, 2022

(b) City of Morgan Hill 2035 General Plan, Safety, Services and Infrastructure Element – Noise Chapter, Adopted July 27, 2016

(c) City of Morgan Hill Public Works Department, Average Daily Traffic Volumes, Exhibit 1, Prepared by Hatch, Mott, McDonald, August 21, 2015

(d) "Noise Assessment Study for the Planned 'Dunne Hill Meadow' Single-Family Subdivision, East Dunne Avenue, Morgan Hill", by Edward L. Pack Associates, Inc., Project No. 47-058, August 7, 2015

(e) "Condit-Evergreen General Plan Amendment Traffic Impact Analysis", by Hexagon Transportation Consultants, June 27, 2014

(f) Highway Research Board, "Highway Noise - A Design Guide for Highway Engineers", Report 117, 1971

APPENDIX B

Noise Standards, Terminology and Instrumentation

1. Noise Standards

A. City of Morgan Hill Safety, Services and Infrastructure Element

The City of Morgan Hill General Plan 2035, adopted July 27, 2016, Safety, Services and Infrastructure Element contains a noise chapter that identifies goals and policies for noise limits with the City of Morgan Hill.

GOAL SSI-8 Prevention of noise from interfering with human activities or causing health problems.

Policy SSI-8.1
Exterior Noise Level Standards. Require new development projects to be designed and constructed to meet acceptable exterior noise level standards (see Table SSI-1), as follows:

Apply a maximum exterior noise level of 60dBA L_{dn} in residential areas where outdoor use is a major consideration (e.g., backyards in single-family housing developments and recreation areas in multi-family housing projects). Where the City determines that providing an L_{dn} of 60 dBA or lower cannot be achieved after the application of reasonable and feasible mitigation, an L_{dn} of 65 dBA maybe permitted.

Indoor noise levels should not exceed an L_{dn} of 45 dBA in new residential housing units.

Noise levels in new residential development exposed to an exterior L_{dn} 60 dBA or greater should be limited to a maximum instantaneous noise level (e.g., trucks on busy streets, train warning whistles) in bedrooms of 50 dBA. Maximum instantaneous noise levels in all other habitable rooms should not exceed 55dBA. The maximum outdoor noise level for new residences near the railroad shall be70 dBA L_{dn}, recognizing that train noise is characterized by relatively few loud events.

Policy SSI-8.2
Impact Evaluation. The impact of a proposed development project on existing land uses should be evaluated in terms of the potential for adverse community response based on significant increase in existing noise levels, regardless of compatibility guidelines.

Policy SSI-8.3

Commercial and Industrial Noise Level Standards. Evaluate interior noise levels in commercial and industrial structures on a case by case basis based on the use of the space.

Policy SSI-8.4

Office Noise Level Standards. Interior noise levels in office buildings should be maintained at 45 dBA L_{eq} (hourly average) or less, rather than 45 dBA L_{dn} (daily average).

Policy SSI-8.5

Traffic Noise Level Standards. Consider noise level increases resulting from traffic associated with new projects significant if: a) the noise level increase is 5 dBA L_{dn} or greater, with a future noise level of less than 60 dBA L_{dn}, or b) the noise level increase is 3 dBA L_{dn} or greater, with a future noise level of 60 dBA L_{dn} or greater.

Policy SSI-8.6

Stationary Noise Level Standards. Consider noise levels produced by stationary noise sources associated with new projects significant if they substantially exceed existing ambient noise levels.

Policy SSI-8.7

Other Noise Sources. Consider noise levels produced by other noise sources (such as ballfields) significant if an acoustical study demonstrates they would substantially exceed ambient noise levels.

Policy SSI-8.8

Screening. Use the Noise Contour map to screen projects to determine if acoustical studies shall be required.

Policy SSI-8.9

Site Planning and Design. Require attention to site planning and design techniques other than sound walls to reduce noise impacts, including: a) installing earth berms, b) increasing the distance between the noise source and the receiver; c) using non-sensitive structures such as parking lots, utility areas, and garages to shield noise sensitive areas; d) orienting buildings to shield outdoor spaces from the noise source; and e) minimizing the noise at its source.

Action SSI-8.A

Noise Contour Map Updates. Assess and track noise levels when specific projects are proposed to determine the continued accuracy of the Noise Contour map. If necessary, based on these assessments, update the future Noise Contour map to reflect changed conditions.

Action SSI-8.B

Zoning Ordinance. Amend the Zoning Ordinance to reflect noise limits intended to protect noise sensitive land uses from intrusion by stationary noise sources.

GOAL SSI-9
Protection from noise associated with motor vehicles and railroad activity.

Policy SSI-9.1
Techniques to Reduce Traffic Noise. Use roadway design, traffic signalization, and other traffic planning techniques (such as limiting truck traffic in residential areas) to reduce noise caused by speed or acceleration of vehicles.

Policy SSI-9.2
Noise Barrier Dimensions. If noise barriers are deemed the only effective mitigation for development along major transportation corridors, require an acoustical analysis to determine necessary dimensions.

Policy SSI-9.3
Sound Wall Design. The maximum height of sound walls shall be eight feet. Residential projects adjacent to the freeway shall be designed to minimize sound wall height through location of a frontage road, use of two sound walls or other applicable measures. Sound wall design and location shall be coordinated for an entire project area and shall meet Caltrans noise attenuation criteria for a projected eight-lane freeway condition. If two sound walls are used, the first shall be located immediately adjacent to the freeway right-of-way and the second shall be located as necessary to meet Caltrans noise requirements for primary outdoor areas. The minimum rear yard setback to the second wall shall be 20 feet.

Policy SSI-9.4
Sound Barrier Vandalism. Ensure that sound barriers do not become targets for vandalism and prioritize clean-up if sound walls are vandalized.

Policy SSI-9.5
Noise Studies for Private Development. In order to prevent significant noise impacts on neighborhood residents which are related to roadway extensions or construction of new roadways, require completion of a detailed noise study during project-level design to quantify noise levels generated by projects such as the Murphy Avenue extension to Mission View Drive and the Walnut Grove Extension to Diana Avenue. The study limits should include noise sensitive land uses adjacent to the project alignment as well as those along existing segments that would be connected to new segments. A significant impact would be identified where traffic noise levels would exceed the “normally acceptable” noise level standard for residential land uses and/or where ambient noise levels would be substantially increased with the project. Project specific mitigation measures could include, but not be limited to, considering the location of the planned roadway alignment relative to existing receivers in the vicinity, evaluating the use of noise barriers to attenuate project-generated traffic noise, and/or evaluating the use of “quiet pavement” to minimize traffic noise levels at the source. Mitigation should be designed to reduce noise levels into compliance with “normally acceptable” levels for residential noise and land use compatibility.

Policy SSI-9.6

Earth Berms. Allow and encourage earth berms in new development projects as an alternative to sound walls if adequate space is available.

Policy SSI-9.7

Sound Barrier Design. Require non-earthen sound barriers to be landscaped, vegetated, or otherwise designed and/or obscured to improve aesthetics and discourage graffiti and other vandalism.

Action SSI-9.A

UPRR Madrone Parkway Crossing Noise Study. In order to prevent significant noise impacts on sensitive receptors and neighborhood residents which are related to an at-grade Madrone Parkway Crossing of the UPRR tracks, during project-level design, conduct a detailed noise study to calculate noise levels expected as a result of train warning whistles and warning bells that would be sounded, and to calculate the increase in ambient noise levels resulting from the project. The study limits should include noise sensitive land uses north and south of the at grade crossing as warning whistles would be expected up to one-quarter mile in each direction. A significant impact would be identified where (it is likely that these receivers are already exposed to noise levels above 60 dBA L_{dn}) where ambient noise levels would be substantially increased with the project. Project specific mitigation measures should include, but not be limited to, evaluating the use of noise barriers to attenuate the warning whistle/bell noise, residential sound insulation, utilizing wayside horns, and/or establishing a train whistle quiet zone per the Federal Railroad Administration's Final Rule on the Use of Locomotive Horns at Highway-Rail Grade Crossings. Mitigation should be designed to avoid a substantial permanent increase in noise.

2. Terminology

A. Statistical Noise Levels

Due to the fluctuating character of urban traffic noise, statistical procedures are needed to provide an adequate description of the environment. A series of statistical descriptors have been developed which represent the noise levels exceeded a given percentage of the time. These descriptors are obtained by direct readout of the Sound Level Meters. Some of the statistical levels used to describe community noise are defined as follows:

L_1 - A noise level exceeded for 1% of the time.

L_{10} - A noise level exceeded for 10% of the time, considered to be an "intrusive" level.

L_{50} - The noise level exceeded 50% of the time representing the "mean" sound level.

L_{90} - The noise level exceeded 90 % of the time, designated as a "background" noise level.

L_{eq} - The continuous equivalent-energy level is that level of a steady-state noise having the same sound energy as a given time-varying noise. The L_{eq} represents the decibel level of the time-averaged value of sound energy or sound pressure squared and is used to calculate the DNL and CNEL.

B. Day-Night Level (DNL)

Noise levels utilized in the standards are described in terms of the Day-Night Level (DNL). The DNL rating is determined by the cumulative noise exposures occurring over a 24-hour day in terms of A-Weighted sound energy. The 24-hour day is divided into two subperiods for the DNL index, i.e., the daytime period from 7:00 a.m. to 10:00 p.m., and the nighttime period from 10:00 p.m. to 7:00 a.m. A 10 dBA weighting factor is applied (added) to the noise levels occurring during the nighttime period to account for the greater sensitivity of people to noise during these hours. The DNL is calculated from the measured L_{eq} in accordance with the following mathematical formula:

$$DNL = \Big[[(10\log_{10}(10^{\Sigma Leq(7\text{-}10)})) \times 15] + [((10\log_{10}(10^{\Sigma Leq(10\text{-}7)}) + 10) \times 9]\Big]/24$$

C. A-Weighted Sound Level

The decibel measure of the sound level utilizing the "A" weighted network of a sound level meter is referred to as "dBA". The "A" weighting is the accepted standard weighting system used when noise is measured and recorded for the purpose of determining total noise levels and conducting statistical analyses of the environment so that the output correlates well with the response of the human ear.

3. Instrumentation

The on-site field measurement data were acquired by the use of one or more of the precision acoustical instruments shown below. The acoustical instrumentation provides a direct readout of the L exceedance statistical levels including the equivalent-energy level (L_{eq}). Input to the meters was provided by a microphone extended to a height of 5 ft. above the ground. The meter conforms to ANSI S1.4 for Type 1 instruments and IEC 61672-1:2002 for Class 1 instruments. The "A" weighting network and the "Fast" response setting of the meter were used in conformance with the applicable ISO and IEC standards. All instrumentation was acoustically calibrated before and after field tests to assure accuracy.

Larson-Davis Model 812 Integrating Sound Level Meter
Larson-Davis LxT Precision Integrating Sound Level Meter
Larson-Davis Model 831 Integrating Sound Level Meter

APPENDIX C

On-Site Noise Measurement Data and Calculation Tables

DNL CALCULATIONS

CLIENT: INTERO REAL ESTATE
FILE: 47-058
PROJECT: HILL MEADOW SINGLE-FAMILY
DATE: 8/3-4/2015
SOURCE: E. DUNNE AVE./HILL RD.

LOCATION 1	E. Dunne Ave.			
Dist. To Source	65 ft.			
TIME	Leq	10^Leq/10		
7:00 AM	64.8	3019951.7		
8:00 AM	65.0	3162277.7		
9:00 AM	64.9	3090295.4		
10:00 AM	63.9	2454708.9		
11:00 AM	63.5	2238721.1		
12:00 PM	62.8	1905460.7		
1:00 PM	62.8	1905460.7		
2:00 PM	63.1	2041737.9		
3:00 PM	63.1	2041737.9		
4:00 PM	61.6	1445439.8		
5:00 PM	62.3	1698243.7		
6:00 PM	64.1	2570395.8		
7:00 PM	62.5	1778279.4		
8:00 PM	61.4	1380384.3		
9:00 PM	60.3	1071519.3	SUM=	31804614.4
10:00 PM	58.2	660693.4	Ld=	75.0
11:00 PM	57.5	562341.3		
12:00 AM	54.9	309029.5		
1:00 AM	54.1	257039.6		
2:00 AM	50.9	123026.9		
3:00 AM	52.3	169824.4		
4:00 AM	57.6	575439.9		
5:00 AM	62.2	1659586.9		
6:00 AM	63.3	2137962.1	SUM=	6454944.1
			Ln=	68.1
	Daytime Level=	75.0		
	Nighttime Level=	78.1		
	DNL=	**66**		
	24-Hour Leq=	62.0		