

**9 Lot Subdivision
Via Florencia
TTM 38273
Initial Study and Mitigated Negative Declaration**

**Lead Agency:
City of Rancho Mirage
69-825 Highway 111
Rancho Mirage, California 92270**



**Prepared by:
BLODGETT BAYLOSIS ENVIRONMENTAL PLANNING
2211 S. HACIENDA BOULEVARD, SUITE 107
HACIENDA HEIGHTS, CALIFORNIA 91745**

June 2024



ENVIRONMENTAL INITIAL STUDY

9 Lot Subdivision

Project Title: 9 Lot Subdivision

City Project No: Tentative Tract Map Case No. TTM22-0004 & Environmental Assessment Case No. EA22-0004 for Tentative Parcel Map 38273

Lead Agency Name and Address: City of Rancho Mirage
69-825 Highway 111
Rancho Mirage, California 92270
Phone: (760) 328-2266

Applicant: Dan Arthofer
La Paloma Homes, Inc.
P.O. Box 10179
Palm Desert, California 92255

Contact Person: Pilar Lopez – Senior Planner

Phone Number: (760) 328-2266

Project Location: Southeast corner of the intersection of Via Florencia and Landy Lane in the City of Rancho Mirage, California (Township 4 South, Range 6 East, Section 30, USGS Cathedral City, California Quadrangle, 1956).

Accessor Parcel Number: 685-100-011

Project Area: ±5.0-Acres

General Plan Designation: Very Low Density Residential (R-L-2)

Zoning Designation: Very Low Density Residential (R-L-2)



| | |
|---|-----------|
| ENVIRONMENTAL INITIAL STUDY | 2 |
| CHAPTER 1: PROJECT DESCRIPTION..... | 5 |
| PROJECT OVERVIEW | 5 |
| PROJECT LOCATION | 5 |
| ACCESS AND PARKING..... | 5 |
| UTILITIES | 5 |
| ENVIRONMENTAL SETTING AND SURROUNDING LAND USES | 6 |
| OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED | 6 |
| Exhibit 1-1 Regional Map..... | 7 |
| Exhibit 1-2 Citywide Map..... | 8 |
| Exhibit 1-3 Local Map..... | 9 |
| Exhibit 1-4 Aerial Photograph | 10 |
| CHAPTER 2: ENVIRONMENTAL ANALYSIS AND DETERMINATION..... | 11 |
| DETERMINATION: | 13 |
| 1 - AESTHETICS..... | 14 |
| 1.1 Setting | 14 |
| 1.2 Discussion of Impacts: | 15 |
| 1.3 Mitigation Measures: | 16 |
| 2 - AGRICULTURE AND FORESTRY RESOURCES..... | 17 |
| 2.1 Setting | 17 |
| 2.2 Discussion of Impacts: | 18 |
| 2.3 Mitigation Measures: | 19 |
| 3 - AIR QUALITY..... | 20 |
| 3.1 Setting | 20 |
| 3.2 Discussion of Impacts: | 21 |
| 3.3 Mitigation Measures: | 24 |
| 4 - BIOLOGICAL RESOURCES..... | 25 |
| 4.1 Setting | 26 |
| 4.2 Discussion of Impacts: | 26 |
| 4.3 Mitigation Measures: | 29 |
| 5 - CULTURAL RESOURCES | 31 |
| 5.1 Setting | 31 |
| 5.2 Discussion of Impacts: | 32 |
| 5.3 Mitigation Measures: | 35 |
| 6 - ENERGY | 36 |
| 6.1 Setting | 36 |
| 6.2 Discussion of Impacts: | 36 |
| 6.3 Mitigation Measures: | 38 |
| 7 - GEOLOGY AND SOILS..... | 39 |
| 7.1 Setting | 40 |
| 7.2 Discussion of Impacts: | 40 |
| 7.3 Mitigation Measures: | 42 |
| 8 – GREENHOUSE GAS EMISSIONS..... | 43 |
| 8.1 Setting | 43 |
| 8.2 Discussion of Impacts: | 45 |
| 8.3 Mitigation Measures: | 46 |
| 9 - HAZARDS AND HAZARDOUS MATERIALS | 47 |
| 9.1 Setting | 47 |
| 9.2 Discussion of Impacts: | 48 |
| 9.3 Mitigation Measures: | 49 |
| 10 - HYDROLOGY AND WATER QUALITY | 50 |
| 10.1 Setting | 50 |
| 10.2 Discussion of Impacts: | 51 |



| | |
|---|-----------|
| 10.3 Mitigation Measures: | 52 |
| 11 - LAND USE AND PLANNING | 53 |
| 11.1 Setting | 53 |
| 11.2 Discussion of Impacts: | 53 |
| 11.3 Mitigation Measures: | 54 |
| 12 - MINERAL RESOURCES | 55 |
| 12.1 Setting | 55 |
| 12.2 Discussion of Impacts: | 55 |
| 12.3 Mitigation Measures: | 56 |
| 13 - NOISE | 57 |
| 13.1 Setting | 57 |
| 13.2 Discussion of Impacts: | 57 |
| 13.3 Mitigation Measures: | 60 |
| 14 - POPULATION AND HOUSING | 61 |
| 14.2 Discussion of Impacts: | 61 |
| 14.3 Mitigation Measures: | 62 |
| 15 - PUBLIC SERVICES | 63 |
| 15.1 Setting | 63 |
| 15.2 Discussion of Impacts: | 63 |
| 15.3 Mitigation Measures: | 65 |
| 16 - RECREATION | 66 |
| 16.1 Setting | 66 |
| 16.2 Discussion of Impacts: | 66 |
| 16.3 Mitigation Measures: | 67 |
| 17 - TRANSPORTATION | 68 |
| 17.1 Setting | 68 |
| 17.2 Discussion of Impacts: | 68 |
| 17.3 Mitigation Measures: | 70 |
| 18 - TRIBAL CULTURAL RESOURCES | 71 |
| 18.1 Setting | 71 |
| 18.2 Discussion of Impacts: | 72 |
| 18.3 Mitigation Measures: | 73 |
| 19 - UTILITIES AND SERVICE SYSTEMS | 75 |
| 19.1 Setting | 75 |
| 19.2 Discussion of Impacts: | 76 |
| 19.3 Mitigation Measures: | 78 |
| 20 - WILDFIRE | 79 |
| 20.1 Setting | 79 |
| 20.2 Discussion of Impacts: | 80 |
| 20.3 Mitigation Measures: | 80 |
| 21 - MANDATORY FINDINGS OF SIGNIFICANCE | 81 |
| 21.1 Setting | 81 |
| 21.2 Discussion of Impacts: | 81 |
| 21.3 Mitigation Measures: | 82 |
| CHAPTER 3: REFERENCES | 87 |
| CHAPTER 4: APPENDICES | 87 |
| CHAPTER 5: REPORT PREPARERS | 87 |



CHAPTER 1: PROJECT DESCRIPTION

PROJECT OVERVIEW

The City of Rancho Mirage is reviewing an application that would involve the construction of a nine-unit subdivision within a 5.0-acre project site. Water and sewer would be provided by the Coachella Valley Water District. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

PROJECT LOCATION

The proposed project site is located in the northeastern portion of the City of Rancho Mirage. The City is located in the eastern portion of Riverside County within the Coachella Valley area. Rancho Mirage is generally bounded on the north by Thousand Palms and Cathedral City; on the east by Palm Desert; on the south by Palm Desert and unincorporated Riverside County; and on the west by Cathedral City. Regional access to the City of Rancho Mirage is provided by the Interstate 10 (I-10) Freeway which extends across the northernmost portion of the City. The I-10 Freeway is located approximately 1.2 miles northeast of the project site. The location of Rancho Mirage, in a regional context, is shown in Exhibit 1-1. A citywide map is provided in Exhibit 1-2. The proposed project site is located approximately 400 feet west of the southwest corner of the intersection of Via Florencia and Landy Lane in the City of Rancho Mirage, California (Township 4 South, Range 6 East, Section 30, USGS Cathedral City, California Quadrangle, 1956). The property is located in an area zoned for very low density residential (R-L-2). A local map is provided in Exhibit 1-3.

ACCESS AND PARKING

The individual units would be arranged around a proposed cul-de-sac roadway with an average curb-to-curb width of 37-feet. The new internal drive aisle would connect to the south side of Via Florencia. Each unit would be provided with an enclosed garage that would accommodate two vehicles.

UTILITIES

Imperial Irrigation District (IID) would provide electricity to the project site. Natural gas service is provided by the Southern California Gas Company. Currently, the existing site is vacant and does not use electricity or natural gas. There are no existing water or wastewater treatment plants, electric power plants, telecommunications facilities, natural gas facilities, or stormwater drainage infrastructure located on-site. Groundwater is the primary source of domestic water supply in the Coachella Valley. The Coachella Valley Water District (CVWD) is the largest provider of potable water in the valley and currently provides potable water in the project vicinity. CVWD operates 6 water reclamation plants and maintains more than 1,000 miles of sewer pipelines and more than 30 lift stations that transport wastewater to the nearest treatment facility and nearly 6.3 billion gallons of wastewater is treated yearly. In addition, wastewater generated by the Project will be conveyed to CVWD Wastewater Reclamation Plant Number 10 in Palm Desert (WRP-10). Per the 2015 CVWD Urban Water Management Plan, WRP-10 has a capacity to treat 18 million gallons per day (MGD). Solid waste disposal and recycling services for the City of Rancho Mirage is provided by Burrtec. Solid waste and recycling collected from the proposed project will be



hauled to the Edom Hill Transfer Station. Waste from this transfer station is then sent to a permitted landfill or recycling facility outside of the Coachella Valley. These include Badlands Disposal Site, El Sobrante Sanitary Landfill and Lamb Canyon Disposal Site.

ENVIRONMENTAL SETTING AND SURROUNDING LAND USES

The relatively level 5.0-acre site ranges from 348 feet above mean sea level (AMSL). The vegetation community present on site supports a heavily disturbed sparse desert scrub habitat encompassing mainly native plants and some non-native grasses. The site contains a few species of plant which include the creosote bush (*Larrea tridentata*), Asian mustard (*Brassica tournefortii*), Schott's Dalea (*Psoralea schottii*), Flatspine burr ragweed (*Ambrosia acanthicarpa*) and cheatgrass (*Bromus tectorum*). The site and the surrounding area are illustrated in Exhibit 1-4.

- *North:* The future Via Florencia road right-of-way extends along the project site's north side. Vacant undeveloped land is located further north. These parcels are designated as Very Low Density Residential (R-L-2).
- *East:* Vacant, undeveloped land extends along the project site's east side. These parcels are designated as Very Low Density Residential (R-L-2).
- *South:* A single-family residential development abuts the project site's south side. These parcels are designated as Very Low Density Residential (R-L-2).
- *West:* Undeveloped land extends along the project site's west side. These parcels are designated as Very Low Density Residential (R-L-2).

OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED

A Discretionary Action is an action taken by a government agency (for this project, the government agency is the City of Rancho Mirage) that calls for an exercise of judgment in deciding whether to approve a project. The following discretionary approvals are required:

- Approval of a Tentative Parcel Map (TPM 38273); and,
- Approval of the Mitigated Negative Declaration (MND); and,
- The adoption of the Mitigation Monitoring and Reporting Program (MMRP).

All potentially interested tribes identified by the NAHC were also contacted pursuant to AB-52 for information regarding their knowledge of cultural resources that were within or near the project area. These groups include the Agua Caliente Band of Cahuilla Indians. Tribal consultation began August 23, 2023 and was concluded September 23, 2023. There are currently no other public agencies whose approval is required at this time. There are currently no other public agencies whose approval is required at this time.

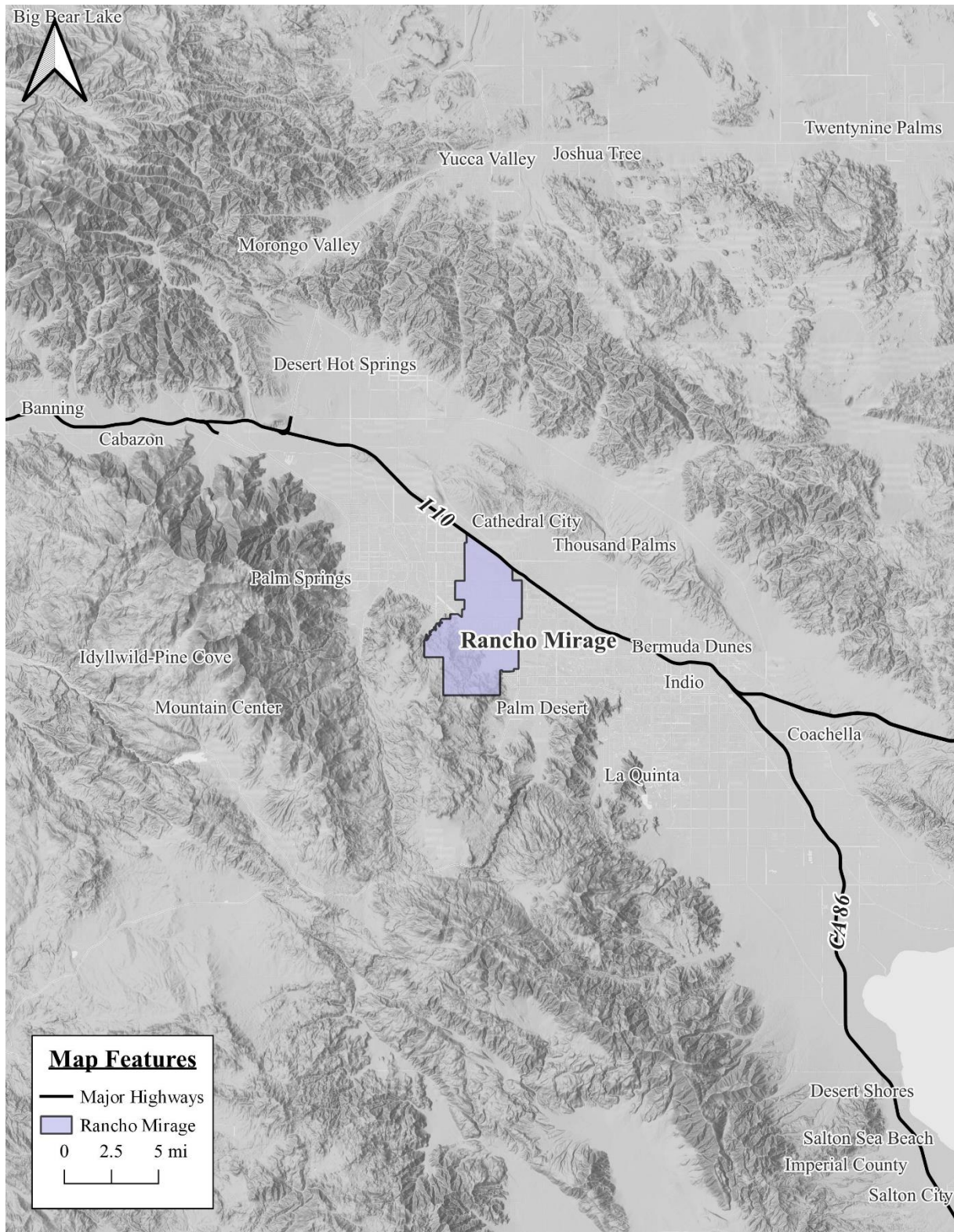


EXHIBIT 1-1 REGIONAL MAP
SOURCE: BLODGETT BAYLOSIS ENVIRONMENTAL PLANNING

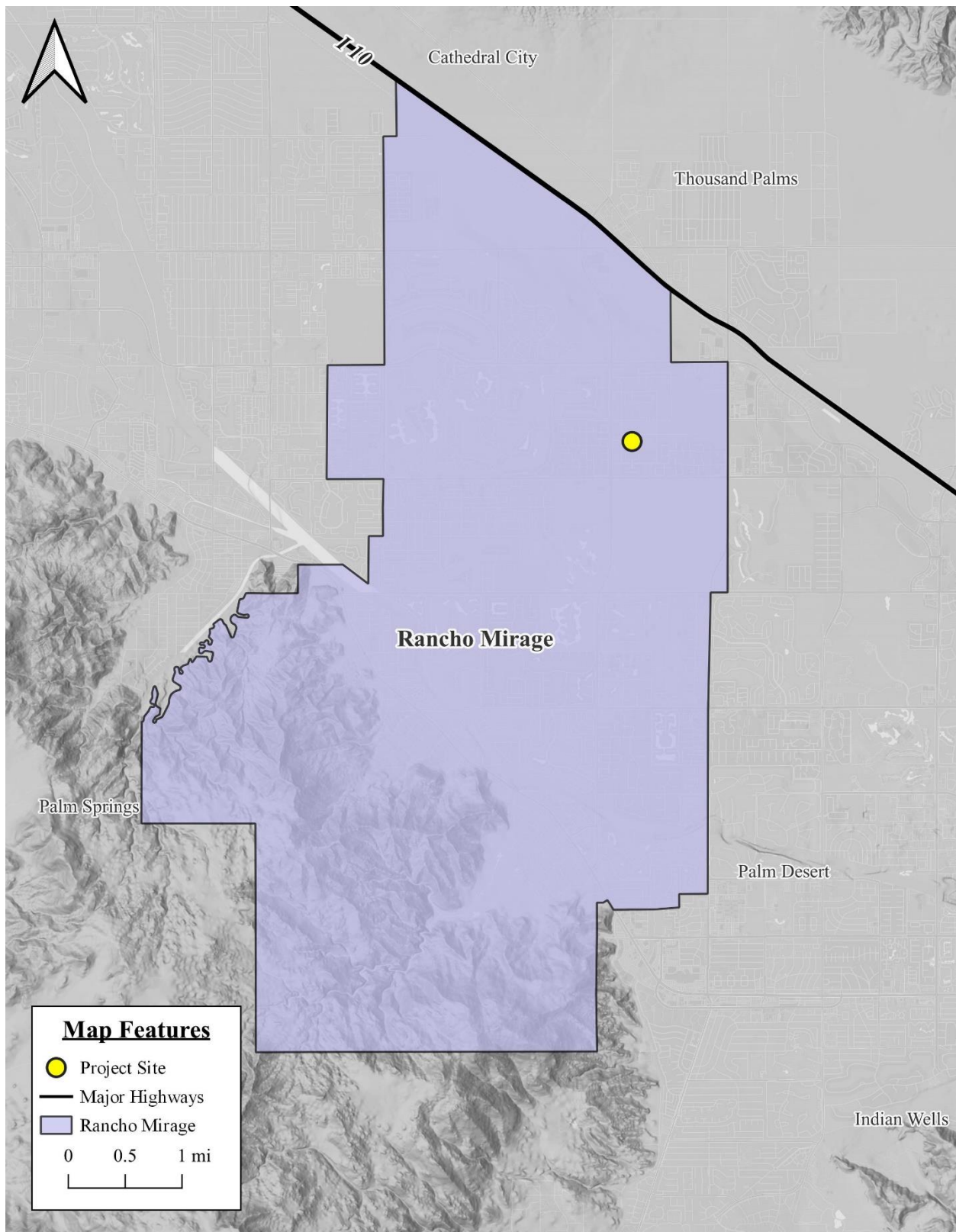


EXHIBIT 1-2 CITYWIDE MAP

SOURCE: BLODGETT BAYLOSIS ENVIRONMENTAL PLANNING

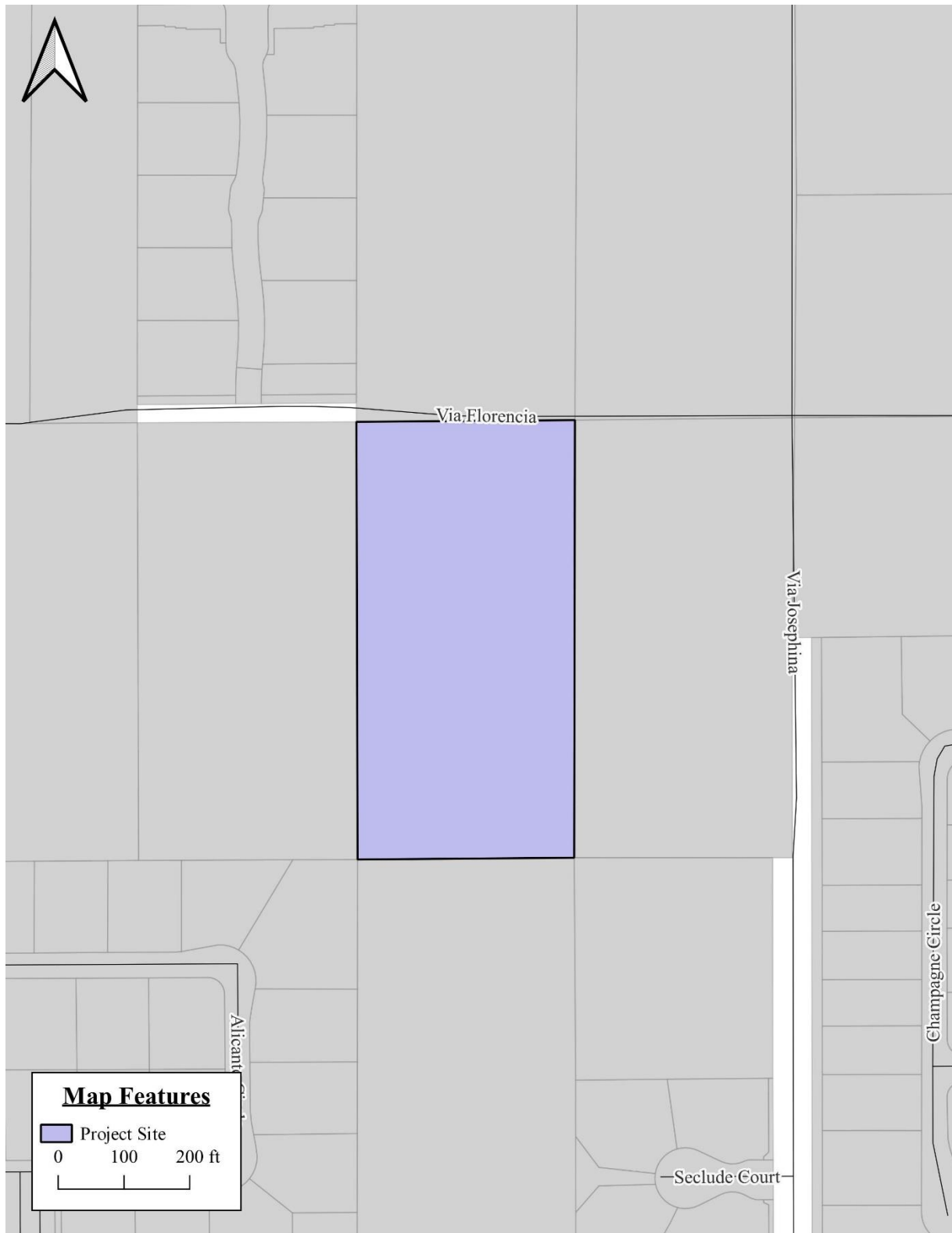


EXHIBIT 1-3 LOCAL MAP
SOURCE: BLODGETT BAYLOSIS ENVIRONMENTAL PLANNING



EXHIBIT 1-4 AERIAL PHOTOGRAPH
SOURCE: BLODGETT BAYLOSIS ENVIRONMENTAL PLANNING



CHAPTER 2: ENVIRONMENTAL ANALYSIS AND DETERMINATION

Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- | | | |
|--|---|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture & Forestry Resources | <input type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Energy |
| <input type="checkbox"/> Geology / Soils | <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials |
| <input type="checkbox"/> Hydrology / Water Quality | <input type="checkbox"/> Land Use / Planning | <input type="checkbox"/> Mineral Resources |
| <input type="checkbox"/> Noise | <input type="checkbox"/> Population / Housing | <input type="checkbox"/> Public Services |
| <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation | <input checked="" type="checkbox"/> Tribal Cultural Resources |
| <input type="checkbox"/> Utilities / Service Systems | <input type="checkbox"/> Wildfire | <input type="checkbox"/> Mandatory Findings of Significance |



Evaluation of Environmental Impacts:

- 1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
- 4) Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
 - a) Earlier Analysis Used. Identify and state where they are available for review.
 - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.



- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify a) the significance criteria or threshold, if any, used to evaluate each question; and b) the mitigation measure identified, if any, to reduce the impact to less than significance.

DETERMINATION: (To be completed by the Lead Agency) On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Pilar Lopez, Senior Planner

Date

City of Rancho Mirage



Environmental Checklist and Discussion:

The following checklist evaluates the proposed Project's potential adverse impacts. For those environmental topics for which a potential adverse impact may exist, a discussion of the existing site environment related to the topic is presented followed by an analysis of the Project's potential adverse impacts. When the Project does not have any potential for adverse impacts for an environmental topic, the reasons why there are no potential adverse impacts are described.

1 - AESTHETICS

| AESTHETICS -- Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|--------------------------------|---|-------------------------------------|-------------------------------------|
| a) Have a substantial adverse effect on a scenic vista? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SOURCES:

Fomotor Engineering, Inc. Preliminary [Tentative Tract Map No. 38273]. Sheet 1. July 26, 2023.
Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.
Rancho Mirage, City of. *City of Rancho Mirage Municipal Code*. As amended 2023.

1.1 SETTING

The evaluation of aesthetics and aesthetic impacts is generally subjective, and it typically requires the identification of key visual features in the area and their importance. The characterization of aesthetic impacts involves establishing the existing visual characteristics including visual resources and scenic vistas that are unique to the area. Visual resources are determined by identifying existing landforms (e.g., topography and grading), views (e.g., scenic resources such as natural features or urban characteristics), and existing light and glare characteristics (e.g., nighttime illumination). Changes to the existing aesthetic environment associated with the proposed project's implementation are identified and *qualitatively* evaluated based on the proposed modifications to the existing setting and the viewers' sensitivity. The project-related



impacts are then compared to the context of the existing setting, using the threshold criteria discussed above.

The natural setting of the Rancho Mirage area is critical to its overall visual character and provides scenic vistas for the community. The Santa Rosa Mountains provide a natural, scenic backdrop to the Rancho Mirage community. The Santa Rosa Mountains are part of the Santa Rosa and San Jacinto Mountains National Monument. The base of the aforementioned mountains is located just over 10 miles to the west of the project site.

1.2 DISCUSSION OF IMPACTS:

a) No Impact.

The City of Rancho Mirage is reviewing an application that would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site. The building pads would range in size from 18,000 square feet to 20,998 square feet. The units would consist of one level with a maximum height of 20-feet. The individual units would be arranged around a proposed cul-de-sac roadway with an average curb-to-curb width of 37-feet. The new internal drive aisle would connect to the south side of Via Florencia. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

The natural setting of the Rancho Mirage area is critical to its overall visual character and provides scenic vistas for the community. The Santa Rosa Mountains provide a natural, scenic backdrop to the Rancho Mirage community. The Santa Rosa Mountains are part of the Santa Rosa and San Jacinto Mountains National Monument. The base of the aforementioned mountains is located just over 10 miles to the west of the project site. The new units would consist of one level with a maximum height of 20-feet above the surrounding grade. Because of the proposed building height of the individual units, the proposed development would not obstruct any significant views of the aforementioned mountains of the existing or future homes located to the east of the development site. Once developed, views of the aforementioned mountains would continue to be visible from the public right-of-way. As a result, no impacts would occur.

b) No Impact.

According to the California Department of Transportation, none of the improved or unimproved roads located adjacent to the project site are designated as scenic highways. Highway 111, located approximately three miles to the southeast of the site, is considered to be an *Eligible State Scenic Highway*, though this roadway is not officially designated as such. According to the Rancho Mirage General Plan, Bob Hope Drive (located approximately 2,000 feet to the west of the site) is a *City-designated Scenic road*. In addition to the foregoing, the project property is currently absent of any historic buildings, structures or other former permanent improvements that would have any aesthetic value. The site's development would also facilitate the site's maintenance and rehabilitation. Lastly, the project site does not contain any buildings listed in the State or National registrar. As a result, no impacts would occur.

c) No Impact.

There are no protected views in the vicinity of the project site (refer to Subsection A). In addition, the City does not have any zoning regulations or other regulations governing scenic quality other



that the development standards for which the new residential units would conform to. As a result, no impacts would occur.

d) Less Than Significant Impact.

The nearest light sensitive receptors are the existing residential units located to the south of the project site. In addition, the properties located to the north, west, and east are zoned for future residential development. The project's lighting would be required to comply with Chapter 17.18.050 of the Rancho Mirage Municipal Code. The proposed project's lighting must be designed so as to prevent emissions of glare or light beyond the property line. All exterior lighting at the project site would be conditioned to be Dark-Sky compliant, in order to reduce the amount of light emitted at the project site at night. This would keep the night skies in the City of Rancho Mirage visible to residents and visitors. Riverside County Ordinance Number 655 regulates light pollution in the County. Ordinance No. 655 restricts the use of certain light fixtures emitting into the night sky undesirable light rays which have a detrimental effect on astronomical observation and research. The project would be required to comply to these County's standards. Since the proposed project would be required to adhere to both the City's and County's light and glare requirements, the impacts would be less than significant.

1.3 MITIGATION MEASURES:

None required.



2 - AGRICULTURE AND FORESTRY RESOURCES

| AGRICULTURE AND FORESTRY RESOURCES – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---------------------------------------|--|-------------------------------------|-------------------------------------|
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Conflict with existing zoning for, or cause rezoning of forest land, timberland, or timberland zoned Timberland Production? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

California Department of Conservation, Division of Land Resource Protection, Farmland Mapping, and Monitoring Program.
California Important Farmland Finder.
 California Department of Conservation, *State of California Williamson Act Contract Land.*

2.1 SETTING

The California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) was established in 1982 to track changes in agricultural land use and to help preserve areas of Important Farmland. It divides the state's land into eight categories of land use designation based on soil quality and existing agriculture uses to produce maps and statistical data. These maps and data are used to help preserve productive farmland and to analyze impacts on farmland. Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance are all Important Farmland and are collectively referred to as Important Farmland in this analysis. The highest rated Important Farmland is Prime Farmland. The California Land Conservation Act of 1965, or the Williamson Act, allows a city or county government to preserve agricultural land or open space through contracts with landowners. Contracts last 10 years and



are automatically renewed unless a notice of nonrenewal is issued.

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The relatively flat site is approximately 94 meters above sea level and contains no slope. The vegetation community present on site supports a heavily disturbed sparse desert scrub habitat encompassing mainly native plants and some non-native grasses. The site is dominated by creosote bush (*Larrea tridentata*). The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site.

The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2). According to the California Department of Conservation, the project site and the adjacent properties do not contain any areas of Farmland of Statewide Importance, and no agricultural uses are located onsite or adjacent to the property.

2.2 DISCUSSION OF IMPACTS:

a) No Impact:

The project site consists of both native and non-native shrubs and grasses. The site is dominated by creosote bush (*Larrea tridentata*). According to the California Department of Conservation, the project site and the adjacent properties do not contain any areas of Farmland of Statewide Importance, and no agricultural uses are located onsite or adjacent to the property. According to the California Farmland Mapping and Monitoring Program the proposed project is located in a portion of Rancho Mirage designated as *Urban and Built-Up Land*. Urban and Built-Up Land is land that is occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures. The project site and the properties on all sides of the project are classified as Urban and Built-Up Land (the entire City of Rancho Mirage is primarily defined by Urban and *Built-Up Land* and land designated as Other). The project site is not located in an area where the existing zoning promote agricultural uses or is otherwise classified as farmland. Therefore, the implementation of the proposed project would not involve the conversion of any prime farmland, unique farmland, or farmland of statewide importance to urban uses. As a result, no impacts would occur.

b) No Impact:

The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2). The northernmost portion of the project site is occupied by an older single-family residence that is in a poor state of repair and there are no agricultural uses located within the site that would be affected by the project's implementation. According to the California Department of Conservation Division of Land Resource Protection, the project site is not subject to a Williamson Act Contract. As a result, no impacts on existing Williamson Act Contracts would result from the proposed project's implementation.

c) No Impact:

There are no forest lands or timber lands located within or adjacent to the site. Furthermore, the site's existing zoning designation does not contemplate forest land or timber land uses. As a result, no impacts will occur.



d) No Impact:

No forest lands are located within the project site. The proposed use would be restricted to the site and would not affect any land under the jurisdiction of the BLM. As a result, no loss or conversion of forest lands to urban uses would result from the proposed project's implementation.

e) No Impact:

The project would not involve the disruption or damage of the existing environment that would result in a loss of farmland to nonagricultural use or conversion of forest land to non-forest use because the project site does not contain any significant vegetation. As a result, no farmland conversion impacts would occur.

2.3 MITIGATION MEASURES:

None required.



3 - AIR QUALITY

| AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|---------------------------------------|--|-------------------------------------|-------------------------------------|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Expose sensitive receptors to substantial pollutant concentrations? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

California Air Pollution Control Officers Association. *California Emissions Estimator Model*. Version 2020. (Used in Appendix A)
 Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.
 Rancho Mirage, City of. *City of Rancho Mirage Municipal Code*. As amended 2023.
 South Coast Air Quality Management District. *Air Quality Analysis Handbook*. 1993.
 South Coast Air Quality Management District. *Final 2016 Air Quality Management Plan*. Adopted March 2017.
 Southern California Association of Governments. *Regional Transportation Plan/Sustainable Communities Strategy 2016-2040. Demographics & Growth Forecast*. April 2016.
 State of California, Department of Finance. *E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2021-2023*. Sacramento, California, May 2023.

3.1 SETTING

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The relatively flat site is approximately 94 meters above sea level and contains no slope. The vegetation community present on site supports a heavily disturbed sparse desert scrub habitat encompassing mainly native plants and some non-native grasses. The site is dominated by creosote bush (*Larrea tridentata*). The following criteria pollutants are evaluated in this ISMND:

- **Ozone (O_3)** is a nearly colorless gas that irritates the lungs, and damages materials and vegetation. Ozone is formed by a photochemical reaction (when nitrogen dioxide is broken down by sunlight).
- **Carbon Monoxide (CO)** is a colorless, odorless toxic gas that interferes with the transfer of oxygen to the brain and is produced by the incomplete combustion of carbon-containing fuels emitted as vehicle exhaust.



- *Nitrogen Oxide (NO_x)* is a yellowish-brown gas, which at high levels can cause breathing difficulties. NO_x is formed when nitric oxide (a pollutant from burning processes) combines with oxygen.
- *Sulfur Dioxide (SO₂)* is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Health effects include acute respiratory symptoms.
- *PM₁₀ and PM_{2.5}* refers to particulate matter less than ten microns and two and one-half microns in diameter, respectively. Particulates of this size cause a greater health risk than larger-sized particles since fine particles can more easily cause irritation.
- *Reactive Organic Gasses (ROG)* refers to organic chemicals that, with the interaction of sunlight photochemical reactions may lead to the creation of “smog.”

Projects in the Salton Sea Air Basin (SSAB) generating construction-related emissions that exceed any of the following emissions thresholds are considered to be significant under CEQA:

- 75 pounds per day of reactive organic compounds;
- 100 pounds per day of nitrogen dioxide;
- 550 pounds per day of carbon monoxide;
- 150 pounds per day of PM₁₀;
- 55 pounds per day of PM_{2.5}; or,
- 150 pounds per day of sulfur oxides.

A project would have a significant effect on air quality if any of the following operational emissions thresholds for criteria pollutants are exceeded:

- 55 pounds per day reactive organic compounds;
- 55 pounds per day of nitrogen dioxide;
- 550 pounds per day of carbon monoxide;
- 150 pounds per day of PM₁₀;
- 55 pounds per day of PM_{2.5}; or,
- 150 pounds per day of sulfur oxides.

3.2 DISCUSSION OF IMPACTS:

a) No Impact:

The City of Rancho Mirage is reviewing an application that would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

Measures to improve regional air quality are outlined in the SCAQMD's Air Quality Management Plan (AQMP). The most recent AQMP was adopted in 2016 and was jointly prepared with the California Air Resources Board (CARB) and the Southern California Association of Governments (SCAG). The AQMP will help the SCAQMD maintain focus on the air quality impacts of major projects associated with goods movement, land use, energy efficiency, and other key areas of growth. Key elements of the 2016 AQMP include enhancements to existing programs to meet the 24-hour PM_{2.5} Federal health standard and a proposed plan of action to reduce ground-level Ozone. The primary criteria for pollutants that remain non-attainment in the local area include PM_{2.5} and Ozone. Specific criteria to determine a project's conformity with the AQMP is defined in



Section 12.3 of the SCAQMD's CEQA Air Quality Handbook. The Air Quality Handbook refers to the following criteria to determine a project's conformity with the AQMP.

The proposed project is consistent with the assumptions underlying the AQMP and the 2003 Coachella Valley PM10 State Implementation Plan and will not conflict with or obstruct implementation of the applicable air quality plan. Projects that are consistent with the projections of employment and/or population forecasts identified in the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) prepared by SCAG are considered consistent with the SCAQMD growth projections, since the RTP/SCS forms the basis of the land use and transportation control portions of the SCAQMD. According to the Growth Forecast Appendix prepared by SCAG for the 2016-2040 RTP/SCS, the City of Rancho Mirage's population is projected to increase from the year 2020 figure of 18,600 to 25,000 in the year 2040, an increase of 6,400. The proposed 9-unit project would potentially result in 17 new residents assuming an average household size of 1.85 persons per unit derived from the most recent California Department of Finance. Therefore, the proposed project is not in conflict with the growth projections established for the City by SCAG. The project's construction emissions would be below the thresholds of significance established by the SCAQMD (the project's daily construction emissions are summarized in Table 1). In addition, the proposed project's long-term (operational) airborne emissions would be below levels that the SCAQMD considers to be a significant impact (refer to Table 2). As a result, no impacts would occur.

b) Less Than Significant Impact:

According to the SCAQMD, any project is significant if it triggers or exceeds the SCAQMD daily emissions threshold identified previously and noted at the bottom of Tables 1 and 2. The proposed project's construction and operation would not lead to a violation of the above-mentioned criteria. The analysis of daily construction and operational emissions was prepared utilizing the California Emissions Estimator Model (CalEEModV.2020.4.0). For air quality modeling purposes, a twelve-month period of construction for all construction phases was assumed.

Table 1
Estimated Daily Construction Emissions

| Construction Phase | ROG | NOx | CO | SO2 | PM10 | PM2.5 |
|-------------------------|-------|-------|-------|------|------|-------|
| Maximum Daily Emissions | 10.32 | 13.91 | 14.21 | 0.03 | 7.77 | 3.98 |
| Daily Thresholds | 75 | 100 | 550 | 150 | 150 | 55 |
| Significant Impact? | No | No | No | No | No | No |

California Air Pollution Control Officers Association. *California Emissions Estimator Model*. Version 2020.4.0. (Used in Appendix A)

Long-term emissions refer to those air quality impacts that would occur once the proposed project has been constructed and is operational. These impacts would continue over the operational life of the project. The two main sources of operational emissions include mobile emissions and area emissions related to off-site electrical generation. The analysis of long-term operational impacts summarized in Table 2 also used the CalEEModV.2020.4.0 computer model. The analysis summarized in Table 2 indicates that the operational (long-term) emissions would be below the SCAQMD daily emissions thresholds.



Table 2
Estimated Operational Emissions in lbs./day

| Emission Source | ROG | NOx | CO | SO2 | PM10 | PM2.5 |
|------------------------------------|------|------|------|------|------|-------|
| Maximum Daily Emissions (lbs./day) | 2.98 | 0.51 | 7.73 | 0.02 | 1.32 | 0.87 |
| Daily Thresholds | 55 | 55 | 550 | 150 | 150 | 55 |
| Significant Impact? | No | No | No | No | No | No |

California Air Pollution Control Officers Association. *California Emissions Estimator Model*. Version 2020.4.0. (Used in Appendix A)

The analysis presented in Tables 3-1 and 3-2 reflects projected emissions that are typically higher during the summer months and represent a worse-case scenario. As indicated in Tables 1 and 2, the impacts are considered to be less than significant. In addition, the SCAQMD Rule Book contains numerous regulations governing various activities undertaken within the district. Among these regulations is Rule 403.2 – Fugitive Dust Control for the South Coast Planning Area, which was adopted in 1996 for the purpose of controlling fugitive dust. Adherence to Rule 403.2 regulations is required for all projects undertaken within the district. Future construction truck drivers must also adhere to Title 13 - §2485 of the California Code of Regulations, which limits the idling of diesel-powered vehicles to less than five minutes. Adherence to the aforementioned standard condition would minimize odor impacts from diesel trucks. As a result, the impacts would be less than significant.

c) Less Than Significant Impact:

According to the SCAQMD, residences, schools, daycare centers, playgrounds, and medical facilities are considered sensitive receptor land uses. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2). As indicated in the previous section (refer to Tables 1 and 2, the proposed subdivision would not result in an exceedance of SCAQMD thresholds. As indicated in Table 3, the project is anticipated to exceed construction LSTs for particulates. Adherence to additional mandatory Rule 403 regulations would reduce fugitive dust emissions by approximately 50% to levels that are less than significant. Rule 403 requires that temporary dust covers be used on any piles of excavated or imported earth to reduce wind-blown dust. In addition, all clearing, earthmoving, or excavation activities must be discontinued during periods of high winds (i.e., greater than 15 mph), so as to prevent excessive amounts of fugitive dust.



Table 3
Local Significance Thresholds SRA 30 for 5 Acres of Disturbance

| Emissions | Maximum Emissions (lbs./day) | Type | Allowable Emissions Threshold (lbs./day) and a Specified Distance from Receptor (in meters) | | | | |
|-------------------|------------------------------|--------------|---|-------|-------|--------|--------|
| | | | 25 | 50 | 100 | 200 | 500 |
| NO _x | 0.51 | Operation | 304 | 340 | 425 | 547 | 875 |
| | 13.91 | Construction | 304 | 340 | 425 | 547 | 875 |
| CO | 7.73 | Operation | 2,292 | 3,237 | 5,331 | 10,178 | 31,115 |
| | 14.21 | Construction | 2,292 | 3,237 | 5,331 | 10,178 | 31,115 |
| PM ₁₀ | 1.32 | Operation | 4 | 11 | 16 | 27 | 60 |
| | 7.77 | Construction | 14 | 44 | 67 | 112 | 248 |
| PM _{2.5} | 0.87 | Operation | 2 | 3 | 5 | 9 | 31 |
| | 3.98 | Construction | 8 | 11 | 19 | 37 | 128 |

California Air Pollution Control Officers Association. *California Emissions Estimator Model*. Version 2020.4.0.
(Used in Appendix A)

The Coachella Valley is currently designated as a serious nonattainment area for PM₁₀ (particulate matter with an aerodynamic diameter of 10 microns or less). Appropriate air quality measures to prevent fugitive dust are required by the City's Fugitive Dust Control ordinance and plan implementation requirements, which are consistent with SCAQMD Rules 403 and 403.1 that apply to the Coachella Valley strategy for reducing fugitive dust emissions. Under the City's dust control regulations, a Local Air Quality Management Plan (LAQMP) must be prepared and approved prior to any earth-moving operations. Consistent with SCAQMD Rules 403 and 403.1, implementation of the Fugitive Dust Control Plan is required to occur under the supervision of an individual with training on Dust Control in the Coachella Valley. The plan would include methods to prevent sediment track-out onto public roads, prevent visible dust emissions from exceeding a 20-percent opacity, and prevent visible dust emissions from extending more than 100 feet (vertically or horizontally from the origin of a source) or crossing any property line. The project's contractors must comply with other SCAQMD regulations governing equipment idling and emissions controls as well as mandatory SCAQMD regulations governing fugitive dust (Rule 403) and odors (Rule 1401). In addition, future truck drivers visiting the site during the project's construction must adhere to Title 13 - §2485 of the California Code of Regulations, which limits the idling of diesel-powered vehicles to less than five minutes. These regulations would reduce particulate emissions by as much as 50%. As a result, the impacts would be less than significant.

d) No Impact:

The SCAQMD has identified those land uses that are typically associated with odor complaints. These uses include activities involving livestock, rendering facilities, food processing plants, chemical plants, composting activities, refineries, landfills, and businesses involved in fiberglass molding. The proposed residential project would not result in the generation of any odors. In addition, construction truck drivers must adhere to Title 13 - §2485 of the California Code of Regulations, which limits the idling of diesel-powered vehicles to less than five minutes. Furthermore, the project's contractors must adhere to SCAQMD rules and regulations that govern fugitive dust during site preparation which would significantly reduce the generation of fugitive dust. As a result, no odor-related impacts would occur.

3.3 MITIGATION MEASURES:

None required.



4 - BIOLOGICAL RESOURCES

| BIOLOGICAL RESOURCES – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|---------------------------------------|--|-------------------------------------|-------------------------------------|
| 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 or U.S. Fish and Wildlife Service? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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, or impede the use of native wildlife nursery sites? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.
Rancho Mirage, City of. *City of Rancho Mirage Municipal Code*. As amended 2023.
RCA Associates, Inc. General Biological Resources Assessment. October 13, 2022.



4.1 SETTING

Sensitive biological resources include a variety of plant and animal species that are specialized and endemic to a particular habitat type. Due to loss of habitat, some of these species have been designated by either, or both, the federal and state government resource agencies as threatened or endangered. Species listed as threatened include those whose numbers have dropped to such low levels and/or whose populations are so isolated that the continuation of the species could be jeopardized. Endangered species are those with such limited numbers or subject to such extreme circumstances that they are considered in imminent danger of extinction. Other government agencies and resource organizations also identify sensitive species, those that are naturally rare and that have been locally depleted and put at risk by human activities. While not in imminent danger of jeopardy or extinction, sensitive species are considered vulnerable and can become candidates for future listing as threatened or endangered.

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The relatively flat site is approximately 94 meters above sea level and contains no slope. The vegetation community present on site supports a heavily disturbed sparse desert scrub habitat encompassing mainly native plants and some non-native grasses. The site is dominated by creosote bush (*Larrea tridentata*). The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site.

The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2). The vegetation community present on site supports a heavily disturbed sparse desert scrub habitat encompassing mainly native plants and some non-native grasses. The site contains a few species of plant which include the creosote bush (*Larrea tridentata*), Asian mustard (*Brassica tournefortii*), Schott's Dalea (*Psoralea schottii*), Flatspine burr ragweed (*Ambrosia acanthicarpa*) and cheatgrass (*Bromus tectorum*).

4.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact With Mitigation:

The site supports a minimal amount of wildlife, with many of them being birds. The site supports a heavily disturbed desert scrub community which sparsely covers the property. Species present on the site included kelch grass (*Schismus barbatus*), creosote bush (*Larrea tridentata*) and Schott's Dalea (*Psoralea schottii*). Birds observed included ravens (*Corvus corax*), rock pigeon (*Columba livia*), mourning dove (*Zenaidura macroura*), greater road runner (*Geococcyx californianus*) and house finch (*Haemorhous mexicanus*). No mammals were seen during the October 2022 survey. Although the Antelope Ground squirrel (*Ammospermophilus leucurus*) was not present during the field investigation, we can assume they are in the area due to current conditions and population distributions. Other wildlife species that may occur on site include desert cottontails (*Sylvilagus audubonii*), California ground squirrels (*Otospermophilus beecheyi*), and Merriam's kangaroo rats (*Dipodomys merriami*) given their wide-spread distribution in the region. No reptiles were observed on site during the October 2022 field investigations. However, some reptiles that may inhabit the site include the Western Whiptail Lizard (*Cnemidophorus tigris*) and Side-blotched lizard (*Uta stansburiana*).



There were no observations that indicated that a potential channel is present on the site. It is the opinion of RCA Associates, Inc. that no additional surveys would be required at this time. In addition, no sensitive habitats (e.g., sensitive species, critical habitats, etc.) have been documented in the immediate area according to the CNDDDB and none were observed during the field investigations. The following are the listed and special status species that could occur on the project site. It is not a comprehensive list of all the species in the quad. This information has been taken from the California Natural Diversity Database and is using the most current version.

- *Desert Tortoise*: The site is located within the documented tortoise, a state and federal threatened species, habitat according to CNDDDB (2022). The property supports no suitable habitat for the desert tortoise based on the location of the site in a developed area of Rancho Mirage. No tortoises were observed anywhere within the property boundaries during the October 4, 2022 surveys. The species is not expected to move onto the site in the near future based on the absence of any potential burrows or sign, absence of any recent observations in the immediate area, and the presence of busy roadways and developments in the immediate area which may act as barriers to migration of tortoises. The protocol survey results are valid for one year as per CDFW and USFWS requirements.
- *Burrowing Owl*: The site is located within documented burrowing owl habitat according to CNDDDB (2022). No owls were seen on the property during the survey, and minimal suitable habitat was observed. Burrowing owls are not expected to occur on the site due to lack of suitable vegetation and burrows.
- *Coachella Valley fringe-toed lizard*: Coachella Valley fringe-toed lizard have not been recently observed in the area according to CNDDDB (2022). The lizards are not expected to occur on the site due to its location being bordered by numerous developments and roadways that act as natural barriers to entry. The Coachella Valley fringe-toed lizard may be very infrequent in this specific area due to the area being highly developed and the amount of human traffic around the project.

Future development of the site would impact the general biological resources present on site, because most if not all of the vegetation would be removed during future construction activities. The site is expected to support very few wildlife species which would be impacted by development activities. Those species with limited mobility (i.e., small mammals and reptiles) would experience increases in mortality during the construction phase. However, more mobile species (i.e., birds, large mammals) would be displaced into adjacent areas and would likely experience minimal impacts. Therefore, loss of about 5.0-acres of a relatively disturbed desert scrub habitat is not expected to have a significant cumulative impact on the overall biological resources in the region given the presence of similar habitat throughout the surrounding area. No sensitive habitats (e.g., wetlands, vernal pools, critical habitats for sensitive species, etc.) were observed on the site during the field investigations.

No Federal or State-listed species were observed on the site during the field investigations which include the desert tortoise. In addition, there are no documented observations of these species either on site or in the immediate area. The site is not expected to support populations of the



desert tortoise based on the absence of habitat, suitable burrows, or signs. The analysis of biological impacts determined that a pre-construction burrowing owl survey may be required by CDFW to determine if any owls have moved on to the site since the October 4, 2022 surveys. As stated in CDFW's *Staff Report on Burrowing Owl Mitigation*, the most effective method of completing a pre-construction survey (take avoidance survey) should be performed within 30 days of ground disturbance, followed by a final pre-construction survey within 24 hours of breaking ground.

Future development activities include the grading and removal of all vegetation from the 5.0-acre parcel; however, cumulative impacts to the general biological resources (plants and animals) in the surrounding area are expected to be negligible. This assumption is based on the habitat containing scarce vegetation of non-native species. The following mitigation measures should be considered:

- **Biological Resources Mitigation No. 1.** Pre-construction surveys for burrowing owls, desert tortoise, and nesting birds protected under the Migratory Bird Treaty Act and Section 3503 of the California Fish and Wildlife Code shall be conducted prior to the commencement of Project-related ground disturbance. a. Appropriate survey methods and timeframes shall be established, to ensure that chances of detecting the target species are maximized. In the event that listed species, such as the desert tortoise, are encountered, authorization from the USFWS and CDFW must be obtained. If nesting birds are detected, avoidance measures shall be implemented to ensure that nests are not disturbed until after young have fledged. b. Pre-construction surveys shall encompass all areas within the potential footprint of disturbance for the project, as well as a reasonable buffer around these areas.
- **Biological Resources Mitigation No. 2.** A focused plant survey should be considered for all special status plant species that have the potential to occur on the site to be performed during the blooming season (April - June) to determine the potential environmental effects of the proposed projects on special status plants and sensitive natural communities following recommended protocols by the Department of Fish and Wildlife.

The above mitigation would reduce the impacts to levels that are less than significant.

b) No Impact:

No drainage channels were observed or are located within the site boundaries. As a result, no impacts are anticipated.

c) No Impact:

No wetland areas or riparian habitats (e.g., wetlands, vernal pools, critical habitats for sensitive species, etc.) were observed on the site during the field investigations. As a result, no impacts are anticipated.



d) No Impact:

The site's utility as a habitat and a migration corridor is constrained by the presence of an adjacent roadway and the development that is present in the neighboring areas. As a result, no impacts are anticipated.

e) No Impact:

Future development of the site would impact the general biological resources present on site, because most if not all of the vegetation would be removed during future construction activities. The site is expected to support very few wildlife species which would be impacted by development activities. Those species with limited mobility (i.e., small mammals and reptiles) would experience increases in mortality during the construction phase. However, more mobile species (i.e., birds, large mammals) would be displaced into adjacent areas and would likely experience minimal impacts. Therefore, loss of about 5.0-acres of a relatively disturbed desert scrub habitat is not expected to have a significant cumulative impact on the overall biological resources in the region given the presence of similar habitat throughout the surrounding area. No sensitive habitats (e.g., wetlands, vernal pools, critical habitats for sensitive species, etc.) were observed on the site during the field investigations. No Federal or State-listed species were observed on the site during the field investigations which include the desert tortoise. In addition, there are no documented observations of these species either on the site or in the immediate area. The site is not expected to support populations of the desert tortoise based on the absence of habitat, suitable burrows, or signs. As a result, no impacts would occur.

f) Less than Significant Impact with Mitigation:

The proposed project's implementation would not be in conflict with the provisions of any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plans. As a result, no impacts are anticipated.

4.3 MITIGATION MEASURES:

The analysis of biological impacts determined that the following mitigation measures would be required to reduce the project's impacts to levels that would be less than significant.

Biological Resources Mitigation No. 1. Pre-construction surveys for burrowing owls, desert tortoise, and nesting birds protected under the Migratory Bird Treaty Act and Section 3503 of the California Fish and Wildlife Code shall be conducted prior to the commencement of Project-related ground disturbance. a. Appropriate survey methods and timeframes shall be established, to ensure that chances of detecting the target species are maximized. In the event that listed species, such as the desert tortoise, are encountered, authorization from the USFWS and CDFW must be obtained. If nesting birds are detected, avoidance measures shall be implemented to ensure that nests are not disturbed until after young have fledged. b. Pre-construction surveys shall encompass all areas within the potential footprint of disturbance for the project, as well as a reasonable buffer around these areas.



Biological Resources Mitigation No. 2. A focused plant survey should be considered for all special status plant species that have the potential to occur on the site to be performed during the blooming season (April - June) to determine the potential environmental effects of the proposed projects on special status plants and sensitive natural communities following recommended protocols by the Department of Fish and Wildlife.



5 - CULTURAL RESOURCES

| CULTURAL RESOURCES – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---------------------------------------|--|-------------------------------------|-------------------------------------|
| a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Disturb any human remains, including those interred outside of formal cemeteries? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SOURCES:

CRM Tech. Historical/Archaeological Resources Survey Report. March 14, 2023.

Southern California Association of Governments. *Regional Transportation Plan/Sustainable Communities Strategy 2016-2040.Demographics &Growth Forecast*. April 2016.

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

U. S. Department of the Interior, National Park Service. National Register of Historic Places. <http://nrhp.focus.nps.gov>. 2023.

5.1 SETTING

Historic structures and sites are defined by local, State, and Federal criteria. A site or structure may be historically significant if it is locally protected through a General Plan or historic preservation ordinance. In addition, a site or structure may be historically significant according to State or Federal criteria even if the locality does not recognize such significance. To be considered eligible for the National Register, a property's significance may be determined if the property is associated with events, activities, or developments that were important in the past, with the lives of people who were important in the past, or represents significant architectural, landscape, or engineering elements. Specific criteria include the following:

- Districts, sites, buildings, structures, and objects that are associated with the lives of significant persons in or past;
- Districts, sites, buildings, structures, and objects that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,
- Districts, sites, buildings, structures, and objects that have yielded or may be likely to yield, information important in history or prehistory.

Ordinarily, properties that have achieved significance within the past 50 years are not considered eligible for the National Register. However, such properties *would qualify* if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- A religious property deriving primary significance from architectural or artistic distinction or historical importance;



- Districts, sites, buildings, structures, and objects that are associated with events that have made a significant contribution to the broad patterns of our history;
- A building or structure removed from its original location that is significant for architectural value, or which is the surviving structure is associated with a historic person or event;
- A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building associated with his or her productive life;
- A cemetery that derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events;
- A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived;
- A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or,
- A property achieving significance within the past 50 years if it is of exceptional importance.

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The relatively flat site is approximately 94 meters above sea level and contains no slope. The vegetation community present on site supports a heavily disturbed sparse desert scrub habitat encompassing mainly native plants and some non-native grasses. The site is dominated by creosote bush (*Larrea tridentata*). The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site.

5.2 DISCUSSION OF IMPACTS:

a) No Impact:

Historical sources consulted during this study yielded no evidence of any settlement or development activities in the project area throughout the historic period. In the surrounding area, the earliest such activities evidently took place in the early post-WWII period, when several scattered buildings appeared across much of Section 30 and along newly constructed roads, including the forerunner of present-day Via Florencia. Archival records indicate that these buildings were the results of a wave of five-acre homestead claims on public land under the provisions of the Small Tract Act of 1938, a practice that was widespread in the southern California desert region at the time. However, none of these so-called "jackrabbit homesteads" were found within the project area itself, which has remained vacant, undeveloped, and apparently unused to the present time despite accelerated growth in the surrounding area since the 1980s. The intensive-level field survey of the project area produced negative results for potential "historical resources," and no buildings, structures, objects, site, or artifact deposits dating to the prehistoric or historic period were encountered throughout the course of the survey. Since the project's implementation would not impact any Federal, State, or locally designated historic resources, no impacts would occur.

b) Less Than Significant Impact:



On September 22, 2022, CRM TECH submitted a written request to the State of California Native American Heritage Commission (NAHC) for a records search in the commission's Sacred Lands File. The NAHC is the State of California's trustee agency for the protection of "tribal cultural resources," as defined by California Public Resources Code §21074, and is tasked with identifying and cataloging properties of Native American cultural value throughout the state. In the meantime, CRM TECH notified the nearby Agua Caliente Band of Cahuilla Indians of the upcoming archaeological field survey and invited tribal participation. The responses from the NAHC and the Agua Caliente Band are summarized below.

From Appendix C – Cultural Study, the letter from Native American Heritage Commission (NAHC) titled "Re: Proposed Tentative Tract Map Numbers 38041, 38266, and 38273 Project, Riverside County" states:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

From Appendix E – Tribal Consultation Letters, the Agua Caliente Band of Cahuilla Indians (ACBCI) Tribal Historic Preservation Office (THPO) letter titled "Re: TTM22-0004" is summarized below:

- Formal government to government consultation under California Assembly Bill No. 52 (AB-52).
- A cultural resources inventory of the project area by a qualified archaeologist prior to any development activities in this area.
- Copies of any cultural resource documentation (report and site records) generated in connection with this project.
- A copy of the records search with associated survey reports and site records from the information center.
- The presence of an archaeologist that meets the Secretary of Interior's standards during any ground disturbing activities.
- The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities (including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior's Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office. (This mitigation measure is listed under Section 18 Tribal Cultural Resources Mitigation Measure No. 1)

On November 1, 2022, Daniel Ballester carried out the field survey of the project area with the assistance of Nicole Raslich, archaeological technician with the Agua Caliente Tribal Historic Preservation Office. The survey was conducted at an intensive level by walking a series of parallel north-south transects at 15-meter (approximately 50-foot) intervals. In this way, the entire project area was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic period (i.e., 50 years or older). Ground visibility was excellent (95 to 100



percent) as vegetation on site was generally sparse. In this environment, however, shifting sands are more likely to contribute to obscured cultural remains than vegetation. According to EIC records, the project area had not been surveyed for cultural resources prior to this study (Fig. 5), and no cultural resources had been recorded on or adjacent to the property. Within the one-mile scope of the records search, EIC records show at least 23 previous studies on various tracts of land and linear features, which collectively covered roughly 35 percent of the land within the scope of the records search. As a result of these and other studies in the vicinity, three prehistoric sites, two historic-period sites, and four isolates—i.e., localities with fewer than three artifacts—have been identified within the one-mile radius.

The prehistoric sites located in the vicinity of the project site consisted mainly of lithic and ceramic scatters and seasonal resource processing locations, but two of the sites, 33-017009 and 33-017010, also contained human remains. The historic-period sites were all fairly common for the Coachella Valley area, such as site 33-026824, a refuse scatter, and Site 33-017008, the remains of a collapsed shed. The sites and isolates were located mostly in the area to the north of the project location, with Site 33-026824 located to the south, and all of them were found more than a half-mile away from the project area. Therefore, none of them requires further consideration during this study. As a result, the impacts would be less than significant.

c) Less Than Significant Impact:

There are no dedicated cemeteries located within or in the vicinity of the project site.¹ The proposed project would be restricted to the project site and therefore would not affect any dedicated cemeteries in the vicinity. Notwithstanding, the following mitigation is mandated by the California Code of Regulations (CCR) Section 15064.5(b)(4):

“A lead agency shall identify potentially feasible measures to mitigate significant adverse changes in the significance of an historical resource. The lead agency shall ensure that any adopted measures to mitigate or avoid significant adverse changes are fully enforceable through permit conditions, agreements, or other measures.”

Additionally, Section 5097.98 of the Public Resources Code states:

“In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with (b) Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27491 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of any death, and the recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative. The coroner shall make his or her determination within two working days from the time the person responsible for the excavation, or his or her authorized representative, notifies the coroner of the discovery or recognition of the human remains. If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of



a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission.”

Adherence to the standard condition would ensure potential impacts remain at levels that are less than significant.

5.3 MITIGATION MEASURES:

None Required. The applicant would be required to follow Tribal Cultural Resources Mitigation Measure No. 1.



6 - ENERGY

| ENERGY – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|--------------------------------|---|-------------------------------------|--------------------------|
| a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SOURCES:

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.
SCAQMD. SCAQMD Air Quality Handbook. 1993.

6.1 SETTING

Imperial Irrigation District would provide electricity to the project site. Natural gas service is provided by the Southern California Gas Company. Currently, the existing site is vacant and does not use electricity or natural gas. Electricity and natural gas are the primary sources of energy in the City of Rancho Mirage. Electricity is provided primarily by Imperial Irrigation District (IID) and the Rancho Mirage Energy Authority (RMEA).

The Rancho Mirage City Council started RMEA for the purpose of helping to reduce the community's SCE electricity bills. Pursuant to CCA law, RMEA is an all-new, locally-run, not-for-profit power program created by the City of Rancho Mirage. RMEA purchases power directly from power providers, pays consultants for compliance functions, and sets electricity rates based on costs. The RMEA's power is delivered through IID poles and wires. IID is still the utility and would continue to bill and collect from customers but using RMEA's lower electricity rates would allow businesses and residents to save 5 percent. IID facilities include 12 kV transmission lines for local distribution. High voltage lines for more distant transmission range up to 115 kV and 230 kV. Substations step down voltage for local distribution and use. The IID operates 133 substations within its service area and two substations are located near the City of Rancho Mirage: one on Interstate 10 and Monterey Avenue (Edom Substation) and one on East Ramon Road (Ramon Substation).

Energy and natural gas consumption were estimated using default energy intensities by building type in CalEEMod. In addition, it was assumed the new buildings would be constructed pursuant to the 2022 CALGreen standards, which was considered in the CalEEMod inputs.

6.2 DISCUSSION OF IMPACTS:

a) Less than Significant Impact:



During construction, the proposed project would consume energy related to the use of fuels used to power construction vehicles and other equipment that would be used during site clearing, grading, and construction. Fuel use associated with construction vehicle trips generated by the proposed project was also estimated; trips include construction worker trips, haul truck trips for material transport, and vendor trips for construction material deliveries. Energy consumed during construction would be temporary in nature and would not present a significant demand on energy resources. The proposed project would be constructed pursuant to the 2022 energy standards of Title 24. Construction equipment greater than 150 horsepower (hp), is also required to comply with the Environmental Protection Agency (EPA)/California Air Resources Board (CARB) Tier 3 emissions standards and shall ensure that all construction equipment is tuned and maintained in accordance with the manufacturer's specifications. For engines from 175 to less than 750 hp, the Tier 4 Final regulations took effect on January 1, 2014. For engines from 49 to less than 75 hp, it took effect on January 1, 2013. Finally, for engines from 75 to less than 175 hp, the Tier 4 regulations took effect on January 1, 2015. In addition, the project would be required to comply with the California Code of Regulations, Title 13, Sections 2449(d)(3) and 2485, which minimizes the idling time of construction equipment either by shutting it off when not in use or by reducing the time of idling to no more than five minutes. These emissions standards require highly efficient combustion systems that maximize fuel efficiency and reduce unnecessary fuel consumption. Therefore, no significant impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction are anticipated and no mitigation measures are required.

The increased demand is expected to be sufficiently served by the existing IID electrical facilities. As shown in Table 4 the proposed project is anticipated to consume 138.7 kWh daily. The proposed project is located within the service area of the Southwest Gas Company. The project site is currently vacant and has no demand for natural gas. Therefore, the development of the proposed project would create a permanent increase in the demand for natural gas. As shown in Table 4, the proposed project is anticipated to consume 1,999.5 cubic feet of natural gas on a daily basis.

Table 4
Proposed Project's Energy Consumption

| Energy Type | Consumption Rate | Daily Energy Consumption |
|-------------------------|--------------------------|--------------------------|
| Electrical Consumption | 5,625 kWh/unit/year | 138.7 kWh/Day |
| Natural Gas Consumption | 6,665 cu. ft./unit/month | 1,999.5 Cu. Ft/Day |

Source: SQAQMD Air Quality Handbook, 1993.

The proposed project's energy consumption would be related to energy that would be used for lighting and other household activities. Lighting would be required to follow the City's Outdoor Lighting Policy, which includes the use of energy efficient lighting. For these reasons, the project would not result in the wasteful, inefficient, or unnecessary use of energy. The project applicant would be required to work with the local electrical utility company to identify existing and future strategies that would be effective in reducing energy consumption. As a result, the impact would be less than significant.

b) Less than Significant Impact:

On January 12, 2010, the State Building Standards Commission adopted updates to the California



Green Building Standards Code (Code) which became effective on January 1, 2011. The California Code of Regulations (CCR) Title 24, Part 11: California Green Building Standards (Title 24) became effective to aid efforts to reduce GHG emissions associated with energy consumption. Title 24 now requires that new buildings reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low pollutant-emitting finish materials. The proposed project as well as any future development within the remainder of the project site would be required to conform to all pertinent energy conservation requirements. The proposed project would be required to comply with all pertinent Title 24 requirements along with other Low Impact Development (LID) requirements.

The project would provide for, and promote, energy efficiencies required under other applicable Federal and State of California standards and regulations, and in doing so, would meet or exceed all California Building Standards Code Title 24 standards. Moreover, energy consumed by the project's operation is calculated to be comparable to, or less than, energy consumed by other single family homes of similar scale and intensity that are constructed and operating in California. On this basis, the project would not result in the inefficient, wasteful, or unnecessary consumption of energy. Further, the project would not cause or result in the need for additional energy producing facilities or energy delivery systems. As a result, the potential impacts would be less than significant.

6.3 MITIGATION MEASURES:

None required.



7 - GEOLOGY AND SOILS

| GEOLOGY AND SOILS – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|---------------------------------------|--|-------------------------------------|--------------------------|
| a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| i) Rupture of a known earthquake fault, as delineated 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. | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| ii) Strong seismic ground shaking? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iii) Seismic-related ground failure, including liquefaction? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iv) Landslides? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Result in substantial soil erosion or the loss of topsoil? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |



SOURCES:

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

UC Davis. *SoilWeb*. Website accessed May 23, 2023.

United States Department of Agriculture. Natural Resources Conservation Service. Website accessed May 23, 2023.

7.1 SETTING

The City of Rancho Mirage is located in a seismically active region. Earthquakes from several active and potentially active faults in the Southern California region could affect the proposed project site. In 1972, the Alquist-Priolo Earthquake Zoning Act was passed in response to the damage sustained in the 1971 San Fernando Earthquake. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. closest active fault to the project site is at the San Andreas Fault, approximately 3.5 miles northeast. Therefore, due to the distance of the fault zone, it can be concluded that the potential fault-rupture risk is low. Surface ruptures are visible instances of horizontal or vertical displacement, or a combination of the two. The amount of ground shaking depends on the intensity of the earthquake, the duration of shaking, soil conditions, type of building, and distance from epicenter or fault.

The potential impacts from fault rupture and ground shaking are considered no greater for the project site than for the surrounding areas given the distance between the site and the fault trace. However, the deep groundwater in Rancho Mirage does not allow the saturation of the sediments; therefore, the potential for liquefaction to occur at the project site is less than significant. Windblown sand and other recently deposited sediments are typically loose and, therefore, potentially subject to seismically induced settlement.

7.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

The proposed project would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

According to the City's General Plan, the project area has a moderate susceptibility to seismically induced settlement. Strong seismic shaking, the 2017 General Plan states, can cause densification or compaction of soils resulting in local or regional settlement of the ground surface, which can cause damage to foundations and structures. To ensure the safety of the project against seismically induced hazards, the project site shall adhere to the standard design requirements stated in the most recent California Building Code (CBC), and the City's building standards. Overall, impacts from seismically induced ground failure such as liquefaction and settlement are anticipated to be less than significant at the project site. As a result, the potential impacts regarding liquefaction and landslides are less than significant.

b) Less Than Significant Impact:

The University of California, Davis SoilWeb database was consulted to determine the nature of the soils that underlie the project site. According to the University of California, Davis SoilWeb database, the property is underlain by Myoma fine sand soils associations consisting of fine sand



with 0 to 5 percent slopes. The proposed project's contractors would be required to adhere to specific requirements that govern wind and water erosion during site preparation and construction activities. Following development, the project site would be paved and landscaped, which would minimize soil erosion. The project's construction would not result in soil erosion with adherence to those development requirements that restrict storm water runoff (and the resulting erosion) and require soil stabilization. In addition, stormwater discharges from construction activities that disturb one or more acres, or smaller sites disturbing less than one acre that are part of a common plan of development or sale, are regulated under the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program.

Prior to initiating construction, contractors must obtain coverage under an NPDES permit, which is administered by the State. In order to obtain an NPDES permit, the project Applicant must prepare a Stormwater Pollution Prevention Plan (SWPPP). Riverside County has identified sample construction Best Management Practices (BMPs) that may be included in the mandatory SWPPP. The use of these construction BMPs identified in the mandatory SWPPP would prevent soil erosion and the discharge of sediment into the local storm drains during the project's construction phase. As a result, the impacts would be less than significant.

c) Less Than Significant Impact:

The proposed project's construction would not result in soil erosion since the project's contractors must implement the construction BMPs identified in the mandatory SWPPP. The BMPs would minimize soil erosion and the discharge of sediment off-site. Additionally, the project site is not located within an area that could be subject to landslides or liquefaction. The soils that underlie the project site possess a low potential for shrinking and swelling. Soils that exhibit certain shrink swell characteristics become sticky when wet and expand according to the moisture content present at the time. Since the soils have a low shrink-swell potential, lateral spreading resulting from an influx of groundwater is slim. Moreover, the project will not result in the direct extraction of groundwater. As a result, the potential impacts would be less than significant.

d) Less Than Significant Impact:

The University of California, Davis SoilWeb database was consulted to determine the nature of the soils that underlie the project site. According to the University of California, Davis SoilWeb database, the property is underlain by Myoma fine sand soils associations consisting of loamy fine sand with 0 to 5 percent slopes. According to the U.S. Department of Agriculture, these soils are acceptable for residential development. The applicant is required to adhere to all requirements detailed by the USDA. As a result, the potential impacts would be less than significant.

e) Less Than Significant Impact:

The proposed project would be required to connect to and utilize the sanitary sewer system. No septic tanks systems would be used. As a result, the impacts would be less than significant.

f) Less Than Significant Impact:

The surface deposits in the proposed project area are composed entirely of younger Quaternary Alluvium. This younger Quaternary Alluvium is unlikely to contain significant vertebrate fossils, at least in the uppermost layers. Paleontological resources provide evidence of past life forms



and their biota, which is valued for the information they yield about the history of earth and its past ecological settings. According to Figure 4.9.3, Paleontological Sensitivity, in the Riverside County General Plan, the property is recognized for having low potential for Paleontological Sensitivity. Areas recognized for having a “low” potential have a reduced likelihood of containing significant non-renewable paleontological resources, including vertebrate or significant invertebrate fossils. Moreover, the site is currently developed as a paved parking lot and is not recognized as a unique paleontological or a unique geologic feature. Additionally, the project property lies in an urbanized context within the City, surrounded by residential uses, office buildings, and commercial buildings. No known paleontological sites are found within the project site. The potential for uncovering any significant resources during construction activities is unlikely, since the site has already been cleared, graded, and significantly disturbed from the construction of the existing development. Therefore, less than significant impacts are anticipated.

7.3 MITIGATION MEASURES:

None required.



8 – GREENHOUSE GAS EMISSIONS

| GREENHOUSE EMISSIONS – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|--------------------------------|---|-------------------------------------|--------------------------|
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SOURCES:

California Air Pollution Control Officers Association. *California Emissions Estimator Model*. Version 2020. (Used in Appendix A)
South Coast Air Quality Management District. *Final 2016 Air Quality Management Plan*. Adopted March 2017.
South Coast Air Quality Management District. *Air Quality Analysis Handbook*. 1993.
Southern California Association of Governments. *Regional Transportation Plan/Sustainable Communities Strategy 2016-2040.Demographics &Growth Forecast*. April 2016.
Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

8.1 SETTING

Examples of greenhouse gasses (GHG) that are produced both by natural and industrial processes include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). The accumulation of GHG in the atmosphere regulates the earth's temperature. Without these natural GHG, the Earth's surface would be about 61°F cooler. However, emissions from fossil fuel combustion have elevated the concentrations of GHG in the atmosphere to above natural levels. These man-made GHG will have the effect of warming atmospheric temperatures with the attendant impacts of changes in the global climate, increased sea levels, and changes to the worldwide biome. The major GHG that influences global warming are described below.

- **Water Vapor.** Water vapor is the most abundant GHG present in the atmosphere. While water vapor is not considered a pollutant, while it remains in the atmosphere it maintains a climate necessary for life. Changes in the atmospheric concentration of water vapor are directly related to the warming of the atmosphere rather than a direct result of industrialization. As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to “hold” more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. When water vapor increases in the atmosphere, more of it would eventually also condense into clouds, which are more able to reflect incoming solar radiation. This would allow less energy to reach the Earth's surface thereby affecting surface temperatures.
- **Carbon Dioxide (CO₂).** The natural production and absorption of CO₂ is achieved through the terrestrial biosphere and the ocean. Manmade sources of CO₂ include the burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid-1700's, these activities have increased the atmospheric concentrations of CO₂. Prior to the



industrial revolution, concentrations were fairly stable at 280 parts per million (ppm). The International Panel on Climate Change (IPCC Fifth Assessment Report, 2014) Emissions of CO₂ from fossil fuel combustion and industrial processes contributed about 78% of the total GHG emissions increase from 1970 to 2010, with a similar percentage contribution for the increase during the period 2000 to 2010.

- *Methane (CH₄)*. CH₄ is an extremely effective absorber of radiation, although its atmospheric concentration is less than that of CO₂. Methane's lifetime in the atmosphere is brief (10 to 12 years), compared to some other GHGs (such as CO₂, N₂O, and Chlorofluorocarbons (CFCs)). CH₄ has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other human-related sources of methane production include fossil-fuel combustion and biomass burning.
- *Nitrous Oxide (N₂O)*. Concentrations of N₂O also began to increase at the beginning of the industrial revolution. In 1998, the global concentration of this GHG was documented at 314 parts per billion (ppb). N₂O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is also commonly used as an aerosol spray propellant.
- *Chlorofluorocarbons (CFC)*. CFCs are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C₂H₆) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the Earth's surface). CFCs have no natural source but were first synthesized in 1928. It was used for refrigerants, aerosol propellants, and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and in 1989 the European Community agreed to ban CFCs by 2000 and subsequent treaties banned CFCs worldwide by 2010. This effort was extremely successful, and the levels of the major CFCs are now remaining level or declining. However, their long atmospheric lifetimes mean that some of the CFCs would remain in the atmosphere for over 100 years.
- *Hydrofluorocarbons (HFC)*. HFCs are synthetic man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF₃), HFC-134a (CF₃CH₂F), and HFC-152a (CH₃CHF₂). Prior to 1990, the only significant emissions were HFC-23. HFC-134a use is increasing due to its use as a refrigerant. Concentrations of HFC-23 and HFC-134a in the atmosphere are now about 10 parts per trillion (ppt) each. Concentrations of HFC-152a are about 1 ppt. HFCs are manmade and used for applications such as automobile air conditioners and refrigerants.
- *Perfluorocarbons (PFC)*. PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays about 60 kilometers above Earth's surface are able to destroy the compounds. Because



of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF₄) and hexafluoroethane (C₂F₆). Concentrations of CF₄ in the atmosphere are over 70 ppt. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing.

- **Sulfur Hexafluoride (SF₆).** SF₆ is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF₆ has the highest global warming potential of any gas evaluated; 23,900 times that of CO₂. Concentrations in the 1990s were about 4 ppt. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

The SCAQMD mass emissions threshold is 3,000 MTCO₂E per year. Carbon dioxide equivalent, or CO₂E, is a term that is used for describing different greenhouse gases in a common and collective unit.

8.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

The proposed project would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The new internal drive aisle would connect to the south side of Via Florencia. Water and sewer would be provided by the Coachella Valley Water District. Two retention basins would be located in the site's northern boundary (south of Via Florencia) and would total 16,298 square feet. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The State of California requires CEQA documents to do an evaluation of greenhouse gas (GHG) emissions or gases that trap heat in the atmosphere. GHG are emitted by both natural processes and human activities. Examples of GHG that are produced both by natural and industrial processes include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Carbon dioxide equivalent, or CO₂E, is a term that is used for describing different greenhouse gases in a common and collective unit. The SCAQMD established the 3,000 MTCO₂ threshold for residential land uses. As indicated in Table 5, the operational CO₂E is 4,217.01 pounds per day or 769.6 MTCO₂E per year which is well below the threshold.

Table 5
Greenhouse Gas Emissions (lbs./day)

| Source | GHG Emissions (pounds/day) | | | |
|------------------------------|----------------------------|-----------------|------------------|---|
| | CO ₂ | CH ₄ | N ₂ O | CO ₂ E |
| Long-Term – Area Emissions | 0.02 | -- | -- | 0.02 |
| Long-Term – Energy Emissions | 1,052.48 | 0.02 | 0.02 | 1,058.74 |
| Long-Term – Mobile Emissions | 4,151.79 | 0.21 | 0.20 | 4,217.01 |
| Long-Term – Total Emissions | 5,204.29 | 0.23 | 0.20 | 4,217.01 |
| Total Construction Emissions | 7,453.96 | 1.85 | 0.06 | 7,517.95 |
| Significance Threshold | | | | 3,000 MTCO₂E per Year |

California Air Pollution Control Officers Association. *California Emissions Estimator Model*. Version 2020.4.0. (Used in Appendix A)



As indicated in Table 3-5, the majority of the GHG emissions (4,217.01 CO₂E lbs/day or 769.6 MTCO₂E/year) would originate from mobile sources. *As a result, the potential impacts are considered to be less than significant.*

b) Less Than Significant Impact:

The Rancho Mirage General Plan's Safety Element in its section on Climate Change includes Goals, Policies and Programs with a preamble identifying the City's efforts to coordinate with state, regional, and County agencies to establish and maintain an up to date database on climate change conditions in the region, legislation affecting the City's regulatory responsibilities, and changing technical assessments that refine or re-characterize the climate change impacts affecting the region. The City would also monitor the effectiveness of its adaptation strategies. The City's development review process is designed to assure that development proposals are thoroughly evaluated regarding climate change and that comprehensive mitigation measures are developed and implemented. The City is also taking a proactive role to assure the public is safe by informing them about severity of climate change impacts and what resources are available to them to mitigate these impacts. Therefore, the project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases. Furthermore, the project would also comply with applicable Green Building Standards and City of Rancho Mirage's policies regarding sustainability (as dictated by the City's General Plan, Sustainability Plan, and Energy Action Plan).

The previous section evaluated the proposed project's GHG emissions. The analysis determined that the GHG emissions would be below the regionally accepted thresholds. The calculated emissions would not exceed the GHG and criteria air pollutant thresholds and therefore would not interfere with the City's efforts to monitor and do its part to address climate change. The proposed project would not involve or require any variance from an adopted plan, policy, or regulation governing GHG emissions. As a result, no potential conflict with an applicable greenhouse gas policy plan, policy, or regulation would occur and the potential impacts are considered to be less than significant.

8.3 Mitigation Measures:

None required.



9 - HAZARDS AND HAZARDOUS MATERIALS

| HAZARDS AND HAZARDOUS MATERIALS – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|--------------------------------------|--|-------------------------------------|-------------------------------------|
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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, would it create a significant hazard to the public or the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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, would the project result in a safety hazard for people residing or working in the project area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| g) 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

CalEPA. DTSC's Hazardous Waste and Substances Site List - Site Cleanup (Cortese List).

Toll-Free Airline. Los Angeles County Public and Private Airports, California.

CalFire. Very High Fire Hazard Severity Zone Map.

Rancho Mirage, City of. City of Rancho Mirage 2017 General Plan Update. Adopted November 16, 2017.

9.1 SETTING



Hazardous materials refer generally to hazardous substances that exhibit corrosive, poisonous, flammable, and/or reactive properties and have the potential to harm human health and/or the environment. Hazardous materials are used in a wide variety of products (household cleaners, industrial solvents, paint, pesticides, etc.) and in the manufacturing of products (e.g., electronics, newspapers, plastic products). Hazardous materials can include petroleum, natural gas, synthetic gas, acutely toxic chemicals, and other toxic chemicals that are used in agriculture, commercial, and industrial uses; businesses; hospitals; and households. Accidental releases of hazardous materials can occur from a variety of causes, including highway incidents, warehouse fires, train derailments, shipping accidents, and industrial incidents. The northernmost portion of the project site is occupied by an older single-family residence that is in a poor state of repair. The only mature trees located within the property are located in the yard areas of this residence. The remainder of the project site consists of both native and non-native shrubs and grasses. The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site.

9.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

The proposed project would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The project's construction would require the use of diesel fuel to power the construction equipment. The diesel fuel would be properly sealed in tanks and would be transported to the site by truck. Other hazardous materials that would be used on-site during the project's construction phases include, but are not limited to, gasoline, solvents, architectural coatings, and equipment lubricants. These products are strictly controlled and regulated and in the event of any spill, cleanup activities would be required to adhere to all pertinent protocols. As a result, less than significant impacts would occur.

b) Less Than Significant Impact:

The project's construction would require the use of diesel fuel to power the construction equipment. The diesel fuel would be properly sealed in tanks and would be transported to the site by truck. Other hazardous materials that would be used on-site during the project's construction phase include, but are not limited to, gasoline, solvents, architectural coatings, and equipment lubricants. These products are strictly controlled and regulated and in the event of any spill, cleanup activities would be required to adhere to all pertinent protocols. As indicated in Subsection D, the project site is not listed in either the CalEPA's Cortese List or the Environstor database. As a result, the likelihood of encountering contamination or other environmental concerns during the project's construction phase is remote. As a result, the impacts would be less than significant.

c) No Impact:

There are no schools located within one-quarter of a mile from the project site. Palm Valley School is located approximately 2.3 miles west of the project site. Rancho Mirage High School is located approximately 2.5 miles to the northwest of the project site. Rancho Mirage Elementary School is located approximately 3.6 miles to the southwest of the project site. The next nearest schools to the project site include Abraham Lincoln Elementary School, Palm Desert Charter Middle School,



and Palm Desert High School. These schools are located more than 4 miles to the south of the project site. The proposed residential project would not create a hazard to any local school. As a result, no impacts are anticipated.

d) No Impact:

Government Code Section 65962.5 refers to the Hazardous Waste and Substances Site List, commonly known as the Cortese List. The Cortese List is a planning document used by the State and other local agencies to comply with CEQA requirements that require the provision of information regarding the location of hazardous materials release sites. A search was conducted through the California Department of Toxic Substances Control Envirostor website to identify whether the project site is listed in the database as a Cortese site. The project site is not identified as a Cortese site. Therefore, no impacts would occur.

e) No Impact:

The project site is not located within an airport land use plan and the site is not located within two miles of a public airport or public use airport. The nearest airports to the project site include the Palm Springs International Airport is located approximately 5.87 miles northwest of the project site and the Bermuda Dunes Airport is located approximately 9.61 miles southeast of the project. The project would not introduce a structure that would interfere with the approach and take off of aircrafts utilizing any regional airports. As a result, no impacts related to this issue would occur.

f) No Impact:

At no time would any adjacent street be completely closed to traffic during the proposed project's construction. In addition, all construction staging must occur on-site. As a result, no impacts are associated with the proposed project's implementation.

g) No Impact:

The project site is not located within a "moderate fire hazard severity zone." As a result, no impacts would result.

9.3 MITIGATION MEASURES:

None required.



10 - HYDROLOGY AND WATER QUALITY

| HYDROLOGY AND WATER QUALITY – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|--------------------------------------|--|-------------------------------------|-------------------------------------|
| a) Violate any water quality standards or waste discharge requirements? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| i) Result in substantial erosion or siltation on- or off-site? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iv) Impede or redirect flood flows? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

FEMA. Glossary. Flood Zones. Website accessed January 23, 2023.

Fomotor Engineering. Preliminary Hydrology Study for Tentative Tract Map 38273. February 7, 2022.

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

10.1 SETTING

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The proposed project would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site.



Water and sewer would be provided by the Coachella Valley Water District. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

10.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

During construction, compliance with waste discharge requirements would be met through the permit registration and coverage process under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, as amended by 2010- 0014-DWQ and 2012-006-DWQ. This permit is otherwise known as the Construction General Permit (CGP), applicable to any construction activity that results in a land disturbance of equal to or greater than one acre. In addition, stormwater discharges from construction activities that disturb one or more acres, or smaller sites disturbing less than one acre that are part of a common plan of development or sale, are regulated under the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program. As a result, the construction impacts would be less than significant.

b) Less Than Significant Impact:

Water used to control fugitive dust would be transported to the site via truck. No direct ground water extraction would occur. Furthermore, the construction and post-construction BMPs would address contaminants of concern from excess runoff, thereby preventing the contamination of local groundwater. These BMP controls may include, but not be limited to, the following:

- Stabilization practices for all areas disturbed by construction and grading.
- Structural practices for all drainage/discharge locations.
- Stormwater management controls, including measures used to control pollutants occurring in stormwater discharges after construction activities are complete.
- Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel.
- Other controls, including waste disposal practices that prevent discharge of solid materials.

In addition, there would be no direct groundwater withdrawals associated with the proposed project's implementation. As a result, the impacts would be less than significant.

c) Less Than Significant Impact:

The proposed project's location would be restricted to the proposed project site and would not alter the course of any stream or river that would lead to on- or off-site siltation or erosion. As a result, the potential impacts would be less than significant.

d) No Impact:

According to the Federal Emergency Management Agency (FEMA) flood insurance maps obtained for the City of Rancho Mirage, the proposed project site is located in a flood hazard



zone, labeled as "Zone X." Thus, properties located in "Zone X" are areas of minimal flood hazard. The proposed project site is not located in an area that is subject to inundation by seiche or tsunami. In addition, the project site is located inland approximately 71 miles from the Pacific Ocean and the project site would not be exposed to the effects of a tsunami. As a result, no impacts are anticipated.

e) No Impact:

The project's construction would not interfere with any groundwater management or recharge plan since there are no active groundwater management recharge activities on-site or in the vicinity. According to the Appendix F - Hydrology Study prepared for the project site, the project would provide a total hydrologic capacity of 31,655 cubic feet (CF) which is greater than the 3-hour/100 year Synthetic Unit Hydrograph analysis which accounts for the highest net proposed runoff volume of 24,210 CF required. In conclusion, Tentative Tract Map 38273 meets the hydrologic and hydraulic requirements established by the City of Rancho Mirage. As a result, no impacts are anticipated.

10.3 MITIGATION MEASURES:

None required.



11 - LAND USE AND PLANNING

| LAND USE AND URBAN PLANNING – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|--------------------------------------|--|------------------------------------|-------------------------------------|
| a) Physically divide an established community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

Google Maps. Site Accessed May 23, 2023, and Rancho Mirage Zoning Map, Site Accessed, May 23, 2023.
Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

11.1 SETTING

The relatively level 5.0-acre site is located 348 feet above mean sea level. The relatively level site is approximately 94 meters above sea level and contains no slope. The vegetation community present on site supports a heavily disturbed sparse desert scrub habitat encompassing mainly native plants and some non-native grasses. The site is dominated by creosote bush (*Larrea tridentata*). The proposed project would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2). The project site is located in the Section 30 Specific Plan.

11.2 DISCUSSION OF IMPACTS:

a) No Impact:

Land uses and development located in the vicinity of the proposed project site are outlined below:

- *North of the project site:* The future Via Florencia road right-of-way extends along the project site's north side. Vacant undeveloped land is located further north. These parcels are designated as Very Low Density Residential (R-L-2).
- *East of the project site:* Vacant, undeveloped land extends along the project site's east side. These parcels are designated as Very Low Density Residential (R-L-2).
- *South of the project site:* A single-family residential development abuts the project site's south side. These parcels are designated as Very Low Density Residential (R-L-2).
- *West of the project site:* Undeveloped land extends along the project site's west side. These parcels are designated as Very Low Density Residential (R-L-2).

The granting of the requested entitlements and subsequent construction of the proposed project would not result in any expansion of the use beyond the current boundaries. As a result, the



project will not lead to any division of an existing established neighborhood. As a result, no impacts would occur.

b) No Impact:

The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2). The project site is located in the Section 30 Specific Plan. According to the Rancho Mirage Land Use Element, this designation provides for single-family residential development typically on individual lots of about 0.5-acre. Planned residential developments are also an appropriate form under this designation. Lands with this designation may serve to buffer more dense residential development from estate residential uses. The proposed development would be consistent with this land use designation. As a result, no impacts would occur.

11.3 MITIGATION MEASURES:

None required.



12 - MINERAL RESOURCES

| MINERAL RESOURCES – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|--------------------------------|---|------------------------------|-------------------------------------|
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

California, State of. Department of Conservation. *California Oil, Gas, and Geothermal Resources Well Finder*.
California Department of Conservation. *Mineral Land Classification Map for Riverside County* accessed May 28, 2023.
Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

12.1 SETTING

The Surface Mining and Reclamation Act of 1975 (SMARA) has developed mineral land classification maps and reports to assist in the protection and development of mineral resources. According to the SMARA, the following four mineral land use classifications are identified:

- *Mineral Resource Zone 1 (MRZ-1)*: This land use classification refers to areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- *Mineral Resource Zone 2 (MRZ-2)*: This land use classification refers to areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists.
- *Mineral Resource Zone 3 (MRZ-3)*: This land use classification refers to areas where the significance of mineral deposits cannot be evaluated from the available data. Hilly or mountainous areas underlain by sedimentary, metamorphic, or igneous rock types and lowland areas underlain by alluvial wash or fan material are often included in this category. Additional information about the quality of material in these areas could either upgrade the classification to MRZ-2 or downgrade it to MRZ-1.
- *Mineral Resource Zone 4 (MRZ-4)*: This land use classification refers to areas where available information is inadequate for assignment to any other mineral resource zone.

12.2 DISCUSSION OF IMPACTS:

a). No Impact:

The City of Rancho Mirage is reviewing an application that would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).



A review of California Division of Oil, Gas, and Geothermal Resources well finder indicates that there are no wells located in the vicinity of the project site. The project site is not located in a Significant Mineral Aggregate Resource Area (SMARA) nor is it located in an area with active mineral extraction activities. A review of California Division of Oil, Gas, and Geothermal Resources well finder indicates that there are no wells located within or in the vicinity of the project site. The project site is located within Mineral Resource Zone (MRZ-3A), which means there may be significant mineral resources present. As indicated previously, there are no active mineral extraction activities occurring on-site or in the adjacent properties. As a result, no impacts to mineral resources would occur.

b) No Impact:

As previously mentioned, no mineral, oil, or energy extraction and/or generation activities are located within the project site. Moreover, the proposed project would not interfere with any resource extraction activity. Therefore, no impacts would result from the implementation of the proposed project.

12.3 MITIGATION MEASURES:

None required.



13 - NOISE

| NOISE – Would the project result in: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|--------------------------------|---|-------------------------------------|-------------------------------------|
| a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Generation of excessive groundborne vibration or groundborne noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) For a project located within the vicinity of a private airstrip or 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, would the project expose people residing or working in the project area to excessive noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

Toll-Free Airline. Riverside, *California*.

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

13.1 SETTING

Noise levels may be described using several methods designed to evaluate the “loudness” of a particular noise. The most commonly used unit for measuring the level of sound is the decibel (dB). Zero on the decibel scale represents the lowest limit of sound that can be heard by humans. The eardrum may rupture at 140 dB. In general, an increase of between 3.0 dB and 5.0 dB in the ambient noise level is considered to represent the threshold for human sensitivity. Noise level increases of 3.0 dB or less are not generally perceptible to persons with average hearing abilities. The most commonly used unit for measuring the level of sound is the decibel (dB). Zero on the decibel scale represents the lowest limit of sound that can be heard by humans.

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site.

13.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site. The building pads would range in size from 18,000 square feet to 20,998



square feet. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

The City regulates noise-generating activities through the Municipal Code and requires that daytime noise levels be 60 dBA CNEL or less at the property line for residential land uses and 45 dBA CNEL or less for all interior areas. Existing land uses in the vicinity of the project site include vacant undeveloped land and residential development. Construction activities would result in localized and temporary increases in ambient noise levels and may impact sensitive receptors. Construction noise sources are regulated within Sections 8.45.050 and 15.04.030(A) 117.1 of the Rancho Mirage Municipal Code which prohibit construction activities other than the hours of 7:00 a.m. to 7:00 p.m., with no construction occurring on Sundays or federal holidays. The project will operate during the hours permitted by the City of Rancho Mirage. These restrictions, muffling of construction equipment, and other measures will reduce, to some extent, construction noise impacts on surrounding land uses. Impacts will be temporary and will end once construction is complete. Construction noise will vary depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the scheduled proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work. As a result, the proposed project will not expose sensitive receptors to excessive noise levels. As a result, the impacts would be less than significant.

b) Less Than Significant Impact:

Construction activities would produce varying degrees of ground vibration, depending on the equipment and methods employed. While ground vibrations from typical construction activities very rarely reach levels high enough to cause damage to structures, special consideration must be made when sensitive or historic land uses are near the construction site. The construction activities that typically generate the highest levels of vibration are blasting and impact pile driving and the use of a vibratory roller. However, the project would not require blasting, pile driving, or vibratory rollers. The largest piece of vibration-generating equipment that could be used for project construction is a large bulldozer. Large bulldozers generate a vibration level of 0.089 in/sec PPV at 25 feet. Existing or potential noise sensitive residential development is located on all sides of the project site. Ground vibrations associated with construction activities using modern construction methods and equipment rarely reach the levels that result in damage to nearby buildings though vibration related to construction activities may be discernible in areas located near the construction site. A possible exception is in older buildings where special care must be taken to avoid damage. Table 3-6 summarizes the levels of vibration and the usual effect on people and buildings. The U.S. Department of Transportation (U.S. DOT) has guidelines for vibration levels from construction related to their activities and recommends that the maximum peak-particle-velocity (PPV) levels remain below 0.05 inches per second at the nearest structures. PPV refers to the movement within the ground of molecular particles and not surface movement. Vibration levels above 0.5 inches per second have the potential to cause architectural damage to normal dwellings. The U.S. DOT also states that vibration levels above 0.015 inches per second (in/sec) are sometimes perceptible to people, and the level at which vibration becomes an irritation to people is 0.64 inches per second. The effects of vibration on buildings are summarized in Table 6.



**Table 6
Common Effects of Construction Vibration**

| Peak Particle Velocity (in/sec) | Effects on Humans | Effects on Buildings |
|---------------------------------|--|---|
| <0.005 | Imperceptible | No effect on buildings |
| 0.005 to 0.015 | Barely perceptible | No effect on buildings |
| 0.02 to 0.05 | Level at which continuous vibrations begin to annoy occupants of nearby buildings | No effect on buildings |
| 0.1 to 0.5 | Vibrations considered unacceptable for persons exposed to continuous or long-term vibration. | Minimal potential for damage to weak or sensitive structures |
| 0.5 to 1.0 | Vibrations considered bothersome by most people, tolerable if short-term in length | Threshold at which there is a risk of architectural damage to buildings with plastered ceilings and walls. Some risk to ancient monuments and ruins. |
| 1.0 to 2.0 | | U.S. Bureau of Mines data indicates that blasting vibration in this range will not harm most buildings. Most construction vibration limits are in this range. |
| >3.0 | Vibration is unpleasant | Potential for architectural damage and possible minor structural damage |

Source: U.S. Department of Transportation

Various types of construction equipment have been measured under a wide variety of construction activities with an average of source levels reported in terms of velocity levels as shown in Table 7. Although the table gives one level for each piece of equipment, it should be noted that there is a considerable variation in reported ground vibration levels from construction activities. The data in Table 7 does provide a reasonable estimate for a wide range of soil conditions. Based on Transit Noise and Vibration Impact Assessment, a vibration level of 102 VdB (vibration decibels, or 0.5 inches per second [in/sec]) is considered safe and would not result in any construction vibration damage.

**Table 7
Vibration Source Levels for Typical Construction Equipment**

| Construction Equipment | | PPV @25 ft. (inches/sec.) | Vibration (VdB) @ 25 ft. |
|------------------------|-------------|------------------------------|-----------------------------|
| Pile Driver (impact) | Upper range | 1.58 | 112 |
| | Typical | 0.644 | 104 |
| Pile Drive (Sonic) | Upper range | 0.734 | 105 |
| | Typical | 0.170 | 93 |
| Clam Shovel Drop | | 0.202 | 94 |
| Large Bulldozer | | 0.089 | 87 |
| Caisson Drilling | | 0.089 | 87 |
| Loaded Trucks | | 0.076 | 86 |
| Small Bulldozer | | 0.035 | 79 |

Source: Federal Highway Administration FHWA Noise and Vibration During Construction

The project will be required to adhere to all pertinent City noise control regulations. The limited duration of construction activities and the City's construction-related noise control requirements



will reduce the potential impacts. A vibration level of 0.089 in/sec PPV at 25 feet would be 0.53 in/sec PPV at 40 feet and 0.089 in/sec PPV at 25 feet (refer to Table 7). These vibration levels would be less than the FTA thresholds. Additionally, construction equipment would move throughout the entire site and would only be located near the project boundaries for short periods of time. Thus, vibration levels at the receptors located near the project boundaries would be less than these maximum levels for a majority of the construction period. Although vibration levels may be perceptible for short periods of time, maximum vibration levels would not exceed FTA thresholds. Therefore, project construction would not generate excessive ground borne vibration or ground borne noise levels, and impacts would be less than significant. As a result, the impacts would be less than significant.

c) No Impact:

The project site is not located within an airport land use plan and is located within two miles of a public airport or public use airport. The nearest airports to the project site include the Palm Springs International Airport is located approximately 5.87 miles northwest of the project site and the Bermuda Dunes Airport is located approximately 9.61 miles southeast of the project. The proposed use is not considered to be a sensitive receptor and no sensitive receptors are located adjacent to the project site. As a result, the proposed project will not expose people residing or working in the project area to excessive noise levels related to airport uses. As a result, no impacts would occur.

13.3 MITIGATION MEASURES:

None required.



14 - POPULATION AND HOUSING

| POPULATION AND HOUSING – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|--------------------------------|---|-------------------------------------|--------------------------|
| a) Induce substantial unplanned 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)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SOURCES:

Toll-Free Airline. Riverside, California.

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2021-2023*. Sacramento, California, May 2023.

14.1 SETTING

The site is dominated by creosote bush (*Larrea tridentata*). The proposed project would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site. The individual units would be arranged around a proposed cul-de-sac roadway with an average curb-to-curb width of 37-feet. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

14.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

Growth-inducing impacts are generally associated with the provision of urban services to an undeveloped or rural area. Growth-inducing impacts include the following:

- *New development in an area presently undeveloped and economic factors which may influence development.* The site is currently largely undeveloped (the site is occupied by an older single-family residence) though the site has been disturbed. All land use surrounding the property are designated for residential development.
- *Extension of roadways and other transportation facilities.* Future roadway and infrastructure connections will serve the proposed project site only.
- *Extension of infrastructure and other improvements.* The installation of any new utility lines will not lead to subsequent offsite development since these utility connections will serve the site only.
- *Major off-site public projects (treatment plants, etc.).* The project's increase in demand for



utility services can be accommodated without the construction or expansion of landfills, water treatment plants, or wastewater treatment plants.

- *The removal of housing requiring replacement housing elsewhere.* The site is vacant. As a result, no replacement housing will be required.
- *Additional population growth leading to increased demand for goods and services.* The proposed 9-unit project would potentially result in 17 new residents assuming an average household size of 1.85 persons per unit derived from the most recent California Department of Finance.
- *Short-term growth-inducing impacts related to the project's construction.* The project will result in temporary employment during the construction phase.

The newly established roads and existing utility lines will serve the project site only and will not extend into undeveloped areas. The proposed project will not result in any unplanned growth. Therefore, the impacts would be less than significant.

b) Less Than Significant Impact:

The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2). The proposed 9-unit project would potentially result in 17 new residents assuming an average household size of 1.85 persons per unit derived from the most recent California Department of Finance. The site is currently vacant. *Therefore, the impacts would be less than significant.*

14.3 MITIGATION MEASURES:

None required.



15 - PUBLIC SERVICES

| PUBLIC SERVICES – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|---|---------------------------------------|--|-------------------------------------|--------------------------|
| a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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: | | | | |
| i) Fire protection? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| ii) Police protection? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iii) Schools? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iv) Parks? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| v) Other public facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SOURCES:

Toll-Free Airline. Riverside, *California*.

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

Riverside County Fire Department for Rancho Mirage. Information from the following website: <https://ranchomirageca.gov/our-city/city-departments/fire/>

15.1 SETTING

The site is dominated by creosote bush (*Larrea tridentata*). The proposed project would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

15.2 DISCUSSION OF IMPACTS:

i) Less Than Significant Impact:

The Riverside County Fire Department (RCFD), under contract with the City of Rancho Mirage, provides a full range of 24-hour fire protection and emergency medical services to the City. The City's Fire Department is made up of 27 sworn, 2 full time non-sworn and 1 part time nonsworn personnel), serving 24.7 square miles with an estimated service population of 17,504 (Riverside County Fire Department for Rancho Mirage). RCFD maintains two fire stations within the City of Rancho Mirage, Fire Station 50, and Fire Station 69. Fire Station 50 is located at 70-801 Highway 111 and this station covers the southern portion of the City and is equipped with a Medic Engine and Paramedic Ambulance. Five firefighters are staffed at this station daily and



three of the five firefighters are paramedics. Fire Station 69 is located at 71-751 Gerald Ford Drive and covers the northern portion of Rancho Mirage and is also staffed with five firefighters daily, with three of the five fire fighters being paramedics. The Riverside County Fire Department operates under a Regional Fire Protection Program, which allows all of its fire stations to provide support as needed regardless of jurisdictional boundaries.

The RCFD currently reviews all new development plans. The proposed project would be required to conform to all fire protection and prevention requirements, including, but not limited to, building setbacks, emergency access, and fire flow (or the flow rate of water that is available for extinguishing fires). The proposed project would only place an incremental demand on fire services since the including the installation of fire hydrants and sprinkler systems inside the buildings. Furthermore, the project will be reviewed by County Fire officials to ensure adequate fire service and safety as a result of project implementation. Development of the proposed project would result in a minimal increase in demand for fire services. Service calls could place an additional demand on fire personnel, fire apparatus and equipment. project will be constructed with strict adherence to all pertinent building and fire codes. In addition, the proposed project would be required to implement all pertinent Fire Code Standards. As a result, the impacts would be less than significant.

ii) Less Than Significant Impact:

Law enforcement services in the City of Rancho Mirage are provided under A contractual agreement with Riverside County Sheriff's Department (RCSD). Their staff consists of 29 full time officers (24 sworn and 5 non-sworn). The officers have a daily staffing of 7 officers that work in two, 12-hour shifts. Four deputy patrol officers work the day shift, and 3 deputy patrol officers work the night shift. The City currently provides 1.77 officers per 1,000 residents. The Sheriff's department provides 24-hour police law enforcement services and operates a small police substation at the Rancho Mirage Public Library. The main County sheriff's station is located Palm Desert at 73-705 Gerald Ford Drive. This station is approximately 4.4 miles from the project site. The City's police department patrols 7 days a week, 365 days a year and 24-hours a day. The RCSD contract provides for a staff of 30 full time officers (25 sworn and 5 non-sworn). The officers have a daily staffing of 7 officers that work in two, 12-hour shifts. Four deputy patrol officers work the day shift, and 3 deputy patrol officers work the night shift. The City's contract currently provides 1.65 officers per 1,000 residents, which is well above the commonly used and accepted ratio of one officer per 1,000 residents. Emergency response times vary and are dependent on the location of patrol cars. The average response time for priority 1 calls in the City of Rancho Mirage was 5 to 6 minutes.

The project site is located in an existing urban area and is currently serviced by the Sheriff's Department. Therefore, the proposed project would not substantially increase the need for new or expanded police facilities and response times are not expected to be impacted. Additionally, all new construction in the City will be required to pay Development Impact Fees to assist in offsetting impacts to police services. As a result, the impacts would be less than significant.

iii) Less Than Significant Impact:

The project site is within the boundary of the Palm Springs Unified School District (PSUSD). The construction of the proposed 9 single-family units would not create a significant increase in school enrollments. The project would be required to pay *School Impact Fees* to the PSUSD. Current



impact fees at the time of writing are \$4.79 per square foot for residential development. The payment of these fees is considered to be mitigation of potential impacts. As a result, the impacts would be less than significant.

iv) Less Than Significant Impact:

City of Rancho Mirage provides public parks, open space, and multi-city recreational facilities with various amenities. The proposed project would be required to comply with the City's parkland in lieu fee (Quimby) and other development impact fees requirements. The future residents generated by project implementation may lead to an incremental increase in physical deterioration of City public recreational facilities. The occupancy of the 9-units would not substantially increase the use of existing parks as to accelerate their physical deterioration since the site is relatively small and it would provide private open space amenities. Additionally, the project will be required to comply with the City's development impact fee requirements. As a result, the impacts would be less than significant.

v) Less Than Significant Impact:

The proposed project would not create direct demand for other governmental service. As a result, the impacts would be less than significant.

15.3 MITIGATION MEASURES:

None required.



16 - RECREATION

| RECREATION – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|--------------------------------|---|-------------------------------------|--------------------------|
| 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 would occur or be accelerated? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SOURCES:

Fomotor Engineering, Inc. Preliminary [Tentative Tract Map No. 38273]. Sheet 1. July 26, 2023.
Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

16.1 SETTING

The City of Rancho Mirage is reviewing an application that would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The building pads would range in size from 18,000 square feet to 20,998 square feet. Water and sewer would be provided by the Coachella Valley Water District. Two retention basins would be located in the site's northern boundary (south of Via Florencia) and would total 16,298 square feet. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

16.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

The City of Rancho Mirage is reviewing an application that would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The individual units would be arranged around a proposed cul-de-sac roadway with an average curb-to-curb width of 37-feet. The new internal drive aisle would connect to the south side of Via Florencia. Water and sewer would be provided by the Coachella Valley Water District. Two retention basins would be located in the site's northern boundary (south of Via Florencia) and would total 16,298 square feet. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

The project would be required to comply with the City's parkland in lieu fee (Quimby) and other development impact fees requirements. The future residents generated by project implementation may lead to an incremental increase in physical deterioration of City public recreational facilities. The occupancy of the 9-units would not substantially increase the use of existing parks as to accelerate their physical deterioration since the site is relatively small and it would provide private open space amenities. Additionally, the project will be required to comply with the City's development impact fee requirements. As a result, the impacts would be less than significant.



b) Less Than Significant Impact:

As previously indicated, the implementation of the proposed project would not physically impact any existing parks and recreational facilities in the City. No such facilities are located adjacent to the project site. As a result, the impacts would be less than significant.

16.3 MITIGATION MEASURES:

None required.



17 - TRANSPORTATION

| TRANSPORTATION – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|--------------------------------|---|-------------------------------------|-------------------------------------|
| a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) Result in inadequate emergency access? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

Fomotor Engineering, Inc. Preliminary [Tentative Tract Map No. 38273]. Sheet 1. July 26, 2023.
Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

17.1 SETTING

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The remainder of the project site consists of both native and non-native shrubs and grasses. The site is dominated by creosote bush (*Larrea tridentata*). The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site.

The City of Rancho Mirage is reviewing an application that would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site. The individual units would be arranged around a proposed cul-de-sac roadway with an average curb-to-curb width of 37-feet. The new internal drive aisle would connect to the south side of Via Florencia. Water and sewer would be provided by the Coachella Valley Water District. . The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).

17.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

The trip generation for the proposed project is based on the trip generation rates for Land Use 210 – “Single-Family Detached Housing” included in the Institute of Transportation Engineers’



(ITE) *Trip Generation*, 11th Edition. As shown in Table 8, the proposed project is forecast to generate 6 total trips in the a.m. peak hour, 8 total trips in the p.m. peak hour, and 85 daily trips.

Table 8
Project Trip Generation

| Land Use | Units | AM Peak Hour | | | PM Peak Hour | | | Daily |
|---------------|--------------|--------------|------|-------|--------------|------|-------|-------|
| | | In | Out | Total | In | Out | Total | |
| Single Family | ITE Code 210 | 0.19 | 0.56 | 0.74 | 0.62 | 0.37 | 0.99 | 9.44 |
| Project | 9 units | 2 | 4 | 6 | 5 | 3 | 8 | 85 |

Source: Institute of Transportation Engineers' (ITE) *Trip Generation*, 11th Edition

The total trip generation assumed 85 trip ends per day for 9 single-family units. Of this total, 6 trips would occur during the AM peak hour and 8 trips would occur during the PM peak hour. The proposed project would not create a level of service deficiency at any area intersection due to the limited trip generation. As a result, the impacts will be less than significant.

b) No Impact:

Transportation Analysis Policy identifies three types of screening criteria under which projects are not required to submit a detailed VMT analysis and a presumption of a less than significant transportation impact can be made based on the facts of the project. Certain types of projects are exempt from the need to prepare a detailed VMT and may be presumed to result in a less than significant VMT impact as they are local serving by nature, thus shortening travel distances by introducing shopping/services within the community, or they are small enough to not warrant assessment. As specified in the City's Transportation Analysis Policy, the following types of projects may be presumed to result in a less than significant VMT impact:

- Local serving retail projects less than 50,000 square feet
- Day care centers;
- Local parks;
- Local-serving public facilities;
- Ministerial projects;
- Small infill projects;
- Restricted affordable, transit supportive residential projects in planned growth areas with high-quality Transit;
- Transportation projects that do not increase VMT; and
- Projects that generate less than 110 daily vehicle trips. This provision generally correlates to typical development as listed as follows: 11 single-family residential dwelling units; 16 multi-family condominium or townhouse residential dwelling units; or 10,000 square feet of office.

The proposed project's trip daily generation is 85 trips. As a result, no impacts would occur.



c) Less Than Significant Impact:

The individual units would be arranged around the proposed cul-de-sac roadway. Each unit would be provided with an enclosed garage that would accommodate two vehicles. The driveway apron would accommodate an additional two vehicles. The entry way would be gated and would have a curb-to-curb width of 60 feet (30-feet for the ingress travel land and 30-feet for the egress travel lane). The internal roadway would have a curb-to-curb width of approximately 37-foot. The internal roadway is referred to as "Lot A" on the site plan. The proposed project will not expose future drivers to dangerous intersections or sharp curves and the proposed project will not introduce incompatible equipment or vehicles to the adjacent roads. As a result, the potential impacts would be less than significant.

d) No Impact:

The proposed project would not affect emergency access to any adjacent parcels. At no time during construction will adjacent streets be completely closed to traffic. All construction staging must occur on-site. As a result, no impacts are associated with the proposed project's implementation.

17.3 MITIGATION MEASURES:

None required.



18 - TRIBAL CULTURAL RESOURCES

| TRIBAL CULTURAL RESOURCES – Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 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: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|---------------------------------------|--|-------------------------------------|-------------------------------------|
| i) 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 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| ii) 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 § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

Fomotor Engineering, Inc. Preliminary [Tentative Tract Map No. 38273]. Sheet 1. July 26, 2023.
Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

18.1 SETTING

On September 22, 2022, CRM TECH submitted a written request to the State of California Native American Heritage Commission (NAHC) for a records search in the commission's Sacred Lands File. The NAHC is the State of California's trustee agency for the protection of "tribal cultural resources," as defined by California Public Resources Code §21074, and is tasked with identifying and cataloging properties of Native American cultural value throughout the state. In the meantime, CRM TECH notified the nearby Agua Caliente Band of Cahuilla Indians of the upcoming archaeological field survey and invited tribal participation. The responses from the NAHC and the Agua Caliente Band are summarized below:

From Appendix E – Cultural Study, the letter from Native American Heritage Commission (NAHC) titled "Re: Proposed Tentative Tract Map Numbers 38041, 38266, and 38273 Project, Riverside County" states:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other



sources of cultural resources should also be contacted for information regarding known and recorded sites.

From Appendix E – Tribal Consultation Letters, the Agua Caliente Band of Cahuilla Indians (ACBCI) Tribal Historic Preservation Office (THPO) letter titled “Re: TTM22-0004” is summarized below:

- Formal government to government consultation under California Assembly Bill No. 52 (AB-52).
- A cultural resources inventory of the project area by a qualified archaeologist prior to any development activities in this area.
- Copies of any cultural resource documentation (report and site records) generated in connection with this project.
- A copy of the records search with associated survey reports and site records from the information center.
- The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities (including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior’s Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office.

The proposed project would involve the construction and occupancy of a nine lot subdivision within a 5.0-acre (gross area) project site. The project site’s General Plan and Zoning designation is Very Low Density Residential (R-L-2).

18.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The proposed project would involve the construction of a nine-unit subdivision within a 5.0-acre (gross area) project site. The remainder of the project site consists of both native and non-native shrubs and grasses. The site is dominated by creosote bush (*Larrea tridentata*).

A Tribal Resource is defined in Public Resources Code section 21074 and includes the following:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following: included or determined to be eligible for inclusion in the California Register of Historical Resources or included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
- 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 I of Section 5024.1. In applying the criteria set forth in subdivision I of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.



- A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.
- A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a “non-unique archaeological resource” as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms to the criteria of subdivision (a).

All potentially interested tribes identified by the NAHC were also contacted pursuant to AB-52 for information regarding their knowledge of cultural resources that were within or near the project area. Tribal consultation ended on September 23, 2023. The tribal consultation letters are attached as Appendix E – Tribal Consultation Letters. All potentially interested tribes identified by the NAHC were also contacted pursuant to AB-52 for information regarding their knowledge of cultural resources that were within or near the project area. These groups include the Twenty-Nine Palms Band of Mission Indians, Twenty-Nine Palms, Agua Caliente Band of Cahuilla Indians, Augustine Band of Cahuilla Mission Indians, Cabazon Band of Mission Indians, Cahuilla Band of Indians, Los Coyotes Band of Mission Indians, Morongo Band of Mission Indians, Ramona Band of Cahuilla Mission, Soboba Band of Luiseno Indians, Santa Rosa Band of Mission Indians, and Torres Martinez Desert Cahuilla Indians. Agua Caliente Band of Cahuilla Indians (ACBCI) states the project site is not within the ACBCI Reservation but it is within the Tribe’s Traditional Use Area.

The Agua Caliente Band of Cahuilla Indians (ACBCI) Tribal Historic Preservation Office (THPO) requests the following tribal cultural mitigation measures:

Tribal Cultural Resources Mitigation Measures No. 1. The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities (including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior’s Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office.

There are currently no other public agencies whose approval is required at this time. Adherence to the above mitigation measures and the standard condition presented in Subsection B under Cultural Resources will minimize potential impacts to levels that are less than significant with mitigation measures.

b) No Impact:

The project site is located within or on the Agua Caliente Band of Cahuilla Indians territory. A search of the National Register of Historic Places and the list of California Historical Resources was conducted, and it was determined that no Native historic resources was listed within the City of Rancho Mirage. Since the project’s implementation would not impact any Federal, State, or locally designated historic resources. As a result, no impacts would occur.

18.3 MITIGATION MEASURES:



The Agua Caliente Band of Cahuilla Indians (ACBCI) Tribal Historic Preservation Office (THPO) requests the following tribal cultural mitigation measures:

Tribal Cultural Resources Mitigation Measures No. 1. The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities (including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior's Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office.



19 - UTILITIES AND SERVICE SYSTEMS

| UTILITIES AND SERVICE SYSTEMS – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|--------------------------------------|--|-------------------------------------|-------------------------------------|
| a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

Fomotor Engineering, Inc. Preliminary [Tentative Tract Map No. 38273]. Sheet 1. July 26, 2023.

Los Angeles County Sanitation Districts. *Services*. 2023.

Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

19.1 SETTING

The City of Rancho Mirage is reviewing an application that would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The individual units would be arranged around a proposed cul-de-sac roadway with an average curb-to-curb width of 37-feet. The new internal drive aisle would connect to the south side of Via Florencia. Water and sewer would be provided by the Coachella Valley Water District. Two retention basins would be located in the site's northern boundary (south of Via Florencia) and would total 16,298 square feet. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).



19.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact:

There are no existing water or wastewater treatment plants, electric power plants, telecommunications facilities, natural gas facilities, or stormwater drainage infrastructure located on-site. Therefore, the project's implementation will not require the relocation of any of the aforementioned facilities. The project site is currently undeveloped and undisturbed. As a result, the potential impacts would be less than significant.

b) Less Than Significant Impact:

Groundwater is the primary source of domestic water supply in the Coachella Valley. The Coachella Valley Water District (CVWD) is the largest provider of potable water in the valley and currently provides potable water in the project vicinity. CVWD operates more than 100 wells and serves a population of 290,000 in its service areas. CVWD's 2012 adopted Water Management Plan and 2015 Urban Water Management Plan (UWMP) have been developed to assist the agency in reliably meeting current and future water demands in a cost-effective manner. The 2015 UWMP serves as a planning tool that documents actions in support of long-term water resources planning and ensures adequate water supplies are available to meet the existing and future urban water demands. As indicated in Table 9, the proposed project is projected to consume approximately 5,013 gallons of water on a daily basis.

Table 9
Water Consumption (gals/day)

| Use | Unit | Factor | Generation |
|--------------------|---------|--------------------------|-----------------|
| Single-family Home | 9 units | 557 gals./dwelling unit* | 5,013 gals./day |
| Total | 9 units | | 5,013 gals./day |

Source: Coachella Valley Water District. 2022-23 Annual Review. 2023.

*Based on 301 gals./capita/day

The existing water supply facilities and infrastructure will be able to accommodate this additional demand. In addition, the proposed project will be equipped with water efficient fixtures and drought tolerant landscaping will be planted throughout the project site. As a result, the impacts are considered to be less than significant. As a result, the impacts will be less than significant.

c) Less Than Significant Impact:

The CVWD operates 6 water reclamation plants and maintains more than 1,000 miles of sewer pipelines and more than 30 lift stations that transport wastewater to the nearest treatment facility and nearly 6.3 billion gallons of wastewater is treated yearly. CVWD's peak flow factor of 200 gallons per day per equivalent dwelling unit (EDU), was used to determine the proposed wastewater generation for the project. The site was found to provide approximately 55 EDU and estimates a total wastewater demand of approximately 11,000 gallons per day (gpd), or 0.011 MGD. In addition, wastewater generated by the Project will be conveyed to CVWD Wastewater Reclamation Plant Number 10 in Palm Desert (WRP-10). Per the 2015 CVWD Urban Water Management Plan, WRP-10 has a capacity to treat 18 million gallons per day (MGD). This plant treats an annual average flow of 10.8 MGD (12,000 AFY) from the activated sludge plant.



According to Table 10, the proposed project is expected to generate approximately 1,161 gallons of sewage per day.

Table 10
Wastewater (Effluent) Generation (gals/day)

| Use | Unit | Factor | Generation |
|---------------------------|---------|---------------------|-----------------|
| Single Family Residential | 9 units | 129 gals./unit/day* | 1,161 gals./day |
| Total | 9 units | | 1,161 gals./day |

Source: Coachella Valley Water District. 2022-23 Annual Review. 2023.

*Based on 69.6 gals./capita/day

The proposed project's sewage generation will likely be lower since the new plumbing fixtures that will be installed will consist of water conserving fixtures as is required by the current City Code requirements. As a result, the impacts are expected to be less than significant.

d) Less Than Significant Impact:

Solid waste disposal and recycling services for the City of Rancho Mirage is provided by Burrtec. Solid waste and recycling collected from the proposed project will be hauled to the Edom Hill Transfer Station. Waste from this transfer station is then sent to a permitted landfill or recycling facility outside of the Coachella Valley. These include Badlands Disposal Site, El Sobrante Sanitary Landfill and Lamb Canyon Disposal Site. Cal-Recycle data indicates the Bandlands Disposal site has 15,748,799 cubic yards of remaining capacity, the El Sobrante Landfill has a remaining capacity of 143,977,170 tons of solid waste, and Lamb Canyon Disposal has a remaining solid waste capacity of 19,242,950 cubic yards.

The proposed project is anticipated to generate approximately 143 pounds per day of solid waste (refer to Table 11 shown on the following page). The projected quantify of solid waste is limited and can be accommodate by the existing capacity. As a result, the potential impacts are considered to be less than significant.

Table 11
Solid Waste Generation (lbs/day)

| Use | Unit | Factor | Generation |
|---------------------------|---------|--------------------|--------------|
| Single Family Residential | 9 units | 15.9 lbs./unit/day | 143 lbs./day |
| Total | 9 units | | 143 lbs./day |

Source: California Department of Resources Recycling and Recovery (CalRecycle). *Jurisdiction Review Reports*. 2023.

*Based on 8.60 lbs./capita/day

e) No Impact:

The proposed project, like all other development in Rancho Mirage and Riverside County, would be required to adhere to City and County ordinances with respect to waste reduction and



recycling. As a result, no impacts related to State and local statutes governing solid waste are anticipated.

19.3 MITIGATION MEASURES:

None required.



20 - WILDFIRE

| WILDFIRE – Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|---------------------------------------|--|-------------------------------------|-------------------------------------|
| If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: | | | | |
| a) Substantially impair an adopted emergency response plan or emergency evacuation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

SOURCES:

Fomotor Engineering, Inc. Preliminary [Tentative Tract Map No. 38273]. Sheet 1. July 26, 2023.
Rancho Mirage, City of. *City of Rancho Mirage 2017 General Plan Update*. Adopted November 16, 2017.

20.1 SETTING

The relatively level 5.0-acre site is 348 feet above mean sea level (AMSL). The project site consists of both native and non-native shrubs and grasses. The site is dominated by creosote bush (*Larrea tridentata*).

The proposed project would involve the construction of a nine lot subdivision within a 5.0-acre (gross area) project site. The individual units would be arranged around a proposed cul-de-sac roadway with an average curb-to-curb width of 37-feet. The new internal drive aisle would connect to the south side of Via Florencia. Water and sewer would be provided by the Coachella Valley Water District. Two retention basins would be located in the site's northern boundary (south of Via Florencia) and would total 16,298 square feet. The project site's General Plan and Zoning designation is Very Low Density Residential (R-L-2).



20.2 DISCUSSION OF IMPACTS:

a) No Impact:

Surface streets that would be improved would serve the project site and adjacent area. Furthermore, the proposed project would not involve the closure or alteration of any existing evacuation routes that would be important in the event of a wildfire. At no time during construction will adjacent streets be completely closed to traffic. All construction staging must occur on-site. As a result, no impacts would occur.

b) No Impact:

The project site is located in the midst of an undeveloped area. The proposed project may be exposed to particulate emissions generated by wildland fires in the mountains located to the west of the site. However, the potential impacts would not be exclusive to the project site since criteria pollutant emissions from wildland fires may affect the entire City as well as the surrounding cities and unincorporated county areas. As a result, no impacts would occur.

c) No Impact:

The project site is not located in an area that is classified as a moderate fire risk severity within a State Responsibility Area (SRA), and therefore will not require the installation of specialized infrastructure such as *fire roads, fuel breaks, or emergency water* sources. As a result, no impacts would occur.

d) No Impact:

There is no risk from wildfire within the project site or the surrounding area given the project site's distance from any area that may be subject to a wildfire event. In addition, the site is not located within a moderate fire risk and state responsibility area. Therefore, the project would not expose future residents to flooding or landslides facilitated by runoff flowing down barren and charred slopes. As a result, no impacts would occur.

20.3 MITIGATION MEASURES:

None required.



21 - MANDATORY FINDINGS OF SIGNIFICANCE

| MANDATORY FINDINGS OF SIGNIFICANCE | Potentially Significant Impact | Less Than Significant with Mitigation Incorporation | Less Than Significant Impact | No Impact |
|--|--------------------------------|---|------------------------------|-------------------------------------|
| 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? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 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)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

21.1 SETTING

The following findings can be made regarding the Mandatory Findings of Significance set forth in Section 15065 of the CEQA Guidelines based on the results of this environmental assessment.

21.2 DISCUSSION OF IMPACTS:

a) Less Than Significant Impact with Mitigation:

The proposed project *would not* have the potential to substantially 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, substantially 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 indicated in Chapter 2.1 through Chapter 2.20, the proposed project will not result in any significant unmitigable environmental impacts.*

The mitigations are listed below under Biological Resources Mitigation Measures No. 1-2 and Tribal Cultural Resources Mitigation Measures No. 1.

b) No Impact:

The proposed project *would not* have impacts that are individually limited, but cumulatively considerable. *The environmental impacts will not lead to a cumulatively significant impact on any of the issues analyzed herein.*

c) Less Than Significant Impact with Mitigation:

The proposed project *would not* have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly. *As indicated in Chapter 2.1 through 2.20, the proposed project will not result in any significant unmitigable environmental impacts.*

The mitigations are listed below under Biological Resources Mitigation Measures No. 1-2 and Tribal Cultural Resources Mitigation Measures No. 1.

21.3 MITIGATION MEASURES:

Biological Resources Mitigation No. 1. Pre-construction surveys for burrowing owls, desert tortoise, and nesting birds protected under the Migratory Bird Treaty Act and Section 3503 of the California Fish and Wildlife Code shall be conducted prior to the commencement of Project-related ground disturbance. a. Appropriate survey methods and timeframes shall be established, to ensure that chances of detecting the target species are maximized. In the event that listed species, such as the desert tortoise, are encountered, authorization from the USFWS and CDFW must be obtained. If nesting birds are detected, avoidance measures shall be implemented to ensure that nests are not disturbed until after young have fledged. b. Pre-construction surveys shall encompass all areas within the potential footprint of disturbance for the project, as well as a reasonable buffer around these areas.

Biological Resources Mitigation No. 2. A focused plant survey should be considered for all special status plant species that have the potential to occur on the site to be performed during the blooming season (April - June) to determine the potential environmental effects of the proposed projects on special status plants and sensitive natural communities following recommended protocols by the Department of Fish and Wildlife.

The Agua Caliente Band of Cahuilla Indians (ACBCI) Tribal Historic Preservation Office (THPO) requests the following tribal cultural mitigation measures:

Tribal Cultural Resources Mitigation Measures No. 1. The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities



(including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior's Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office.



Table 12: Mitigation Monitoring and Reporting Program

| Mitigation Measure | Responsible Agency | Timing | Verification (Date and Initials) |
|--|---|---------------------------------------|----------------------------------|
| AESTHETICS | | | |
| No Mitigation was required. | | | |
| AGRICULTURAL RESOURCES | | | |
| No Mitigation was required. | | | |
| AIR QUALITY | | | |
| No Mitigation was required. | | | |
| BIOLOGICAL RESOURCES | | | |
| Biological Resources Mitigation No. 1. Pre-construction surveys for burrowing owls, desert tortoise, and nesting birds protected under the Migratory Bird Treaty Act and Section 3503 of the California Fish and Wildlife Code shall be conducted prior to the commencement of Project-related ground disturbance. a. Appropriate survey methods and timeframes shall be established, to ensure that chances of detecting the target species are maximized. In the event that listed species, such as the desert tortoise, are encountered, authorization from the USFWS and CDFW must be obtained. If nesting birds are detected, avoidance measures shall be implemented to ensure that nests are not disturbed until after young have fledged. b. Pre-construction surveys shall encompass all areas within the potential footprint of disturbance for the project, as well as a reasonable buffer around these areas. | Project Developer is the responsible party. Qualified Biologist City of Rancho Mirage | Prior to commencement of Construction | |
| Biological Resources Mitigation No. 2. A focused plant survey should be considered for all special status plant species that have the potential to occur on the site to be performed during the blooming season (April - June) to determine the potential environmental effects of the proposed projects on special status plants and sensitive natural communities following recommended protocols by the Department of Fish and Wildlife. | Project Developer is the responsible party. Qualified Biologist City of Rancho Mirage | Prior to commencement of Construction | |
| CULTURAL RESOURCES | | | |
| No Mitigation was required. | | | |
| GEOLOGY AND SOILS | | | |
| No Mitigation was required. | | | |
| GREENHOUSE GAS EMISSIONS | | | |
| No Mitigation was required. | | | |
| HAZARDS AND HAZARDOUS MATERIALS | | | |
| No Mitigation was required. | | | |
| HYDROLOGY AND WATER QUALITY | | | |
| No Mitigation was required. | | | |



| LAND USE AND PLANNING | | | |
|--|-----------------------|---|--|
| No Mitigation was required. | | | |
| MINERAL RESOURCES | | | |
| No Mitigation was required. | | | |
| NOISE | | | |
| No Mitigation was required. | | | |
| POPULATION AND HOUSING | | | |
| No Mitigation was required. | | | |
| PUBLIC SERVICES | | | |
| No Mitigation was required. | | | |
| RECREATION | | | |
| No Mitigation was required. | | | |
| TRANSPORTATION/TRAFFIC | | | |
| No Mitigation was required. | | | |
| TRIBAL CULTURAL RESOURCES | | | |
| <p>The Agua Caliente Band of Cahuilla Indians (ACBCI) Tribal Historic Preservation Office (THPO) requests the following tribal cultural mitigation measures:</p> <p>Tribal Cultural Resources Mitigation Measures No. 1. The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities (including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior's Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office.</p> | City of Rancho Mirage | Prior to commencement of construction and ends when construction is complete. | |
| UTILITIES AND SERVICE SYSTEMS | | | |
| No Mitigation was required. | | | |
| WILDFIRE | | | |
| No Mitigation was required. | | | |



THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK.



CHAPTER 3: REFERENCES

The references that were consulted have been identified under each section.

CHAPTER 4: APPENDICES

Appendix A – Air Quality Worksheets

Appendix B – Biological Study

Appendix C – Cultural Study

Appendix D – Energy & Utilities Worksheets

Appendix E – Tribal Consultation Letters

Appendix F – Hydrology Study

CHAPTER 5: REPORT PREPARERS

Lead Agency

City of Rancho Mirage
69-825 Highway 111
Rancho Mirage, California 92270

Subconsultants

Blodgett Baylosis Environmental Planning
2211 S. Hacienda Boulevard, Suite 107
Hacienda Heights, California 91745
(626) 336-0033
Marc Blodgett, Project Principal
Raymond Wen, Project Manager & GIS Technician

RCA Associates, Inc.
15555 Main Street, #D4-235
Hesperia, California 92345
(760) 596-0017
Ryan Hunter, Senior Environmental Scientist/Biologist
Brian Bunyi, Environmental Scientist/Wildlife Biologist

CRM Tech
1016 East Cooley Drive, Suite A/B
Colton, CA 92324
Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator



THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK.



APPENDIX A – AIR QUALITY WORKSHEETS

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

RNCH 002

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|-----------------------|------|---------------|-------------|--------------------|------------|
| Single Family Housing | 9.00 | Dwelling Unit | 2.92 | 16,200.00 | 26 |

1.2 Other Project Characteristics

| | | | | | |
|-------------------------|----------------------------|-------------------------|-------|---------------------------|-------|
| Urbanization | Urban | Wind Speed (m/s) | 2.2 | Precipitation Freq (Days) | 31 |
| Climate Zone | 10 | | | Operational Year | 2026 |
| Utility Company | Southern California Edison | | | | |
| CO2 Intensity (lb/MWhr) | 390.98 | CH4 Intensity (lb/MWhr) | 0.033 | N2O Intensity (lb/MWhr) | 0.004 |

1.3 User Entered Comments & Non-Default Data

Project Characteristics -
Land Use -

| Table Name | Column Name | Default Value | New Value |
|------------|-------------|---------------|-----------|
|------------|-------------|---------------|-----------|

2.0 Emissions Summary

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**2.1 Overall Construction (Maximum Daily Emission)****Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|----------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|------------------------|------------------------|---------------|--------------------|------------------------|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2024 | 10.3205 | 13.9116 | 14.2122 | 0.0255 | 7.1944 | 0.6319 | 7.7672 | 3.4544 | 0.5902 | 3.9814 | 0.0000 | 2,450.504 4 | 2,450.504 4 | 0.7694 | 3.4300e-003 | 2,470.241 7 |
| 2025 | 10.3104 | 1.1472 | 1.8396 | 3.0600e-003 | 0.0112 | 0.0516 | 0.0627 | 2.9600e-003 | 0.0516 | 0.0545 | 0.0000 | 290.7273 | 290.7273 | 0.0156 | 2.0000e-004 | 291.1746 |
| Maximum | 10.3205 | 13.9116 | 14.2122 | 0.0255 | 7.1944 | 0.6319 | 7.7672 | 3.4544 | 0.5902 | 3.9814 | 0.0000 | 2,450.504 4 | 2,450.504 4 | 0.7694 | 3.4300e-003 | 2,470.241 7 |

Mitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|----------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|------------------------|------------------------|---------------|--------------------|------------------------|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2024 | 10.3205 | 13.9116 | 14.2122 | 0.0255 | 7.1944 | 0.6319 | 7.7672 | 3.4544 | 0.5902 | 3.9814 | 0.0000 | 2,450.504 4 | 2,450.504 4 | 0.7694 | 3.4300e-003 | 2,470.241 7 |
| 2025 | 10.3104 | 1.1472 | 1.8396 | 3.0600e-003 | 0.0112 | 0.0516 | 0.0627 | 2.9600e-003 | 0.0516 | 0.0545 | 0.0000 | 290.7273 | 290.7273 | 0.0156 | 2.0000e-004 | 291.1746 |
| Maximum | 10.3205 | 13.9116 | 14.2122 | 0.0255 | 7.1944 | 0.6319 | 7.7672 | 3.4544 | 0.5902 | 3.9814 | 0.0000 | 2,450.504 4 | 2,450.504 4 | 0.7694 | 3.4300e-003 | 2,470.241 7 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

[illegible]

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**2.2 Overall Operational****Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------------|-----------------|-----------------|---------------|---------------|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 2.7291 | 0.1953 | 5.3188 | 0.0117 | | 0.6916 | 0.6916 | | 0.6916 | 0.6916 | 84.3023 | 163.3370 | 247.6392 | 0.2527 | 5.7200e-003 | 255.6615 |
| Energy | 7.5200e-003 | 0.0643 | 0.0274 | 4.1000e-004 | | 5.2000e-003 | 5.2000e-003 | | 5.2000e-003 | 5.2000e-003 | | 82.0572 | 82.0572 | 1.5700e-003 | 1.5000e-003 | 82.5448 |
| Mobile | 0.2386 | 0.2455 | 2.3799 | 5.5300e-003 | 0.6182 | 3.8500e-003 | 0.6221 | 0.1648 | 3.5800e-003 | 0.1683 | | 564.3790 | 564.3790 | 0.0341 | 0.0230 | 572.0782 |
| Total | 2.9752 | 0.5050 | 7.7260 | 0.0177 | 0.6182 | 0.7007 | 1.3189 | 0.1648 | 0.7004 | 0.8651 | 84.3023 | 809.7731 | 894.0754 | 0.2884 | 0.0302 | 910.2845 |

Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------------|-----------------|-----------------|---------------|---------------|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 2.7291 | 0.1953 | 5.3188 | 0.0117 | | 0.6916 | 0.6916 | | 0.6916 | 0.6916 | 84.3023 | 163.3370 | 247.6392 | 0.2527 | 5.7200e-003 | 255.6615 |
| Energy | 7.5200e-003 | 0.0643 | 0.0274 | 4.1000e-004 | | 5.2000e-003 | 5.2000e-003 | | 5.2000e-003 | 5.2000e-003 | | 82.0572 | 82.0572 | 1.5700e-003 | 1.5000e-003 | 82.5448 |
| Mobile | 0.2386 | 0.2455 | 2.3799 | 5.5300e-003 | 0.6182 | 3.8500e-003 | 0.6221 | 0.1648 | 3.5800e-003 | 0.1683 | | 564.3790 | 564.3790 | 0.0341 | 0.0230 | 572.0782 |
| Total | 2.9752 | 0.5050 | 7.7260 | 0.0177 | 0.6182 | 0.7007 | 1.3189 | 0.1648 | 0.7004 | 0.8651 | 84.3023 | 809.7731 | 894.0754 | 0.2884 | 0.0302 | 910.2845 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|-------------------|------|------|------|------|---------------|--------------|------------|----------------|---------------|-------------|----------|----------|-----------|------|------|------|
| Percent Reduction | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

3.0 Construction Detail**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|--------------|-----------------------|-----------------------|------------|------------|---------------|----------|-------------------|
| 1 | Demolition | Demolition | 1/1/2024 | 1/26/2024 | 5 | 20 | |
| 2 | Site Preparation | Site Preparation | 1/27/2024 | 1/31/2024 | 5 | 3 | |
| 3 | Grading | Grading | 2/1/2024 | 2/8/2024 | 5 | 6 | |
| 4 | Building Construction | Building Construction | 2/9/2024 | 12/12/2024 | 5 | 220 | |
| 5 | Paving | Paving | 12/13/2024 | 12/26/2024 | 5 | 10 | |
| 6 | Architectural Coating | Architectural Coating | 12/27/2024 | 1/9/2025 | 5 | 10 | |

Acres of Grading (Site Preparation Phase): 4.5**Acres of Grading (Grading Phase): 6****Acres of Paving: 0****Residential Indoor: 32,805; Residential Outdoor: 10,935; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|-----------------------|--------------------------|--------|-------------|-------------|-------------|
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Paving | Cement and Mortar Mixers | 1 | 8.00 | 9 | 0.56 |
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Building Construction | Cranes | 1 | 8.00 | 231 | 0.29 |
| Building Construction | Forklifts | 2 | 7.00 | 89 | 0.20 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

| | | | | | |
|-----------------------|---------------------------|---|------|-----|------|
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Site Preparation | Graders | 1 | 8.00 | 187 | 0.41 |
| Paving | Pavers | 1 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 1 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Demolition | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Site Preparation | Scrapers | 1 | 8.00 | 367 | 0.48 |
| Building Construction | Tractors/Loaders/Backhoes | 1 | 6.00 | 97 | 0.37 |
| Demolition | Tractors/Loaders/Backhoes | 3 | 8.00 | 97 | 0.37 |
| Grading | Tractors/Loaders/Backhoes | 2 | 7.00 | 97 | 0.37 |
| Paving | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Site Preparation | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 3 | 8.00 | 46 | 0.45 |

Trips and VMT

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|-----------------------|-------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|---------------------|----------------------|----------------------|-----------------------|
| Demolition | 5 | 13.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Site Preparation | 3 | 8.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 4 | 10.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 8 | 3.00 | 1.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 15.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 1.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |

3.1 Mitigation Measures Construction

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.2 Demolition - 2024****Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|----------------|----------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.4397 | 13.8867 | 13.4879 | 0.0241 | | 0.6311 | 0.6311 | | 0.5895 | 0.5895 | | 2,324.945 9 | 2,324.945 9 | 0.5884 | | 2,339.656 2 |
| Total | 1.4397 | 13.8867 | 13.4879 | 0.0241 | | 0.6311 | 0.6311 | | 0.5895 | 0.5895 | | 2,324.945 9 | 2,324.945 9 | 0.5884 | | 2,339.656 2 |

Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|-----------------|-----------------|--------------------|--------------------|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0387 | 0.0249 | 0.4247 | 1.2400e-003 | 0.1453 | 7.8000e-004 | 0.1461 | 0.0385 | 7.2000e-004 | 0.0393 | | 124.8862 | 124.8862 | 2.8200e-003 | 2.7400e-003 | 125.7721 |
| Total | 0.0387 | 0.0249 | 0.4247 | 1.2400e-003 | 0.1453 | 7.8000e-004 | 0.1461 | 0.0385 | 7.2000e-004 | 0.0393 | | 124.8862 | 124.8862 | 2.8200e-003 | 2.7400e-003 | 125.7721 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.2 Demolition - 2024****Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|----------------|----------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|-------------------|-------------------|---------------|-----|-------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.4397 | 13.8867 | 13.4879 | 0.0241 | | 0.6311 | 0.6311 | | 0.5895 | 0.5895 | 0.0000 | 2,324.9459 | 2,324.9459 | 0.5884 | | 2,339.6562 |
| Total | 1.4397 | 13.8867 | 13.4879 | 0.0241 | | 0.6311 | 0.6311 | | 0.5895 | 0.5895 | 0.0000 | 2,324.9459 | 2,324.9459 | 0.5884 | | 2,339.6562 |

Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|-----------------|-----------------|--------------------|--------------------|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0387 | 0.0249 | 0.4247 | 1.2400e-003 | 0.1453 | 7.8000e-004 | 0.1461 | 0.0385 | 7.2000e-004 | 0.0393 | | 124.8862 | 124.8862 | 2.8200e-003 | 2.7400e-003 | 125.7721 |
| Total | 0.0387 | 0.0249 | 0.4247 | 1.2400e-003 | 0.1453 | 7.8000e-004 | 0.1461 | 0.0385 | 7.2000e-004 | 0.0393 | | 124.8862 | 124.8862 | 2.8200e-003 | 2.7400e-003 | 125.7721 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.3 Site Preparation - 2024****Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 1.5908 | 0.0000 | 1.5908 | 0.1718 | 0.0000 | 0.1718 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.2406 | 13.1186 | 9.5796 | 0.0245 | | 0.4971 | 0.4971 | | 0.4573 | 0.4573 | | 2,373.651 4 | 2,373.651 4 | 0.7677 | | 2,392.843 5 |
| Total | 1.2406 | 13.1186 | 9.5796 | 0.0245 | 1.5908 | 0.4971 | 2.0878 | 0.1718 | 0.4573 | 0.6291 | | 2,373.651 4 | 2,373.651 4 | 0.7677 | | 2,392.843 5 |

Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|----------------|----------------|--------------------|--------------------|----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0238 | 0.0153 | 0.2614 | 7.6000e-004 | 0.0894 | 4.8000e-004 | 0.0899 | 0.0237 | 4.4000e-004 | 0.0242 | | 76.8531 | 76.8531 | 1.7400e-003 | 1.6800e-003 | 77.3982 |
| Total | 0.0238 | 0.0153 | 0.2614 | 7.6000e-004 | 0.0894 | 4.8000e-004 | 0.0899 | 0.0237 | 4.4000e-004 | 0.0242 | | 76.8531 | 76.8531 | 1.7400e-003 | 1.6800e-003 | 77.3982 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.3 Site Preparation - 2024****Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 1.5908 | 0.0000 | 1.5908 | 0.1718 | 0.0000 | 0.1718 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.2406 | 13.1186 | 9.5796 | 0.0245 | | 0.4971 | 0.4971 | | 0.4573 | 0.4573 | 0.0000 | 2,373.651 4 | 2,373.651 4 | 0.7677 | | 2,392.843 5 |
| Total | 1.2406 | 13.1186 | 9.5796 | 0.0245 | 1.5908 | 0.4971 | 2.0878 | 0.1718 | 0.4573 | 0.6291 | 0.0000 | 2,373.651 4 | 2,373.651 4 | 0.7677 | | 2,392.843 5 |

Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|----------------|----------------|--------------------|--------------------|----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0238 | 0.0153 | 0.2614 | 7.6000e-004 | 0.0894 | 4.8000e-004 | 0.0899 | 0.0237 | 4.4000e-004 | 0.0242 | | 76.8531 | 76.8531 | 1.7400e-003 | 1.6800e-003 | 77.3982 |
| Total | 0.0238 | 0.0153 | 0.2614 | 7.6000e-004 | 0.0894 | 4.8000e-004 | 0.0899 | 0.0237 | 4.4000e-004 | 0.0242 | | 76.8531 | 76.8531 | 1.7400e-003 | 1.6800e-003 | 77.3982 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.4 Grading - 2024****Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 7.0826 | 0.0000 | 7.0826 | 3.4247 | 0.0000 | 3.4247 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.3015 | 13.8178 | 8.6998 | 0.0206 | | 0.5722 | 0.5722 | | 0.5265 | 0.5265 | | 1,995.580 3 | 1,995.580 3 | 0.6454 | | 2,011.715 5 |
| Total | 1.3015 | 13.8178 | 8.6998 | 0.0206 | 7.0826 | 0.5722 | 7.6548 | 3.4247 | 0.5265 | 3.9512 | | 1,995.580 3 | 1,995.580 3 | 0.6454 | | 2,011.715 5 |

Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|----------------|----------------|--------------------|--------------------|----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0298 | 0.0191 | 0.3267 | 9.5000e-004 | 0.1118 | 6.0000e-004 | 0.1124 | 0.0296 | 5.5000e-004 | 0.0302 | | 96.0663 | 96.0663 | 2.1700e-003 | 2.1000e-003 | 96.7477 |
| Total | 0.0298 | 0.0191 | 0.3267 | 9.5000e-004 | 0.1118 | 6.0000e-004 | 0.1124 | 0.0296 | 5.5000e-004 | 0.0302 | | 96.0663 | 96.0663 | 2.1700e-003 | 2.1000e-003 | 96.7477 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.4 Grading - 2024****Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 7.0826 | 0.0000 | 7.0826 | 3.4247 | 0.0000 | 3.4247 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.3015 | 13.8178 | 8.6998 | 0.0206 | | 0.5722 | 0.5722 | | 0.5265 | 0.5265 | 0.0000 | 1,995.580 3 | 1,995.580 3 | 0.6454 | | 2,011.715 5 |
| Total | 1.3015 | 13.8178 | 8.6998 | 0.0206 | 7.0826 | 0.5722 | 7.6548 | 3.4247 | 0.5265 | 3.9512 | 0.0000 | 1,995.580 3 | 1,995.580 3 | 0.6454 | | 2,011.715 5 |

Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|----------------|----------------|--------------------|--------------------|----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0298 | 0.0191 | 0.3267 | 9.5000e-004 | 0.1118 | 6.0000e-004 | 0.1124 | 0.0296 | 5.5000e-004 | 0.0302 | | 96.0663 | 96.0663 | 2.1700e-003 | 2.1000e-003 | 96.7477 |
| Total | 0.0298 | 0.0191 | 0.3267 | 9.5000e-004 | 0.1118 | 6.0000e-004 | 0.1124 | 0.0296 | 5.5000e-004 | 0.0302 | | 96.0663 | 96.0663 | 2.1700e-003 | 2.1000e-003 | 96.7477 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.5 Building Construction - 2024****Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|----------------|----------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.5971 | 12.8235 | 14.1002 | 0.0250 | | 0.5381 | 0.5381 | | 0.5153 | 0.5153 | | 2,289.654 1 | 2,289.654 1 | 0.4265 | | 2,300.315 4 |
| Total | 1.5971 | 12.8235 | 14.1002 | 0.0250 | | 0.5381 | 0.5381 | | 0.5153 | 0.5153 | | 2,289.654 1 | 2,289.654 1 | 0.4265 | | 2,300.315 4 |

Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|----------------|----------------|--------------------|--------------------|----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 1.0800e-003 | 0.0365 | 0.0141 | 1.8000e-004 | 6.4000e-003 | 2.1000e-004 | 6.6200e-003 | 1.8400e-003 | 2.0000e-004 | 2.0500e-003 | | 19.3211 | 19.3211 | 6.6000e-004 | 2.8000e-003 | 20.1723 |
| Worker | 8.9400e-003 | 5.7400e-003 | 0.0980 | 2.9000e-004 | 0.0335 | 1.8000e-004 | 0.0337 | 8.8900e-003 | 1.7000e-004 | 9.0600e-003 | | 28.8199 | 28.8199 | 6.5000e-004 | 6.3000e-004 | 29.0243 |
| Total | 0.0100 | 0.0422 | 0.1121 | 4.7000e-004 | 0.0399 | 3.9000e-004 | 0.0403 | 0.0107 | 3.7000e-004 | 0.0111 | | 48.1410 | 48.1410 | 1.3100e-003 | 3.4300e-003 | 49.1966 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.5 Building Construction - 2024****Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|----------------|----------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.5971 | 12.8235 | 14.1002 | 0.0250 | | 0.5381 | 0.5381 | | 0.5153 | 0.5153 | 0.0000 | 2,289.654 1 | 2,289.654 1 | 0.4265 | | 2,300.315 4 |
| Total | 1.5971 | 12.8235 | 14.1002 | 0.0250 | | 0.5381 | 0.5381 | | 0.5153 | 0.5153 | 0.0000 | 2,289.654 1 | 2,289.654 1 | 0.4265 | | 2,300.315 4 |

Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|----------------|----------------|--------------------|--------------------|----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 1.0800e-003 | 0.0365 | 0.0141 | 1.8000e-004 | 6.4000e-003 | 2.1000e-004 | 6.6200e-003 | 1.8400e-003 | 2.0000e-004 | 2.0500e-003 | | 19.3211 | 19.3211 | 6.6000e-004 | 2.8000e-003 | 20.1723 |
| Worker | 8.9400e-003 | 5.7400e-003 | 0.0980 | 2.9000e-004 | 0.0335 | 1.8000e-004 | 0.0337 | 8.8900e-003 | 1.7000e-004 | 9.0600e-003 | | 28.8199 | 28.8199 | 6.5000e-004 | 6.3000e-004 | 29.0243 |
| Total | 0.0100 | 0.0422 | 0.1121 | 4.7000e-004 | 0.0399 | 3.9000e-004 | 0.0403 | 0.0107 | 3.7000e-004 | 0.0111 | | 48.1410 | 48.1410 | 1.3100e-003 | 3.4300e-003 | 49.1966 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.6 Paving - 2024****Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8425 | 8.1030 | 11.7069 | 0.0179 | | 0.3957 | 0.3957 | | 0.3652 | 0.3652 | | 1,710.202 4 | 1,710.202 4 | 0.5420 | | 1,723.752 9 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Total | 0.8425 | 8.1030 | 11.7069 | 0.0179 | | 0.3957 | 0.3957 | | 0.3652 | 0.3652 | | 1,710.202 4 | 1,710.202 4 | 0.5420 | | 1,723.752 9 |

Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|-----------------|-----------------|--------------------|--------------------|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0447 | 0.0287 | 0.4900 | 1.4300e-003 | 0.1677 | 9.0000e-004 | 0.1686 | 0.0445 | 8.3000e-004 | 0.0453 | | 144.0995 | 144.0995 | 3.2600e-003 | 3.1600e-003 | 145.1216 |
| Total | 0.0447 | 0.0287 | 0.4900 | 1.4300e-003 | 0.1677 | 9.0000e-004 | 0.1686 | 0.0445 | 8.3000e-004 | 0.0453 | | 144.0995 | 144.0995 | 3.2600e-003 | 3.1600e-003 | 145.1216 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.6 Paving - 2024****Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|------------------------|------------------------|---------------|-----|------------------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.8425 | 8.1030 | 11.7069 | 0.0179 | | 0.3957 | 0.3957 | | 0.3652 | 0.3652 | 0.0000 | 1,710.202 4 | 1,710.202 4 | 0.5420 | | 1,723.752 9 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Total | 0.8425 | 8.1030 | 11.7069 | 0.0179 | | 0.3957 | 0.3957 | | 0.3652 | 0.3652 | 0.0000 | 1,710.202 4 | 1,710.202 4 | 0.5420 | | 1,723.752 9 |

Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|---------------|---------------|---------------|--------------------|---------------|--------------------|---------------|----------------|--------------------|---------------|----------|-----------------|-----------------|--------------------|--------------------|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0447 | 0.0287 | 0.4900 | 1.4300e-003 | 0.1677 | 9.0000e-004 | 0.1686 | 0.0445 | 8.3000e-004 | 0.0453 | | 144.0995 | 144.0995 | 3.2600e-003 | 3.1600e-003 | 145.1216 |
| Total | 0.0447 | 0.0287 | 0.4900 | 1.4300e-003 | 0.1677 | 9.0000e-004 | 0.1686 | 0.0445 | 8.3000e-004 | 0.0453 | | 144.0995 | 144.0995 | 3.2600e-003 | 3.1600e-003 | 145.1216 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.7 Architectural Coating - 2024****Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-----------------|----------------|---------------|---------------|--------------------|---------------|---------------|---------------|----------------|---------------|---------------|----------|-----------------|-----------------|---------------|-----|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 10.1368 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.1808 | 1.2188 | 1.8101 | 2.9700e-003 | | 0.0609 | 0.0609 | | 0.0609 | 0.0609 | | 281.4481 | 281.4481 | 0.0159 | | 281.8443 |
| Total | 10.3175 | 1.2188 | 1.8101 | 2.9700e-003 | | 0.0609 | 0.0609 | | 0.0609 | 0.0609 | | 281.4481 | 281.4481 | 0.0159 | | 281.8443 |

Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|--------------------|--------------------|---------------|--------------------|---------------|--------------------|---------------|--------------------|--------------------|--------------------|----------|---------------|---------------|--------------------|--------------------|---------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.9800e-003 | 1.9100e-003 | 0.0327 | 1.0000e-004 | 0.0112 | 6.0000e-005 | 0.0112 | 2.9600e-003 | 6.0000e-005 | 3.0200e-003 | | 9.6066 | 9.6066 | 2.2000e-004 | 2.1000e-004 | 9.6748 |
| Total | 2.9800e-003 | 1.9100e-003 | 0.0327 | 1.0000e-004 | 0.0112 | 6.0000e-005 | 0.0112 | 2.9600e-003 | 6.0000e-005 | 3.0200e-003 | | 9.6066 | 9.6066 | 2.2000e-004 | 2.1000e-004 | 9.6748 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.7 Architectural Coating - 2024****Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-----------------|----------------|---------------|---------------|--------------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|-----------------|-----------------|---------------|-----|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 10.1368 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.1808 | 1.2188 | 1.8101 | 2.9700e-003 | | 0.0609 | 0.0609 | | 0.0609 | 0.0609 | 0.0000 | 281.4481 | 281.4481 | 0.0159 | | 281.8443 |
| Total | 10.3175 | 1.2188 | 1.8101 | 2.9700e-003 | | 0.0609 | 0.0609 | | 0.0609 | 0.0609 | 0.0000 | 281.4481 | 281.4481 | 0.0159 | | 281.8443 |

Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|--------------------|--------------------|---------------|--------------------|---------------|--------------------|---------------|--------------------|--------------------|--------------------|----------|---------------|---------------|--------------------|--------------------|---------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.9800e-003 | 1.9100e-003 | 0.0327 | 1.0000e-004 | 0.0112 | 6.0000e-005 | 0.0112 | 2.9600e-003 | 6.0000e-005 | 3.0200e-003 | | 9.6066 | 9.6066 | 2.2000e-004 | 2.1000e-004 | 9.6748 |
| Total | 2.9800e-003 | 1.9100e-003 | 0.0327 | 1.0000e-004 | 0.0112 | 6.0000e-005 | 0.0112 | 2.9600e-003 | 6.0000e-005 | 3.0200e-003 | | 9.6066 | 9.6066 | 2.2000e-004 | 2.1000e-004 | 9.6748 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.7 Architectural Coating - 2025****Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-----------------|----------------|---------------|---------------|--------------------|---------------|---------------|---------------|----------------|---------------|---------------|----------|-----------------|-----------------|---------------|-----|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 10.1368 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.1709 | 1.1455 | 1.8091 | 2.9700e-003 | | 0.0515 | 0.0515 | | 0.0515 | 0.0515 | | 281.4481 | 281.4481 | 0.0154 | | 281.8319 |
| Total | 10.3076 | 1.1455 | 1.8091 | 2.9700e-003 | | 0.0515 | 0.0515 | | 0.0515 | 0.0515 | | 281.4481 | 281.4481 | 0.0154 | | 281.8319 |

Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|--------------------|--------------------|---------------|--------------------|---------------|--------------------|---------------|--------------------|--------------------|--------------------|----------|---------------|---------------|--------------------|--------------------|---------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.7900e-003 | 1.7200e-003 | 0.0304 | 9.0000e-005 | 0.0112 | 6.0000e-005 | 0.0112 | 2.9600e-003 | 5.0000e-005 | 3.0200e-003 | | 9.2792 | 9.2792 | 2.0000e-004 | 2.0000e-004 | 9.3428 |
| Total | 2.7900e-003 | 1.7200e-003 | 0.0304 | 9.0000e-005 | 0.0112 | 6.0000e-005 | 0.0112 | 2.9600e-003 | 5.0000e-005 | 3.0200e-003 | | 9.2792 | 9.2792 | 2.0000e-004 | 2.0000e-004 | 9.3428 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.7 Architectural Coating - 2025****Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-----------------|----------------|---------------|---------------|--------------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|-----------------|-----------------|---------------|-----|-----------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 10.1368 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.1709 | 1.1455 | 1.8091 | 2.9700e-003 | | 0.0515 | 0.0515 | | 0.0515 | 0.0515 | 0.0000 | 281.4481 | 281.4481 | 0.0154 | | 281.8319 |
| Total | 10.3076 | 1.1455 | 1.8091 | 2.9700e-003 | | 0.0515 | 0.0515 | | 0.0515 | 0.0515 | 0.0000 | 281.4481 | 281.4481 | 0.0154 | | 281.8319 |

Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|--------------|--------------------|--------------------|---------------|--------------------|---------------|--------------------|---------------|--------------------|--------------------|--------------------|----------|---------------|---------------|--------------------|--------------------|---------------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.7900e-003 | 1.7200e-003 | 0.0304 | 9.0000e-005 | 0.0112 | 6.0000e-005 | 0.0112 | 2.9600e-003 | 5.0000e-005 | 3.0200e-003 | | 9.2792 | 9.2792 | 2.0000e-004 | 2.0000e-004 | 9.3428 |
| Total | 2.7900e-003 | 1.7200e-003 | 0.0304 | 9.0000e-005 | 0.0112 | 6.0000e-005 | 0.0112 | 2.9600e-003 | 5.0000e-005 | 3.0200e-003 | | 9.2792 | 9.2792 | 2.0000e-004 | 2.0000e-004 | 9.3428 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-------------|--------|--------|--------|-------------|---------------|--------------|------------|----------------|---------------|-------------|----------|-----------|-----------|--------|--------|----------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 0.2386 | 0.2455 | 2.3799 | 5.5300e-003 | 0.6182 | 3.8500e-003 | 0.6221 | 0.1648 | 3.5800e-003 | 0.1683 | | 564.3790 | 564.3790 | 0.0341 | 0.0230 | 572.0782 |
| Unmitigated | 0.2386 | 0.2455 | 2.3799 | 5.5300e-003 | 0.6182 | 3.8500e-003 | 0.6221 | 0.1648 | 3.5800e-003 | 0.1683 | | 564.3790 | 564.3790 | 0.0341 | 0.0230 | 572.0782 |

4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|-----------------------|-------------------------|----------|--------|-------------|------------|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Single Family Housing | 84.96 | 85.86 | 76.95 | 286,850 | 286,850 |
| Total | 84.96 | 85.86 | 76.95 | 286,850 | 286,850 |

4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|-----------------------|------------|------------|-------------|------------|------------|-------------|----------------|----------|---------|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Single Family Housing | 14.70 | 5.90 | 8.70 | 40.20 | 19.20 | 40.60 | 86 | 11 | 3 |

4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Single Family Housing | 0.540893 | 0.062748 | 0.186142 | 0.127785 | 0.023768 | 0.006610 | 0.012333 | 0.009205 | 0.000817 | 0.000491 | 0.024860 | 0.000754 | 0.003594 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|------------------------|-------------|--------|--------|-------------|---------------|--------------|-------------|----------------|---------------|-------------|----------|-----------|-----------|-------------|-------------|---------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| NaturalGas Mitigated | 7.5200e-003 | 0.0643 | 0.0274 | 4.1000e-004 | | 5.2000e-003 | 5.2000e-003 | | 5.2000e-003 | 5.2000e-003 | | 82.0572 | 82.0572 | 1.5700e-003 | 1.5000e-003 | 82.5448 |
| NaturalGas Unmitigated | 7.5200e-003 | 0.0643 | 0.0274 | 4.1000e-004 | | 5.2000e-003 | 5.2000e-003 | | 5.2000e-003 | 5.2000e-003 | | 82.0572 | 82.0572 | 1.5700e-003 | 1.5000e-003 | 82.5448 |

5.2 Energy by Land Use - NaturalGas

Unmitigated

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-----------------------|----------------|-------------|--------|--------|-------------|---------------|--------------|-------------|----------------|---------------|-------------|----------|-----------|-----------|-------------|-------------|---------|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Single Family Housing | 697.486 | 7.5200e-003 | 0.0643 | 0.0274 | 4.1000e-004 | | 5.2000e-003 | 5.2000e-003 | | 5.2000e-003 | 5.2000e-003 | | 82.0572 | 82.0572 | 1.5700e-003 | 1.5000e-003 | 82.5448 |
| Total | | 7.5200e-003 | 0.0643 | 0.0274 | 4.1000e-004 | | 5.2000e-003 | 5.2000e-003 | | 5.2000e-003 | 5.2000e-003 | | 82.0572 | 82.0572 | 1.5700e-003 | 1.5000e-003 | 82.5448 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-----------------------|----------------|--------------------|---------------|---------------|--------------------|---------------|--------------------|--------------------|----------------|--------------------|--------------------|----------|----------------|----------------|--------------------|--------------------|----------------|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| Single Family Housing | 0.697486 | 7.5200e-003 | 0.0643 | 0.0274 | 4.1000e-004 | | 5.2000e-003 | 5.2000e-003 | | 5.2000e-003 | 5.2000e-003 | | 82.0572 | 82.0572 | 1.5700e-003 | 1.5000e-003 | 82.5448 |
| Total | | 7.5200e-003 | 0.0643 | 0.0274 | 4.1000e-004 | | 5.2000e-003 | 5.2000e-003 | | 5.2000e-003 | 5.2000e-003 | | 82.0572 | 82.0572 | 1.5700e-003 | 1.5000e-003 | 82.5448 |

6.0 Area Detail

6.1 Mitigation Measures Area

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-------------|--------|--------|--------|--------|---------------|--------------|------------|----------------|---------------|-------------|----------|-----------|-----------|--------|-------------|----------|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 2.7291 | 0.1953 | 5.3188 | 0.0117 | | 0.6916 | 0.6916 | | 0.6916 | 0.6916 | 84.3023 | 163.3370 | 247.6392 | 0.2527 | 5.7200e-003 | 255.6615 |
| Unmitigated | 2.7291 | 0.1953 | 5.3188 | 0.0117 | | 0.6916 | 0.6916 | | 0.6916 | 0.6916 | 84.3023 | 163.3370 | 247.6392 | 0.2527 | 5.7200e-003 | 255.6615 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**6.2 Area by SubCategory****Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------------|-----------------|-----------------|---------------|--------------------|-----------------|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.0278 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 0.3208 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 2.3583 | 0.1867 | 4.5770 | 0.0117 | | 0.6875 | 0.6875 | | 0.6875 | 0.6875 | 84.3023 | 162.0000 | 246.3023 | 0.2514 | 5.7200e-003 | 254.2925 |
| Landscaping | 0.0223 | 8.5400e-003 | 0.7418 | 4.0000e-005 | | 4.1200e-003 | 4.1200e-003 | | 4.1200e-003 | 4.1200e-003 | | 1.3370 | 1.3370 | 1.2800e-003 | | 1.3690 |
| Total | 2.7291 | 0.1953 | 5.3188 | 0.0117 | | 0.6916 | 0.6916 | | 0.6916 | 0.6916 | 84.3023 | 163.3370 | 247.6392 | 0.2527 | 5.7200e-003 | 255.6615 |

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**6.2 Area by SubCategory****Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|----------------|-----------------|-----------------|---------------|--------------------|-----------------|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.0278 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 0.3208 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 2.3583 | 0.1867 | 4.5770 | 0.0117 | | 0.6875 | 0.6875 | | 0.6875 | 0.6875 | 84.3023 | 162.0000 | 246.3023 | 0.2514 | 5.7200e-003 | 254.2925 |
| Landscaping | 0.0223 | 8.5400e-003 | 0.7418 | 4.0000e-005 | | 4.1200e-003 | 4.1200e-003 | | 4.1200e-003 | 4.1200e-003 | | 1.3370 | 1.3370 | 1.2800e-003 | | 1.3690 |
| Total | 2.7291 | 0.1953 | 5.3188 | 0.0117 | | 0.6916 | 0.6916 | | 0.6916 | 0.6916 | 84.3023 | 163.3370 | 247.6392 | 0.2527 | 5.7200e-003 | 255.6615 |

7.0 Water Detail**7.1 Mitigation Measures Water**

RNCH 002 - South Coast AQMD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

| | | | | | | |
|----------------|--------|-----------|-----------|-------------|-------------|-----------|
| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|----------------|--------|-----------|-----------|-------------|-------------|-----------|

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

| | | | | | | |
|----------------|--------|-----------|------------|-------------|-------------|-----------|
| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|----------------|--------|-----------|------------|-------------|-------------|-----------|

Boilers

| | | | | | |
|----------------|--------|----------------|-----------------|---------------|-----------|
| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|----------------|--------|----------------|-----------------|---------------|-----------|

User Defined Equipment

| | |
|----------------|--------|
| Equipment Type | Number |
|----------------|--------|

11.0 Vegetation



APPENDIX B – BIOLOGICAL STUDY

GENERAL BIOLOGICAL RESOURCES ASSESSMENT

**RANCHO MIRAGE, RIVERSIDE COUNTY, CALIFORNIA
(Township 4 South, Range 6 East, Section 30)
(APN: 685-100-011)**

Prepared for:

**Fomotor Engineering
225 S. Civic Drive, Suite 1-5
Palm Springs, CA 92262**

Prepared by:

**RCA Associates, Inc.
15555 Main Street, #D4-235
Hesperia, California 92345
(760) 596-0017**

Principal Investigators:

**Ryan Hunter, Senior Environmental Scientist/Biologist
Brian Bunyi, Environmental Scientist/Wildlife Biologist**



Project: #2022-161 BA

October 13, 2022

TITLE PAGE

Date Report Written: October 13, 2022

Date Field Work Completed: October 4, 2022

Report Title: General Biological Resources Assessment

Project Location: Rancho Mirage, California
APN: 685-100-011

Prepared for: Fomotor Engineering

Principal Investigators: Ryan Hunter, Senior Environmental Scientist/Biologist
Brian Bunyi, Environmental Scientist/Wildlife Biologist

Contact Information:

Randall C. Arnold, Jr.
RCA Associates, Inc.
15555 Main Street, #D4-235
Hesperia, California 92345
(760) 596-0017
rarnold@rcaassociatesllc.com
www.rcaassociatesllc.com

Ryan D. Hunter
RCA Associates, Inc.
15555 Main Street, #D4-235
Hesperia, CA 92345
(760) 998-9165
rhunter@rcaassociatesllc.com
www.rcaassociatesllc.com

Table of Contents

| | | |
|-----|---|----|
| 1.0 | INTRODUCTION AND SUMMARY | 1 |
| 2.0 | EXISTING CONDITIONS..... | 2 |
| 3.0 | METHODOLOGIES | 4 |
| 4.0 | LITERATURE SEARCH | 5 |
| 5.0 | RESULTS | 8 |
| 5.1 | General Biological Resources | 8 |
| 5.2 | Federal and State Listed Species | 9 |
| 5.3 | Species of Special Concern | 9 |
| 5.4 | Jurisdictional Waters and Riparian Habitat..... | 9 |
| 5.5 | Protected Plants | 10 |
| 6.0 | IMPACTS AND MITIGATION MEASURES | 11 |
| 6.1 | General Biological Resources | 11 |
| 6.2 | Federal and State Listed and Species of Special Concern | 11 |
| 7.0 | CONCLUSIONS AND CONSIDERATIONS | 12 |
| 8.0 | BIBLIOGRAPHY | 13 |
| | CERTIFICATION | 15 |

Appendix A – Tables and Figures
REGULATORY CONTEXT

1.0 INTRODUCTION AND SUMMARY

Biological surveys were conducted on a 5.0-acre parcel (Approximate), located on the southwest corner of the intersection of Via Florencia and Via Josefina in the City of Rancho Mirage, California (Township 4 South, Range 6 East, Section 30, USGS Cathedral City, California Quadrangle, 1956) (Figures 1 and 2). The property is located in an area zoned for very low density usage (RL-2) in Rancho Mirage, California.

As part of the environmental process, California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS) data sources were reviewed. Following the data review, surveys were performed on the site on October 4, 2022, during which the biological resources on the site and in the surrounding areas were documented by biologists from RCA Associates, Inc. As part of the surveys, the property and adjoining areas were evaluated for the presence of native habitats which may support populations of sensitive wildlife species. The property was also evaluated for the presence of sensitive habitats including wetlands, vernal pools, riparian habitats, and jurisdictional areas.

Habitat assessments were also conducted for the desert tortoise and burrowing owl. Based on data from USFWS, CDFW, and a search of the California Natural Diversity Database (CNDDDB, 2022). Scientific nomenclature for this report is based on the following references: Hickman (1993), Munz (1974), Stebbins (2003), Sibley (2016) and Whitaker (1980).

2.0 EXISTING CONDITIONS

The property is approximately 5.0-acres and is located the southeast of the intersection of Via Florencia and Via Josefina in the City of Rancho Mirage, California (APN: 685-100-011). The site is located in Section 30, Township 4 South, Range 6 East (USGS Cathedral City, CA 7.5-minute quadrangle) (Figures 1 and 2). Vacant land surrounds the property in the north, east and west while a community of homes lines the southern border of the property.

The relatively flat site is approximately 94 meters above sea level and contains no slope. The vegetation community present on site supports a heavily disturbed sparse desert scrub habitat encompassing mainly native plants and some non-native grasses. The site contains a few species of plant which include the creosote bush (*Larrea tridentata*), Asian mustard (*Brassica tournefortii*), Schott's Dalea (*Psoralea schottii*), Flatspine burr ragweed (*Ambrosia acanthicarpa*) and cheatgrass (*Bromus tectorum*). Section 5.0 provides a more detailed discussion of the various plant species observed during the surveys.

The site supports a minimal amount of wildlife, with many of them being birds. Species that were not observed, but are expected to occur on site given their abundance in the surrounding areas include California ground squirrel (*Otospermophilus beecheyi*) and antelope ground squirrel (*Ammospermophilus leucurus*).

Birds observed included common ravens (*Corvus corax*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), red-tailed hawk (*Buteo jamaicensis*), black phoebe (*Sayornis nigricans*), greater road runner (*Geococcyx californianus*) and rock pigeon (*Columba livia*). Section 5.0 provides a more detailed discussion of the various species observed during the surveys.

No reptiles were observed during the field investigation, however there were a number of reptile tracks along the property and we can assume that they are present in the area. Species that are expected to occur on site include the western whiptail lizard (*Cnemidophorus tigris*) and common side-blotched lizard (*Uta stansburiana*). Table 2 provides a compendium of wildlife species.

There were no observations that indicated that a potential channel is present on the site. It is the opinion of RCA Associates, Inc. that no additional surveys will be required at this time.

In addition, no sensitive habitats (e.g., sensitive species, critical habitats, etc.) have been documented in the immediate area according to the CNDDDB (2022) and none were observed during the field investigations.

3.0 METHODOLOGIES

General biological surveys were conducted on October 4, 2022, during which biologists from RCA Associates, Inc. initially walked meandering transects throughout the property. During the surveys, data was collected on the plant and animal species present on the site. All plants and animals detected during the surveys were recorded and are provided in Tables 1 & 2 (Appendix A). The property was also evaluated for the presence of habitats which might support sensitive species. Scientific nomenclature for this report is based on the following references: Hickman (1993), Munz (1974), Stebbins (2003), Sibley (2016) and Whitaker (1980). Following completion of the initial reconnaissance survey, habitat assessments were conducted for the desert tortoise and burrowing owl. Weather conditions consisted of wind speeds of 0 to 5 mph, temperatures in the low to mid 80's (°F) (AM), and 0% cloud cover. The applicable methodologies are summarized below.

General Plant and Animal Surveys: Meandering transects were walked on the site and in surrounding areas (i.e., the zone of influence) where accessible at a pace that allowed for careful documentation of the plant and animal species present on the site. All plants observed were identified in the field or sampled and brought back for further identification. Wildlife was identified through visual observations and/or by vocalizations. Habitat assessments were conducted for the desert tortoise and burrowing owl. Tables 1 and 2 (Appendix A) provides a comprehensive compendium of the various plant and animal; species observed during the field investigations.

4.0 LITERATURE SEARCH

As part of the environmental process, a search of the California Natural Diversity Database (CNDDDB) search was performed. Based on this review, it was determined that sixteen special status species have been documented within the Cathedral City quad of the property. The following tables provide data on each special status species which has been documented in the area.

Table 4-1: Federal and State Listed Species and State Species of Special Concern.

E = Endangered; T = Threatened; SSC = Species of special concern; CNPS = California Native Plant Society; CNDDDB = California Natural Diversity Data Base

| NAME | STATUS | HABITAT REQUIREMENTS | PRESENCE/ ABSENCE ON PROPERTY |
|--|--|-----------------------------------|---|
| Plant Species | | | |
| Within Cathedral City Quadrangle | | | |
| Chaparral sand-verbena (<i>Abronia villosa</i> var. <i>aurita</i>) | Federal: None State: None CNPS: 1B.1 | Desert Scrub | The site does not support suitable habitat for the species; and none were observed during field surveys. |
| Horn's milk-vetch (<i>Diplacus mohavensis</i>) | Federal: None State: None CNPS: 1B.1 | Alkali Sink, wetland-riparian | Site does not support minimum suitable habitat for the species; and no species were observed during the field survey. |
| Coachella Valley milk-vetch (<i>Astragalus lentiginosus</i> var. <i>coachellae</i>) | Federal: Endangered State: None CNPS: 1B.2 | Creosote Bush Scrub | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |
| Arizona spurge (<i>Euphorbia arizonica</i>) | Federal: None State: None CNPS: 2B.3 | Desert Habitat with compact soils | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |
| Flat-seeded spurge (<i>Euphorbia platysperma</i>) | Federal: None State: None CNPS: 1B.2 | Creosote Bush Scrub | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |
| Slender cottonheads (<i>Nemacaulis denudata</i> var. <i>gracilis</i>) | Federal: None State: None CNPS: 2B.2 | Dunes and sandy areas | The site does support minimum suitable habitat for the species; however none were observed during field surveys. |

| | | | |
|--|--|---|--|
| Desert spike-moss (<i>Selaginella eremophila</i>) | Federal: None State: None CNPS: 2B.2 | Rocky and sandy slopes, in open rock or crevices, on rock or terrestrial. | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |
| Purple stemodia (<i>Stemodia durantifolia</i>) | Federal: None State: None CNPS: 2B.1 | wetland-riparian | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |

Notes:

Status abbreviations:

- CNPS List 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
- CNPS List 1B: Plants rare, threatened, or endangered in California and elsewhere
- CNPS List 2A: Plants presumed extirpated in California, but more common somewhere else
- CNPS List 2B: Plants rare, threatened, or endangered in California, but more common somewhere else
- CNPS List 3: Plants about which more information is needed - a review list
- CNPS List 4: Plants of limited distribution - a watch list
 - .1 Seriously threatened in California (over 80% of occurrences threatened/ high degree and immediacy of threat)
 - .2 Moderately threatened in California (20-80% occurrences threatened/ moderate degree and immediacy of threat)
 - .3 Not very threatened in California (<20% of occurrences threatened/ low degree and immediacy of threat or no current threats known)

| NAME | STATUS | HABITAT REQUIREMENTS | PRESENCE/ ABSENCE ON PROPERTY |
|--|---|--------------------------------|--|
| Wildlife Species | | | |
| Within Cathedral City Quadrangle | | | |
| Western yellow bat (<i>Lasiurus xanthinus</i>) | Federal: None State: None CDFW: SSC | Riparian woodland | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |
| Burrowing owl (<i>Athene cunicularia</i>) | Federal: None State: None CDFW: SSC | Grasslands and desert habitats | The site does not support minimal suitable habitat for the species and no owls or owl sign, or suitable burrows, were observed during field surveys. |
| Casey's June beetle (<i>Dinacoma caseyi</i>) | Federal: Endangered State: None | Alluvial habitat | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |

| | | | |
|--|---|--|--|
| Flat-tailed horned lizard (<i>Phrynosoma mcallii</i>) | Federal: None State: None CDFW: SSC | Sandy desert hardpan or gravel flats | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |
| Le Conte's thrasher (<i>Toxostoma lecontei</i>) | Federal: None State: None CDFW: SSC | Desert scrub | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |
| Coastal California gnatcatcher (<i>Poliophtila californica californica</i>) | Federal: Threatened State: None CDFW: SSC | Coastal sage scrub | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |
| Coachella Valley fringe-toed lizard (<i>Uma inornate</i>) | Federal: Threatened State: Endangered | Sandy desert habitat | The site does support minimum suitable habitat for the species; However, none were observed during field surveys. |
| Palm Springs round-tailed ground squirrel (<i>Xerospermophilus tereticaudus chlorus</i>) | Federal: None State: None CDFW: SSC | Desert succulent shrub, desert wash, desert scrub, alkali desert scrub, and levees in cropland habitat. | The site does not support minimum suitable habitat for the species; and none were observed during field surveys. |

5.0 RESULTS

5.1 General Biological Resources

The site supports a heavily disturbed desert scrub community which sparsely covers the property (Figure 3). Species present on the site included kelch grass (*Schismus barbatus*), creosote bush (*Larrea tridentata*) and Schott's Dalea (*Psorothamnus schottii*). Table 1 provides a compendium of all plants occurring on the site and/or in the immediate surrounding area.

Birds observed included ravens (*Corvus corax*), rock pigeon (*Columba livia*), mourning dove (*Zenaida macroura*), greater road runner (*Geococcyx californianus*) and house finch (*Haemorhous mexicanus*). Table 2 provides a complete compendium of wildlife species occurring on site or in the surrounding area

No mammals were seen during the October 2022 survey. Although the Antelope Ground squirrel (*Ammospermophilus leucurus*) were not present during the field investigation we can assume they are in the area due to current conditions and population distributions. Other wildlife species that may occur on site include desert cottontails (*Sylvilagus audubonii*) and California ground squirrels (*Otospermophilus beecheyi*), and Merriam's kangaroo rats (*Dipodomys merriami*) may also occur on the site given their wide-spread distribution in the region. Tables 1 and 2 (Appendix A) provides a compendium of the various plant and animal species identified during the field investigations and those common to the area. No distinct wildlife corridors were identified on the site or in the immediate area.

No reptiles were observed on site during the October 2022 field investigations. However, some reptiles that may inhabit the site include the Western Whiptail Lizard (*Cnemidophorus tigris*) and Side-blotched lizard (*Uta stansburiana*).

No sensitive habitats (e.g., wetlands, vernal pools, critical habitats for sensitive species, etc.) were observed on the site during the field investigations.

The following are the listed and special status species that have the ability to occur on the project site. It is not a comprehensive list of all the species in the quad. This information has been taken from the California Natural Diversity Database and is using the most current version.

5.2 Federal and State Listed Species

Desert Tortoise: The site is located within the documented tortoise, a state and federal threatened species, habitat according to CNDDDB (2022). The property supports no suitable habitat for the desert tortoise based on the location of the site in a developed area of Rancho Mirage. No tortoises were observed anywhere within the property boundaries during the October 4, 2022 surveys. The species is not expected to move onto the site in the near future based on the absence of any potential burrows or sign, absence of any recent observations in the immediate area, and the presence of busy roadways and developments in the immediate area which may act as barriers to migration of tortoises. The protocol survey results are valid for one year as per CDFW and USFWS requirements.

5.3 Species of Special Concern

Burrowing Owl: The site is located within documented burrowing owl habitat according to CNDDDB (2022). No owls were seen on the property during the survey, and minimal suitable habitat was observed. Burrowing owls are not expected to occur on the site due to lack of suitable vegetation and burrows.

Coachella Valley fringe-toed lizard: Coachella Valley fringe-toed lizard have not been recently observed in the area according to CNDDDB (2022). The lizards are not expected to occur on the site due to its location being bordered by numerous developments and roadways that act as natural barriers to entry. The Coachella Valley fringe-toed lizard may be very infrequent in this specific area due to the area being highly developed and the amount of human traffic around the project site.

5.4 Jurisdictional Waters and Riparian Habitat

No riparian vegetation (e.g., cottonwoods, willows, etc.) exist on the site. No potential channels were observed on the property and it is the opinion of RCA Associates that no further surveys will be necessary.

5.5 Protected Plants

As of September 22, 2020, the California Department of Fish and Wildlife temporarily listed the western Joshua tree (*Yucca brevifolia*) as an endangered species until a final decision is made in 2022. Joshua trees were not observed on site during the October 4, 2022 field investigations.

6.0 IMPACTS AND MITIGATION MEASURES

6.1 General Biological Resources

Future development of the site will impact the general biological resources present on site, because most if not all of the vegetation will be removed during future construction activities. The site is expected to support very few wildlife species which will be impacted by development activities. Those species with limited mobility (i.e., small mammals and reptiles) will experience increases in mortality during the construction phase. However, more mobile species (i.e., birds, large mammals) will be displaced into adjacent areas and will likely experience minimal impacts. Therefore, loss of about 5.0-acres of a relatively disturbed desert scrub habitat is not expected to have a significant cumulative impact on the overall biological resources in the region given the presence of similar habitat throughout the surrounding area. No sensitive habitats (e.g., wetlands, vernal pools, critical habitats for sensitive species, etc.) were observed on the site during the field investigations.

6.2 Federal and State Listed and Species of Special Concern

No federal or State-listed species were observed on the site during the field investigations which include the desert tortoise. In addition, there are no documented observations of these species either on the site or in the immediate area. The site is not expected to support populations of the desert tortoise based on the absence of habitat, suitable burrows, or signs.

The Western Joshua tree (*Yucca brevifolia*), a candidate threatened species under the California Endangered Species Act (CESA), was not observed on site. Refer to section 5.5 for more information on the status and requirements on this species.

A pre-construction burrowing owl survey may be required by CDFW to determine if any owls have moved on to the site since the October 4, 2022 surveys. As stated in CDFW's *Staff Report on Burrowing Owl Mitigation*, the most effective method of completing a pre-construction survey (take avoidance survey) should be performed within 30 days of ground disturbance, followed by a final pre-construction survey within 24 hours of breaking ground.

7.0 CONCLUSIONS AND CONSIDERATIONS

Future development activities include the grading and removal of all vegetation from the 5.0-acre parcel; however, cumulative impacts to the general biological resources (plants and animals) in the surrounding area are expected to be negligible. This assumption is based on the habitat containing scarce vegetation of non-native species. As discussed above, the site does not support any desert tortoises or burrowing owls due to the lack of suitable habitat and potential burrows. Joshua trees (a state candidate species) were not observed in the field investigations during October 2022 survey. The following mitigation measures should be considered:

1. Pre-construction surveys for burrowing owls, desert tortoise, and nesting birds protected under the Migratory Bird Treaty Act and Section 3503 of the California Fish and Wildlife Code shall be conducted prior to the commencement of Project-related ground disturbance.
 - a. Appropriate survey methods and timeframes shall be established, to ensure that chances of detecting the target species are maximized. In the event that listed species, such as the desert tortoise, are encountered, authorization from the USFWS and CDFW must be obtained. If nesting birds are detected, avoidance measures shall be implemented to ensure that nests are not disturbed until after young have fledged.
 - b. Pre-construction surveys shall encompass all areas within the potential footprint of disturbance for the project, as well as a reasonable buffer around these areas.
2. A focused plant survey should be considered for all special status plant species that have the potential to occur on the site to be performed during the blooming season (April - June) to determine the potential environmental effects of the proposed projects on special status plants and sensitive natural communities following recommended protocols by the Department of Fish and Wildlife.

If any sensitive species are observed on the property during future activities, CDFW and USFWS (as applicable) should be contacted to discuss specific mitigation measures which may be required for the individual species. CDFW and USFWS are the only agencies which can grant authorization for the “take” of any sensitive species and can approve the implementation of any applicable mitigation measures.

8.0 BIBLIOGRAPHY

- Baldwin, Bruce G, et. al.
2002. The Jepson Desert Manual. Vascular Plants of Southeastern California. University of California Press, Berkeley, CA.
- Bureau of Land Management
January 2005. Final Environmental Impact Report and Statement for the West Mojave Plan. Vol. 1A.
- California Burrowing Owl Consortium
1993. Burrowing Owl Survey Protocol and Mitigation Guidelines.
- California Department of Fish and Game
1990. California Wildlife: Volume 1 (Amphibians and Reptiles), Volume II (Birds), and Volume III (Mammals).
- California Department of Fish and Game
2014. Rarefind 3 Natural Diversity Database. Habitat and Data Analysis Branch. Sacramento, CA.
- California Department of Fish and Game
March 7, 2013. Staff Report on Burrowing Owl Mitigation. 34 pp.
- California Native Plant Society
2001. Inventory of Rare and Endangered Plants of California (sixth edition). Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. California Native Plant Society. Sacramento, CA x + 388 pp.
- Ehrlich, P., Dobkin., Wheye, D.
Birder's Handbook. A Field Guide to the Natural History of North American Birds. Simon & Schuster Building Rockefeller Center 1230 Avenue of the Americas. New York, New York 10020.
- Hickman, James C.
The Jepson Manual Higher Plants of California. University of California Press. Berkeley, CA. 3rd Edition. 1996.
- Jaeger, Edmund C.
1969. Desert Wild Flowers. Stanford University Press, Stanford, California. 321 pp.
- Kays, R. W. & Wilson, D. E.
Mammals of North America. Princeton University Press, Princeton, New Jersey. 2002.
- Munz, Philip A.
1974. A Flora of Southern California. University of California Press, Berkeley, California. 1086 pp.

Sibley, David Allen.

Sibley Birds West: Field Guide to Birds of Western North America. Knopf. 2016

Stebbins, Robert C.

A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Company. 2003.

U.S. Fish and Wildlife Service

2010 Desert Tortoise Survey Protocol.

Whitaker, John O.

The Audubon Society Field Guide to North American Mammals. Alfred A Knopf, Inc. 1980.

CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits, presents the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Fieldwork conducted for this assessment was performed by Ryan Hunter and Brian Bunyi. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

Date: 10/13/2022 Signed: *Ryan Hunter*
Brian Bunyi

Field Work Performed By: Ryan Hunter
Senior Environmental Scientist/Biologist

Field Work Performed By: Brian Bunyi
Environmental Scientist/Wildlife Biologist

Appendix A
Tables and Figures



Legend

Project Boundary



Figure 1: Regional Exhibit

Produced By: RCA Associates Inc.

**SW of the Intersection of
Via Florencia and Via
Josefina**

| | |
|------------|-----------------------------|
| Source: | Uinta Software |
| Acreage: | 5.0 Acre (Approximately) |
| Project #: | 2022-162 BA |





Legend
 Project Boundary

| | | | | |
|--|--|---|--|--|
| | <p>Figure 2: Vicinity Exhibit</p> <p>Produced By: RCA Associates Inc.</p> | <p>SW of the Intersection of Via Florencia and Via Josefinia</p> | <p>Source: Uinta Software</p> | |
| | | | <p>Acreage: 5.0 Acre (Approximately)</p> | |
| | | | <p>Project #: 2022-162 BA</p> | |
| | | | | |

CENTER OF SITE LOOKING NORTH



CENTER OF SITE LOOKING EAST



FIGURE 3: PHOTOGRAPHS OF SITE

CENTER OF SITE LOOKING SOUTH



CENTER OF SITE LOOKING WEST



FIGURE 3, cont: PHOTOGRAPHS OF SITE

Figure 4: Site Plans

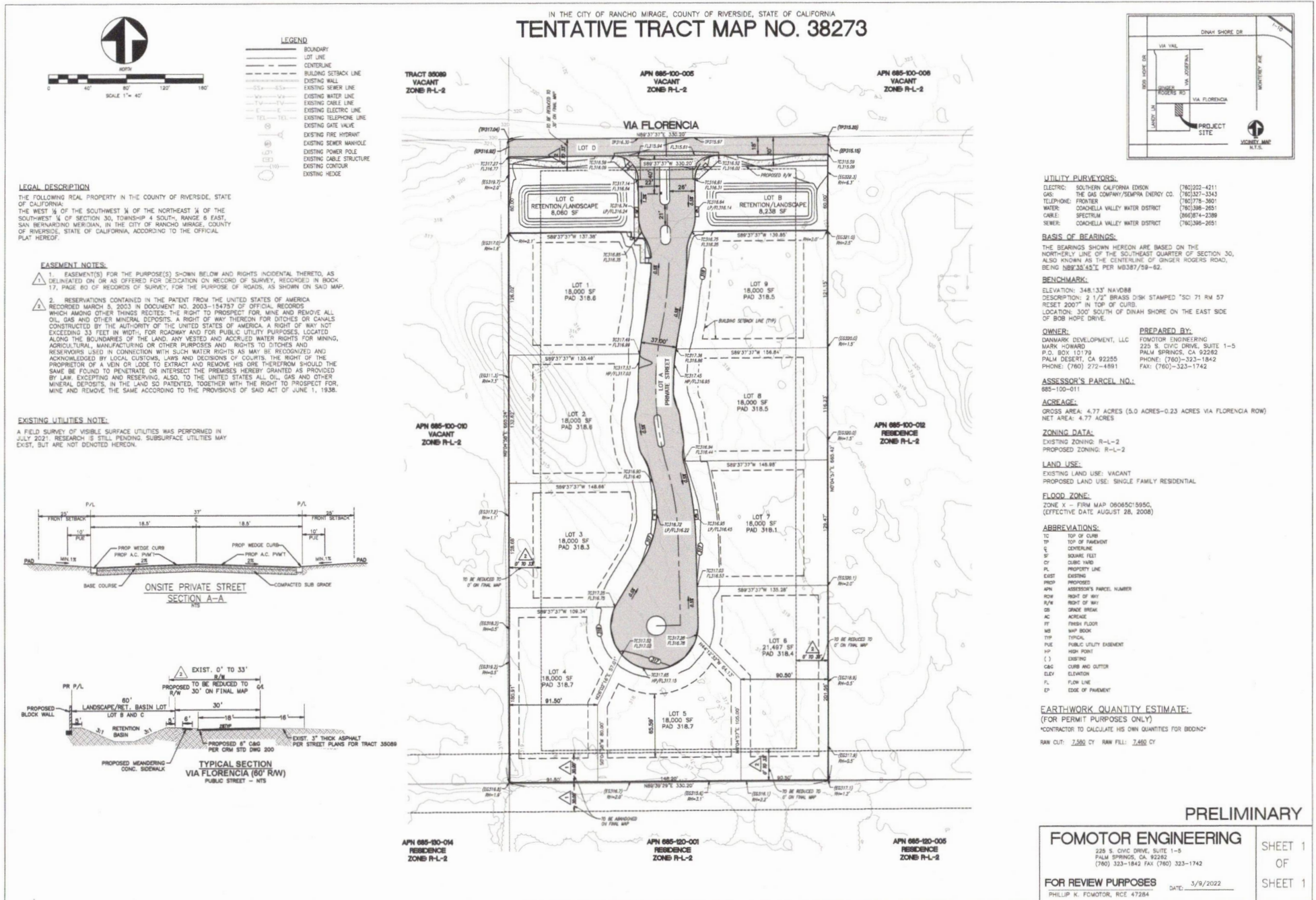


Table 1 - Plants observed on the site and known to occur in the immediate surrounding area.

| Common Name | Scientific Name | Location |
|-----------------------|--------------------------------|--------------------------------------|
| Asian mustard | <i>Brassica tournefortii</i> | On Site and in the surrounding area. |
| Creosote bush | <i>Larrea tridentata</i> | “ |
| Cheatgrass | <i>Bromus tectorum</i> | “ |
| Tumbleweed | <i>Kali tragus var. tragus</i> | “ |
| Flatspine bur ragweed | <i>Ambrosia acanthicarpa</i> | “ |
| Western tansymustard | <i>Descurainia pinnata</i> | “ |
| Kelch grass | <i>Schismus barbatus</i> | “ |

Note: The above list is not intended to be a comprehensive list of every plant which may occur on the site or in the zone of influence.

Table 2 - Wildlife observed on the site during the field investigations.

| Common Name | Scientific Name | Location |
|---------------------|--------------------------------|--------------------------------------|
| Common raven | <i>Corvus corax</i> | On-site and in the surrounding area. |
| House finch | <i>Carpodacus mexicanus</i> | “ |
| Rock pigeon | <i>Columba livia</i> | “ |
| House sparrow | <i>Passer domesticus</i> | “ |
| Mourning Dove | <i>Zenaida macroura</i> | “ |
| Red-Tailed Hawk | <i>Buteo jamaicensis</i> | “ |
| Greater road runner | <i>Geococcyx californianus</i> | “ |

Note: The above Table is not a comprehensive list of every animal species which may occur in the area, but is a list of those common species which were identified on the site or which have been observed in the region by biologists from RCA Associates, Inc.

REGULATORY CONTEXT

The following provides a summary of federal and state regulatory jurisdiction over biological and wetland resources. Although most of these regulations do not directly apply to the site, given the general lack of sensitive resources, they provide important background information.

Federal Endangered Species Act

The USFWS has jurisdiction over federally listed threatened and endangered plant and animal species. The federal Endangered Species Act (ESA) and its implementing regulations prohibit the take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10 of the ESA. ESA defines “take” as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Federal regulation 50CFR17.3 defines the term “harass” as an intentional or negligent act that creates the likelihood of injuring wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns such as breeding, feeding, or sheltering (50CFR17.3). Furthermore, federal regulation 50CFR17.3 defines “harm” as an act that either kills or injures a listed species. By definition, “harm” includes habitat modification or degradation that actually kills or injures a listed species by significantly impairing essential behavior patterns such as breeding, spawning, rearing, migrating, feeding, or sheltering (50CFR217.12).

Section 10(a) of the ESA establishes a process for obtaining an incidental take permit that authorizes non federal entities to incidentally take federally listed wildlife or fish. Incidental take is defined by ESA as take that is “incidental to, and not the purpose of, the carrying out of another wise lawful activity.” Preparation of a habitat conservation plan, generally referred to as an HCP, is required for all Section 10(a) permit applications. The USFWS and National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA Fisheries Service) have joint authority under the ESA for administering the incidental take program. NOAA Fisheries Service has jurisdiction over anadromous fish species and USFWS has jurisdiction over all other fish and wildlife species.

Section 7 of the ESA requires all federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any species listed under the ESA,

or result in the destruction or adverse modification of its habitat. Federal agencies are also required to minimize impacts to all listed species resulting from their actions, including issuance of permits or funding. Section 7 requires consideration of the indirect effects of a project, effects on federally listed plants, and effects on critical habitat (ESA requires that the USFWS identify critical habitat to the maximum extent that it is prudent and determinable when a species is listed as threatened or endangered). This consultation results in a Biological Opinion prepared by the USFWS stating whether implementation of the HCP will result in jeopardy to any HCP Covered Species or will adversely modify critical habitat and the measures necessary to avoid or minimize effects to listed species.

Although federally listed animals are legally protected from harm no matter where they occur, section 9 of the ESA provides protection for endangered plants by prohibiting the malicious destruction on federal land and other “take” that violates State law. Protection for plants not living on federal lands is provided by the California Endangered Species Act.

California Endangered Species Act

CDFW has jurisdiction over species listed as threatened or endangered under Section 2080 of the California Fish and Wildlife Code. Section 2080 prohibits the take of a species listed by CDFW as threatened or endangered. The state definition of take is similar to the federal definition, except that Section 2080 does not prohibit indirect harm to listed species by way of habitat modification. To qualify as take under the state ESA, an action must have direct, demonstrable detrimental effect on individuals of the species. Impacts on habitat that may ultimately result in effects on individuals are not considered take under the state ESA but can be considered take under the federal ESA.

Proponents of a project affecting a state-listed species must consult with CDFW and enter into a management agreement and take permit under Section 2081. The state ESA consultation process is similar to the federal process. California ESA does not require preparation of a state biological assessment; the federal biological assessment and the CEQA analysis or any other relevant information can provide the basis for consultation. California ESA requires that CDFW coordinate consultation for joint federally listed and state-listed species to the extent possible; generally, the state opinion for the listed species is brief and references provisions under the federal opinion.

Clean Water Act, Section 404

The COE and the U.S. Environmental Protection Agency regulate the placement of dredged or fill material into “Waters of the United States” under Section 404 of the Clean Water Act. Waters of the United States include lakes, rivers, streams, and their tributaries, and wetlands. Wetlands are defined for regulatory purposes as “areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 Code of Federal Regulations [CFR] 328.3, 40 CFR 230.3).

The COE may issue either individual permits on a case-by-case basis or general permits on a program level. General permits are pre-authorized and are issued to cover similar activities that are expected to cause only minimal adverse environmental effects. Nationwide permits (NWP’s) are general permits issued to cover particular fill activities. All NWP’s have general conditions that must be met for the permits to apply to a particular project, as well as specific conditions that apply to each NWP.

Clean Water Act, Section 401

Section 401 of the Clean Water Act requires water quality certification and authorization of placement of dredged or fill material in wetlands and Other Waters of the United States. In accordance with Section 401 of the Clean Water Act, criteria for allowable discharges into surface waters have been developed by the State Water Resources Control Board, Division of Water Quality. As such, proponents of any new project which may impair water quality as a result of the project are required to create a post construction stormwater management plan to ensure offsite water quality is not degraded. The resulting requirements are used as criteria in granting National Pollution Discharge Elimination System (NPDES) permits or waivers, which are obtained through the Central Valley Regional Water Quality Control Board (RWQCB). Any activity or facility that will discharge waste (such as soils from construction) into surface waters, or from which waste may be discharged, must obtain an NPDES permit or waiver from the RWQCB. The RWQCB evaluates an NPDES permit application to determine whether the proposed discharge is consistent with the adopted water quality objectives of the basin plan.

California Fish and Wildlife Code, Sections 1600-1616

Under the California Fish and Wildlife Code, Sections 1600-1616 CDFW regulates projects that divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream, or lake. Proponents of such projects must notify CDFW and enter into a streambed alteration agreement with them.

Section 1602 of the California Fish and Wildlife Code requires a state or local government agency, public utility, or private entity to notify CDFW before it begins a construction project that will: (1) divert, obstruct, or change the natural flow or the bed, bank, channel, or bank of any river, stream, or lake; (2) use materials from a streambed; or (3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake. Once the notification is filed and determined to be complete, CDFW issues a streambed alteration agreement that contains conditions for construction and operations of the proposed project.

California Fish and Wildlife Code, Section 3503.5

Under the California Fish and Wildlife Code, Section 3503.5, it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks, eagles, and falcons) or Strigiformes (owls). Take would include the disturbance of an active nest resulting in the abandonment or loss of young.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) prohibits the taking, hunting, killing, selling, purchasing, etc. of migratory birds, parts of migratory birds, or their eggs and nests. As used in the MBTA, the term “take” is defined as “to pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill, unless the context otherwise requires.” Most bird species native to North America are covered by this act.

Sensitive Natural Communities

The California Office of Planning and Research and the Office of Permit Assistance (1986) define project effects that substantially diminish habitat for fish, wildlife, or plants, or that disrupt or

divide the physical arrangement of an established community as significant impacts under CEQA. This definition applies to certain natural communities because of their scarcity and ecological values and because the remaining occurrences are vulnerable to elimination. For this study, the term “sensitive natural community” includes those communities that, if eliminated or substantially degraded, would sustain a significant adverse impact as defined under CEQA. Sensitive natural communities are important ecologically because their degradation and destruction could threaten populations of dependent plant and wildlife species and significantly reduce the regional distribution and viability of the community. If the number and extent of sensitive natural communities continue to diminish, the status of rare, threatened, or endangered species could become more precarious, and populations of common species (i.e., not special status species) could become less viable. Loss of sensitive natural communities also can eliminate or reduce important ecosystem functions, such as water filtration by wetlands and bank stabilization by riparian woodlands for example.

Protected Plants

The California Desert Native Plant Act was passed in 1981 to protect non-listed California desert native plants from unlawful harvesting on both public and privately-owned lands. Harvest, transport, sale, or possession of specific native desert plants is prohibited unless a person has a valid permit. The following plants are under the protection of the California Desert Native Plants Act:

- Dalea spinosa (smoketree)
- All species of the genus Prosopis (mesquites)
- All species of the family Agavaceae (century plants, nolinias, yuccas)
- All species of Cactus
- Creosote Rings, ten feet in diameter or greater
- All Joshua Trees

The project would be required to comply with the County of San Bernardino Desert Native Plant Protection Ordinance. The removal of any trees listed under Section 88.01.060 would be required to comply with Section 88.01.050, which requires the project applicant to apply for a Tree or Plant Removal Permit prior to removal from the project site.



APPENDIX C – CULTURAL STUDY

HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT

TENTATIVE TRACT MAP NO. 38273

**Assessor's Parcel No. 685-100-011
City of Rancho Mirage, Riverside County, California**

For Submittal to:

Development Services Department, Planning Division
City of Rancho Mirage
69825 Highway 111
Rancho Mirage, CA 92270

Prepared for:

Philip Fomotor, P.E., P.L.S.
Fomotor Engineering
225 South Civic Drive, Suite I-5
Palm Springs, CA 92262

Prepared by:

CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, CA 92324

Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

March 14, 2023
CRM TECH Contract No. 3946

Title: Historical/Archaeological Resources Survey: Tentative Tract Map No. 38273, Assessor's Parcel No. 685-100-011, City of Rancho Mirage, Riverside County, California

Author(s): Daniel Ballester, Archaeologist/Field Director

Consulting Firm: CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, CA 92324
(909) 824-6400

Date: March 14, 2023

For Submittal to: Development Services Department, Planning Division
City of Rancho Mirage
69825 Highway 111
Rancho Mirage, CA 92270
(760) 328-2266

Prepared for: Philip Fomotor, P.E., P.L.S.
Fomotor Engineering
225 South Civic Drive, Suite I-5
Palm Springs, CA 92262

Project Size: 4.77 acres

USGS Quadrangle: Cathedral City, Calif., 7.5' quadrangle (Section 30, T4S R6E, San Bernardino Baseline and Meridian)

Keywords: Coachella Valley, western Colorado Desert; no "historical resources" under CEQA

MANAGEMENT SUMMARY

Between September 2022 and March 2023, at the request of Fomotor Engineering, CRM TECH performed a cultural resources study on 4.77 acres of vacant desert land on the northern edge of the City of Rancho Mirage, Riverside County, California. The subject property of the study, Tentative Tract Map No. 38273, encompasses what is currently Assessor's Parcel No. 685-100-011, located on the south side of Via Florencia near its intersection with Via Josefina, in the southwest quarter of Section 30, T4S R6E, San Bernardino Baseline and Meridian.

The study is part of the environmental review process for a proposed subdivision of the property for residential development. The City of Rancho Mirage, as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA). The purpose of the study is to provide the City with the necessary information and analysis to determine whether the proposed project would cause substantial adverse changes to any "historical resources," as defined by CEQA, that may exist in or around the project area.

In order to identify such resources, CRM TECH initiated a historical/archaeological resources records search and a Native American Sacred Lands File search, contacted local Native American representatives, pursued historical background research, and carried out an intensive-level field survey. Throughout the various avenues of research, this study encountered no "historical resources" within or adjacent to the project area. Therefore, CRM TECH recommends to the City of Rancho Mirage a conclusion that the proposed project will have *No Impact* on any "historical resources."

No further cultural resources investigation is recommended for the project unless development plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are discovered during any earth-moving operations associated with the project, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

TABLE OF CONTENTS

| | |
|---|----|
| MANAGEMENT SUMMARY | i |
| INTRODUCTION | 1 |
| SETTING..... | 4 |
| Current Natural Setting | 4 |
| Cultural Setting | 5 |
| Prehistoric Context..... | 5 |
| Ethnohistoric Context | 5 |
| Historic Context | 7 |
| RESEARCH METHODS | 8 |
| Records Search..... | 8 |
| Native American Participation..... | 8 |
| Historical Background Research..... | 8 |
| Field Survey | 8 |
| RESULTS AND FINDINGS | 9 |
| Records Search..... | 9 |
| Native American Participation..... | 9 |
| Historical Background Research..... | 9 |
| Field Survey | 12 |
| DISCUSSION | 12 |
| CONCLUSIONS AND RECOMMENDATIONS | 13 |
| REFERENCES | 13 |
| APPENDIX 1: Personnel Qualifications | 15 |
| APPENDIX 2: Native American Responses | 18 |

LIST OF FIGURES

| | |
|---|----|
| Figure 1. Project vicinity..... | 1 |
| Figure 2. Project area | 2 |
| Figure 3. Recent satellite image of the project area..... | 3 |
| Figure 4. Overview of the project area | 4 |
| Figure 5. Previous cultural resources studies..... | 10 |
| Figure 6. The project area and vicinity in 1853-1856..... | 11 |
| Figure 7. The project area and vicinity in 1901 | 11 |
| Figure 8. The project area and vicinity in 1941 | 11 |
| Figure 9. The project area and vicinity in 1951-1958..... | 11 |

INTRODUCTION

Between September 2022 and March 2023, at the request of Fomotor Engineering, CRM TECH performed a cultural resources study on 4.77 acres of vacant desert land on the northern edge of the City of Rancho Mirage, Riverside County, California (Fig. 1). The subject property of the study, Tentative Tract Map No. 38273, encompasses what is currently Assessor's Parcel No. 685-100-011, located on the south side of Via Florencia near its intersection with Via Josefina, in the southwest quarter of Section 30, T4S R6E, San Bernardino Baseline and Meridian (Figs. 2, 3).

The study is part of the environmental review process for a proposed subdivision of the property for residential development. The City of Rancho Mirage, as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.). The purpose of the study is to provide the City with the necessary information and analysis to determine whether the proposed project would cause substantial adverse changes to any "historical resources," as defined by CEQA, that may exist in or around the project area.

In order to identify such resources, CRM TECH initiated a historical/archaeological resources records search and a Native American Sacred Lands File search, contacted local Native American representatives, pursued historical background research, and carried out an intensive-level field survey. The following report is a complete account of the methods, results, and final conclusion of the study. Personnel who participated in the study are named in the appropriate sections below, and their qualifications are provided in Appendix 1.

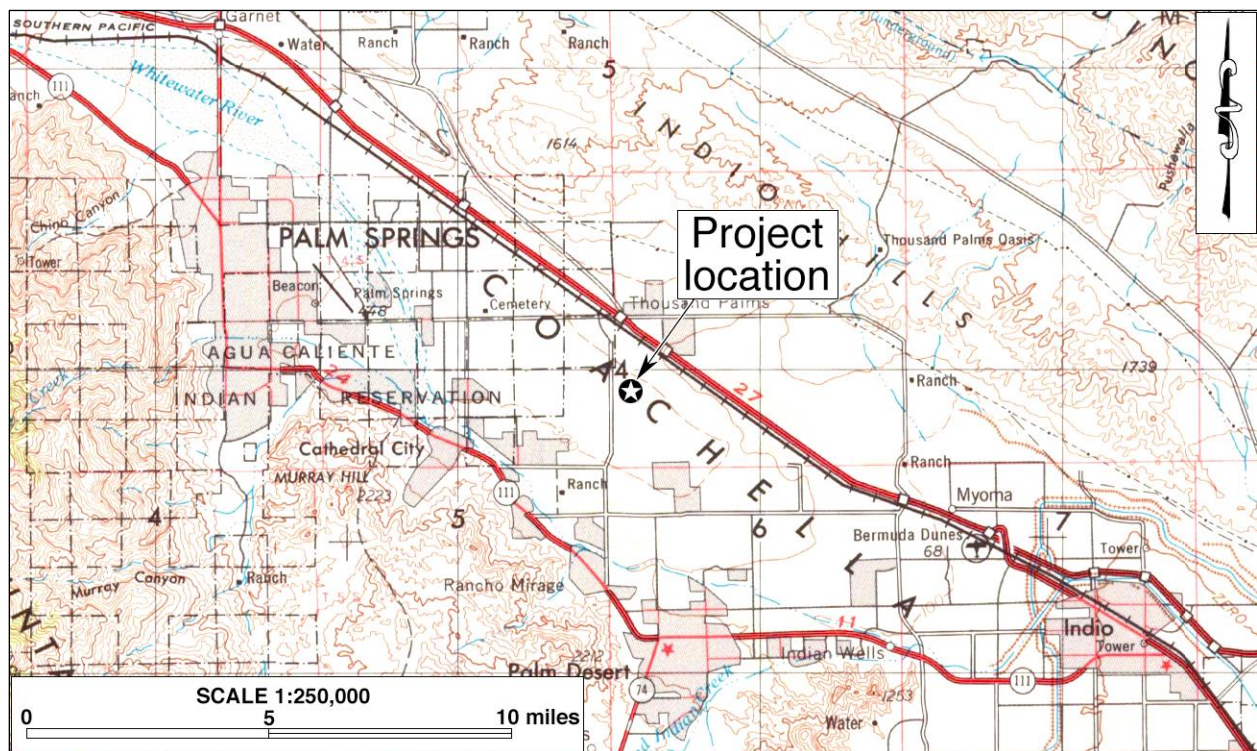


Figure 1. Project vicinity (based on USGS Santa Ana, Calif., 120'x60' quadrangle [USGS 1979]).

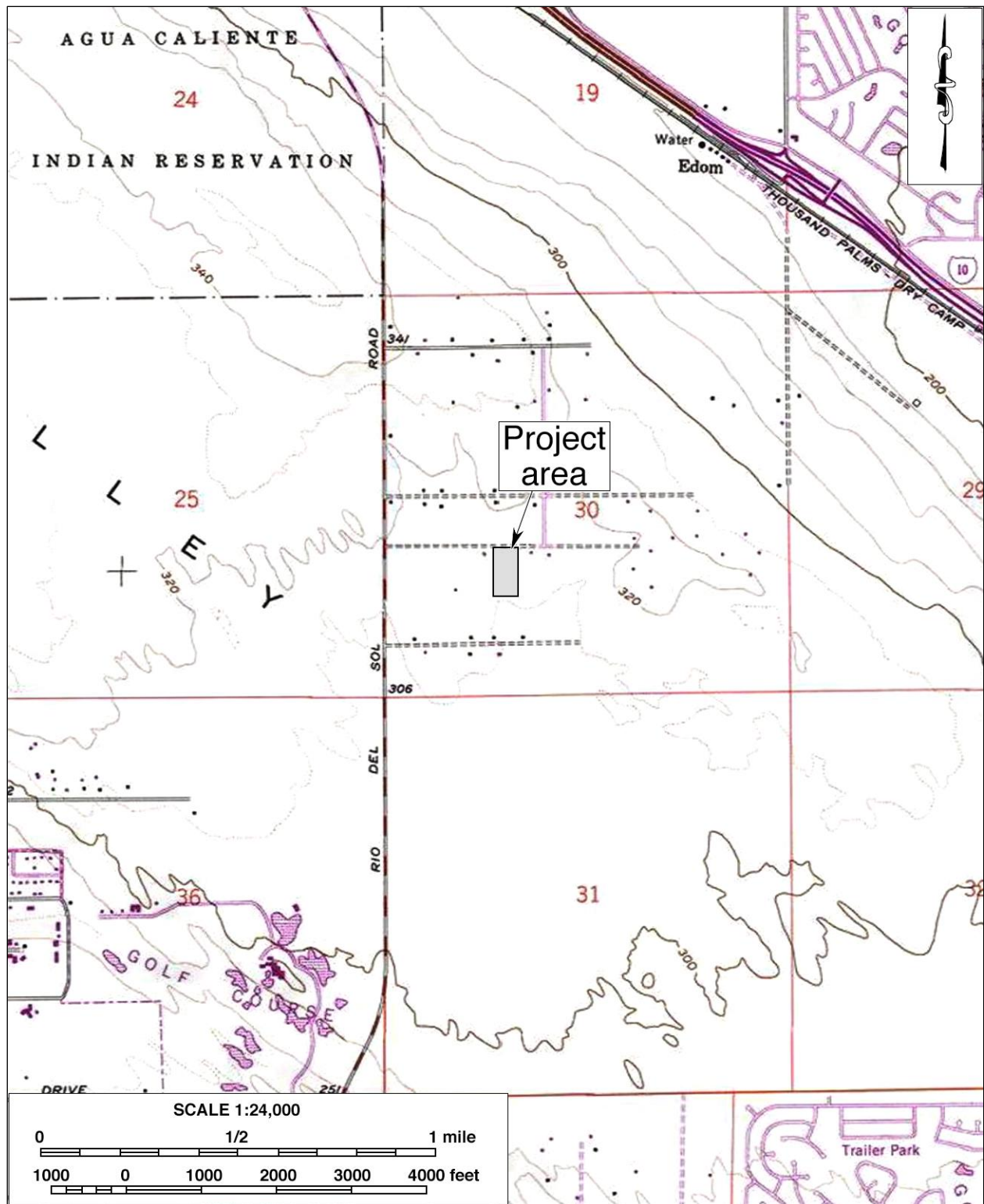


Figure 2. Project area (based on USGS Cathedral City, Calif., 7.5' quadrangles [USGS 1981]).



Figure 3. Recent satellite image of the project area.

SETTING

CURRENT NATURAL SETTING

The City of Rancho Mirage is located in the Coachella Valley, a northwest-southeast trending desert valley that constitutes the western end of the Colorado Desert. Dictated by this geographic setting, the climate and environment of the region are typical of the southern California desert country, marked by extremes in temperature and aridity. Temperatures in the region reach over 120 degrees Fahrenheit in summer, and dip to near freezing in winter. Average annual precipitation is less than five inches, and the average annual evaporation rate exceeds three feet.

The rectangular-shaped project area lies on the generally level and sandy desert floor between the San Jacinto Mountains to the southwest and the Indio Hills to the northeast. The adjacent land features a residential neighborhood to the south, newly constructed housing pads and undeveloped land to the north, a residential property to the east, and an undeveloped parcel to the west (Fig. 3). Elevations in the project area range roughly from 310 feet to 315 feet above mean sea level, with the terrain sloping gently downward to the south.

Vegetation in the vicinity consists mainly of creosote bushes and brittlebush with occasional examples of small grasses and brush. The surface soil is characterized by the lightly undulating, somewhat compact sand dunes and shows a small amount of recent disturbance along the perimeter (Fig. 4). Sources of the disturbance included recent construction activities associated with construction and paving of Via Florencia, construction of a block wall along the southern boundary, while off-road vehicle tracks were also observed.



Figure 4. Overview of the project area (view to the north; photograph taken on November 1, 2022).

CULTURAL SETTING

Prehistoric Context

Numerous investigations on the history of cultural development in southern California have led researchers to propose a number of cultural chronologies for the desert regions. A specific cultural sequence for the Colorado Desert was offered by Schaefer (1994) on the basis of the many archaeological studies conducted in the area. The earliest time period identified is the Paleoindian (ca. 8,000 to 10,000-12,000 years ago), when “small, mobile bands” of hunters and gatherers, who relied on a variety of small and large game animals as well as wild plants for subsistence, roamed the region (*ibid.*:63). These small groups settled “on mesas and terraces overlooking larger washes” (*ibid.*:64). The artifact assemblage of that period typically consists of very simple stone tools, “cleared circles, rock rings, [and] some geoglyph types” (*ibid.*).

The Early Archaic Period follows and dates to ca. 8,000 to 4,000 years ago. It appears that a decrease in population density occurred at this time and that the indigenous groups of the area relied more on foraging than hunting. Very few archaeological remains have been identified to this time period. The ensuing Late Archaic Period (ca. 4,000 to 1,500 years ago) is characterized by continued low population densities and groups of “flexible” sizes that settled near available seasonal food resources and relied on “opportunistic” hunting of game animals. Groundstone artifacts for food processing were prominent during this time period.

The most recent period in Schaefer’s scheme, the Late Prehistoric, dates from ca. 1,500 years ago to the time of the Spanish missions, and saw the continuation of the seasonal settlement pattern. Peoples of the Late Prehistoric Period were associated with the Patayan cultural pattern and relied more heavily on the availability of seasonal “wild plants and animal resources” (Schaefer 1994:66). It was during this period that ceramics and the bow/arrow were introduced into the region.

The shores of Holocene Lake Cahuilla, during times of its presence, attracted much settlement and resource procurement activities. In times of the lake’s desiccation and absence, according to Schaefer (1994:66), the Native people moved away from its receding shores towards rivers, streams, and mountains. Numerous archaeological sites dating to the last high stand of Holocene Lake Cahuilla, roughly between 1600 and 1700 A.D., have been identified along its former shoreline. Testing and mitigative excavations at these sites have recovered brown and buff ware ceramics, a variety of groundstone and projectile point types, ornaments, and cremation remains.

Ethnohistoric Context

The Coachella Valley is a historical center of Native American settlement, where U.S. surveyors noted large numbers of Indian villages and *rancherías*, occupied by the Cahuilla people, in the mid-19th century. The origin of the name “Cahuilla” is unclear, but may originate from their own word *káwiya*, meaning master or boss (Bean 1978). The Takic-speaking Cahuilla are generally divided by anthropologists into three groups, according to their geographic setting: the Pass Cahuilla of the San Geronimo Pass-Palm Springs area, the Mountain Cahuilla of the San Jacinto and Santa Rosa Mountains and the Cahuilla Valley, and the Desert Cahuilla of the eastern Coachella Valley. The basic written sources on Cahuilla culture and history include Kroeber (1925), Strong (1929), and

Bean (1978), based on information provided by such Cahuilla informants as Juan Siva, Francisco Patencio, Katherine Siva Saubel, and Mariano Saubel. The following ethnohistoric discussion is based primarily on these sources.

The Cahuilla did not have a single name that referred to an all-inclusive tribal affiliation. Instead, membership was in terms of lineages or clans. Each lineage or clan belonged to one of two main divisions of the people, known as moieties. Their moieties were named for the Wildcat, or *Tuktum*, and Coyote, or *Istam*. Members of clans in one moiety had to marry into clans from the other moiety. Individual clans had villages, or central places, and territories they called their own, for purposes of hunting game, and gathering raw materials for food, medicine, ritual, or tool use. They interacted with other clans through trade, intermarriage, and ceremonies.

Cahuilla subsistence was defined by the surrounding landscape and primarily based on the hunting and gathering of wild and cultivated foods, exploiting nearly all of the resources available in a highly developed seasonal mobility system. They were adapted to the arid conditions of the desert floor, the lacustral cycles of Holocene Lake Cahuilla, and the environments of the nearby mountains. When the lake was full, or nearly full, the Cahuilla would take advantage of the resources presented by the body of fresh water, building elaborate stone fish traps. Once the lake had desiccated, they relied on the available terrestrial resources. The cooler temperatures and resources available at higher elevations in the nearby mountains were also taken advantage of.

The Cahuilla diet included seeds, roots, wild fruits and berries, acorns, wild onions, piñon nuts, and mesquite and screw beans. Medicinal plants such as creosote, California sagebrush, yerba buena and elderberry were typically cultivated near villages (Bean and Saubel 1972). Common game animals included deer, antelope, big horn sheep, rabbits, wood rats and, when Holocene Lake Cahuilla was present, fish and waterfowl. The Cahuilla hunted with throwing sticks, clubs, nets, traps, and snares, as well as bows and arrow (Bean 1978; CSRI 2002). Common tools included manos and metates, mortars and pestles, hammerstones, fire drills, awls, arrow-straighteners, and stone knives and scrapers. These lithic tools were made from locally sourced material as well as materials procured through trade or travel. They also used wood, horn, and bone spoons and stirrers; baskets for winnowing, leaching, grinding, transporting, parching, storing, and cooking; and pottery vessels for carrying water, storage, cooking, and serving food and drink (*ibid.*).

As the landscape defined their subsistence practices, the tending and cultivation practices of the Cahuilla helped shape the landscape. Biological studies have recently found evidence that the fan palms found in the Coachella Valley and throughout the southeastern California desert (*Washingtonia filifera*) may not be relics from a paleo-tropical environment, but instead a relatively recent addition brought to the area and cultivated by native populations (Anderson 2005). The planting of palms by the Cahuilla is well-documented, as is their enhancement of palm stands through the practice of controlled burning (*ibid.*; Bean and Saubel 1972). Burning palm stands would increase fruit yield dramatically by eliminating pests such as the palm borer beetle, date scales, and spider mites (Bean and Saubel 1972). It also prevented out-of-control wildfires by eliminating dead undergrowth before it accumulated to dangerous levels. The Cahuilla also burned stands of chia to produce higher yields, and deergrass to yield straighter, more abundant stalks for basketry (*ibid.*; Anderson 2005).

Population data prior to European contact is almost impossible to obtain, but estimates range from 3,600 to as high as 10,000 persons covering a territory of over 2,400 square miles. During the 19th century, the Cahuilla population was decimated as a result of European diseases, most notably smallpox, for which the Native peoples had no immunity. Today, Native Americans of Pass or Desert Cahuilla heritage are mostly affiliated with one or more of the Indian reservations in and near the Coachella Valley, including Agua Caliente, Morongo, Cabazon, Torres Martinez, and Augustine. There has been a resurgence of traditional ceremonies in recent years, and the language, songs, and stories are now being taught to the youngest generations.

Historic Context

In 1823-1825, José Romero, José Maria Estudillo, and Romualdo Pacheco became the first noted European explorers to travel through the Coachella Valley when they led a series of expeditions in search of a route to Yuma (Johnston 1987:92-95). Due to its harsh environment, few non-Indians ventured into the desert valley during the Mexican and early American periods, except those who traveled along the established trails. The most important of these trails was the Cocomaricopa Trail, an ancient Indian trading route that was “discovered” in 1862 by William David Bradshaw and known after that as the Bradshaw Trail (Gunther 1984:71; Ross 1992:25). In much of the Coachella Valley, this historic wagon road traversed a similar course to that of present-day State Route 111. During the 1860s-1870s, the Bradshaw Trail served as the main thoroughfare between coastal southern California and the Colorado River, until the completion of the Southern Pacific Railroad in 1876-1877 brought an end to its heyday (Johnston 1987:185).

Non-Indian settlement in the Coachella Valley began in the 1870s with the establishment of railroad stations along the Southern Pacific Railroad, and spread further in the 1880s after public land was opened for claims under the Homestead Act, the Desert Land Act, and other federal land laws (Laflin 1998:35-36; Robinson 1948:169-171). Farming became the dominant economic activity in the valley thanks to the development of underground water sources, often in the form of artesian wells. Around the turn of the century, the date palm was introduced into the Coachella Valley, and by the late 1910s dates were the main agricultural crop and the tree an iconic image celebrating the region as the “Arabia of America” (Shields Date Gardens 1957). Then, starting in the 1920s, a new industry featuring equestrian camps, resorts, hotels, and eventually country clubs began to spread throughout the Coachella Valley, transforming it into southern California’s premier winter retreat.

In the Rancho Mirage area, the first notable settlement activities occurred in the 1910s-1920s, when several date ranches were established in the present-day city boundary (Love and Tang 1996:7). In 1924, R.P. “Bert” Davie and E.E. McIntyre subdivided the Rancho Rio del Sol Estates around today’s Clancy Lane, creating a small community nicknamed “Little Santa Monica” (*ibid.*:8). Ten years later, Louis Blankenhorn and Laurence Macomber began a new subdivision at the mouth of Magnesia Spring Canyon, and for the first time bestowed the name Rancho Mirage on the community (*ibid.*). After the end of WWII, Rancho Mirage embarked on a period of rapid growth. With the development of the Thunderbird Country Club and the Tamarisk Country Club in 1951-1952, Rancho Mirage set the trend in the post-WWII boom among the five cove communities along Highway 111 (*ibid.*:8-9). This trend has continued into the present and has given rise to the City of Rancho Mirage’s popular reputation as the “country club city.”

RESEARCH METHODS

RECORDS SEARCH

The historical/archaeological resources records search was completed by the Eastern Information Center (EIC) at the University of California, Riverside, on October 26, 2022. During the records search, EIC administrative/coordinator assistant Eulices Lopez examined maps and records on file for previously identified cultural resources and existing cultural resources reports within a one-mile radius of the project location. Previously identified cultural resources include properties designated as California Historical Landmarks, Points of Historical Interest, or Riverside County Historic Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resources Inventory.

NATIVE AMERICAN PARTICIPATION

On September 22, 2022, CRM TECH submitted a written request to the State of California Native American Heritage Commission (NAHC) for a records search in the commission's Sacred Lands File. The NAHC is the State of California's trustee agency for the protection of "tribal cultural resources," as defined by California Public Resources Code §21074, and is tasked with identifying and cataloging properties of Native American cultural value throughout the state. In the meantime, CRM TECH notified the nearby Agua Caliente Band of Cahuilla Indians of the upcoming archaeological field survey and invited tribal participation. The responses from the NAHC and the Agua Caliente Band are summarized below and attached to this report in Appendix 2.

HISTORICAL BACKGROUND RESEARCH

Historical background research for this study was conducted by CRM TECH field director Daniel Ballester. Sources consulted during the research included published literature in local and regional history, U.S. General Land Office (GLO) land survey plat maps dated 1856, U.S. General Land Office (GLO) topographic maps dated 1904-1981, and aerial/satellite images taken between 1972 and 2021. The historical maps are accessible at the websites of the U.S. Bureau of Land Management and the USGS, and the aerial/satellite images are available at the Nationwide Environmental Title Research (NETR) Online website and through the Google Earth software.

FIELD SURVEY

On November 1, 2022, Daniel Ballester carried out the field survey of the project area with the assistance of Nicole Raslich, archaeological technician with the Agua Caliente Tribal Historic Preservation Office. The survey was conducted at an intensive level by walking a series of parallel north-south transects at 15-meter (approximately 50-foot) intervals. In this way, the entire project area was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic period (i.e., 50 years or older). Ground visibility was excellent (95 to 100 percent) as vegetation on site was generally sparse. In this environment, however, shifting sands are more likely to contribute to obscured cultural remains than is vegetation.

RESULTS AND FINDINGS

RECORDS SEARCH

According to EIC records, the project area had not been surveyed for cultural resources prior to this study (Fig. 5), and no cultural resources had been recorded on or adjacent to the property. Within the one-mile scope of the records search, EIC records show at least 23 previous studies on various tracts of land and linear features, which collectively covered roughly 35 percent of the land within the scope of the records search (Fig. 5). As a result of these and other studies in the vicinity, three prehistoric sites, two historic-period sites, and four isolates—i.e., localities with fewer than three artifacts—have been identified within the one-mile radius.

The prehistoric sites in the vicinity consisted mainly of lithic and ceramic scatters and seasonal resource processing locations, but two of the sites, 33-017009 and 33-017010, also contained human remains. The historic-period sites were all fairly common for the Coachella Valley area, such as site 33-026824, a refuse scatter, and Site 33-017008, the remains of a collapsed shed. The sites and isolates were located mostly in the area to the north of the project location, with Site 33-026824 located to the south, and all of them were found more than a half-mile away from the project area. Therefore, none of them requires further consideration during this study.

NATIVE AMERICAN PARTICIPATION

In response to CRM TECH's inquiry, the NAHC reported in a letter dated November 3, 2022, that the Sacred Lands File search did not identify any Native American cultural resources in the project vicinity. Noting that the absence of specific information would not necessarily indicate the absence of cultural resources, however, the NAHC recommended that local Native American groups be consulted for further information and provided a referral list potential contacts in the region. The NAHC's reply, including the referral list, is attached in Appendix 2 for reference by the City of Rancho Mirage in future government-to-government consultations with the pertinent Native American representatives, if necessary.

As mentioned above, Nicole Raslich from the Agua Caliente Tribal Historic Preservation Office participated in the archaeological field survey of the project area following CRM TECH's outreach effort. In a letter dated October 6, 2022, Ms. Raslich identified the project location as a part of the tribe's Traditional Use Area. She requested copies of all cultural resource documentation generated for the project for tribal review as well as the presence of archaeological and Native American monitors during ground-disturbing activities in the project area.

HISTORICAL BACKGROUND RESEARCH

Historical sources consulted during this study yielded no evidence of any settlement or development activities in the project area throughout the historic period (Figs. 6-9; NETR Online 1972). In the surrounding area, the earliest such activities evidently took place in the early post-WWII period, when a number of scattered buildings appeared across much of Section 30 and along newly constructed roads, including the forerunner of present-day Via Florencia (Fig. 9). Archival records indicate that these buildings were the results of a wave of five-acre homestead claims on public land

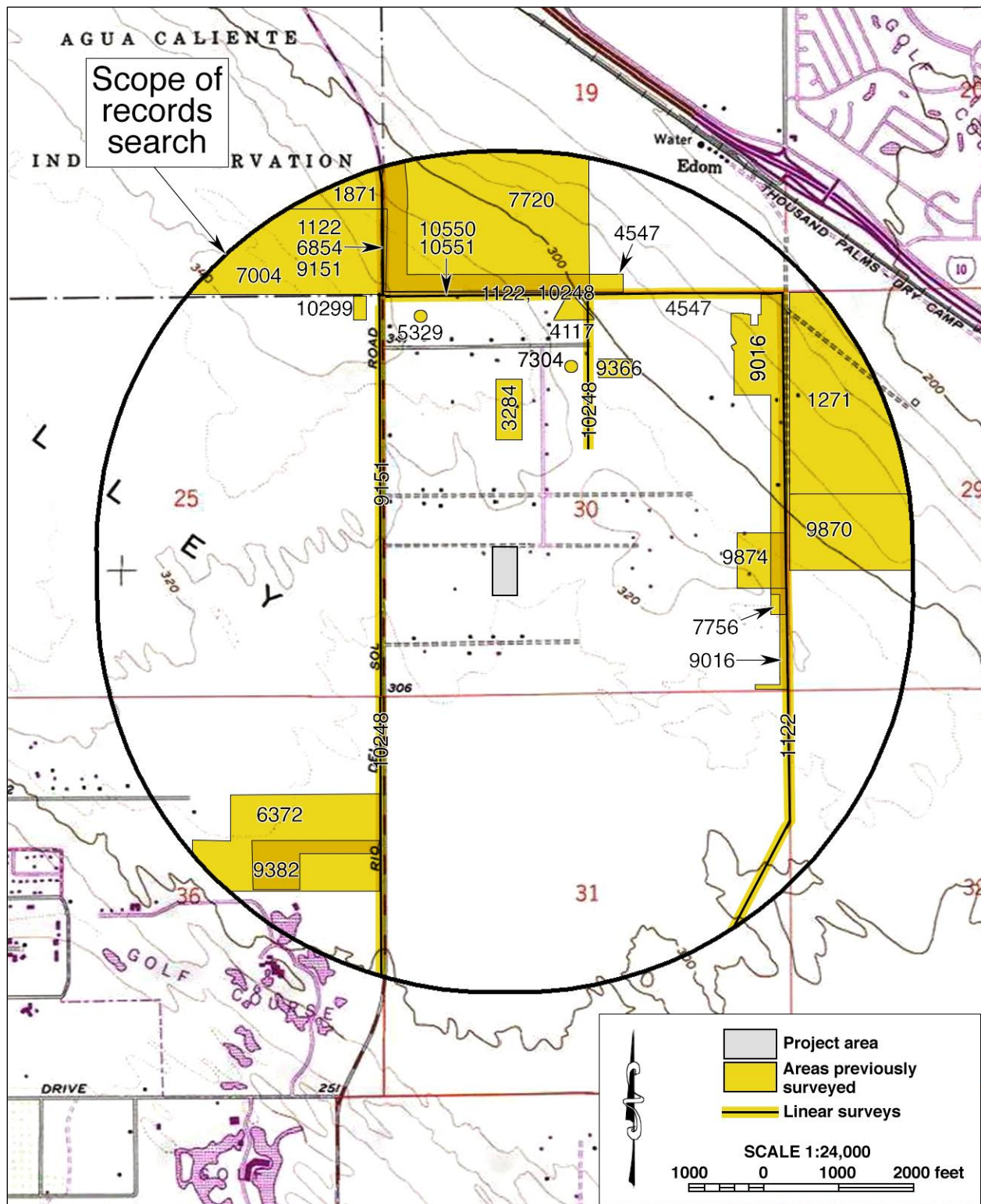


Figure 5. Previous cultural resources studies in the vicinity of the project area, listed by EIC file number. Locations of known historical/archaeological resources are not shown as a protective measure.

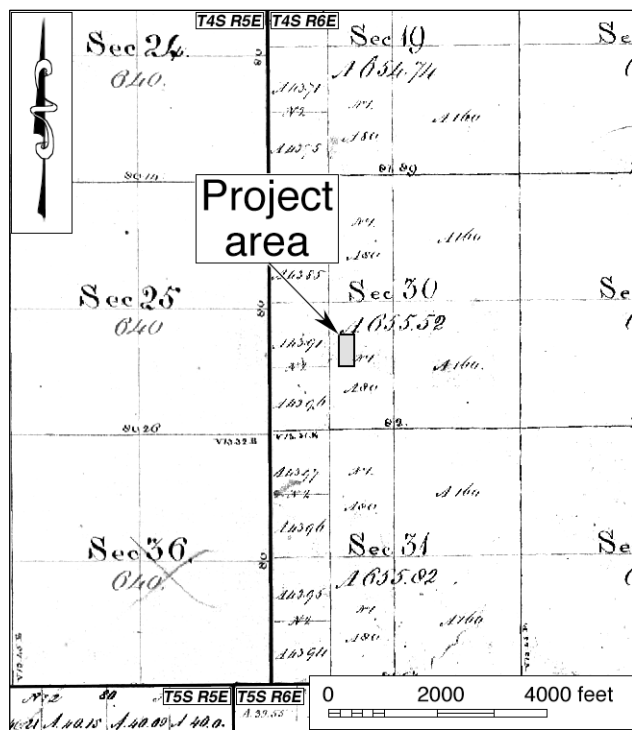


Figure 6. The project area and vicinity in 1853-1856 (source: GLO 1856-d)

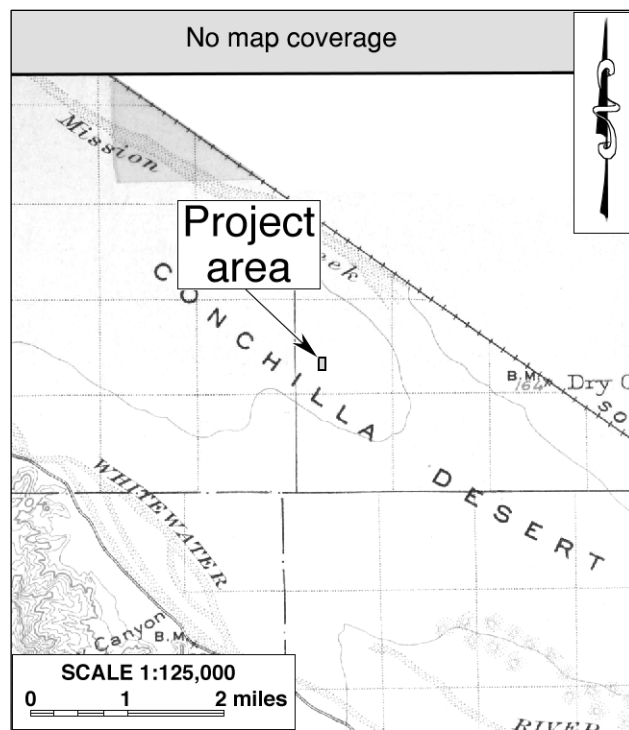


Figure 7. The project area and vicinity in 1901 (source: USGS 1904).

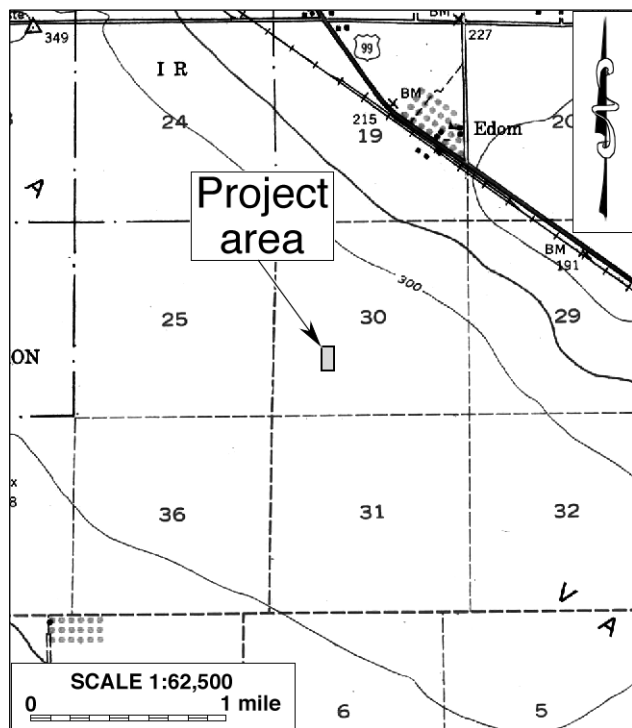


Figure 8. The project area and vicinity in 1941 (source: USGS 1941).

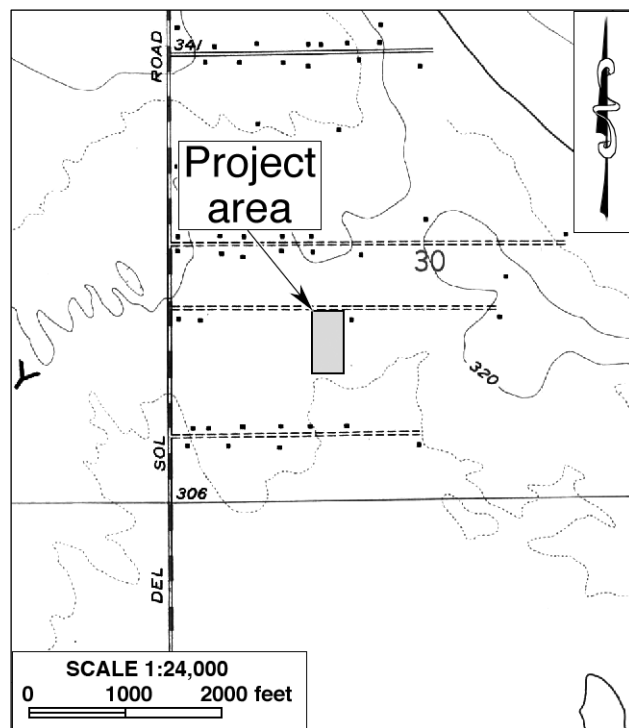


Figure 9. The project area and vicinity in 1951-1958 (source: USGS 1958).

under the provisions of the Small Tract Act of 1938, a practice that was widespread in the southern California desert region at the time (BLM n.d.). However, none of these so-called “jackrabbit homesteads” were found within the project area itself, which has remained vacant, undeveloped, and apparently unused to the present time despite accelerated growth in the surrounding area since the 1980s (Fig. 2; NETR Online 1972-2018; Google Earth 1985-2021).

FIELD SURVEY

The intensive-level field survey of the project area produced negative results for potential “historical resources,” and no buildings, structures, objects, site, or artifact deposits dating to the prehistoric or historic period were encountered throughout the course of the survey.

DISCUSSION

The purpose of this study is to identify any cultural resources within the project area and to assist the City of Rancho Mirage in determining whether such resources meet the official definition of “historical resources,” as provided in the California Public Resources Code, in particular CEQA. According to PRC §5020.1(j), “‘historical resource’ includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.”

More specifically, CEQA guidelines state that the term “historical resources” applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the lead agency (Title 14 CCR §15064.5(a)(1)-(3)). Regarding the proper criteria for the evaluation of historical significance, CEQA guidelines mandate that “generally a resource shall be considered by the lead agency to be ‘historically significant’ if the resource meets the criteria for listing on the California Register of Historical Resources” (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

- (1) Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.
- (2) Is associated with the lives of persons important in our past.
- (3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- (4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

In summary of the research results presented above, no potential “historical resources” were previously recorded within the project area, and none were found during the present survey. In addition, the Native American input did not identify any sites of traditional cultural value nearby, and no notable cultural features were known to be present in the project area throughout the historic period. Based on these findings, and in light of the significance criteria listed above, the present report concludes that no “historical resources” exist within the project area.

CONCLUSIONS AND RECOMMENDATIONS

CEQA establishes that a project that may cause a substantial adverse change in the significance of a “historical resource” is a project that may have a significant effect on the environment (PRC §21084.1). “Substantial adverse change,” according to PRC §5020.1(q), “means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired.” As stated above, this study has concluded that no “historical resources,” as defined by CEQA, are present within the project area. Accordingly, CRM TECH presents the following recommendations to the City of Rancho Mirage:

- The proposed project will not cause a substantial adverse change to any known “historical resources.”
- No further cultural resources investigation is necessary for the project unless development plans undergo such changes as to include areas not covered by this study.
- If buried cultural materials are discovered during any earth-moving operations associated with the project, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

REFERENCES

- Anderson, M. Kat
2005 *Tending the Wild: Native American Knowledge and the Management of California's Natural Resources*. University of California Press, Berkeley.
- Bean, Lowell John
1978 Cahuilla. In Robert F. Heizer (ed.): *Handbook of North American Indians*, Vol. 8: *California*; pp. 575-587. Smithsonian Institution, Washington, D.C.
- Bean, Lowell John, and Katherine Siva Saubel
1972 *Temalpakh: Cahuilla Indian Knowledge and Usage of Plants*. Malki Museum Press, Banning, California.
- BLM (Bureau of Land Management, U.S. Department of the Interior)
n.d. The Official Federal Land Records Site. <http://www.glorerecords.blm.gov>.
- CSRI (Cultural Systems Research, Inc.)
2002 The Native Americans of Joshua Tree National Park: An Ethnographic Overview and Assessment Study. [Http://www.cr.nps.gov/history/online_books/jotr/history6.htm](http://www.cr.nps.gov/history/online_books/jotr/history6.htm).
- GLO (General Land Office, U.S. Department of the Interior)
1856a Plat map: Township No. 4 South Range No. 5 East, SBBM; surveyed in 1855-1856.
1856b Plat map: Township No. 4 South Range No. 6 East, SBBM; surveyed in 1855-1856.
1856c Plat Map: Township No. 5 North Range No. 5 West, SBBM; surveyed in 1853-1855.
1856d Plat Map: Township No. 5 North Range No. 6 West, SBBM; surveyed in 1853-1855.
- Google Earth
1985-2021 Aerial photographs of the project vicinity; taken in 1985, 1996, 2002, 2004-2006, 2009, 2011-2013, 2015-2019, and 2021. Available through the Google Earth software.
- Gunther, Jane Davies
1984 *Riverside County, California, Place Names: Their Origins and Their Stories*. J.D. Gunther, Riverside.

Johnston, Francis J.

1987 *The Bradshaw Trail*; revised edition. Historical Commission Press, Riverside.

Kroeber, Alfred L.

1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Government Printing Office, Washington, D.C.

Laflin, Patricia

1998 *Coachella Valley California: A Pictorial History*. The Donning Company, Virginia Beach, Virginia.

Love, Bruce, and Bai "Tom" Tang

1996 Cultural Resources Report: Rancho Mirage General Plan, City of Rancho Mirage, Riverside County, California. On File, Eastern Information Center, University of California, Riverside.

NETR (Nationwide Environmental Title Research) Online

1972-2020 Aerial photographs of the project vicinity; taken in 1972, 1984, 1996, 2002, 2005, 2009, 2010, 2012, 2014, 2016, 2018, and 2020. <http://www.historicaerials.com>.

Robinson, W.W.

1948 *Land in California*. University of California Press, Berkeley.

Ross, Delmer G.

1992 *Gold Road to La Paz: An Interpretive Guide to the Bradshaw Trail*. Tales of the Mojave Road Publishing Company, Essex, California.

Schaefer, Jerry

1994 The Challenge of Archaeological Research in the Colorado Desert: Recent Approaches and Discoveries. *Journal of California and Great Basin Anthropology* 16(1):60-80.

Shields Date Gardens

1957 *Coachella Valley Desert Trails and the Romance and Sex Life of the Date*. Shields Date Gardens, Indio.

Strong, William Duncan

1929 *Aboriginal Society in Southern California*. University of California Publications in American Archaeology and Ethnology, Vol. 26.

USGS (United States Geological Survey, U.S. Department of the Interior)

1904 Map: Indio, Calif. (30', 1:125,000); surveyed in 1901.

1941 Map: Edom, Calif. (15', 1:62,500); aerial photographs taken in 1941.

1958 Map: Thousand Palms, Calif. (15', 1:62,500); aerial photographs taken in 1951-1956, field-checked in 1958.

1979 Map: Santa Ana, Calif. (120'x60', 1:250,000); 1959 edition revised.

1981 Map: Cathedral City, Calif. (7.5', 1:24,000); 1958 edition photorevised in 1978.

APPENDIX 1: PERSONNEL QUALIFICATIONS

PRINCIPAL INVESTIGATOR/HISTORIAN Bai “Tom” Tang, M.A.

Education

- | | |
|-----------|--|
| 1988-1993 | Graduate Program in Public History/Historic Preservation, University of California, Riverside. |
| 1987 | M.A., American History, Yale University, New Haven, Connecticut. |
| 1982 | B.A., History, Northwestern University, Xi'an, China. |
| 2000 | “Introduction to Section 106 Review,” presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno. |
| 1994 | “Assessing the Significance of Historic Archaeological Sites,” presented by the Historic Preservation Program, University of Nevada, Reno. |

Professional Experience

- | | |
|-----------|---|
| 2002- | Principal Investigator, CRM TECH, Riverside/Colton, California. |
| 1993-2002 | Project Historian/Architectural Historian, CRM TECH, Riverside, California. |
| 1993-1997 | Project Historian, Greenwood and Associates, Pacific Palisades, California. |
| 1991-1993 | Project Historian, Archaeological Research Unit, University of California, Riverside. |
| 1990 | Intern Researcher, California State Office of Historic Preservation, Sacramento. |
| 1990-1992 | Teaching Assistant, History of Modern World, University of California, Riverside. |
| 1988-1993 | Research Assistant, American Social History, University of California, Riverside. |
| 1985-1988 | Research Assistant, Modern Chinese History, Yale University. |
| 1985-1986 | Teaching Assistant, Modern Chinese History, Yale University. |
| 1982-1985 | Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China. |

Cultural Resources Management Reports

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (with Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

PRINCIPAL INVESTIGATOR/ARCHAEOLOGIST
Michael Hogan, Ph.D., RPA (Registered Professional Archaeologist)

Education

- 1991 Ph.D., Anthropology, University of California, Riverside.
- 1981 B.S., Anthropology, University of California, Riverside; with honors.
- 1980-1981 Education Abroad Program, Lima, Peru.

- 2002 “Section 106—National Historic Preservation Act: Federal Law at the Local Level,”
UCLA Extension Course #888.
- 2002 “Recognizing Historic Artifacts,” workshop presented by Richard Norwood,
Historical Archaeologist.
- 2002 “Wending Your Way through the Regulatory Maze,” symposium presented by the
Association of Environmental Professionals.
- 1992 “Southern California Ceramics Workshop,” presented by Jerry Schaefer.
- 1992 “Historic Artifact Workshop,” presented by Anne Duffield-Stoll.

Professional Experience

- 2002- Principal Investigator, CRM TECH, Riverside/Colton, California.
- 1999-2002 Project Archaeologist/Field Director, CRM TECH, Riverside, California.
- 1996-1998 Project Director and Ethnographer, Statistical Research, Inc., Redlands, California.
- 1992-1998 Assistant Research Anthropologist, University of California, Riverside.
- 1992-1995 Project Director, Archaeological Research Unit, U.C. Riverside.
- 1993-1994 Adjunct Professor, Riverside Community College, Mt. San Jacinto College, U.C.
Riverside, Chapman University, and San Bernardino Valley College.
- 1991-1992 Crew Chief, Archaeological Research Unit, U.C. Riverside.
- 1984-1998 Project Director, Field Director, Crew Chief, and Archaeological Technician for
various southern California cultural resources management firms.

Research Interests

Cultural Resource Management, Southern Californian Archaeology, Settlement and Exchange Patterns, Specialization and Stratification, Culture Change, Native American Culture, Cultural Diversity.

Cultural Resources Management Reports

Principal investigator for, author or co-author of, and contributor to numerous cultural resources management study reports since 1986.

Memberships

Society for American Archaeology; Society for California Archaeology; Pacific Coast Archaeological Society; Coachella Valley Archaeological Society.

PROJECT ARCHAEOLOGIST/FIELD DIRECTOR
Daniel Ballester, M.S., RPA (Registered Professional Archaeologist)

Education

| | |
|------|--|
| 2013 | M.S., Geographic Information System (GIS), University of Redlands, California. |
| 1998 | B.A., Anthropology, California State University, San Bernardino. |
| 1997 | Archaeological Field School, University of Las Vegas and University of California, Riverside. |
| 1994 | University of Puerto Rico, Rio Piedras, Puerto Rico. |
| 2007 | Certificate in Geographic Information Systems (GIS), California State University, San Bernardino. |
| 2002 | “Historic Archaeology Workshop,” presented by Richard Norwood, Base Archaeologist, Edwards Air Force Base; presented at CRM TECH, Riverside, California. |

Professional Experience

| | |
|-----------|---|
| 2002- | Field Director/GIS Specialist, CRM TECH, Riverside/Colton, California. |
| 2011-2012 | GIS Specialist for Caltrans District 8 Project, Garcia and Associates, San Anselmo, California. |
| 2009-2010 | Field Crew Chief, Garcia and Associates, San Anselmo, California. |
| 2009-2010 | Field Crew, ECorp, Redlands. |
| 1999-2002 | Project Archaeologist, CRM TECH, Riverside, California. |
| 1998-1999 | Field Crew, K.E.A. Environmental, San Diego, California. |
| 1998 | Field Crew, A.S.M. Affiliates, Encinitas, California. |
| 1998 | Field Crew, Archaeological Research Unit, University of California, Riverside. |

Cultural Resources Management Reports

Field Director, co-author, and contributor to numerous cultural management reports since 2002.

APPENDIX 2

NATIVE AMERICAN RESPONSES

AGUA CALIENTE BAND OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION



03-008-2022-005

October 06, 2022

[VIA EMAIL TO:ngallardo@crmtech.us]
CRM TECH
Ms. Nina Gallardo
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Re: TTM 38041, 38266, 38273

Dear Ms. Nina Gallardo,

The Agua Caliente Band of Cahuilla Indians (ACBCI) appreciates your efforts to include the Tribal Historic Preservation Office (THPO) in the TTM 38041, 38266, 38273 project. The project area is not located within the boundaries of the ACBCI Reservation. However, it is within the Tribe's Traditional Use Area. For this reason, the ACBCI THPO requests the following:

- *A cultural resources inventory of the project area by a qualified archaeologist prior to any development activities in this area.
- *A copy of the records search with associated survey reports and site records from the information center.
- *Copies of any cultural resource documentation (report and site records) generated in connection with this project.
- *The presence of an archaeologist that meets the Secretary of Interior's standards during any ground disturbing activities.
- *The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities (including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior's Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office.

Again, the Agua Caliente appreciates your interest in our cultural heritage. If you have questions or require additional information, please call me at (760) 883-1134. You may also email me at ACBCI-THPO@aguacaliente.net.

Cordially,

AGUA CALIENTE BAND OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION



Nicole Raslich
Archaeological Technician
Tribal Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS



NATIVE AMERICAN HERITAGE COMMISSION

November 3, 2022

Nina Gallardo
CRM TECH

Via Email to: ngallardo@crmtech.us

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Sara Dutschke
Miwok

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Buffy McQuillen
Yokayo Pomo, Yuki,
Nomlaki

COMMISSIONER
Wayne Nelson
Luiseño

COMMISSIONER
Stanley Rodriguez
Kumeyaay

COMMISSIONER
[Vacant]

COMMISSIONER
[Vacant]

EXECUTIVE SECRETARY
**Raymond C.
Hitchcock**
Miwok/Nisenan

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

Re: Proposed Tentative Tract Map Numbers 38041, 38266, and 38273 Project, Riverside County

Dear Ms. Gallardo:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green
Cultural Resources Analyst

Attachment

**Native American Heritage Commission
Native American Contact List
Riverside County
11/3/2022**

Agua Caliente Band of Cahuilla Indians

Reid Milanovich, Chairperson
5401 Dinah Shore Drive Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6800
Fax: (760) 699-6919
laviles@aguacaliente.net

Los Coyotes Band of Cahuilla and Cupeño Indians

Ray Chapparosa, Chairperson
P.O. Box 189 Cahuilla
Warner Springs, CA, 92086-0189
Phone: (760) 782 - 0711
Fax: (760) 782-0712

Agua Caliente Band of Cahuilla Indians

Patricia Garcia-Plotkin, Director
5401 Dinah Shore Drive Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6907
Fax: (760) 699-6924
ACBCI-THPO@aguacaliente.net

Morongo Band of Mission Indians

Robert Martin, Chairperson
12700 Pumarra Road Cahuilla
Banning, CA, 92220 Serrano
Phone: (951) 755 - 5110
Fax: (951) 755-5177
abrierty@morongo-nsn.gov

Augustine Band of Cahuilla Mission Indians

Amanda Vance, Chairperson
84-001 Avenue 54 Cahuilla
Coachella, CA, 92236
Phone: (760) 398 - 4722
Fax: (760) 369-7161
hhaines@augustinetribe.com

Morongo Band of Mission Indians

Ann Brierty, THPO
12700 Pumarra Road Cahuilla
Banning, CA, 92220 Serrano
Phone: (951) 755 - 5259
Fax: (951) 572-6004
abrierty@morongo-nsn.gov

Cabazon Band of Mission Indians

Doug Welmas, Chairperson
84-245 Indio Springs Parkway Cahuilla
Indio, CA, 92203
Phone: (760) 342 - 2593
Fax: (760) 347-7880
jstapp@cabazonindians-nsn.gov

Quechan Tribe of the Fort Yuma Reservation

Jill McCormick, Historic
Preservation Officer
P.O. Box 1899 Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

Cahuilla Band of Indians

Daniel Salgado, Chairperson
52701 U.S. Highway 371 Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 5549
Fax: (951) 763-2808
Chairman@cahuilla.net

Quechan Tribe of the Fort Yuma Reservation

Manfred Scott, Acting Chairman
Kw'ts'an Cultural Committee
P.O. Box 1899 Quechan
Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Proposed Tentative Tract Map Numbers 38041, 38266, and 38273 Project, Riverside County.

**Native American Heritage Commission
Native American Contact List
Riverside County
11/3/2022**

Ramona Band of Cahuilla

Joseph Hamilton, Chairperson
P.O. Box 391670 Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
admin@ramona-nsn.gov

***Torres-Martinez Desert Cahuilla
Indians***

Cultural Committee,
P.O. Box 1160 Cahuilla
Thermal, CA, 92274
Phone: (760) 397 - 0300
Fax: (760) 397-8146
Cultural-
Committee@torresmartinez-
nsn.gov

Ramona Band of Cahuilla

John Gomez, Environmental
Coordinator
P. O. Box 391670 Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
jgomez@ramona-nsn.gov

***Santa Rosa Band of Cahuilla
Indians***

Lovina Redner, Tribal Chair
P.O. Box 391820 Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
lsaul@santarosa-nsn.gov

***Soboba Band of Luiseno
Indians***

Isaiah Vivanco, Chairperson
P. O. Box 487 Cahuilla
San Jacinto, CA, 92581 Luiseno
Phone: (951) 654 - 5544
Fax: (951) 654-4198
ivivanco@soboba-nsn.gov

***Soboba Band of Luiseno
Indians***

Joseph Ontiveros, Cultural
Resource Department
P.O. BOX 487 Cahuilla
San Jacinto, CA, 92581 Luiseno
Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Proposed Tentative Tract Map Numbers 38041, 38266, and 38273 Project, Riverside County.



TTM 38273
Initial Study/Mitigated Negative Declaration
June 2024

APPENDIX D – ENERGY & UTILITIES WORKSHEETS

INTRODUCTION TO ENERGY SCREENING TABLES

The following worksheets are used to evaluate the potential impacts of a project.

Table 1 Definition of Project

This Table is used to establish the proposed development parameters that are used in the calculation of energy usage. The independent variable to be entered is identified by shading. For residential development, the number of housing units should be entered in the shaded area. For non-residential development, the total floor area of development should be entered in the shaded area.

Table 2 Summary of Project Impacts

Consumption/Generation Rates. This table indicates the development's projected electrical consumption, natural gas consumption, water consumption, effluent generation, and solid waste generation. No modifications should be made to this table.

Tables 3 through 4 Calculation of Project Impacts

Tables 3 through 4 indicate the results of the analysis.

Table 3 Electrical Consumption - This Table calculates the projected electrical consumption for new development. Default generation rates provided in the shaded areas may be changed.

Table 4 Natural Gas Consumption - This Table calculates the projected natural gas usage for new development. Default generation rates provided in the shaded areas may be changed.

Table 1 Project Name: RNCH 002 - TTM38273

Definition of Project Parameters - Enter independent variable (no. of units or floor area) in the shaded area. The independent variable to be entered is the number of units (for residential development) or the gross floor area (for non-residential development).

| Land Use | Independent | Factor |
|-----------------------------|-----------------|-------------------------|
| Residential Uses | Variable | Total Units |
| Single-Family Residential | No. of Units | 9 |
| Medium Density Residential | No. of Units | 0 |
| Multiple-Family Residential | No. of Units | 0 |
| Mobile Home | No. of Units | 0 |
| Office Uses | Variable | Total Floor Area |
| Office | Sq. Ft. | 0 |
| Medical Office Building | Sq. Ft. | 0 |
| Office Park | Sq. Ft. | 0 |
| Bank/Financial Services | Sq. Ft. | 0 |
| Commercial Uses | Variable | Floor Area/Rooms |
| Specialty Retail Commercial | Sq. Ft. | 0 |
| Convenience Store | Sq. Ft. | 0 |
| Movie Theater | Sq. Ft. | 0 |
| Shopping Center | Sq. Ft. | 0 |
| Sit-Down Restaurant | Sq. Ft. | 0 |
| Fast-Food Restaurant | Sq. Ft. | 0 |
| Hotel | Rooms | 0 |
| Manufacturing Uses | Variable | Total Floor Area |
| Industrial Park | Sq. Ft. | 0 |
| Manufacturing | Sq. Ft. | 0 |
| General Light Industry | Sq. Ft. | 0 |
| Warehouse | Sq. Ft. | 0 |
| Public/Institutional | Variable | Total Floor Area |
| Public/Institutional | Sq. Ft. | 0 |
| Open Space | Sq. Ft. | 0 |

Table 2: Projected Energy Consumption and Generation

Summary of Project Impacts - Results of analysis identified below. No modifications should be made to this Table.

| Utilities Consumption and Generation | Factor | Rates |
|--------------------------------------|----------------|---------|
| Electrical Consumption | kWh/day | 138.70 |
| Natural Gas Consumption | cubic feet/day | 1,999.5 |

Table 3: Electrical Consumption

| Project Component | Units of Measure | Consumption Factor | | Projected Consumption |
|--|------------------|--------------------|------------------|-----------------------|
| Residential Uses | No. of Units | kWh | Variable | kWh/Unit/Day |
| Single-Family Residential | 9 | 5,625.00 | kWh/Unit/Year | 138.7 |
| Medium Density Residential | 0 | 5,625.00 | kWh/Unit/Year | 0.0 |
| Multiple-Family Residential | 0 | 5,625.00 | kWh/Unit/Year | 0.0 |
| Mobile Home | 0 | 4,644.00 | kWh/Unit/Year | 0.0 |
| Office Uses | Sq. Ft. | kWh | Variable | kWh/Sq. Ft./Day |
| Office | 0 | 20.80 | kWh/Sq. Ft./Year | 0.0 |
| Medical Office Building | 0 | 14.20 | kWh/Sq. Ft./Year | 0.0 |
| Office Park | 0 | 20.80 | kWh/Sq. Ft./Year | 0.0 |
| Bank/Financial Services | 0 | 20.80 | kWh/Sq. Ft./Year | 0.0 |
| Commercial Uses | Sq. Ft./Rooms | kWh | Variable | kWh/Sq. Ft./Day |
| Specialty Retail Commercial | 0 | 16.00 | kWh/Sq. Ft./Year | 0.0 |
| Convenience Store | 0 | 16.00 | kWh/Sq. Ft./Year | 0.0 |
| Movie Theater | 0 | 16.00 | kWh/Sq. Ft./Year | 0.0 |
| Shopping Center | 0 | 35.90 | kWh/Sq. Ft./Year | 0 |
| Sit-Down Restaurant | 0 | 49.10 | kWh/Sq. Ft./Year | 0.0 |
| Fast-Food Restaurant | 0 | 49.10 | kWh/Sq. Ft./Year | 0.0 |
| Hotel | 0 | 8,955.00 | kWh/Sq. Ft./Year | 0.0 |
| Manufacturing Uses | Sq. Ft. | kWh | Variable | kWh/Sq. Ft./Day |
| Industrial Park | 0 | 4.80 | kWh/Sq. Ft./Year | 0.0 |
| Manufacturing | 0 | 4.80 | kWh/Sq. Ft./Year | 0.0 |
| General Light Industry | 0 | 4.80 | kWh/Sq. Ft./Year | 0.0 |
| Warehouse | 0 | 4.80 | kWh/Sq. Ft./Year | 0.0 |
| Public/Institutional | Sq. Ft. | kWh | Variable | kWh/Sq. Ft./Day |
| Public/Institutional | 0 | 4.80 | kWh/Sq. Ft./Year | 0.0 |
| Open Space | 0 | 0.00 | kWh/Sq. Ft./Year | 0.0 |
| Total Daily Electrical Consumption (kWh/day) | | | | 138.7 |

Sources:

Residential rates were derived from the SCAQMD's CEQA Air Quality Handbook (April 1993).

All other rates are from Common Forecasting Methodology VII Demand Forms, 1989

Table 4: Natural Gas Consumption

| Project Component | Units of Measure | Consumption Factor | | Projected Consumption |
|-----------------------------|------------------|---------------------|---------------------|-----------------------|
| Residential Uses | No. of Units | Cu. Ft. of Nat. Gas | Variable | Cu. Ft./Day |
| Single-Family Residential | 9 | 6,665.00 | Cu. Ft./Mo./Unit | 1,999.5 |
| Medium Density Residential | 0 | 4,011.50 | Cu. Ft./Mo./Unit | 0.0 |
| Multiple-Family Residential | 0 | 4,011.50 | Cu. Ft./Mo./Unit | 0.0 |
| Mobile Home | 0 | 4,011.50 | Cu. Ft./Mo./Unit | 0.0 |
| Office Uses | Sq. Ft. | Cu. Ft. of Nat. Gas | Variable | Cu. Ft./Day |
| Office | 0 | 2.00 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Medical Office Building | 0 | 2.00 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Office Park | 0 | 2.00 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Bank/Financial Services | 0 | 2.00 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Commercial Uses | Sq. Ft./Rooms | Cu. Ft. of Nat. Gas | Variable | Cu. Ft./Day |
| Specialty Retail Commercial | 0 | 2.90 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Convenience Store | 0 | 2.90 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Movie Theater | 0 | 2.90 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Shopping Center | 0 | 2.90 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Sit-Down Restaurant | 0 | 2.90 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Fast-Food Restaurant | 0 | 2.90 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Hotel | 0 | 2.90 | Cu. Ft./Mo./Room | 0.0 |
| Manufacturing Uses | Sq. Ft. | Cu. Ft. of Nat. Gas | Variable | Cu. Ft./Day |
| Industrial Park | 0 | 4.70 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Manufacturing | 0 | 4.70 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| General Light Industry | 0 | 4.70 | Cu. Ft./Mo./Sq. Ft. | 0.0 |

| | | | | |
|--|---------|---------------------|---------------------|-------------|
| Warehouse | 0 | 4.70 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Public/Institutional Use | Sq. Ft. | Cu. Ft. of Nat. Gas | Variable | Cu. Ft./Day |
| Public/Institutional | 0 | 2.90 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Open Space | 0 | 2.90 | Cu. Ft./Mo./Sq. Ft. | 0.0 |
| Total Daily Natural Gas Consumption (cubic feet/day) | | | | 1,999.5 |
| Sources: | | | | |
| South Coast Air Quality Management District, CEQA Air Quality Handbook. April 1993 | | | | |

INTRODUCTION TO UTILITY SCREENING TABLES

The following worksheets are used to evaluate the potential impacts of a project.

Table 1 Definition of Project

This Table is used to establish the proposed development parameters that are used in the calculation of utilities usage. The independent variable to be entered is identified by shading. For residential development, the number of housing units should be entered in the shaded area. For non-residential development, the total floor area of development should be entered in the shaded area.

Tables 2 Summary of Project Impacts

Consumption/Generation Rates. This table indicates the development's projected electrical consumption, natural gas consumption, water consumption, effluent generation, and solid waste generation. No modifications should be made to this table.

Tables 3 through 5 Calculation of Project Impacts

Tables 3 through 7 indicate the results of the analysis.

Table 3 Water Consumption - This Table calculates the projected water consumption rates for new development. Default generation rates provided in the shaded areas may be changed.

Table 4 Sewage Generation - This Table calculates the projected effluent generation rates for new development. Default generation rates provided in the shaded areas may be changed.

Table 5 Solid Waste Generation - This Table calculates the projected waste generation for new development. Default generation rates provided in the shaded areas may be changed.

Table 1 Project Name: RNCH 002 - TTM 38273

Definition of Project Parameters - Enter independent variable (no. of units or floor area) in the shaded area. The independent variable to be entered is the number of units (for residential development) or the gross floor area (for non-residential development).

| Land Use | Independent | Factor |
|-----------------------------|-----------------|-------------------------|
| Residential Uses | Variable | Total Units |
| Single-Family Residential | No. of Units | 9 |
| Medium Density Residential | No. of Units | 0 |
| Multiple-Family Residential | No. of Units | 0 |
| Mobile Home | No. of Units | 0 |
| Office Uses | Variable | Total Floor Area |
| Office | Sq. Ft. | 0 |
| Medical Office Building | Sq. Ft. | 0 |
| Office Park | Sq. Ft. | 0 |
| Bank/Financial Services | Sq. Ft. | 0 |
| Commercial Uses | Variable | Floor Area/Rooms |
| Specialty Retail Commercial | Sq. Ft. | 0 |
| Convenience Store | Sq. Ft. | 0 |
| Movie Theater | Sq. Ft. | 0 |
| Shopping Center | Sq. Ft. | 0 |
| Sit-Down Restaurant | Sq. Ft. | 0 |
| Fast-Food Restaurant | Sq. Ft. | 0 |
| Hotel | Rooms | 0 |
| Manufacturing Uses | Variable | Total Floor Area |
| Industrial Park | Sq. Ft. | 0 |
| Manufacturing | Sq. Ft. | 0 |
| General Light Industry | Sq. Ft. | 0 |
| Warehouse | Sq. Ft. | 0 |
| Public/Institutional | Variable | Total Floor Area |
| Public/Institutional | Sq. Ft. | 0 |
| Open Space | Sq. Ft. | 0 |

Table 2: Projected Utility Consumption and Generation

Summary of Project Impacts - Results of analysis identified below. No modifications should be made to this Table.

| Utilities Consumption and Generation | Factor | Rates |
|--------------------------------------|-------------|-------|
| Water Consumption | gallons/day | 3,510 |
| Sewage Generation | gallons/day | 2,340 |
| Solid Waste Generation | pounds/day | 110 |

| Table 3: Water Consumption | | | | |
|--|------------------|--------------------|-------------------|-----------------------|
| Project Component | Units of Measure | Consumption Factor | | Projected Consumption |
| Residential Uses | No. of Units | Gals. of Water | Variable | Gals./Day |
| Single-Family Residential | 9 | 390.00 | Gals./Day/Unit | 3,510.0 |
| Medium Density Residential | 0 | 300.00 | Gals./Day/Unit | 0.0 |
| Multiple-Family Residential | 0 | 234.00 | Gals./Day/Unit | 0.0 |
| Mobile Home | 0 | 234.00 | Gals./Day/Unit | 0.0 |
| Office Uses | Sq. Ft. | Gals. of Water | Variable | Gals./Day |
| Office | 0 | 0.30 | Gals./Day/Sq. Ft. | 0.0 |
| Medical Office Building | 0 | 0.30 | Gals./Day/Sq. Ft. | 0.0 |
| Office Park | 0 | 0.30 | Gals./Day/Sq. Ft. | 0.0 |
| Bank/Financial Services | 0 | 0.15 | Gals./Day/Sq. Ft. | 0.0 |
| Commercial Uses | Sq. Ft./Room | Gals. of Water | Variable | Gals./Day |
| Specialty Retail Commercial | 0 | 0.15 | Gals./Day/Sq. Ft. | 0.0 |
| Convenience Store | 0 | 0.15 | Gals./Day/Sq. Ft. | 0.0 |
| Movie Theater | 0 | 0.20 | Gals./Day/Sq. Ft. | 0.0 |
| Shopping Center | 0 | 0.50 | Gals./Day/Sq. Ft. | 0.0 |
| Sit-Down Restaurant | 0 | 1.50 | Gals./Day/Sq. Ft. | 0.0 |
| Fast-Food Restaurant | 0 | 0.12 | Gals./Day/Sq. Ft. | 0.0 |
| Hotel | 0 | 187.50 | Gals./Day/Room. | 0.0 |
| Manufacturing Uses | Sq. Ft. | Gals. of Water | Variable | Gals./Day |
| Industrial Park | 0 | 0.30 | Gals./Day/Sq. Ft. | 0.0 |
| Manufacturing | 0 | 0.30 | Gals./Day/Sq. Ft. | 0.0 |
| General Light Industry | 0 | 0.30 | Gals./Day/Sq. Ft. | 0.0 |
| Warehouse | 0 | 0.05 | Gals./Day/Sq. Ft. | 0.0 |
| Public/Institutional Use | Sq. Ft. | Gals. of Water | Variable | Gals./Day |
| Public/Institutional | 0 | 0.12 | Gals./Day/Sq. Ft. | 0.0 |
| Open Space | 0 | 0.12 | Gals./Day/Sq. Ft. | 0.0 |
| Total Daily Water Consumption (gallons/day) | | | | 3,510.0 |
| Source: Derived from Los Angeles County Sanitation District rates (150% of effluent generation). | | | | |

| Table 4: Sewage Generation | | | | |
|-----------------------------|------------------|-------------------|-------------------|-----------------------|
| Project Component | Units of Measure | Generation Factor | | Projected Consumption |
| Residential Uses | # of Units | Gals. of Effluent | Variable | Gals./Day |
| Single-Family Residential | 9 | 260.00 | Gals./Day/Unit | 2,340.0 |
| Medium Density Residential | 0 | 200.00 | Gals./Day/Unit | 0.0 |
| Multiple-Family Residential | 0 | 156.00 | Gals./Day/Unit | 0.0 |
| Mobile Home | 0 | 156.00 | Gals./Day/Unit | 0.0 |
| Office Uses | Sq. Ft. | Gals. of Effluent | Variable | Gals./Day |
| Office | 0 | 0.20 | Gals./Day/Sq. Ft. | 0.0 |
| Medical Office Building | 0 | 0.20 | Gals./Day/Sq. Ft. | 0.0 |
| Office Park | 0 | 0.20 | Gals./Day/Sq. Ft. | 0.0 |
| Bank/Financial Services | 0 | 0.10 | Gals./Day/Sq. Ft. | 0.0 |
| Commercial Uses | Sq. Ft./# Rooms | Gals. of Effluent | Variable | Gals./Day |
| Specialty Retail Commercial | 0 | 0.10 | Gals./Day/Sq. Ft. | 0.0 |
| Convenience Store | 0 | 0.10 | Gals./Day/Sq. Ft. | 0.0 |
| Movie Theater | 0 | 0.13 | Gals./Day/Sq. Ft. | 0.0 |
| Shopping Center | 0 | 0.33 | Gals./Day/Sq. Ft. | 0.0 |
| Sit-Down Restaurant | 0 | 1.00 | Gals./Day/Sq. Ft. | 0.0 |
| Fast-Food Restaurant | 0 | 0.08 | Gals./Day/Sq. Ft. | 0.0 |
| Hotel | 0 | 125 | Gals./Day/Room. | 0.0 |
| Manufacturing Uses | Sq. Ft. | Gals. of Effluent | Variable | Gals./Day |
| Industrial Park | 0 | 0.20 | Gals./Day/Sq. Ft. | 0.0 |
| Manufacturing | 0 | 0.20 | Gals./Day/Sq. Ft. | 0.0 |
| General Light Industry | 0 | 0.20 | Gals./Day/Sq. Ft. | 0.0 |
| Warehouse | 0 | 0.03 | Gals./Day/Sq. Ft. | 0.0 |
| Public/Institutional Use | Sq. Ft. | Gals. of Effluent | Variable | Gals./Day |
| Public/Institutional | 0 | 0.10 | Gals./Day/Sq. Ft. | 0.0 |
| Open Space | 0 | 0.10 | Gals./Day/Sq. Ft. | 0.0 |

| | |
|--|---------|
| Total Daily Sewage Generation (gallons/day) | 2,340.0 |
| Source: Los Angeles County Sanitation Districts. | |

Table 5: Solid Waste Generation

| Project Component | Units of Measure | Generation Factor | | Projected Generation |
|------------------------------------|------------------|-------------------|------------------------|----------------------|
| Residential Uses | # of Units | Lbs.of Waste | Variable | Lbs./Day |
| Single-Family Residential | 9 | 12.23 | Lbs./Day/Unit | 110.1 |
| Medium Density Residential | 0 | 12.23 | Lbs./Day/Unit | 0.0 |
| Multiple-Family Residential | 0 | 12.23 | Lbs./Day/Unit | 0.0 |
| Mobile Home | 0 | 12.23 | Lbs./Day/Unit | 0.0 |
| Office Uses | Sq. Ft. | Lbs.of Waste | Variable | Lbs./Day |
| Office | 0 | 6.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Medical Office Building | 0 | 6.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Office Park | 0 | 6.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Bank/Financial Services | 0 | 6.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Commercial Uses | Sq. Ft./# Rooms | Lbs.of Waste | Variable | Lbs./Day |
| Specialty Retail Commercial | 0 | 42.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Convenience Store | 0 | 42.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Movie Theater | 0 | 6.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Shopping Center | 0 | 6.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Sit-Down Restaurant | 0 | 6.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Fast-Food Restaurant | 0 | 42.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Hotel | 0 | 6.00 | Lbs./Day/Room | 0.0 |
| Manufacturing Uses | Sq. Ft. | Lbs.of Waste | Variable | Lbs./Day |
| Industrial Park | 0 | 8.93 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Manufacturing | 0 | 8.93 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| General Light Industry | 0 | 8.93 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Warehouse | 0 | 8.93 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Public/Institutional Use | Sq. Ft. | Lbs.of Waste | Variable | Lbs./Day |
| Public/Institutional | 0 | 4.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Open Space | 0 | 3.00 | Lbs./Day/1,000 Sq. Ft. | 0.0 |
| Total Daily Solid Waste Generation | | | | 110.1 |

Source: City of Los Angeles CEQA Thresholds Guide, 2006, and
City of Los Angeles Average Solid Waste Generation Rates, April 1981



APPENDIX E – TRIBAL CONSULTATION LETTERS

AGUA CALIENTE BAND OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION



03-008-2023-004

August 30, 2023

[VIA EMAIL TO:pilarl@ranchomirageca.gov]
City of Rancho Mirage
Pilar Lopez
68-825 Highway 111
Rancho Mirage, California 92270

Re: TTM22-0004

Dear Pilar Lopez,

The Agua Caliente Band of Cahuilla Indians (ACBCI) appreciates your efforts to include the Tribal Historic Preservation Office (THPO) in the TTM22-0004 project. The project area is not located within the boundaries of the ACBCI Reservation. However, it is within the Tribe's Traditional Use Area. For this reason, the ACBCI THPO requests the following:

- *Formal government to government consultation under California Assembly Bill No. 52 (AB-52).

- *A cultural resources inventory of the project area by a qualified archaeologist prior to any development activities in this area.

- *Copies of any cultural resource documentation (report and site records) generated in connection with this project.

- *A copy of the records search with associated survey reports and site records from the information center.

- *The presence of an approved Agua Caliente Native American Cultural Resource Monitor(s) during any ground disturbing activities (including archaeological testing and surveys). Should buried cultural deposits be encountered, the Monitor may request that destructive construction halt and the Monitor shall notify a Qualified Archaeologist (Secretary of the Interior's Standards and Guidelines) to investigate and, if necessary, prepare a mitigation plan for submission to the State Historic Preservation Officer and the Agua Caliente Tribal Historic Preservation Office.

Again, the Agua Caliente appreciates your interest in our cultural heritage. If you have questions or require additional information, please call me at (760) 423-3485. You may also email me at ACBCI-THPO@aguacaliente.net.

Cordially,

AGUA CALIENTE BAND OF CAHUILLA INDIANS



Xitlaly Madrigal
Cultural Resources Analyst
Tribal Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION OFFICE

VIA ELECTRONIC MAIL

planning@ranchomirageca.gov

Pilar Lopez
Senior Planner
Development Services Department
69-825 Highway 111
Rancho Mirage, CA 92270

**MORONGO
BAND OF
MISSION
INDIANS**



A SOVEREIGN NATION

September 25, 2023

Re: AB 52 Consultation for TTM 38273

The Morongo Band of Mission Indians (Tribe/MBMI) Tribal Historic Preservation Office received your letter regarding the above referenced Project. The proposed Project is not located within the boundaries of the ancestral territory or traditional use area of the Cahuilla and Serrano people of the Morongo Band of Mission Indians.

Thank you for notifying the MBMI about this project. MBMI encourages your consultation with tribes more closely associated with the lands upon which the project is located.

Respectfully,



Bernadette Ann Brierty
Tribal Historic Preservation Officer
Morongo Band of Mission Indians

CC: Morongo THPO



TWENTY-NINE PALMS BAND OF MISSION INDIANS

46-200 Harrison Place. Coachella, CA. 92236. Ph. 760.863.2444. Fax: 760.863.2449

September 25, 2023

Pilar Lopez, Senior Planner
City of rancho Mirage
69-825 Highway 111
Rancho Mirage, CA 92270

RE: Environmental Assessment Case No. EA22-0006 and Tentative Tract Map

Dear Ms. Lopez,

This letter is in regards to an informal consultation and in compliance with AB-52 and Environmental Assessment Case No. EA22-0006 and Tentative Tract Map. The proposed project includes a tentative Tract Map No. 38273 to divide an existing vacant lot (APN:685-100-001) into nine lots to allow for the development of up to 9 single-family homes. The project site totals +5.00 acres with lot sizes ranging from 18,000 square feet to 20,998 square feet.

After reviewing the proposed project, the Twenty-Nine Palms Band of Mission Indians has determined: The project is outside of the known Chemehuevi Traditional Use Area. The other tribes who do have cultural affiliation with the project area should be contacted.

If you have any questions, please do not hesitate to contact the Tribal Historic Preservation Office at (760) 775-3259 or by email at Christopher.Nicosia@29palmsbomi-nsn.gov.

Sincerely,

Christopher Nicosia
Cultural Resources Manager, Twenty-Nine Palms Band of Mission Indians



APPENDIX F – HYDROLOGY STUDY

PRELIMINARY HYDROLOGY STUDY
for
TENTATIVE TRACT MAP 38273
RANCHO MIRAGE, CALIFORNIA

Prepared for:
La Paloma Homes, Inc.
Mark Howard
P.O. Box 10179
Palm Desert, CA 92255

Prepared by:
***FOMOTOR
ENGINEERING***

225 S. Civic Drive, Suite 1-5
Palm Springs, California 92262
Phone (760)323-1842
Fax (760)323-1742

February 7, 2022



Table of Contents

I. Report

II. Reference Material

- a. Vicinity Map
- b. Flood Insurance Rate Map (U.S. Department of Homeland Security Federal Emergency Management Act Map Service Center)
- c. Hydrologic Soils Group Map (From US Department of Agriculture Soil Conservation Service)
- d. Point Precipitation Frequency (National Oceanic and Atmospheric Administration's Precipitation Frequency Data Server)
- e. Log Plot of NOAA 100-Year Precipitation for Slope of Intensity Duration Curve (As Per RCFC Hydrology Manual)
- f. Basin Routing Spreadsheet Calculations
- g. Impervious Cover for Developed Areas – Plate D-5.6 (RCFC&WCD Hydrology Manual)
- h. City of Rancho Mirage Standard Detail 310 for Retention Basins
- i. Geotechnical Report (LandMark Consultants, inc., September 2021)

III. 100-Year / 1, 3, 6, and 24hr Synthetic Unit Hydrograph (SUH) Analysis

- i. Onsite Post Development SUH For Proposed Retention Storage

IV. 100-Year / 1, 3, 6, and 24hr Synthetic Unit Hydrograph (SUH) Analysis

- i. Onsite Pre Development SUH For Existing Depression Storage

V. 100-Year Rational Method Analysis

- i. Offsite Run-On Peak Discharge Calculations

VI. Exhibit

- i. Preliminary Hydrology Exhibit

PRELIMINARY HYDROLOGY STUDY FOR TENTATIVE TRACT MAP 38273

PROJECT SITE LOCATION

The 4.76 acre (5.04 acres gross) proposed Tract Map site is located on the south side of Via Florencia, and east of Landy Lane, in the City of Rancho Mirage, County of Riverside, California. The proposed development site lies in Section 30, T4S, R6E, and SBBM, with APN: 685-100-011.

PROJECT SITE DESCRIPTION

The project site is presently vacant. The site slopes across the eastern and southern portions of the lot from west to east from appx. 319 to 321 feet at 2.1-percent. There is a natural depression on the western side of the lot that is 7 feet deep, and has a total storage capacity of 111,653 cu-ft. The project site is entirely composed of Hydrologic Soil Type "A". A housing tract is proposed on this site. The project site area is in FEMA unshaded flood Zone X, which is described as: "Area of Minimal Flood Hazard". (See Riverside County Flood Insurance Rate Map number 06065C1595G, Effective August 28, 2008, in Reference Materials).

PURPOSE

The entire project site area was analyzed for offsite existing and onsite proposed conditions using Synthetic Unit Hydrograph analysis for the 1, 3, 6, and 24-hour duration 100-year storm event to determine the worst case contributing runoff volume, by routing the resulting hydrographs through the existing and proposed basins, and using infiltration as the outflow. This computed peak inflow net runoff volume was used to size the proposed retention basins as per City of Rancho Mirage Standard Detail 310 for Retention Basins. The runoff from the proposed onsite area would drain into the onsite street, flow west to collect in the combination inlets, and be directed to the proposed dual retention basin system. Storm drains will be sized for the 100-year peak discharge, which will be calculated from sub-watersheds using the Rational Formula.

METHODOLOGY

The materials included with this study are presented to satisfy the criteria set forth in the Riverside County Flood Control & Water Conservation District (RCFC & WCD) Hydrology Manual. The onsite existing and post-developed condition design peak runoff volume were determined using the 1, 3, 6, and 24-hour duration storms for the 100 year event. Peak discharges of the 100-year storm event will be determined with the Rational Formula. Synthetic Unit Hydrograph (SUH) and Rational Formula calculations were performed in accordance with RCFC & WCD criteria using CIVLDESIGN/CIVILCADD, a computer program developed by Joseph E. Bonadiman and Associates, Inc. The Hydrologic Soil Group area was determined with the Natural Resources Conservation Service's National Cooperative Soil Survey (See Reference Material). Point precipitation frequency data was obtained with the National Oceanic and Atmospheric Administration's (NOAA) Precipitation Frequency Data Server from Atlas 14 (See Reference Material.). The NOAA point precipitation data of the 100-year event was plotted on a log-log plot to obtain the slope of intensity duration curve to be used in the Rational Method analysis (See Reference Materials). All storm drains will be modeled with the computer modeling software, Hydraflow Storm

Sewers Extensions for AutoCAD Civil3D 2014, Version 10.3 by Autodesk, Inc. Grated storm drain inlets will be sized as per U.S. Department of Transportation Federal Highway Administration Hydraulic Engineering Circular No. 22, Third Edition (September 2009, Revised August 2013) Urban Drainage Design Manual. Curb inlet openings will be sized as per Los Angeles County Flood Control District (LACFCD) Hydraulic Design Manual, March 1982. Swale capacity will be calculated with Hydraflow Express Extensions for AutoCAD Civil3D 2014, Version 10.3 by Autodesk, Inc.

RESULT OF SYNTHETIC UNIT HYDROGRAPH ANALYSIS

Summary of results of the Synthetic Unit Hydrograph (SUH) analysis are as follows:

Please refer to the attached Preliminary Hydrology Plan, Basin Routing Spreadsheets, and SUH Output Files in the Reference Materials:

Proposed Onsite Area Runoff to Basin

| <i>BASIN ID</i> | <i>CONTRIBUTING AREA (ACRES)</i> | <i>STORM FREQUENCY (YEAR)</i> | <i>DURATION (HOUR)</i> | <i>RUNOFF VOLUME (CU-FT)- POST DEV</i> | <i>PEAK RUNOFF STORAGE VOLUME VS INFILTRATION (CU-FT) -POST DEV</i> | <i>TIME TO PEAK RUNOFF STORAGE VOLUME (HOUR)</i> | <i>TIME TO EMPTY SURFACE BASIN (HOUR)</i> |
|-----------------|--------------------------------------|---------------------------------------|----------------------------|--|---|--|---|
| ON PROP | 4.89 | 100 | 1 | 26,765 | 23,025 | 1.0 | 7.6 |
| ON PROP | 4.89 | 100 | 3 | 34,765 | 24,210 | 2.9 | 9.8 |
| ON PROP | 4.89 | 100 | 6 | 41,240 | 22,748 | 5.7 | 12.3 |
| ON PROP | 4.89 | 100 | 24 | 53,155 | 12,545 | 16.0 | 20.3 |

Existing Onsite Depression Area Runoff

| <i>BASIN ID</i> | <i>CONTRIBUTING AREA (ACRES)</i> | <i>STORM FREQUENCY (YEAR)</i> | <i>DURATION (HOUR)</i> | <i>RUNOFF VOLUME (CU-FT)- POST DEV</i> | <i>PEAK RUNOFF STORAGE VOLUME VS INFILTRATION (CU-FT) -POST DEV</i> | <i>TIME TO PEAK RUNOFF STORAGE VOLUME (HOUR)</i> | <i>TIME TO EMPTY SURFACE BASIN (HOUR)</i> |
|-----------------|--------------------------------------|---------------------------------------|----------------------------|--|---|--|---|
| ON DEP | 6.49 | 100 | 1 | 32,565 | 14,760 | 1.0 | 2.3 |
| ON DEP | 6.49 | 100 | 3 | 37,378 | 12,595 | 2.8 | 4.0 |
| ON DEP | 6.49 | 100 | 6 | 38,018 | 10,274 | 5.6 | 6.6 |
| ON DEP | 6.49 | 100 | 24 | 34,883 | 0 | 0 | 0 |

RESULT OF RATIONAL METHOD ANALYSIS

Summary of results of the Rational Method analysis are as follows:

Please refer to the attached Preliminary Hydrology Plan, and Rational Method Output Files in the Reference Materials:

Existing Offsite Area Run-On to Site

| <i>BASIN ID</i> | <i>CONTRIBUTING AREA (ACRES)</i> | <i>STORM FREQUENCY (YEAR)</i> | <i>PEAK DISCHARGE (CU-FT PER SEC)</i> |
|---------------------|--------------------------------------|---------------------------------------|---|
| <i>OFF-1</i> | <i>0.78</i> | <i>100</i> | <i>2.73</i> |
| <i>OFF-2</i> | <i>0.45</i> | <i>100</i> | <i>1.52</i> |
| <i>OFF-3</i> | <i>0.45</i> | <i>100</i> | <i>1.50</i> |
| <i>OFF-4</i> | <i>0.14</i> | <i>100</i> | <i>0.43</i> |
| <i>OFF-5</i> | <i>0.10</i> | <i>100</i> | <i>0.43</i> |

EXISTING CONDITION DISCUSSION

An infiltration test was performed at the project site, which had a resulting raw measured infiltration rate of 10.3-inches per hour, for a design rate of 5 inches per hour. The City of Rancho Mirage allows the use of half the measured raw infiltration rate up to 5 inches per hour. Each of the existing 1, 3, 6, and 24-hour durations of the 100-year flood event Synthetic Unit Hydrograph outputs that contribute to the onsite existing depression were run through the depression using the design infiltration rate as the outflow (See Basin Routing Spreadsheets in the Reference Materials), and a summary of the results are shown in the above table. The 1-hour / 100-year Synthetic Unit Hydrograph analysis accounted for the highest net proposed runoff volume of 14,760 cubic-feet for the contributing onsite depression area under existing pre-construction conditions when considering infiltration outflow and hydrographs of the of the 1, 3, 6, and 24-hour duration events. The existing depression has the capacity to hold 111,653 cubic-feet of runoff at a peak water depth of 3.36 feet, and peak water surface of 313.36 feet. (See Preliminary Hydrology Plan in the reference Materials). The infiltration rate exceeded the inflow of the 100-year / 24-hour existing hydrograph resulting in no ponding in the existing depression under the given duration storm event. The proposed development would reduce the existing watershed area contributing to the remaining portion of the onsite depression (only offsite portion would remain) from 6.49 to 0.78 acres. (See Preliminary Hydrology Plan in the Reference Materials).

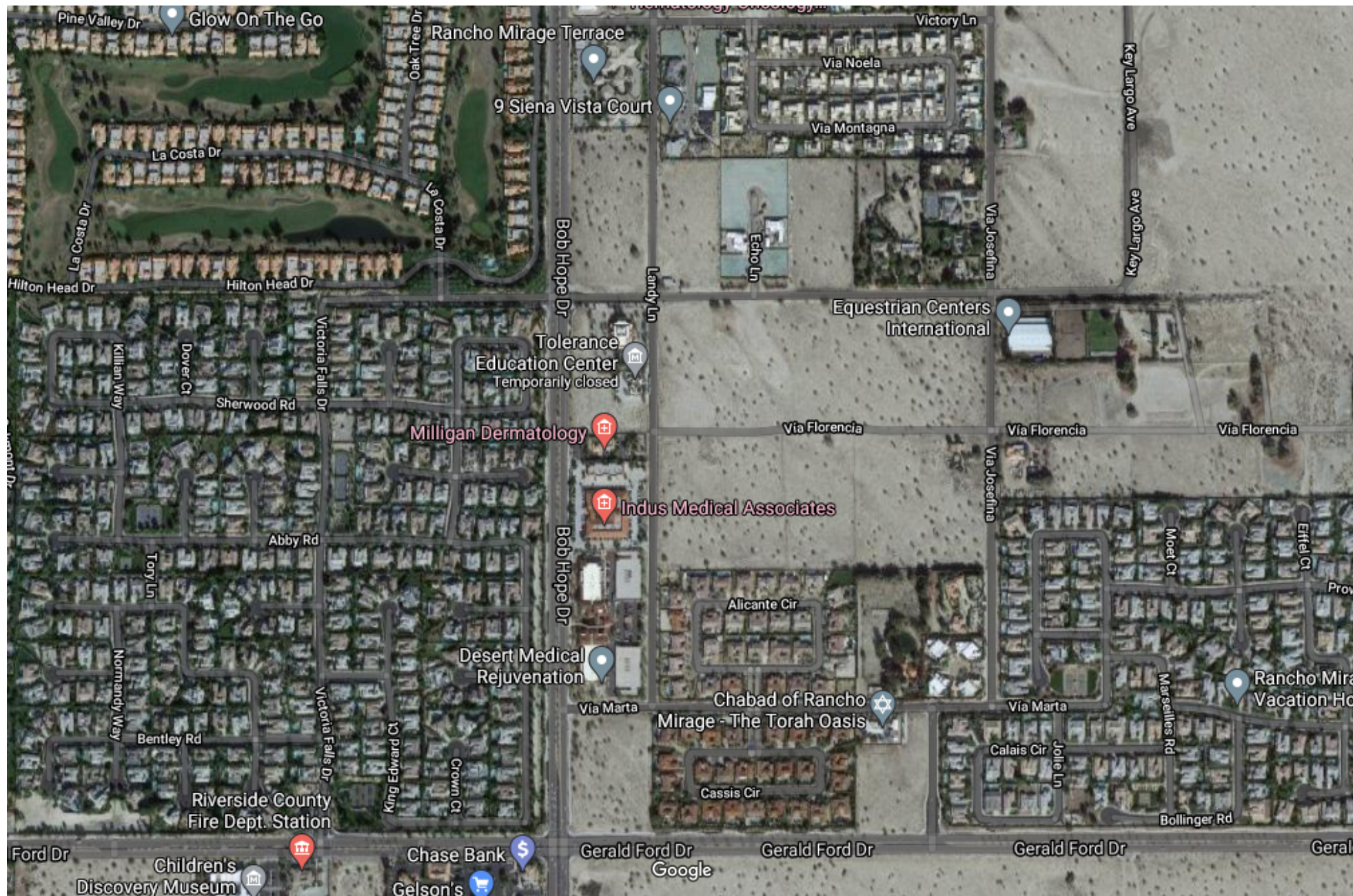
PROPOSED CONDITION DISCUSSION

The design infiltration rate of 5 inches per hour was used to size the proposed onsite basin system. Each of the 1, 3, 6, and 24-hour durations of the 100-year flood event Synthetic Unit Hydrograph outputs were run through the two proposed retention basin areas using the design infiltration rate as the outflow (See Basin Routing Spreadsheets in the Reference Materials), and a summary of the results are shown in the above table. The 3-hour / 100-year Synthetic Unit Hydrograph analysis accounted for the highest net proposed runoff volume of 24,210 cubic-feet for the contributing onsite area under post-construction conditions when considering infiltration outflow and hydrographs of the of the 1, 3, 6, and 24-hour duration events. The east retention basin was sized to hold 16,042 cubic-feet, and the west basin to hold 15,613 cu-ft, for a total of 31,655 cu-ft of storage capacity. Both basins would have 3 to 1 side slopes. The peak net onsite runoff

volume would have a 100-year water surface depth of 3.26 feet in the East Basin and 3.32 feet in the West Basin. (See Preliminary Hydrology Plan in the Reference Materials).

All proposed storm drains, inlets and swales will be sized to adequately convey their respective 100-year Rational Method discharges. In general, the storm drain and inlet system would more than adequately convey the post-development 100-year peak discharge to the proposed retention basins, which are sized to more than handle the required post-development runoff.

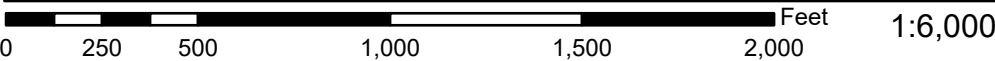
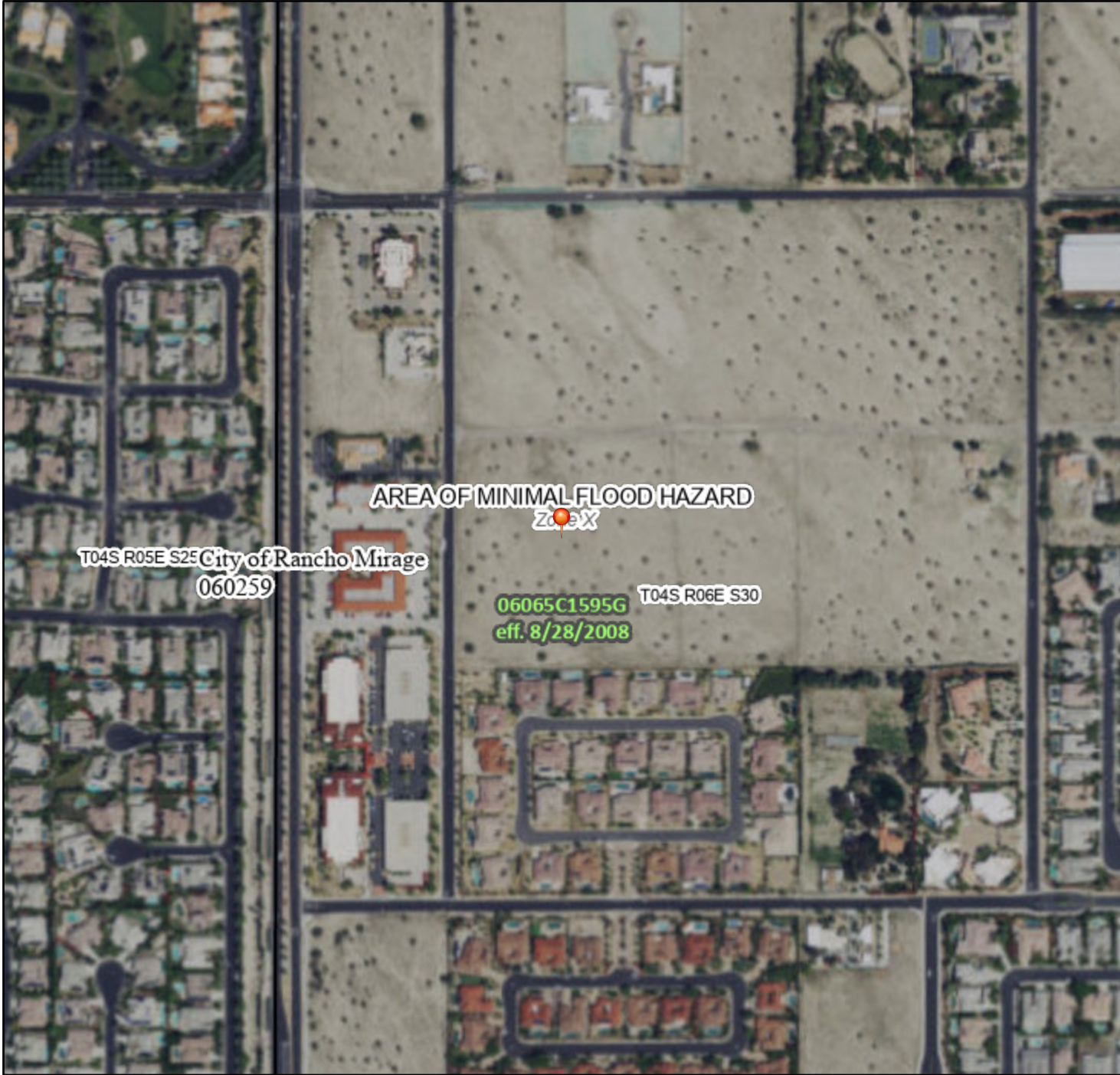
REFERENCE MATERIAL



National Flood Hazard Layer FIRMMette



116°24'31"W 33°47'45"N



Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

| | | |
|-----------------------------|--|---|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE) Zone A, V, A99 |
| | | With BFE or Depth Zone AE, AO, AH, VE, AR |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
| | | Future Conditions 1% Annual Chance Flood Hazard Zone X |
| | | Area with Reduced Flood Risk due to Levee. See Notes. Zone X |
| | | Area with Flood Risk due to Levee Zone D |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard Zone X |
| | | Effective LOMRs |
| | | Area of Undetermined Flood Hazard Zone D |
| GENERAL STRUCTURES | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| OTHER FEATURES | | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| MAP PANELS | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |



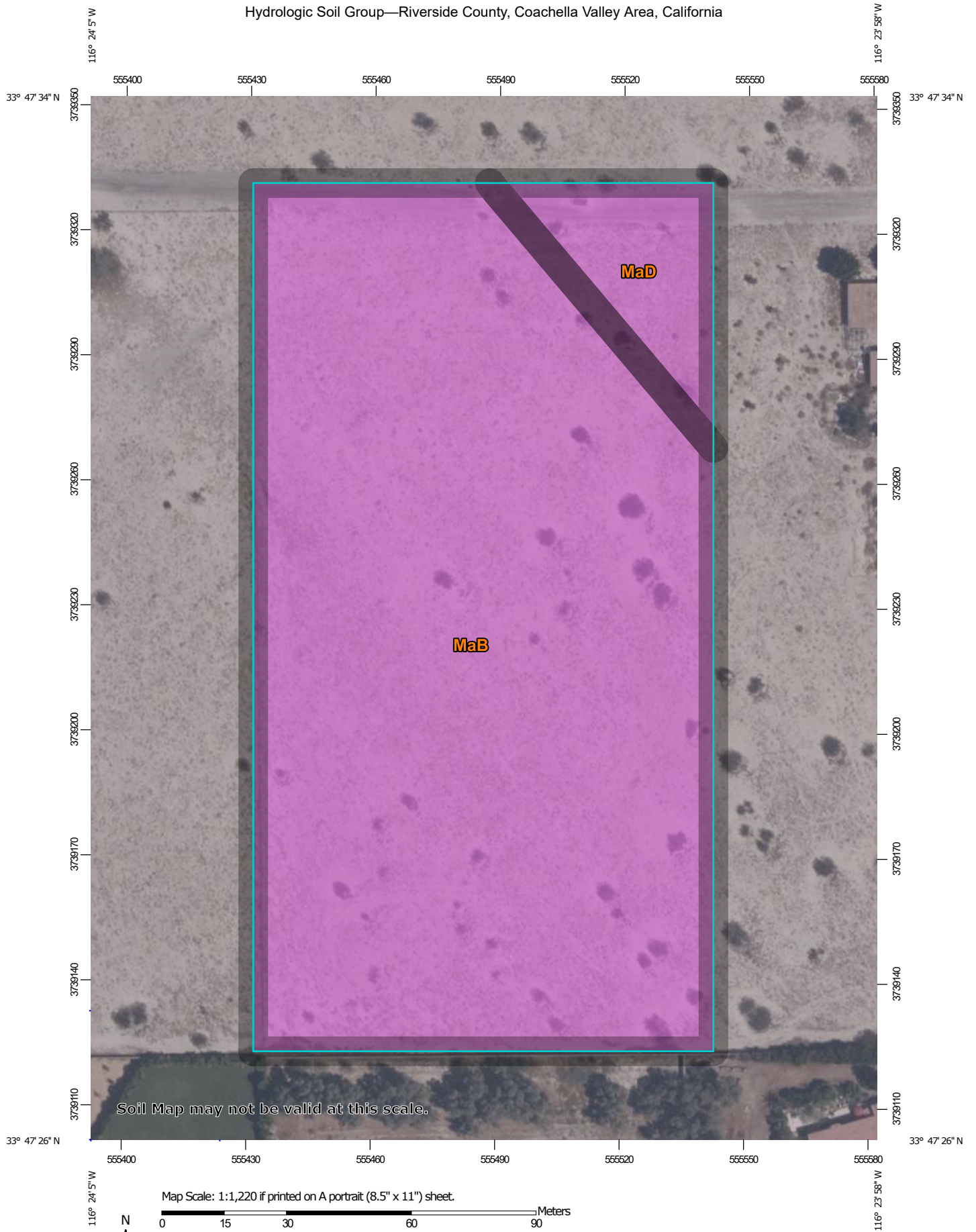
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

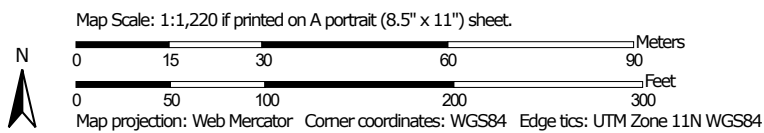
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **2/9/2022 at 1:35 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Hydrologic Soil Group—Riverside County, Coachella Valley Area, California




Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Riverside County, Coachella Valley Area, California
 Survey Area Data: Version 12, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 18, 2018—Aug 22, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------|--------------|----------------|
| MaB | Myoma fine sand, 0 to 5 percent slopes | A | 5.3 | 92.6% |
| MaD | Myoma fine sand, 5 to 15 percent slopes | A | 0.4 | 7.4% |
| Totals for Area of Interest | | | 5.7 | 100.0% |

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition



NOAA Atlas 14, Volume 6, Version 2
Location name: Rancho Mirage, California, USA*
Latitude: 33.7918°, Longitude: -116.4007°
Elevation: 315.91 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeries](#)

PF tabular

| PDS-based point 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 | 0.061 (0.050-0.073) | 0.094 (0.078-0.114) | 0.145 (0.120-0.176) | 0.193 (0.159-0.236) | 0.269 (0.214-0.342) | 0.338 (0.263-0.438) | 0.418 (0.318-0.556) | 0.513 (0.379-0.702) | 0.666 (0.471-0.951) | 0.841 (0.575-1.24) |
| 10-min | 0.087 (0.072-0.105) | 0.134 (0.112-0.163) | 0.208 (0.172-0.253) | 0.276 (0.227-0.339) | 0.386 (0.307-0.490) | 0.484 (0.377-0.628) | 0.599 (0.455-0.797) | 0.735 (0.543-1.01) | 0.955 (0.676-1.36) | 1.21 (0.824-1.78) |
| 15-min | 0.105 (0.088-0.127) | 0.163 (0.135-0.197) | 0.251 (0.208-0.305) | 0.334 (0.275-0.410) | 0.466 (0.371-0.592) | 0.586 (0.456-0.760) | 0.725 (0.551-0.964) | 0.889 (0.656-1.22) | 1.16 (0.817-1.65) | 1.46 (0.996-2.16) |
| 30-min | 0.164 (0.136-0.198) | 0.253 (0.211-0.307) | 0.391 (0.325-0.476) | 0.521 (0.428-0.639) | 0.727 (0.578-0.923) | 0.913 (0.711-1.18) | 1.13 (0.858-1.50) | 1.39 (1.02-1.90) | 1.80 (1.27-2.57) | 2.27 (1.55-3.36) |
| 60-min | 0.239 (0.199-0.289) | 0.370 (0.308-0.448) | 0.571 (0.474-0.694) | 0.759 (0.625-0.932) | 1.06 (0.844-1.35) | 1.33 (1.04-1.73) | 1.65 (1.25-2.19) | 2.02 (1.49-2.77) | 2.63 (1.86-3.75) | 3.32 (2.27-4.90) |
| 2-hr | 0.340 (0.283-0.411) | 0.515 (0.429-0.625) | 0.776 (0.644-0.945) | 1.01 (0.836-1.25) | 1.38 (1.10-1.76) | 1.71 (1.33-2.21) | 2.07 (1.57-2.75) | 2.49 (1.84-3.40) | 3.13 (2.21-4.47) | 3.71 (2.53-5.48) |
| 3-hr | 0.409 (0.341-0.495) | 0.616 (0.512-0.747) | 0.920 (0.764-1.12) | 1.20 (0.984-1.47) | 1.62 (1.29-2.05) | 1.98 (1.54-2.56) | 2.38 (1.81-3.17) | 2.84 (2.10-3.89) | 3.53 (2.50-5.04) | 4.14 (2.83-6.13) |
| 6-hr | 0.557 (0.464-0.675) | 0.837 (0.697-1.02) | 1.24 (1.03-1.51) | 1.61 (1.32-1.97) | 2.15 (1.71-2.73) | 2.62 (2.04-3.39) | 3.13 (2.38-4.16) | 3.70 (2.73-5.07) | 4.57 (3.23-6.52) | 5.30 (3.62-7.84) |
| 12-hr | 0.667 (0.556-0.809) | 1.02 (0.846-1.23) | 1.52 (1.26-1.85) | 1.98 (1.63-2.42) | 2.65 (2.11-3.37) | 3.23 (2.52-4.19) | 3.87 (2.94-5.15) | 4.59 (3.39-6.28) | 5.66 (4.00-8.08) | 6.58 (4.49-9.73) |
| 24-hr | 0.779 (0.690-0.898) | 1.21 (1.07-1.40) | 1.83 (1.62-2.12) | 2.39 (2.09-2.79) | 3.23 (2.74-3.89) | 3.94 (3.27-4.85) | 4.73 (3.84-5.96) | 5.62 (4.44-7.27) | 6.96 (5.28-9.36) | 8.11 (5.95-11.3) |
| 2-day | 0.862 (0.763-0.994) | 1.35 (1.20-1.56) | 2.06 (1.82-2.39) | 2.69 (2.35-3.14) | 3.63 (3.08-4.37) | 4.42 (3.67-5.44) | 5.30 (4.30-6.66) | 6.27 (4.95-8.11) | 7.73 (5.86-10.4) | 8.97 (6.58-12.5) |
| 3-day | 0.903 (0.799-1.04) | 1.42 (1.26-1.64) | 2.17 (1.92-2.52) | 2.84 (2.48-3.31) | 3.83 (3.24-4.61) | 4.66 (3.87-5.73) | 5.58 (4.52-7.02) | 6.60 (5.21-8.53) | 8.12 (6.15-10.9) | 9.41 (6.90-13.1) |
| 4-day | 0.930 (0.823-1.07) | 1.47 (1.30-1.70) | 2.25 (1.99-2.61) | 2.94 (2.57-3.43) | 3.97 (3.36-4.78) | 4.83 (4.01-5.94) | 5.78 (4.69-7.27) | 6.83 (5.39-8.83) | 8.40 (6.37-11.3) | 9.72 (7.13-13.5) |
| 7-day | 0.992 (0.878-1.14) | 1.58 (1.40-1.83) | 2.43 (2.15-2.82) | 3.19 (2.79-3.72) | 4.30 (3.64-5.18) | 5.24 (4.35-6.43) | 6.26 (5.07-7.87) | 7.39 (5.83-9.55) | 9.06 (6.87-12.2) | 10.5 (7.68-14.6) |
| 10-day | 1.04 (0.922-1.20) | 1.67 (1.48-1.93) | 2.57 (2.27-2.98) | 3.37 (2.95-3.93) | 4.56 (3.86-5.49) | 5.55 (4.61-6.82) | 6.64 (5.38-8.35) | 7.84 (6.19-10.1) | 9.61 (7.29-12.9) | 11.1 (8.14-15.4) |
| 20-day | 1.13 (1.00-1.30) | 1.83 (1.61-2.11) | 2.84 (2.50-3.28) | 3.73 (3.26-4.35) | 5.07 (4.29-6.10) | 6.19 (5.14-7.60) | 7.41 (6.01-9.33) | 8.77 (6.92-11.3) | 10.8 (8.16-14.5) | 12.4 (9.12-17.3) |
| 30-day | 1.26 (1.11-1.45) | 2.04 (1.80-2.35) | 3.18 (2.80-3.68) | 4.19 (3.67-4.89) | 5.72 (4.84-6.88) | 7.00 (5.81-8.60) | 8.40 (6.81-10.6) | 9.95 (7.85-12.9) | 12.2 (9.27-16.5) | 14.1 (10.4-19.7) |
| 45-day | 1.37 (1.21-1.57) | 2.22 (1.96-2.56) | 3.48 (3.07-4.03) | 4.61 (4.04-5.38) | 6.32 (5.36-7.61) | 7.77 (6.45-9.55) | 9.35 (7.59-11.8) | 11.1 (8.77-14.4) | 13.7 (10.4-18.4) | 15.8 (11.6-22.0) |
| 60-day | 1.49 (1.32-1.71) | 2.42 (2.14-2.79) | 3.80 (3.35-4.39) | 5.04 (4.41-5.88) | 6.93 (5.87-8.34) | 8.54 (7.09-10.5) | 10.3 (8.36-13.0) | 12.3 (9.67-15.8) | 15.1 (11.5-20.4) | 17.6 (12.9-24.4) |

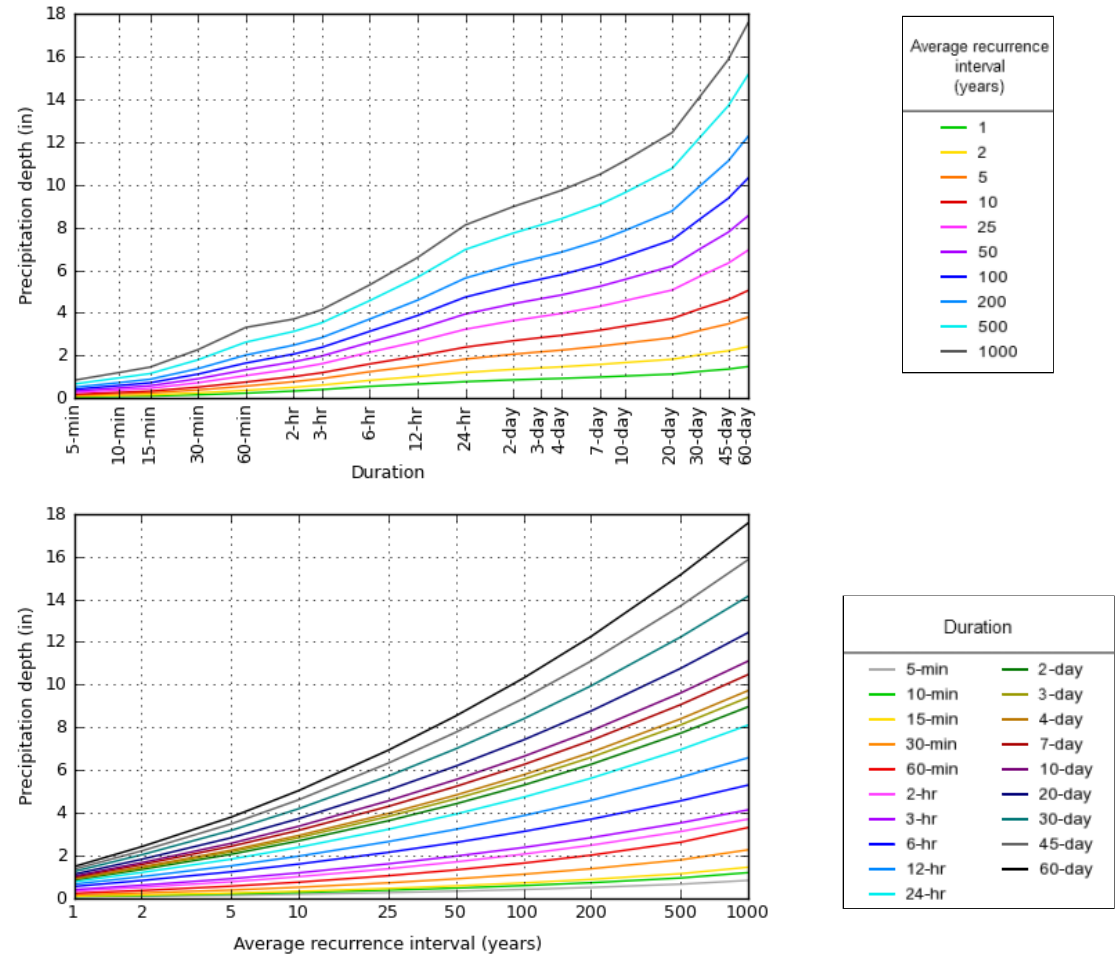
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.7918°, Longitude: -116.4007°



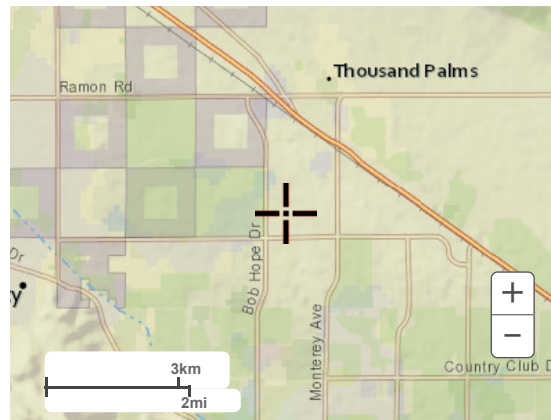
NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Thu Jul 22 17:52:50 2021

[Back to Top](#)

Maps & aerals

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

[US Department of Commerce](#)
[National Oceanic and Atmospheric Administration](#)
[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)

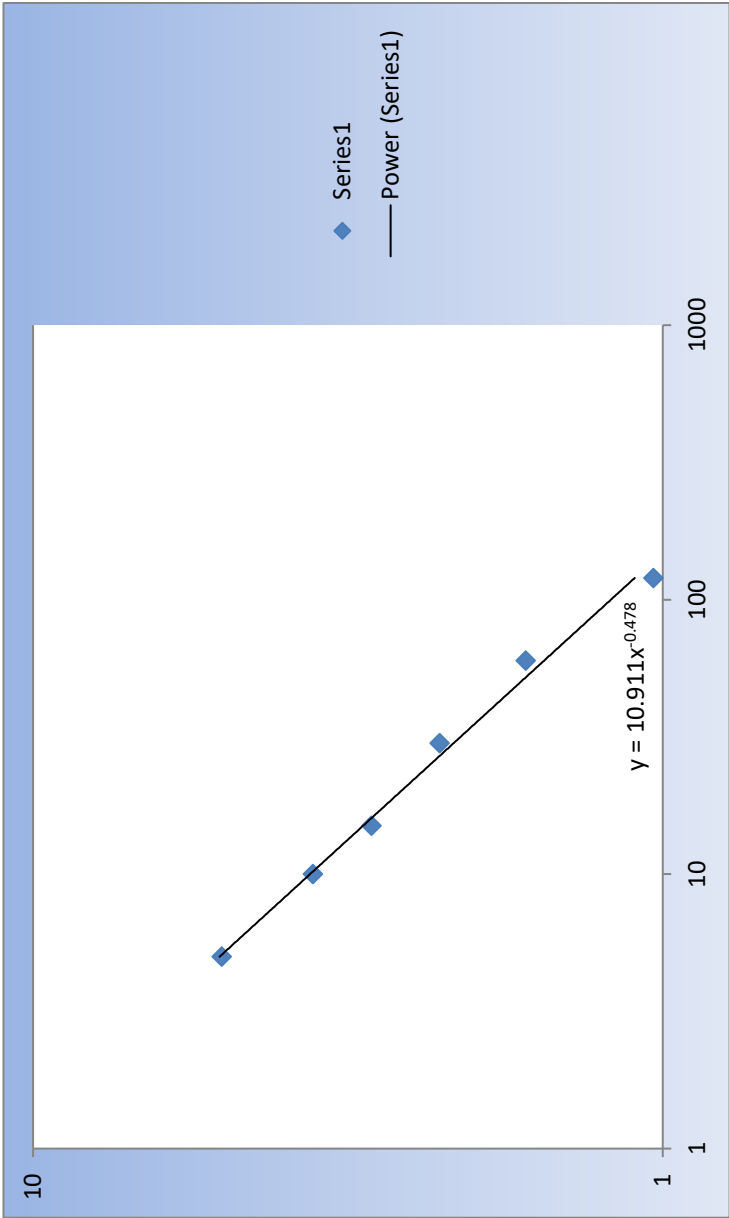
NOAA ATLAS 14 DATA

| Time (min) | I (in/hr) | Depth (in) |
|------------|-----------|------------|
| 5 | 5.016 | 0.418 |
| 10 | 3.594 | 0.599 |
| 15 | 2.9 | 0.725 |
| 30 | 2.26 | 1.13 |
| 60 | 1.65 | 1.65 |
| 120 | 1.035 | 2.07 |

NOAA ATLAS INTENSITY - DURATION WORKSHEET

| | |
|--------------|----------------|
| PROJECT | FLORENCIA EAST |
| PROJ. NUMBER | 21091 |
| STORM EVENT | 100-YEAR |
| DATE | 2/7/2022 |

| INTENSITY VALUES FROM GRAPH | |
|-----------------------------|-------|
| CONSTANT FROM GRAPH | 10.91 |
| EXPONENT FROM GRAPH | -0.48 |



BASIN ROUTING **PROJECT: VIA FLORENCIA**
100-YEAR-1-HOUR PROPOSED HYDROGRAPH

PROJECT NO. 21091
ONSITE

DATE: 2/9/2022

BASIN EMPTY IN 7.6HRS

AVERAGE BASIN AREA FOR INFILTRATION=

INFILTRATION RATE (IN/HR)= 5

INFILTRATION RATE (CU-FT/SEC) 0.98403

1-hour=60min

Area for Inf(sf): 8502

1HR PEAK STORAGE= 23025CF

PEAK RUNOFF IN 1.0HR

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 5 | 0.0151 | 0.0151 | 657.756 | 657.756 | 295.21 | 362.55 | 362.55 |
| 10 | 0.0377 | 0.0226 | 984.456 | 1642.212 | 295.21 | 689.25 | 1051.80 |
| 15 | 0.0621 | 0.0244 | 1062.864 | 2705.076 | 295.21 | 767.66 | 1819.45 |
| 20 | 0.0879 | 0.0258 | 1123.848 | 3828.924 | 295.21 | 828.64 | 2648.09 |
| 25 | 0.1161 | 0.0282 | 1228.392 | 5057.316 | 295.21 | 933.18 | 3581.27 |
| 30 | 0.1481 | 0.032 | 1393.92 | 6451.236 | 295.21 | 1098.71 | 4679.99 |
| 35 | 0.1851 | 0.037 | 1611.72 | 8062.956 | 295.21 | 1316.51 | 5996.50 |
| 40 | 0.2322 | 0.0471 | 2051.676 | 10114.632 | 295.21 | 1756.47 | 7752.97 |
| 45 | 0.3081 | 0.0759 | 3306.204 | 13420.836 | 295.21 | 3011.00 | 10763.96 |
| 50 | 0.5038 | 0.1957 | 8524.692 | 21945.528 | 295.21 | 8229.48 | 18993.44 |
| 55 | 0.5849 | 0.0811 | 3532.716 | 25478.244 | 295.21 | 3237.51 | 22230.95 |
| 60 | 0.6099 | 0.025 | 1089 | 26567.244 | 295.21 | 793.79 | 23024.74 |
| 65 | 0.6144 | 0.0045 | 196.02 | 26763.264 | 295.21 | (99.19) | 22925.56 |
| 70 | | | 0 | 26763.264 | 295.21 | (295.21) | 22630.35 |
| 75 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 22335.14 |
| 80 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 22039.93 |
| 85 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 21744.72 |
| 90 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 21449.51 |
| 95 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 21154.31 |
| 100 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 20859.10 |
| 105 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 20563.89 |
| 110 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 20268.68 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 115 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 19973.47 |
| 120 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 19678.26 |
| 125 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 19383.06 |
| 130 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 19087.85 |
| 135 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 18792.64 |
| 140 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 18497.43 |
| 145 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 18202.22 |
| 150 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 17907.01 |
| 155 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 17611.81 |
| 160 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 17316.60 |
| 165 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 17021.39 |
| 170 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 16726.18 |
| 175 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 16430.97 |
| 180 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 16135.76 |
| 185 | | 0 | 0 | 26763.264 | 295.21 | (295.21) | 15840.56 |
| 190 | | | | 26763.264 | 295.21 | (295.21) | 15545.35 |
| 195 | | | | 26763.264 | 295.21 | (295.21) | 15250.14 |
| 200 | | | | 26763.264 | 295.21 | (295.21) | 14954.93 |
| 205 | | | | 26763.264 | 295.21 | (295.21) | 14659.72 |
| 210 | | | | 26763.264 | 295.21 | (295.21) | 14364.51 |
| 215 | | | | 26763.264 | 295.21 | (295.21) | 14069.31 |
| 220 | | | | 26763.264 | 295.21 | (295.21) | 13774.10 |
| 225 | | | | 26763.264 | 295.21 | (295.21) | 13478.89 |
| 230 | | | | 26763.264 | 295.21 | (295.21) | 13183.68 |
| 235 | | | | 26763.264 | 295.21 | (295.21) | 12888.47 |
| 240 | | | | 26763.264 | 295.21 | (295.21) | 12593.26 |
| 245 | | | | 26763.264 | 295.21 | (295.21) | 12298.06 |
| 250 | | | | 26763.264 | 295.21 | (295.21) | 12002.85 |
| 255 | | | | 26763.264 | 295.21 | (295.21) | 11707.64 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 260 | | | | 26763.264 | 295.21 | (295.21) | 11412.43 |
| 265 | | | | 26763.264 | 295.21 | (295.21) | 11117.22 |
| 270 | | | | 26763.264 | 295.21 | (295.21) | 10822.01 |
| 275 | | | | 26763.264 | 295.21 | (295.21) | 10526.81 |
| 280 | | | | 26763.264 | 295.21 | (295.21) | 10231.60 |
| 285 | | | | 26763.264 | 295.21 | (295.21) | 9936.39 |
| 290 | | | | 26763.264 | 295.21 | (295.21) | 9641.18 |
| 295 | | | | 26763.264 | 295.21 | (295.21) | 9345.97 |
| 300 | | | | 26763.264 | 295.21 | (295.21) | 9050.76 |
| 305 | | | | 26763.264 | 295.21 | (295.21) | 8755.56 |
| 310 | | | | 26763.264 | 295.21 | (295.21) | 8460.35 |
| 315 | | | | 26763.264 | 295.21 | (295.21) | 8165.14 |
| 320 | | | | 26763.264 | 295.21 | (295.21) | 7869.93 |
| 325 | | | | 26763.264 | 295.21 | (295.21) | 7574.72 |
| 330 | | | | 26763.264 | 295.21 | (295.21) | 7279.51 |
| 335 | | | | 26763.264 | 295.21 | (295.21) | 6984.31 |
| 340 | | | | 26763.264 | 295.21 | (295.21) | 6689.10 |
| 345 | | | | 26763.264 | 295.21 | (295.21) | 6393.89 |
| 350 | | | | 26763.264 | 295.21 | (295.21) | 6098.68 |
| 355 | | | | 26763.264 | 295.21 | (295.21) | 5803.47 |
| 360 | | | | 26763.264 | 295.21 | (295.21) | 5508.26 |
| 365 | | | | 26763.264 | 295.21 | (295.21) | 5213.06 |
| 370 | | | | 26763.264 | 295.21 | (295.21) | 4917.85 |
| 375 | | | | 26763.264 | 295.21 | (295.21) | 4622.64 |
| 380 | | | | 26763.264 | 295.21 | (295.21) | 4327.43 |
| 385 | | | | 26763.264 | 295.21 | (295.21) | 4032.22 |
| 390 | | | | 26763.264 | 295.21 | (295.21) | 3737.01 |
| 395 | | | | 26763.264 | 295.21 | (295.21) | 3441.81 |
| 400 | | | | 26763.264 | 295.21 | (295.21) | 3146.60 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 405 | | | | 26763.264 | 295.21 | (295.21) | 2851.39 |
| 410 | | | | 26763.264 | 295.21 | (295.21) | 2556.18 |
| 415 | | | | 26763.264 | 295.21 | (295.21) | 2260.97 |
| 420 | | | | 26763.264 | 295.21 | (295.21) | 1965.76 |
| 425 | | | | 26763.264 | 295.21 | (295.21) | 1670.56 |
| 430 | | | | 26763.264 | 295.21 | (295.21) | 1375.35 |
| 435 | | | | 26763.264 | 295.21 | (295.21) | 1080.14 |
| 440 | | | | 26763.264 | 295.21 | (295.21) | 784.93 |
| 445 | | | | 26763.264 | 295.21 | (295.21) | 489.72 |
| 450 | | | | 26763.264 | 295.21 | (295.21) | 194.51 |
| 455 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 460 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 465 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 470 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 475 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 480 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 485 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 490 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 495 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 500 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 505 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 510 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 515 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 520 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 525 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 530 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 535 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 540 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |
| 545 | | | | 26763.264 | 295.21 | (295.21) | 0.00 |

BASIN ROUTING PROJECT: VIA FLORENCIA
100-YEAR-3-HOUR PROPOSED HYDROGRAPH

PROJECT NO. 21091 DATE: 2/10/2022

AVERAGE BASIN AREA FOR INFILTRATION=
 INFILTRATION RATE (IN/HR)= 5
 INFILTRATION RATE (CU-FT/SEC) 0.98403

ONSITE
 BASIN EMPTY IN 9.8 HRS
 3-hours=180min
 Area for Inf(sf): 8502
 3HR PEAK STORAGE= 24210CF
 PEAK RUNOFF IN 2.9HRS

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) | | |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|--------------------------|------------------------|
| 5 | 0.0061 | 0.0061 | 265.716 | 265.716 | 295.21 | (29.49) | 0.00 | EAST | BASIN |
| 10 | 0.0139 | 0.0078 | 339.768 | 605.484 | 295.21 | 44.56 | 44.56 | BASIN DATA: | |
| 15 | 0.0201 | 0.0062 | 270.072 | 875.556 | 295.21 | (25.14) | 19.42 | | |
| 20 | 0.029 | 0.0089 | 387.684 | 1263.24 | 295.21 | 92.48 | 111.90 | DEPTH | AREA(SF) VOL INC. (CF) |
| 25 | 0.0387 | 0.0097 | 422.532 | 1685.772 | 295.21 | 127.32 | 239.22 | 0 | 2392 |
| 30 | 0.0507 | 0.012 | 522.72 | 2208.492 | 295.21 | 227.51 | 466.73 | 1 | 3145 2768.5 |
| 35 | 0.0611 | 0.0104 | 453.024 | 2661.516 | 295.21 | 157.82 | 624.55 | 2 | 3964 3554.5 |
| 40 | 0.0731 | 0.012 | 522.72 | 3184.236 | 295.21 | 227.51 | 852.06 | 3 | 4847 4405.5 |
| 45 | 0.0857 | 0.0126 | 548.856 | 3733.092 | 295.21 | 253.65 | 1105.71 | 4 | 5780 5313.5 |
| 50 | 0.0961 | 0.0104 | 453.024 | 4186.116 | 295.21 | 157.82 | 1263.53 | | |
| 55 | 0.1065 | 0.0104 | 453.024 | 4639.14 | 295.21 | 157.82 | 1421.34 | | |
| 60 | 0.1187 | 0.0122 | 531.432 | 5170.572 | 295.21 | 236.22 | 1657.56 | BASIN STORAGE CAPACITY= | |
| 65 | 0.1344 | 0.0157 | 683.892 | 5854.464 | 295.21 | 388.68 | 2046.25 | | |
| 70 | 0.1509 | 0.0165 | 718.74 | 6573.204 | 295.21 | 423.53 | 2469.78 | WEST | BASIN |
| 75 | 0.1674 | 0.0165 | 718.74 | 7291.944 | 295.21 | 423.53 | 2893.31 | BASIN DATA: | |
| 80 | 0.1824 | 0.015 | 653.4 | 7945.344 | 295.21 | 358.19 | 3251.50 | DEPTH | AREA(SF) VOL INC. (CF) |
| 85 | 0.2015 | 0.0191 | 831.996 | 8777.34 | 295.21 | 536.79 | 3788.29 | 0 | 2319 |
| 90 | 0.2227 | 0.0212 | 923.472 | 9700.812 | 295.21 | 628.26 | 4416.55 | 1 | 3055 2687 |
| 95 | 0.2418 | 0.0191 | 831.996 | 10532.808 | 295.21 | 536.79 | 4953.34 | 2 | 3856 3455.5 |
| 100 | 0.2625 | 0.0207 | 901.692 | 11434.5 | 295.21 | 606.48 | 5559.83 | 3 | 4723 4289.5 |
| 105 | 0.2884 | 0.0259 | 1128.204 | 12562.704 | 295.21 | 833.00 | 6392.82 | 4 | 5638 5180.5 |
| 110 | 0.3141 | 0.0257 | 1119.492 | 13682.196 | 295.21 | 824.28 | 7217.11 | | |
| 115 | 0.3378 | 0.0237 | 1032.372 | 14714.568 | 295.21 | 737.16 | 7954.27 | BASIN STORAGE CAPACITY= | |
| 120 | 0.3618 | 0.024 | 1045.44 | 15760.008 | 295.21 | 750.23 | 8704.50 | BOTH BASIN STORAGE CAP.= | |
| 125 | 0.3869 | 0.0251 | 1093.356 | 16853.364 | 295.21 | 798.15 | 9502.65 | PEAK NET RUNOFF (3HR) | |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 130 | 0.4204 | 0.0335 | 1459.26 | 18312.624 | 295.21 | 1164.05 | 10666.70 |
| 135 | 0.4624 | 0.042 | 1829.52 | 20142.144 | 295.21 | 1534.31 | 12201.01 |
| 140 | 0.4947 | 0.0323 | 1406.988 | 21549.132 | 295.21 | 1111.78 | 13312.79 |
| 145 | 0.5488 | 0.0541 | 2356.596 | 23905.728 | 295.21 | 2061.39 | 15374.18 |
| 150 | 0.6137 | 0.0649 | 2827.044 | 26732.772 | 295.21 | 2531.84 | 17906.01 |
| 155 | 0.6865 | 0.0728 | 3171.168 | 29903.94 | 295.21 | 2875.96 | 20781.97 |
| 160 | 0.7438 | 0.0573 | 2495.988 | 32399.928 | 295.21 | 2200.78 | 22982.75 |
| 165 | 0.7666 | 0.0228 | 993.168 | 33393.096 | 295.21 | 697.96 | 23680.71 |
| 170 | 0.7797 | 0.0131 | 570.636 | 33963.732 | 295.21 | 275.43 | 23956.14 |
| 175 | 0.7923 | 0.0126 | 548.856 | 34512.588 | 295.21 | 253.65 | 24209.79 |
| 180 | 0.7974 | 0.0051 | 222.156 | 34734.744 | 295.21 | (73.05) | 24136.74 |
| 185 | 0.7981 | 0.0007 | 30.492 | 34765.236 | 295.21 | (264.72) | 23872.02 |
| 190 | | | | 34765.236 | 295.21 | (295.21) | 23576.81 |
| 195 | | | | 34765.236 | 295.21 | (295.21) | 23281.60 |
| 200 | | | | 34765.236 | 295.21 | (295.21) | 22986.40 |
| 205 | | | | 34765.236 | 295.21 | (295.21) | 22691.19 |
| 210 | | | | 34765.236 | 295.21 | (295.21) | 22395.98 |
| 215 | | | | 34765.236 | 295.21 | (295.21) | 22100.77 |
| 220 | | | | 34765.236 | 295.21 | (295.21) | 21805.56 |
| 225 | | | | 34765.236 | 295.21 | (295.21) | 21510.35 |
| 230 | | | | 34765.236 | 295.21 | (295.21) | 21215.15 |
| 235 | | | | 34765.236 | 295.21 | (295.21) | 20919.94 |
| 240 | | | | 34765.236 | 295.21 | (295.21) | 20624.73 |
| 245 | | | | 34765.236 | 295.21 | (295.21) | 20329.52 |
| 250 | | | | 34765.236 | 295.21 | (295.21) | 20034.31 |
| 255 | | | | 34765.236 | 295.21 | (295.21) | 19739.10 |
| 260 | | | | 34765.236 | 295.21 | (295.21) | 19443.90 |
| 265 | | | | 34765.236 | 295.21 | (295.21) | 19148.69 |
| 270 | | | | 34765.236 | 295.21 | (295.21) | 18853.48 |
| 275 | | | | 34765.236 | 295.21 | (295.21) | 18558.27 |
| 280 | | | | 34765.236 | 295.21 | (295.21) | 18263.06 |
| 285 | | | | 34765.236 | 295.21 | (295.21) | 17967.85 |

East basin water depth: 3.26ft

West basin water depth: 3.32ft

East Basin Infiltration Area=4308sf

West Basin Infiltration Area=4194sf

Total Infiltration Area=8502sf

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 290 | | | | 34765.236 | 295.21 | (295.21) | 17672.65 |
| 295 | | | | 34765.236 | 295.21 | (295.21) | 17377.44 |
| 300 | | | | 34765.236 | 295.21 | (295.21) | 17082.23 |
| 305 | | | | 34765.236 | 295.21 | (295.21) | 16787.02 |
| 310 | | | | 34765.236 | 295.21 | (295.21) | 16491.81 |
| 315 | | | | 34765.236 | 295.21 | (295.21) | 16196.60 |
| 320 | | | | 34765.236 | 295.21 | (295.21) | 15901.40 |
| 325 | | | | 34765.236 | 295.21 | (295.21) | 15606.19 |
| 330 | | | | 34765.236 | 295.21 | (295.21) | 15310.98 |
| 335 | | | | 34765.236 | 295.21 | (295.21) | 15015.77 |
| 340 | | | | 34765.236 | 295.21 | (295.21) | 14720.56 |
| 345 | | | | 34765.236 | 295.21 | (295.21) | 14425.35 |
| 350 | | | | 34765.236 | 295.21 | (295.21) | 14130.15 |
| 355 | | | | 34765.236 | 295.21 | (295.21) | 13834.94 |
| 360 | | | | 34765.236 | 295.21 | (295.21) | 13539.73 |
| 365 | | | | 34765.236 | 295.21 | (295.21) | 13244.52 |
| 370 | | | | 34765.236 | 295.21 | (295.21) | 12949.31 |
| 375 | | | | 34765.236 | 295.21 | (295.21) | 12654.10 |
| 380 | | | | 34765.236 | 295.21 | (295.21) | 12358.90 |
| 385 | | | | 34765.236 | 295.21 | (295.21) | 12063.69 |
| 390 | | | | 34765.236 | 295.21 | (295.21) | 11768.48 |
| 395 | | | | 34765.236 | 295.21 | (295.21) | 11473.27 |
| 400 | | | | 34765.236 | 295.21 | (295.21) | 11178.06 |
| 405 | | | | 34765.236 | 295.21 | (295.21) | 10882.85 |
| 410 | | | | 34765.236 | 295.21 | (295.21) | 10587.65 |
| 415 | | | | 34765.236 | 295.21 | (295.21) | 10292.44 |
| 420 | | | | 34765.236 | 295.21 | (295.21) | 9997.23 |
| 425 | | | | 34765.236 | 295.21 | (295.21) | 9702.02 |
| 430 | | | | 34765.236 | 295.21 | (295.21) | 9406.81 |
| 435 | | | | 34765.236 | 295.21 | (295.21) | 9111.60 |
| 440 | | | | 34765.236 | 295.21 | (295.21) | 8816.40 |
| 445 | | | | 34765.236 | 295.21 | (295.21) | 8521.19 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 450 | | | | 34765.236 | 295.21 | (295.21) | 8225.98 |
| 455 | | | | 34765.236 | 295.21 | (295.21) | 7930.77 |
| 460 | | | | 34765.236 | 295.21 | (295.21) | 7635.56 |
| 465 | | | | 34765.236 | 295.21 | (295.21) | 7340.35 |
| 470 | | | | 34765.236 | 295.21 | (295.21) | 7045.15 |
| 475 | | | | 34765.236 | 295.21 | (295.21) | 6749.94 |
| 480 | | | | 34765.236 | 295.21 | (295.21) | 6454.73 |
| 485 | | | | 34765.236 | 295.21 | (295.21) | 6159.52 |
| 490 | | | | 34765.236 | 295.21 | (295.21) | 5864.31 |
| 495 | | | | 34765.236 | 295.21 | (295.21) | 5569.10 |
| 500 | | | | 34765.236 | 295.21 | (295.21) | 5273.90 |
| 505 | | | | 34765.236 | 295.21 | (295.21) | 4978.69 |
| 510 | | | | 34765.236 | 295.21 | (295.21) | 4683.48 |
| 515 | | | | 34765.236 | 295.21 | (295.21) | 4388.27 |
| 520 | | | | 34765.236 | 295.21 | (295.21) | 4093.06 |
| 525 | | | | 34765.236 | 295.21 | (295.21) | 3797.85 |
| 530 | | | | 34765.236 | 295.21 | (295.21) | 3502.65 |
| 535 | | | | 34765.236 | 295.21 | (295.21) | 3207.44 |
| 540 | | | | 34765.236 | 295.21 | (295.21) | 2912.23 |
| 545 | | | | 34765.236 | 295.21 | (295.21) | 2617.02 |
| 550 | | | | 34765.236 | 295.21 | (295.21) | 2321.81 |
| 555 | | | | 34765.236 | 295.21 | (295.21) | 2026.60 |
| 560 | | | | 34765.236 | 295.21 | (295.21) | 1731.40 |
| 565 | | | | 34765.236 | 295.21 | (295.21) | 1436.19 |
| 570 | | | | 34765.236 | 295.21 | (295.21) | 1140.98 |
| 575 | | | | 34765.236 | 295.21 | (295.21) | 845.77 |
| 580 | | | | 34765.236 | 295.21 | (295.21) | 550.56 |
| 585 | | | | 34765.236 | 295.21 | (295.21) | 255.35 |
| 590 | | | | 34765.236 | 295.21 | (295.21) | 0.00 |
| 595 | | | | 34765.236 | 295.21 | (295.21) | 0.00 |
| 600 | | | | 34765.236 | 295.21 | (295.21) | 0.00 |
| 605 | | | | 34765.236 | 295.21 | (295.21) | 0.00 |

BASIN ROUTING PROJECT: VIA FLORENCIA
100-YEAR-6-HOUR PROPOSED HYDROGRAPH

PROJECT NO. 21091
ONSITE

DATE: 2/10/2022

AVERAGE BASIN AREA FOR INFILTRATION=
 INFILTRATION RATE (IN/HR)= 5
 INFILTRATION RATE (CU-FT/SEC) 0.98403

BASINS EMPTY IN 12.3 HRS
 6-hours=360min
 Area for Inf(sf): 8502
 6HR PEAK STORAGE= 22748CF
 PEAK RUNOFF IN 5.7 HRS

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 5 | 0.0026 | 0.0026 | 113.256 | 113.256 | 295.21 | (181.95) | 0.00 |
| 10 | 0.0064 | 0.0038 | 165.528 | 278.784 | 295.21 | (129.68) | 0.00 |
| 15 | 0.0103 | 0.0039 | 169.884 | 448.668 | 295.21 | (125.32) | 0.00 |
| 20 | 0.0143 | 0.004 | 174.24 | 622.908 | 295.21 | (120.97) | 0.00 |
| 25 | 0.0182 | 0.0039 | 169.884 | 792.792 | 295.21 | (125.32) | 0.00 |
| 30 | 0.0227 | 0.0045 | 196.02 | 988.812 | 295.21 | (99.19) | 0.00 |
| 35 | 0.0273 | 0.0046 | 200.376 | 1189.188 | 295.21 | (94.83) | 0.00 |
| 40 | 0.0319 | 0.0046 | 200.376 | 1389.564 | 295.21 | (94.83) | 0.00 |
| 45 | 0.0366 | 0.0047 | 204.732 | 1594.296 | 295.21 | (90.48) | 0.00 |
| 50 | 0.0412 | 0.0046 | 200.376 | 1794.672 | 295.21 | (94.83) | 0.00 |
| 55 | 0.0458 | 0.0046 | 200.376 | 1995.048 | 295.21 | (94.83) | 0.00 |
| 60 | 0.051 | 0.0052 | 226.512 | 2221.56 | 295.21 | (68.70) | 0.00 |
| 65 | 0.0564 | 0.0054 | 235.224 | 2456.784 | 295.21 | (59.98) | 0.00 |
| 70 | 0.0618 | 0.0054 | 235.224 | 2692.008 | 295.21 | (59.98) | 0.00 |
| 75 | 0.0671 | 0.0053 | 230.868 | 2922.876 | 295.21 | (64.34) | 0.00 |
| 80 | 0.0725 | 0.0054 | 235.224 | 3158.1 | 295.21 | (59.98) | 0.00 |
| 85 | 0.0779 | 0.0054 | 235.224 | 3393.324 | 295.21 | (59.98) | 0.00 |
| 90 | 0.0833 | 0.0054 | 235.224 | 3628.548 | 295.21 | (59.98) | 0.00 |
| 95 | 0.0886 | 0.0053 | 230.868 | 3859.416 | 295.21 | (64.34) | 0.00 |
| 100 | 0.094 | 0.0054 | 235.224 | 4094.64 | 295.21 | (59.98) | 0.00 |
| 105 | 0.0994 | 0.0054 | 235.224 | 4329.864 | 295.21 | (59.98) | 0.00 |
| 110 | 0.1048 | 0.0054 | 235.224 | 4565.088 | 295.21 | (59.98) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 115 | 0.1102 | 0.0054 | 235.224 | 4800.312 | 295.21 | (59.98) | 0.00 |
| 120 | 0.1165 | 0.0063 | 274.428 | 5074.74 | 295.21 | (20.78) | 0.00 |
| 125 | 0.1222 | 0.0057 | 248.292 | 5323.032 | 295.21 | (46.92) | 0.00 |
| 130 | 0.1286 | 0.0064 | 278.784 | 5601.816 | 295.21 | (16.42) | 0.00 |
| 135 | 0.1352 | 0.0066 | 287.496 | 5889.312 | 295.21 | (7.71) | 0.00 |
| 140 | 0.1419 | 0.0067 | 291.852 | 6181.164 | 295.21 | (3.36) | 0.00 |
| 145 | 0.1485 | 0.0066 | 287.496 | 6468.66 | 295.21 | (7.71) | 0.00 |
| 150 | 0.1552 | 0.0067 | 291.852 | 6760.512 | 295.21 | (3.36) | 0.00 |
| 155 | 0.1618 | 0.0066 | 287.496 | 7048.008 | 295.21 | (7.71) | 0.00 |
| 160 | 0.1685 | 0.0067 | 291.852 | 7339.86 | 295.21 | (3.36) | 0.00 |
| 165 | 0.1761 | 0.0076 | 331.056 | 7670.916 | 295.21 | 35.85 | 35.85 |
| 170 | 0.184 | 0.0079 | 344.124 | 8015.04 | 295.21 | 48.92 | 84.76 |
| 175 | 0.192 | 0.008 | 348.48 | 8363.52 | 295.21 | 53.27 | 138.04 |
| 180 | 0.1999 | 0.0079 | 344.124 | 8707.644 | 295.21 | 48.92 | 186.95 |
| 185 | 0.2078 | 0.0079 | 344.124 | 9051.768 | 295.21 | 48.92 | 235.87 |
| 190 | 0.2168 | 0.009 | 392.04 | 9443.808 | 295.21 | 96.83 | 332.70 |
| 195 | 0.226 | 0.0092 | 400.752 | 9844.56 | 295.21 | 105.54 | 438.24 |
| 200 | 0.2352 | 0.0092 | 400.752 | 10245.312 | 295.21 | 105.54 | 543.79 |
| 205 | 0.2454 | 0.0102 | 444.312 | 10689.624 | 295.21 | 149.10 | 692.89 |
| 210 | 0.2568 | 0.0114 | 496.584 | 11186.208 | 295.21 | 201.38 | 894.26 |
| 215 | 0.2696 | 0.0128 | 557.568 | 11743.776 | 295.21 | 262.36 | 1156.62 |
| 220 | 0.2826 | 0.013 | 566.28 | 12310.056 | 295.21 | 271.07 | 1427.70 |
| 225 | 0.2966 | 0.014 | 609.84 | 12919.896 | 295.21 | 314.63 | 1742.33 |
| 230 | 0.311 | 0.0144 | 627.264 | 13547.16 | 295.21 | 332.06 | 2074.38 |
| 235 | 0.3263 | 0.0153 | 666.468 | 14213.628 | 295.21 | 371.26 | 2445.64 |
| 240 | 0.3418 | 0.0155 | 675.18 | 14888.808 | 295.21 | 379.97 | 2825.61 |
| 245 | 0.3584 | 0.0166 | 723.096 | 15611.904 | 295.21 | 427.89 | 3253.50 |
| 250 | 0.3763 | 0.0179 | 779.724 | 16391.628 | 295.21 | 484.52 | 3738.02 |
| 255 | 0.3954 | 0.0191 | 831.996 | 17223.624 | 295.21 | 536.79 | 4274.81 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 260 | 0.4158 | 0.0204 | 888.624 | 18112.248 | 295.21 | 593.42 | 4868.22 |
| 265 | 0.4375 | 0.0217 | 945.252 | 19057.5 | 295.21 | 650.04 | 5518.27 |
| 270 | 0.4594 | 0.0219 | 953.964 | 20011.464 | 295.21 | 658.76 | 6177.02 |
| 275 | 0.4824 | 0.023 | 1001.88 | 21013.344 | 295.21 | 706.67 | 6883.69 |
| 280 | 0.5066 | 0.0242 | 1054.152 | 22067.496 | 295.21 | 758.94 | 7642.64 |
| 285 | 0.5321 | 0.0255 | 1110.78 | 23178.276 | 295.21 | 815.57 | 8458.21 |
| 290 | 0.5579 | 0.0258 | 1123.848 | 24302.124 | 295.21 | 828.64 | 9286.85 |
| 295 | 0.5847 | 0.0268 | 1167.408 | 25469.532 | 295.21 | 872.20 | 10159.05 |
| 300 | 0.6127 | 0.028 | 1219.68 | 26689.212 | 295.21 | 924.47 | 11083.52 |
| 305 | 0.6461 | 0.0334 | 1454.904 | 28144.116 | 295.21 | 1159.70 | 12243.21 |
| 310 | 0.6858 | 0.0397 | 1729.332 | 29873.448 | 295.21 | 1434.12 | 13677.34 |
| 315 | 0.7298 | 0.044 | 1916.64 | 31790.088 | 295.21 | 1621.43 | 15298.77 |
| 320 | 0.7777 | 0.0479 | 2086.524 | 33876.612 | 295.21 | 1791.32 | 17090.09 |
| 325 | 0.8315 | 0.0538 | 2343.528 | 36220.14 | 295.21 | 2048.32 | 19138.41 |
| 330 | 0.8956 | 0.0641 | 2792.196 | 39012.336 | 295.21 | 2496.99 | 21635.39 |
| 335 | 0.9253 | 0.0297 | 1293.732 | 40306.068 | 295.21 | 998.52 | 22633.92 |
| 340 | 0.9347 | 0.0094 | 409.464 | 40715.532 | 295.21 | 114.26 | 22748.17 |
| 345 | 0.9393 | 0.0046 | 200.376 | 40915.908 | 295.21 | (94.83) | 22653.34 |
| 350 | 0.9427 | 0.0034 | 148.104 | 41064.012 | 295.21 | (147.10) | 22506.24 |
| 355 | 0.945 | 0.0023 | 100.188 | 41164.2 | 295.21 | (195.02) | 22311.22 |
| 360 | 0.9465 | 0.0015 | 65.34 | 41229.54 | 295.21 | (229.87) | 22081.35 |
| 365 | 0.9467 | 0.0002 | 8.712 | 41238.252 | 295.21 | (286.50) | 21794.85 |
| 370 | | | | 41238.252 | 295.21 | (295.21) | 21499.64 |
| 375 | | | | 41238.252 | 295.21 | (295.21) | 21204.43 |
| 380 | | | | 41238.252 | 295.21 | (295.21) | 20909.23 |
| 385 | | | | 41238.252 | 295.21 | (295.21) | 20614.02 |
| 390 | | | | 41238.252 | 295.21 | (295.21) | 20318.81 |
| 395 | | | | 41238.252 | 295.21 | (295.21) | 20023.60 |
| 400 | | | | 41238.252 | 295.21 | (295.21) | 19728.39 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 405 | | | | 41238.252 | 295.21 | (295.21) | 19433.18 |
| 410 | | | | 41238.252 | 295.21 | (295.21) | 19137.98 |
| 415 | | | | 41238.252 | 295.21 | (295.21) | 18842.77 |
| 420 | | | | 41238.252 | 295.21 | (295.21) | 18547.56 |
| 425 | | | | 41238.252 | 295.21 | (295.21) | 18252.35 |
| 430 | | | | 41238.252 | 295.21 | (295.21) | 17957.14 |
| 435 | | | | 41238.252 | 295.21 | (295.21) | 17661.93 |
| 440 | | | | 41238.252 | 295.21 | (295.21) | 17366.73 |
| 445 | | | | 41238.252 | 295.21 | (295.21) | 17071.52 |
| 450 | | | | 41238.252 | 295.21 | (295.21) | 16776.31 |
| 455 | | | | 41238.252 | 295.21 | (295.21) | 16481.10 |
| 460 | | | | 41238.252 | 295.21 | (295.21) | 16185.89 |
| 465 | | | | 41238.252 | 295.21 | (295.21) | 15890.68 |
| 470 | | | | 41238.252 | 295.21 | (295.21) | 15595.48 |
| 475 | | | | 41238.252 | 295.21 | (295.21) | 15300.27 |
| 480 | | | | 41238.252 | 295.21 | (295.21) | 15005.06 |
| 485 | | | | 41238.252 | 295.21 | (295.21) | 14709.85 |
| 490 | | | | 41238.252 | 295.21 | (295.21) | 14414.64 |
| 495 | | | | 41238.252 | 295.21 | (295.21) | 14119.43 |
| 500 | | | | 41238.252 | 295.21 | (295.21) | 13824.23 |
| 505 | | | | 41238.252 | 295.21 | (295.21) | 13529.02 |
| 510 | | | | 41238.252 | 295.21 | (295.21) | 13233.81 |
| 515 | | | | 41238.252 | 295.21 | (295.21) | 12938.60 |
| 520 | | | | 41238.252 | 295.21 | (295.21) | 12643.39 |
| 525 | | | | 41238.252 | 295.21 | (295.21) | 12348.18 |
| 530 | | | | 41238.252 | 295.21 | (295.21) | 12052.98 |
| 535 | | | | 41238.252 | 295.21 | (295.21) | 11757.77 |
| 540 | | | | 41238.252 | 295.21 | (295.21) | 11462.56 |
| 545 | | | | 41238.252 | 295.21 | (295.21) | 11167.35 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 550 | | | | 41238.252 | 295.21 | (295.21) | 10872.14 |
| 555 | | | | 41238.252 | 295.21 | (295.21) | 10576.93 |
| 560 | | | | 41238.252 | 295.21 | (295.21) | 10281.73 |
| 565 | | | | 41238.252 | 295.21 | (295.21) | 9986.52 |
| 570 | | | | 41238.252 | 295.21 | (295.21) | 9691.31 |
| 575 | | | | 41238.252 | 295.21 | (295.21) | 9396.10 |
| 580 | | | | 41238.252 | 295.21 | (295.21) | 9100.89 |
| 585 | | | | 41238.252 | 295.21 | (295.21) | 8805.68 |
| 590 | | | | 41238.252 | 295.21 | (295.21) | 8510.48 |
| 595 | | | | 41238.252 | 295.21 | (295.21) | 8215.27 |
| 600 | | | | 41238.252 | 295.21 | (295.21) | 7920.06 |
| 605 | | | | 41238.252 | 295.21 | (295.21) | 7624.85 |
| 610 | | | | 41238.252 | 295.21 | (295.21) | 7329.64 |
| 615 | | | | 41238.252 | 295.21 | (295.21) | 7034.43 |
| 620 | | | | 41238.252 | 295.21 | (295.21) | 6739.23 |
| 625 | | | | 41238.252 | 295.21 | (295.21) | 6444.02 |
| 630 | | | | 41238.252 | 295.21 | (295.21) | 6148.81 |
| 635 | | | | 41238.252 | 295.21 | (295.21) | 5853.60 |
| 640 | | | | 41238.252 | 295.21 | (295.21) | 5558.39 |
| 645 | | | | 41238.252 | 295.21 | (295.21) | 5263.18 |
| 650 | | | | 41238.252 | 295.21 | (295.21) | 4967.98 |
| 655 | | | | 41238.252 | 295.21 | (295.21) | 4672.77 |
| 660 | | | | 41238.252 | 295.21 | (295.21) | 4377.56 |
| 665 | | | | 41238.252 | 295.21 | (295.21) | 4082.35 |
| 670 | | | | 41238.252 | 295.21 | (295.21) | 3787.14 |
| 675 | | | | 41238.252 | 295.21 | (295.21) | 3491.93 |
| 680 | | | | 41238.252 | 295.21 | (295.21) | 3196.73 |
| 685 | | | | 41238.252 | 295.21 | (295.21) | 2901.52 |
| 690 | | | | 41238.252 | 295.21 | (295.21) | 2606.31 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 695 | | | | 41238.252 | 295.21 | (295.21) | 2311.10 |
| 700 | | | | 41238.252 | 295.21 | (295.21) | 2015.89 |
| 705 | | | | 41238.252 | 295.21 | (295.21) | 1720.68 |
| 710 | | | | 41238.252 | 295.21 | (295.21) | 1425.48 |
| 715 | | | | 41238.252 | 295.21 | (295.21) | 1130.27 |
| 720 | | | | 41238.252 | 295.21 | (295.21) | 835.06 |
| 725 | | | | 41238.252 | 295.21 | (295.21) | 539.85 |
| 730 | | | | 41238.252 | 295.21 | (295.21) | 244.64 |
| 735 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 740 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 745 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 750 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 755 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 760 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 765 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 770 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 775 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 780 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 785 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 790 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 795 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 800 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 805 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 810 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 815 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 820 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 825 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 830 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |
| 835 | | | | 41238.252 | 295.21 | (295.21) | 0.00 |

BASIN ROUTING **PROJECT: VIA FLORENCIA**
100-YEAR-24-HOUR PROPOSED HYDROGRAPH

PROJECT NO. 21091

DATE: 2/10/2022

ONSITE

BASINS EMPTY IN 20.3 HRS

24-hours=1440min

Area for Inf(sf): 8502

24 HR PEAK STORAGE= 12545

PEAK RUNOFF IN 16.0 HRS

AVERAGE BASIN AREA FOR INFILTRATION=

INFILTRATION RATE (IN/HR)= 5

INFILTRATION RATE (CU-FT/SEC) 0.98403

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 5 | 0.0005 | 0.0005 | 21.78 | 21.78 | 295.21 | (273.43) | 0.00 |
| 10 | 0.0012 | 0.0007 | 30.492 | 52.272 | 295.21 | (264.72) | 0.00 |
| 15 | 0.0018 | 0.0006 | 26.136 | 78.408 | 295.21 | (269.07) | 0.00 |
| 20 | 0.0028 | 0.001 | 43.56 | 121.968 | 295.21 | (251.65) | 0.00 |
| 25 | 0.0038 | 0.001 | 43.56 | 165.528 | 295.21 | (251.65) | 0.00 |
| 30 | 0.0048 | 0.001 | 43.56 | 209.088 | 295.21 | (251.65) | 0.00 |
| 35 | 0.0058 | 0.001 | 43.56 | 252.648 | 295.21 | (251.65) | 0.00 |
| 40 | 0.0068 | 0.001 | 43.56 | 296.208 | 295.21 | (251.65) | 0.00 |
| 45 | 0.0078 | 0.001 | 43.56 | 339.768 | 295.21 | (251.65) | 0.00 |
| 50 | 0.009 | 0.0012 | 52.272 | 392.04 | 295.21 | (242.94) | 0.00 |
| 55 | 0.0103 | 0.0013 | 56.628 | 448.668 | 295.21 | (238.58) | 0.00 |
| 60 | 0.0117 | 0.0014 | 60.984 | 509.652 | 295.21 | (234.22) | 0.00 |
| 65 | 0.0127 | 0.001 | 43.56 | 553.212 | 295.21 | (251.65) | 0.00 |
| 70 | 0.0137 | 0.001 | 43.56 | 596.772 | 295.21 | (251.65) | 0.00 |
| 75 | 0.0147 | 0.001 | 43.56 | 640.332 | 295.21 | (251.65) | 0.00 |
| 80 | 0.0157 | 0.001 | 43.56 | 683.892 | 295.21 | (251.65) | 0.00 |
| 85 | 0.0167 | 0.001 | 43.56 | 727.452 | 295.21 | (251.65) | 0.00 |
| 90 | 0.0177 | 0.001 | 43.56 | 771.012 | 295.21 | (251.65) | 0.00 |
| 95 | 0.0187 | 0.001 | 43.56 | 814.572 | 295.21 | (251.65) | 0.00 |
| 100 | 0.0197 | 0.001 | 43.56 | 858.132 | 295.21 | (251.65) | 0.00 |
| 105 | 0.0207 | 0.001 | 43.56 | 901.692 | 295.21 | (251.65) | 0.00 |
| 110 | 0.022 | 0.0013 | 56.628 | 958.32 | 295.21 | (238.58) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 115 | 0.0233 | 0.0013 | 56.628 | 1014.948 | 295.21 | (238.58) | 0.00 |
| 120 | 0.0246 | 0.0013 | 56.628 | 1071.576 | 295.21 | (238.58) | 0.00 |
| 125 | 0.0259 | 0.0013 | 56.628 | 1128.204 | 295.21 | (238.58) | 0.00 |
| 130 | 0.0273 | 0.0014 | 60.984 | 1189.188 | 295.21 | (234.22) | 0.00 |
| 135 | 0.0286 | 0.0013 | 56.628 | 1245.816 | 295.21 | (238.58) | 0.00 |
| 140 | 0.0299 | 0.0013 | 56.628 | 1302.444 | 295.21 | (238.58) | 0.00 |
| 145 | 0.0313 | 0.0014 | 60.984 | 1363.428 | 295.21 | (234.22) | 0.00 |
| 150 | 0.0326 | 0.0013 | 56.628 | 1420.056 | 295.21 | (238.58) | 0.00 |
| 155 | 0.0342 | 0.0016 | 69.696 | 1489.752 | 295.21 | (225.51) | 0.00 |
| 160 | 0.0358 | 0.0016 | 69.696 | 1559.448 | 295.21 | (225.51) | 0.00 |
| 165 | 0.0375 | 0.0017 | 74.052 | 1633.5 | 295.21 | (221.16) | 0.00 |
| 170 | 0.0391 | 0.0016 | 69.696 | 1703.196 | 295.21 | (225.51) | 0.00 |
| 175 | 0.0408 | 0.0017 | 74.052 | 1777.248 | 295.21 | (221.16) | 0.00 |
| 180 | 0.0425 | 0.0017 | 74.052 | 1851.3 | 295.21 | (221.16) | 0.00 |
| 185 | 0.0441 | 0.0016 | 69.696 | 1920.996 | 295.21 | (225.51) | 0.00 |
| 190 | 0.0458 | 0.0017 | 74.052 | 1995.048 | 295.21 | (221.16) | 0.00 |
| 195 | 0.0474 | 0.0016 | 69.696 | 2064.744 | 295.21 | (225.51) | 0.00 |
| 200 | 0.0491 | 0.0017 | 74.052 | 2138.796 | 295.21 | (221.16) | 0.00 |
| 205 | 0.0508 | 0.0017 | 74.052 | 2212.848 | 295.21 | (221.16) | 0.00 |
| 210 | 0.0524 | 0.0016 | 69.696 | 2282.544 | 295.21 | (225.51) | 0.00 |
| 215 | 0.0541 | 0.0017 | 74.052 | 2356.596 | 295.21 | (221.16) | 0.00 |
| 220 | 0.0558 | 0.0017 | 74.052 | 2430.648 | 295.21 | (221.16) | 0.00 |
| 225 | 0.0574 | 0.0016 | 69.696 | 2500.344 | 295.21 | (225.51) | 0.00 |
| 230 | 0.0593 | 0.0019 | 82.764 | 2583.108 | 295.21 | (212.44) | 0.00 |
| 235 | 0.0613 | 0.002 | 87.12 | 2670.228 | 295.21 | (208.09) | 0.00 |
| 240 | 0.0633 | 0.002 | 87.12 | 2757.348 | 295.21 | (208.09) | 0.00 |
| 245 | 0.0653 | 0.002 | 87.12 | 2844.468 | 295.21 | (208.09) | 0.00 |
| 250 | 0.0673 | 0.002 | 87.12 | 2931.588 | 295.21 | (208.09) | 0.00 |
| 255 | 0.0693 | 0.002 | 87.12 | 3018.708 | 295.21 | (208.09) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 260 | 0.0715 | 0.0022 | 95.832 | 3114.54 | 295.21 | (199.38) | 0.00 |
| 265 | 0.0739 | 0.0024 | 104.544 | 3219.084 | 295.21 | (190.66) | 0.00 |
| 270 | 0.0762 | 0.0023 | 100.188 | 3319.272 | 295.21 | (195.02) | 0.00 |
| 275 | 0.0785 | 0.0023 | 100.188 | 3419.46 | 295.21 | (195.02) | 0.00 |
| 280 | 0.0808 | 0.0023 | 100.188 | 3519.648 | 295.21 | (195.02) | 0.00 |
| 285 | 0.0832 | 0.0024 | 104.544 | 3624.192 | 295.21 | (190.66) | 0.00 |
| 290 | 0.0857 | 0.0025 | 108.9 | 3733.092 | 295.21 | (186.31) | 0.00 |
| 295 | 0.0884 | 0.0027 | 117.612 | 3850.704 | 295.21 | (177.60) | 0.00 |
| 300 | 0.0911 | 0.0027 | 117.612 | 3968.316 | 295.21 | (177.60) | 0.00 |
| 305 | 0.0932 | 0.0021 | 91.476 | 4059.792 | 295.21 | (203.73) | 0.00 |
| 310 | 0.0952 | 0.002 | 87.12 | 4146.912 | 295.21 | (208.09) | 0.00 |
| 315 | 0.0972 | 0.002 | 87.12 | 4234.032 | 295.21 | (208.09) | 0.00 |
| 320 | 0.0994 | 0.0022 | 95.832 | 4329.864 | 295.21 | (199.38) | 0.00 |
| 325 | 0.1018 | 0.0024 | 104.544 | 4434.408 | 295.21 | (190.66) | 0.00 |
| 330 | 0.1041 | 0.0023 | 100.188 | 4534.596 | 295.21 | (195.02) | 0.00 |
| 335 | 0.1067 | 0.0026 | 113.256 | 4647.852 | 295.21 | (181.95) | 0.00 |
| 340 | 0.1093 | 0.0026 | 113.256 | 4761.108 | 295.21 | (181.95) | 0.00 |
| 345 | 0.112 | 0.0027 | 117.612 | 4878.72 | 295.21 | (177.60) | 0.00 |
| 350 | 0.1146 | 0.0026 | 113.256 | 4991.976 | 295.21 | (181.95) | 0.00 |
| 355 | 0.1173 | 0.0027 | 117.612 | 5109.588 | 295.21 | (177.60) | 0.00 |
| 360 | 0.1199 | 0.0026 | 113.256 | 5222.844 | 295.21 | (181.95) | 0.00 |
| 365 | 0.1229 | 0.003 | 130.68 | 5353.524 | 295.21 | (164.53) | 0.00 |
| 370 | 0.1259 | 0.003 | 130.68 | 5484.204 | 295.21 | (164.53) | 0.00 |
| 375 | 0.1288 | 0.0029 | 126.324 | 5610.528 | 295.21 | (168.88) | 0.00 |
| 380 | 0.1318 | 0.003 | 130.68 | 5741.208 | 295.21 | (164.53) | 0.00 |
| 385 | 0.1348 | 0.003 | 130.68 | 5871.888 | 295.21 | (164.53) | 0.00 |
| 390 | 0.1378 | 0.003 | 130.68 | 6002.568 | 295.21 | (164.53) | 0.00 |
| 395 | 0.1411 | 0.0033 | 143.748 | 6146.316 | 295.21 | (151.46) | 0.00 |
| 400 | 0.1444 | 0.0033 | 143.748 | 6290.064 | 295.21 | (151.46) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 405 | 0.1477 | 0.0033 | 143.748 | 6433.812 | 295.21 | (151.46) | 0.00 |
| 410 | 0.151 | 0.0033 | 143.748 | 6577.56 | 295.21 | (151.46) | 0.00 |
| 415 | 0.1543 | 0.0033 | 143.748 | 6721.308 | 295.21 | (151.46) | 0.00 |
| 420 | 0.1577 | 0.0034 | 148.104 | 6869.412 | 295.21 | (147.10) | 0.00 |
| 425 | 0.161 | 0.0033 | 143.748 | 7013.16 | 295.21 | (151.46) | 0.00 |
| 430 | 0.1643 | 0.0033 | 143.748 | 7156.908 | 295.21 | (151.46) | 0.00 |
| 435 | 0.1676 | 0.0033 | 143.748 | 7300.656 | 295.21 | (151.46) | 0.00 |
| 440 | 0.1712 | 0.0036 | 156.816 | 7457.472 | 295.21 | (138.39) | 0.00 |
| 445 | 0.1748 | 0.0036 | 156.816 | 7614.288 | 295.21 | (138.39) | 0.00 |
| 450 | 0.1785 | 0.0037 | 161.172 | 7775.46 | 295.21 | (134.04) | 0.00 |
| 455 | 0.1824 | 0.0039 | 169.884 | 7945.344 | 295.21 | (125.32) | 0.00 |
| 460 | 0.1864 | 0.004 | 174.24 | 8119.584 | 295.21 | (120.97) | 0.00 |
| 465 | 0.1904 | 0.004 | 174.24 | 8293.824 | 295.21 | (120.97) | 0.00 |
| 470 | 0.1946 | 0.0042 | 182.952 | 8476.776 | 295.21 | (112.26) | 0.00 |
| 475 | 0.1989 | 0.0043 | 187.308 | 8664.084 | 295.21 | (107.90) | 0.00 |
| 480 | 0.2033 | 0.0044 | 191.664 | 8855.748 | 295.21 | (103.54) | 0.00 |
| 485 | 0.2081 | 0.0048 | 209.088 | 9064.836 | 295.21 | (86.12) | 0.00 |
| 490 | 0.2131 | 0.005 | 217.8 | 9282.636 | 295.21 | (77.41) | 0.00 |
| 495 | 0.2181 | 0.005 | 217.8 | 9500.436 | 295.21 | (77.41) | 0.00 |
| 500 | 0.223 | 0.0049 | 213.444 | 9713.88 | 295.21 | (81.76) | 0.00 |
| 505 | 0.228 | 0.005 | 217.8 | 9931.68 | 295.21 | (77.41) | 0.00 |
| 510 | 0.233 | 0.005 | 217.8 | 10149.48 | 295.21 | (77.41) | 0.00 |
| 515 | 0.2382 | 0.0052 | 226.512 | 10375.992 | 295.21 | (68.70) | 0.00 |
| 520 | 0.2435 | 0.0053 | 230.868 | 10606.86 | 295.21 | (64.34) | 0.00 |
| 525 | 0.2489 | 0.0054 | 235.224 | 10842.084 | 295.21 | (59.98) | 0.00 |
| 530 | 0.2544 | 0.0055 | 239.58 | 11081.664 | 295.21 | (55.63) | 0.00 |
| 535 | 0.2601 | 0.0057 | 248.292 | 11329.956 | 295.21 | (46.92) | 0.00 |
| 540 | 0.2657 | 0.0056 | 243.936 | 11573.892 | 295.21 | (51.27) | 0.00 |
| 545 | 0.2723 | 0.0066 | 287.496 | 11861.388 | 295.21 | (7.71) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 550 | 0.2791 | 0.0068 | 296.208 | 12157.596 | 295.21 | 1.00 | 1.00 |
| 555 | 0.286 | 0.0069 | 300.564 | 12458.16 | 295.21 | 5.36 | 6.36 |
| 560 | 0.2934 | 0.0074 | 322.344 | 12780.504 | 295.21 | 27.14 | 33.49 |
| 565 | 0.301 | 0.0076 | 331.056 | 13111.56 | 295.21 | 35.85 | 69.34 |
| 570 | 0.3086 | 0.0076 | 331.056 | 13442.616 | 295.21 | 35.85 | 105.19 |
| 575 | 0.3167 | 0.0081 | 352.836 | 13795.452 | 295.21 | 57.63 | 162.81 |
| 580 | 0.325 | 0.0083 | 361.548 | 14157 | 295.21 | 66.34 | 229.15 |
| 585 | 0.3333 | 0.0083 | 361.548 | 14518.548 | 295.21 | 66.34 | 295.49 |
| 590 | 0.3422 | 0.0089 | 387.684 | 14906.232 | 295.21 | 92.48 | 387.97 |
| 595 | 0.3512 | 0.009 | 392.04 | 15298.272 | 295.21 | 96.83 | 484.80 |
| 600 | 0.3602 | 0.009 | 392.04 | 15690.312 | 295.21 | 96.83 | 581.63 |
| 605 | 0.3661 | 0.0059 | 257.004 | 15947.316 | 295.21 | (38.20) | 543.43 |
| 610 | 0.3711 | 0.005 | 217.8 | 16165.116 | 295.21 | (77.41) | 466.02 |
| 615 | 0.3761 | 0.005 | 217.8 | 16382.916 | 295.21 | (77.41) | 388.61 |
| 620 | 0.381 | 0.0049 | 213.444 | 16596.36 | 295.21 | (81.76) | 306.85 |
| 625 | 0.386 | 0.005 | 217.8 | 16814.16 | 295.21 | (77.41) | 229.44 |
| 630 | 0.391 | 0.005 | 217.8 | 17031.96 | 295.21 | (77.41) | 152.03 |
| 635 | 0.3983 | 0.0073 | 317.988 | 17349.948 | 295.21 | 22.78 | 174.81 |
| 640 | 0.4062 | 0.0079 | 344.124 | 17694.072 | 295.21 | 48.92 | 223.73 |
| 645 | 0.4142 | 0.008 | 348.48 | 18042.552 | 295.21 | 53.27 | 277.00 |
| 650 | 0.4222 | 0.008 | 348.48 | 18391.032 | 295.21 | 53.27 | 330.27 |
| 655 | 0.4302 | 0.008 | 348.48 | 18739.512 | 295.21 | 53.27 | 383.54 |
| 660 | 0.4382 | 0.008 | 348.48 | 19087.992 | 295.21 | 53.27 | 436.81 |
| 665 | 0.4458 | 0.0076 | 331.056 | 19419.048 | 295.21 | 35.85 | 472.66 |
| 670 | 0.4532 | 0.0074 | 322.344 | 19741.392 | 295.21 | 27.14 | 499.80 |
| 675 | 0.4607 | 0.0075 | 326.7 | 20068.092 | 295.21 | 31.49 | 531.29 |
| 680 | 0.4682 | 0.0075 | 326.7 | 20394.792 | 295.21 | 31.49 | 562.78 |
| 685 | 0.4757 | 0.0075 | 326.7 | 20721.492 | 295.21 | 31.49 | 594.27 |
| 690 | 0.4832 | 0.0075 | 326.7 | 21048.192 | 295.21 | 31.49 | 625.76 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 695 | 0.4898 | 0.0066 | 287.496 | 21335.688 | 295.21 | (7.71) | 618.05 |
| 700 | 0.4961 | 0.0063 | 274.428 | 21610.116 | 295.21 | (20.78) | 597.27 |
| 705 | 0.5024 | 0.0063 | 274.428 | 21884.544 | 295.21 | (20.78) | 576.49 |
| 710 | 0.5093 | 0.0069 | 300.564 | 22185.108 | 295.21 | 5.36 | 581.84 |
| 715 | 0.5163 | 0.007 | 304.92 | 22490.028 | 295.21 | 9.71 | 591.56 |
| 720 | 0.5233 | 0.007 | 304.92 | 22794.948 | 295.21 | 9.71 | 601.27 |
| 725 | 0.5339 | 0.0106 | 461.736 | 23256.684 | 295.21 | 166.53 | 767.80 |
| 730 | 0.5454 | 0.0115 | 500.94 | 23757.624 | 295.21 | 205.73 | 973.53 |
| 735 | 0.557 | 0.0116 | 505.296 | 24262.92 | 295.21 | 210.09 | 1183.62 |
| 740 | 0.5692 | 0.0122 | 531.432 | 24794.352 | 295.21 | 236.22 | 1419.84 |
| 745 | 0.5814 | 0.0122 | 531.432 | 25325.784 | 295.21 | 236.22 | 1656.06 |
| 750 | 0.5937 | 0.0123 | 535.788 | 25861.572 | 295.21 | 240.58 | 1896.64 |
| 755 | 0.6071 | 0.0134 | 583.704 | 26445.276 | 295.21 | 288.50 | 2185.14 |
| 760 | 0.6207 | 0.0136 | 592.416 | 27037.692 | 295.21 | 297.21 | 2482.35 |
| 765 | 0.6344 | 0.0137 | 596.772 | 27634.464 | 295.21 | 301.56 | 2783.91 |
| 770 | 0.6486 | 0.0142 | 618.552 | 28253.016 | 295.21 | 323.34 | 3107.25 |
| 775 | 0.6629 | 0.0143 | 622.908 | 28875.924 | 295.21 | 327.70 | 3434.95 |
| 780 | 0.6773 | 0.0144 | 627.264 | 29503.188 | 295.21 | 332.06 | 3767.01 |
| 785 | 0.6942 | 0.0169 | 736.164 | 30239.352 | 295.21 | 440.96 | 4207.96 |
| 790 | 0.7118 | 0.0176 | 766.656 | 31006.008 | 295.21 | 471.45 | 4679.41 |
| 795 | 0.7294 | 0.0176 | 766.656 | 31772.664 | 295.21 | 471.45 | 5150.86 |
| 800 | 0.7471 | 0.0177 | 771.012 | 32543.676 | 295.21 | 475.80 | 5626.66 |
| 805 | 0.7648 | 0.0177 | 771.012 | 33314.688 | 295.21 | 475.80 | 6102.47 |
| 810 | 0.7825 | 0.0177 | 771.012 | 34085.7 | 295.21 | 475.80 | 6578.27 |
| 815 | 0.7947 | 0.0122 | 531.432 | 34617.132 | 295.21 | 236.22 | 6814.49 |
| 820 | 0.8054 | 0.0107 | 466.092 | 35083.224 | 295.21 | 170.88 | 6985.38 |
| 825 | 0.8161 | 0.0107 | 466.092 | 35549.316 | 295.21 | 170.88 | 7156.26 |
| 830 | 0.8268 | 0.0107 | 466.092 | 36015.408 | 295.21 | 170.88 | 7327.15 |
| 835 | 0.8375 | 0.0107 | 466.092 | 36481.5 | 295.21 | 170.88 | 7498.03 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 840 | 0.8483 | 0.0108 | 470.448 | 36951.948 | 295.21 | 175.24 | 7673.27 |
| 845 | 0.8611 | 0.0128 | 557.568 | 37509.516 | 295.21 | 262.36 | 7935.63 |
| 850 | 0.8745 | 0.0134 | 583.704 | 38093.22 | 295.21 | 288.50 | 8224.12 |
| 855 | 0.8879 | 0.0134 | 583.704 | 38676.924 | 295.21 | 288.50 | 8512.62 |
| 860 | 0.9008 | 0.0129 | 561.924 | 39238.848 | 295.21 | 266.72 | 8779.34 |
| 865 | 0.9136 | 0.0128 | 557.568 | 39796.416 | 295.21 | 262.36 | 9041.69 |
| 870 | 0.9264 | 0.0128 | 557.568 | 40353.984 | 295.21 | 262.36 | 9304.05 |
| 875 | 0.9392 | 0.0128 | 557.568 | 40911.552 | 295.21 | 262.36 | 9566.41 |
| 880 | 0.9521 | 0.0129 | 561.924 | 41473.476 | 295.21 | 266.72 | 9833.13 |
| 885 | 0.9649 | 0.0128 | 557.568 | 42031.044 | 295.21 | 262.36 | 10095.49 |
| 890 | 0.9773 | 0.0124 | 540.144 | 42571.188 | 295.21 | 244.94 | 10340.43 |
| 895 | 0.9896 | 0.0123 | 535.788 | 43106.976 | 295.21 | 240.58 | 10581.00 |
| 900 | 1.0019 | 0.0123 | 535.788 | 43642.764 | 295.21 | 240.58 | 10821.58 |
| 905 | 1.0137 | 0.0118 | 514.008 | 44156.772 | 295.21 | 218.80 | 11040.38 |
| 910 | 1.0254 | 0.0117 | 509.652 | 44666.424 | 295.21 | 214.44 | 11254.83 |
| 915 | 1.0371 | 0.0117 | 509.652 | 45176.076 | 295.21 | 214.44 | 11469.27 |
| 920 | 1.0483 | 0.0112 | 487.872 | 45663.948 | 295.21 | 192.66 | 11661.94 |
| 925 | 1.0594 | 0.0111 | 483.516 | 46147.464 | 295.21 | 188.31 | 11850.24 |
| 930 | 1.0705 | 0.0111 | 483.516 | 46630.98 | 295.21 | 188.31 | 12038.55 |
| 935 | 1.0796 | 0.0091 | 396.396 | 47027.376 | 295.21 | 101.19 | 12139.74 |
| 940 | 1.0882 | 0.0086 | 374.616 | 47401.992 | 295.21 | 79.41 | 12219.15 |
| 945 | 1.0968 | 0.0086 | 374.616 | 47776.608 | 295.21 | 79.41 | 12298.55 |
| 950 | 1.1055 | 0.0087 | 378.972 | 48155.58 | 295.21 | 83.76 | 12382.32 |
| 955 | 1.1141 | 0.0086 | 374.616 | 48530.196 | 295.21 | 79.41 | 12461.72 |
| 960 | 1.1228 | 0.0087 | 378.972 | 48909.168 | 295.21 | 83.76 | 12545.49 |
| 965 | 1.1257 | 0.0029 | 126.324 | 49035.492 | 295.21 | (168.88) | 12376.60 |
| 970 | 1.127 | 0.0013 | 56.628 | 49092.12 | 295.21 | (238.58) | 12138.02 |
| 975 | 1.1283 | 0.0013 | 56.628 | 49148.748 | 295.21 | (238.58) | 11899.44 |
| 980 | 1.1297 | 0.0014 | 60.984 | 49209.732 | 295.21 | (234.22) | 11665.22 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 985 | 1.131 | 0.0013 | 56.628 | 49266.36 | 295.21 | (238.58) | 11426.64 |
| 990 | 1.1323 | 0.0013 | 56.628 | 49322.988 | 295.21 | (238.58) | 11188.06 |
| 995 | 1.1334 | 0.0011 | 47.916 | 49370.904 | 295.21 | (247.29) | 10940.77 |
| 1000 | 1.1344 | 0.001 | 43.56 | 49414.464 | 295.21 | (251.65) | 10689.12 |
| 1005 | 1.1354 | 0.001 | 43.56 | 49458.024 | 295.21 | (251.65) | 10437.47 |
| 1010 | 1.1364 | 0.001 | 43.56 | 49501.584 | 295.21 | (251.65) | 10185.82 |
| 1015 | 1.1374 | 0.001 | 43.56 | 49545.144 | 295.21 | (251.65) | 9934.17 |
| 1020 | 1.1384 | 0.001 | 43.56 | 49588.704 | 295.21 | (251.65) | 9682.52 |
| 1025 | 1.1399 | 0.0015 | 65.34 | 49654.044 | 295.21 | (229.87) | 9452.66 |
| 1030 | 1.1416 | 0.0017 | 74.052 | 49728.096 | 295.21 | (221.16) | 9231.50 |
| 1035 | 1.1432 | 0.0016 | 69.696 | 49797.792 | 295.21 | (225.51) | 9005.99 |
| 1040 | 1.1449 | 0.0017 | 74.052 | 49871.844 | 295.21 | (221.16) | 8784.83 |
| 1045 | 1.1465 | 0.0016 | 69.696 | 49941.54 | 295.21 | (225.51) | 8559.32 |
| 1050 | 1.1482 | 0.0017 | 74.052 | 50015.592 | 295.21 | (221.16) | 8338.16 |
| 1055 | 1.1499 | 0.0017 | 74.052 | 50089.644 | 295.21 | (221.16) | 8117.01 |
| 1060 | 1.1515 | 0.0016 | 69.696 | 50159.34 | 295.21 | (225.51) | 7891.49 |
| 1065 | 1.1532 | 0.0017 | 74.052 | 50233.392 | 295.21 | (221.16) | 7670.34 |
| 1070 | 1.1546 | 0.0014 | 60.984 | 50294.376 | 295.21 | (234.22) | 7436.11 |
| 1075 | 1.1559 | 0.0013 | 56.628 | 50351.004 | 295.21 | (238.58) | 7197.53 |
| 1080 | 1.1572 | 0.0013 | 56.628 | 50407.632 | 295.21 | (238.58) | 6958.95 |
| 1085 | 1.1586 | 0.0014 | 60.984 | 50468.616 | 295.21 | (234.22) | 6724.73 |
| 1090 | 1.1599 | 0.0013 | 56.628 | 50525.244 | 295.21 | (238.58) | 6486.15 |
| 1095 | 1.1612 | 0.0013 | 56.628 | 50581.872 | 295.21 | (238.58) | 6247.57 |
| 1100 | 1.1625 | 0.0013 | 56.628 | 50638.5 | 295.21 | (238.58) | 6008.99 |
| 1105 | 1.1639 | 0.0014 | 60.984 | 50699.484 | 295.21 | (234.22) | 5774.76 |
| 1110 | 1.1652 | 0.0013 | 56.628 | 50756.112 | 295.21 | (238.58) | 5536.18 |
| 1115 | 1.1663 | 0.0011 | 47.916 | 50804.028 | 295.21 | (247.29) | 5288.89 |
| 1120 | 1.1673 | 0.001 | 43.56 | 50847.588 | 295.21 | (251.65) | 5037.24 |
| 1125 | 1.1683 | 0.001 | 43.56 | 50891.148 | 295.21 | (251.65) | 4785.59 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 1130 | 1.169 | 0.0007 | 30.492 | 50921.64 | 295.21 | (264.72) | 4520.88 |
| 1135 | 1.1697 | 0.0007 | 30.492 | 50952.132 | 295.21 | (264.72) | 4256.16 |
| 1140 | 1.1703 | 0.0006 | 26.136 | 50978.268 | 295.21 | (269.07) | 3987.09 |
| 1145 | 1.1713 | 0.001 | 43.56 | 51021.828 | 295.21 | (251.65) | 3735.44 |
| 1150 | 1.1722 | 0.0009 | 39.204 | 51061.032 | 295.21 | (256.00) | 3479.44 |
| 1155 | 1.1732 | 0.001 | 43.56 | 51104.592 | 295.21 | (251.65) | 3227.79 |
| 1160 | 1.1745 | 0.0013 | 56.628 | 51161.22 | 295.21 | (238.58) | 2989.21 |
| 1165 | 1.1758 | 0.0013 | 56.628 | 51217.848 | 295.21 | (238.58) | 2750.63 |
| 1170 | 1.1772 | 0.0014 | 60.984 | 51278.832 | 295.21 | (234.22) | 2516.40 |
| 1175 | 1.1782 | 0.001 | 43.56 | 51322.392 | 295.21 | (251.65) | 2264.75 |
| 1180 | 1.1792 | 0.001 | 43.56 | 51365.952 | 295.21 | (251.65) | 2013.11 |
| 1185 | 1.1802 | 0.001 | 43.56 | 51409.512 | 295.21 | (251.65) | 1761.46 |
| 1190 | 1.181 | 0.0008 | 34.848 | 51444.36 | 295.21 | (260.36) | 1501.10 |
| 1195 | 1.1816 | 0.0006 | 26.136 | 51470.496 | 295.21 | (269.07) | 1232.02 |
| 1200 | 1.1823 | 0.0007 | 30.492 | 51500.988 | 295.21 | (264.72) | 967.31 |
| 1205 | 1.1832 | 0.0009 | 39.204 | 51540.192 | 295.21 | (256.00) | 711.30 |
| 1210 | 1.1842 | 0.001 | 43.56 | 51583.752 | 295.21 | (251.65) | 459.66 |
| 1215 | 1.1852 | 0.001 | 43.56 | 51627.312 | 295.21 | (251.65) | 208.01 |
| 1220 | 1.1862 | 0.001 | 43.56 | 51670.872 | 295.21 | (251.65) | 0.00 |
| 1225 | 1.1872 | 0.001 | 43.56 | 51714.432 | 295.21 | (251.65) | 0.00 |
| 1230 | 1.1882 | 0.001 | 43.56 | 51757.992 | 295.21 | (251.65) | 0.00 |
| 1235 | 1.1892 | 0.001 | 43.56 | 51801.552 | 295.21 | (251.65) | 0.00 |
| 1240 | 1.1902 | 0.001 | 43.56 | 51845.112 | 295.21 | (251.65) | 0.00 |
| 1245 | 1.1912 | 0.001 | 43.56 | 51888.672 | 295.21 | (251.65) | 0.00 |
| 1250 | 1.1919 | 0.0007 | 30.492 | 51919.164 | 295.21 | (264.72) | 0.00 |
| 1255 | 1.1926 | 0.0007 | 30.492 | 51949.656 | 295.21 | (264.72) | 0.00 |
| 1260 | 1.1932 | 0.0006 | 26.136 | 51975.792 | 295.21 | (269.07) | 0.00 |
| 1265 | 1.1942 | 0.001 | 43.56 | 52019.352 | 295.21 | (251.65) | 0.00 |
| 1270 | 1.1952 | 0.001 | 43.56 | 52062.912 | 295.21 | (251.65) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 1275 | 1.1962 | 0.001 | 43.56 | 52106.472 | 295.21 | (251.65) | 0.00 |
| 1280 | 1.1969 | 0.0007 | 30.492 | 52136.964 | 295.21 | (264.72) | 0.00 |
| 1285 | 1.1976 | 0.0007 | 30.492 | 52167.456 | 295.21 | (264.72) | 0.00 |
| 1290 | 1.1982 | 0.0006 | 26.136 | 52193.592 | 295.21 | (269.07) | 0.00 |
| 1295 | 1.1991 | 0.0009 | 39.204 | 52232.796 | 295.21 | (256.00) | 0.00 |
| 1300 | 1.2001 | 0.001 | 43.56 | 52276.356 | 295.21 | (251.65) | 0.00 |
| 1305 | 1.2011 | 0.001 | 43.56 | 52319.916 | 295.21 | (251.65) | 0.00 |
| 1310 | 1.2019 | 0.0008 | 34.848 | 52354.764 | 295.21 | (260.36) | 0.00 |
| 1315 | 1.2025 | 0.0006 | 26.136 | 52380.9 | 295.21 | (269.07) | 0.00 |
| 1320 | 1.2032 | 0.0007 | 30.492 | 52411.392 | 295.21 | (264.72) | 0.00 |
| 1325 | 1.2041 | 0.0009 | 39.204 | 52450.596 | 295.21 | (256.00) | 0.00 |
| 1330 | 1.2051 | 0.001 | 43.56 | 52494.156 | 295.21 | (251.65) | 0.00 |
| 1335 | 1.2061 | 0.001 | 43.56 | 52537.716 | 295.21 | (251.65) | 0.00 |
| 1340 | 1.2069 | 0.0008 | 34.848 | 52572.564 | 295.21 | (260.36) | 0.00 |
| 1345 | 1.2075 | 0.0006 | 26.136 | 52598.7 | 295.21 | (269.07) | 0.00 |
| 1350 | 1.2082 | 0.0007 | 30.492 | 52629.192 | 295.21 | (264.72) | 0.00 |
| 1355 | 1.2088 | 0.0006 | 26.136 | 52655.328 | 295.21 | (269.07) | 0.00 |
| 1360 | 1.2095 | 0.0007 | 30.492 | 52685.82 | 295.21 | (264.72) | 0.00 |
| 1365 | 1.2102 | 0.0007 | 30.492 | 52716.312 | 295.21 | (264.72) | 0.00 |
| 1370 | 1.2108 | 0.0006 | 26.136 | 52742.448 | 295.21 | (269.07) | 0.00 |
| 1375 | 1.2115 | 0.0007 | 30.492 | 52772.94 | 295.21 | (264.72) | 0.00 |
| 1380 | 1.2122 | 0.0007 | 30.492 | 52803.432 | 295.21 | (264.72) | 0.00 |
| 1385 | 1.2128 | 0.0006 | 26.136 | 52829.568 | 295.21 | (269.07) | 0.00 |
| 1390 | 1.2135 | 0.0007 | 30.492 | 52860.06 | 295.21 | (264.72) | 0.00 |
| 1395 | 1.2142 | 0.0007 | 30.492 | 52890.552 | 295.21 | (264.72) | 0.00 |
| 1400 | 1.2148 | 0.0006 | 26.136 | 52916.688 | 295.21 | (269.07) | 0.00 |
| 1405 | 1.2155 | 0.0007 | 30.492 | 52947.18 | 295.21 | (264.72) | 0.00 |
| 1410 | 1.2162 | 0.0007 | 30.492 | 52977.672 | 295.21 | (264.72) | 0.00 |
| 1415 | 1.2168 | 0.0006 | 26.136 | 53003.808 | 295.21 | (269.07) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 1420 | 1.2175 | 0.0007 | 30.492 | 53034.3 | 295.21 | (264.72) | 0.00 |
| 1425 | 1.2181 | 0.0006 | 26.136 | 53060.436 | 295.21 | (269.07) | 0.00 |
| 1430 | 1.2188 | 0.0007 | 30.492 | 53090.928 | 295.21 | (264.72) | 0.00 |
| 1435 | 1.2195 | 0.0007 | 30.492 | 53121.42 | 295.21 | (264.72) | 0.00 |
| 1440 | 1.2201 | 0.0006 | 26.136 | 53147.556 | 295.21 | (269.07) | 0.00 |
| 1445 | 1.2203 | 0.0002 | 8.712 | 53156.268 | 295.21 | (286.50) | 0.00 |
| 1450 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1455 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1460 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1465 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1470 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1475 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1480 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1485 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1490 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1495 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1500 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1505 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1510 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1515 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1520 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1525 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1530 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1535 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1540 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1545 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1550 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1555 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |
| 1560 | | | | 53156.268 | 295.21 | (295.21) | 0.00 |

BASIN ROUTING

100-YEAR-1-HOUR EXISTING HYDROGRAPH

PROJECT: VIA FLORENCIA

EXISTING DEPRESSION

PROJECT NO. 21091

DATE: 2/9/2022

BASIN EMPTY IN2.3 HRS

AVERAGE BASIN AREA FOR INFILTRATION=

INFILTRATION RATE (IN/HR)=5

INFILTRATION RATE (CU-FT/SEC)3.38819

1-hour=60min

Area for Inf(sf):29274

1HR PEAK STORAGE=14760CF

PEAK RUNOFF IN 1.0HR

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 5 | 0.0151 | 0.0151 | 657.756 | 657.756 | 1016.46 | (358.70) | 0.00 |
| 10 | 0.0377 | 0.0226 | 984.456 | 1642.212 | 1016.46 | (32.00) | 0.00 |
| 15 | 0.0621 | 0.0244 | 1062.864 | 2705.076 | 1016.46 | 46.41 | 46.41 |
| 20 | 0.0879 | 0.0258 | 1123.848 | 3828.924 | 1016.46 | 107.39 | 153.80 |
| 25 | 0.1161 | 0.0282 | 1228.392 | 5057.316 | 1016.46 | 211.93 | 365.73 |
| 30 | 0.1481 | 0.032 | 1393.92 | 6451.236 | 1016.46 | 377.46 | 743.19 |
| 35 | 0.1851 | 0.037 | 1611.72 | 8062.956 | 1016.46 | 595.26 | 1338.45 |
| 40 | 0.2322 | 0.0471 | 2051.676 | 10114.632 | 1016.46 | 1035.22 | 2373.67 |
| 45 | 0.3081 | 0.0759 | 3306.204 | 13420.836 | 1016.46 | 2289.75 | 4663.42 |
| 50 | 0.5038 | 0.1957 | 8524.692 | 21945.528 | 1016.46 | 7508.23 | 12171.65 |
| 55 | 0.5849 | 0.0811 | 3532.716 | 25478.244 | 1016.46 | 2516.26 | 14687.91 |
| 60 | 0.6099 | 0.025 | 1089 | 26567.244 | 1016.46 | 72.54 | 14760.45 |
| 65 | 0.6144 | 0.0045 | 196.02 | 26763.264 | 1016.46 | (820.44) | 13940.01 |
| 70 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 12923.55 |
| 75 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 11907.09 |
| 80 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 10890.64 |
| 85 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 9874.18 |
| 90 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 8857.72 |
| 95 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 7841.26 |
| 100 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 6824.80 |
| 105 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 5808.34 |
| 110 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 4791.89 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 115 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 3775.43 |
| 120 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 2758.97 |
| 125 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 1742.51 |
| 130 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 726.05 |
| 135 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 140 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 145 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 150 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 155 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 160 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 165 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 170 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 175 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 180 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 185 | | | 0 | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 190 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 195 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 200 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 205 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 210 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 215 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 220 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 225 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 230 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 235 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 240 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 245 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 250 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |
| 255 | | | | 26763.264 | 1016.46 | (1016.46) | 0.00 |

BASIN ROUTING PROJECT: VIA FLORENCIA
100-YEAR-3-HOUR EXISTING HYDROGRAPH

PROJECT NO. 21091
EXISTING DEPRESSION

DATE: 2/10/2022

AVERAGE BASIN AREA FOR INFILTRATION=
 INFILTRATION RATE (IN/HR)= 5
 INFILTRATION RATE (CU-FT/SEC) 3.38819

BASIN EMPTY IN 4.0 HRS
 3-hours=180min
 Area for Inf(sf): 29274
 3HR PEAK STORAGE= 12595CF
 PEAK RUNOFF IN 2.8 HRS

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 5 | 0.0022 | 0.0022 | 95.832 | 95.832 | 1016.46 | (920.63) | 0.00 |
| 10 | 0.0064 | 0.0042 | 182.952 | 278.784 | 1016.46 | (833.51) | 0.00 |
| 15 | 0.0098 | 0.0034 | 148.104 | 426.888 | 1016.46 | (868.35) | 0.00 |
| 20 | 0.0145 | 0.0047 | 204.732 | 631.62 | 1016.46 | (811.73) | 0.00 |
| 25 | 0.0213 | 0.0068 | 296.208 | 927.828 | 1016.46 | (720.25) | 0.00 |
| 30 | 0.0303 | 0.009 | 392.04 | 1319.868 | 1016.46 | (624.42) | 0.00 |
| 35 | 0.0392 | 0.0089 | 387.684 | 1707.552 | 1016.46 | (628.77) | 0.00 |
| 40 | 0.0486 | 0.0094 | 409.464 | 2117.016 | 1016.46 | (606.99) | 0.00 |
| 45 | 0.0594 | 0.0108 | 470.448 | 2587.464 | 1016.46 | (546.01) | 0.00 |
| 50 | 0.0686 | 0.0092 | 400.752 | 2988.216 | 1016.46 | (615.71) | 0.00 |
| 55 | 0.0768 | 0.0082 | 357.192 | 3345.408 | 1016.46 | (659.27) | 0.00 |
| 60 | 0.0865 | 0.0097 | 422.532 | 3767.94 | 1016.46 | (593.93) | 0.00 |
| 65 | 0.0998 | 0.0133 | 579.348 | 4347.288 | 1016.46 | (437.11) | 0.00 |
| 70 | 0.1155 | 0.0157 | 683.892 | 5031.18 | 1016.46 | (332.57) | 0.00 |
| 75 | 0.1316 | 0.0161 | 701.316 | 5732.496 | 1016.46 | (315.14) | 0.00 |
| 80 | 0.1467 | 0.0151 | 657.756 | 6390.252 | 1016.46 | (358.70) | 0.00 |
| 85 | 0.1642 | 0.0175 | 762.3 | 7152.552 | 1016.46 | (254.16) | 0.00 |
| 90 | 0.1855 | 0.0213 | 927.828 | 8080.38 | 1016.46 | (88.63) | 0.00 |
| 95 | 0.2061 | 0.0206 | 897.336 | 8977.716 | 1016.46 | (119.12) | 0.00 |
| 100 | 0.2271 | 0.021 | 914.76 | 9892.476 | 1016.46 | (101.70) | 0.00 |
| 105 | 0.2531 | 0.026 | 1132.56 | 11025.036 | 1016.46 | 116.10 | 116.10 |
| 110 | 0.2815 | 0.0284 | 1237.104 | 12262.14 | 1016.46 | 220.65 | 336.75 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 115 | 0.3082 | 0.0267 | 1163.052 | 13425.192 | 1016.46 | 146.59 | 483.34 |
| 120 | 0.3344 | 0.0262 | 1141.272 | 14566.464 | 1016.46 | 124.81 | 608.15 |
| 125 | 0.3615 | 0.0271 | 1180.476 | 15746.94 | 1016.46 | 164.02 | 772.17 |
| 130 | 0.3958 | 0.0343 | 1494.108 | 17241.048 | 1016.46 | 477.65 | 1249.82 |
| 135 | 0.4412 | 0.0454 | 1977.624 | 19218.672 | 1016.46 | 961.17 | 2210.99 |
| 140 | 0.4832 | 0.042 | 1829.52 | 21048.192 | 1016.46 | 813.06 | 3024.05 |
| 145 | 0.5377 | 0.0545 | 2374.02 | 23422.212 | 1016.46 | 1357.56 | 4381.61 |
| 150 | 0.6125 | 0.0748 | 3258.288 | 26680.5 | 1016.46 | 2241.83 | 6623.44 |
| 155 | 0.6983 | 0.0858 | 3737.448 | 30417.948 | 1016.46 | 2720.99 | 9344.43 |
| 160 | 0.7767 | 0.0784 | 3415.104 | 33833.052 | 1016.46 | 2398.65 | 11743.08 |
| 165 | 0.8196 | 0.0429 | 1868.724 | 35701.776 | 1016.46 | 852.27 | 12595.34 |
| 170 | 0.8376 | 0.018 | 784.08 | 36485.856 | 1016.46 | (232.38) | 12362.96 |
| 175 | 0.85 | 0.0124 | 540.144 | 37026 | 1016.46 | (476.31) | 11886.65 |
| 180 | 0.8564 | 0.0064 | 278.784 | 37304.784 | 1016.46 | (737.67) | 11148.97 |
| 185 | 0.8578 | 0.0014 | 60.984 | 37365.768 | 1016.46 | (955.47) | 10193.50 |
| 190 | 0.8581 | 0.0003 | 13.068 | 37378.836 | 1016.46 | (1003.39) | 9190.11 |
| 195 | 0.8581 | 0 | 0 | 37378.836 | 1016.46 | (1016.46) | 8173.65 |
| 200 | | | | 37378.836 | 1016.46 | (1016.46) | 7157.19 |
| 205 | | | | 37378.836 | 1016.46 | (1016.46) | 6140.74 |
| 210 | | | | 37378.836 | 1016.46 | (1016.46) | 5124.28 |
| 215 | | | | 37378.836 | 1016.46 | (1016.46) | 4107.82 |
| 220 | | | | 37378.836 | 1016.46 | (1016.46) | 3091.36 |
| 225 | | | | 37378.836 | 1016.46 | (1016.46) | 2074.90 |
| 230 | | | | 37378.836 | 1016.46 | (1016.46) | 1058.44 |
| 235 | | | | 37378.836 | 1016.46 | (1016.46) | 41.98 |
| 240 | | | | 37378.836 | 1016.46 | (1016.46) | 0.00 |
| 245 | | | | 37378.836 | 1016.46 | (1016.46) | 0.00 |
| 250 | | | | 37378.836 | 1016.46 | (1016.46) | 0.00 |
| 255 | | | | 37378.836 | 1016.46 | (1016.46) | 0.00 |

BASIN ROUTING PROJECT: VIA FLORENCIA
100-YEAR-6-HOUR EXISTING HYDROGRAPH

PROJECT NO. 21091
EXISTING DEPRESSION

DATE: 2/10/2022

AVERAGE BASIN AREA FOR INFILTRATION=
 INFILTRATION RATE (IN/HR)= 5
 INFILTRATION RATE (CU-FT/SEC) 3.38819

BASINS EMPTY IN 6.6 HRS
 6-hours=360min
 Area for Inf(sf): 29274
 6HR PEAK STORAGE= 10274CF
 PEAK RUNOFF IN 5.6 HRS

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 5 | 0.0004 | 0.0004 | 17.424 | 17.424 | 1016.46 | (999.03) | 0.00 |
| 10 | 0.0012 | 0.0008 | 34.848 | 52.272 | 1016.46 | (981.61) | 0.00 |
| 15 | 0.0022 | 0.001 | 43.56 | 95.832 | 1016.46 | (972.90) | 0.00 |
| 20 | 0.0032 | 0.001 | 43.56 | 139.392 | 1016.46 | (972.90) | 0.00 |
| 25 | 0.0042 | 0.001 | 43.56 | 182.952 | 1016.46 | (972.90) | 0.00 |
| 30 | 0.0053 | 0.0011 | 47.916 | 230.868 | 1016.46 | (968.54) | 0.00 |
| 35 | 0.0065 | 0.0012 | 52.272 | 283.14 | 1016.46 | (964.19) | 0.00 |
| 40 | 0.0077 | 0.0012 | 52.272 | 335.412 | 1016.46 | (964.19) | 0.00 |
| 45 | 0.0089 | 0.0012 | 52.272 | 387.684 | 1016.46 | (964.19) | 0.00 |
| 50 | 0.0101 | 0.0012 | 52.272 | 439.956 | 1016.46 | (964.19) | 0.00 |
| 55 | 0.0112 | 0.0011 | 47.916 | 487.872 | 1016.46 | (968.54) | 0.00 |
| 60 | 0.0126 | 0.0014 | 60.984 | 548.856 | 1016.46 | (955.47) | 0.00 |
| 65 | 0.014 | 0.0014 | 60.984 | 609.84 | 1016.46 | (955.47) | 0.00 |
| 70 | 0.0155 | 0.0015 | 65.34 | 675.18 | 1016.46 | (951.12) | 0.00 |
| 75 | 0.017 | 0.0015 | 65.34 | 740.52 | 1016.46 | (951.12) | 0.00 |
| 80 | 0.0185 | 0.0015 | 65.34 | 805.86 | 1016.46 | (951.12) | 0.00 |
| 85 | 0.0199 | 0.0014 | 60.984 | 866.844 | 1016.46 | (955.47) | 0.00 |
| 90 | 0.0214 | 0.0015 | 65.34 | 932.184 | 1016.46 | (951.12) | 0.00 |
| 95 | 0.0229 | 0.0015 | 65.34 | 997.524 | 1016.46 | (951.12) | 0.00 |
| 100 | 0.0244 | 0.0015 | 65.34 | 1062.864 | 1016.46 | (951.12) | 0.00 |
| 105 | 0.0259 | 0.0015 | 65.34 | 1128.204 | 1016.46 | (951.12) | 0.00 |
| 110 | 0.0274 | 0.0015 | 65.34 | 1193.544 | 1016.46 | (951.12) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 115 | 0.0288 | 0.0014 | 60.984 | 1254.528 | 1016.46 | (955.47) | 0.00 |
| 120 | 0.0311 | 0.0023 | 100.188 | 1354.716 | 1016.46 | (916.27) | 0.00 |
| 125 | 0.0333 | 0.0022 | 95.832 | 1450.548 | 1016.46 | (920.63) | 0.00 |
| 130 | 0.0357 | 0.0024 | 104.544 | 1555.092 | 1016.46 | (911.91) | 0.00 |
| 135 | 0.0388 | 0.0031 | 135.036 | 1690.128 | 1016.46 | (881.42) | 0.00 |
| 140 | 0.0419 | 0.0031 | 135.036 | 1825.164 | 1016.46 | (881.42) | 0.00 |
| 145 | 0.0451 | 0.0032 | 139.392 | 1964.556 | 1016.46 | (877.07) | 0.00 |
| 150 | 0.0483 | 0.0032 | 139.392 | 2103.948 | 1016.46 | (877.07) | 0.00 |
| 155 | 0.0514 | 0.0031 | 135.036 | 2238.984 | 1016.46 | (881.42) | 0.00 |
| 160 | 0.0546 | 0.0032 | 139.392 | 2378.376 | 1016.46 | (877.07) | 0.00 |
| 165 | 0.0586 | 0.004 | 174.24 | 2552.616 | 1016.46 | (842.22) | 0.00 |
| 170 | 0.0633 | 0.0047 | 204.732 | 2757.348 | 1016.46 | (811.73) | 0.00 |
| 175 | 0.0681 | 0.0048 | 209.088 | 2966.436 | 1016.46 | (807.37) | 0.00 |
| 180 | 0.073 | 0.0049 | 213.444 | 3179.88 | 1016.46 | (803.01) | 0.00 |
| 185 | 0.0778 | 0.0048 | 209.088 | 3388.968 | 1016.46 | (807.37) | 0.00 |
| 190 | 0.0835 | 0.0057 | 248.292 | 3637.26 | 1016.46 | (768.17) | 0.00 |
| 195 | 0.0899 | 0.0064 | 278.784 | 3916.044 | 1016.46 | (737.67) | 0.00 |
| 200 | 0.0964 | 0.0065 | 283.14 | 4199.184 | 1016.46 | (733.32) | 0.00 |
| 205 | 0.1038 | 0.0074 | 322.344 | 4521.528 | 1016.46 | (694.11) | 0.00 |
| 210 | 0.1127 | 0.0089 | 387.684 | 4909.212 | 1016.46 | (628.77) | 0.00 |
| 215 | 0.1232 | 0.0105 | 457.38 | 5366.592 | 1016.46 | (559.08) | 0.00 |
| 220 | 0.1346 | 0.0114 | 496.584 | 5863.176 | 1016.46 | (519.87) | 0.00 |
| 225 | 0.147 | 0.0124 | 540.144 | 6403.32 | 1016.46 | (476.31) | 0.00 |
| 230 | 0.1602 | 0.0132 | 574.992 | 6978.312 | 1016.46 | (441.47) | 0.00 |
| 235 | 0.1743 | 0.0141 | 614.196 | 7592.508 | 1016.46 | (402.26) | 0.00 |
| 240 | 0.1891 | 0.0148 | 644.688 | 8237.196 | 1016.46 | (371.77) | 0.00 |
| 245 | 0.2049 | 0.0158 | 688.248 | 8925.444 | 1016.46 | (328.21) | 0.00 |
| 250 | 0.2223 | 0.0174 | 757.944 | 9683.388 | 1016.46 | (258.51) | 0.00 |
| 255 | 0.2413 | 0.019 | 827.64 | 10511.028 | 1016.46 | (188.82) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 260 | 0.262 | 0.0207 | 901.692 | 11412.72 | 1016.46 | (114.77) | 0.00 |
| 265 | 0.2844 | 0.0224 | 975.744 | 12388.464 | 1016.46 | (40.71) | 0.00 |
| 270 | 0.3076 | 0.0232 | 1010.592 | 13399.056 | 1016.46 | (5.87) | 0.00 |
| 275 | 0.3319 | 0.0243 | 1058.508 | 14457.564 | 1016.46 | 42.05 | 42.05 |
| 280 | 0.3577 | 0.0258 | 1123.848 | 15581.412 | 1016.46 | 107.39 | 149.44 |
| 285 | 0.3852 | 0.0275 | 1197.9 | 16779.312 | 1016.46 | 181.44 | 330.88 |
| 290 | 0.4135 | 0.0283 | 1232.748 | 18012.06 | 1016.46 | 216.29 | 547.17 |
| 295 | 0.4429 | 0.0294 | 1280.664 | 19292.724 | 1016.46 | 264.21 | 811.38 |
| 300 | 0.4737 | 0.0308 | 1341.648 | 20634.372 | 1016.46 | 325.19 | 1136.57 |
| 305 | 0.5095 | 0.0358 | 1559.448 | 22193.82 | 1016.46 | 542.99 | 1679.56 |
| 310 | 0.553 | 0.0435 | 1894.86 | 24088.68 | 1016.46 | 878.40 | 2557.96 |
| 315 | 0.6032 | 0.0502 | 2186.712 | 26275.392 | 1016.46 | 1170.25 | 3728.21 |
| 320 | 0.6589 | 0.0557 | 2426.292 | 28701.684 | 1016.46 | 1409.83 | 5138.04 |
| 325 | 0.7213 | 0.0624 | 2718.144 | 31419.828 | 1016.46 | 1701.69 | 6839.73 |
| 330 | 0.795 | 0.0737 | 3210.372 | 34630.2 | 1016.46 | 2193.91 | 9033.64 |
| 335 | 0.8468 | 0.0518 | 2256.408 | 36886.608 | 1016.46 | 1239.95 | 10273.59 |
| 340 | 0.8646 | 0.0178 | 775.368 | 37661.976 | 1016.46 | (241.09) | 10032.50 |
| 345 | 0.8698 | 0.0052 | 226.512 | 37888.488 | 1016.46 | (789.95) | 9242.56 |
| 350 | 0.8713 | 0.0015 | 65.34 | 37953.828 | 1016.46 | (951.12) | 8291.44 |
| 355 | 0.8721 | 0.0008 | 34.848 | 37988.676 | 1016.46 | (981.61) | 7309.83 |
| 360 | 0.8725 | 0.0004 | 17.424 | 38006.1 | 1016.46 | (999.03) | 6310.79 |
| 365 | 0.8727 | 0.0002 | 8.712 | 38014.812 | 1016.46 | (1007.75) | 5303.05 |
| 370 | 0.8728 | 1E-04 | 4.356 | 38019.168 | 1016.46 | (1012.10) | 4290.95 |
| 375 | 0.8728 | 0 | 0 | 38019.168 | 1016.46 | (1016.46) | 3274.49 |
| 380 | | | | 38019.168 | 1016.46 | (1016.46) | 2258.03 |
| 385 | | | | 38019.168 | 1016.46 | (1016.46) | 1241.57 |
| 390 | | | | 38019.168 | 1016.46 | (1016.46) | 225.11 |
| 395 | | | | 38019.168 | 1016.46 | (1016.46) | 0.00 |
| 400 | | | | 38019.168 | 1016.46 | (1016.46) | 0.00 |

BASIN ROUTING**PROJECT: VIA FLORENCIA****PROJECT NO. 21091****DATE:****2/10/2022****100-YEAR-24-HOUR EXISTING HYDROGRAPH****EXISTING DEPRESSION**

BASINS EMPTY IN 0.0 HRS

AVERAGE BASIN AREA FOR INFILTRATION=

24-hours=1440min

INFILTRATION RATE (IN/HR)= 5

Area for Inf(sf): 29274

INFILTRATION RATE (CU-FT/SEC) 3.38819

24 HR PEAK STORAGE= 0

PEAK RUNOFF IN 0.0 HRS

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 5 | 0.0001 | 0.0001 | 4.356 | 4.356 | 1016.46 | (1012.10) | 0.00 |
| 10 | 0.0002 | 0.0001 | 4.356 | 8.712 | 1016.46 | (1012.10) | 0.00 |
| 15 | 0.0004 | 0.0002 | 8.712 | 17.424 | 1016.46 | (1007.75) | 0.00 |
| 20 | 0.0006 | 0.0002 | 8.712 | 26.136 | 1016.46 | (1007.75) | 0.00 |
| 25 | 0.0009 | 0.0003 | 13.068 | 39.204 | 1016.46 | (1003.39) | 0.00 |
| 30 | 0.0011 | 0.0002 | 8.712 | 47.916 | 1016.46 | (1007.75) | 0.00 |
| 35 | 0.0014 | 0.0003 | 13.068 | 60.984 | 1016.46 | (1003.39) | 0.00 |
| 40 | 0.0016 | 0.0002 | 8.712 | 69.696 | 1016.46 | (1007.75) | 0.00 |
| 45 | 0.0019 | 0.0003 | 13.068 | 82.764 | 1016.46 | (1003.39) | 0.00 |
| 50 | 0.0022 | 0.0003 | 13.068 | 95.832 | 1016.46 | (1003.39) | 0.00 |
| 55 | 0.0025 | 0.0003 | 13.068 | 108.9 | 1016.46 | (1003.39) | 0.00 |
| 60 | 0.0028 | 0.0003 | 13.068 | 121.968 | 1016.46 | (1003.39) | 0.00 |
| 65 | 0.0031 | 0.0003 | 13.068 | 135.036 | 1016.46 | (1003.39) | 0.00 |
| 70 | 0.0034 | 0.0003 | 13.068 | 148.104 | 1016.46 | (1003.39) | 0.00 |
| 75 | 0.0037 | 0.0003 | 13.068 | 161.172 | 1016.46 | (1003.39) | 0.00 |
| 80 | 0.0039 | 0.0002 | 8.712 | 169.884 | 1016.46 | (1007.75) | 0.00 |
| 85 | 0.0042 | 0.0003 | 13.068 | 182.952 | 1016.46 | (1003.39) | 0.00 |
| 90 | 0.0044 | 0.0002 | 8.712 | 191.664 | 1016.46 | (1007.75) | 0.00 |
| 95 | 0.0047 | 0.0003 | 13.068 | 204.732 | 1016.46 | (1003.39) | 0.00 |
| 100 | 0.005 | 0.0003 | 13.068 | 217.8 | 1016.46 | (1003.39) | 0.00 |
| 105 | 0.0052 | 0.0002 | 8.712 | 226.512 | 1016.46 | (1007.75) | 0.00 |
| 110 | 0.0055 | 0.0003 | 13.068 | 239.58 | 1016.46 | (1003.39) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 115 | 0.0058 | 0.0003 | 13.068 | 252.648 | 1016.46 | (1003.39) | 0.00 |
| 120 | 0.0062 | 0.0004 | 17.424 | 270.072 | 1016.46 | (999.03) | 0.00 |
| 125 | 0.0065 | 0.0003 | 13.068 | 283.14 | 1016.46 | (1003.39) | 0.00 |
| 130 | 0.0069 | 0.0004 | 17.424 | 300.564 | 1016.46 | (999.03) | 0.00 |
| 135 | 0.0072 | 0.0003 | 13.068 | 313.632 | 1016.46 | (1003.39) | 0.00 |
| 140 | 0.0075 | 0.0003 | 13.068 | 326.7 | 1016.46 | (1003.39) | 0.00 |
| 145 | 0.0079 | 0.0004 | 17.424 | 344.124 | 1016.46 | (999.03) | 0.00 |
| 150 | 0.0082 | 0.0003 | 13.068 | 357.192 | 1016.46 | (1003.39) | 0.00 |
| 155 | 0.0086 | 0.0004 | 17.424 | 374.616 | 1016.46 | (999.03) | 0.00 |
| 160 | 0.009 | 0.0004 | 17.424 | 392.04 | 1016.46 | (999.03) | 0.00 |
| 165 | 0.0094 | 0.0004 | 17.424 | 409.464 | 1016.46 | (999.03) | 0.00 |
| 170 | 0.0099 | 0.0005 | 21.78 | 431.244 | 1016.46 | (994.68) | 0.00 |
| 175 | 0.0103 | 0.0004 | 17.424 | 448.668 | 1016.46 | (999.03) | 0.00 |
| 180 | 0.0107 | 0.0004 | 17.424 | 466.092 | 1016.46 | (999.03) | 0.00 |
| 185 | 0.0111 | 0.0004 | 17.424 | 483.516 | 1016.46 | (999.03) | 0.00 |
| 190 | 0.0116 | 0.0005 | 21.78 | 505.296 | 1016.46 | (994.68) | 0.00 |
| 195 | 0.012 | 0.0004 | 17.424 | 522.72 | 1016.46 | (999.03) | 0.00 |
| 200 | 0.0124 | 0.0004 | 17.424 | 540.144 | 1016.46 | (999.03) | 0.00 |
| 205 | 0.0129 | 0.0005 | 21.78 | 561.924 | 1016.46 | (994.68) | 0.00 |
| 210 | 0.0133 | 0.0004 | 17.424 | 579.348 | 1016.46 | (999.03) | 0.00 |
| 215 | 0.0137 | 0.0004 | 17.424 | 596.772 | 1016.46 | (999.03) | 0.00 |
| 220 | 0.0141 | 0.0004 | 17.424 | 614.196 | 1016.46 | (999.03) | 0.00 |
| 225 | 0.0146 | 0.0005 | 21.78 | 635.976 | 1016.46 | (994.68) | 0.00 |
| 230 | 0.015 | 0.0004 | 17.424 | 653.4 | 1016.46 | (999.03) | 0.00 |
| 235 | 0.0155 | 0.0005 | 21.78 | 675.18 | 1016.46 | (994.68) | 0.00 |
| 240 | 0.016 | 0.0005 | 21.78 | 696.96 | 1016.46 | (994.68) | 0.00 |
| 245 | 0.0166 | 0.0006 | 26.136 | 723.096 | 1016.46 | (990.32) | 0.00 |
| 250 | 0.0171 | 0.0005 | 21.78 | 744.876 | 1016.46 | (994.68) | 0.00 |
| 255 | 0.0176 | 0.0005 | 21.78 | 766.656 | 1016.46 | (994.68) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 260 | 0.0181 | 0.0005 | 21.78 | 788.436 | 1016.46 | (994.68) | 0.00 |
| 265 | 0.0187 | 0.0006 | 26.136 | 814.572 | 1016.46 | (990.32) | 0.00 |
| 270 | 0.0193 | 0.0006 | 26.136 | 840.708 | 1016.46 | (990.32) | 0.00 |
| 275 | 0.0199 | 0.0006 | 26.136 | 866.844 | 1016.46 | (990.32) | 0.00 |
| 280 | 0.0205 | 0.0006 | 26.136 | 892.98 | 1016.46 | (990.32) | 0.00 |
| 285 | 0.0211 | 0.0006 | 26.136 | 919.116 | 1016.46 | (990.32) | 0.00 |
| 290 | 0.0217 | 0.0006 | 26.136 | 945.252 | 1016.46 | (990.32) | 0.00 |
| 295 | 0.0224 | 0.0007 | 30.492 | 975.744 | 1016.46 | (985.97) | 0.00 |
| 300 | 0.0231 | 0.0007 | 30.492 | 1006.236 | 1016.46 | (985.97) | 0.00 |
| 305 | 0.0237 | 0.0006 | 26.136 | 1032.372 | 1016.46 | (990.32) | 0.00 |
| 310 | 0.0242 | 0.0005 | 21.78 | 1054.152 | 1016.46 | (994.68) | 0.00 |
| 315 | 0.0247 | 0.0005 | 21.78 | 1075.932 | 1016.46 | (994.68) | 0.00 |
| 320 | 0.0253 | 0.0006 | 26.136 | 1102.068 | 1016.46 | (990.32) | 0.00 |
| 325 | 0.0259 | 0.0006 | 26.136 | 1128.204 | 1016.46 | (990.32) | 0.00 |
| 330 | 0.0265 | 0.0006 | 26.136 | 1154.34 | 1016.46 | (990.32) | 0.00 |
| 335 | 0.0271 | 0.0006 | 26.136 | 1180.476 | 1016.46 | (990.32) | 0.00 |
| 340 | 0.0278 | 0.0007 | 30.492 | 1210.968 | 1016.46 | (985.97) | 0.00 |
| 345 | 0.0285 | 0.0007 | 30.492 | 1241.46 | 1016.46 | (985.97) | 0.00 |
| 350 | 0.0291 | 0.0006 | 26.136 | 1267.596 | 1016.46 | (990.32) | 0.00 |
| 355 | 0.0298 | 0.0007 | 30.492 | 1298.088 | 1016.46 | (985.97) | 0.00 |
| 360 | 0.0305 | 0.0007 | 30.492 | 1328.58 | 1016.46 | (985.97) | 0.00 |
| 365 | 0.0312 | 0.0007 | 30.492 | 1359.072 | 1016.46 | (985.97) | 0.00 |
| 370 | 0.032 | 0.0008 | 34.848 | 1393.92 | 1016.46 | (981.61) | 0.00 |
| 375 | 0.0328 | 0.0008 | 34.848 | 1428.768 | 1016.46 | (981.61) | 0.00 |
| 380 | 0.0335 | 0.0007 | 30.492 | 1459.26 | 1016.46 | (985.97) | 0.00 |
| 385 | 0.0343 | 0.0008 | 34.848 | 1494.108 | 1016.46 | (981.61) | 0.00 |
| 390 | 0.0351 | 0.0008 | 34.848 | 1528.956 | 1016.46 | (981.61) | 0.00 |
| 395 | 0.0359 | 0.0008 | 34.848 | 1563.804 | 1016.46 | (981.61) | 0.00 |
| 400 | 0.0367 | 0.0008 | 34.848 | 1598.652 | 1016.46 | (981.61) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 405 | 0.0376 | 0.0009 | 39.204 | 1637.856 | 1016.46 | (977.25) | 0.00 |
| 410 | 0.0384 | 0.0008 | 34.848 | 1672.704 | 1016.46 | (981.61) | 0.00 |
| 415 | 0.0393 | 0.0009 | 39.204 | 1711.908 | 1016.46 | (977.25) | 0.00 |
| 420 | 0.0401 | 0.0008 | 34.848 | 1746.756 | 1016.46 | (981.61) | 0.00 |
| 425 | 0.041 | 0.0009 | 39.204 | 1785.96 | 1016.46 | (977.25) | 0.00 |
| 430 | 0.0418 | 0.0008 | 34.848 | 1820.808 | 1016.46 | (981.61) | 0.00 |
| 435 | 0.0427 | 0.0009 | 39.204 | 1860.012 | 1016.46 | (977.25) | 0.00 |
| 440 | 0.0436 | 0.0009 | 39.204 | 1899.216 | 1016.46 | (977.25) | 0.00 |
| 445 | 0.0445 | 0.0009 | 39.204 | 1938.42 | 1016.46 | (977.25) | 0.00 |
| 450 | 0.0454 | 0.0009 | 39.204 | 1977.624 | 1016.46 | (977.25) | 0.00 |
| 455 | 0.0464 | 0.001 | 43.56 | 2021.184 | 1016.46 | (972.90) | 0.00 |
| 460 | 0.0474 | 0.001 | 43.56 | 2064.744 | 1016.46 | (972.90) | 0.00 |
| 465 | 0.0485 | 0.0011 | 47.916 | 2112.66 | 1016.46 | (968.54) | 0.00 |
| 470 | 0.0495 | 0.001 | 43.56 | 2156.22 | 1016.46 | (972.90) | 0.00 |
| 475 | 0.0506 | 0.0011 | 47.916 | 2204.136 | 1016.46 | (968.54) | 0.00 |
| 480 | 0.0517 | 0.0011 | 47.916 | 2252.052 | 1016.46 | (968.54) | 0.00 |
| 485 | 0.0529 | 0.0012 | 52.272 | 2304.324 | 1016.46 | (964.19) | 0.00 |
| 490 | 0.0542 | 0.0013 | 56.628 | 2360.952 | 1016.46 | (959.83) | 0.00 |
| 495 | 0.0554 | 0.0012 | 52.272 | 2413.224 | 1016.46 | (964.19) | 0.00 |
| 500 | 0.0567 | 0.0013 | 56.628 | 2469.852 | 1016.46 | (959.83) | 0.00 |
| 505 | 0.058 | 0.0013 | 56.628 | 2526.48 | 1016.46 | (959.83) | 0.00 |
| 510 | 0.0593 | 0.0013 | 56.628 | 2583.108 | 1016.46 | (959.83) | 0.00 |
| 515 | 0.0606 | 0.0013 | 56.628 | 2639.736 | 1016.46 | (959.83) | 0.00 |
| 520 | 0.062 | 0.0014 | 60.984 | 2700.72 | 1016.46 | (955.47) | 0.00 |
| 525 | 0.0633 | 0.0013 | 56.628 | 2757.348 | 1016.46 | (959.83) | 0.00 |
| 530 | 0.0647 | 0.0014 | 60.984 | 2818.332 | 1016.46 | (955.47) | 0.00 |
| 535 | 0.0662 | 0.0015 | 65.34 | 2883.672 | 1016.46 | (951.12) | 0.00 |
| 540 | 0.0676 | 0.0014 | 60.984 | 2944.656 | 1016.46 | (955.47) | 0.00 |
| 545 | 0.0697 | 0.0021 | 91.476 | 3036.132 | 1016.46 | (924.98) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 550 | 0.0724 | 0.0027 | 117.612 | 3153.744 | 1016.46 | (898.85) | 0.00 |
| 555 | 0.0752 | 0.0028 | 121.968 | 3275.712 | 1016.46 | (894.49) | 0.00 |
| 560 | 0.0785 | 0.0033 | 143.748 | 3419.46 | 1016.46 | (872.71) | 0.00 |
| 565 | 0.0823 | 0.0038 | 165.528 | 3584.988 | 1016.46 | (850.93) | 0.00 |
| 570 | 0.0862 | 0.0039 | 169.884 | 3754.872 | 1016.46 | (846.57) | 0.00 |
| 575 | 0.0905 | 0.0043 | 187.308 | 3942.18 | 1016.46 | (829.15) | 0.00 |
| 580 | 0.0953 | 0.0048 | 209.088 | 4151.268 | 1016.46 | (807.37) | 0.00 |
| 585 | 0.1003 | 0.005 | 217.8 | 4369.068 | 1016.46 | (798.66) | 0.00 |
| 590 | 0.1057 | 0.0054 | 235.224 | 4604.292 | 1016.46 | (781.23) | 0.00 |
| 595 | 0.1115 | 0.0058 | 252.648 | 4856.94 | 1016.46 | (763.81) | 0.00 |
| 600 | 0.1175 | 0.006 | 261.36 | 5118.3 | 1016.46 | (755.10) | 0.00 |
| 605 | 0.1213 | 0.0038 | 165.528 | 5283.828 | 1016.46 | (850.93) | 0.00 |
| 610 | 0.123 | 0.0017 | 74.052 | 5357.88 | 1016.46 | (942.41) | 0.00 |
| 615 | 0.1244 | 0.0014 | 60.984 | 5418.864 | 1016.46 | (955.47) | 0.00 |
| 620 | 0.1257 | 0.0013 | 56.628 | 5475.492 | 1016.46 | (959.83) | 0.00 |
| 625 | 0.1269 | 0.0012 | 52.272 | 5527.764 | 1016.46 | (964.19) | 0.00 |
| 630 | 0.1282 | 0.0013 | 56.628 | 5584.392 | 1016.46 | (959.83) | 0.00 |
| 635 | 0.1311 | 0.0029 | 126.324 | 5710.716 | 1016.46 | (890.13) | 0.00 |
| 640 | 0.1356 | 0.0045 | 196.02 | 5906.736 | 1016.46 | (820.44) | 0.00 |
| 645 | 0.1403 | 0.0047 | 204.732 | 6111.468 | 1016.46 | (811.73) | 0.00 |
| 650 | 0.1452 | 0.0049 | 213.444 | 6324.912 | 1016.46 | (803.01) | 0.00 |
| 655 | 0.1501 | 0.0049 | 213.444 | 6538.356 | 1016.46 | (803.01) | 0.00 |
| 660 | 0.1551 | 0.005 | 217.8 | 6756.156 | 1016.46 | (798.66) | 0.00 |
| 665 | 0.1598 | 0.0047 | 204.732 | 6960.888 | 1016.46 | (811.73) | 0.00 |
| 670 | 0.1642 | 0.0044 | 191.664 | 7152.552 | 1016.46 | (824.79) | 0.00 |
| 675 | 0.1685 | 0.0043 | 187.308 | 7339.86 | 1016.46 | (829.15) | 0.00 |
| 680 | 0.1729 | 0.0044 | 191.664 | 7531.524 | 1016.46 | (824.79) | 0.00 |
| 685 | 0.1773 | 0.0044 | 191.664 | 7723.188 | 1016.46 | (824.79) | 0.00 |
| 690 | 0.1818 | 0.0045 | 196.02 | 7919.208 | 1016.46 | (820.44) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 695 | 0.1856 | 0.0038 | 165.528 | 8084.736 | 1016.46 | (850.93) | 0.00 |
| 700 | 0.1887 | 0.0031 | 135.036 | 8219.772 | 1016.46 | (881.42) | 0.00 |
| 705 | 0.1917 | 0.003 | 130.68 | 8350.452 | 1016.46 | (885.78) | 0.00 |
| 710 | 0.1951 | 0.0034 | 148.104 | 8498.556 | 1016.46 | (868.35) | 0.00 |
| 715 | 0.199 | 0.0039 | 169.884 | 8668.44 | 1016.46 | (846.57) | 0.00 |
| 720 | 0.203 | 0.004 | 174.24 | 8842.68 | 1016.46 | (842.22) | 0.00 |
| 725 | 0.2098 | 0.0068 | 296.208 | 9138.888 | 1016.46 | (720.25) | 0.00 |
| 730 | 0.2193 | 0.0095 | 413.82 | 9552.708 | 1016.46 | (602.64) | 0.00 |
| 735 | 0.2293 | 0.01 | 435.6 | 9988.308 | 1016.46 | (580.86) | 0.00 |
| 740 | 0.2399 | 0.0106 | 461.736 | 10450.044 | 1016.46 | (554.72) | 0.00 |
| 745 | 0.2509 | 0.011 | 479.16 | 10929.204 | 1016.46 | (537.30) | 0.00 |
| 750 | 0.2621 | 0.0112 | 487.872 | 11417.076 | 1016.46 | (528.59) | 0.00 |
| 755 | 0.2741 | 0.012 | 522.72 | 11939.796 | 1016.46 | (493.74) | 0.00 |
| 760 | 0.2869 | 0.0128 | 557.568 | 12497.364 | 1016.46 | (458.89) | 0.00 |
| 765 | 0.2999 | 0.013 | 566.28 | 13063.644 | 1016.46 | (450.18) | 0.00 |
| 770 | 0.3134 | 0.0135 | 588.06 | 13651.704 | 1016.46 | (428.40) | 0.00 |
| 775 | 0.3273 | 0.0139 | 605.484 | 14257.188 | 1016.46 | (410.97) | 0.00 |
| 780 | 0.3413 | 0.014 | 609.84 | 14867.028 | 1016.46 | (406.62) | 0.00 |
| 785 | 0.3574 | 0.0161 | 701.316 | 15568.344 | 1016.46 | (315.14) | 0.00 |
| 790 | 0.3754 | 0.018 | 784.08 | 16352.424 | 1016.46 | (232.38) | 0.00 |
| 795 | 0.3938 | 0.0184 | 801.504 | 17153.928 | 1016.46 | (214.95) | 0.00 |
| 800 | 0.4123 | 0.0185 | 805.86 | 17959.788 | 1016.46 | (210.60) | 0.00 |
| 805 | 0.4309 | 0.0186 | 810.216 | 18770.004 | 1016.46 | (206.24) | 0.00 |
| 810 | 0.4495 | 0.0186 | 810.216 | 19580.22 | 1016.46 | (206.24) | 0.00 |
| 815 | 0.4638 | 0.0143 | 622.908 | 20203.128 | 1016.46 | (393.55) | 0.00 |
| 820 | 0.474 | 0.0102 | 444.312 | 20647.44 | 1016.46 | (572.15) | 0.00 |
| 825 | 0.4836 | 0.0096 | 418.176 | 21065.616 | 1016.46 | (598.28) | 0.00 |
| 830 | 0.4931 | 0.0095 | 413.82 | 21479.436 | 1016.46 | (602.64) | 0.00 |
| 835 | 0.5026 | 0.0095 | 413.82 | 21893.256 | 1016.46 | (602.64) | 0.00 |

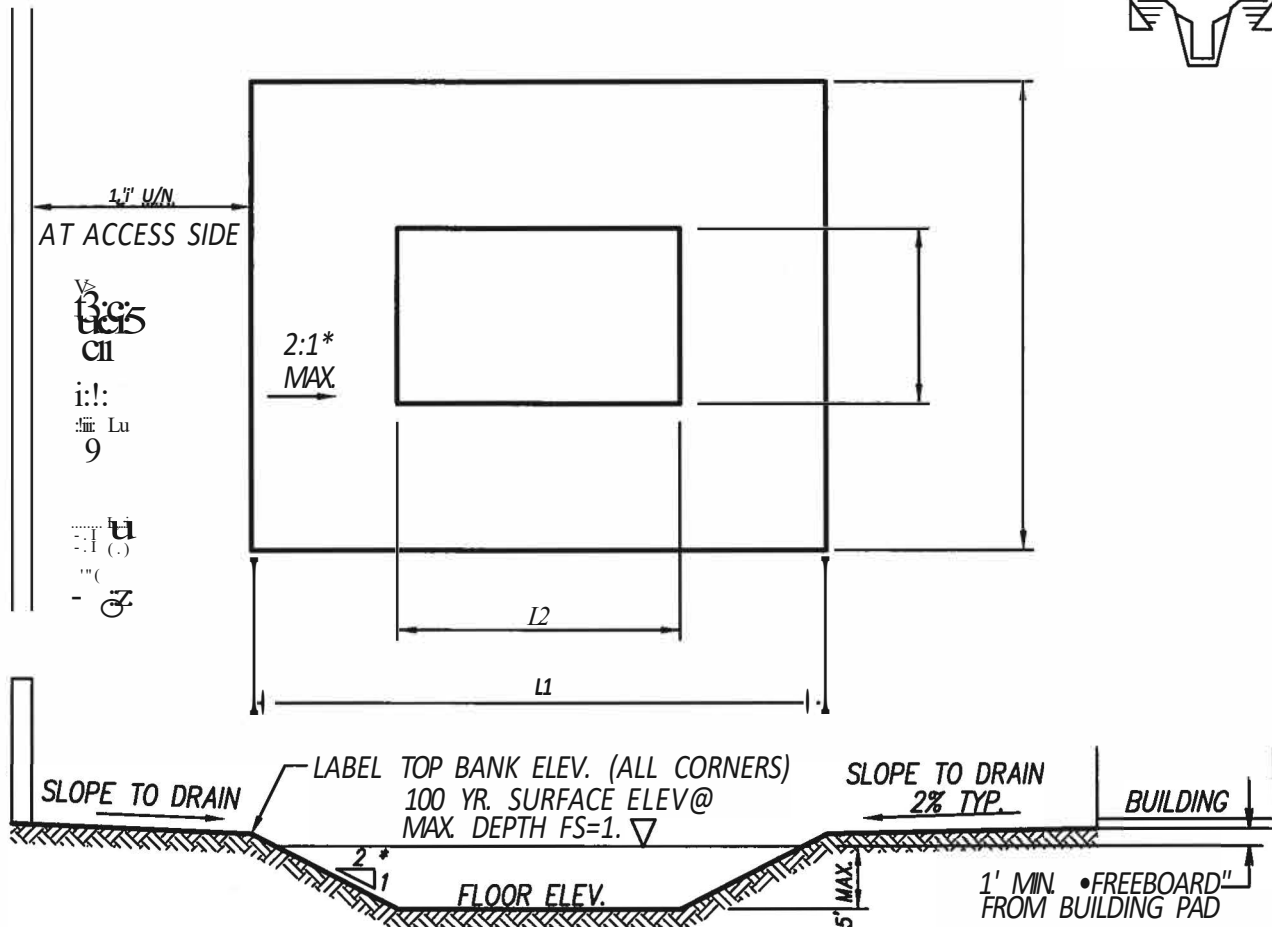
| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 840 | 0.5122 | 0.0096 | 418.176 | 22311.432 | 1016.46 | (598.28) | 0.00 |
| 845 | 0.5234 | 0.0112 | 487.872 | 22799.304 | 1016.46 | (528.59) | 0.00 |
| 850 | 0.5361 | 0.0127 | 553.212 | 23352.516 | 1016.46 | (463.25) | 0.00 |
| 855 | 0.5492 | 0.0131 | 570.636 | 23923.152 | 1016.46 | (445.82) | 0.00 |
| 860 | 0.5619 | 0.0127 | 553.212 | 24476.364 | 1016.46 | (463.25) | 0.00 |
| 865 | 0.5744 | 0.0125 | 544.5 | 25020.864 | 1016.46 | (471.96) | 0.00 |
| 870 | 0.5868 | 0.0124 | 540.144 | 25561.008 | 1016.46 | (476.31) | 0.00 |
| 875 | 0.5993 | 0.0125 | 544.5 | 26105.508 | 1016.46 | (471.96) | 0.00 |
| 880 | 0.6118 | 0.0125 | 544.5 | 26650.008 | 1016.46 | (471.96) | 0.00 |
| 885 | 0.6244 | 0.0126 | 548.856 | 27198.864 | 1016.46 | (467.60) | 0.00 |
| 890 | 0.6366 | 0.0122 | 531.432 | 27730.296 | 1016.46 | (485.03) | 0.00 |
| 895 | 0.6485 | 0.0119 | 518.364 | 28248.66 | 1016.46 | (498.09) | 0.00 |
| 900 | 0.6604 | 0.0119 | 518.364 | 28767.024 | 1016.46 | (498.09) | 0.00 |
| 905 | 0.6719 | 0.0115 | 500.94 | 29267.964 | 1016.46 | (515.52) | 0.00 |
| 910 | 0.6831 | 0.0112 | 487.872 | 29755.836 | 1016.46 | (528.59) | 0.00 |
| 915 | 0.6943 | 0.0112 | 487.872 | 30243.708 | 1016.46 | (528.59) | 0.00 |
| 920 | 0.7051 | 0.0108 | 470.448 | 30714.156 | 1016.46 | (546.01) | 0.00 |
| 925 | 0.7156 | 0.0105 | 457.38 | 31171.536 | 1016.46 | (559.08) | 0.00 |
| 930 | 0.7261 | 0.0105 | 457.38 | 31628.916 | 1016.46 | (559.08) | 0.00 |
| 935 | 0.735 | 0.0089 | 387.684 | 32016.6 | 1016.46 | (628.77) | 0.00 |
| 940 | 0.7424 | 0.0074 | 322.344 | 32338.944 | 1016.46 | (694.11) | 0.00 |
| 945 | 0.7497 | 0.0073 | 317.988 | 32656.932 | 1016.46 | (698.47) | 0.00 |
| 950 | 0.7569 | 0.0072 | 313.632 | 32970.564 | 1016.46 | (702.83) | 0.00 |
| 955 | 0.7642 | 0.0073 | 317.988 | 33288.552 | 1016.46 | (698.47) | 0.00 |
| 960 | 0.7715 | 0.0073 | 317.988 | 33606.54 | 1016.46 | (698.47) | 0.00 |
| 965 | 0.7755 | 0.004 | 174.24 | 33780.78 | 1016.46 | (842.22) | 0.00 |
| 970 | 0.7765 | 0.001 | 43.56 | 33824.34 | 1016.46 | (972.90) | 0.00 |
| 975 | 0.777 | 0.0005 | 21.78 | 33846.12 | 1016.46 | (994.68) | 0.00 |
| 980 | 0.7774 | 0.0004 | 17.424 | 33863.544 | 1016.46 | (999.03) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 985 | 0.7777 | 0.0003 | 13.068 | 33876.612 | 1016.46 | (1003.39) | 0.00 |
| 990 | 0.7781 | 0.0004 | 17.424 | 33894.036 | 1016.46 | (999.03) | 0.00 |
| 995 | 0.7784 | 0.0003 | 13.068 | 33907.104 | 1016.46 | (1003.39) | 0.00 |
| 1000 | 0.7786 | 0.0002 | 8.712 | 33915.816 | 1016.46 | (1007.75) | 0.00 |
| 1005 | 0.7789 | 0.0003 | 13.068 | 33928.884 | 1016.46 | (1003.39) | 0.00 |
| 1010 | 0.7791 | 0.0002 | 8.712 | 33937.596 | 1016.46 | (1007.75) | 0.00 |
| 1015 | 0.7794 | 0.0003 | 13.068 | 33950.664 | 1016.46 | (1003.39) | 0.00 |
| 1020 | 0.7797 | 0.0003 | 13.068 | 33963.732 | 1016.46 | (1003.39) | 0.00 |
| 1025 | 0.78 | 0.0003 | 13.068 | 33976.8 | 1016.46 | (1003.39) | 0.00 |
| 1030 | 0.7804 | 0.0004 | 17.424 | 33994.224 | 1016.46 | (999.03) | 0.00 |
| 1035 | 0.7808 | 0.0004 | 17.424 | 34011.648 | 1016.46 | (999.03) | 0.00 |
| 1040 | 0.7812 | 0.0004 | 17.424 | 34029.072 | 1016.46 | (999.03) | 0.00 |
| 1045 | 0.7817 | 0.0005 | 21.78 | 34050.852 | 1016.46 | (994.68) | 0.00 |
| 1050 | 0.7821 | 0.0004 | 17.424 | 34068.276 | 1016.46 | (999.03) | 0.00 |
| 1055 | 0.7825 | 0.0004 | 17.424 | 34085.7 | 1016.46 | (999.03) | 0.00 |
| 1060 | 0.783 | 0.0005 | 21.78 | 34107.48 | 1016.46 | (994.68) | 0.00 |
| 1065 | 0.7834 | 0.0004 | 17.424 | 34124.904 | 1016.46 | (999.03) | 0.00 |
| 1070 | 0.7838 | 0.0004 | 17.424 | 34142.328 | 1016.46 | (999.03) | 0.00 |
| 1075 | 0.7841 | 0.0003 | 13.068 | 34155.396 | 1016.46 | (1003.39) | 0.00 |
| 1080 | 0.7845 | 0.0004 | 17.424 | 34172.82 | 1016.46 | (999.03) | 0.00 |
| 1085 | 0.7848 | 0.0003 | 13.068 | 34185.888 | 1016.46 | (1003.39) | 0.00 |
| 1090 | 0.7851 | 0.0003 | 13.068 | 34198.956 | 1016.46 | (1003.39) | 0.00 |
| 1095 | 0.7855 | 0.0004 | 17.424 | 34216.38 | 1016.46 | (999.03) | 0.00 |
| 1100 | 0.7858 | 0.0003 | 13.068 | 34229.448 | 1016.46 | (1003.39) | 0.00 |
| 1105 | 0.7862 | 0.0004 | 17.424 | 34246.872 | 1016.46 | (999.03) | 0.00 |
| 1110 | 0.7865 | 0.0003 | 13.068 | 34259.94 | 1016.46 | (1003.39) | 0.00 |
| 1115 | 0.7868 | 0.0003 | 13.068 | 34273.008 | 1016.46 | (1003.39) | 0.00 |
| 1120 | 0.7871 | 0.0003 | 13.068 | 34286.076 | 1016.46 | (1003.39) | 0.00 |
| 1125 | 0.7873 | 0.0002 | 8.712 | 34294.788 | 1016.46 | (1007.75) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 1130 | 0.7875 | 0.0002 | 8.712 | 34303.5 | 1016.46 | (1007.75) | 0.00 |
| 1135 | 0.7877 | 0.0002 | 8.712 | 34312.212 | 1016.46 | (1007.75) | 0.00 |
| 1140 | 0.7879 | 0.0002 | 8.712 | 34320.924 | 1016.46 | (1007.75) | 0.00 |
| 1145 | 0.7881 | 0.0002 | 8.712 | 34329.636 | 1016.46 | (1007.75) | 0.00 |
| 1150 | 0.7884 | 0.0003 | 13.068 | 34342.704 | 1016.46 | (1003.39) | 0.00 |
| 1155 | 0.7886 | 0.0002 | 8.712 | 34351.416 | 1016.46 | (1007.75) | 0.00 |
| 1160 | 0.7889 | 0.0003 | 13.068 | 34364.484 | 1016.46 | (1003.39) | 0.00 |
| 1165 | 0.7892 | 0.0003 | 13.068 | 34377.552 | 1016.46 | (1003.39) | 0.00 |
| 1170 | 0.7896 | 0.0004 | 17.424 | 34394.976 | 1016.46 | (999.03) | 0.00 |
| 1175 | 0.7899 | 0.0003 | 13.068 | 34408.044 | 1016.46 | (1003.39) | 0.00 |
| 1180 | 0.7901 | 0.0002 | 8.712 | 34416.756 | 1016.46 | (1007.75) | 0.00 |
| 1185 | 0.7904 | 0.0003 | 13.068 | 34429.824 | 1016.46 | (1003.39) | 0.00 |
| 1190 | 0.7906 | 0.0002 | 8.712 | 34438.536 | 1016.46 | (1007.75) | 0.00 |
| 1195 | 0.7908 | 0.0002 | 8.712 | 34447.248 | 1016.46 | (1007.75) | 0.00 |
| 1200 | 0.791 | 0.0002 | 8.712 | 34455.96 | 1016.46 | (1007.75) | 0.00 |
| 1205 | 0.7912 | 0.0002 | 8.712 | 34464.672 | 1016.46 | (1007.75) | 0.00 |
| 1210 | 0.7914 | 0.0002 | 8.712 | 34473.384 | 1016.46 | (1007.75) | 0.00 |
| 1215 | 0.7917 | 0.0003 | 13.068 | 34486.452 | 1016.46 | (1003.39) | 0.00 |
| 1220 | 0.7919 | 0.0002 | 8.712 | 34495.164 | 1016.46 | (1007.75) | 0.00 |
| 1225 | 0.7922 | 0.0003 | 13.068 | 34508.232 | 1016.46 | (1003.39) | 0.00 |
| 1230 | 0.7924 | 0.0002 | 8.712 | 34516.944 | 1016.46 | (1007.75) | 0.00 |
| 1235 | 0.7927 | 0.0003 | 13.068 | 34530.012 | 1016.46 | (1003.39) | 0.00 |
| 1240 | 0.793 | 0.0003 | 13.068 | 34543.08 | 1016.46 | (1003.39) | 0.00 |
| 1245 | 0.7932 | 0.0002 | 8.712 | 34551.792 | 1016.46 | (1007.75) | 0.00 |
| 1250 | 0.7934 | 0.0002 | 8.712 | 34560.504 | 1016.46 | (1007.75) | 0.00 |
| 1255 | 0.7936 | 0.0002 | 8.712 | 34569.216 | 1016.46 | (1007.75) | 0.00 |
| 1260 | 0.7938 | 0.0002 | 8.712 | 34577.928 | 1016.46 | (1007.75) | 0.00 |
| 1265 | 0.794 | 0.0002 | 8.712 | 34586.64 | 1016.46 | (1007.75) | 0.00 |
| 1270 | 0.7942 | 0.0002 | 8.712 | 34595.352 | 1016.46 | (1007.75) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 1275 | 0.7945 | 0.0003 | 13.068 | 34608.42 | 1016.46 | (1003.39) | 0.00 |
| 1280 | 0.7947 | 0.0002 | 8.712 | 34617.132 | 1016.46 | (1007.75) | 0.00 |
| 1285 | 0.7949 | 0.0002 | 8.712 | 34625.844 | 1016.46 | (1007.75) | 0.00 |
| 1290 | 0.7951 | 0.0002 | 8.712 | 34634.556 | 1016.46 | (1007.75) | 0.00 |
| 1295 | 0.7953 | 0.0002 | 8.712 | 34643.268 | 1016.46 | (1007.75) | 0.00 |
| 1300 | 0.7955 | 0.0002 | 8.712 | 34651.98 | 1016.46 | (1007.75) | 0.00 |
| 1305 | 0.7958 | 0.0003 | 13.068 | 34665.048 | 1016.46 | (1003.39) | 0.00 |
| 1310 | 0.796 | 0.0002 | 8.712 | 34673.76 | 1016.46 | (1007.75) | 0.00 |
| 1315 | 0.7962 | 0.0002 | 8.712 | 34682.472 | 1016.46 | (1007.75) | 0.00 |
| 1320 | 0.7963 | 1E-04 | 4.356 | 34686.828 | 1016.46 | (1012.10) | 0.00 |
| 1325 | 0.7965 | 0.0002 | 8.712 | 34695.54 | 1016.46 | (1007.75) | 0.00 |
| 1330 | 0.7968 | 0.0003 | 13.068 | 34708.608 | 1016.46 | (1003.39) | 0.00 |
| 1335 | 0.797 | 0.0002 | 8.712 | 34717.32 | 1016.46 | (1007.75) | 0.00 |
| 1340 | 0.7973 | 0.0003 | 13.068 | 34730.388 | 1016.46 | (1003.39) | 0.00 |
| 1345 | 0.7974 | 1E-04 | 4.356 | 34734.744 | 1016.46 | (1012.10) | 0.00 |
| 1350 | 0.7976 | 0.0002 | 8.712 | 34743.456 | 1016.46 | (1007.75) | 0.00 |
| 1355 | 0.7978 | 0.0002 | 8.712 | 34752.168 | 1016.46 | (1007.75) | 0.00 |
| 1360 | 0.798 | 0.0002 | 8.712 | 34760.88 | 1016.46 | (1007.75) | 0.00 |
| 1365 | 0.7981 | 1E-04 | 4.356 | 34765.236 | 1016.46 | (1012.10) | 0.00 |
| 1370 | 0.7983 | 0.0002 | 8.712 | 34773.948 | 1016.46 | (1007.75) | 0.00 |
| 1375 | 0.7985 | 0.0002 | 8.712 | 34782.66 | 1016.46 | (1007.75) | 0.00 |
| 1380 | 0.7986 | 1E-04 | 4.356 | 34787.016 | 1016.46 | (1012.10) | 0.00 |
| 1385 | 0.7988 | 0.0002 | 8.712 | 34795.728 | 1016.46 | (1007.75) | 0.00 |
| 1390 | 0.799 | 0.0002 | 8.712 | 34804.44 | 1016.46 | (1007.75) | 0.00 |
| 1395 | 0.7991 | 1E-04 | 4.356 | 34808.796 | 1016.46 | (1012.10) | 0.00 |
| 1400 | 0.7993 | 0.0002 | 8.712 | 34817.508 | 1016.46 | (1007.75) | 0.00 |
| 1405 | 0.7995 | 0.0002 | 8.712 | 34826.22 | 1016.46 | (1007.75) | 0.00 |
| 1410 | 0.7997 | 0.0002 | 8.712 | 34834.932 | 1016.46 | (1007.75) | 0.00 |
| 1415 | 0.7998 | 1E-04 | 4.356 | 34839.288 | 1016.46 | (1012.10) | 0.00 |

| Time Interval (min) | Runoff Total (AC-FT) | Runoff per Interval (AC-FT) | Runoff per Interval (CU-FT) | Total Runoff Before Infiltration (CU-FT) | Infiltration per Interval (CU-FT) | Basin Storage Vol Increase or Decrease per Interval (CU-FT) | Total Basin Storage (CU-FT) |
|---------------------|----------------------|-----------------------------|-----------------------------|--|-----------------------------------|---|-----------------------------|
| 1420 | 0.8 | 0.0002 | 8.712 | 34848 | 1016.46 | (1007.75) | 0.00 |
| 1425 | 0.8002 | 0.0002 | 8.712 | 34856.712 | 1016.46 | (1007.75) | 0.00 |
| 1430 | 0.8003 | 1E-04 | 4.356 | 34861.068 | 1016.46 | (1012.10) | 0.00 |
| 1435 | 0.8005 | 0.0002 | 8.712 | 34869.78 | 1016.46 | (1007.75) | 0.00 |
| 1440 | 0.8007 | 0.0002 | 8.712 | 34878.492 | 1016.46 | (1007.75) | 0.00 |
| 1445 | 0.8008 | 1E-04 | 4.356 | 34882.848 | 1016.46 | (1012.10) | 0.00 |
| 1450 | 0.8008 | 0 | 0 | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1455 | 0.8008 | 0 | 0 | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1460 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1465 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1470 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1475 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1480 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1485 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1490 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1495 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1500 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1505 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1510 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1515 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1520 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1525 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1530 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1535 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1540 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1545 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1550 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1555 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |
| 1560 | | | | 34882.848 | 1016.46 | (1016.46) | 0.00 |



DESIGN CRITERIA

MAX. PERCOLATION RATE = 1"/HR.

MAX. DEPTH AT PEAK STORAGE = 5'

FACTOR OF SAFETY F.S. = 1.0 MINIMUM

ONE FOOT MINIMUM "FREEBOARD" BELOW LOWEST BUILDING PAD TO MAXIMUM WATER LEVEL

THE BASIN SHALL BE DESIGNED TO RETAIN THE RUNOFF FROM THE WORST CASE OF THE 1 HR., 6 HR., OR 24 HR. DURATION, 100 YEAR FREQUENCY STORM.

SEE SHT. 2 OF 2 FOR MINIMUM PLAN REQUIREMENTS

* SLOPES STEEPER THAN 5:1 WILL REQUIRE EROSION CONTROL APPROVED BY THE CITY ENGINEER.
(TYPICAL EROSION CONTROL CONSISTS OF CONTINUOUS GROUND COVER LIKE GRASS, OR WASHED ROCK WITH A DIAMETER OF 1" OR LARGER, PLACED TO A DEPTH OF 1" OVER WEED BARRIER CLOTH.)

CITY OF RANCHO MIRAGE

STANDARD

REVISIONS

• 7/5/2012

RETENTION BASIN

DETAIL

310

SHT. 1 OF 2

William Shirs 7/12/12
APPROVED BY: CITY ENGINEER DATE



AT A MINIMUM. PLANS SHALL INCLUDE THE FOLLOWING INFORMATION:

1. BOUNDARY (LOT LINES) INCLUDING BEARING AND DISTANCES
2. SLOPE SYMBOLS, OR FINISH CONTOURS, WITH SLOPE RATIOS OR PERCENTAGES
- * 3. ELEVATION LABELS FOR: BOTTOM, WATER SURFACE AT VOL. MAX. FOR 100YR. STORM, AND TOP
(HYDROLOGY CALCULATIONS SHALL BE SUBMITTED VERIFYING BASIN AREA, DEPTH, AND VOLUME.)
4. DIMENSIONS (LENGTH, WIDTH AND DEPTH) OR SCALED DRAWING
5. FINISHED SURFACE ELEVATIONS FOR IDENTIFYING THE FLOW PATHS
6. RIP-RAP OR APPROPRIATE EROSION CONTROL IF SLOPES EXCEED 20% (5:1)
7. ANY STRUCTURES, PIPES, HEADWALLS, RIP-RAP, DRYNELLS, ETC. SHOWN WITH
REFERENCE TO STREET PLANS, STORM DRAIN PLANS, OR GRADING PLANS
(A DRYNELL IS RECOMMENDED FOR LARGER RETENTION BASINS AS A WAY OF
INTERCEPTING RUNOFF WATER THAT MIGHT CAUSE A CONSTANT SWAMPY AREA
TO DEVELOP IN THE RETENTION BASIN. FLOWS TO CWD CHANNELS OR TO LAKES
TYPICALLY REQUIRE A DRYNELL TO INTERCEPT STREET RUNOFF. MAINTENANCE IS
EASIEST IF THE DRYNELL IS NEAR THE STREET SO VACUUM TRUCKS CAN ACCESS THEM.
SEE STANDARD DRAWINGS 306 AND 311.)

CITY OF RANCHO MIRAGE

STANDARD

R:  NS

RETENTION BASIN NOTES

DETAIL

310

SHT. 2 OF 2

1-----18

ENGINE? TTE

Geotechnical Report

APNs 685-100-009 & 011 Rancho Mirage, California

Prepared for:

La Paloma Homes

P.O. Box 10179

Palm Desert, CA 92262



Prepared by:



LandMark Consultants, Inc.
77-948 Wildcat Drive
Palm Desert, CA 92211
(760) 360-0665

September 2021



780 N. 4th Street
El Centro, CA 92243
(760) 370-3000
landmark@landmark-ca.com

77-948 Wildcat Drive
Palm Desert, CA 92211
(760) 360-0665
gchandra@landmark-ca.com

September 10, 2021

Mr. Mark Howard
La Paloma Homes
P.O. Box 10179
Palm Desert, CA 92262

Geotechnical Report
APNs 685-100-009 & 011
Rancho Mirage, California
LC/Report No.: LP21209

Dear Mr. Howard:

As per your request, ***LandMark Consultants, Inc.*** is providing the following geotechnical report for the proposed new single-family residential subdivision project located south of Via Florencia between Landy Lane and Via Josefina in Rancho Mirage, California. The proposed development will consist of eighteen (18) new single-family home lots, and the proposed residential homes will be one story, wood/metal-frame structures with shallow reinforced concrete foundations and slab-on-grade concrete floors.

Purpose of Work

The purpose of this study was to investigate the upper 10 feet of subsurface soil at selected locations within the site for evaluation of physical/engineering properties. From the analysis of the field and laboratory data, professional opinions were developed and are provided in this report regarding geotechnical conditions at this site and the effect on design and construction.

Field Exploration

Subsurface exploration was performed on August 4, 2021 using a backhoe to excavate six (6) exploratory test pits to an approximate depth of 10 feet below the existing ground surface. The test pit locations are shown on the Site and Exploration Plan (Plate A-2). Bulk samples were obtained at selected depths in the test pits. The test pits were located by taped or paced measurements and should be considered approximate.

A geo-technician observed the digging operations and maintained log of the test pits during exploration. The logs were edited in final form after a review of retrieved samples and the field and laboratory data. The test pit logs are presented on Plates B-1 thru B-6 in Appendix B. Soils encountered have been classified according to the Unified Soil Classification System. A key to the test pit logs is presented on Plate B-7. The stratification lines shown on the subsurface logs represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth.

After logging and sampling the soil, the exploratory test pits were backfilled with the excavated material. The backfill was loosely placed and was not compacted to the requirements specified for engineered fill.

Laboratory Testing

Laboratory tests were conducted on selected bulk soil samples to aid in classification and evaluation of selected properties of the site soils. The tests were conducted in general conformance to the procedures of the American Society for Testing and Materials (ASTM) or other standardized methods as referenced below. The laboratory testing program consisted of the following tests:

- < Particle Size Analyses (ASTM D422)
- < Moisture-Density Relationship (ASTM D1557)
- < Collapse Potential (ASTM D5333)
- < Chemical Analyses (soluble sulfates & chlorides, pH, and resistivity) (Caltrans Methods)

The laboratory test results are presented on the subsurface logs (Appendix B) and on Plates C-1 through C-4 in Appendix C. Engineering parameters of soil strength, compressibility, and relative density utilized for developing design criteria provided within this report were extrapolated from data obtained from the field and laboratory testing program.

Site Conditions

The project site consists of two rectangular parcels, elongated in the north-south direction, that are separated by a parcel that is not included in this project. The site currently is vacant with scattered desert vegetation and weeds covering the site. The project site is bounded by Via Florence to the north (dirt road) and vacant parcels to the east and west.

Adjacent properties are flat-lying and are approximately at the same elevation with this site. Single family residences and vacant lots are located surrounding the site.

The project site lies at an elevation of approximately 315 feet above mean sea level (AMSL) in the Coachella Valley region of the California low desert. Annual rainfall in this arid region is less than 4 inches per year with four months of average summertime temperatures above 100 °F. Winter temperatures are mild, seldom reaching freezing.

Geologic Setting

The project site is located in the Coachella Valley portion of the Salton Trough physiographic province. The Salton Trough is a geologic structural depression resulting from large scale regional faulting. The trough is bounded on the northeast by the San Andreas Fault and Chocolate Mountains and the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments since the Miocene Epoch. Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity. Figure 1 shows the location of the site in relation to regional faults and physiographic features.

The surrounding regional geology includes the Peninsular Ranges (Santa Rosa and San Jacinto Mountains) to the south and west, the Salton Basin to the southeast, and the Little San Bernardino and Orocopia Mountains to the north and east. Hundreds of feet to several thousand feet of Quaternary fluvial, lacustrine, and aeolian soil deposits underlie the Coachella Valley. The southeastern part of the Coachella Valley lies below sea level. In the geologic past, the ancient Lake Cahuilla submerged the area. Calcareous tufa deposits may be observed along the ancient shoreline as high as elevation 45 feet above mean seal level (AMSL) along the Santa Rosa Mountains from La Quinta southward. Lacustrine (lake bed) deposits comprise the subsurface soils over much of the eastern Coachella Valley with alluvial outwash along the flanks of the valley.

Subsurface Soils

Subsurface soils encountered during the field exploration conducted on August 4, 2021 consist of sand (SP-SM and SP) (Myoma fine sand). The near surface soils are non-expansive in nature. The subsurface logs (Plates B-1 thru B-6) depict the stratigraphic relationships of the various soil types.

Groundwater

Groundwater was not encountered in the test pits during the time of exploration. Well information collected near the subject site (Well 338195N1 163903W001) indicates that the ground water level ranges from 190 feet to 199 feet below the ground surfaces in the last 5 years in the vicinity of the project site. Historic groundwater records in the vicinity of the project site indicate that groundwater has fluctuated between 100 and 215 feet below the ground surface over the last 60 years according to a report "Coachella Valley Investigation" conducted by the Department of Water Resources, published July 1964.

Faulting

The project site is located in the seismically active Coachella Valley of southern California with numerous mapped faults of the San Andreas Fault System traversing the region. We have performed a computer-aided search of known faults or seismic zones that lie within a 43-mile radius of the project site (Table 1). A fault map illustrating known active faults relative to the site is presented on Figure 1, *Regional Fault Map*. Figure 2 shows the project site in relation to local faults.

The criterion for fault classification adopted by the California Geological Survey defines Earthquake Fault Zones along active or potentially active faults. An active fault is one that has ruptured during Holocene time (roughly within the last 11,000 years). A fault that has ruptured during the last 1.8 million years (Quaternary time), but has not been proven by direct evidence to have not moved within Holocene time is considered to be potentially active. A fault that has not moved during Quaternary time is considered to be inactive. ***Review of the current Alquist-Priolo Earthquake Fault Zone maps (CGS, 2000a) indicates that the nearest mapped Earthquake Fault Zone is the San Andreas fault (San Bernardino-South segment) located approximately 3.8 miles northeast of the project site.***

General Ground Motion Analysis

The project site is considered likely to be subjected to moderate to strong ground motion from earthquakes in the region. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Acceleration magnitudes also are dependent upon attenuation by rock and soil deposits, direction of rupture and type of fault; therefore, ground motions may vary considerably in the same general area.

2019 CBC General Ground Motion Parameters: The California Building Code (CBC) requires that a site-specific ground motion hazard analysis be performed in accordance with ASCE 7-16 Section 11.4.8 for structures on Site Class D and E sites with S_1 greater than or equal to 0.2 and Site Class E sites with S_s greater than or equal to 1.0. ***This project site has been classified as Site Class D and has a S_1 value of 0.73, which would require a site-specific ground motion hazard analysis.*** However, ASCE 7-16 Section 11.4.8 provides three exceptions which permit the use of conservative values of design parameters for certain conditions for Site Class D and E sites in lieu of a site-specific hazard analysis. The exceptions are:

- Exception 1: Structures on Site Class E sites with S_s greater than or equal to 1.0, provided the site coefficient F_a is taken as equal to that of Site Class C.
- Exception 2: Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient C_s is determined by Equations 12.8-2 for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Equation 12.8-3 for $1.5T_s \leq T \leq T_L$ or Equation 12.8-4 for $T > T_L$.
- Exception 3: Structures on Site Class E sites with S_1 greater than or equal to 0.2, provided that T is less than or equal to T_s and the equivalent static force procedure is used for design.

Based on our understanding of the proposed development, the seismic design parameters presented in Table 2 were calculated assuming that one of the exceptions listed above applies to the proposed structures at this site. **However, the structural engineer should verify that one of the exceptions is applicable to the proposed structures.** If none of the exceptions apply, our office should be consulted to perform a site-specific ground motion hazard analysis.

The 2019 CBC general ground motion parameters are based on the Risk-Targeted Maximum Considered Earthquake (MCER). The Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps Web Application (SEAOC, 2020) was used to obtain the site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters. Design spectral response acceleration parameters are defined as the earthquake ground motions that are two-thirds (2/3) of the corresponding MCER ground motions. The Maximum Considered Earthquake Geometric Mean (MCEa) peak ground acceleration adjusted for soil site class effects (PGAM) value to be used for liquefaction and seismic settlement analysis in accordance with 2019 CBC Section 1803A.5.12 ($PGAM = F_{ra}A * PGA$) is estimated at 0.84g for the project site. ***Design earthquake ground motion parameters are provided in Table 2.***

Seismic and Other Hazards

- ▶ **Groundshaking.** The primary seismic hazard at the project site is the potential for strong groundshaking during earthquakes along the San Andreas fault. A further discussion of groundshaking mentioned above.
- ▶ **Surface Rupture.** The project site does not lie within a State of California, Alquist-Priolo Earthquake Fault Zone or County of Riverside Fault Zone. Surface fault rupture is considered to be unlikely at the project site because of the well-delineated fault lines through the Coachella Valley as shown on USGS and CDMG maps. However, because of the high tectonic activity and deep alluvium of the region, we cannot preclude the potential for surface rupture on undiscovered or new faults that may underlie the site.
- ▶ **Liquefaction.** Liquefaction is unlikely to be a potential hazard at the site, due to groundwater deeper than 50 feet (the maximum depth that liquefaction is known to occur).

Other Potential Geologic Hazards.

- ▶ **Landsliding.** The hazard of landsliding is unlikely due to the regional planar topography. No ancient landslides are shown on geologic maps of the region and no indications of landslides were observed during our site investigation.
- ▶ **Volcanic hazards.** The site is not located in proximity to any known volcanically active area and the risk of volcanic hazards is considered very low.
- ▶ **Tsunamis, sieches, and flooding.** The site does not lie near any large bodies of water, so the threat of tsunami, sieches, or other seismically-induced flooding is unlikely.
- ▶ **Expansive soil.** The near surface soils at the project site consist of sands which are non-expansive.

Hydroconsolidation

In arid climatic regions, granular soils have a potential to collapse upon wetting. This collapse (hydro-consolidation) phenomena is the result of the lubrication of soluble cements (carbonates) in the soil matrix causing the soil to densify from its loose configuration during deposition.

Collapse potential tests (Plate C-3) performed on a remolded sample from the site indicated a slight risk of collapse upon saturation.

Soil Infiltration Rate

The double ring infiltrometer (ASTM D3385) was used for infiltration test on this site, to depths of approximately 5 feet below the existing ground surface, corresponding to the anticipated bottom depth of the on-site storm-water retention system. The double ring infiltrometer consists of 12-inch inner ring and a 24-inch outer ring. With constant head test method per ASTM D3385, water is consistently added to both the outer and inner rings to maintain a constant level throughout the testing

Soil infiltration rate measured range from 10.3 in/hr to 10.9 in/hr. An oil/water separator should be installed at inlets to the storm-water retention basin to prevent sealing of the basin bottom with silt and oil residues. The field test results and rate calculations are attached in Appendix D of this report.

Site Preparation

Pre-grade Meeting: Prior to site preparation, a meeting should be held at the site with as a minimum, the owner's representative, grading contractor and geotechnical engineer in attendance.

Clearing and Grubbing: Any surface improvements, debris or vegetation including grass, trees, and weeds on the site at the time of construction should be removed from the construction area. Root balls should be completely excavated. Organic stripping should be hauled from the site and not used as fill. *Any trash, construction debris, concrete slabs, old pavement, landfill, and buried obstructions such as old foundations, un-controlled fills and utility lines exposed during rough grading should be traced to the limits of the foreign material by the grading contractor and removed under our supervision.* Any excavations resulting from site clearing should be dish-shaped to the lowest depth of disturbance and backfilled under the observation of the geotechnical engineer's representative.

House Pad Preparation: The existing surface soil within the proposed house pad areas should be removed to 36 inches below the original grade or 18 inches below the lowest foundation grade (whichever deeper), extending five feet beyond all exterior wall/column lines (including adjacent concrete areas). Exposed sub-grade should be scarified to a depth of 6 to 8 inches, uniformly moisture conditioned to at least 6% over optimum moisture content, and re-compacted a minimum of 95% of the maximum density determined in accordance with ASTM D1557 methods.

Auxiliary Structures Foundation Preparation: Auxiliary structures such as free standing or retaining walls should have footings extended to a minimum of 18 inches below grade. The existing soil beneath the structure foundation prepared in the manner described for the house pad except the preparation needs only to extend 18 inches below and beyond the footing.

Sidewalk and Concrete Hardscape Areas: In areas other than the building pad which are to receive concrete slabs, the ground surface should be over-excavated to a depth of 8 to 12 inches, uniformly moisture conditioned to at least 2% over optimum moisture, and re-compacted to at least 90% of ASTM D1557 maximum density.

The on-site soils are suitable for use as compacted fill and utility trench backfill. Imported fill soil (if required) should be similar to onsite soil or non-expansive, granular soil meeting the USCS classifications of SM, SP-SM, or SW-SM with a maximum rock size of 6 inches and no less than 5% passing the No. 200 sieve. ***The geotechnical engineer should approve imported fill soil sources before hauling material to the site.*** Native and imported materials should be placed in lifts no greater than 8 inches in loose thickness, uniformly moisture conditioned to at least 2% over optimum moisture, and re-compacted to at least 90% of ASTM D1557 maximum density.

Moisture Control and Drainage: The moisture condition of the house pad should be maintained during trenching and utility installation until concrete is placed or should be rewetted before initiating delayed construction. Adequate site drainage is essential to future performance of the project. Infiltration of excess irrigation water and stormwaters can adversely affect the performance of the subsurface soil at the site. Positive drainage should be maintained away from all structures (5% for 5 feet minimum across unpaved areas) to prevent ponding and subsequent saturation of the native soil.

Gutters and downspouts may be considered as a means to convey water away from foundations. If landscape irrigation is allowed next to the building, drip irrigation systems or lined planter boxes should be used. The subgrade soil should be maintained in a moist, but not saturated state, and not allowed to dry out. Drainage should be maintained without ponding.

Utility Trench Backfill

On-site soil free of debris, vegetation, and other deleterious matter may be suitable for use as utility trench backfill. Backfill within roadways should be placed in layers not more than 6 to 8 inches in thickness, uniformly moisture conditioned to at least 2% over optimum moisture and mechanically compacted to a minimum of 90% of the ASTM D1557 maximum dry density except for the top 12 inches of the trench which shall be compacted to at least 95%. Native backfill should only be placed and compacted after encapsulating buried pipes with suitable bedding and pipe envelope material.

Pipe envelope/bedding should be clean sand (Sand Equivalent $SE > 30$) or crushed rock. If crushed rock is used, a geotextile filter fabric (Mirafi 140N or equivalent) should be used to encapsulate the crushed rock to reduce the potential for in-washing of fines into the gravel void space. Precautions should be taken in the compaction of the backfill to avoid damage to the pipes and structures.

Soil Bearing Values and Lateral Loads

The subsurface soils consist of sand with some gravel to maximum penetrated. An allowable soil bearing pressure of 1,800 psf could be used. Passive resistance of lateral earth pressure may be calculated using an equivalent fluid pressure of 350 pcf to resist lateral loadings. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.38 may also be used at the base of the footings to resist lateral loading. Static earth pressure equivalent to that exerted by a fluid weighing 35 pcf for unrestrained (active) conditions and 50 pcf for restrained (at-rest) conditions.

Foundations

All exterior and interior foundations should be embedded a minimum of 18 inches deep. Continuous wall footings should have a minimum width of 12 inches. Spread footings should have a minimum width of 24 inches and should not be structurally isolated. ***Recommended concrete reinforcement and sizing for all footings should be provided by the structural engineer.***

Slabs-on-Grade

Concrete slabs and flatwork should be a minimum of 4 inches thick. The concrete floor slabs may either be monolithically placed with the foundation or dowelled after footing placement. The concrete slabs may be placed on granular subgrade that has been compacted at least 90% relative compaction (ASTM D1557). ***Slab thickness and steel reinforcement should be determined by the design engineer.***

American Concrete Institute (ACI) guidelines (ACI 302.1R-04 Chapter 3, Section 3.2.3) provide recommendations regarding the use of moisture barriers beneath concrete slabs. The concrete floor slabs should be underlain by a 10-mil polyethylene vapor retarder that works as a capillary break to reduce moisture migration into the slab section. All laps and seams should be overlapped 6-inches or as recommended by the manufacturer. The vapor retarder should be protected from puncture. The joints and penetrations should be sealed with the manufacturer's recommended adhesive, pressure-sensitive tape, or both. The vapor retarder should extend a minimum of 12 inches into the footing excavations. The vapor retarder may lie directly on the granular fill with 2 inches of clean sand cover.

Placing sand over the vapor retarder may increase moisture transmission through the slab, because it provides a reservoir for bleed water from the concrete to collect. The sand placed over the vapor retarder may also move and mound prior to concrete placement, resulting in an irregular slab thickness. For areas with moisture sensitive flooring materials, ACI recommends that concrete slabs be placed without a sand cover directly over the vapor retarder, provided that the concrete mix uses a low-water cement ratio and concrete curing methods are employed to compensate for release of bleed water through the top of the slab. The vapor retarder should have a minimum thickness of 15-mil (Stego-Wrap or equivalent).

All independent concrete flatworks should be underlain by 12 inches of moisture conditioned and compacted soils. All flatwork should be jointed in square patterns and at irregularities in shape at a maximum spacing of 10 feet or the least width of the sidewalk.

Permanent Slopes

Cut and Fill slopes should be constructed generally no steeper than 3 (H):1(V) to permit slope maintenance with motor graders, and provide erosional stability from wind or rain while unprotected without landscape cover. Slopes with a 2(H):1(V) gradient are permitted, provided it is recognized that such slopes are more prone to erosion and do not permit maintenance by motorized riding equipment and require landscape cover to retard erosion.

Concrete Mixes and Corrosivity

Selected chemical analyses for corrosivity were conducted on bulk samples of the near surface soil from the project site (Plate C-2). The native soils have low levels of sulfate and chloride ion concentrations. Resistivity determinations on the soil indicate a moderate potential for metal loss because of electrochemical corrosion processes.

A minimum of 2,500 psi concrete of Type II Portland Cement with a maximum water/cement ratio of 0.60 (by weight) should be used for concrete placed in contact with native soil on this project (sitework including streets, sidewalks, driveways, patios, and other wall foundations).

Landmark does not practice corrosion engineering. We recommend that a qualified corrosion engineer evaluate the corrosion potential on metal construction materials and concrete at the site.

Observation and Density Testing

Site preparation and fill placement should be continuously observed and tested by a representative of a qualified geotechnical engineering firm. Near full-time observation services during the excavation and scarification process is necessary to detect undesirable materials or conditions and soft areas that may be encountered in the construction area.

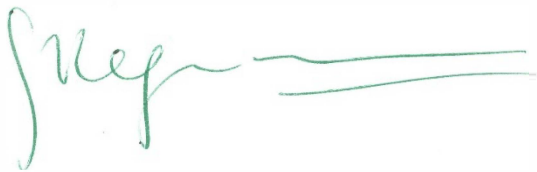
The geotechnical firm that provides observation and testing during construction shall assume the responsibility of ***"geotechnical engineer of record"*** and, as such, shall perform additional tests and investigation as necessary to satisfy themselves as to the site conditions and the recommendations for site development.

Closure

We did not encounter soil conditions that would preclude implementation of the proposed project provided the recommendations contained in this report are implemented in the design and construction of this project.

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. If you have any questions or comments regarding our findings, please call our office at (760) 360-0665.

Respectfully Submitted,
LandMark Consultants, Inc.



Greg M. Chandra, P.E., M.ASCE
Principal Engineer

**Attachments:**

- Appendix A: Vicinity and Site Maps
- Appendix B: Subsurface Soil Logs and Soil Key
- Appendix C: Laboratory Test Results
- Appendix D: Soil Infiltration Test Result

TABLES

Table 1
Summary of Characteristics of Closest Known Active Faults

| Fault Name | Approximate Distance (miles) | Approximate Distance (km) | Maximum Moment Magnitude (Mw) | Fault Length (km) | Slip Rate (mm/yr) |
|--------------------------------------|------------------------------|---------------------------|-------------------------------|-------------------|-------------------|
| San Andreas - San Bernardino (South) | 3.8 | 6.1 | 7.4 | 103 ± 10 | 3.0 ± 7 |
| Garnet Hill * | 4.9 | 7.8 | | | |
| San Andreas - San Bernardino (North) | 6.0 | 9.6 | 7.5 | 103 ± 10 | 2.4 ± 6 |
| San Andreas - Coachella | 9.6 | 15.4 | 7.2 | 96 ± 10 | 2.5 ± 5 |
| Indio Hills * | 9.9 | 15.8 | | | |
| Blue Cut* | 11.7 | 18.7 | | | |
| Eureka Peak | 12.5 | 20.0 | 6.4 | 19 ± 2 | 0.6 ± 0.4 |
| BumtMtn. | 18.4 | 29.4 | 6.5 | 21 ± 2 | 0.6 ± 0.4 |
| Morongo * | 20.1 | 32.1 | | | |
| San Jacinto - Anza | 20.9 | 33.4 | 7.2 | 91 ± 9 | 1.2 ± 6 |
| Pinto Mtn. | 21.9 | 35.0 | 7.2 | 74 ± 7 | 2.5 ± 2 |
| San Jacinto - Coyote Creek | 23.9 | 38.2 | 6.8 | 41 ± 4 | 4 ± 2 |
| Landers | 25.7 | 41.2 | 7.3 | 83 ± 8 | 0.6 ± 0.4 |
| San Jacinto - San Jacinto Valley | 30.8 | 49.3 | 6.9 | 43 ± 4 | 1.2 ± 6 |
| Pisgah Mtn. - Mesquite Lake | 32.1 | 51.4 | 7.3 | 89 ± 9 | 0.6 ± 0.4 |
| Johnson Valley (northern) | 35.1 | 56.2 | 6.7 | 35 ± 4 | 0.6 ± 0.4 |
| S. Emerson - Copper Mtn. | 35.3 | 56.5 | 7 | 54 ± 5 | 0.6 ± 0.4 |
| North Frontal Fault Zone - Eastern | 36.3 | 58.0 | 6.7 | 27 ± 3 | 0.5 ± 0.3 |
| Lenwood- Lockhart- Old Woman Springs | 41.0 | 65.6 | 7.5 | 145 ± 15 | 0.6 ± 0.4 |
| Hot Springs * | 41.4 | 66.2 | | | |
| Calico-Hidalgo | 41.6 | 66.6 | 7.3 | 95 ± 10 | 0.6 ± 0.4 |
| San Jacinto - Borrego | 42.6 | 68.2 | 6.6 | 29 ± 3 | 4 ± 2 |

* Note: Faults not included in CGS database.

Table 2
2019 California Building Code (CBC) and ASCE 7-16 Seismic Parameters

| | | |
|--------------------------|-------------|-------------------------------------|
| Soil Site Class: | D | ASCE 7-16 Reference Table 20.3-1 |
| Latitude: | 33.7918 N | |
| Longitude: | -116.4006 W | |
| Risk Category: | II | |
| Seismic Design Category: | D | |

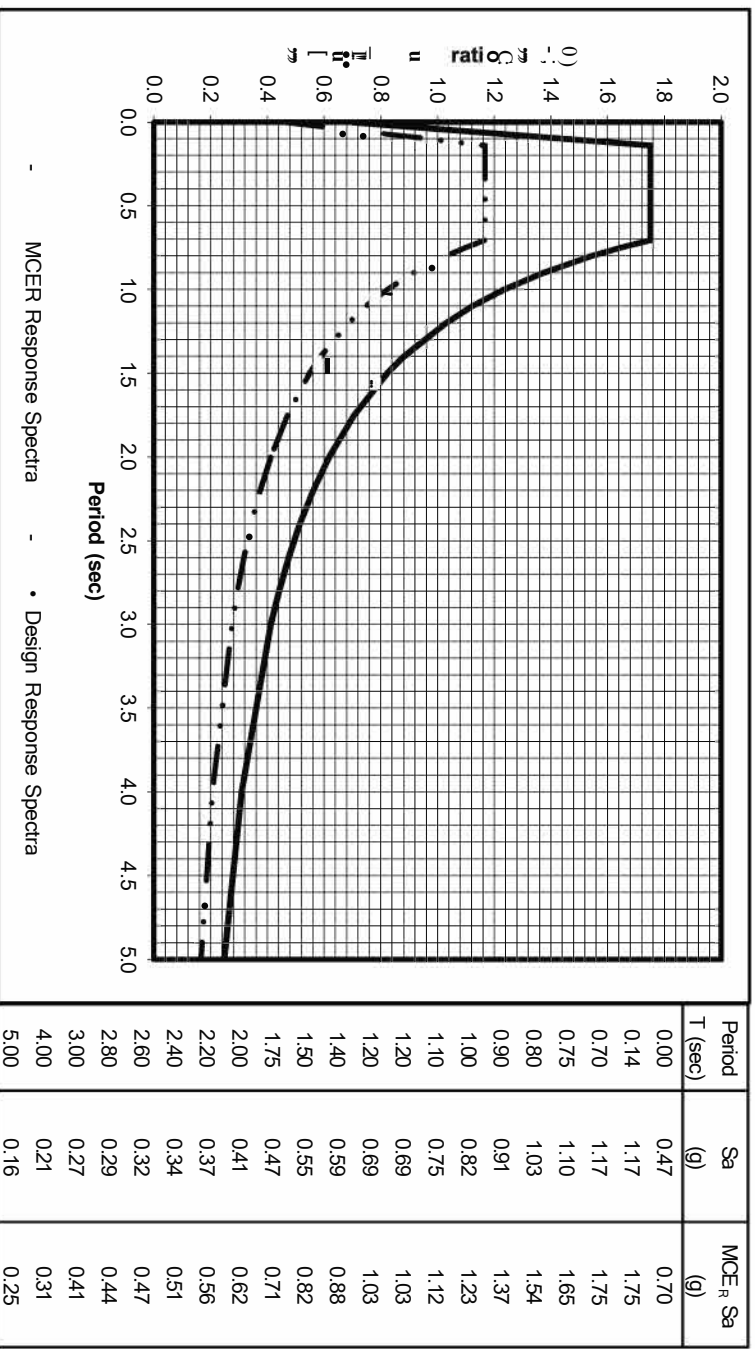
Maximum Considered Earthquake (MCE) Ground Motion

| | | | |
|--|----------------------------------|---------------|----------------------|
| Mapped MCE_R Short Period Spectral Response | S_s | 1.751 g | ASCE Figure 22-1 |
| Mapped MCE_R 1 second Spectral Response | S₁ | 0.726 g | ASCE Figure 22-2 |
| Short Period (0.2 s) Site Coefficient | F_a | 1.00 | ASCE Table 11.4-1 |
| Long Period (1.0 s) Site Coefficient | F_v | 1.70 | ASCE Table 11.4-2 |
| MCE_R Spectral Response Acceleration Parameter (0.2 s) | S_{M_s} | 1.751 g | ASCE Equation 11.4-1 |
| MCE_R Spectral Response Acceleration Parameter (1.0 s) | S_{M₁} | 1.234 g | ASCE Equation 11.4-2 |
| | | $= F_v * S_1$ | |

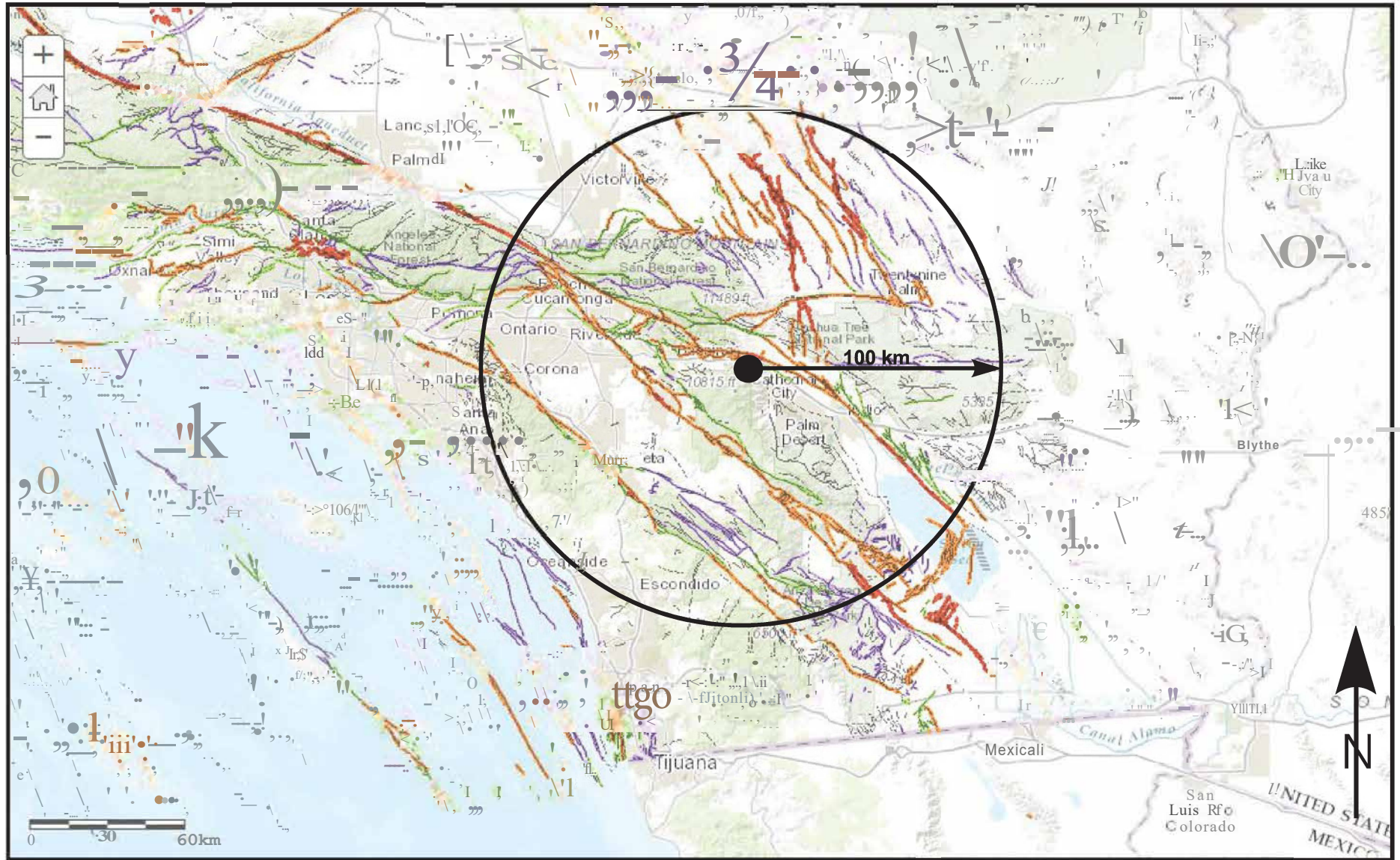
Design Earthquake Ground Motion

| | | | | |
|---|-----------------------|---------|------------------|----------------------|
| Design Spectral Response Acceleration Parameter (0.2 s) | S_{ms} | 1.167 g | $= 2/3 * S_{ms}$ | ASCE Equation 11.4-3 |
| Design Spectral Response Acceleration Parameter (1.0 s) | S_m | 0.823 g | $= 2/3 * S_{m1}$ | ASCE Equation 11.4-4 |
| Risk Coefficient at Short Periods (less than 0.2 s) | C_{as} | 0.896 | | ASCE Figure 22-17 |
| Risk Coefficient at Long Periods (greater than 1.0 s) | C_{RI} | 0.881 | | ASCE Figure 22-18 |

| | | | | |
|--------------------------|----------------------|----------|-----------------------|----------------------|
| | T_L | 8.00 sec | | ASCE Figure 22-12 |
| | T₀ | 0.14 sec | $= 0.2 * S_0 / S_0 s$ | |
| | T_s | 0.70 sec | $= S_0 / S_0 s$ | |
| Peak Ground Acceleration | PGAM | 0.84 g | | ASCE Equation 11.8-1 |



FIGURES

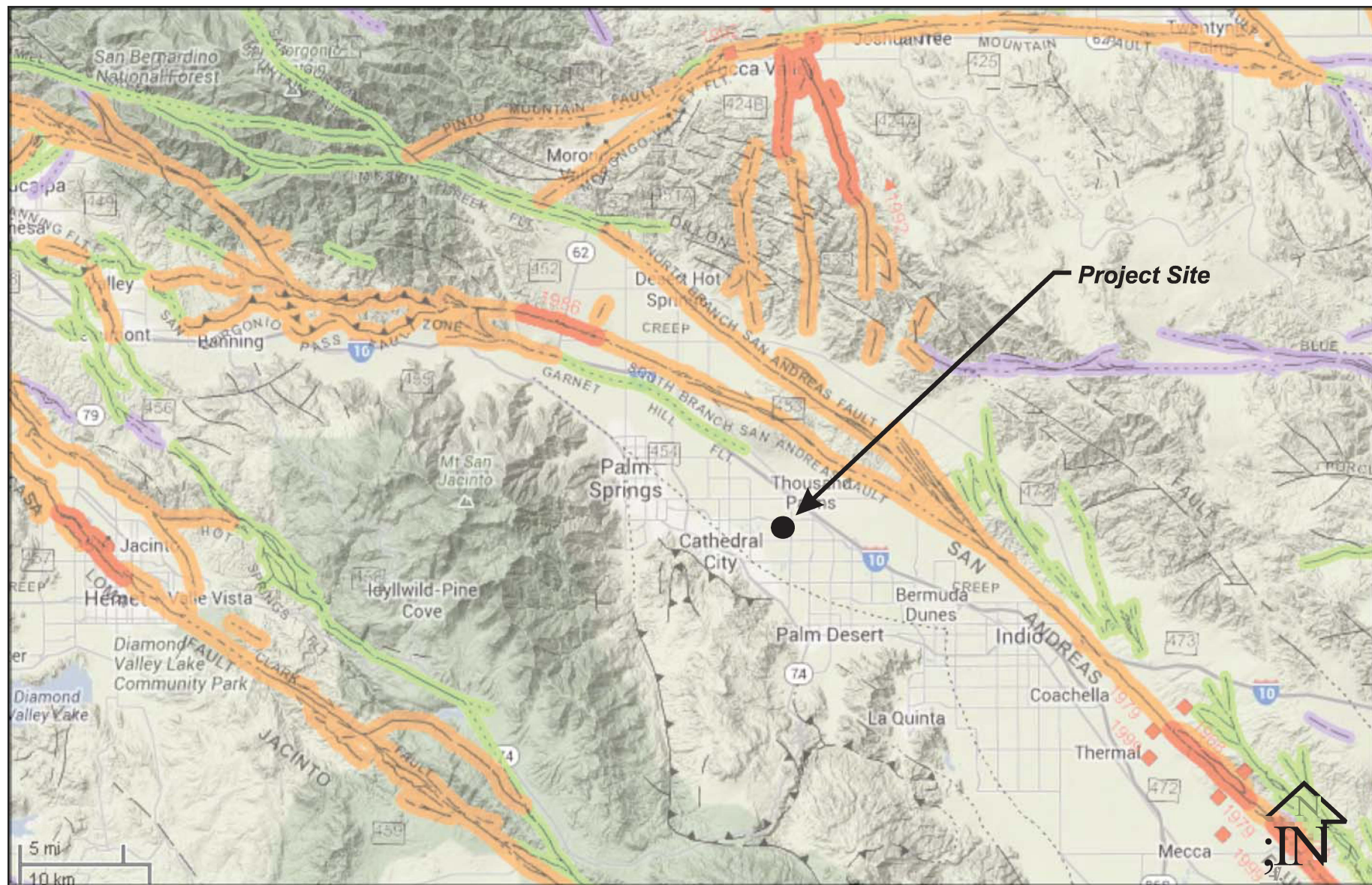


Source: California Geological Survey_2010 Fault Activity Map of California <http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#>

LANDMARK
Geo-Engineers and Geologists
Project No.: LP21209

Regional Fault Map

Figure 1



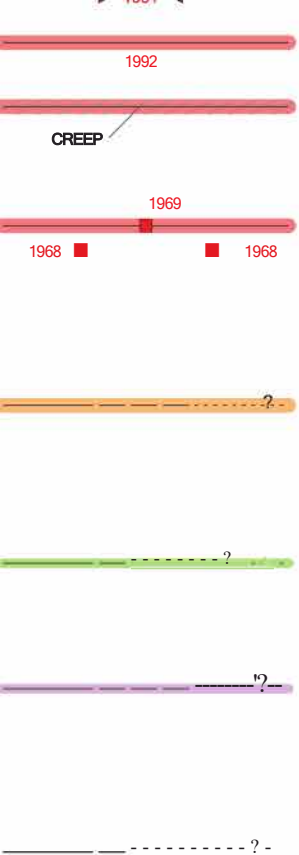
Source: California Geological Survey 2010 Fault Activity Map of California
<http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#>

LANDMARK
 Geo-Engineers and Geologists

Project No.: LP21209

Map of Local Faults

Figure 2



No triangle by date indicates an intermediate point along fault break.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

Square on fault indicates where fault creep slippage has occurred that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

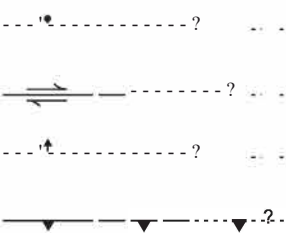
Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

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

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

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

ADDITIONAL FAULT SYMBOLS



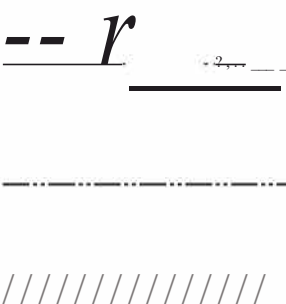
Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened. On offshore faults, barbs simply indicate a reverse fault regardless of steepness of dip.

OTHER SYMBOLS



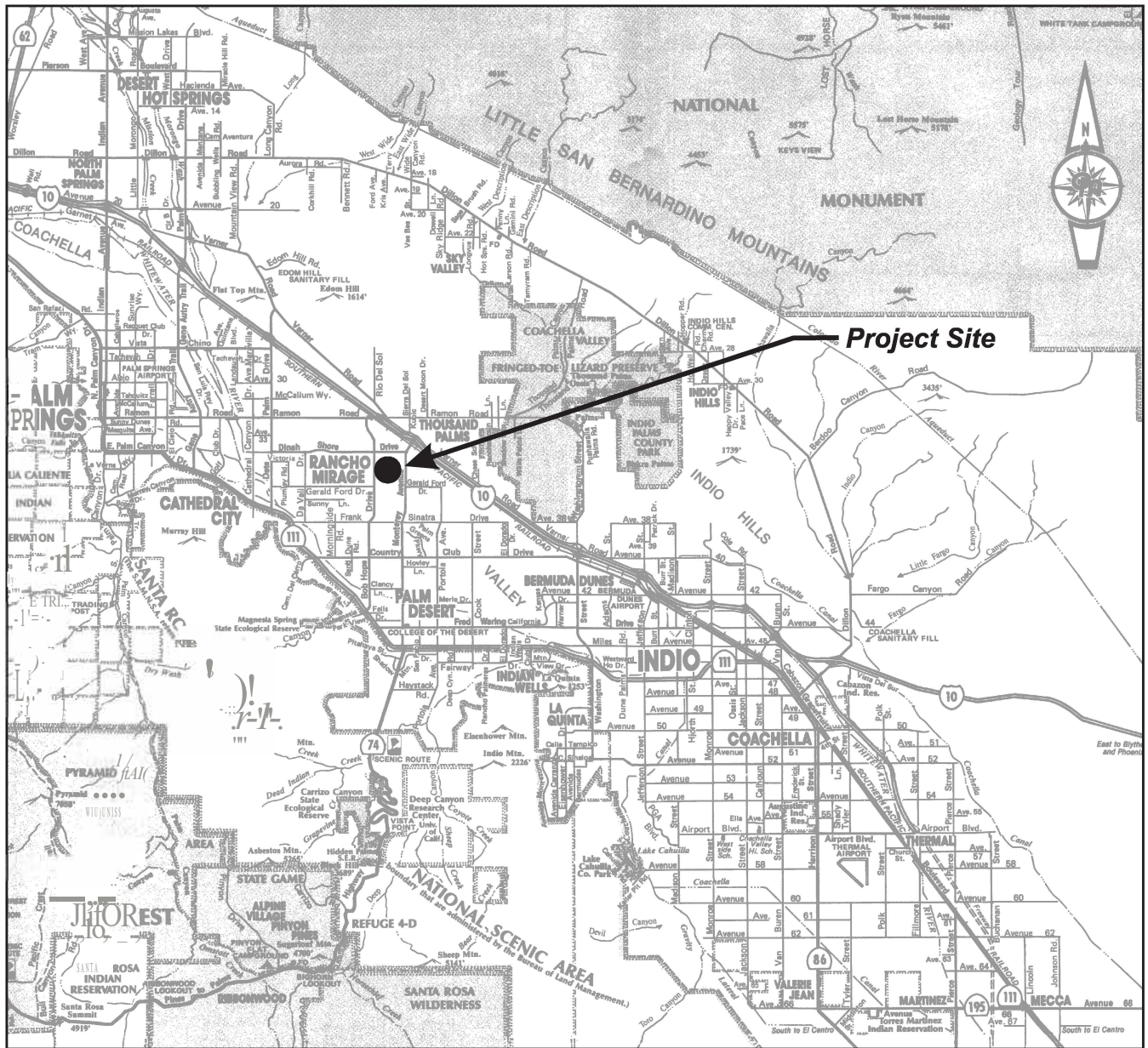
Numbers refer to annotations listed in the appendices of the accompanying report. Annotations include fault name, age of fault displacement, and pertinent references including Earthquake Fault Zone maps where a fault has been zoned by the Alquist-Priolo Earthquake Fault Zoning Act. This Act requires the State Geologist to delineate zones to encompass faults with Holocene displacement.

Structural discontinuity (offshore) separating differing Neogene structural domains. May indicate discontinuities between basement rocks.

Brawley Seismic Zone, a linear zone of seismicity locally up to 10 km wide associated with the releasing step between the Imperial and San Andreas faults.

| | | | | |
|--|-------|--|--|----------------------|
| | Years | | | TYPE C/""D IDTTT""LT |
|--|-------|--|--|----------------------|

APPENDIX A



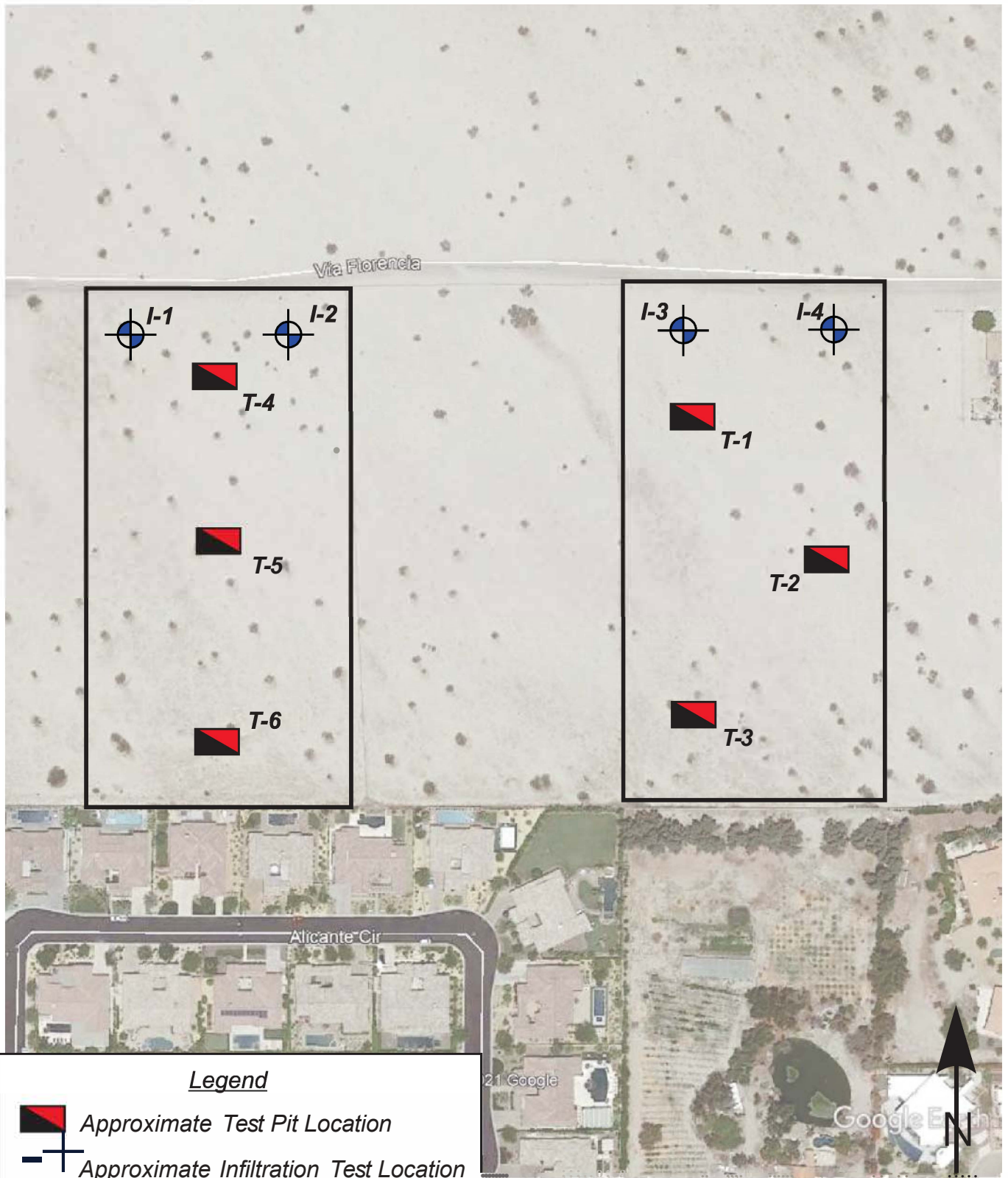
LANDMARK

Geo-Engineers and Geologists

Project No.: LP21209

Vicinity Map

Plate
A-1



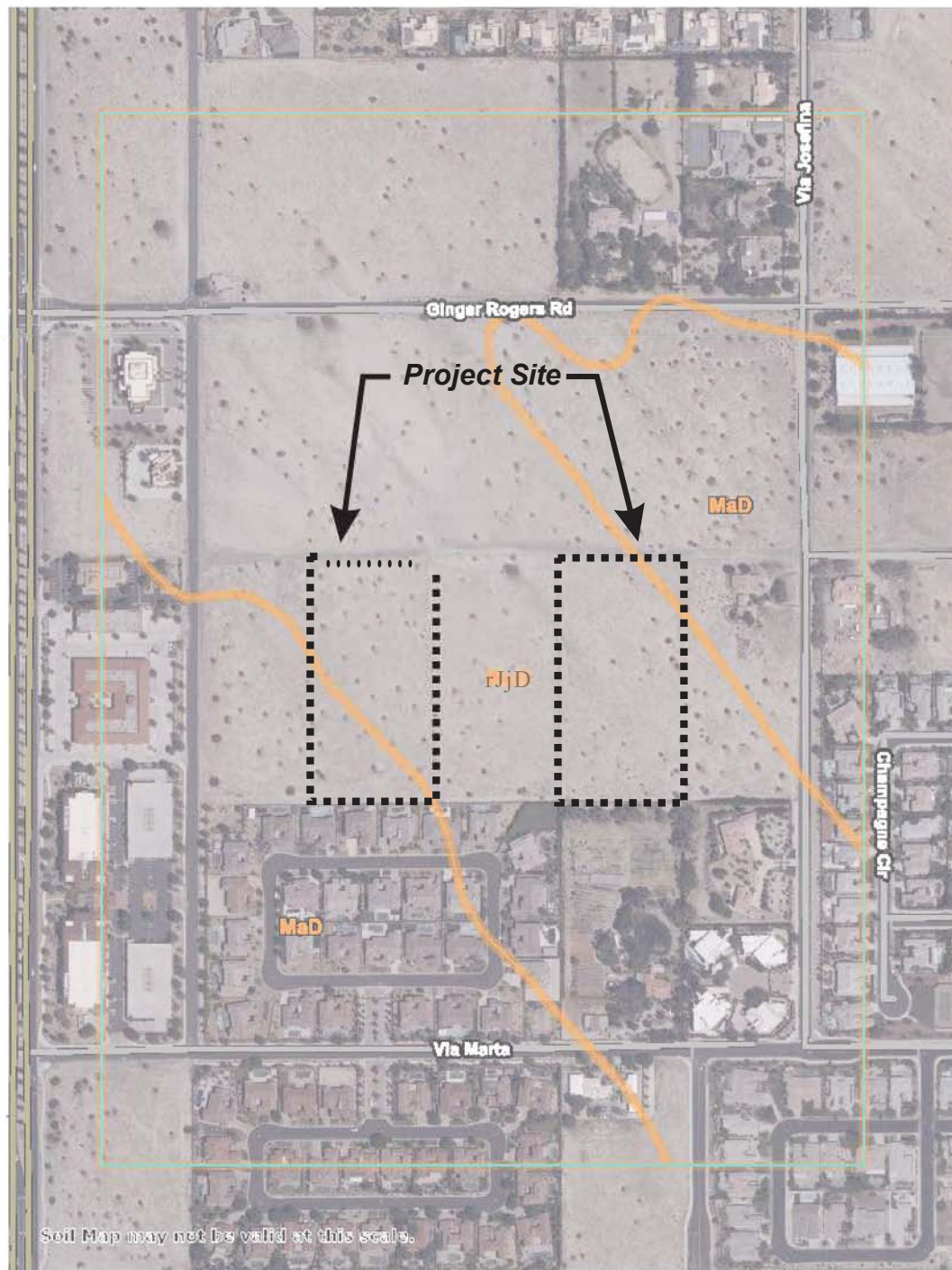
LANDMARK

Geo-Engineers and Geologists

Project No.: LP21209

Site and Exploration Plan

Plate
A-2



USDA
Natural Resources
Conservation Service

Well Soil Survey
National Cooperative Soil Survey




































9/3/2021
Page 1 of 3

LANDMARK
Geo-Engineers and Geologists
Project No.: LP21209

**USDA Soil Conservation
Soil Service Map**

**Plate
A-3**

MAP LEGEND

| | | |
|--|--|---|
| Area of Interest (AOI) | | Spoil Area |
|  Area of Interest (AOI) | |  Stony Spot |
| Soils | |  Very Stony Spot |
|  Soil Map Unit Polygons | |  Wet Spot |
|  Soil Map Unit Lines | |  Other |
|  Soil Map Unit Points | |  Special Line Features |
| Special Point Features | | Water Features |
|  Blowout | |  Streams and Canals |
|  Borrow Pit | | Transportation |
|  Clay Spot | |  Rails |
|  Closed Depression | |  Interstate Highways |
|  Gravel Pit | |  US Routes |
|  Gravelly Spot | |  Major Roads |
|  Landfill | |  Local Roads |
|  Lava Flow | | Background |
|  Marsh or swamp | |  Aerial Photography |
|  Mine or Quarry | | |
|  Miscellaneous Water | | |
|  Perennial Water | | |
|  Rock Outcrop | | |
|  Saline Spot | | |
|  Sandy Spot | | |
|  Severely Eroded Spot | | |
|  Sinkhole | | |
|  Slide or Slip | | |
|  SodicSpot | | |

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Riverside County, Coachella Valley Area, California
Survey Area Data: Version 12, Jun 8, 2020

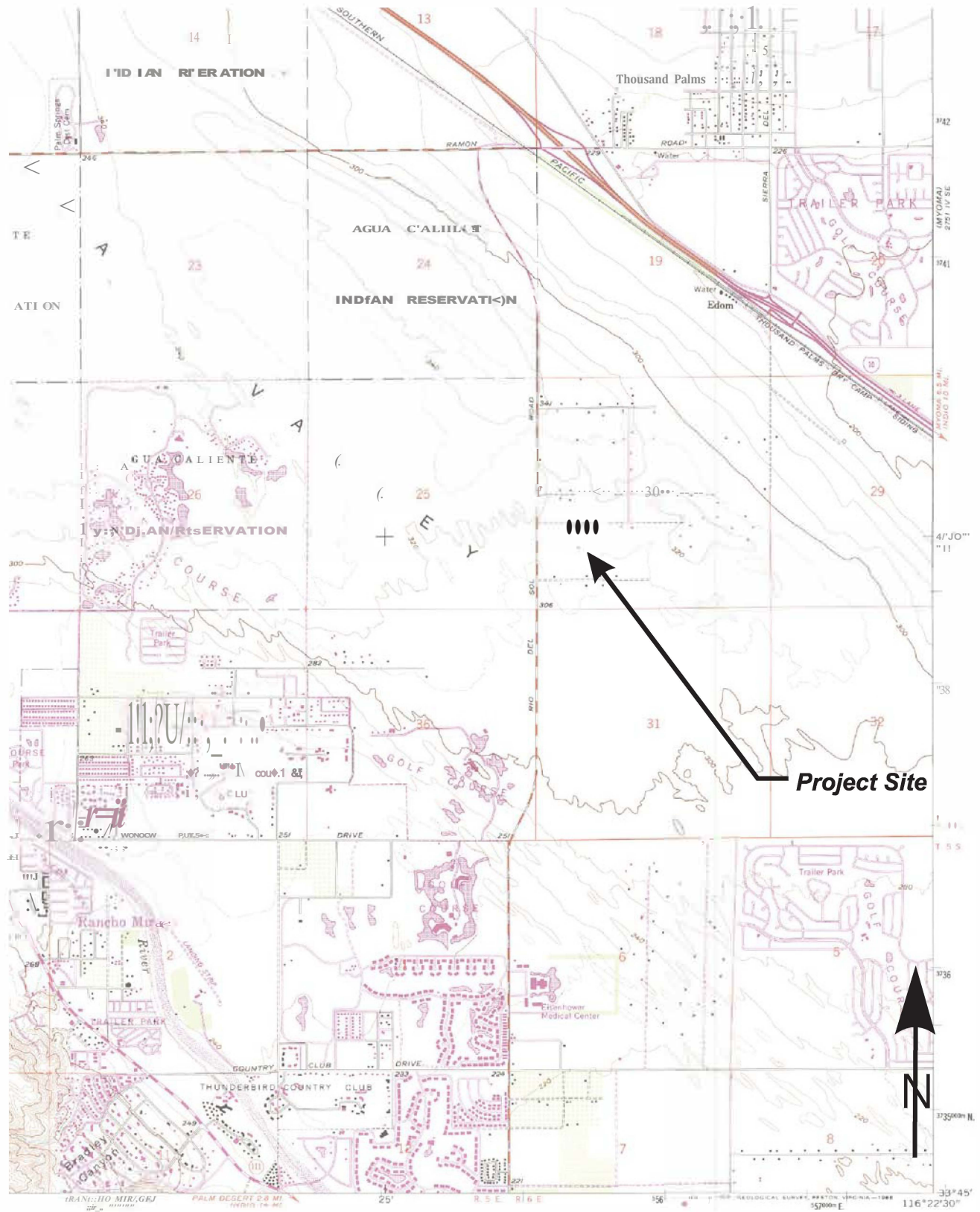
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 18, 2018-Aug 22, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------------|----------------|
| MaB | Myoma fine sand, 0 to 5 percent slopes | 80.5 | 60.4% |
| MaD | Myoma fine sand, 5 to 15 percent slopes | 52.7 | 39.6% |
| Totals for Area of Interest | | 133.2 | 100.0% |



LANDMARK

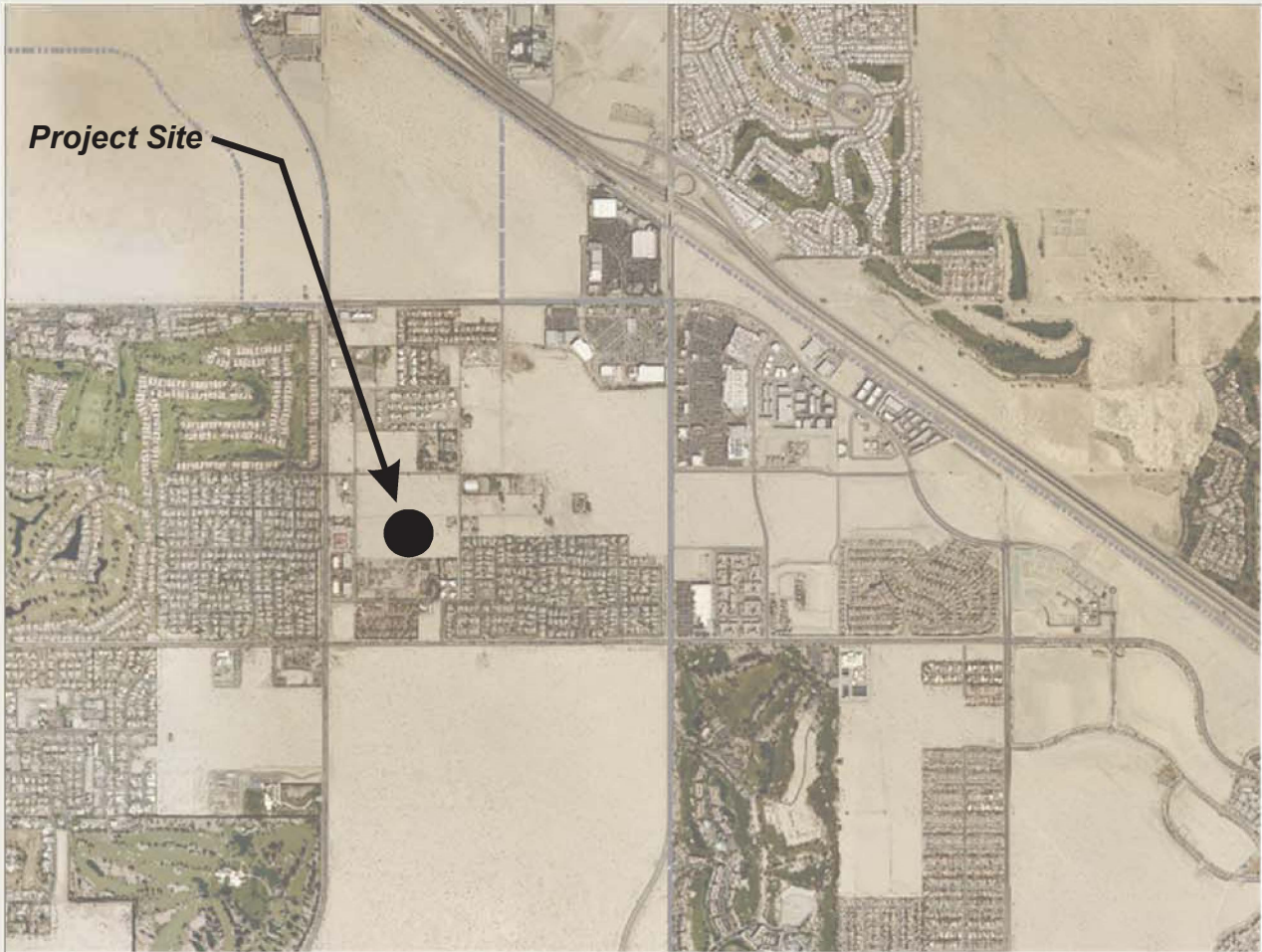
Geo-Engineers and Geologists

Project No.: LP21209

Topographic Map

Plate
A-4

Fault Map



Legend

- Faults**
 (THESE ARE NOT TO SCALE)
 - ANGELES FAULT
 - THERRSIDE COULP
- Fault Zones**
 - O, G, T, U, D, S, R
 - COUNTY FAULT ZONE
 - B, S, T, D, E, I, L, U, T, O, F
 - SAN ANDREAS FAULT ZONE
 - SAN JACINTO FAULT ZONE

Notes



0 3,009 6,019 Feet

"IMPORTANT" Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

REPORT PRINTED ON: 11/11/2018 9:09:04 AM

Riverside County GIS

LANDMARK

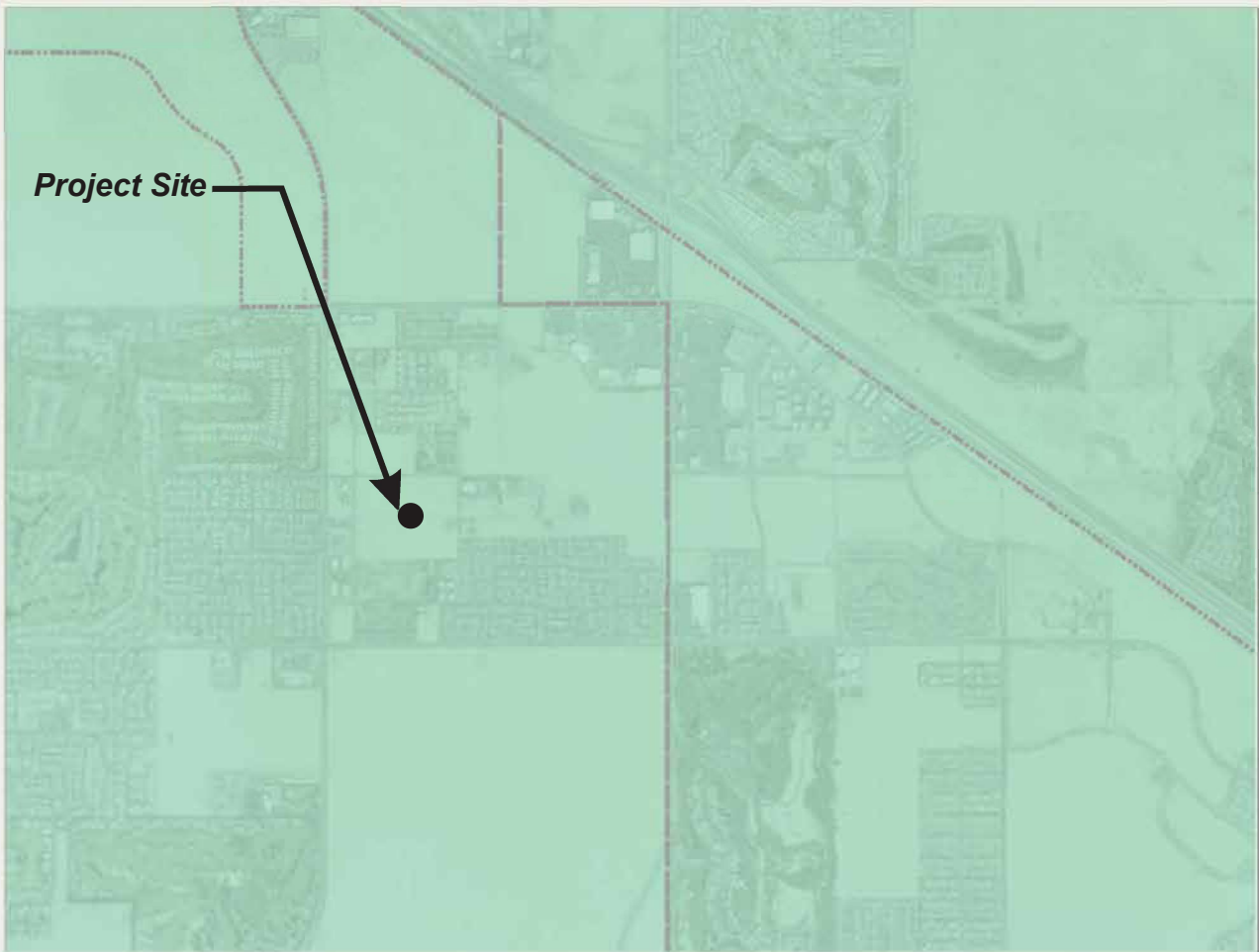
Geo-Engineers and Geologists

Project No.: LP21209

**Riverside County
Geographic Information System (GIS)
Fault Map**

**Plate
A-5**

Subsidence Map



Legend

- Subsidence**
- Directly
 - Indirect
 - Subsidence

Notes



IMPORTANT Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

REPORT PRINTED ON 11/8/2018 9:07:28 AM

Riverside County GIS

LANDMARK

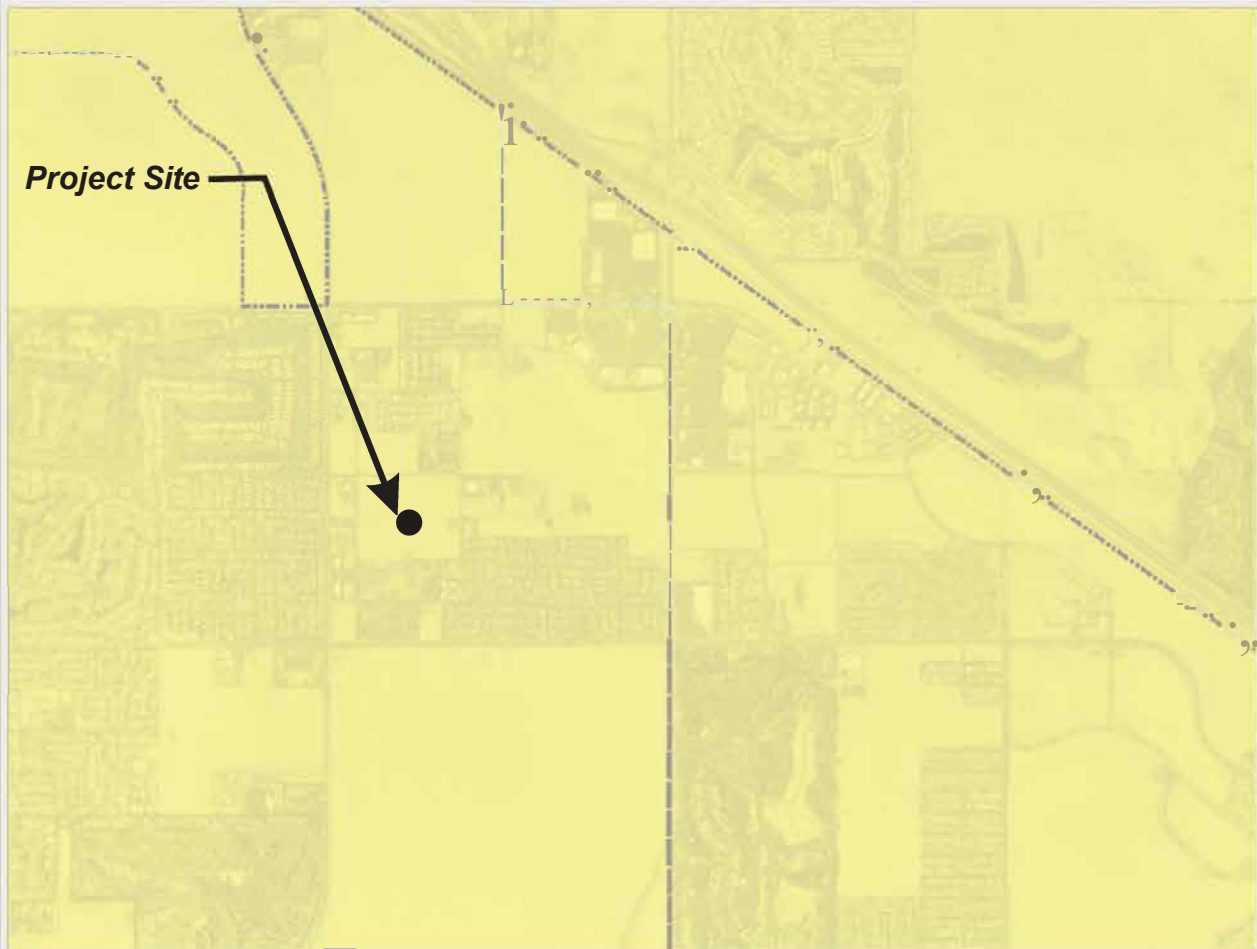
Geo-Engineers and Geologists

Project No.: LP21209

**Riverside County
Geographic Information System (GIS)
Subsidence**

**Plate
A-6**

Liquefaction Map



Legend

- Liquefaction
- High
 - Low
 - 4k to 10k
 - 10k to 15k
 - 15k to 20k

Notes



0

0 3,000 6,000 Feet

"IMPORTANT" Maps and data are to be used for reference purposes only. Map features are approximate and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any or the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

REPORT PRINTED ON 11/18/2018 9:08:14 AM

Riverside County GIS

LANDMARK
Geo-Engineers and Geologists

Project No.: LP21209

Riverside County
Geographic Information System (GIS)
Liquefaction Zones

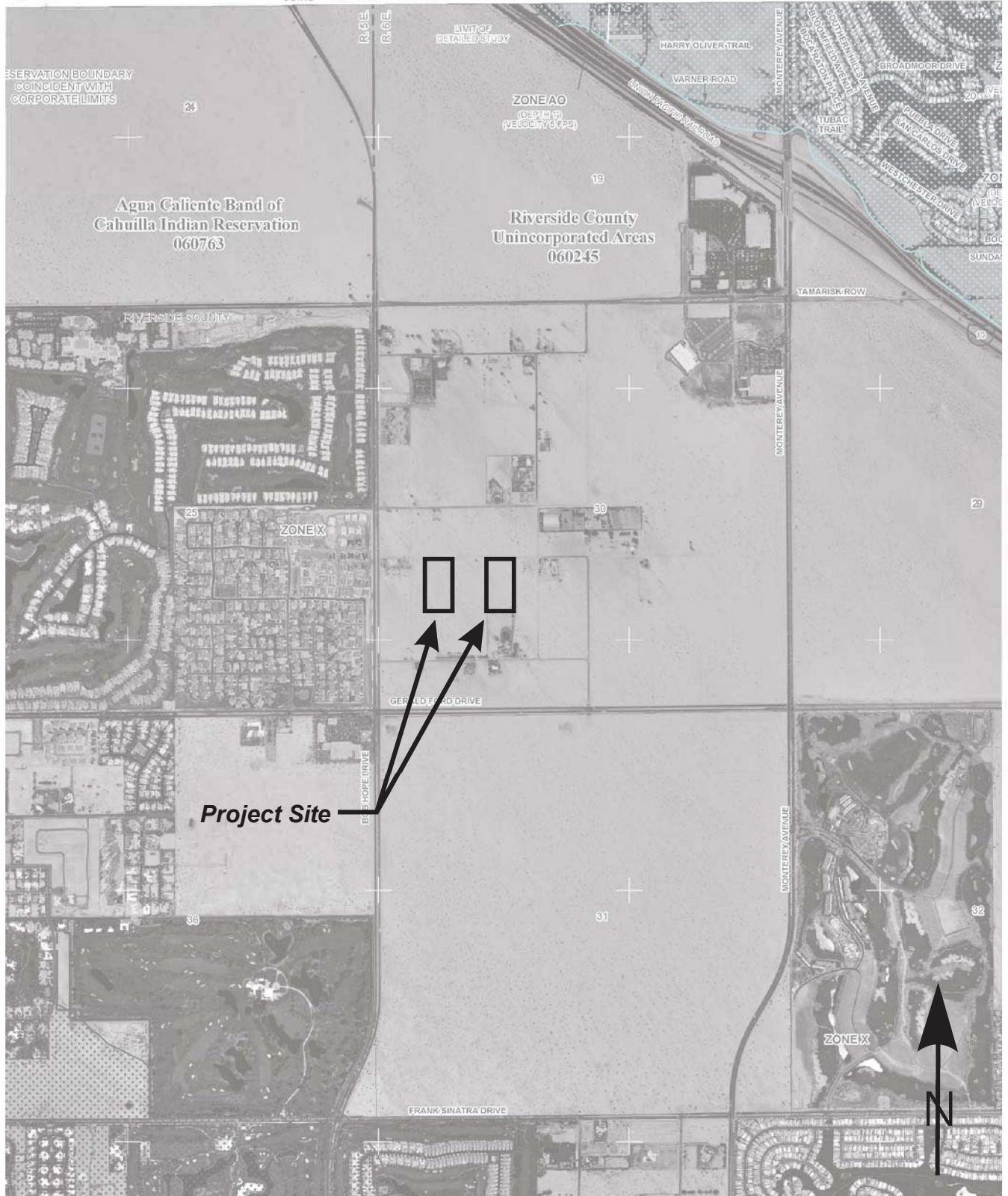
Plate
A-7

6510000 FT

JOINS PANEL 1585

6515000 FT

6520000 FT



APPENDIX B

[illegible]

[illegible]

| FIELD | | | | LOG OF TEST PIT NO. T-3 | | LABORATORY | | |
|----------------------------|--|-------------|------------|---|--|------------------------------|-------------|--|
| W | | USCS CLASS. | BLOW COUNT | DESCRIPTION OF MATERIAL | | MOISTURE CONTENT (% dry wt.) | OTHER TESTS | |
| DEPTH | | | | | | | | |
| 10 | | | | SAND (SP): Gray-brown, dry, medium dense, medium to fine grained | | | | |
| 5 | | | | | | | | |
| 15 | | | | Total Depth = 10.0 ft. Moisture and density values by Nuclear Densometer (ASTM 6938) Backfilled with excavated soil | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |
| 30 | | | | | | | | |
| DATE EXCAVATED: 8/4/21 | | | | TOTAL DEPTH: 10.0 feet | | DEPTH TO WATER: N/A | | |
| LOGGED BY: J. Lorenzana | | | | TYPE OF BIT: Backhoe | | DIAMETER: N/A | | |
| SURFACE ELEVATION: 31.5 ft | | | | HAMMER WT.: N/A | | DROP: N/A | | |
| PROJECT NO. LP21209 | | | | LANDMARK Geo-Engineers and Geologists | | PLATE 8-3 | | |

| FIELD | | | | LOG OF TEST PIT NO. T-4 | | LABORATORY | | |
|--------------------------|--|--|------------|------------------------------|--|---------------------|------------------------------|-------------|
| W a | | USCS CLASS. | BLOW COUNT | DESCRIPTION OF MATERIAL | | TYPE OF SOIL | MOISTURE CONTENT (% dry wt.) | OTHER TESTS |
| 1 | | SAND (SP): Gray-brown, dry, medium dense, medium to fine grained | | | SAND (SP): Gray-brown, dry, medium dense, medium to fine grained | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | Total Depth = 9.0 ft. Moisture and density values by Nuclear Densometer (ASTM 6938) Backfilled with excavated soil | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| DATE EXCAVATED: 8/4/21 | | | | TOTAL DEPTH: 9.0 feet | | DEPTH TO WATER: N/A | | |
| LOGGED BY: J. Lorenzana | | | | TYPE OF BIT: Backhoe | | DIAMETER: N/A | | |
| SURFACE ELEVATION: 315.1 | | | | HAMMER WT.: N/A | | DROP: N/A | | |
| PROJECT NO. LP21209 | | | | LANDMARK | | PLATE 8-4 | | |
| | | | | Geo-Engineers and Geologists | | | | |

| DEPTH | FIELD | | | LOG OF TEST PIT NO. T-5 SHEET NO. 1 DESCRIPTION OF MATERIAL | LABORATORY | | |
|-------|-------------------|--|------------|---|-------------------|------------------------------|-------------|
| | WATER CONTENT (%) | USCS CLASS. | BLOW COUNT | | WATER CONTENT (%) | MOISTURE CONTENT (% dry wt.) | OTHER TESTS |
| 5 | | SAND (SP): Gray-brown, dry, medium dense, medium to fine grained | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 10 | | Total Depth = 9.0 ft. Moisture and density values by Nuclear Densometer (ASTM 6938) Backfilled with excavated soil | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 15 | | | | | | | |
| 20 | | | | | | | |
| 25 | | | | | | | |
| 30 | | | | | | | |

DATE EXCAVATED: 8/4/21

LOGGED BY: J. Lorenzana

SURFACE ELEVATION: Approx. 3.15 ft

TOTAL DEPTH: 9.0 feet

TYPE OF BT: Backhoe

HAMMER WT.: N/A

DEPTH TO WATER: N/A

DIAMETER: N/A

DROP: N/A

PROJECT NO. LP21209

LANDMARK

Geo-Engineers and Geologists

PLATE 8-5

[illegible]

DEFINITION OF TERMS

| PRIMARY DIVISIONS | | SYMBOLS | | SECONDARY DIVISIONS | |
|--|--|------------------------------------|--|---------------------|---|
| Coarse grained soils More than half of material is larger than No. 200 sieve | Gravels | Clean gravels (less than 5% fines) | | GW | Well graded gravels, gravel-sand mixtures, little or no fines |
| | More than half of coarse fraction is larger than No. 4 sieve | Gravel with fines | | GP | Poorly graded gravels, or gravel-sand mixtures, little or no fines |
| | | | | GM | Silty gravels, gravel-sand-silt mixtures, non-plastic fines |
| | | | | GC | Clayey gravels, gravel-sand-clay mixtures, plastic fines |
| | | | | SW | Well graded sands, gravelly sands, little or no fines |
| | Sands | Clean sands (less than 5% fines) | | SP | Poorly graded sands or gravelly sands, little or no fines |
| Fine grained soils More than half of material is smaller than No. 200 sieve | Silts and clays | Liquid limit is less than 50% | | ML | Inorganic silts, clayey silts with slight plasticity |
| | | | | CL | Inorganic clays of low to medium plasticity, gravelly, sandy, or lean clays |
| | | | | OL | Organic silts and organic clays of low plasticity |
| | Silts and clays | Liquid limit is more than 50% | | MH | Inorganic silts, micaceous or diatomaceous silty soils, elastic silts |
| | | | | CH | Inorganic clays of high plasticity, fat clays |
| | | | | OH | Organic clays of medium to high plasticity, organic silts |
| Highly organic soils | | | | P T | Peat and other highly organic soils |

GRAIN SIZES

| Silts and Clays | Sand | | | Gravel | | Cobbles | Boulders |
|-----------------|--------------------------|--------|--------|-----------------------|--------|---------|----------|
| | Fine | Medium | Coarse | Fine | Coarse | | |
| | 200 | 40 | 10 | 4 | 3/4" | 3" | 12" |
| | US Standard Series Sieve | | | Clear Square Openings | | | |

| Sands, Gravels, etc. | Blows/ft.* |
|----------------------|------------|
| Very Loose | 0-4 |
| Loose | 4-10 |
| Medium Dense | 10-30 |
| Dense | 30-50 |
| Very Dense | Over 50 |

| Clays & Plastic Silts | Strength** | Blows/ft.* |
|-----------------------|------------|------------|
| Very Soft | 0-0.25 | 0-2 |
| Soft | 0.25-0.5 | 2-4 |
| Firm | 0.5-1.0 | 4-8 |
| Stiff | 1.0-2.0 | 8-16 |
| Very Stiff | 2.0-4.0 | 16-32 |
| Hard | Over 4.0 | Over 32 |

* Number of blows of 140 lb. hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 in. I.D.) split spoon (ASTM D1586).

** Unconfined compressive strength in tons/s.f. as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D1586), Pocket Penetrometer, Torvane, or visual observation.

Type of Samples:

◆ Ring Sample Standard Penetration Test Shelby Tube Bulk (Bag) Sample

Drilling Notes:

1 Sampling and Blow Counts

Ring Sampler - Number of blows per foot of a 140 lb. hammer falling 30 inches.

Standard Penetration Test - Number of blows per foot.

Shelby Tube - Three (3) inch nominal diameter tube hydraulically pushed.

2 P. P. = Pocket Penetrometer (tons/s.f.).

3 NR = No recovery.

4 GWT ◆ = Ground Water Table observed @ specified time.

LANDMARK
Geo-Engineers and Geologists

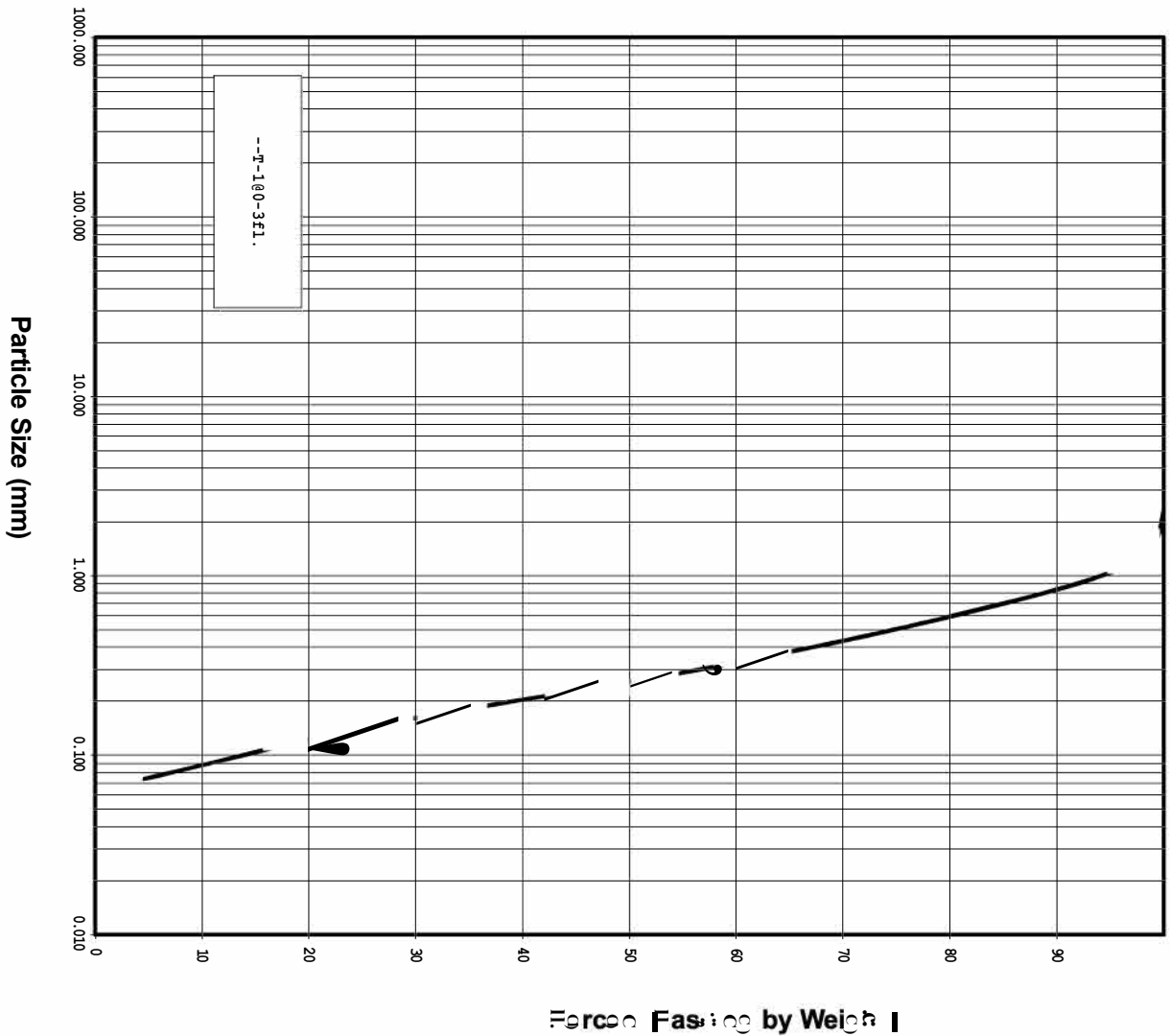
Project No. LP21209

Key to Logs

Plate
B-7

APPENDIX C

| SIEVE ANALYSIS | | | | | |
|----------------------|--------|------|--------|--------|---------------|
| Cobbles and Boulders | Gravel | | Sand | | Silt and Clay |
| | Coarse | Fine | Coarse | Medium | Fine |



LANDMARK CONSULTANTS, INC.

CLIENT: La Paloma Homes

PROJECT: APN 685-100-009 & 011 – Rancho Mirage, CA

JOB No.: LP21209

DATE: 08/18/21

CHEMICAL ANALYSIS

| | | |
|---|--------|-----------------|
| Boring: | T-1 | Caltrans |
| Sample Depth, ft: | 0-3 | Method |
| pH: | 8.6 | 643 |
| Electrical Conductivity (mmhos): | -- | 424 |
| Resistivity (ohm-cm): | 10,700 | 643 |
| Chloride (Cl), ppm: | 50 | 422 |
| Sulfate (S04), ppm: | 5 | 417 |

General Guidelines for Soil Corrosivity

| Material Affected | Chemical Agent | Amount in Soil (ppm) | Degree of Corrosivity |
|--------------------|-------------------|----------------------|-----------------------|
| Concrete | Soluble Sulfates | 0-1,000 | Low |
| | | 1,000 - 2,000 | Moderate |
| | | 2,000 - 20,000 | Severe |
| | | > 20,000 | Very Severe |
| Normal Grade Steel | Soluble Chlorides | 0-200 | Low |
| | | 200- 700 | Moderate |
| | | 700 -1,500 | Severe |
| | | > 1,500 | Very Severe |
| Normal Grade Steel | Resistivity | 1-1,000 | Very Severe |
| | | 1,000 - 2,000 | Severe |
| | | 2,000 - 10,000 | Moderate |
| | | > 10,000 | Low |

LANDMARK
Geo-Engineers and Geologists

Project No.: LP21209

**Selected Chemical
Test Results**

**Plate
C-2**

LANDMARK CONSULTANTS, INC.

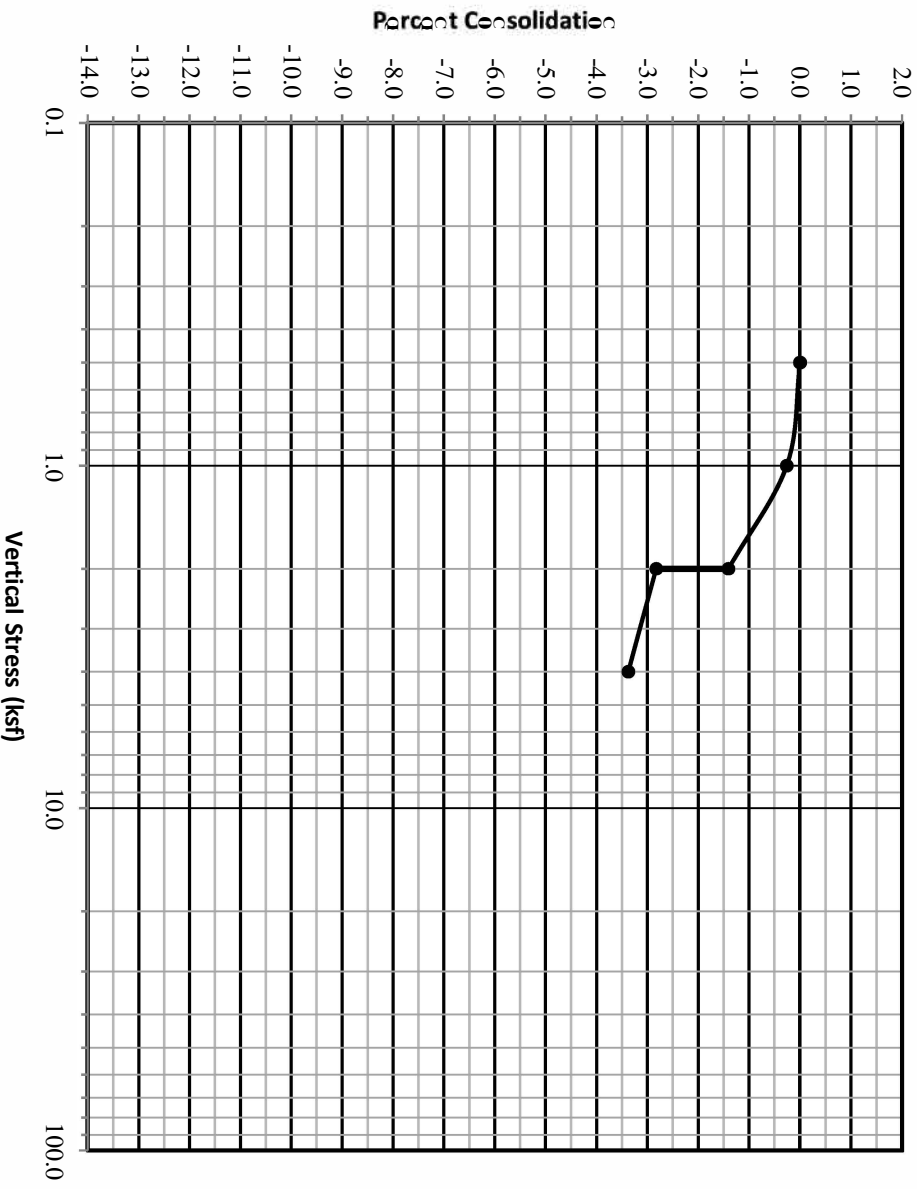
CLIENT: La Paloma Homes

PROJECT: APNs 685-100-009 & 011

JOB NO: LP21209

DATE: 8/12/2021

COLAPSE POTENTIAL TEST (ASTM D5333)



Collapse Potential: 1.4 % (Slight)

Results of Test

| | | |
|--|-------------------------|-------|
| Sample Location: T-1 @ 5 ft. | Initial | Final |
| Soil Type: Gray Brown Sand (SM/SP) | Dry Density (pcf): 94.3 | 102.0 |
| Overburden Pressure, P _o : 0.48 ksf | Water Content (%): 1.4 | 24.5 |
| | Void Ratio (e): 0.754 | 0.622 |
| | Saturation(%): 5.0 | 104.5 |



Geo-Engineers and Geologists

Project No.: LP21209

One Dimensional Consolidation
Test Results

Plate
C-3

Client: La Paloma Homes

Soil Description: Lt brown Sand (SP-SM)

Project: APN 2685-100-009 & 011 - Rancho Mirage, CA

Sample Location: 11 @ 0-2 ft

Project No.: LB21209

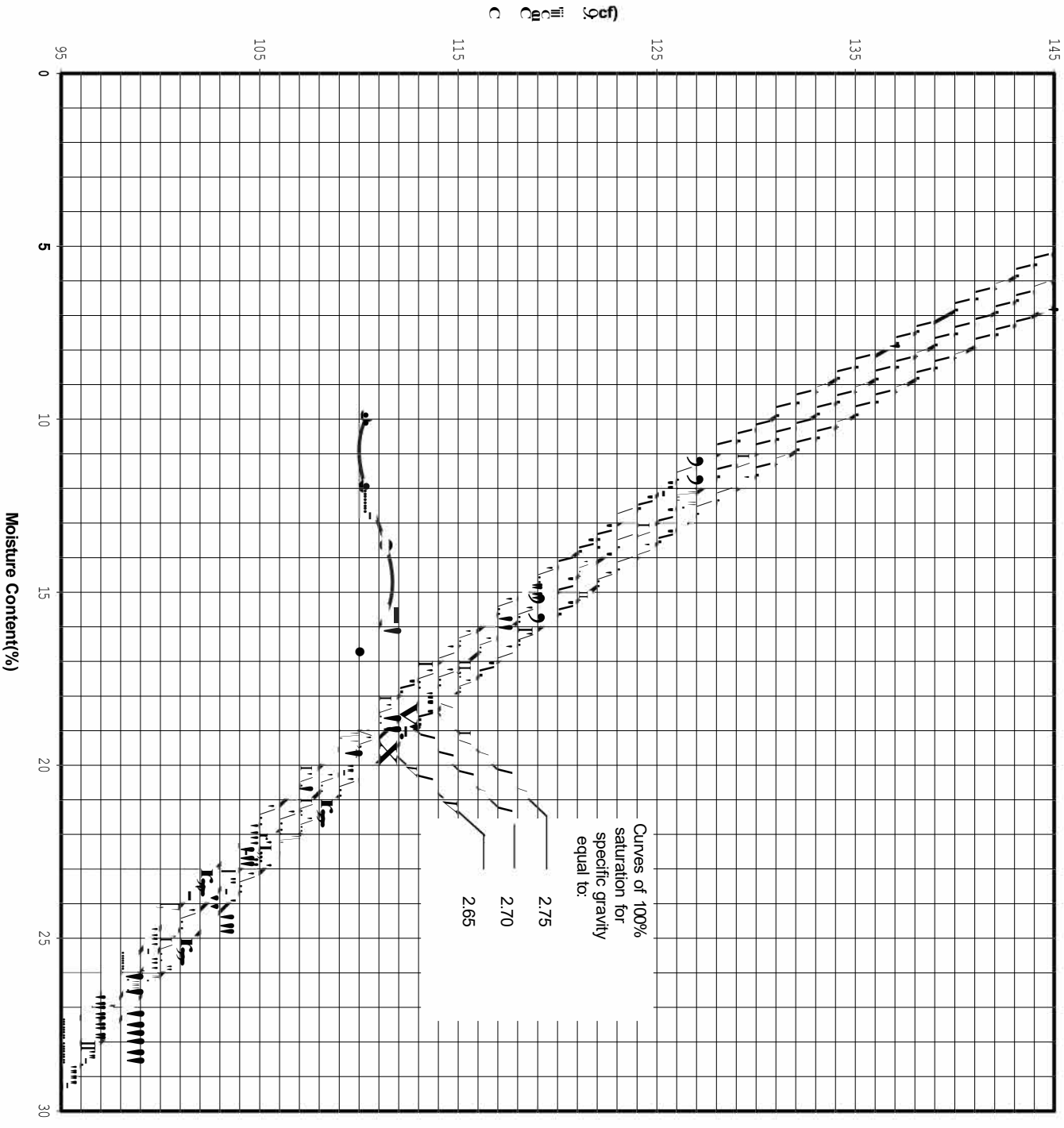
Test Method: ASTM D-1557 A

Date: 8/11/2021

Maximum Dry Density (pcf): 111.7

Lab. No.: N/A

Optimum Moisture Content (%): 14.7



LANDMARK

Geo-Engineers and Geologists

Project No.: LP21209

Moisture Density Relationship

Plate
C-4

APPENDIX D

DOUBLE RING INFILTRATION RATE CALCULATIONS

| | | | | | | | | | | | | | |
|--|--|--------------------|----------------------|--------------------|---------------------------|---------------|--------------------|-----------------|------------------|---------------|--------------|----------------|-----|
| Job No.: <u>LP21209</u> | | INNER RING | | | | | | | | | | | |
| Test Hole: <u>11</u> | | Interval Number | Initial Water(cm) | Final Water(cm) | Con. Factor (cm to in) | Water (in) | Area Mar. (in2) | Volume (in3) | Area IR (in2) | Time (min) | Time (hr) | Vir (in/hr) | |
| Date: <u>8/5/2021</u> | | 1 | 40 | 19 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 | |
| | | 2 | 37 | 19 | 0.39 | 7.1 | 8.9 | 63.4 | 113.1 | 4 | 0.07 | 8.4 | |
| | | 3 | 42 | 19 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 | |
| | | 4 | 30 | 12 | 0.39 | 7.1 | 8.9 | 63.4 | 113.1 | 4 | 0.07 | 8.4 | |
| | | 5 | 48 | 24 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 | |
| | | 6 | 50 | 30 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 | |
| | | 7 | 30 | 8 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 | |
| | | 8 | 49 | 25 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 | |
| | | 9 | 25 | 3 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 | |
| | | 10 | 50 | 25 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | |
| | | 11 | 25 | 4 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 | |
| | | 12 | 50 | 26 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 | |
| | | 13 | 26 | 5 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 | |
| AVERAGE RATE* = <table border="1"><tr><td>10.4</td></tr></table> | | 10.4 | 14 | 48 | 27 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 |
| 10.4 | | | | | | | | | | | | | |
| (in/hr) | | 15 | 27 | 5 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 | |
| | | 16 | 47 | 26 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 | |
| | | 17 | 26 | 4 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 | |
| | | 18 | 50 | 25 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | |
| | | 19 | 25 | 5 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 | |
| | | 20 | 48 | 24 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 | |
| | | 21 | 45 | 23 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 | |
| | | 22 | 50 | 25 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | |
| | | 23 | 25 | 5 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 | |
| | | 24 | 49 | 26 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 | |
| | | 25 | 26 | 2 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 | |
| | | 26 | | | | | | | | | | | |
| | | 27 | | | | | | | | | | | |
| | | 28 | | | | | | | | | | | |
| | | 29 | | | | | | | | | | | |
| | | 30 | | | | | | | | | | | |

DOUBLE RING INFILTRATION RATE CALCULATIONS

| | | | | | | | | | | | | |
|--|--|--------------------|----------------------|--------------------|---------------------------|---------------|--------------------|-----------------|------------------|---------------|--------------|----------------|
| Job No.: <u>LP21209</u> | | INNER RING | | | | | | | | | | |
| Test Hole: <u>12</u> | | Interval Number | Initial Water(cm) | Final Water(cm) | Con. Factor (cm to in) | Water (in) | Area Mar. (in2) | Volume (in3) | Area IR (in2) | Time (min) | Time (hr) | Vir (in/hr) |
| Date: <u>8/5/2021</u> | | 1 | 40 | 10 | 0.39 | 11.8 | 8.9 | 105.6 | 113.1 | 4 | 0.07 | 14.0 |
| | | 2 | 37 | 19 | 0.39 | 7.1 | 8.9 | 63.4 | 113.1 | 4 | 0.07 | 8.4 |
| | | 3 | 45 | 22 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 |
| | | 4 | 35 | 13 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 |
| | | 5 | 38 | 13 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 |
| | | 6 | 45 | 22 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 |
| | | 7 | 37 | 13 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 8 | 59 | 35 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 9 | 35 | 15 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 |
| | | 10 | 40 | 15 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 |
| | | 11 | 35 | 15 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 |
| | | 12 | 50 | 28 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 |
| | | 13 | 28 | 4 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| AVERAGE RATE* = <div>10.4</div> (in/hr) | | 14 | 49 | 26 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 |
| | | 15 | 26 | 5 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 |
| | | 16 | 57 | 35 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 |
| | | 17 | 35 | 15 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 |
| | | 18 | 50 | 27 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 |
| | | 19 | 27 | 5 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 |
| | | 20 | 48 | 22 | 0.39 | 10.2 | 8.9 | 91.5 | 113.1 | 4 | 0.07 | 12.1 |
| | | 21 | 22 | 9 | 0.39 | 5.1 | 8.9 | 45.8 | 113.1 | 4 | 0.07 | 6.1 |
| | | 22 | 50 | 26 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 23 | 26 | 2 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 24 | 55 | 30 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 |
| | | 25 | 30 | 12 | 0.39 | 7.1 | 8.9 | 63.4 | 113.1 | 4 | 0.07 | 8.4 |
| | | 26 | | | | | | | | | | |
| | | 27 | | | | | | | | | | |
| | | 28 | | | | | | | | | | |
| | | 29 | | | | | | | | | | |
| | | 30 | | | | | | | | | | |

DOUBLE RING INFILTRATION RATE CALCULATIONS

| Job No.: <u>LP21209</u> | | INNER RING | | | | | | | | | | | |
|---|----|-----------------|-------------------|-----------------|------------------------|------------|-----------------|--------------|---------------|------------|-----------|-------------|------|
| Test Hole: <u>13</u> | | Interval Number | Initial Water(cm) | Final Water(cm) | Con. Factor (cm to in) | Water (in) | Area Mar. (in2) | Volume (in3) | Area IR (in2) | Time (min) | Time (hr) | Vir (in/hr) | |
| Date: <u>8/5/2021</u> | | 1 | 50 | 20 | 0.39 | 11.8 | 8.9 | 105.6 | 113.1 | 4 | 0.07 | 14.0 | |
| | | 2 | 40 | 15 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | |
| | | 3 | 45 | 22 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 | |
| | | 4 | 22 | 3 | 0.39 | 7.5 | 8.9 | 66.9 | 113.1 | 4 | 0.07 | 8.9 | |
| | | 5 | 38 | 13 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | |
| | | 6 | 45 | 22 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 | |
| | | 7 | 22 | 4 | 0.39 | 7.1 | 8.9 | 63.4 | 113.1 | 4 | 0.07 | 8.4 | |
| | | 8 | 55 | 40 | 0.39 | 5.9 | 8.9 | 52.8 | 113.1 | 4 | 0.07 | 7.0 | |
| | | 9 | 40 | 19 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 | |
| | | 10 | 40 | 15 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | |
| | | 11 | 35 | 15 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 | |
| | | 12 | 50 | 28 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 | |
| | | 13 | 28 | 6 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 | |
| AVERAGE RATE* = <table><tr><td>10.3</td></tr></table> (in/hr) | | 10.3 | 14 | 49 | 25 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| 10.3 | | | | | | | | | | | | | |
| 15 | 25 | 5 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 | | | |
| 16 | 55 | 30 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | | | |
| 17 | 30 | 15 | 0.39 | 5.9 | 8.9 | 52.8 | 113.1 | 4 | 0.07 | 7.0 | | | |
| 18 | 50 | 27 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 | | | |
| 19 | 27 | 5 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 | | | |
| 20 | 48 | 22 | 0.39 | 10.2 | 8.9 | 91.5 | 113.1 | 4 | 0.07 | 12.1 | | | |
| 21 | 22 | 11 | 0.39 | 4.3 | 8.9 | 38.7 | 113.1 | 4 | 0.07 | 5.1 | | | |
| 22 | 50 | 25 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | | | |
| 23 | 25 | 2 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 | | | |
| 24 | 55 | 30 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 | | | |
| 25 | 30 | 12 | 0.39 | 7.1 | 8.9 | 63.4 | 113.1 | 4 | 0.07 | 8.4 | | | |
| 26 | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |

DOUBLE RING INFILTRATION RATE CALCULATIONS

| Job No.: LP21209 | | INNER RING | | | | | | | | | | |
|------------------------------|--|-----------------|-------------------|-----------------|------------------------|------------|-----------------|--------------|---------------|------------|-----------|-------------|
| Test Hole: 14 | | Interval Number | Initial Water(cm) | Final Water(cm) | Con. Factor (cm to in) | Water (in) | Area Mar. (in2) | Volume (in3) | Area IR (in2) | Time (min) | Time (hr) | Vir (in/hr) |
| Date: 8/5/2021 | | 1 | 50 | 29 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 |
| | | 2 | 29 | 9 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 |
| | | 3 | 52 | 29 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 |
| | | 4 | 29 | 2 | 0.39 | 10.6 | 8.9 | 95.1 | 113.1 | 4 | 0.07 | 12.6 |
| | | 5 | 48 | 24 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 6 | 24 | 2 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 |
| | | 7 | 30 | 8 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 |
| | | 8 | 49 | 25 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 9 | 25 | 3 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 |
| | | 10 | 50 | 25 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 |
| | | 11 | 25 | 4 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 |
| | | 12 | 50 | 26 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 13 | 26 | 5 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 |
| AVERAGE RATE* = 10.9 (in/hr) | | 14 | 52 | 29 | 0.39 | 9.1 | 8.9 | 81.0 | 113.1 | 4 | 0.07 | 10.7 |
| | | 15 | 29 | 5 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 16 | 47 | 26 | 0.39 | 8.3 | 8.9 | 73.9 | 113.1 | 4 | 0.07 | 9.8 |
| | | 17 | 26 | 4 | 0.39 | 8.7 | 8.9 | 77.5 | 113.1 | 4 | 0.07 | 10.3 |
| | | 18 | 50 | 25 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 |
| | | 19 | 25 | 5 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 |
| | | 20 | 50 | 24 | 0.39 | 10.2 | 8.9 | 91.5 | 113.1 | 4 | 0.07 | 12.1 |
| | | 21 | 24 | 13 | 0.39 | 4.3 | 8.9 | 38.7 | 113.1 | 4 | 0.07 | 5.1 |
| | | 22 | 50 | 25 | 0.39 | 9.8 | 8.9 | 88.0 | 113.1 | 4 | 0.07 | 11.7 |
| | | 23 | 25 | 5 | 0.39 | 7.9 | 8.9 | 70.4 | 113.1 | 4 | 0.07 | 9.3 |
| | | 24 | 52 | 26 | 0.39 | 10.2 | 8.9 | 91.5 | 113.1 | 4 | 0.07 | 12.1 |
| | | 25 | 26 | 2 | 0.39 | 9.4 | 8.9 | 84.5 | 113.1 | 4 | 0.07 | 11.2 |
| | | 26 | | | | | | | | | | |
| | | 27 | | | | | | | | | | |
| | | 28 | | | | | | | | | | |
| | | 29 | | | | | | | | | | |
| | | 30 | | | | | | | | | | |

**100-YR / ONSITE SYNTHETIC UNIT
HYDROGRAPH ANALYSIS
(POST DEVELOPED CONDITION)**

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012, Version 8.2
Study date 02/09/22 File: PR100YR1HR1100.out

+++++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6312

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

PROPOSED CONDITION 100-YEAR / 1-HOUR SUH ONSITE RUNOFF
jn 21091 MARK HOWARD
02-09-2022
FOMOTOR ENGINEERING

Drainage Area = 4.89(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.89(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 200.00(Ft.)
Length along longest watercourse measured to centroid = 100.00(Ft.)
Length along longest watercourse = 0.038 Mi.
Length along longest watercourse measured to centroid = 0.019 Mi.
Difference in elevation = 1.00(Ft.)
Slope along watercourse = 26.4000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.012 Hr.
Lag time = 0.74 Min.
25% of lag time = 0.19 Min.
40% of lag time = 0.30 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 4.89 | 0.37 | 1.81 |

100 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 4.89 | 1.65 | 8.07 |

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.370(In)
Area Averaged 100-Year Rainfall = 1.650(In)

Point rain (area averaged) = 1.650(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.650(In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %
4.890 78.00 0.521
Total Area Entered = 4.89(Ac.)

| | | | | | | |
|------|-------|-------------|------------|------------------|--------|-----------------|
| RI | RI | Infil. Rate | Impervious | Adj. Infil. Rate | Area% | F |
| AMC2 | AMC-2 | (In/Hr) | (Dec.%) | (In/Hr) | (Dec.) | (In/Hr) |
| 78.0 | 78.0 | 0.268 | 0.521 | 0.142 | 1.000 | 0.142 |
| | | | | | | Sum (F) = 0.142 |

Area averaged mean soil loss (F) (In/Hr) = 0.142

Minimum soil loss rate ((In/Hr)) = 0.071

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.483

Slope of intensity-duration curve for a 1 hour storm =0.5800

Unit Hydrograph DESERT S-Curve

Unit Hydrograph Data

| Unit time period (hrs) | Time % of lag | Distribution Graph % | Unit Hydrograph (CFS) |
|---------------------------|---------------|-------------------------|--------------------------|
| 1 | 0.083 | 675.198 | 78.105 |
| 2 | 0.167 | 1350.397 | 21.895 |
| | | Sum = 100.000 | Sum= 4.928 |

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

| Unit Time (Hr.) | Pattern Percent | Storm Rain (In/Hr) | Loss rate(In./Hr) | | Effective (In/Hr) |
|--------------------|--------------------|-----------------------|-------------------|----------|----------------------|
| | | | Max | Low | |
| 1 | 0.08 | 3.60 | 0.713 | (0.344) | 0.571 |
| 2 | 0.17 | 4.20 | 0.832 | (0.402) | 0.689 |
| 3 | 0.25 | 4.40 | 0.871 | (0.421) | 0.729 |
| 4 | 0.33 | 4.60 | 0.911 | (0.440) | 0.769 |
| 5 | 0.42 | 5.00 | 0.990 | (0.478) | 0.848 |
| 6 | 0.50 | 5.60 | 1.109 | (0.536) | 0.967 |
| 7 | 0.58 | 6.40 | 1.267 | (0.612) | 1.125 |
| 8 | 0.67 | 8.10 | 1.604 | (0.775) | 1.462 |
| 9 | 0.75 | 13.10 | 2.594 | (1.253) | 2.452 |
| 10 | 0.83 | 34.50 | 6.831 | (3.299) | 6.689 |
| 11 | 0.92 | 6.70 | 1.327 | (0.641) | 1.184 |
| 12 | 1.00 | 3.80 | 0.752 | (0.363) | 0.610 |

(Loss Rate Not Used)

Sum = 100.0

Sum = 18.1

Flood volume = Effective rainfall 1.51(In)

times area 4.9(Ac.) / [(In) / (Ft.)] = 0.6(Ac.Ft)

Total soil loss = 0.14(In)

Total soil loss = 0.058(Ac.Ft)

Total rainfall = 1.65(In)

Flood volume = 26764.6 Cubic Feet

Total soil loss = 2522.8 Cubic Feet

Peak flow rate of this hydrograph = 28.406(CFS)

+++++

1 - H O U R S T O R M R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume | Ac.Ft | Q(CFS) | 0 | 7.5 | 15.0 | 22.5 | 30.0 |
|-----------|--------|-------|--------|---|-----|------|------|------|
| 0+ 5 | 0.0151 | 2.20 | V Q | | | | | |
| 0+10 | 0.0377 | 3.27 | V Q | | | | | |
| 0+15 | 0.0621 | 3.55 | Q | | | | | |
| 0+20 | 0.0879 | 3.75 | QV | | | | | |
| 0+25 | 0.1161 | 4.09 | Q V | | | | | |

| | | | | | | | | | |
|------|--------|-------|---|---|---|---|---|---|---|
| 0+30 | 0.1481 | 4.64 | | Q | V | | | | |
| 0+35 | 0.1851 | 5.38 | | Q | | V | | | |
| 0+40 | 0.2322 | 6.84 | | | Q | | V | | |
| 0+45 | 0.3081 | 11.02 | | | | Q | V | | |
| 0+50 | 0.5038 | 28.41 | | | | | | V | Q |
| 0+55 | 0.5849 | 11.78 | | | | Q | | | V |
| 1+ 0 | 0.6099 | 3.63 | | Q | | | | | V |
| 1+ 5 | 0.6144 | 0.66 | Q | | | | | | V |

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012, Version 8.2
Study date 08/11/21 File: PR100YR3HR3100.out

+++++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6312

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

PROPOSED CONDITION 100-YEAR / 3-HOUR SUH RUNOFF
JN 21091 MARK HOWARD
08-11-2021
FOMOTOR ENGINEERING

Drainage Area = 4.89(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.89(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 200.00(Ft.)
Length along longest watercourse measured to centroid = 100.00(Ft.)
Length along longest watercourse = 0.038 Mi.
Length along longest watercourse measured to centroid = 0.019 Mi.
Difference in elevation = 1.00(Ft.)
Slope along watercourse = 26.4000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.012 Hr.
Lag time = 0.74 Min.
25% of lag time = 0.19 Min.
40% of lag time = 0.30 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 4.89 | 0.62 | 3.01 |

100 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 4.89 | 2.38 | 11.64 |

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.616(In)
Area Averaged 100-Year Rainfall = 2.380(In)

Point rain (area averaged) = 2.380(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.380(In)

Sub-Area Data:

| Area(Ac.) | Runoff Index | Impervious % |
|--------------------------------|--------------|--------------|
| 4.890 | 78.00 | 0.521 |
| Total Area Entered = 4.89(Ac.) | | |

| RI | RI | Infil. Rate | Impervious | Adj. Infil. Rate | Area% | F |
|-----------|-------|-------------|------------|------------------|--------|---------|
| AMC2 | AMC-2 | (In/Hr) | (Dec.%) | (In/Hr) | (Dec.) | (In/Hr) |
| 78.0 | 78.0 | 0.268 | 0.521 | 0.142 | 1.000 | 0.142 |
| Sum (F) = | | | | | | 0.142 |

Area averaged mean soil loss (F) (In/Hr) = 0.142
Minimum soil loss rate ((In/Hr)) = 0.071

(for 24 hour storm duration)
 Soil loss rate (decimal) = 0.483

Unit Hydrograph
 DESERT S-Curve

Unit Hydrograph Data

| Unit time period (hrs) | Time % of lag | Distribution Graph % | Unit Hydrograph (CFS) |
|---------------------------|---------------|-------------------------|--------------------------|
| 1 0.083 | 675.198 | 78.105 | 3.849 |
| 2 0.167 | 1350.397 | 21.895 | 1.079 |
| | Sum = 100.000 | Sum= | 4.928 |

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

| Unit Time (Hr.) | Pattern Percent | Storm Rain (In/Hr) | Loss rate(In./Hr) Max Low | Effective (In/Hr) |
|--------------------|--------------------|-----------------------|--------------------------------|----------------------|
| 1 0.08 | 1.30 | 0.371 | 0.142 (0.179) | 0.229 |
| 2 0.17 | 1.30 | 0.371 | 0.142 (0.179) | 0.229 |
| 3 0.25 | 1.10 | 0.314 | 0.142 (0.152) | 0.172 |
| 4 0.33 | 1.50 | 0.428 | 0.142 (0.207) | 0.286 |
| 5 0.42 | 1.50 | 0.428 | 0.142 (0.207) | 0.286 |
| 6 0.50 | 1.80 | 0.514 | 0.142 (0.248) | 0.372 |
| 7 0.58 | 1.50 | 0.428 | 0.142 (0.207) | 0.286 |
| 8 0.67 | 1.80 | 0.514 | 0.142 (0.248) | 0.372 |
| 9 0.75 | 1.80 | 0.514 | 0.142 (0.248) | 0.372 |
| 10 0.83 | 1.50 | 0.428 | 0.142 (0.207) | 0.286 |
| 11 0.92 | 1.60 | 0.457 | 0.142 (0.221) | 0.315 |
| 12 1.00 | 1.80 | 0.514 | 0.142 (0.248) | 0.372 |
| 13 1.08 | 2.20 | 0.628 | 0.142 (0.304) | 0.486 |
| 14 1.17 | 2.20 | 0.628 | 0.142 (0.304) | 0.486 |
| 15 1.25 | 2.20 | 0.628 | 0.142 (0.304) | 0.486 |
| 16 1.33 | 2.00 | 0.571 | 0.142 (0.276) | 0.429 |
| 17 1.42 | 2.60 | 0.743 | 0.142 (0.359) | 0.600 |
| 18 1.50 | 2.70 | 0.771 | 0.142 (0.373) | 0.629 |
| 19 1.58 | 2.40 | 0.685 | 0.142 (0.331) | 0.543 |
| 20 1.67 | 2.70 | 0.771 | 0.142 (0.373) | 0.629 |
| 21 1.75 | 3.30 | 0.942 | 0.142 (0.455) | 0.800 |
| 22 1.83 | 3.10 | 0.885 | 0.142 (0.428) | 0.743 |
| 23 1.92 | 2.90 | 0.828 | 0.142 (0.400) | 0.686 |
| 24 2.00 | 3.00 | 0.857 | 0.142 (0.414) | 0.715 |
| 25 2.08 | 3.10 | 0.885 | 0.142 (0.428) | 0.743 |
| 26 2.17 | 4.20 | 1.199 | 0.142 (0.580) | 1.057 |
| 27 2.25 | 5.00 | 1.428 | 0.142 (0.690) | 1.286 |
| 28 2.33 | 3.50 | 1.000 | 0.142 (0.483) | 0.857 |
| 29 2.42 | 6.80 | 1.942 | 0.142 (0.938) | 1.800 |
| 30 2.50 | 7.30 | 2.085 | 0.142 (1.007) | 1.943 |
| 31 2.58 | 8.20 | 2.342 | 0.142 (1.132) | 2.200 |
| 32 2.67 | 5.90 | 1.685 | 0.142 (0.814) | 1.543 |
| 33 2.75 | 2.00 | 0.571 | 0.142 (0.276) | 0.429 |
| 34 2.83 | 1.80 | 0.514 | 0.142 (0.248) | 0.372 |
| 35 2.92 | 1.80 | 0.514 | 0.142 (0.248) | 0.372 |
| 36 3.00 | 0.60 | 0.171 | (0.142) 0.083 | 0.089 |

(Loss Rate Not Used)

Sum = 100.0 Sum = 23.5

Flood volume = Effective rainfall 1.96(In)
 times area 4.9(Ac.) / [(In)/(Ft.)] = 0.8(Ac.Ft)
 Total soil loss = 0.42(In)
 Total soil loss = 0.172(Ac.Ft)
 Total rainfall = 2.38(In)
 Flood volume = 34765.2 Cubic Feet
 Total soil loss = 7480.6 Cubic Feet

Peak flow rate of this hydrograph = 10.569(CFS)

3 - H O U R S T O R M
 R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m) Volume Ac.Ft Q(CFS) 0 5.0 10.0 15.0 20.0

| | | | | | | | | | |
|------|--------|-------|-------|--|--|--|--|--|--|
| 0+ 5 | 0.0061 | 0.88 | VQ | | | | | | |
| 0+10 | 0.0139 | 1.13 | V Q | | | | | | |
| 0+15 | 0.0201 | 0.91 | Q | | | | | | |
| 0+20 | 0.0290 | 1.29 | VQ | | | | | | |
| 0+25 | 0.0387 | 1.41 | VQ | | | | | | |
| 0+30 | 0.0507 | 1.74 | VQ | | | | | | |
| 0+35 | 0.0611 | 1.50 | Q | | | | | | |
| 0+40 | 0.0731 | 1.74 | Q | | | | | | |
| 0+45 | 0.0857 | 1.83 | QV | | | | | | |
| 0+50 | 0.0961 | 1.50 | QV | | | | | | |
| 0+55 | 0.1065 | 1.52 | Q V | | | | | | |
| 1+ 0 | 0.1187 | 1.77 | Q V | | | | | | |
| 1+ 5 | 0.1344 | 2.27 | Q V | | | | | | |
| 1+10 | 0.1509 | 2.40 | Q V | | | | | | |
| 1+15 | 0.1674 | 2.40 | Q V | | | | | | |
| 1+20 | 0.1824 | 2.18 | Q V | | | | | | |
| 1+25 | 0.2015 | 2.78 | Q V | | | | | | |
| 1+30 | 0.2227 | 3.07 | Q V | | | | | | |
| 1+35 | 0.2418 | 2.77 | Q V | | | | | | |
| 1+40 | 0.2625 | 3.01 | Q V | | | | | | |
| 1+45 | 0.2884 | 3.76 | Q V | | | | | | |
| 1+50 | 0.3141 | 3.73 | Q V | | | | | | |
| 1+55 | 0.3378 | 3.44 | Q V | | | | | | |
| 2+ 0 | 0.3618 | 3.49 | Q V | | | | | | |
| 2+ 5 | 0.3869 | 3.63 | Q V | | | | | | |
| 2+10 | 0.4204 | 4.87 | Q V | | | | | | |
| 2+15 | 0.4624 | 6.09 | Q V | | | | | | |
| 2+20 | 0.4947 | 4.69 | Q V | | | | | | |
| 2+25 | 0.5488 | 7.86 | Q V | | | | | | |
| 2+30 | 0.6137 | 9.42 | Q V | | | | | | |
| 2+35 | 0.6865 | 10.57 | Q V | | | | | | |
| 2+40 | 0.7438 | 8.32 | Q V | | | | | | |
| 2+45 | 0.7666 | 3.32 | Q V | | | | | | |
| 2+50 | 0.7797 | 1.90 | Q V | | | | | | |
| 2+55 | 0.7923 | 1.83 | Q V | | | | | | |
| 3+ 0 | 0.7974 | 0.74 | Q | | | | | | |
| 3+ 5 | 0.7981 | 0.10 | Q | | | | | | |

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012, Version 8.2
Study date 08/11/21 File: PR100YR3HR6100.out

+++++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6312

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

PROPOSED CONDITION 100-YEAR / 6-HOUR SUH RUNOFF
JN 21091 MARK HOWARD
08-11-2021
FOMOTOR ENGINEERING

Drainage Area = 4.89(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.89(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 200.00(Ft.)
Length along longest watercourse measured to centroid = 100.00(Ft.)
Length along longest watercourse = 0.038 Mi.
Length along longest watercourse measured to centroid = 0.019 Mi.
Difference in elevation = 1.00(Ft.)
Slope along watercourse = 26.4000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.012 Hr.
Lag time = 0.74 Min.
25% of lag time = 0.19 Min.
40% of lag time = 0.30 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 4.89 | 0.84 | 4.09 |

100 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 4.89 | 3.13 | 15.31 |

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.837(In)
Area Averaged 100-Year Rainfall = 3.130(In)

Point rain (area averaged) = 3.130(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.130(In)

Sub-Area Data:

| Area(Ac.) | Runoff Index | Impervious % |
|--------------------------------|--------------|--------------|
| 4.890 | 78.00 | 0.521 |
| Total Area Entered = 4.89(Ac.) | | |

| RI | RI | Infil. Rate | Impervious | Adj. Infil. Rate | Area% | F |
|-----------|-------|-------------|------------|------------------|--------|---------|
| AMC2 | AMC-2 | (In/Hr) | (Dec.%) | (In/Hr) | (Dec.) | (In/Hr) |
| 78.0 | 78.0 | 0.268 | 0.521 | 0.142 | 1.000 | 0.142 |
| Sum (F) = | | | | | | 0.142 |

Area averaged mean soil loss (F) (In/Hr) = 0.142
Minimum soil loss rate ((In/Hr)) = 0.071

(for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.483

Unit Hydrograph
 DESERT S-Curve

Unit Hydrograph Data

| Unit time period (hrs) | Time % of lag | Distribution Graph % | Unit Hydrograph (CFS) |
|---------------------------|---------------|-------------------------|--------------------------|
| 1 0.083 | 675.198 | 78.105 | 3.849 |
| 2 0.167 | 1350.397 | 21.895 | 1.079 |
| | Sum = 100.000 | Sum= | 4.928 |

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

| Unit Time (Hr.) | Pattern Percent | Storm Rain (In/Hr) | Loss rate(In./Hr) | | Effective (In/Hr) |
|--------------------|--------------------|-----------------------|-------------------|----------|----------------------|
| | | | Max | Low | |
| 1 | 0.08 | 0.188 | (0.142) | 0.091 | 0.097 |
| 2 | 0.17 | 0.225 | (0.142) | 0.109 | 0.116 |
| 3 | 0.25 | 0.225 | (0.142) | 0.109 | 0.116 |
| 4 | 0.33 | 0.225 | (0.142) | 0.109 | 0.116 |
| 5 | 0.42 | 0.225 | (0.142) | 0.109 | 0.116 |
| 6 | 0.50 | 0.263 | (0.142) | 0.127 | 0.136 |
| 7 | 0.58 | 0.263 | (0.142) | 0.127 | 0.136 |
| 8 | 0.67 | 0.263 | (0.142) | 0.127 | 0.136 |
| 9 | 0.75 | 0.263 | (0.142) | 0.127 | 0.136 |
| 10 | 0.83 | 0.263 | (0.142) | 0.127 | 0.136 |
| 11 | 0.92 | 0.263 | (0.142) | 0.127 | 0.136 |
| 12 | 1.00 | 0.300 | 0.142 | (0.145) | 0.158 |
| 13 | 1.08 | 0.300 | 0.142 | (0.145) | 0.158 |
| 14 | 1.17 | 0.300 | 0.142 | (0.145) | 0.158 |
| 15 | 1.25 | 0.300 | 0.142 | (0.145) | 0.158 |
| 16 | 1.33 | 0.300 | 0.142 | (0.145) | 0.158 |
| 17 | 1.42 | 0.300 | 0.142 | (0.145) | 0.158 |
| 18 | 1.50 | 0.300 | 0.142 | (0.145) | 0.158 |
| 19 | 1.58 | 0.300 | 0.142 | (0.145) | 0.158 |
| 20 | 1.67 | 0.300 | 0.142 | (0.145) | 0.158 |
| 21 | 1.75 | 0.300 | 0.142 | (0.145) | 0.158 |
| 22 | 1.83 | 0.300 | 0.142 | (0.145) | 0.158 |
| 23 | 1.92 | 0.300 | 0.142 | (0.145) | 0.158 |
| 24 | 2.00 | 0.338 | 0.142 | (0.163) | 0.196 |
| 25 | 2.08 | 0.300 | 0.142 | (0.145) | 0.158 |
| 26 | 2.17 | 0.338 | 0.142 | (0.163) | 0.196 |
| 27 | 2.25 | 0.338 | 0.142 | (0.163) | 0.196 |
| 28 | 2.33 | 0.338 | 0.142 | (0.163) | 0.196 |
| 29 | 2.42 | 0.338 | 0.142 | (0.163) | 0.196 |
| 30 | 2.50 | 0.338 | 0.142 | (0.163) | 0.196 |
| 31 | 2.58 | 0.338 | 0.142 | (0.163) | 0.196 |
| 32 | 2.67 | 0.338 | 0.142 | (0.163) | 0.196 |
| 33 | 2.75 | 1.00 | 0.376 | (0.181) | 0.233 |
| 34 | 2.83 | 1.00 | 0.376 | (0.181) | 0.233 |
| 35 | 2.92 | 1.00 | 0.376 | (0.181) | 0.233 |
| 36 | 3.00 | 1.00 | 0.376 | (0.181) | 0.233 |
| 37 | 3.08 | 1.00 | 0.376 | (0.181) | 0.233 |
| 38 | 3.17 | 1.10 | 0.413 | (0.200) | 0.271 |
| 39 | 3.25 | 1.10 | 0.413 | (0.200) | 0.271 |
| 40 | 3.33 | 1.10 | 0.413 | (0.200) | 0.271 |
| 41 | 3.42 | 1.20 | 0.451 | (0.218) | 0.309 |
| 42 | 3.50 | 1.30 | 0.488 | (0.236) | 0.346 |
| 43 | 3.58 | 1.40 | 0.526 | (0.254) | 0.384 |
| 44 | 3.67 | 1.40 | 0.526 | (0.254) | 0.384 |
| 45 | 3.75 | 1.50 | 0.563 | (0.272) | 0.421 |
| 46 | 3.83 | 1.50 | 0.563 | (0.272) | 0.421 |
| 47 | 3.92 | 1.60 | 0.601 | (0.290) | 0.459 |
| 48 | 4.00 | 1.60 | 0.601 | (0.290) | 0.459 |
| 49 | 4.08 | 1.70 | 0.639 | (0.309) | 0.496 |
| 50 | 4.17 | 1.80 | 0.676 | (0.327) | 0.534 |
| 51 | 4.25 | 1.90 | 0.714 | (0.345) | 0.572 |
| 52 | 4.33 | 2.00 | 0.751 | (0.363) | 0.609 |
| 53 | 4.42 | 2.10 | 0.789 | (0.381) | 0.647 |
| 54 | 4.50 | 2.10 | 0.789 | (0.381) | 0.647 |
| 55 | 4.58 | 2.20 | 0.826 | (0.399) | 0.684 |
| 56 | 4.67 | 2.30 | 0.864 | (0.417) | 0.722 |

| | | | | | | |
|----|------|------|-------|----------|----------|-------|
| 57 | 4.75 | 2.40 | 0.901 | 0.142 | (0.436) | 0.759 |
| 58 | 4.83 | 2.40 | 0.901 | 0.142 | (0.436) | 0.759 |
| 59 | 4.92 | 2.50 | 0.939 | 0.142 | (0.454) | 0.797 |
| 60 | 5.00 | 2.60 | 0.977 | 0.142 | (0.472) | 0.834 |
| 61 | 5.08 | 3.10 | 1.164 | 0.142 | (0.563) | 1.022 |
| 62 | 5.17 | 3.60 | 1.352 | 0.142 | (0.653) | 1.210 |
| 63 | 5.25 | 3.90 | 1.465 | 0.142 | (0.708) | 1.323 |
| 64 | 5.33 | 4.20 | 1.577 | 0.142 | (0.762) | 1.435 |
| 65 | 5.42 | 4.70 | 1.765 | 0.142 | (0.853) | 1.623 |
| 66 | 5.50 | 5.60 | 2.103 | 0.142 | (1.016) | 1.961 |
| 67 | 5.58 | 1.90 | 0.714 | 0.142 | (0.345) | 0.572 |
| 68 | 5.67 | 0.90 | 0.338 | 0.142 | (0.163) | 0.196 |
| 69 | 5.75 | 0.60 | 0.225 | (0.142) | 0.109 | 0.116 |
| 70 | 5.83 | 0.50 | 0.188 | (0.142) | 0.091 | 0.097 |
| 71 | 5.92 | 0.30 | 0.113 | (0.142) | 0.054 | 0.058 |
| 72 | 6.00 | 0.20 | 0.075 | (0.142) | 0.036 | 0.039 |

(Loss Rate Not Used)

Sum = 100.0 Sum = 27.9

Flood volume = Effective rainfall 2.32(In)
times area 4.9(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)
Total soil loss = 0.81(In)
Total soil loss = 0.329(Ac.Ft)
Total rainfall = 3.13(In)
Flood volume = 41240.0 Cubic Feet
Total soil loss = 14318.8 Cubic Feet

Peak flow rate of this hydrograph = 9.305(CFS)

+++++

6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|-----------|--------------|--------|-------|-----|-----|-----|------|
| ----- | | | | | | | |
| 0+ 5 | 0.0026 | 0.37 | VQ | | | | |
| 0+10 | 0.0064 | 0.55 | V Q | | | | |
| 0+15 | 0.0103 | 0.57 | V Q | | | | |
| 0+20 | 0.0143 | 0.57 | V Q | | | | |
| 0+25 | 0.0182 | 0.57 | V Q | | | | |
| 0+30 | 0.0227 | 0.65 | V Q | | | | |
| 0+35 | 0.0273 | 0.67 | IVQ | | | | |
| 0+40 | 0.0319 | 0.67 | IVQ | | | | |
| 0+45 | 0.0366 | 0.67 | IVQ | | | | |
| 0+50 | 0.0412 | 0.67 | IVQ | | | | |
| 0+55 | 0.0458 | 0.67 | IVQ | | | | |
| 1+ 0 | 0.0510 | 0.76 | I VQ | | | | |
| 1+ 5 | 0.0564 | 0.78 | I VQ | | | | |
| 1+10 | 0.0618 | 0.78 | I VQ | | | | |
| 1+15 | 0.0671 | 0.78 | I VQ | | | | |
| 1+20 | 0.0725 | 0.78 | I Q | | | | |
| 1+25 | 0.0779 | 0.78 | I Q | | | | |
| 1+30 | 0.0833 | 0.78 | I Q | | | | |
| 1+35 | 0.0886 | 0.78 | I Q | | | | |
| 1+40 | 0.0940 | 0.78 | I Q | | | | |
| 1+45 | 0.0994 | 0.78 | I QV | | | | |
| 1+50 | 0.1048 | 0.78 | I QV | | | | |
| 1+55 | 0.1102 | 0.78 | I QV | | | | |
| 2+ 0 | 0.1165 | 0.93 | I QV | | | | |
| 2+ 5 | 0.1222 | 0.82 | I Q V | | | | |
| 2+10 | 0.1286 | 0.93 | I Q V | | | | |
| 2+15 | 0.1352 | 0.97 | I Q V | | | | |
| 2+20 | 0.1419 | 0.97 | I Q V | | | | |
| 2+25 | 0.1485 | 0.97 | I Q V | | | | |
| 2+30 | 0.1552 | 0.97 | I Q V | | | | |
| 2+35 | 0.1618 | 0.97 | I Q V | | | | |
| 2+40 | 0.1685 | 0.97 | I Q V | | | | |
| 2+45 | 0.1761 | 1.11 | I Q V | | | | |
| 2+50 | 0.1840 | 1.15 | I Q V | | | | |
| 2+55 | 0.1920 | 1.15 | I Q V | | | | |
| 3+ 0 | 0.1999 | 1.15 | I Q V | | | | |
| 3+ 5 | 0.2078 | 1.15 | I Q V | | | | |
| 3+10 | 0.2168 | 1.30 | I Q V | | | | |
| 3+15 | 0.2260 | 1.34 | I Q V | | | | |
| 3+20 | 0.2352 | 1.34 | I Q V | | | | |
| 3+25 | 0.2454 | 1.48 | I Q V | | | | |
| 3+30 | 0.2568 | 1.67 | I Q V | | | | |

[illegible]

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012, Version 8.2
Study date 08/11/21 File: PR100YR3HR24100.out

+++++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6312

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

PROPOSED CONDITION 100-YEAR / 24-HOUR SUH RUNOFF
JN 21091 MARK HOWARD
08-11-2021
FOMOTOR ENGINEERING

Drainage Area = 4.89(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.89(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 200.00(Ft.)
Length along longest watercourse measured to centroid = 100.00(Ft.)
Length along longest watercourse = 0.038 Mi.
Length along longest watercourse measured to centroid = 0.019 Mi.
Difference in elevation = 1.00(Ft.)
Slope along watercourse = 26.4000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.012 Hr.
Lag time = 0.74 Min.
25% of lag time = 0.19 Min.
40% of lag time = 0.30 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 4.89 | 1.21 | 5.92 |

100 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 4.89 | 4.73 | 23.13 |

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.210(In)
Area Averaged 100-Year Rainfall = 4.730(In)

Point rain (area averaged) = 4.730(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.730(In)

Sub-Area Data:

| Area(Ac.) | Runoff Index | Impervious % |
|--------------------------------|--------------|--------------|
| 4.890 | 78.00 | 0.521 |
| Total Area Entered = 4.89(Ac.) | | |

| RI | RI | Infil. Rate | Impervious | Adj. Infil. Rate | Area% | F |
|-----------|-------|-------------|------------|------------------|--------|---------|
| AMC2 | AMC-2 | (In/Hr) | (Dec.%) | (In/Hr) | (Dec.) | (In/Hr) |
| 78.0 | 78.0 | 0.268 | 0.521 | 0.142 | 1.000 | 0.142 |
| Sum (F) = | | | | | | 0.142 |

Area averaged mean soil loss (F) (In/Hr) = 0.142
Minimum soil loss rate ((In/Hr)) = 0.071

(for 24 hour storm duration)
 Soil loss rate (decimal) = 0.483

Unit Hydrograph
 DESERT S-Curve

Unit Hydrograph Data

| Unit time period (hrs) | Time % of lag | Distribution Graph % | Unit Hydrograph (CFS) |
|---------------------------|---------------|-------------------------|--------------------------|
| 1 0.083 | 675.198 | 78.105 | 3.849 |
| 2 0.167 | 1350.397 | 21.895 | 1.079 |
| | | Sum = 100.000 | Sum= 4.928 |

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

| Unit Time (Hr.) | Pattern Percent | Storm Rain (In/Hr) | Loss rate(In./Hr) | | Effective (In/Hr) |
|--------------------|--------------------|-----------------------|-------------------|-------|----------------------|
| | | | Max | Low | |
| 1 0.08 | 0.07 | 0.038 | (0.252) | 0.018 | 0.020 |
| 2 0.17 | 0.07 | 0.038 | (0.251) | 0.018 | 0.020 |
| 3 0.25 | 0.07 | 0.038 | (0.250) | 0.018 | 0.020 |
| 4 0.33 | 0.10 | 0.057 | (0.249) | 0.027 | 0.029 |
| 5 0.42 | 0.10 | 0.057 | (0.248) | 0.027 | 0.029 |
| 6 0.50 | 0.10 | 0.057 | (0.247) | 0.027 | 0.029 |
| 7 0.58 | 0.10 | 0.057 | (0.246) | 0.027 | 0.029 |
| 8 0.67 | 0.10 | 0.057 | (0.245) | 0.027 | 0.029 |
| 9 0.75 | 0.10 | 0.057 | (0.244) | 0.027 | 0.029 |
| 10 0.83 | 0.13 | 0.076 | (0.243) | 0.037 | 0.039 |
| 11 0.92 | 0.13 | 0.076 | (0.242) | 0.037 | 0.039 |
| 12 1.00 | 0.13 | 0.076 | (0.241) | 0.037 | 0.039 |
| 13 1.08 | 0.10 | 0.057 | (0.240) | 0.027 | 0.029 |
| 14 1.17 | 0.10 | 0.057 | (0.239) | 0.027 | 0.029 |
| 15 1.25 | 0.10 | 0.057 | (0.238) | 0.027 | 0.029 |
| 16 1.33 | 0.10 | 0.057 | (0.238) | 0.027 | 0.029 |
| 17 1.42 | 0.10 | 0.057 | (0.237) | 0.027 | 0.029 |
| 18 1.50 | 0.10 | 0.057 | (0.236) | 0.027 | 0.029 |
| 19 1.58 | 0.10 | 0.057 | (0.235) | 0.027 | 0.029 |
| 20 1.67 | 0.10 | 0.057 | (0.234) | 0.027 | 0.029 |
| 21 1.75 | 0.10 | 0.057 | (0.233) | 0.027 | 0.029 |
| 22 1.83 | 0.13 | 0.076 | (0.232) | 0.037 | 0.039 |
| 23 1.92 | 0.13 | 0.076 | (0.231) | 0.037 | 0.039 |
| 24 2.00 | 0.13 | 0.076 | (0.230) | 0.037 | 0.039 |
| 25 2.08 | 0.13 | 0.076 | (0.229) | 0.037 | 0.039 |
| 26 2.17 | 0.13 | 0.076 | (0.228) | 0.037 | 0.039 |
| 27 2.25 | 0.13 | 0.076 | (0.227) | 0.037 | 0.039 |
| 28 2.33 | 0.13 | 0.076 | (0.226) | 0.037 | 0.039 |
| 29 2.42 | 0.13 | 0.076 | (0.225) | 0.037 | 0.039 |
| 30 2.50 | 0.13 | 0.076 | (0.224) | 0.037 | 0.039 |
| 31 2.58 | 0.17 | 0.095 | (0.224) | 0.046 | 0.049 |
| 32 2.67 | 0.17 | 0.095 | (0.223) | 0.046 | 0.049 |
| 33 2.75 | 0.17 | 0.095 | (0.222) | 0.046 | 0.049 |
| 34 2.83 | 0.17 | 0.095 | (0.221) | 0.046 | 0.049 |
| 35 2.92 | 0.17 | 0.095 | (0.220) | 0.046 | 0.049 |
| 36 3.00 | 0.17 | 0.095 | (0.219) | 0.046 | 0.049 |
| 37 3.08 | 0.17 | 0.095 | (0.218) | 0.046 | 0.049 |
| 38 3.17 | 0.17 | 0.095 | (0.217) | 0.046 | 0.049 |
| 39 3.25 | 0.17 | 0.095 | (0.216) | 0.046 | 0.049 |
| 40 3.33 | 0.17 | 0.095 | (0.215) | 0.046 | 0.049 |
| 41 3.42 | 0.17 | 0.095 | (0.214) | 0.046 | 0.049 |
| 42 3.50 | 0.17 | 0.095 | (0.214) | 0.046 | 0.049 |
| 43 3.58 | 0.17 | 0.095 | (0.213) | 0.046 | 0.049 |
| 44 3.67 | 0.17 | 0.095 | (0.212) | 0.046 | 0.049 |
| 45 3.75 | 0.17 | 0.095 | (0.211) | 0.046 | 0.049 |
| 46 3.83 | 0.20 | 0.114 | (0.210) | 0.055 | 0.059 |
| 47 3.92 | 0.20 | 0.114 | (0.209) | 0.055 | 0.059 |
| 48 4.00 | 0.20 | 0.114 | (0.208) | 0.055 | 0.059 |
| 49 4.08 | 0.20 | 0.114 | (0.207) | 0.055 | 0.059 |
| 50 4.17 | 0.20 | 0.114 | (0.206) | 0.055 | 0.059 |
| 51 4.25 | 0.20 | 0.114 | (0.206) | 0.055 | 0.059 |
| 52 4.33 | 0.23 | 0.132 | (0.205) | 0.064 | 0.068 |
| 53 4.42 | 0.23 | 0.132 | (0.204) | 0.064 | 0.068 |
| 54 4.50 | 0.23 | 0.132 | (0.203) | 0.064 | 0.068 |
| 55 4.58 | 0.23 | 0.132 | (0.202) | 0.064 | 0.068 |
| 56 4.67 | 0.23 | 0.132 | (0.201) | 0.064 | 0.068 |

| | | | | | | |
|-----|-------|------|-------|----------------|-------|-------|
| 57 | 4.75 | 0.23 | 0.132 | (0.200) | 0.064 | 0.068 |
| 58 | 4.83 | 0.27 | 0.151 | (0.199) | 0.073 | 0.078 |
| 59 | 4.92 | 0.27 | 0.151 | (0.199) | 0.073 | 0.078 |
| 60 | 5.00 | 0.27 | 0.151 | (0.198) | 0.073 | 0.078 |
| 61 | 5.08 | 0.20 | 0.114 | (0.197) | 0.055 | 0.059 |
| 62 | 5.17 | 0.20 | 0.114 | (0.196) | 0.055 | 0.059 |
| 63 | 5.25 | 0.20 | 0.114 | (0.195) | 0.055 | 0.059 |
| 64 | 5.33 | 0.23 | 0.132 | (0.194) | 0.064 | 0.068 |
| 65 | 5.42 | 0.23 | 0.132 | (0.193) | 0.064 | 0.068 |
| 66 | 5.50 | 0.23 | 0.132 | (0.193) | 0.064 | 0.068 |
| 67 | 5.58 | 0.27 | 0.151 | (0.192) | 0.073 | 0.078 |
| 68 | 5.67 | 0.27 | 0.151 | (0.191) | 0.073 | 0.078 |
| 69 | 5.75 | 0.27 | 0.151 | (0.190) | 0.073 | 0.078 |
| 70 | 5.83 | 0.27 | 0.151 | (0.189) | 0.073 | 0.078 |
| 71 | 5.92 | 0.27 | 0.151 | (0.188) | 0.073 | 0.078 |
| 72 | 6.00 | 0.27 | 0.151 | (0.188) | 0.073 | 0.078 |
| 73 | 6.08 | 0.30 | 0.170 | (0.187) | 0.082 | 0.088 |
| 74 | 6.17 | 0.30 | 0.170 | (0.186) | 0.082 | 0.088 |
| 75 | 6.25 | 0.30 | 0.170 | (0.185) | 0.082 | 0.088 |
| 76 | 6.33 | 0.30 | 0.170 | (0.184) | 0.082 | 0.088 |
| 77 | 6.42 | 0.30 | 0.170 | (0.183) | 0.082 | 0.088 |
| 78 | 6.50 | 0.30 | 0.170 | (0.183) | 0.082 | 0.088 |
| 79 | 6.58 | 0.33 | 0.189 | (0.182) | 0.091 | 0.098 |
| 80 | 6.67 | 0.33 | 0.189 | (0.181) | 0.091 | 0.098 |
| 81 | 6.75 | 0.33 | 0.189 | (0.180) | 0.091 | 0.098 |
| 82 | 6.83 | 0.33 | 0.189 | (0.179) | 0.091 | 0.098 |
| 83 | 6.92 | 0.33 | 0.189 | (0.179) | 0.091 | 0.098 |
| 84 | 7.00 | 0.33 | 0.189 | (0.178) | 0.091 | 0.098 |
| 85 | 7.08 | 0.33 | 0.189 | (0.177) | 0.091 | 0.098 |
| 86 | 7.17 | 0.33 | 0.189 | (0.176) | 0.091 | 0.098 |
| 87 | 7.25 | 0.33 | 0.189 | (0.175) | 0.091 | 0.098 |
| 88 | 7.33 | 0.37 | 0.208 | (0.175) | 0.101 | 0.108 |
| 89 | 7.42 | 0.37 | 0.208 | (0.174) | 0.101 | 0.108 |
| 90 | 7.50 | 0.37 | 0.208 | (0.173) | 0.101 | 0.108 |
| 91 | 7.58 | 0.40 | 0.227 | (0.172) | 0.110 | 0.117 |
| 92 | 7.67 | 0.40 | 0.227 | (0.171) | 0.110 | 0.117 |
| 93 | 7.75 | 0.40 | 0.227 | (0.171) | 0.110 | 0.117 |
| 94 | 7.83 | 0.43 | 0.246 | (0.170) | 0.119 | 0.127 |
| 95 | 7.92 | 0.43 | 0.246 | (0.169) | 0.119 | 0.127 |
| 96 | 8.00 | 0.43 | 0.246 | (0.168) | 0.119 | 0.127 |
| 97 | 8.08 | 0.50 | 0.284 | (0.167) | 0.137 | 0.147 |
| 98 | 8.17 | 0.50 | 0.284 | (0.167) | 0.137 | 0.147 |
| 99 | 8.25 | 0.50 | 0.284 | (0.166) | 0.137 | 0.147 |
| 100 | 8.33 | 0.50 | 0.284 | (0.165) | 0.137 | 0.147 |
| 101 | 8.42 | 0.50 | 0.284 | (0.164) | 0.137 | 0.147 |
| 102 | 8.50 | 0.50 | 0.284 | (0.164) | 0.137 | 0.147 |
| 103 | 8.58 | 0.53 | 0.303 | (0.163) | 0.146 | 0.156 |
| 104 | 8.67 | 0.53 | 0.303 | (0.162) | 0.146 | 0.156 |
| 105 | 8.75 | 0.53 | 0.303 | (0.161) | 0.146 | 0.156 |
| 106 | 8.83 | 0.57 | 0.322 | (0.160) | 0.155 | 0.166 |
| 107 | 8.92 | 0.57 | 0.322 | (0.160) | 0.155 | 0.166 |
| 108 | 9.00 | 0.57 | 0.322 | (0.159) | 0.155 | 0.166 |
| 109 | 9.08 | 0.63 | 0.359 | 0.158 (0.174) | | 0.201 |
| 110 | 9.17 | 0.63 | 0.359 | 0.157 (0.174) | | 0.202 |
| 111 | 9.25 | 0.63 | 0.359 | 0.157 (0.174) | | 0.203 |
| 112 | 9.33 | 0.67 | 0.378 | 0.156 (0.183) | | 0.222 |
| 113 | 9.42 | 0.67 | 0.378 | 0.155 (0.183) | | 0.223 |
| 114 | 9.50 | 0.67 | 0.378 | 0.154 (0.183) | | 0.224 |
| 115 | 9.58 | 0.70 | 0.397 | 0.154 (0.192) | | 0.244 |
| 116 | 9.67 | 0.70 | 0.397 | 0.153 (0.192) | | 0.244 |
| 117 | 9.75 | 0.70 | 0.397 | 0.152 (0.192) | | 0.245 |
| 118 | 9.83 | 0.73 | 0.416 | 0.152 (0.201) | | 0.265 |
| 119 | 9.92 | 0.73 | 0.416 | 0.151 (0.201) | | 0.265 |
| 120 | 10.00 | 0.73 | 0.416 | 0.150 (0.201) | | 0.266 |
| 121 | 10.08 | 0.50 | 0.284 | (0.149) | 0.137 | 0.147 |
| 122 | 10.17 | 0.50 | 0.284 | (0.149) | 0.137 | 0.147 |
| 123 | 10.25 | 0.50 | 0.284 | (0.148) | 0.137 | 0.147 |
| 124 | 10.33 | 0.50 | 0.284 | (0.147) | 0.137 | 0.147 |
| 125 | 10.42 | 0.50 | 0.284 | (0.146) | 0.137 | 0.147 |
| 126 | 10.50 | 0.50 | 0.284 | (0.146) | 0.137 | 0.147 |
| 127 | 10.58 | 0.67 | 0.378 | 0.145 (0.183) | | 0.233 |
| 128 | 10.67 | 0.67 | 0.378 | 0.144 (0.183) | | 0.234 |
| 129 | 10.75 | 0.67 | 0.378 | 0.144 (0.183) | | 0.235 |
| 130 | 10.83 | 0.67 | 0.378 | 0.143 (0.183) | | 0.235 |
| 131 | 10.92 | 0.67 | 0.378 | 0.142 (0.183) | | 0.236 |
| 132 | 11.00 | 0.67 | 0.378 | 0.142 (0.183) | | 0.237 |
| 133 | 11.08 | 0.63 | 0.359 | 0.141 (0.174) | | 0.219 |
| 134 | 11.17 | 0.63 | 0.359 | 0.140 (0.174) | | 0.219 |
| 135 | 11.25 | 0.63 | 0.359 | 0.139 (0.174) | | 0.220 |

| | | | | | | |
|-----|-------|------|-------|----------|----------|-------|
| 136 | 11.33 | 0.63 | 0.359 | 0.139 | (0.174) | 0.221 |
| 137 | 11.42 | 0.63 | 0.359 | 0.138 | (0.174) | 0.221 |
| 138 | 11.50 | 0.63 | 0.359 | 0.137 | (0.174) | 0.222 |
| 139 | 11.58 | 0.57 | 0.322 | 0.137 | (0.155) | 0.185 |
| 140 | 11.67 | 0.57 | 0.322 | 0.136 | (0.155) | 0.186 |
| 141 | 11.75 | 0.57 | 0.322 | 0.135 | (0.155) | 0.186 |
| 142 | 11.83 | 0.60 | 0.341 | 0.135 | (0.165) | 0.206 |
| 143 | 11.92 | 0.60 | 0.341 | 0.134 | (0.165) | 0.207 |
| 144 | 12.00 | 0.60 | 0.341 | 0.133 | (0.165) | 0.207 |
| 145 | 12.08 | 0.83 | 0.473 | 0.133 | (0.229) | 0.340 |
| 146 | 12.17 | 0.83 | 0.473 | 0.132 | (0.229) | 0.341 |
| 147 | 12.25 | 0.83 | 0.473 | 0.131 | (0.229) | 0.342 |
| 148 | 12.33 | 0.87 | 0.492 | 0.131 | (0.238) | 0.361 |
| 149 | 12.42 | 0.87 | 0.492 | 0.130 | (0.238) | 0.362 |
| 150 | 12.50 | 0.87 | 0.492 | 0.129 | (0.238) | 0.363 |
| 151 | 12.58 | 0.93 | 0.530 | 0.129 | (0.256) | 0.401 |
| 152 | 12.67 | 0.93 | 0.530 | 0.128 | (0.256) | 0.402 |
| 153 | 12.75 | 0.93 | 0.530 | 0.127 | (0.256) | 0.402 |
| 154 | 12.83 | 0.97 | 0.549 | 0.127 | (0.265) | 0.422 |
| 155 | 12.92 | 0.97 | 0.549 | 0.126 | (0.265) | 0.423 |
| 156 | 13.00 | 0.97 | 0.549 | 0.126 | (0.265) | 0.423 |
| 157 | 13.08 | 1.13 | 0.643 | 0.125 | (0.311) | 0.518 |
| 158 | 13.17 | 1.13 | 0.643 | 0.124 | (0.311) | 0.519 |
| 159 | 13.25 | 1.13 | 0.643 | 0.124 | (0.311) | 0.520 |
| 160 | 13.33 | 1.13 | 0.643 | 0.123 | (0.311) | 0.520 |
| 161 | 13.42 | 1.13 | 0.643 | 0.122 | (0.311) | 0.521 |
| 162 | 13.50 | 1.13 | 0.643 | 0.122 | (0.311) | 0.522 |
| 163 | 13.58 | 0.77 | 0.435 | 0.121 | (0.210) | 0.314 |
| 164 | 13.67 | 0.77 | 0.435 | 0.120 | (0.210) | 0.315 |
| 165 | 13.75 | 0.77 | 0.435 | 0.120 | (0.210) | 0.315 |
| 166 | 13.83 | 0.77 | 0.435 | 0.119 | (0.210) | 0.316 |
| 167 | 13.92 | 0.77 | 0.435 | 0.119 | (0.210) | 0.316 |
| 168 | 14.00 | 0.77 | 0.435 | 0.118 | (0.210) | 0.317 |
| 169 | 14.08 | 0.90 | 0.511 | 0.117 | (0.247) | 0.393 |
| 170 | 14.17 | 0.90 | 0.511 | 0.117 | (0.247) | 0.394 |
| 171 | 14.25 | 0.90 | 0.511 | 0.116 | (0.247) | 0.395 |
| 172 | 14.33 | 0.87 | 0.492 | 0.116 | (0.238) | 0.376 |
| 173 | 14.42 | 0.87 | 0.492 | 0.115 | (0.238) | 0.377 |
| 174 | 14.50 | 0.87 | 0.492 | 0.114 | (0.238) | 0.377 |
| 175 | 14.58 | 0.87 | 0.492 | 0.114 | (0.238) | 0.378 |
| 176 | 14.67 | 0.87 | 0.492 | 0.113 | (0.238) | 0.379 |
| 177 | 14.75 | 0.87 | 0.492 | 0.113 | (0.238) | 0.379 |
| 178 | 14.83 | 0.83 | 0.473 | 0.112 | (0.229) | 0.361 |
| 179 | 14.92 | 0.83 | 0.473 | 0.112 | (0.229) | 0.361 |
| 180 | 15.00 | 0.83 | 0.473 | 0.111 | (0.229) | 0.362 |
| 181 | 15.08 | 0.80 | 0.454 | 0.110 | (0.219) | 0.344 |
| 182 | 15.17 | 0.80 | 0.454 | 0.110 | (0.219) | 0.344 |
| 183 | 15.25 | 0.80 | 0.454 | 0.109 | (0.219) | 0.345 |
| 184 | 15.33 | 0.77 | 0.435 | 0.109 | (0.210) | 0.326 |
| 185 | 15.42 | 0.77 | 0.435 | 0.108 | (0.210) | 0.327 |
| 186 | 15.50 | 0.77 | 0.435 | 0.108 | (0.210) | 0.328 |
| 187 | 15.58 | 0.63 | 0.359 | 0.107 | (0.174) | 0.252 |
| 188 | 15.67 | 0.63 | 0.359 | 0.107 | (0.174) | 0.253 |
| 189 | 15.75 | 0.63 | 0.359 | 0.106 | (0.174) | 0.253 |
| 190 | 15.83 | 0.63 | 0.359 | 0.105 | (0.174) | 0.254 |
| 191 | 15.92 | 0.63 | 0.359 | 0.105 | (0.174) | 0.255 |
| 192 | 16.00 | 0.63 | 0.359 | 0.104 | (0.174) | 0.255 |
| 193 | 16.08 | 0.13 | 0.076 | (0.104) | 0.037 | 0.039 |
| 194 | 16.17 | 0.13 | 0.076 | (0.103) | 0.037 | 0.039 |
| 195 | 16.25 | 0.13 | 0.076 | (0.103) | 0.037 | 0.039 |
| 196 | 16.33 | 0.13 | 0.076 | (0.102) | 0.037 | 0.039 |
| 197 | 16.42 | 0.13 | 0.076 | (0.102) | 0.037 | 0.039 |
| 198 | 16.50 | 0.13 | 0.076 | (0.101) | 0.037 | 0.039 |
| 199 | 16.58 | 0.10 | 0.057 | (0.101) | 0.027 | 0.029 |
| 200 | 16.67 | 0.10 | 0.057 | (0.100) | 0.027 | 0.029 |
| 201 | 16.75 | 0.10 | 0.057 | (0.100) | 0.027 | 0.029 |
| 202 | 16.83 | 0.10 | 0.057 | (0.099) | 0.027 | 0.029 |
| 203 | 16.92 | 0.10 | 0.057 | (0.099) | 0.027 | 0.029 |
| 204 | 17.00 | 0.10 | 0.057 | (0.098) | 0.027 | 0.029 |
| 205 | 17.08 | 0.17 | 0.095 | (0.098) | 0.046 | 0.049 |
| 206 | 17.17 | 0.17 | 0.095 | (0.097) | 0.046 | 0.049 |
| 207 | 17.25 | 0.17 | 0.095 | (0.097) | 0.046 | 0.049 |
| 208 | 17.33 | 0.17 | 0.095 | (0.096) | 0.046 | 0.049 |
| 209 | 17.42 | 0.17 | 0.095 | (0.096) | 0.046 | 0.049 |
| 210 | 17.50 | 0.17 | 0.095 | (0.095) | 0.046 | 0.049 |
| 211 | 17.58 | 0.17 | 0.095 | (0.095) | 0.046 | 0.049 |
| 212 | 17.67 | 0.17 | 0.095 | (0.094) | 0.046 | 0.049 |
| 213 | 17.75 | 0.17 | 0.095 | (0.094) | 0.046 | 0.049 |
| 214 | 17.83 | 0.13 | 0.076 | (0.093) | 0.037 | 0.039 |

| | | | | | | |
|-----|-------|------|-------|----------|-------|-------|
| 215 | 17.92 | 0.13 | 0.076 | (0.093) | 0.037 | 0.039 |
| 216 | 18.00 | 0.13 | 0.076 | (0.092) | 0.037 | 0.039 |
| 217 | 18.08 | 0.13 | 0.076 | (0.092) | 0.037 | 0.039 |
| 218 | 18.17 | 0.13 | 0.076 | (0.092) | 0.037 | 0.039 |
| 219 | 18.25 | 0.13 | 0.076 | (0.091) | 0.037 | 0.039 |
| 220 | 18.33 | 0.13 | 0.076 | (0.091) | 0.037 | 0.039 |
| 221 | 18.42 | 0.13 | 0.076 | (0.090) | 0.037 | 0.039 |
| 222 | 18.50 | 0.13 | 0.076 | (0.090) | 0.037 | 0.039 |
| 223 | 18.58 | 0.10 | 0.057 | (0.089) | 0.027 | 0.029 |
| 224 | 18.67 | 0.10 | 0.057 | (0.089) | 0.027 | 0.029 |
| 225 | 18.75 | 0.10 | 0.057 | (0.088) | 0.027 | 0.029 |
| 226 | 18.83 | 0.07 | 0.038 | (0.088) | 0.018 | 0.020 |
| 227 | 18.92 | 0.07 | 0.038 | (0.088) | 0.018 | 0.020 |
| 228 | 19.00 | 0.07 | 0.038 | (0.087) | 0.018 | 0.020 |
| 229 | 19.08 | 0.10 | 0.057 | (0.087) | 0.027 | 0.029 |
| 230 | 19.17 | 0.10 | 0.057 | (0.086) | 0.027 | 0.029 |
| 231 | 19.25 | 0.10 | 0.057 | (0.086) | 0.027 | 0.029 |
| 232 | 19.33 | 0.13 | 0.076 | (0.086) | 0.037 | 0.039 |
| 233 | 19.42 | 0.13 | 0.076 | (0.085) | 0.037 | 0.039 |
| 234 | 19.50 | 0.13 | 0.076 | (0.085) | 0.037 | 0.039 |
| 235 | 19.58 | 0.10 | 0.057 | (0.084) | 0.027 | 0.029 |
| 236 | 19.67 | 0.10 | 0.057 | (0.084) | 0.027 | 0.029 |
| 237 | 19.75 | 0.10 | 0.057 | (0.084) | 0.027 | 0.029 |
| 238 | 19.83 | 0.07 | 0.038 | (0.083) | 0.018 | 0.020 |
| 239 | 19.92 | 0.07 | 0.038 | (0.083) | 0.018 | 0.020 |
| 240 | 20.00 | 0.07 | 0.038 | (0.083) | 0.018 | 0.020 |
| 241 | 20.08 | 0.10 | 0.057 | (0.082) | 0.027 | 0.029 |
| 242 | 20.17 | 0.10 | 0.057 | (0.082) | 0.027 | 0.029 |
| 243 | 20.25 | 0.10 | 0.057 | (0.081) | 0.027 | 0.029 |
| 244 | 20.33 | 0.10 | 0.057 | (0.081) | 0.027 | 0.029 |
| 245 | 20.42 | 0.10 | 0.057 | (0.081) | 0.027 | 0.029 |
| 246 | 20.50 | 0.10 | 0.057 | (0.080) | 0.027 | 0.029 |
| 247 | 20.58 | 0.10 | 0.057 | (0.080) | 0.027 | 0.029 |
| 248 | 20.67 | 0.10 | 0.057 | (0.080) | 0.027 | 0.029 |
| 249 | 20.75 | 0.10 | 0.057 | (0.079) | 0.027 | 0.029 |
| 250 | 20.83 | 0.07 | 0.038 | (0.079) | 0.018 | 0.020 |
| 251 | 20.92 | 0.07 | 0.038 | (0.079) | 0.018 | 0.020 |
| 252 | 21.00 | 0.07 | 0.038 | (0.078) | 0.018 | 0.020 |
| 253 | 21.08 | 0.10 | 0.057 | (0.078) | 0.027 | 0.029 |
| 254 | 21.17 | 0.10 | 0.057 | (0.078) | 0.027 | 0.029 |
| 255 | 21.25 | 0.10 | 0.057 | (0.078) | 0.027 | 0.029 |
| 256 | 21.33 | 0.07 | 0.038 | (0.077) | 0.018 | 0.020 |
| 257 | 21.42 | 0.07 | 0.038 | (0.077) | 0.018 | 0.020 |
| 258 | 21.50 | 0.07 | 0.038 | (0.077) | 0.018 | 0.020 |
| 259 | 21.58 | 0.10 | 0.057 | (0.076) | 0.027 | 0.029 |
| 260 | 21.67 | 0.10 | 0.057 | (0.076) | 0.027 | 0.029 |
| 261 | 21.75 | 0.10 | 0.057 | (0.076) | 0.027 | 0.029 |
| 262 | 21.83 | 0.07 | 0.038 | (0.076) | 0.018 | 0.020 |
| 263 | 21.92 | 0.07 | 0.038 | (0.075) | 0.018 | 0.020 |
| 264 | 22.00 | 0.07 | 0.038 | (0.075) | 0.018 | 0.020 |
| 265 | 22.08 | 0.10 | 0.057 | (0.075) | 0.027 | 0.029 |
| 266 | 22.17 | 0.10 | 0.057 | (0.075) | 0.027 | 0.029 |
| 267 | 22.25 | 0.10 | 0.057 | (0.074) | 0.027 | 0.029 |
| 268 | 22.33 | 0.07 | 0.038 | (0.074) | 0.018 | 0.020 |
| 269 | 22.42 | 0.07 | 0.038 | (0.074) | 0.018 | 0.020 |
| 270 | 22.50 | 0.07 | 0.038 | (0.074) | 0.018 | 0.020 |
| 271 | 22.58 | 0.07 | 0.038 | (0.073) | 0.018 | |

Sum = 100.0 Sum = 35.9

Flood volume = Effective rainfall 2.99(In)

$$\text{times area} \quad 4.9 (\text{Ac.}) / [(\text{In}) / (\text{Ft.})] = 1.2 (\text{Ac.Ft})$$

Total soil loss = 1.74 (In)

Total soil loss = 0.707(Ac.Ft)
 Total rainfall = 4.73(In)
 Flood volume = 53155.4 Cubic Feet
 Total soil loss = 30804.6 Cubic Feet

 Peak flow rate of this hydrograph = 2.571(CFS)

+++++

24 - H O U R S T O R M
 R u n o f f H y d r o g r a p h

 Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume | Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|-----------|--------|-------|-----------|---|-----|-----|-----|------|
| 0+ 5 | 0.0005 | | 0.08 Q | | | | | |
| 0+10 | 0.0012 | | 0.10 Q | | | | | |
| 0+15 | 0.0018 | | 0.10 Q | | | | | |
| 0+20 | 0.0028 | | 0.13 Q | | | | | |
| 0+25 | 0.0038 | | 0.14 Q | | | | | |
| 0+30 | 0.0048 | | 0.14 Q | | | | | |
| 0+35 | 0.0058 | | 0.14 Q | | | | | |
| 0+40 | 0.0068 | | 0.14 Q | | | | | |
| 0+45 | 0.0078 | | 0.14 Q | | | | | |
| 0+50 | 0.0090 | | 0.18 Q | | | | | |
| 0+55 | 0.0103 | | 0.19 Q | | | | | |
| 1+ 0 | 0.0117 | | 0.19 Q | | | | | |
| 1+ 5 | 0.0127 | | 0.16 Q | | | | | |
| 1+10 | 0.0137 | | 0.14 Q | | | | | |
| 1+15 | 0.0147 | | 0.14 Q | | | | | |
| 1+20 | 0.0157 | | 0.14 Q | | | | | |
| 1+25 | 0.0167 | | 0.14 Q | | | | | |
| 1+30 | 0.0177 | | 0.14 Q | | | | | |
| 1+35 | 0.0187 | | 0.14 Q | | | | | |
| 1+40 | 0.0197 | | 0.14 Q | | | | | |
| 1+45 | 0.0207 | | 0.14 Q | | | | | |
| 1+50 | 0.0220 | | 0.18 Q | | | | | |
| 1+55 | 0.0233 | | 0.19 Q | | | | | |
| 2+ 0 | 0.0246 | | 0.19 Q | | | | | |
| 2+ 5 | 0.0259 | | 0.19 Q | | | | | |
| 2+10 | 0.0273 | | 0.19 Q | | | | | |
| 2+15 | 0.0286 | | 0.19 Q | | | | | |
| 2+20 | 0.0299 | | 0.19 Q | | | | | |
| 2+25 | 0.0313 | | 0.19 QV | | | | | |
| 2+30 | 0.0326 | | 0.19 QV | | | | | |
| 2+35 | 0.0342 | | 0.23 QV | | | | | |
| 2+40 | 0.0358 | | 0.24 QV | | | | | |
| 2+45 | 0.0375 | | 0.24 QV | | | | | |
| 2+50 | 0.0391 | | 0.24 QV | | | | | |
| 2+55 | 0.0408 | | 0.24 QV | | | | | |
| 3+ 0 | 0.0425 | | 0.24 QV | | | | | |
| 3+ 5 | 0.0441 | | 0.24 QV | | | | | |
| 3+10 | 0.0458 | | 0.24 QV | | | | | |
| 3+15 | 0.0474 | | 0.24 QV | | | | | |
| 3+20 | 0.0491 | | 0.24 QV | | | | | |
| 3+25 | 0.0508 | | 0.24 QV | | | | | |
| 3+30 | 0.0524 | | 0.24 QV | | | | | |
| 3+35 | 0.0541 | | 0.24 QV | | | | | |
| 3+40 | 0.0558 | | 0.24 QV | | | | | |
| 3+45 | 0.0574 | | 0.24 QV | | | | | |
| 3+50 | 0.0593 | | 0.28 IQ | | | | | |
| 3+55 | 0.0613 | | 0.29 IQV | | | | | |
| 4+ 0 | 0.0633 | | 0.29 IQV | | | | | |
| 4+ 5 | 0.0653 | | 0.29 IQV | | | | | |
| 4+10 | 0.0673 | | 0.29 IQV | | | | | |
| 4+15 | 0.0693 | | 0.29 IQV | | | | | |
| 4+20 | 0.0715 | | 0.33 IQV | | | | | |
| 4+25 | 0.0739 | | 0.34 IQV | | | | | |
| 4+30 | 0.0762 | | 0.34 IQV | | | | | |
| 4+35 | 0.0785 | | 0.34 IQV | | | | | |
| 4+40 | 0.0808 | | 0.34 IQV | | | | | |
| 4+45 | 0.0832 | | 0.34 IQV | | | | | |
| 4+50 | 0.0857 | | 0.38 IQV | | | | | |
| 4+55 | 0.0884 | | 0.39 IQV | | | | | |
| 5+ 0 | 0.0911 | | 0.39 IQV | | | | | |
| 5+ 5 | 0.0932 | | 0.31 IQ V | | | | | |
| 5+10 | 0.0952 | | 0.29 IQ V | | | | | |
| 5+15 | 0.0972 | | 0.29 IQ V | | | | | |

| | | | | | | | | | | |
|-------|--------|------|---|---|--|--|--|--|--|--|
| 5+20 | 0.0994 | 0.33 | Q | V | | | | | | |
| 5+25 | 0.1018 | 0.34 | Q | V | | | | | | |
| 5+30 | 0.1041 | 0.34 | Q | V | | | | | | |
| 5+35 | 0.1067 | 0.38 | Q | V | | | | | | |
| 5+40 | 0.1093 | 0.39 | Q | V | | | | | | |
| 5+45 | 0.1120 | 0.39 | Q | V | | | | | | |
| 5+50 | 0.1146 | 0.39 | Q | V | | | | | | |
| 5+55 | 0.1173 | 0.39 | Q | V | | | | | | |
| 6+ 0 | 0.1199 | 0.39 | Q | V | | | | | | |
| 6+ 5 | 0.1229 | 0.42 | Q | V | | | | | | |
| 6+10 | 0.1259 | 0.43 | Q | V | | | | | | |
| 6+15 | 0.1288 | 0.43 | Q | V | | | | | | |
| 6+20 | 0.1318 | 0.43 | Q | V | | | | | | |
| 6+25 | 0.1348 | 0.43 | Q | V | | | | | | |
| 6+30 | 0.1378 | 0.43 | Q | V | | | | | | |
| 6+35 | 0.1411 | 0.47 | Q | V | | | | | | |
| 6+40 | 0.1444 | 0.48 | Q | V | | | | | | |
| 6+45 | 0.1477 | 0.48 | Q | V | | | | | | |
| 6+50 | 0.1510 | 0.48 | Q | V | | | | | | |
| 6+55 | 0.1543 | 0.48 | Q | V | | | | | | |
| 7+ 0 | 0.1577 | 0.48 | Q | V | | | | | | |
| 7+ 5 | 0.1610 | 0.48 | Q | V | | | | | | |
| 7+10 | 0.1643 | 0.48 | Q | V | | | | | | |
| 7+15 | 0.1676 | 0.48 | Q | V | | | | | | |
| 7+20 | 0.1712 | 0.52 | Q | V | | | | | | |
| 7+25 | 0.1748 | 0.53 | Q | V | | | | | | |
| 7+30 | 0.1785 | 0.53 | Q | V | | | | | | |
| 7+35 | 0.1824 | 0.57 | Q | V | | | | | | |
| 7+40 | 0.1864 | 0.58 | Q | V | | | | | | |
| 7+45 | 0.1904 | 0.58 | Q | V | | | | | | |
| 7+50 | 0.1946 | 0.62 | Q | V | | | | | | |
| 7+55 | 0.1989 | 0.63 | Q | V | | | | | | |
| 8+ 0 | 0.2033 | 0.63 | Q | V | | | | | | |
| 8+ 5 | 0.2081 | 0.70 | Q | V | | | | | | |
| 8+10 | 0.2131 | 0.72 | Q | V | | | | | | |
| 8+15 | 0.2181 | 0.72 | Q | V | | | | | | |
| 8+20 | 0.2230 | 0.72 | Q | V | | | | | | |
| 8+25 | 0.2280 | 0.72 | Q | V | | | | | | |
| 8+30 | 0.2330 | 0.72 | Q | V | | | | | | |
| 8+35 | 0.2382 | 0.76 | Q | V | | | | | | |
| 8+40 | 0.2435 | 0.77 | Q | V | | | | | | |
| 8+45 | 0.2489 | 0.77 | Q | V | | | | | | |
| 8+50 | 0.2544 | 0.81 | Q | V | | | | | | |
| 8+55 | 0.2601 | 0.82 | Q | V | | | | | | |
| 9+ 0 | 0.2657 | 0.82 | Q | V | | | | | | |
| 9+ 5 | 0.2723 | 0.95 | Q | V | | | | | | |
| 9+10 | 0.2791 | 1.00 | Q | V | | | | | | |
| 9+15 | 0.2860 | 1.00 | Q | V | | | | | | |
| 9+20 | 0.2934 | 1.08 | Q | V | | | | | | |
| 9+25 | 0.3010 | 1.10 | Q | V | | | | | | |
| 9+30 | 0.3086 | 1.10 | Q | V | | | | | | |
| 9+35 | 0.3167 | 1.18 | Q | V | | | | | | |
| 9+40 | 0.3250 | 1.20 | Q | V | | | | | | |
| 9+45 | 0.3333 | 1.21 | Q | V | | | | | | |
| 9+50 | 0.3422 | 1.28 | Q | V | | | | | | |
| 9+55 | 0.3512 | 1.31 | Q | V | | | | | | |
| 10+ 0 | 0.3602 | 1.31 | Q | V | | | | | | |
| 10+ 5 | 0.3661 | 0.85 | Q | V | | | | | | |
| 10+10 | 0.3711 | 0.72 | Q | V | | | | | | |
| 10+15 | 0.3761 | 0.72 | Q | V | | | | | | |
| 10+20 | 0.3810 | 0.72 | Q | V | | | | | | |
| 10+25 | 0.3860 | 0.72 | Q | V | | | | | | |
| 10+30 | 0.3910 | 0.72 | Q | V | | | | | | |
| 10+35 | 0.3983 | 1.06 | Q | V | | | | | | |
| 10+40 | 0.4062 | 1.15 | Q | V | | | | | | |
| 10+45 | 0.4142 | 1.16 | Q | V | | | | | | |
| 10+50 | 0.4222 | 1.16 | Q | V | | | | | | |
| 10+55 | 0.4302 | 1.16 | Q | V | | | | | | |
| 11+ 0 | 0.4382 | 1.17 | Q | V | | | | | | |
| 11+ 5 | 0.4458 | 1.10 | Q | V | | | | | | |
| 11+10 | 0.4532 | 1.08 | Q | V | | | | | | |
| 11+15 | 0.4607 | 1.08 | Q | V | | | | | | |
| 11+20 | 0.4682 | 1.09 | Q | V | | | | | | |
| 11+25 | 0.4757 | 1.09 | Q | V | | | | | | |
| 11+30 | 0.4832 | 1.09 | Q | V | | | | | | |
| 11+35 | 0.4898 | 0.95 | Q | V | | | | | | |
| 11+40 | 0.4961 | 0.91 | Q | V | | | | | | |
| 11+45 | 0.5024 | 0.92 | Q | V | | | | | | |
| 11+50 | 0.5093 | 0.99 | Q | V | | | | | | |

| | | | | | | | | | | | |
|-------|--------|------|--|---|--|---|--|--|--|--|--|
| 11+55 | 0.5163 | 1.02 | | Q | | V | | | | | |
| 12+ 0 | 0.5233 | 1.02 | | Q | | V | | | | | |
| 12+ 5 | 0.5339 | 1.53 | | Q | | V | | | | | |
| 12+10 | 0.5454 | 1.68 | | Q | | V | | | | | |
| 12+15 | 0.5570 | 1.68 | | Q | | V | | | | | |
| 12+20 | 0.5692 | 1.76 | | Q | | V | | | | | |
| 12+25 | 0.5814 | 1.78 | | Q | | V | | | | | |
| 12+30 | 0.5937 | 1.79 | | Q | | V | | | | | |
| 12+35 | 0.6071 | 1.94 | | Q | | V | | | | | |
| 12+40 | 0.6207 | 1.98 | | Q | | V | | | | | |
| 12+45 | 0.6344 | 1.98 | | Q | | V | | | | | |
| 12+50 | 0.6486 | 2.06 | | Q | | V | | | | | |
| 12+55 | 0.6629 | 2.08 | | Q | | V | | | | | |
| 13+ 0 | 0.6773 | 2.09 | | Q | | V | | | | | |
| 13+ 5 | 0.6942 | 2.45 | | Q | | V | | | | | |
| 13+10 | 0.7118 | 2.56 | | Q | | V | | | | | |
| 13+15 | 0.7294 | 2.56 | | Q | | V | | | | | |
| 13+20 | 0.7471 | 2.56 | | Q | | V | | | | | |
| 13+25 | 0.7648 | 2.57 | | Q | | V | | | | | |
| 13+30 | 0.7825 | 2.57 | | Q | | V | | | | | |
| 13+35 | 0.7947 | 1.77 | | Q | | V | | | | | |
| 13+40 | 0.8054 | 1.55 | | Q | | V | | | | | |
| 13+45 | 0.8161 | 1.55 | | Q | | V | | | | | |
| 13+50 | 0.8268 | 1.56 | | Q | | V | | | | | |
| 13+55 | 0.8375 | 1.56 | | Q | | V | | | | | |
| 14+ 0 | 0.8483 | 1.56 | | Q | | V | | | | | |
| 14+ 5 | 0.8611 | 1.86 | | Q | | V | | | | | |
| 14+10 | 0.8745 | 1.94 | | Q | | V | | | | | |
| 14+15 | 0.8879 | 1.94 | | Q | | V | | | | | |
| 14+20 | 0.9008 | 1.88 | | Q | | V | | | | | |
| 14+25 | 0.9136 | 1.86 | | Q | | V | | | | | |
| 14+30 | 0.9264 | 1.86 | | Q | | V | | | | | |
| 14+35 | 0.9392 | 1.86 | | Q | | V | | | | | |
| 14+40 | 0.9521 | 1.87 | | Q | | V | | | | | |
| 14+45 | 0.9649 | 1.87 | | Q | | V | | | | | |
| 14+50 | 0.9773 | 1.80 | | Q | | V | | | | | |
| 14+55 | 0.9896 | 1.78 | | Q | | V | | | | | |
| 15+ 0 | 1.0019 | 1.78 | | Q | | V | | | | | |
| 15+ 5 | 1.0137 | 1.71 | | Q | | V | | | | | |
| 15+10 | 1.0254 | 1.70 | | Q | | V | | | | | |
| 15+15 | 1.0371 | 1.70 | | Q | | V | | | | | |
| 15+20 | 1.0483 | 1.63 | | Q | | V | | | | | |
| 15+25 | 1.0594 | 1.61 | | Q | | V | | | | | |
| 15+30 | 1.0705 | 1.61 | | Q | | V | | | | | |
| 15+35 | 1.0796 | 1.33 | | Q | | V | | | | | |
| 15+40 | 1.0882 | 1.25 | | Q | | V | | | | | |
| 15+45 | 1.0968 | 1.25 | | Q | | V | | | | | |
| 15+50 | 1.1055 | 1.25 | | Q | | V | | | | | |
| 15+55 | 1.1141 | 1.25 | | Q | | V | | | | | |
| 16+ 0 | 1.1228 | 1.26 | | Q | | V | | | | | |
| 16+ 5 | 1.1257 | 0.43 | | Q | | V | | | | | |
| 16+10 | 1.1270 | 0.19 | | Q | | V | | | | | |
| 16+15 | 1.1283 | 0.19 | | Q | | V | | | | | |
| 16+20 | 1.1297 | 0.19 | | Q | | V | | | | | |
| 16+25 | 1.1310 | 0.19 | | Q | | V | | | | | |
| 16+30 | 1.1323 | 0.19 | | Q | | V | | | | | |
| 16+35 | 1.1334 | 0.16 | | Q | | V | | | | | |
| 16+40 | 1.1344 | 0.14 | | Q | | V | | | | | |
| 16+45 | 1.1354 | 0.14 | | Q | | V | | | | | |
| 16+50 | 1.1364 | 0.14 | | Q | | V | | | | | |
| 16+55 | 1.1374 | 0.14 | | Q | | V | | | | | |
| 17+ 0 | 1.1384 | 0.14 | | Q | | V | | | | | |
| 17+ 5 | 1.1399 | 0.22 | | Q | | V | | | | | |
| 17+10 | 1.1416 | 0.24 | | Q | | V | | | | | |
| 17+15 | 1.1432 | 0.24 | | Q | | V | | | | | |
| 17+20 | 1.1449 | 0.24 | | Q | | V | | | | | |
| 17+25 | 1.1465 | 0.24 | | Q | | V | | | | | |
| 17+30 | 1.1482 | 0.24 | | Q | | V | | | | | |
| 17+35 | 1.1499 | 0.24 | | Q | | V | | | | | |
| 17+40 | 1.1515 | 0.24 | | Q | | V | | | | | |
| 17+45 | 1.1532 | 0.24 | | Q | | V | | | | | |
| 17+50 | 1.1546 | 0.20 | | Q | | V | | | | | |
| 17+55 | 1.1559 | 0.19 | | Q | | V | | | | | |
| 18+ 0 | 1.1572 | 0.19 | | Q | | V | | | | | |
| 18+ 5 | 1.1586 | 0.19 | | Q | | V | | | | | |
| 18+10 | 1.1599 | 0.19 | | Q | | V | | | | | |
| 18+15 | 1.1612 | 0.19 | | Q | | V | | | | | |
| 18+20 | 1.1625 | 0.19 | | Q | | V | | | | | |
| 18+25 | 1.1639 | 0.19 | | Q | | V | | | | | |

| | | | | | | | | |
|-------|--------|------|---|--|--|--|---|--|
| 18+30 | 1.1652 | 0.19 | Q | | | | V | |
| 18+35 | 1.1663 | 0.16 | Q | | | | V | |
| 18+40 | 1.1673 | 0.14 | Q | | | | V | |
| 18+45 | 1.1683 | 0.14 | Q | | | | V | |
| 18+50 | 1.1690 | 0.11 | Q | | | | V | |
| 18+55 | 1.1697 | 0.10 | Q | | | | V | |
| 19+ 0 | 1.1703 | 0.10 | Q | | | | V | |
| 19+ 5 | 1.1713 | 0.13 | Q | | | | V | |
| 19+10 | 1.1722 | 0.14 | Q | | | | V | |
| 19+15 | 1.1732 | 0.14 | Q | | | | V | |
| 19+20 | 1.1745 | 0.18 | Q | | | | V | |
| 19+25 | 1.1758 | 0.19 | Q | | | | V | |
| 19+30 | 1.1772 | 0.19 | Q | | | | V | |
| 19+35 | 1.1782 | 0.16 | Q | | | | V | |
| 19+40 | 1.1792 | 0.14 | Q | | | | V | |
| 19+45 | 1.1802 | 0.14 | Q | | | | V | |
| 19+50 | 1.1810 | 0.11 | Q | | | | V | |
| 19+55 | 1.1816 | 0.10 | Q | | | | V | |
| 20+ 0 | 1.1823 | 0.10 | Q | | | | V | |
| 20+ 5 | 1.1832 | 0.13 | Q | | | | V | |
| 20+10 | 1.1842 | 0.14 | Q | | | | V | |
| 20+15 | 1.1852 | 0.14 | Q | | | | V | |
| 20+20 | 1.1862 | 0.14 | Q | | | | V | |
| 20+25 | 1.1872 | 0.14 | Q | | | | V | |
| 20+30 | 1.1882 | 0.14 | Q | | | | V | |
| 20+35 | 1.1892 | 0.14 | Q | | | | V | |
| 20+40 | 1.1902 | 0.14 | Q | | | | V | |
| 20+45 | 1.1912 | 0.14 | Q | | | | V | |
| 20+50 | 1.1919 | 0.11 | Q | | | | V | |
| 20+55 | 1.1926 | 0.10 | Q | | | | V | |
| 21+ 0 | 1.1932 | 0.10 | Q | | | | V | |
| 21+ 5 | 1.1942 | 0.13 | Q | | | | V | |
| 21+10 | 1.1952 | 0.14 | Q | | | | V | |
| 21+15 | 1.1962 | 0.14 | Q | | | | V | |
| 21+20 | 1.1969 | 0.11 | Q | | | | V | |
| 21+25 | 1.1976 | 0.10 | Q | | | | V | |
| 21+30 | 1.1982 | 0.10 | Q | | | | V | |
| 21+35 | 1.1991 | 0.13 | Q | | | | V | |
| 21+40 | 1.2001 | 0.14 | Q | | | | V | |
| 21+45 | 1.2011 | 0.14 | Q | | | | V | |
| 21+50 | 1.2019 | 0.11 | Q | | | | V | |
| 21+55 | 1.2025 | 0.10 | Q | | | | V | |
| 22+ 0 | 1.2032 | 0.10 | Q | | | | V | |
| 22+ 5 | 1.2041 | 0.13 | Q | | | | V | |
| 22+10 | 1.2051 | 0.14 | Q | | | | V | |
| 22+15 | 1.2061 | 0.14 | Q | | | | V | |
| 22+20 | 1.2069 | 0.11 | Q | | | | V | |
| 22+25 | 1.2075 | 0.10 | Q | | | | V | |
| 22+30 | 1.2082 | 0.10 | Q | | | | V | |
| 22+35 | 1.2088 | 0.10 | Q | | | | V | |
| 22+40 | 1.2095 | 0.10 | Q | | | | V | |
| 22+45 | 1.2102 | 0.10 | Q | | | | V | |
| 22+50 | 1.2108 | 0.10 | Q | | | | V | |
| 22+55 | 1.2115 | 0.10 | Q | | | | V | |
| 23+ 0 | 1.2122 | 0.10 | Q | | | | V | |
| 23+ 5 | 1.2128 | 0.10 | Q | | | | V | |
| 23+10 | 1.2135 | 0.10 | Q | | | | V | |
| 23+15 | 1.2142 | 0.10 | Q | | | | V | |
| 23+20 | 1.2148 | 0.10 | Q | | | | V | |
| 23+25 | 1.2155 | 0.10 | Q | | | | V | |
| 23+30 | 1.2162 | 0.10 | Q | | | | V | |
| 23+35 | 1.2168 | 0.10 | Q | | | | V | |
| 23+40 | 1.2175 | 0.10 | Q | | | | V | |
| 23+45 | 1.2181 | 0.10 | Q | | | | V | |
| 23+50 | 1.2188 | 0.10 | Q | | | | V | |
| 23+55 | 1.2195 | 0.10 | Q | | | | V | |
| 24+ 0 | 1.2201 | 0.10 | Q | | | | V | |
| 24+ 5 | 1.2203 | 0.02 | Q | | | | V | |

**100-YR / ONSITE AND OFFSITE
SYNTHETIC UNIT HYDROGRAPH
DEPRESSION ANALYSIS (PRE
DEVELOPED CONDITION)**

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012, Version 8.2
Study date 02/11/22 File: DEPRESSION100YR1HR1100.out

+++++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6312

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

NATURAL DEPRESSION 100-YEAR / 1-HOUR EXISTING SUH RUNOFF
JN 21091
02-11-2022
FOMOTOR ENGINEERING

Drainage Area = 6.49(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.49(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 446.92(Ft.)
Length along longest watercourse measured to centroid = 223.46(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.042 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 82.6994 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.20 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 6.49 | 0.37 | 2.40 |

100 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 6.49 | 1.65 | 10.71 |

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.370(In)
Area Averaged 100-Year Rainfall = 1.650(In)

Point rain (area averaged) = 1.650(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.650(In)

Sub-Area Data:

| Area(Ac.) | Runoff Index | Impervious % |
|--------------------------------|--------------|--------------|
| 6.490 | 78.00 | 0.000 |
| Total Area Entered = 6.49(Ac.) | | |

| RI | RI | Infil. Rate | Impervious | Adj. Infil. Rate | Area% | F |
|-----------|-------|-------------|------------|------------------|--------|---------|
| AMC2 | AMC-2 | (In/Hr) | (Dec.%) | (In/Hr) | (Dec.) | (In/Hr) |
| 78.0 | 78.0 | 0.268 | 0.000 | 0.268 | 1.000 | 0.268 |
| Sum (F) = | | | | | | 0.268 |

Area averaged mean soil loss (F) (In/Hr) = 0.268
Minimum soil loss rate ((In/Hr)) = 0.134

(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.5800

Unit Hydrograph DESERT S-Curve

Unit Hydrograph Data

| Unit time period (hrs) | Time % of lag | Distribution Graph % | Unit Hydrograph (CFS) |
|---------------------------|---------------|-------------------------|--------------------------|
| 1 | 0.083 | 227.630 | 46.806 |
| 2 | 0.167 | 455.261 | 43.591 |
| 3 | 0.250 | 682.891 | 7.431 |
| 4 | 0.333 | 910.521 | 2.172 |
| | | Sum = 100.000 | Sum= 6.541 |

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

| Unit Time (Hr.) | Pattern Percent | Storm Rain (In/Hr) | Loss rate(In./Hr) | | Effective (In/Hr) |
|--------------------|--------------------|-----------------------|-------------------|----------|----------------------|
| | | | Max | Low | |
| 1 | 0.08 | 3.60 | 0.268 | (0.641) | 0.445 |
| 2 | 0.17 | 4.20 | 0.268 | (0.748) | 0.564 |
| 3 | 0.25 | 4.40 | 0.268 | (0.784) | 0.604 |
| 4 | 0.33 | 4.60 | 0.268 | (0.820) | 0.643 |
| 5 | 0.42 | 5.00 | 0.268 | (0.891) | 0.722 |
| 6 | 0.50 | 5.60 | 0.268 | (0.998) | 0.841 |
| 7 | 0.58 | 6.40 | 0.268 | (1.140) | 1.000 |
| 8 | 0.67 | 8.10 | 0.268 | (1.443) | 1.336 |
| 9 | 0.75 | 13.10 | 0.268 | (2.334) | 2.326 |
| 10 | 0.83 | 34.50 | 0.268 | (6.148) | 6.563 |
| 11 | 0.92 | 6.70 | 0.268 | (1.194) | 1.059 |
| 12 | 1.00 | 3.80 | 0.268 | (0.677) | 0.485 |

(Loss Rate Not Used)

Sum = 100.0 Sum = 16.6

Flood volume = Effective rainfall 1.38(In)
times area 6.5(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)
Total soil loss = 0.27(In)
Total soil loss = 0.145(Ac.Ft)
Total rainfall = 1.65(In)
Flood volume = 32565.3 Cubic Feet
Total soil loss = 6304.3 Cubic Feet

Peak flow rate of this hydrograph = 27.530(CFS)

+++++

1 - H O U R S T O R M R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 7.5 | 15.0 | 22.5 | 30.0 |
|-----------|--------------|--------|------|-----|------|------|------|
| 0+ 5 | 0.0094 | 1.36 | VQ | | | | |
| 0+10 | 0.0300 | 3.00 | V Q | | | | |
| 0+15 | 0.0553 | 3.67 | V Q | | | | |
| 0+20 | 0.0831 | 4.03 | VQ | | | | |
| 0+25 | 0.1135 | 4.42 | QV | | | | |
| 0+30 | 0.1482 | 5.04 | QV | | | | |
| 0+35 | 0.1889 | 5.90 | Q V | | | | |
| 0+40 | 0.2402 | 7.46 | Q V | | | | |
| 0+45 | 0.3197 | 11.54 | | Q V | | | |
| 0+50 | 0.5093 | 27.53 | | | V | Q | |
| 0+55 | 0.6697 | 23.29 | | | | Q V | |
| 1+ 0 | 0.7250 | 8.03 | | Q | | | V |
| 1+ 5 | 0.7445 | 2.83 | Q | | | | V |
| 1+10 | 0.7471 | 0.39 | Q | | | | V |
| 1+15 | 0.7476 | 0.07 | Q | | | | V |

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012, Version 8.2
Study date 02/11/22 File: DEPRESSION100YR3HR3100.out

+++++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6312

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

NATURAL DEPRESSION 100-YEAR / 3-HOUR EXISTING SUH RUNOFF
JN 21091
02-11-2022
FOMOTOR ENGINEERING

Drainage Area = 6.49(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.49(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 446.92(Ft.)
Length along longest watercourse measured to centroid = 223.46(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.042 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 82.6994 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.20 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 6.49 | 0.62 | 4.00 |

100 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 6.49 | 2.38 | 15.45 |

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.616(In)
Area Averaged 100-Year Rainfall = 2.380(In)

Point rain (area averaged) = 2.380(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.380(In)

Sub-Area Data:

| Area(Ac.) | Runoff Index | Impervious % |
|--------------------------------|--------------|--------------|
| 6.490 | 78.00 | 0.000 |
| Total Area Entered = 6.49(Ac.) | | |

| RI | RI | Infil. Rate | Impervious | Adj. Infil. Rate | Area% | F |
|-----------|-------|-------------|------------|------------------|--------|---------|
| AMC2 | AMC-2 | (In/Hr) | (Dec.%) | (In/Hr) | (Dec.) | (In/Hr) |
| 78.0 | 78.0 | 0.268 | 0.000 | 0.268 | 1.000 | 0.268 |
| Sum (F) = | | | | | | 0.268 |

Area averaged mean soil loss (F) (In/Hr) = 0.268
Minimum soil loss rate ((In/Hr)) = 0.134

(for 24 hour storm duration)
 Soil loss rate (decimal) = 0.900

Unit Hydrograph
 DESERT S-Curve

Unit Hydrograph Data

| Unit time period (hrs) | Time % of lag | Distribution Graph % | Unit Hydrograph (CFS) |
|---------------------------|---------------|-------------------------|--------------------------|
| 1 0.083 | 227.630 | 46.806 | 3.061 |
| 2 0.167 | 455.261 | 43.591 | 2.851 |
| 3 0.250 | 682.891 | 7.431 | 0.486 |
| 4 0.333 | 910.521 | 2.172 | 0.142 |
| | | Sum = 100.000 | Sum= 6.541 |

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

| Unit Time (Hr.) | Pattern Percent | Storm Rain (In/Hr) | Loss rate(In./Hr) | | Effective (In/Hr) |
|--------------------|--------------------|-----------------------|-------------------|----------|----------------------|
| | | | Max | Low | |
| 1 0.08 | 1.30 | 0.371 | 0.268 | (0.334) | 0.104 |
| 2 0.17 | 1.30 | 0.371 | 0.268 | (0.334) | 0.104 |
| 3 0.25 | 1.10 | 0.314 | 0.268 | (0.283) | 0.047 |
| 4 0.33 | 1.50 | 0.428 | 0.268 | (0.386) | 0.161 |
| 5 0.42 | 1.50 | 0.428 | 0.268 | (0.386) | 0.161 |
| 6 0.50 | 1.80 | 0.514 | 0.268 | (0.463) | 0.246 |
| 7 0.58 | 1.50 | 0.428 | 0.268 | (0.386) | 0.161 |
| 8 0.67 | 1.80 | 0.514 | 0.268 | (0.463) | 0.246 |
| 9 0.75 | 1.80 | 0.514 | 0.268 | (0.463) | 0.246 |
| 10 0.83 | 1.50 | 0.428 | 0.268 | (0.386) | 0.161 |
| 11 0.92 | 1.60 | 0.457 | 0.268 | (0.411) | 0.189 |
| 12 1.00 | 1.80 | 0.514 | 0.268 | (0.463) | 0.246 |
| 13 1.08 | 2.20 | 0.628 | 0.268 | (0.565) | 0.361 |
| 14 1.17 | 2.20 | 0.628 | 0.268 | (0.565) | 0.361 |
| 15 1.25 | 2.20 | 0.628 | 0.268 | (0.565) | 0.361 |
| 16 1.33 | 2.00 | 0.571 | 0.268 | (0.514) | 0.304 |
| 17 1.42 | 2.60 | 0.743 | 0.268 | (0.668) | 0.475 |
| 18 1.50 | 2.70 | 0.771 | 0.268 | (0.694) | 0.503 |
| 19 1.58 | 2.40 | 0.685 | 0.268 | (0.617) | 0.418 |
| 20 1.67 | 2.70 | 0.771 | 0.268 | (0.694) | 0.503 |
| 21 1.75 | 3.30 | 0.942 | 0.268 | (0.848) | 0.675 |
| 22 1.83 | 3.10 | 0.885 | 0.268 | (0.797) | 0.618 |
| 23 1.92 | 2.90 | 0.828 | 0.268 | (0.745) | 0.561 |
| 24 2.00 | 3.00 | 0.857 | 0.268 | (0.771) | 0.589 |
| 25 2.08 | 3.10 | 0.885 | 0.268 | (0.797) | 0.618 |
| 26 2.17 | 4.20 | 1.199 | 0.268 | (1.080) | 0.932 |
| 27 2.25 | 5.00 | 1.428 | 0.268 | (1.285) | 1.160 |
| 28 2.33 | 3.50 | 1.000 | 0.268 | (0.900) | 0.732 |
| 29 2.42 | 6.80 | 1.942 | 0.268 | (1.748) | 1.674 |
| 30 2.50 | 7.30 | 2.085 | 0.268 | (1.876) | 1.817 |
| 31 2.58 | 8.20 | 2.342 | 0.268 | (2.108) | 2.074 |
| 32 2.67 | 5.90 | 1.685 | 0.268 | (1.516) | 1.417 |
| 33 2.75 | 2.00 | 0.571 | 0.268 | (0.514) | 0.304 |
| 34 2.83 | 1.80 | 0.514 | 0.268 | (0.463) | 0.246 |
| 35 2.92 | 1.80 | 0.514 | 0.268 | (0.463) | 0.246 |
| 36 3.00 | 0.60 | 0.171 | (0.268) | 0.154 | 0.017 |

(Loss Rate Not Used)

Sum = 100.0 Sum = 19.0

Flood volume = Effective rainfall 1.59(In)
 times area 6.5(Ac.) / [(In) / (Ft.)] = 0.9(Ac.Ft)
 Total soil loss = 0.79(In)
 Total soil loss = 0.429(Ac.Ft)
 Total rainfall = 2.38(In)
 Flood volume = 37377.8 Cubic Feet
 Total soil loss = 18690.3 Cubic Feet

Peak flow rate of this hydrograph = 12.456(CFS)

3 - H O U R S T O R M
 R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume | Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|-----------|--------|-------|--------|---|-----|------|------|------|
| 0+ 5 | 0.0022 | 0.32 | Q | | | | | |
| 0+10 | 0.0064 | 0.61 | VQ | | | | | |
| 0+15 | 0.0098 | 0.49 | Q | | | | | |
| 0+20 | 0.0145 | 0.69 | VQ | | | | | |
| 0+25 | 0.0213 | 0.99 | VQ | | | | | |
| 0+30 | 0.0303 | 1.30 | VQ | | | | | |
| 0+35 | 0.0392 | 1.30 | VQ | | | | | |
| 0+40 | 0.0486 | 1.36 | Q | | | | | |
| 0+45 | 0.0594 | 1.57 | VQ | | | | | |
| 0+50 | 0.0686 | 1.34 | QV | | | | | |
| 0+55 | 0.0768 | 1.19 | QV | | | | | |
| 1+ 0 | 0.0865 | 1.41 | Q V | | | | | |
| 1+ 5 | 0.0998 | 1.92 | QV | | | | | |
| 1+10 | 0.1155 | 2.28 | QV | | | | | |
| 1+15 | 0.1316 | 2.34 | Q V | | | | | |
| 1+20 | 0.1467 | 2.19 | Q V | | | | | |
| 1+25 | 0.1642 | 2.55 | Q V | | | | | |
| 1+30 | 0.1855 | 3.10 | Q V | | | | | |
| 1+35 | 0.2061 | 2.99 | Q V | | | | | |
| 1+40 | 0.2271 | 3.05 | Q V | | | | | |
| 1+45 | 0.2531 | 3.78 | Q V | | | | | |
| 1+50 | 0.2815 | 4.12 | Q V | | | | | |
| 1+55 | 0.3082 | 3.88 | Q V | | | | | |
| 2+ 0 | 0.3344 | 3.80 | Q V | | | | | |
| 2+ 5 | 0.3615 | 3.93 | Q V | | | | | |
| 2+10 | 0.3958 | 4.98 | Q V | | | | | |
| 2+15 | 0.4412 | 6.60 | Q V | | | | | |
| 2+20 | 0.4832 | 6.09 | Q V | | | | | |
| 2+25 | 0.5377 | 7.91 | Q V | | | | | |
| 2+30 | 0.6125 | 10.86 | Q V | | | | | |
| 2+35 | 0.6983 | 12.46 | Q V | | | | | |
| 2+40 | 0.7767 | 11.38 | Q V | | | | | |
| 2+45 | 0.8196 | 6.24 | Q | | | | | |
| 2+50 | 0.8376 | 2.61 | Q | | | | | |
| 2+55 | 0.8500 | 1.81 | Q | | | | | |
| 3+ 0 | 0.8564 | 0.92 | Q | | | | | |
| 3+ 5 | 0.8578 | 0.20 | Q | | | | | |
| 3+10 | 0.8581 | 0.04 | Q | | | | | |
| 3+15 | 0.8581 | 0.00 | Q | | | | | |

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012, Version 8.2
Study date 02/11/22 File: DEPRESSION100YR6HR6100.out

+++++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6312

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

NATURAL DEPRESSION 100-YEAR / 6-HOUR EXISTING RUNOFF SUH
JN 21091
FOMOTOR ENGINEERING
02-11-2022

Drainage Area = 6.49(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.49(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 446.92(Ft.)
Length along longest watercourse measured to centroid = 223.46(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.042 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 82.6994 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.20 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 6.49 | 0.84 | 5.43 |

100 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 6.49 | 3.13 | 20.31 |

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.837(In)
Area Averaged 100-Year Rainfall = 3.130(In)

Point rain (area averaged) = 3.130(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.130(In)

Sub-Area Data:

| Area(Ac.) | Runoff Index | Impervious % |
|--------------------------------|--------------|--------------|
| 6.490 | 78.00 | 0.000 |
| Total Area Entered = 6.49(Ac.) | | |

| RI | RI | Infil. Rate | Impervious | Adj. Infil. Rate | Area% | F |
|-----------|-------|-------------|------------|------------------|--------|---------|
| AMC2 | AMC-2 | (In/Hr) | (Dec.%) | (In/Hr) | (Dec.) | (In/Hr) |
| 78.0 | 78.0 | 0.268 | 0.000 | 0.268 | 1.000 | 0.268 |
| Sum (F) = | | | | | | 0.268 |

Area averaged mean soil loss (F) (In/Hr) = 0.268
Minimum soil loss rate ((In/Hr)) = 0.134

(for 24 hour storm duration)
 Soil loss rate (decimal) = 0.900

Unit Hydrograph
 DESERT S-Curve

Unit Hydrograph Data

| Unit time period (hrs) | Time % of lag | Distribution Graph % | Unit Hydrograph (CFS) |
|---------------------------|---------------|-------------------------|--------------------------|
| 1 0.083 | 227.630 | 46.806 | 3.061 |
| 2 0.167 | 455.261 | 43.591 | 2.851 |
| 3 0.250 | 682.891 | 7.431 | 0.486 |
| 4 0.333 | 910.521 | 2.172 | 0.142 |
| | | Sum = 100.000 | Sum= 6.541 |

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

| Unit Time (Hr.) | Pattern Percent | Storm Rain (In/Hr) | Loss rate(In./Hr) | | Effective (In/Hr) |
|--------------------|--------------------|-----------------------|-------------------|----------|----------------------|
| | | | Max | Low | |
| 1 0.08 | 0.50 | 0.188 | (0.268) | 0.169 | 0.019 |
| 2 0.17 | 0.60 | 0.225 | (0.268) | 0.203 | 0.023 |
| 3 0.25 | 0.60 | 0.225 | (0.268) | 0.203 | 0.023 |
| 4 0.33 | 0.60 | 0.225 | (0.268) | 0.203 | 0.023 |
| 5 0.42 | 0.60 | 0.225 | (0.268) | 0.203 | 0.023 |
| 6 0.50 | 0.70 | 0.263 | (0.268) | 0.237 | 0.026 |
| 7 0.58 | 0.70 | 0.263 | (0.268) | 0.237 | 0.026 |
| 8 0.67 | 0.70 | 0.263 | (0.268) | 0.237 | 0.026 |
| 9 0.75 | 0.70 | 0.263 | (0.268) | 0.237 | 0.026 |
| 10 0.83 | 0.70 | 0.263 | (0.268) | 0.237 | 0.026 |
| 11 0.92 | 0.70 | 0.263 | (0.268) | 0.237 | 0.026 |
| 12 1.00 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 13 1.08 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 14 1.17 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 15 1.25 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 16 1.33 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 17 1.42 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 18 1.50 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 19 1.58 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 20 1.67 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 21 1.75 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 22 1.83 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 23 1.92 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 24 2.00 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 25 2.08 | 0.80 | 0.300 | 0.268 | (0.270) | 0.033 |
| 26 2.17 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 27 2.25 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 28 2.33 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 29 2.42 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 30 2.50 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 31 2.58 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 32 2.67 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 33 2.75 | 1.00 | 0.376 | 0.268 | (0.338) | 0.108 |
| 34 2.83 | 1.00 | 0.376 | 0.268 | (0.338) | 0.108 |
| 35 2.92 | 1.00 | 0.376 | 0.268 | (0.338) | 0.108 |
| 36 3.00 | 1.00 | 0.376 | 0.268 | (0.338) | 0.108 |
| 37 3.08 | 1.00 | 0.376 | 0.268 | (0.338) | 0.108 |
| 38 3.17 | 1.10 | 0.413 | 0.268 | (0.372) | 0.146 |
| 39 3.25 | 1.10 | 0.413 | 0.268 | (0.372) | 0.146 |
| 40 3.33 | 1.10 | 0.413 | 0.268 | (0.372) | 0.146 |
| 41 3.42 | 1.20 | 0.451 | 0.268 | (0.406) | 0.183 |
| 42 3.50 | 1.30 | 0.488 | 0.268 | (0.439) | 0.221 |
| 43 3.58 | 1.40 | 0.526 | 0.268 | (0.473) | 0.258 |
| 44 3.67 | 1.40 | 0.526 | 0.268 | (0.473) | 0.258 |
| 45 3.75 | 1.50 | 0.563 | 0.268 | (0.507) | 0.296 |
| 46 3.83 | 1.50 | 0.563 | 0.268 | (0.507) | 0.296 |
| 47 3.92 | 1.60 | 0.601 | 0.268 | (0.541) | 0.333 |
| 48 4.00 | 1.60 | 0.601 | 0.268 | (0.541) | 0.333 |
| 49 4.08 | 1.70 | 0.639 | 0.268 | (0.575) | 0.371 |
| 50 4.17 | 1.80 | 0.676 | 0.268 | (0.608) | 0.408 |
| 51 4.25 | 1.90 | 0.714 | 0.268 | (0.642) | 0.446 |
| 52 4.33 | 2.00 | 0.751 | 0.268 | (0.676) | 0.484 |
| 53 4.42 | 2.10 | 0.789 | 0.268 | (0.710) | 0.521 |
| 54 4.50 | 2.10 | 0.789 | 0.268 | (0.710) | 0.521 |

| | | | | | | |
|----|------|------|-------|----------|----------|-------|
| 55 | 4.58 | 2.20 | 0.826 | 0.268 | (0.744) | 0.559 |
| 56 | 4.67 | 2.30 | 0.864 | 0.268 | (0.777) | 0.596 |
| 57 | 4.75 | 2.40 | 0.901 | 0.268 | (0.811) | 0.634 |
| 58 | 4.83 | 2.40 | 0.901 | 0.268 | (0.811) | 0.634 |
| 59 | 4.92 | 2.50 | 0.939 | 0.268 | (0.845) | 0.671 |
| 60 | 5.00 | 2.60 | 0.977 | 0.268 | (0.879) | 0.709 |
| 61 | 5.08 | 3.10 | 1.164 | 0.268 | (1.048) | 0.897 |
| 62 | 5.17 | 3.60 | 1.352 | 0.268 | (1.217) | 1.085 |
| 63 | 5.25 | 3.90 | 1.465 | 0.268 | (1.318) | 1.197 |
| 64 | 5.33 | 4.20 | 1.577 | 0.268 | (1.420) | 1.310 |
| 65 | 5.42 | 4.70 | 1.765 | 0.268 | (1.589) | 1.498 |
| 66 | 5.50 | 5.60 | 2.103 | 0.268 | (1.893) | 1.836 |
| 67 | 5.58 | 1.90 | 0.714 | 0.268 | (0.642) | 0.446 |
| 68 | 5.67 | 0.90 | 0.338 | 0.268 | (0.304) | 0.070 |
| 69 | 5.75 | 0.60 | 0.225 | (0.268) | 0.203 | 0.023 |
| 70 | 5.83 | 0.50 | 0.188 | (0.268) | 0.169 | 0.019 |
| 71 | 5.92 | 0.30 | 0.113 | (0.268) | 0.101 | 0.011 |
| 72 | 6.00 | 0.20 | 0.075 | (0.268) | 0.068 | 0.008 |

(Loss Rate Not Used)

Sum = 100.0 Sum = 19.4

Flood volume = Effective rainfall 1.61(In)
times area 6.5(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)
Total soil loss = 1.52(In)
Total soil loss = 0.820(Ac.Ft)
Total rainfall = 3.13(In)
Flood volume = 38018.0 Cubic Feet
Total soil loss = 35719.1 Cubic Feet

Peak flow rate of this hydrograph = 10.702(CFS)

+++++
6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|-----------|--------------|--------|------|-----|------|------|------|
| 0+ 5 | 0.0004 | 0.06 | Q | | | | |
| 0+10 | 0.0012 | 0.12 | Q | | | | |
| 0+15 | 0.0022 | 0.14 | Q | | | | |
| 0+20 | 0.0032 | 0.15 | Q | | | | |
| 0+25 | 0.0042 | 0.15 | Q | | | | |
| 0+30 | 0.0053 | 0.16 | Q | | | | |
| 0+35 | 0.0065 | 0.17 | Q | | | | |
| 0+40 | 0.0077 | 0.17 | Q | | | | |
| 0+45 | 0.0089 | 0.17 | Q | | | | |
| 0+50 | 0.0101 | 0.17 | Q | | | | |
| 0+55 | 0.0112 | 0.17 | Q | | | | |
| 1+ 0 | 0.0126 | 0.19 | Q | | | | |
| 1+ 5 | 0.0140 | 0.21 | Q | | | | |
| 1+10 | 0.0155 | 0.21 | Q | | | | |
| 1+15 | 0.0170 | 0.22 | Q | | | | |
| 1+20 | 0.0185 | 0.22 | Q | | | | |
| 1+25 | 0.0199 | 0.22 | Q | | | | |
| 1+30 | 0.0214 | 0.22 | Q | | | | |
| 1+35 | 0.0229 | 0.22 | QV | | | | |
| 1+40 | 0.0244 | 0.22 | QV | | | | |
| 1+45 | 0.0259 | 0.22 | QV | | | | |
| 1+50 | 0.0274 | 0.22 | QV | | | | |
| 1+55 | 0.0288 | 0.22 | QV | | | | |
| 2+ 0 | 0.0311 | 0.33 | QV | | | | |
| 2+ 5 | 0.0333 | 0.32 | QV | | | | |
| 2+10 | 0.0357 | 0.35 | QV | | | | |
| 2+15 | 0.0388 | 0.44 | QV | | | | |
| 2+20 | 0.0419 | 0.46 | QV | | | | |
| 2+25 | 0.0451 | 0.46 | Q V | | | | |
| 2+30 | 0.0483 | 0.46 | Q V | | | | |
| 2+35 | 0.0514 | 0.46 | Q V | | | | |
| 2+40 | 0.0546 | 0.46 | Q V | | | | |
| 2+45 | 0.0586 | 0.58 | IQV | | | | |
| 2+50 | 0.0633 | 0.68 | IQV | | | | |
| 2+55 | 0.0681 | 0.70 | IQ V | | | | |
| 3+ 0 | 0.0730 | 0.71 | IQ V | | | | |
| 3+ 5 | 0.0778 | 0.71 | IQ V | | | | |
| 3+10 | 0.0835 | 0.82 | IQ V | | | | |
| 3+15 | 0.0899 | 0.93 | IQ V | | | | |
| 3+20 | 0.0964 | 0.95 | IQ V | | | | |

| | | | | | | | | |
|------|--------|-------|-----|--|--|--|--|--|
| 3+25 | 0.1038 | 1.07 | Q V | | | | | |
| 3+30 | 0.1127 | 1.29 | Q V | | | | | |
| 3+35 | 0.1232 | 1.53 | Q V | | | | | |
| 3+40 | 0.1346 | 1.66 | Q V | | | | | |
| 3+45 | 0.1470 | 1.80 | Q V | | | | | |
| 3+50 | 0.1602 | 1.91 | Q V | | | | | |
| 3+55 | 0.1743 | 2.05 | Q V | | | | | |
| 4+ 0 | 0.1891 | 2.16 | Q V | | | | | |
| 4+ 5 | 0.2049 | 2.29 | Q V | | | | | |
| 4+10 | 0.2223 | 2.52 | Q V | | | | | |
| 4+15 | 0.2413 | 2.76 | Q V | | | | | |
| 4+20 | 0.2620 | 3.00 | Q V | | | | | |
| 4+25 | 0.2844 | 3.25 | Q V | | | | | |
| 4+30 | 0.3076 | 3.38 | Q V | | | | | |
| 4+35 | 0.3319 | 3.52 | Q V | | | | | |
| 4+40 | 0.3577 | 3.75 | Q V | | | | | |
| 4+45 | 0.3852 | 3.99 | Q V | | | | | |
| 4+50 | 0.4135 | 4.12 | Q V | | | | | |
| 4+55 | 0.4429 | 4.26 | Q V | | | | | |
| 5+ 0 | 0.4737 | 4.49 | Q V | | | | | |
| 5+ 5 | 0.5095 | 5.19 | Q V | | | | | |
| 5+10 | 0.5530 | 6.32 | Q V | | | | | |
| 5+15 | 0.6032 | 7.30 | Q V | | | | | |
| 5+20 | 0.6589 | 8.08 | Q V | | | | | |
| 5+25 | 0.7213 | 9.06 | Q V | | | | | |
| 5+30 | 0.7950 | 10.70 | Q V | | | | | |
| 5+35 | 0.8468 | 7.52 | Q V | | | | | |
| 5+40 | 0.8646 | 2.59 | Q V | | | | | |
| 5+45 | 0.8698 | 0.75 | Q V | | | | | |
| 5+50 | 0.8713 | 0.22 | Q V | | | | | |
| 5+55 | 0.8721 | 0.11 | Q V | | | | | |
| 6+ 0 | 0.8725 | 0.07 | Q V | | | | | |
| 6+ 5 | 0.8727 | 0.03 | Q V | | | | | |
| 6+10 | 0.8728 | 0.01 | Q V | | | | | |
| 6+15 | 0.8728 | 0.00 | Q V | | | | | |

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2012, Version 8.2
Study date 02/11/22 File: DEPRESSION100YR24HR24100.out

+++++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6312

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

NATURAL DEPRESSION 100-YEAR / 24-HOUR EXISTING SUH RUNOFF
JN 21091
FOMOTOR ENGINEERING
02-11-2022

Drainage Area = 6.49(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.49(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 446.92(Ft.)
Length along longest watercourse measured to centroid = 223.46(Ft.)
Length along longest watercourse = 0.085 Mi.
Length along longest watercourse measured to centroid = 0.042 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 82.6994 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.037 Hr.
Lag time = 2.20 Min.
25% of lag time = 0.55 Min.
40% of lag time = 0.88 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 6.49 | 1.21 | 7.85 |

100 YEAR Area rainfall data:

| Area(Ac.) [1] | Rainfall(In) [2] | Weighting[1*2] |
|---------------|------------------|----------------|
| 6.49 | 4.73 | 30.70 |

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.210(In)
Area Averaged 100-Year Rainfall = 4.730(In)

Point rain (area averaged) = 4.730(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.730(In)

Sub-Area Data:

| Area(Ac.) | Runoff Index | Impervious % |
|--------------------------------|--------------|--------------|
| 6.490 | 78.00 | 0.000 |
| Total Area Entered = 6.49(Ac.) | | |

| RI | RI | Infil. Rate | Impervious | Adj. Infil. Rate | Area% | F |
|-----------|-------|-------------|------------|------------------|--------|---------|
| AMC2 | AMC-2 | (In/Hr) | (Dec.%) | (In/Hr) | (Dec.) | (In/Hr) |
| 78.0 | 78.0 | 0.268 | 0.000 | 0.268 | 1.000 | 0.268 |
| Sum (F) = | | | | | | 0.268 |

Area averaged mean soil loss (F) (In/Hr) = 0.268
Minimum soil loss rate ((In/Hr)) = 0.134

(for 24 hour storm duration)
 Soil loss rate (decimal) = 0.900

Unit Hydrograph
 DESERT S-Curve

Unit Hydrograph Data

| Unit time period (hrs) | Time % of lag | Distribution Graph % | Unit Hydrograph (CFS) |
|---------------------------|---------------|-------------------------|--------------------------|
| 1 0.083 | 227.630 | 46.806 | 3.061 |
| 2 0.167 | 455.261 | 43.591 | 2.851 |
| 3 0.250 | 682.891 | 7.431 | 0.486 |
| 4 0.333 | 910.521 | 2.172 | 0.142 |
| | | Sum = 100.000 | Sum= 6.541 |

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

| Unit Time (Hr.) | Pattern Percent | Storm Rain (In/Hr) | Loss rate(In./Hr) | | Effective (In/Hr) |
|--------------------|--------------------|-----------------------|-------------------|-------|----------------------|
| | | | Max | Low | |
| 1 0.08 | 0.07 | 0.038 | (0.474) | 0.034 | 0.004 |
| 2 0.17 | 0.07 | 0.038 | (0.473) | 0.034 | 0.004 |
| 3 0.25 | 0.07 | 0.038 | (0.471) | 0.034 | 0.004 |
| 4 0.33 | 0.10 | 0.057 | (0.469) | 0.051 | 0.006 |
| 5 0.42 | 0.10 | 0.057 | (0.467) | 0.051 | 0.006 |
| 6 0.50 | 0.10 | 0.057 | (0.465) | 0.051 | 0.006 |
| 7 0.58 | 0.10 | 0.057 | (0.463) | 0.051 | 0.006 |
| 8 0.67 | 0.10 | 0.057 | (0.462) | 0.051 | 0.006 |
| 9 0.75 | 0.10 | 0.057 | (0.460) | 0.051 | 0.006 |
| 10 0.83 | 0.13 | 0.076 | (0.458) | 0.068 | 0.008 |
| 11 0.92 | 0.13 | 0.076 | (0.456) | 0.068 | 0.008 |
| 12 1.00 | 0.13 | 0.076 | (0.454) | 0.068 | 0.008 |
| 13 1.08 | 0.10 | 0.057 | (0.453) | 0.051 | 0.006 |
| 14 1.17 | 0.10 | 0.057 | (0.451) | 0.051 | 0.006 |
| 15 1.25 | 0.10 | 0.057 | (0.449) | 0.051 | 0.006 |
| 16 1.33 | 0.10 | 0.057 | (0.447) | 0.051 | 0.006 |
| 17 1.42 | 0.10 | 0.057 | (0.445) | 0.051 | 0.006 |
| 18 1.50 | 0.10 | 0.057 | (0.444) | 0.051 | 0.006 |
| 19 1.58 | 0.10 | 0.057 | (0.442) | 0.051 | 0.006 |
| 20 1.67 | 0.10 | 0.057 | (0.440) | 0.051 | 0.006 |
| 21 1.75 | 0.10 | 0.057 | (0.438) | 0.051 | 0.006 |
| 22 1.83 | 0.13 | 0.076 | (0.437) | 0.068 | 0.008 |
| 23 1.92 | 0.13 | 0.076 | (0.435) | 0.068 | 0.008 |
| 24 2.00 | 0.13 | 0.076 | (0.433) | 0.068 | 0.008 |
| 25 2.08 | 0.13 | 0.076 | (0.431) | 0.068 | 0.008 |
| 26 2.17 | 0.13 | 0.076 | (0.430) | 0.068 | 0.008 |
| 27 2.25 | 0.13 | 0.076 | (0.428) | 0.068 | 0.008 |
| 28 2.33 | 0.13 | 0.076 | (0.426) | 0.068 | 0.008 |
| 29 2.42 | 0.13 | 0.076 | (0.424) | 0.068 | 0.008 |
| 30 2.50 | 0.13 | 0.076 | (0.423) | 0.068 | 0.008 |
| 31 2.58 | 0.17 | 0.095 | (0.421) | 0.085 | 0.009 |
| 32 2.67 | 0.17 | 0.095 | (0.419) | 0.085 | 0.009 |
| 33 2.75 | 0.17 | 0.095 | (0.417) | 0.085 | 0.009 |
| 34 2.83 | 0.17 | 0.095 | (0.416) | 0.085 | 0.009 |
| 35 2.92 | 0.17 | 0.095 | (0.414) | 0.085 | 0.009 |
| 36 3.00 | 0.17 | 0.095 | (0.412) | 0.085 | 0.009 |
| 37 3.08 | 0.17 | 0.095 | (0.411) | 0.085 | 0.009 |
| 38 3.17 | 0.17 | 0.095 | (0.409) | 0.085 | 0.009 |
| 39 3.25 | 0.17 | 0.095 | (0.407) | 0.085 | 0.009 |
| 40 3.33 | 0.17 | 0.095 | (0.405) | 0.085 | 0.009 |
| 41 3.42 | 0.17 | 0.095 | (0.404) | 0.085 | 0.009 |
| 42 3.50 | 0.17 | 0.095 | (0.402) | 0.085 | 0.009 |
| 43 3.58 | 0.17 | 0.095 | (0.400) | 0.085 | 0.009 |
| 44 3.67 | 0.17 | 0.095 | (0.399) | 0.085 | 0.009 |
| 45 3.75 | 0.17 | 0.095 | (0.397) | 0.085 | 0.009 |
| 46 3.83 | 0.20 | 0.114 | (0.395) | 0.102 | 0.011 |
| 47 3.92 | 0.20 | 0.114 | (0.394) | 0.102 | 0.011 |
| 48 4.00 | 0.20 | 0.114 | (0.392) | 0.102 | 0.011 |
| 49 4.08 | 0.20 | 0.114 | (0.390) | 0.102 | 0.011 |
| 50 4.17 | 0.20 | 0.114 | (0.389) | 0.102 | 0.011 |
| 51 4.25 | 0.20 | 0.114 | (0.387) | 0.102 | 0.011 |
| 52 4.33 | 0.23 | 0.132 | (0.385) | 0.119 | 0.013 |
| 53 4.42 | 0.23 | 0.132 | (0.384) | 0.119 | 0.013 |
| 54 4.50 | 0.23 | 0.132 | (0.382) | 0.119 | 0.013 |

| | | | | | | |
|-----|-------|------|-------|----------|----------|-------|
| 55 | 4.58 | 0.23 | 0.132 | (0.381) | 0.119 | 0.013 |
| 56 | 4.67 | 0.23 | 0.132 | (0.379) | 0.119 | 0.013 |
| 57 | 4.75 | 0.23 | 0.132 | (0.377) | 0.119 | 0.013 |
| 58 | 4.83 | 0.27 | 0.151 | (0.376) | 0.136 | 0.015 |
| 59 | 4.92 | 0.27 | 0.151 | (0.374) | 0.136 | 0.015 |
| 60 | 5.00 | 0.27 | 0.151 | (0.372) | 0.136 | 0.015 |
| 61 | 5.08 | 0.20 | 0.114 | (0.371) | 0.102 | 0.011 |
| 62 | 5.17 | 0.20 | 0.114 | (0.369) | 0.102 | 0.011 |
| 63 | 5.25 | 0.20 | 0.114 | (0.368) | 0.102 | 0.011 |
| 64 | 5.33 | 0.23 | 0.132 | (0.366) | 0.119 | 0.013 |
| 65 | 5.42 | 0.23 | 0.132 | (0.364) | 0.119 | 0.013 |
| 66 | 5.50 | 0.23 | 0.132 | (0.363) | 0.119 | 0.013 |
| 67 | 5.58 | 0.27 | 0.151 | (0.361) | 0.136 | 0.015 |
| 68 | 5.67 | 0.27 | 0.151 | (0.360) | 0.136 | 0.015 |
| 69 | 5.75 | 0.27 | 0.151 | (0.358) | 0.136 | 0.015 |
| 70 | 5.83 | 0.27 | 0.151 | (0.356) | 0.136 | 0.015 |
| 71 | 5.92 | 0.27 | 0.151 | (0.355) | 0.136 | 0.015 |
| 72 | 6.00 | 0.27 | 0.151 | (0.353) | 0.136 | 0.015 |
| 73 | 6.08 | 0.30 | 0.170 | (0.352) | 0.153 | 0.017 |
| 74 | 6.17 | 0.30 | 0.170 | (0.350) | 0.153 | 0.017 |
| 75 | 6.25 | 0.30 | 0.170 | (0.349) | 0.153 | 0.017 |
| 76 | 6.33 | 0.30 | 0.170 | (0.347) | 0.153 | 0.017 |
| 77 | 6.42 | 0.30 | 0.170 | (0.345) | 0.153 | 0.017 |
| 78 | 6.50 | 0.30 | 0.170 | (0.344) | 0.153 | 0.017 |
| 79 | 6.58 | 0.33 | 0.189 | (0.342) | 0.170 | 0.019 |
| 80 | 6.67 | 0.33 | 0.189 | (0.341) | 0.170 | 0.019 |
| 81 | 6.75 | 0.33 | 0.189 | (0.339) | 0.170 | 0.019 |
| 82 | 6.83 | 0.33 | 0.189 | (0.338) | 0.170 | 0.019 |
| 83 | 6.92 | 0.33 | 0.189 | (0.336) | 0.170 | 0.019 |
| 84 | 7.00 | 0.33 | 0.189 | (0.335) | 0.170 | 0.019 |
| 85 | 7.08 | 0.33 | 0.189 | (0.333) | 0.170 | 0.019 |
| 86 | 7.17 | 0.33 | 0.189 | (0.332) | 0.170 | 0.019 |
| 87 | 7.25 | 0.33 | 0.189 | (0.330) | 0.170 | 0.019 |
| 88 | 7.33 | 0.37 | 0.208 | (0.329) | 0.187 | 0.021 |
| 89 | 7.42 | 0.37 | 0.208 | (0.327) | 0.187 | 0.021 |
| 90 | 7.50 | 0.37 | 0.208 | (0.326) | 0.187 | 0.021 |
| 91 | 7.58 | 0.40 | 0.227 | (0.324) | 0.204 | 0.023 |
| 92 | 7.67 | 0.40 | 0.227 | (0.323) | 0.204 | 0.023 |
| 93 | 7.75 | 0.40 | 0.227 | (0.321) | 0.204 | 0.023 |
| 94 | 7.83 | 0.43 | 0.246 | (0.320) | 0.221 | 0.025 |
| 95 | 7.92 | 0.43 | 0.246 | (0.318) | 0.221 | 0.025 |
| 96 | 8.00 | 0.43 | 0.246 | (0.317) | 0.221 | 0.025 |
| 97 | 8.08 | 0.50 | 0.284 | (0.315) | 0.255 | 0.028 |
| 98 | 8.17 | 0.50 | 0.284 | (0.314) | 0.255 | 0.028 |
| 99 | 8.25 | 0.50 | 0.284 | (0.312) | 0.255 | 0.028 |
| 100 | 8.33 | 0.50 | 0.284 | (0.311) | 0.255 | 0.028 |
| 101 | 8.42 | 0.50 | 0.284 | (0.309) | 0.255 | 0.028 |
| 102 | 8.50 | 0.50 | 0.284 | (0.308) | 0.255 | 0.028 |
| 103 | 8.58 | 0.53 | 0.303 | (0.306) | 0.272 | 0.030 |
| 104 | 8.67 | 0.53 | 0.303 | (0.305) | 0.272 | 0.030 |
| 105 | 8.75 | 0.53 | 0.303 | (0.304) | 0.272 | 0.030 |
| 106 | 8.83 | 0.57 | 0.322 | (0.302) | 0.289 | 0.032 |
| 107 | 8.92 | 0.57 | 0.322 | (0.301) | 0.289 | 0.032 |
| 108 | 9.00 | 0.57 | 0.322 | (0.299) | 0.289 | 0.032 |
| 109 | 9.08 | 0.63 | 0.359 | 0.298 | (0.324) | 0.062 |
| 110 | 9.17 | 0.63 | 0.359 | 0.296 | (0.324) | 0.063 |
| 111 | 9.25 | 0.63 | 0.359 | 0.295 | (0.324) | 0.064 |
| 112 | 9.33 | 0.67 | 0.378 | 0.294 | (0.341) | 0.085 |
| 113 | 9.42 | 0.67 | 0.378 | 0.292 | (0.341) | 0.086 |
| 114 | 9.50 | 0.67 | 0.378 | 0.291 | (0.341) | 0.088 |
| 115 | 9.58 | 0.70 | 0.397 | 0.289 | (0.358) | 0.108 |
| 116 | 9.67 | 0.70 | 0.397 | 0.288 | (0.358) | 0.109 |
| 117 | 9.75 | 0.70 | 0.397 | 0.287 | (0.358) | 0.111 |
| 118 | 9.83 | 0.73 | 0.416 | 0.285 | (0.375) | 0.131 |
| 119 | 9.92 | 0.73 | 0.416 | 0.284 | (0.375) | 0.132 |
| 120 | 10.00 | 0.73 | 0.416 | 0.283 | (0.375) | 0.134 |
| 121 | 10.08 | 0.50 | 0.284 | (0.281) | 0.255 | 0.028 |
| 122 | 10.17 | 0.50 | 0.284 | (0.280) | 0.255 | 0.028 |
| 123 | 10.25 | 0.50 | 0.284 | (0.278) | 0.255 | 0.028 |
| 124 | 10.33 | 0.50 | 0.284 | (0.277) | 0.255 | 0.028 |
| 125 | 10.42 | 0.50 | 0.284 | (0.276) | 0.255 | 0.028 |
| 126 | 10.50 | 0.50 | 0.284 | (0.274) | 0.255 | 0.028 |
| 127 | 10.58 | 0.67 | 0.378 | 0.273 | (0.341) | 0.105 |
| 128 | 10.67 | 0.67 | 0.378 | 0.272 | (0.341) | 0.107 |
| 129 | 10.75 | 0.67 | 0.378 | 0.270 | (0.341) | 0.108 |
| 130 | 10.83 | 0.67 | 0.378 | 0.269 | (0.341) | 0.109 |
| 131 | 10.92 | 0.67 | 0.378 | 0.268 | (0.341) | 0.111 |
| 132 | 11.00 | 0.67 | 0.378 | 0.266 | (0.341) | 0.112 |
| 133 | 11.08 | 0.63 | 0.359 | 0.265 | (0.324) | 0.094 |

| | | | | | | |
|-----|-------|------|-------|----------|----------|-------|
| 134 | 11.17 | 0.63 | 0.359 | 0.264 | (0.324) | 0.096 |
| 135 | 11.25 | 0.63 | 0.359 | 0.263 | (0.324) | 0.097 |
| 136 | 11.33 | 0.63 | 0.359 | 0.261 | (0.324) | 0.098 |
| 137 | 11.42 | 0.63 | 0.359 | 0.260 | (0.324) | 0.100 |
| 138 | 11.50 | 0.63 | 0.359 | 0.259 | (0.324) | 0.101 |
| 139 | 11.58 | 0.57 | 0.322 | 0.257 | (0.289) | 0.064 |
| 140 | 11.67 | 0.57 | 0.322 | 0.256 | (0.289) | 0.066 |
| 141 | 11.75 | 0.57 | 0.322 | 0.255 | (0.289) | 0.067 |
| 142 | 11.83 | 0.60 | 0.341 | 0.254 | (0.307) | 0.087 |
| 143 | 11.92 | 0.60 | 0.341 | 0.252 | (0.307) | 0.088 |
| 144 | 12.00 | 0.60 | 0.341 | 0.251 | (0.307) | 0.090 |
| 145 | 12.08 | 0.83 | 0.473 | 0.250 | (0.426) | 0.223 |
| 146 | 12.17 | 0.83 | 0.473 | 0.249 | (0.426) | 0.224 |
| 147 | 12.25 | 0.83 | 0.473 | 0.247 | (0.426) | 0.226 |
| 148 | 12.33 | 0.87 | 0.492 | 0.246 | (0.443) | 0.246 |
| 149 | 12.42 | 0.87 | 0.492 | 0.245 | (0.443) | 0.247 |
| 150 | 12.50 | 0.87 | 0.492 | 0.244 | (0.443) | 0.248 |
| 151 | 12.58 | 0.93 | 0.530 | 0.242 | (0.477) | 0.287 |
| 152 | 12.67 | 0.93 | 0.530 | 0.241 | (0.477) | 0.289 |
| 153 | 12.75 | 0.93 | 0.530 | 0.240 | (0.477) | 0.290 |
| 154 | 12.83 | 0.97 | 0.549 | 0.239 | (0.494) | 0.310 |
| 155 | 12.92 | 0.97 | 0.549 | 0.238 | (0.494) | 0.311 |
| 156 | 13.00 | 0.97 | 0.549 | 0.236 | (0.494) | 0.312 |
| 157 | 13.08 | 1.13 | 0.643 | 0.235 | (0.579) | 0.408 |
| 158 | 13.17 | 1.13 | 0.643 | 0.234 | (0.579) | 0.409 |
| 159 | 13.25 | 1.13 | 0.643 | 0.233 | (0.579) | 0.411 |
| 160 | 13.33 | 1.13 | 0.643 | 0.232 | (0.579) | 0.412 |
| 161 | 13.42 | 1.13 | 0.643 | 0.230 | (0.579) | 0.413 |
| 162 | 13.50 | 1.13 | 0.643 | 0.229 | (0.579) | 0.414 |
| 163 | 13.58 | 0.77 | 0.435 | 0.228 | (0.392) | 0.207 |
| 164 | 13.67 | 0.77 | 0.435 | 0.227 | (0.392) | 0.208 |
| 165 | 13.75 | 0.77 | 0.435 | 0.226 | (0.392) | 0.209 |
| 166 | 13.83 | 0.77 | 0.435 | 0.225 | (0.392) | 0.211 |
| 167 | 13.92 | 0.77 | 0.435 | 0.223 | (0.392) | 0.212 |
| 168 | 14.00 | 0.77 | 0.435 | 0.222 | (0.392) | 0.213 |
| 169 | 14.08 | 0.90 | 0.511 | 0.221 | (0.460) | 0.290 |
| 170 | 14.17 | 0.90 | 0.511 | 0.220 | (0.460) | 0.291 |
| 171 | 14.25 | 0.90 | 0.511 | 0.219 | (0.460) | 0.292 |
| 172 | 14.33 | 0.87 | 0.492 | 0.218 | (0.443) | 0.274 |
| 173 | 14.42 | 0.87 | 0.492 | 0.217 | (0.443) | 0.275 |
| 174 | 14.50 | 0.87 | 0.492 | 0.216 | (0.443) | 0.276 |
| 175 | 14.58 | 0.87 | 0.492 | 0.214 | (0.443) | 0.277 |
| 176 | 14.67 | 0.87 | 0.492 | 0.213 | (0.443) | 0.279 |
| 177 | 14.75 | 0.87 | 0.492 | 0.212 | (0.443) | 0.280 |
| 178 | 14.83 | 0.83 | 0.473 | 0.211 | (0.426) | 0.262 |
| 179 | 14.92 | 0.83 | 0.473 | 0.210 | (0.426) | 0.263 |
| 180 | 15.00 | 0.83 | 0.473 | 0.209 | (0.426) | 0.264 |
| 181 | 15.08 | 0.80 | 0.454 | 0.208 | (0.409) | 0.246 |
| 182 | 15.17 | 0.80 | 0.454 | 0.207 | (0.409) | 0.247 |
| 183 | 15.25 | 0.80 | 0.454 | 0.206 | (0.409) | 0.248 |
| 184 | 15.33 | 0.77 | 0.435 | 0.205 | (0.392) | 0.230 |
| 185 | 15.42 | 0.77 | 0.435 | 0.204 | (0.392) | 0.231 |
| 186 | 15.50 | 0.77 | 0.435 | 0.203 | (0.392) | 0.232 |
| 187 | 15.58 | 0.63 | 0.359 | 0.202 | (0.324) | 0.158 |
| 188 | 15.67 | 0.63 | 0.359 | 0.201 | (0.324) | 0.159 |
| 189 | 15.75 | 0.63 | 0.359 | 0.200 | (0.324) | 0.160 |
| 190 | 15.83 | 0.63 | 0.359 | 0.199 | (0.324) | 0.161 |
| 191 | 15.92 | 0.63 | 0.359 | 0.198 | (0.324) | 0.162 |
| 192 | 16.00 | 0.63 | 0.359 | 0.197 | (0.324) | 0.163 |
| 193 | 16.08 | 0.13 | 0.076 | (0.196) | 0.068 | 0.008 |
| 194 | 16.17 | 0.13 | 0.076 | (0.195) | 0.068 | 0.008 |
| 195 | 16.25 | 0.13 | 0.076 | (0.194) | 0.068 | 0.008 |
| 196 | 16.33 | 0.13 | 0.076 | (0.193) | 0.068 | 0.008 |
| 197 | 16.42 | 0.13 | 0.076 | (0.192) | 0.068 | 0.008 |
| 198 | 16.50 | 0.13 | 0.076 | (0.191) | 0.068 | 0.008 |
| 199 | 16.58 | 0.10 | 0.057 | (0.190) | 0.051 | 0.006 |
| 200 | 16.67 | 0.10 | 0.057 | (0.189) | 0.051 | 0.006 |
| 201 | 16.75 | 0.10 | 0.057 | (0.188) | 0.051 | 0.006 |
| 202 | 16.83 | 0.10 | 0.057 | (0.187) | 0.051 | 0.006 |
| 203 | 16.92 | 0.10 | 0.057 | (0.186) | 0.051 | 0.006 |
| 204 | 17.00 | 0.10 | 0.057 | (0.185) | 0.051 | 0.006 |
| 205 | 17.08 | 0.17 | 0.095 | (0.184) | 0.085 | 0.009 |
| 206 | 17.17 | 0.17 | 0.095 | (0.183) | 0.085 | 0.009 |
| 207 | 17.25 | 0.17 | 0.095 | (0.182) | 0.085 | 0.009 |
| 208 | 17.33 | 0.17 | 0.095 | (0.181) | 0.085 | 0.009 |
| 209 | 17.42 | 0.17 | 0.095 | (0.180) | 0.085 | 0.009 |
| 210 | 17.50 | 0.17 | 0.095 | (0.179) | 0.085 | 0.009 |
| 211 | 17.58 | 0.17 | 0.095 | (0.178) | 0.085 | 0.009 |
| 212 | 17.67 | 0.17 | 0.095 | (0.178) | 0.085 | 0.009 |

| | | | | | | |
|-----|-------|------|-------|----------|-------|-------|
| 213 | 17.75 | 0.17 | 0.095 | (0.177) | 0.085 | 0.009 |
| 214 | 17.83 | 0.13 | 0.076 | (0.176) | 0.068 | 0.008 |
| 215 | 17.92 | 0.13 | 0.076 | (0.175) | 0.068 | 0.008 |
| 216 | 18.00 | 0.13 | 0.076 | (0.174) | 0.068 | 0.008 |
| 217 | 18.08 | 0.13 | 0.076 | (0.173) | 0.068 | 0.008 |
| 218 | 18.17 | 0.13 | 0.076 | (0.172) | 0.068 | 0.008 |
| 219 | 18.25 | 0.13 | 0.076 | (0.172) | 0.068 | 0.008 |
| 220 | 18.33 | 0.13 | 0.076 | (0.171) | 0.068 | 0.008 |
| 221 | 18.42 | 0.13 | 0.076 | (0.170) | 0.068 | 0.008 |
| 222 | 18.50 | 0.13 | 0.076 | (0.169) | 0.068 | 0.008 |
| 223 | 18.58 | 0.10 | 0.057 | (0.168) | 0.051 | 0.006 |
| 224 | 18.67 | 0.10 | 0.057 | (0.167) | 0.051 | 0.006 |
| 225 | 18.75 | 0.10 | 0.057 | (0.167) | 0.051 | 0.006 |
| 226 | 18.83 | 0.07 | 0.038 | (0.166) | 0.034 | 0.004 |
| 227 | 18.92 | 0.07 | 0.038 | (0.165) | 0.034 | 0.004 |
| 228 | 19.00 | 0.07 | 0.038 | (0.164) | 0.034 | 0.004 |
| 229 | 19.08 | 0.10 | 0.057 | (0.163) | 0.051 | 0.006 |
| 230 | 19.17 | 0.10 | 0.057 | (0.163) | 0.051 | 0.006 |
| 231 | 19.25 | 0.10 | 0.057 | (0.162) | 0.051 | 0.006 |
| 232 | 19.33 | 0.13 | 0.076 | (0.161) | 0.068 | 0.008 |
| 233 | 19.42 | 0.13 | 0.076 | (0.160) | 0.068 | 0.008 |
| 234 | 19.50 | 0.13 | 0.076 | (0.160) | 0.068 | 0.008 |
| 235 | 19.58 | 0.10 | 0.057 | (0.159) | 0.051 | 0.006 |
| 236 | 19.67 | 0.10 | 0.057 | (0.158) | 0.051 | 0.006 |
| 237 | 19.75 | 0.10 | 0.057 | (0.157) | 0.051 | 0.006 |
| 238 | 19.83 | 0.07 | 0.038 | (0.157) | 0.034 | 0.004 |
| 239 | 19.92 | 0.07 | 0.038 | (0.156) | 0.034 | 0.004 |
| 240 | 20.00 | 0.07 | 0.038 | (0.155) | 0.034 | 0.004 |
| 241 | 20.08 | 0.10 | 0.057 | (0.155) | 0.051 | 0.006 |
| 242 | 20.17 | 0.10 | 0.057 | (0.154) | 0.051 | 0.006 |
| 243 | 20.25 | 0.10 | 0.057 | (0.153) | 0.051 | 0.006 |
| 244 | 20.33 | 0.10 | 0.057 | (0.153) | 0.051 | 0.006 |
| 245 | 20.42 | 0.10 | 0.057 | (0.152) | 0.051 | 0.006 |
| 246 | 20.50 | 0.10 | 0.057 | (0.151) | 0.051 | 0.006 |
| 247 | 20.58 | 0.10 | 0.057 | (0.151) | 0.051 | 0.006 |
| 248 | 20.67 | 0.10 | 0.057 | (0.150) | 0.051 | 0.006 |
| 249 | 20.75 | 0.10 | 0.057 | (0.150) | 0.051 | 0.006 |
| 250 | 20.83 | 0.07 | 0.038 | (0.149) | 0.034 | 0.004 |
| 251 | 20.92 | 0.07 | 0.038 | (0.148) | 0.034 | 0.004 |
| 252 | 21.00 | 0.07 | 0.038 | (0.148) | 0.034 | 0.004 |
| 253 | 21.08 | 0.10 | 0.057 | (0.147) | 0.051 | 0.006 |
| 254 | 21.17 | 0.10 | 0.057 | (0.147) | 0.051 | 0.006 |
| 255 | 21.25 | 0.10 | 0.057 | (0.146) | 0.051 | 0.006 |
| 256 | 21.33 | 0.07 | 0.038 | (0.145) | 0.034 | 0.004 |
| 257 | 21.42 | 0.07 | 0.038 | (0.145) | 0.034 | 0.004 |
| 258 | 21.50 | 0.07 | 0.038 | (0.144) | 0.034 | 0.004 |
| 259 | 21.58 | 0.10 | 0.057 | (0.144) | 0.051 | 0.006 |
| 260 | 21.67 | 0.10 | 0.057 | (0.143) | 0.051 | 0.006 |
| 261 | 21.75 | 0.10 | 0.057 | (0.143) | 0.051 | 0.006 |
| 262 | 21.83 | 0.07 | 0.038 | (0.142) | 0.034 | 0.004 |
| 263 | 21.92 | 0.07 | 0.038 | (0.142) | 0.034 | 0.004 |
| 264 | 22.00 | 0.07 | 0.038 | (0.141) | 0.034 | 0.004 |
| 265 | 22.08 | 0.10 | 0.057 | (0.141) | 0.051 | 0.006 |
| 266 | 22.17 | 0.10 | 0.057 | (0.140) | 0.051 | 0.006 |
| 267 | 22.25 | 0.10 | 0.057 | (0.140) | 0.051 | 0.006 |
| 268 | 22.33 | 0.07 | 0.038 | (0.139) | 0.034 | 0.004 |
| 269 | 22.42 | 0.07 | 0.038 | (0.139) | 0.034 | 0.004 |
| 270 | 22.50 | 0.07 | 0.038 | (0.139) | 0.034 | 0.004 |
| 271 | 22.58 | 0.07 | 0.038 | (0.138) | 0.034 | 0.004 |
| 272 | 22.67 | 0.07 | 0.038 | (0.138) | 0.034 | 0.004 |
| 273 | 22.75 | 0.07 | 0.038 | (0.137) | 0.034 | 0.004 |
| 274 | 22.83 | 0.07 | 0.038 | (0.137) | 0.034 | 0.004 |
| 275 | 22.92 | 0.07 | 0.038 | (0.137) | 0.034 | 0.004 |
| 276 | 23.00 | 0.07 | 0.038 | (0.136) | 0.034 | 0.004 |
| 277 | 23.08 | 0.07 | 0.038 | (0.136) | 0.034 | 0.004 |
| 278 | 23.17 | 0.07 | 0.038 | (0.136) | 0.034 | 0.004 |
| 279 | 23.25 | 0.07 | 0.038 | (0.136) | 0.034 | 0.004 |
| 280 | 23.33 | 0.07 | 0.038 | (0.135) | 0.034 | 0.004 |
| 281 | 23.42 | 0.07 | 0.038 | (0.135) | 0.034 | 0.004 |
| 282 | 23.50 | 0.07 | 0.038 | (0.135) | 0.034 | 0.004 |
| 283 | 23.58 | 0.07 | 0.038 | (0.135) | 0.034 | 0.004 |
| 284 | 23.67 | 0.07 | 0.038 | (0.134) | 0.034 | 0.004 |
| 285 | 23.75 | 0.07 | 0.038 | (0.134) | 0.034 | 0.004 |
| 286 | 23.83 | 0.07 | 0.038 | (0.134) | 0.034 | 0.004 |
| 287 | 23.92 | 0.07 | 0.038 | (0.134) | 0.034 | 0.004 |
| 288 | 24.00 | 0.07 | 0.038 | (0.134) | 0.034 | 0.004 |

(Loss Rate Not Used)

Sum = 100.0

Sum = 17.8

Flood volume = Effective rainfall 1.48(In)

times area 6.5(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
 Total soil loss = 3.25(In)
 Total soil loss = 1.757(Ac.Ft)
 Total rainfall = 4.73(In)
 Flood volume = 34882.6 Cubic Feet
 Total soil loss = 76548.6 Cubic Feet

 Peak flow rate of this hydrograph = 2.705(CFS)

+++++

24 - H O U R S T O R M
 R u n o f f H y d r o g r a p h

 Hydrograph in 5 Minute intervals ((CFS))

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|-----------|--------------|--------|----|-----|-----|-----|------|
| 0+ 5 | 0.0001 | 0.01 | Q | | | | |
| 0+10 | 0.0002 | 0.02 | Q | | | | |
| 0+15 | 0.0004 | 0.02 | Q | | | | |
| 0+20 | 0.0006 | 0.03 | Q | | | | |
| 0+25 | 0.0009 | 0.04 | Q | | | | |
| 0+30 | 0.0011 | 0.04 | Q | | | | |
| 0+35 | 0.0014 | 0.04 | Q | | | | |
| 0+40 | 0.0016 | 0.04 | Q | | | | |
| 0+45 | 0.0019 | 0.04 | Q | | | | |
| 0+50 | 0.0022 | 0.04 | Q | | | | |
| 0+55 | 0.0025 | 0.05 | Q | | | | |
| 1+ 0 | 0.0028 | 0.05 | Q | | | | |
| 1+ 5 | 0.0031 | 0.04 | Q | | | | |
| 1+10 | 0.0034 | 0.04 | Q | | | | |
| 1+15 | 0.0037 | 0.04 | Q | | | | |
| 1+20 | 0.0039 | 0.04 | Q | | | | |
| 1+25 | 0.0042 | 0.04 | Q | | | | |
| 1+30 | 0.0044 | 0.04 | Q | | | | |
| 1+35 | 0.0047 | 0.04 | Q | | | | |
| 1+40 | 0.0050 | 0.04 | Q | | | | |
| 1+45 | 0.0052 | 0.04 | Q | | | | |
| 1+50 | 0.0055 | 0.04 | Q | | | | |
| 1+55 | 0.0058 | 0.05 | Q | | | | |
| 2+ 0 | 0.0062 | 0.05 | Q | | | | |
| 2+ 5 | 0.0065 | 0.05 | Q | | | | |
| 2+10 | 0.0069 | 0.05 | Q | | | | |
| 2+15 | 0.0072 | 0.05 | Q | | | | |
| 2+20 | 0.0075 | 0.05 | Q | | | | |
| 2+25 | 0.0079 | 0.05 | Q | | | | |
| 2+30 | 0.0082 | 0.05 | Q | | | | |
| 2+35 | 0.0086 | 0.06 | Q | | | | |
| 2+40 | 0.0090 | 0.06 | Q | | | | |
| 2+45 | 0.0094 | 0.06 | Q | | | | |
| 2+50 | 0.0099 | 0.06 | Q | | | | |
| 2+55 | 0.0103 | 0.06 | Q | | | | |
| 3+ 0 | 0.0107 | 0.06 | Q | | | | |
| 3+ 5 | 0.0111 | 0.06 | Q | | | | |
| 3+10 | 0.0116 | 0.06 | Q | | | | |
| 3+15 | 0.0120 | 0.06 | Q | | | | |
| 3+20 | 0.0124 | 0.06 | Q | | | | |
| 3+25 | 0.0129 | 0.06 | Q | | | | |
| 3+30 | 0.0133 | 0.06 | Q | | | | |
| 3+35 | 0.0137 | 0.06 | Q | | | | |
| 3+40 | 0.0141 | 0.06 | Q | | | | |
| 3+45 | 0.0146 | 0.06 | Q | | | | |
| 3+50 | 0.0150 | 0.07 | Q | | | | |
| 3+55 | 0.0155 | 0.07 | Q | | | | |
| 4+ 0 | 0.0160 | 0.07 | Q | | | | |
| 4+ 5 | 0.0166 | 0.07 | Q | | | | |
| 4+10 | 0.0171 | 0.07 | Q | | | | |
| 4+15 | 0.0176 | 0.07 | Q | | | | |
| 4+20 | 0.0181 | 0.08 | Q | | | | |
| 4+25 | 0.0187 | 0.09 | Q | | | | |
| 4+30 | 0.0193 | 0.09 | Q | | | | |
| 4+35 | 0.0199 | 0.09 | Q | | | | |
| 4+40 | 0.0205 | 0.09 | QV | | | | |
| 4+45 | 0.0211 | 0.09 | QV | | | | |
| 4+50 | 0.0217 | 0.09 | QV | | | | |
| 4+55 | 0.0224 | 0.10 | QV | | | | |
| 5+ 0 | 0.0231 | 0.10 | QV | | | | |
| 5+ 5 | 0.0237 | 0.09 | QV | | | | |

| | | | | | | | |
|-------|--------|------|-------|--|--|--|--|
| 5+10 | 0.0242 | 0.08 | QV | | | | |
| 5+15 | 0.0247 | 0.07 | QV | | | | |
| 5+20 | 0.0253 | 0.08 | QV | | | | |
| 5+25 | 0.0259 | 0.09 | QV | | | | |
| 5+30 | 0.0265 | 0.09 | QV | | | | |
| 5+35 | 0.0271 | 0.09 | QV | | | | |
| 5+40 | 0.0278 | 0.10 | QV | | | | |
| 5+45 | 0.0285 | 0.10 | QV | | | | |
| 5+50 | 0.0291 | 0.10 | QV | | | | |
| 5+55 | 0.0298 | 0.10 | QV | | | | |
| 6+ 0 | 0.0305 | 0.10 | QV | | | | |
| 6+ 5 | 0.0312 | 0.10 | QV | | | | |
| 6+10 | 0.0320 | 0.11 | QV | | | | |
| 6+15 | 0.0328 | 0.11 | QV | | | | |
| 6+20 | 0.0335 | 0.11 | QV | | | | |
| 6+25 | 0.0343 | 0.11 | QV | | | | |
| 6+30 | 0.0351 | 0.11 | QV | | | | |
| 6+35 | 0.0359 | 0.12 | QV | | | | |
| 6+40 | 0.0367 | 0.12 | QV | | | | |
| 6+45 | 0.0376 | 0.12 | QV | | | | |
| 6+50 | 0.0384 | 0.12 | QV | | | | |
| 6+55 | 0.0393 | 0.12 | QV | | | | |
| 7+ 0 | 0.0401 | 0.12 | Q V | | | | |
| 7+ 5 | 0.0410 | 0.12 | Q V | | | | |
| 7+10 | 0.0418 | 0.12 | Q V | | | | |
| 7+15 | 0.0427 | 0.12 | Q V | | | | |
| 7+20 | 0.0436 | 0.13 | Q V | | | | |
| 7+25 | 0.0445 | 0.14 | Q V | | | | |
| 7+30 | 0.0454 | 0.14 | Q V | | | | |
| 7+35 | 0.0464 | 0.14 | Q V | | | | |
| 7+40 | 0.0474 | 0.15 | Q V | | | | |
| 7+45 | 0.0485 | 0.15 | Q V | | | | |
| 7+50 | 0.0495 | 0.15 | Q V | | | | |
| 7+55 | 0.0506 | 0.16 | Q V | | | | |
| 8+ 0 | 0.0517 | 0.16 | Q V | | | | |
| 8+ 5 | 0.0529 | 0.17 | Q V | | | | |
| 8+10 | 0.0542 | 0.18 | Q V | | | | |
| 8+15 | 0.0554 | 0.19 | Q V | | | | |
| 8+20 | 0.0567 | 0.19 | Q V | | | | |
| 8+25 | 0.0580 | 0.19 | Q V | | | | |
| 8+30 | 0.0593 | 0.19 | Q V | | | | |
| 8+35 | 0.0606 | 0.19 | Q V | | | | |
| 8+40 | 0.0620 | 0.20 | Q V | | | | |
| 8+45 | 0.0633 | 0.20 | Q V | | | | |
| 8+50 | 0.0647 | 0.20 | Q V | | | | |
| 8+55 | 0.0662 | 0.21 | Q V | | | | |
| 9+ 0 | 0.0676 | 0.21 | Q V | | | | |
| 9+ 5 | 0.0697 | 0.30 | IQ V | | | | |
| 9+10 | 0.0724 | 0.39 | IQ V | | | | |
| 9+15 | 0.0752 | 0.41 | IQ V | | | | |
| 9+20 | 0.0785 | 0.48 | IQ V | | | | |
| 9+25 | 0.0823 | 0.55 | I Q V | | | | |
| 9+30 | 0.0862 | 0.56 | I Q V | | | | |
| 9+35 | 0.0905 | 0.63 | I Q V | | | | |
| 9+40 | 0.0953 | 0.70 | I Q V | | | | |
| 9+45 | 0.1003 | 0.72 | I Q V | | | | |
| 9+50 | 0.1057 | 0.78 | I Q V | | | | |
| 9+55 | 0.1115 | 0.85 | I Q V | | | | |
| 10+ 0 | 0.1175 | 0.87 | I Q V | | | | |
| 10+ 5 | 0.1213 | 0.55 | I Q V | | | | |
| 10+10 | 0.1230 | 0.25 | IQ V | | | | |
| 10+15 | 0.1244 | 0.20 | Q V | | | | |
| 10+20 | 0.1257 | 0.19 | Q V | | | | |
| 10+25 | 0.1269 | 0.19 | Q V | | | | |
| 10+30 | 0.1282 | 0.19 | Q V | | | | |
| 10+35 | 0.1311 | 0.42 | IQ V | | | | |
| 10+40 | 0.1356 | 0.64 | I Q V | | | | |
| 10+45 | 0.1403 | 0.69 | I Q V | | | | |
| 10+50 | 0.1452 | 0.71 | I Q V | | | | |
| 10+55 | 0.1501 | 0.72 | I Q V | | | | |
| 11+ 0 | 0.1551 | 0.73 | I Q V | | | | |
| 11+ 5 | 0.1598 | 0.68 | I Q V | | | | |
| 11+10 | 0.1642 | 0.63 | I Q V | | | | |
| 11+15 | 0.1685 | 0.63 | I Q V | | | | |
| 11+20 | 0.1729 | 0.64 | I Q V | | | | |
| 11+25 | 0.1773 | 0.65 | I Q V | | | | |
| 11+30 | 0.1818 | 0.65 | I Q V | | | | |
| 11+35 | 0.1856 | 0.55 | I Q V | | | | |
| 11+40 | 0.1887 | 0.45 | IQ V | | | | |

| | | | | | | | | | |
|-------|--------|------|---|---|--|--|--|--|--|
| 11+45 | 0.1917 | 0.44 | Q | V | | | | | |
| 11+50 | 0.1951 | 0.50 | Q | V | | | | | |
| 11+55 | 0.1990 | 0.56 | Q | V | | | | | |
| 12+ 0 | 0.2030 | 0.58 | Q | V | | | | | |
| 12+ 5 | 0.2098 | 0.99 | Q | V | | | | | |
| 12+10 | 0.2193 | 1.38 | Q | V | | | | | |
| 12+15 | 0.2293 | 1.45 | Q | V | | | | | |
| 12+20 | 0.2399 | 1.54 | Q | V | | | | | |
| 12+25 | 0.2509 | 1.60 | Q | V | | | | | |
| 12+30 | 0.2621 | 1.62 | Q | V | | | | | |
| 12+35 | 0.2741 | 1.74 | Q | V | | | | | |
| 12+40 | 0.2869 | 1.86 | Q | V | | | | | |
| 12+45 | 0.2999 | 1.89 | Q | V | | | | | |
| 12+50 | 0.3134 | 1.96 | Q | V | | | | | |
| 12+55 | 0.3273 | 2.02 | Q | V | | | | | |
| 13+ 0 | 0.3413 | 2.04 | Q | V | | | | | |
| 13+ 5 | 0.3574 | 2.34 | Q | V | | | | | |
| 13+10 | 0.3754 | 2.61 | Q | V | | | | | |
| 13+15 | 0.3938 | 2.67 | Q | V | | | | | |
| 13+20 | 0.4123 | 2.69 | Q | V | | | | | |
| 13+25 | 0.4309 | 2.70 | Q | V | | | | | |
| 13+30 | 0.4495 | 2.70 | Q | V | | | | | |
| 13+35 | 0.4638 | 2.07 | Q | V | | | | | |
| 13+40 | 0.4740 | 1.49 | Q | V | | | | | |
| 13+45 | 0.4836 | 1.40 | Q | V | | | | | |
| 13+50 | 0.4931 | 1.37 | Q | V | | | | | |
| 13+55 | 0.5026 | 1.38 | Q | V | | | | | |
| 14+ 0 | 0.5122 | 1.39 | Q | V | | | | | |
| 14+ 5 | 0.5234 | 1.63 | Q | V | | | | | |
| 14+10 | 0.5361 | 1.85 | Q | V | | | | | |
| 14+15 | 0.5492 | 1.89 | Q | V | | | | | |
| 14+20 | 0.5619 | 1.86 | Q | V | | | | | |
| 14+25 | 0.5744 | 1.81 | Q | V | | | | | |
| 14+30 | 0.5868 | 1.81 | Q | V | | | | | |
| 14+35 | 0.5993 | 1.81 | Q | V | | | | | |
| 14+40 | 0.6118 | 1.82 | Q | V | | | | | |
| 14+45 | 0.6244 | 1.83 | Q | V | | | | | |
| 14+50 | 0.6366 | 1.77 | Q | V | | | | | |
| 14+55 | 0.6485 | 1.73 | Q | V | | | | | |
| 15+ 0 | 0.6604 | 1.73 | Q | V | | | | | |
| 15+ 5 | 0.6719 | 1.67 | Q | V | | | | | |
| 15+10 | 0.6831 | 1.63 | Q | V | | | | | |
| 15+15 | 0.6943 | 1.62 | Q | V | | | | | |
| 15+20 | 0.7051 | 1.57 | Q | V | | | | | |
| 15+25 | 0.7156 | 1.52 | Q | V | | | | | |
| 15+30 | 0.7261 | 1.52 | Q | V | | | | | |
| 15+35 | 0.7350 | 1.29 | Q | V | | | | | |
| 15+40 | 0.7424 | 1.08 | Q | V | | | | | |
| 15+45 | 0.7497 | 1.05 | Q | V | | | | | |
| 15+50 | 0.7569 | 1.05 | Q | V | | | | | |
| 15+55 | 0.7642 | 1.06 | Q | V | | | | | |
| 16+ 0 | 0.7715 | 1.06 | Q | V | | | | | |
| 16+ 5 | 0.7755 | 0.59 | Q | V | | | | | |
| 16+10 | 0.7765 | 0.15 | Q | V | | | | | |
| 16+15 | 0.7770 | 0.07 | Q | V | | | | | |
| 16+20 | 0.7774 | 0.05 | Q | V | | | | | |
| 16+25 | 0.7777 | 0.05 | Q | V | | | | | |
| 16+30 | 0.7781 | 0.05 | Q | V | | | | | |
| 16+35 | 0.7784 | 0.04 | Q | V | | | | | |
| 16+40 | 0.7786 | 0.04 | Q | V | | | | | |
| 16+45 | 0.7789 | 0.04 | Q | V | | | | | |
| 16+50 | 0.7791 | 0.04 | Q | V | | | | | |
| 16+55 | 0.7794 | 0.04 | Q | V | | | | | |
| 17+ 0 | 0.7797 | 0.04 | Q | V | | | | | |
| 17+ 5 | 0.7800 | 0.05 | Q | V | | | | | |
| 17+10 | 0.7804 | 0.06 | Q | V | | | | | |
| 17+15 | 0.7808 | 0.06 | Q | V | | | | | |
| 17+20 | 0.7812 | 0.06 | Q | V | | | | | |
| 17+25 | 0.7817 | 0.06 | Q | V | | | | | |
| 17+30 | 0.7821 | 0.06 | Q | V | | | | | |
| 17+35 | 0.7825 | 0.06 | Q | V | | | | | |
| 17+40 | 0.7830 | 0.06 | Q | V | | | | | |
| 17+45 | 0.7834 | 0.06 | Q | V | | | | | |
| 17+50 | 0.7838 | 0.06 | Q | V | | | | | |
| 17+55 | 0.7841 | 0.05 | Q | V | | | | | |
| 18+ 0 | 0.7845 | 0.05 | Q | V | | | | | |
| 18+ 5 | 0.7848 | 0.05 | Q | V | | | | | |
| 18+10 | 0.7851 | 0.05 | Q | V | | | | | |
| 18+15 | 0.7855 | 0.05 | Q | V | | | | | |

| | | | | | | | |
|-------|--------|------|---|--|--|--|---|
| 18+20 | 0.7858 | 0.05 | Q | | | | V |
| 18+25 | 0.7862 | 0.05 | Q | | | | V |
| 18+30 | 0.7865 | 0.05 | Q | | | | V |
| 18+35 | 0.7868 | 0.04 | Q | | | | V |
| 18+40 | 0.7871 | 0.04 | Q | | | | V |
| 18+45 | 0.7873 | 0.04 | Q | | | | V |
| 18+50 | 0.7875 | 0.03 | Q | | | | V |
| 18+55 | 0.7877 | 0.03 | Q | | | | V |
| 19+ 0 | 0.7879 | 0.03 | Q | | | | V |
| 19+ 5 | 0.7881 | 0.03 | Q | | | | V |
| 19+10 | 0.7884 | 0.04 | Q | | | | V |
| 19+15 | 0.7886 | 0.04 | Q | | | | V |
| 19+20 | 0.7889 | 0.04 | Q | | | | V |
| 19+25 | 0.7892 | 0.05 | Q | | | | V |
| 19+30 | 0.7896 | 0.05 | Q | | | | V |
| 19+35 | 0.7899 | 0.04 | Q | | | | V |
| 19+40 | 0.7901 | 0.04 | Q | | | | V |
| 19+45 | 0.7904 | 0.04 | Q | | | | V |
| 19+50 | 0.7906 | 0.03 | Q | | | | V |
| 19+55 | 0.7908 | 0.03 | Q | | | | V |
| 20+ 0 | 0.7910 | 0.03 | Q | | | | V |
| 20+ 5 | 0.7912 | 0.03 | Q | | | | V |
| 20+10 | 0.7914 | 0.04 | Q | | | | V |
| 20+15 | 0.7917 | 0.04 | Q | | | | V |
| 20+20 | 0.7919 | 0.04 | Q | | | | V |
| 20+25 | 0.7922 | 0.04 | Q | | | | V |
| 20+30 | 0.7924 | 0.04 | Q | | | | V |
| 20+35 | 0.7927 | 0.04 | Q | | | | V |
| 20+40 | 0.7930 | 0.04 | Q | | | | V |
| 20+45 | 0.7932 | 0.04 | Q | | | | V |
| 20+50 | 0.7934 | 0.03 | Q | | | | V |
| 20+55 | 0.7936 | 0.03 | Q | | | | V |
| 21+ 0 | 0.7938 | 0.03 | Q | | | | V |
| 21+ 5 | 0.7940 | 0.03 | Q | | | | V |
| 21+10 | 0.7942 | 0.04 | Q | | | | V |
| 21+15 | 0.7945 | 0.04 | Q | | | | V |
| 21+20 | 0.7947 | 0.03 | Q | | | | V |
| 21+25 | 0.7949 | 0.03 | Q | | | | V |
| 21+30 | 0.7951 | 0.03 | Q | | | | V |
| 21+35 | 0.7953 | 0.03 | Q | | | | V |
| 21+40 | 0.7955 | 0.04 | Q | | | | V |
| 21+45 | 0.7958 | 0.04 | Q | | | | V |
| 21+50 | 0.7960 | 0.03 | Q | | | | V |
| 21+55 | 0.7962 | 0.03 | Q | | | | V |
| 22+ 0 | 0.7963 | 0.03 | Q | | | | V |
| 22+ 5 | 0.7965 | 0.03 | Q | | | | V |
| 22+10 | 0.7968 | 0.04 | Q | | | | V |
| 22+15 | 0.7970 | 0.04 | Q | | | | V |
| 22+20 | 0.7973 | 0.03 | Q | | | | V |
| 22+25 | 0.7974 | 0.03 | Q | | | | V |
| 22+30 | 0.7976 | 0.03 | Q | | | | V |
| 22+35 | 0.7978 | 0.02 | Q | | | | V |
| 22+40 | 0.7980 | 0.02 | Q | | | | V |
| 22+45 | 0.7981 | 0.02 | Q | | | | V |
| 22+50 | 0.7983 | 0.02 | Q | | | | V |
| 22+55 | 0.7985 | 0.02 | Q | | | | V |
| 23+ 0 | 0.7986 | 0.02 | Q | | | | V |
| 23+ 5 | 0.7988 | 0.02 | Q | | | | V |
| 23+10 | 0.7990 | 0.02 | Q | | | | V |
| 23+15 | 0.7991 | 0.02 | Q | | | | V |
| 23+20 | 0.7993 | 0.02 | Q | | | | V |
| 23+25 | 0.7995 | 0.02 | Q | | | | V |
| 23+30 | 0.7997 | 0.02 | Q | | | | V |
| 23+35 | 0.7998 | 0.02 | Q | | | | V |
| 23+40 | 0.8000 | 0.02 | Q | | | | V |
| 23+45 | 0.8002 | 0.02 | Q | | | | V |
| 23+50 | 0.8003 | 0.02 | Q | | | | V |
| 23+55 | 0.8005 | 0.02 | Q | | | | V |
| 24+ 0 | 0.8007 | 0.02 | Q | | | | V |
| 24+ 5 | 0.8008 | 0.01 | Q | | | | V |
| 24+10 | 0.8008 | 0.00 | Q | | | | V |
| 24+15 | 0.8008 | 0.00 | Q | | | | V |

**100-YR / OFFSITE RATIONAL
METHOD ANALYSIS
(POST DEVELOPED CONDITION)**

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2012 Version 8.0
Rational Hydrology Study Date: 02/11/22 File:OFF1.out

OFFSITE WATERSHED OFF-1 100-YEAR PEAK DISCHARGE
JN 21091 MARK HOWARD TTM 38273
02-11-2022
FOMOTOR ENGINEERING

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6312

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.370(In.)
100 year, 1 hour precipitation = 1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.650(In/Hr)
Slope of intensity duration curve = 0.4800

Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 192.100(Ft.)
Top (of initial area) elevation = 323.000(Ft.)
Bottom (of initial area) elevation = 311.000(Ft.)
Difference in elevation = 12.000(Ft.)
Slope = 0.06247 s(percent)= 6.25
TC = $k(0.530)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 7.561 min.
Rainfall intensity = 4.460(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.784
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 2.729(CFS)
Total initial stream area = 0.780(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 0.78 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 67.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2012 Version 8.0
Rational Hydrology Study Date: 02/11/22 File:OFF2.out

WATERSHED OFF-2 100-YEAR PEAK DISCHARGE
JN 21091 TTM 38273
02-11-2022
FOMOTOR ENGINEERING

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6312

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.370(In.)
100 year, 1 hour precipitation = 1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.650(In/Hr)
Slope of intensity duration curve = 0.4800

+++++
Process from Point/Station 200.000 to Point/Station 210.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 148.140(Ft.)
Top (of initial area) elevation = 323.000(Ft.)
Bottom (of initial area) elevation = 319.000(Ft.)
Difference in elevation = 4.000(Ft.)
Slope = 0.02700 s(percent)= 2.70
 $TC = k(0.530)*[(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 8.059 min.
Rainfall intensity = 4.325(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.781
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 1.521(CFS)
Total initial stream area = 0.450(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 0.45 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 67.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2012 Version 8.0
Rational Hydrology Study Date: 02/11/22 File:OFF3.out

WATERSHED OFF-3 100-YEAR PEAK DISCHARGE
JN 21091
02-11-2022
FOMOTOR ENGINEERING

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6312

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.370(In.)
100 year, 1 hour precipitation = 1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.650(In/Hr)
Slope of intensity duration curve = 0.4800

+++++
Process from Point/Station 300.000 to Point/Station 310.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 98.410(Ft.)
Top (of initial area) elevation = 323.000(Ft.)
Bottom (of initial area) elevation = 322.000(Ft.)
Difference in elevation = 1.000(Ft.)
Slope = 0.01016 s(percent)= 1.02
TC = $k(0.530)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 8.320 min.
Rainfall intensity = 4.259(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.780
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 1.495(CFS)
Total initial stream area = 0.450(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 0.45 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 67.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2012 Version 8.0
Rational Hydrology Study Date: 02/11/22 File:OFF4.out

WATERSHED OFF-4 100-YEAR PEAK DISCHARGE
JN 21091 TTM 38273
02-11-2022
FOMOTOR ENGINEERING

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6312

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.370(In.)
100 year, 1 hour precipitation = 1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.650(In/Hr)
Slope of intensity duration curve = 0.4800

+++++
Process from Point/Station 400.000 to Point/Station 410.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 153.720(Ft.)
Top (of initial area) elevation = 323.000(Ft.)
Bottom (of initial area) elevation = 321.000(Ft.)
Difference in elevation = 2.000(Ft.)
Slope = 0.01301 s(percent)= 1.30
 $TC = k(0.530)*[(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 9.465 min.
Rainfall intensity = 4.004(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.773
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 0.433(CFS)
Total initial stream area = 0.140(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 0.14 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 67.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2012 Version 8.0
Rational Hydrology Study Date: 02/11/22 File:OFF5.out

WATERSHED OFF-5 100-YEAR PEAK DISCHARGE
JN 21091 TTM38273
02-11-2022
FOMOTOR ENGINEERING

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6312

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.370(In.)
100 year, 1 hour precipitation = 1.650(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.650(In/Hr)
Slope of intensity duration curve = 0.4800

Process from Point/Station 500.000 to Point/Station 510.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 56.670(Ft.)
Top (of initial area) elevation = 320.000(Ft.)
Bottom (of initial area) elevation = 318.000(Ft.)
Difference in elevation = 2.000(Ft.)
Slope = 0.03529 s(percent)= 3.53
TC = $k(0.530)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
Initial area time of concentration = 5.201 min.
Rainfall intensity = 5.337(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.801
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 67.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 0.428(CFS)
Total initial stream area = 0.100(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 0.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 67.0

EXHIBITS

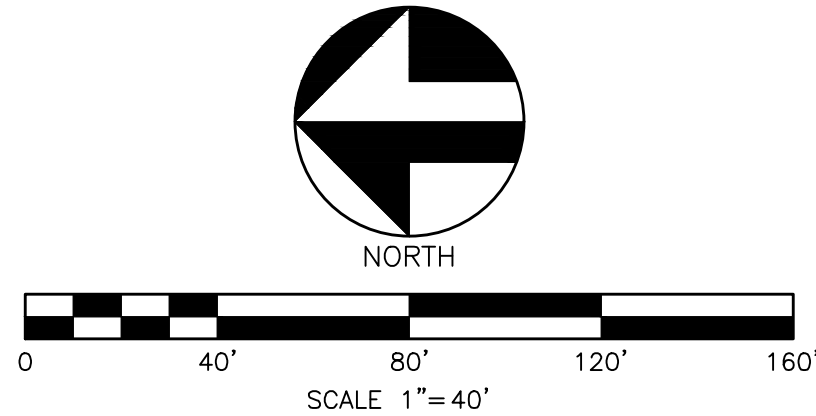
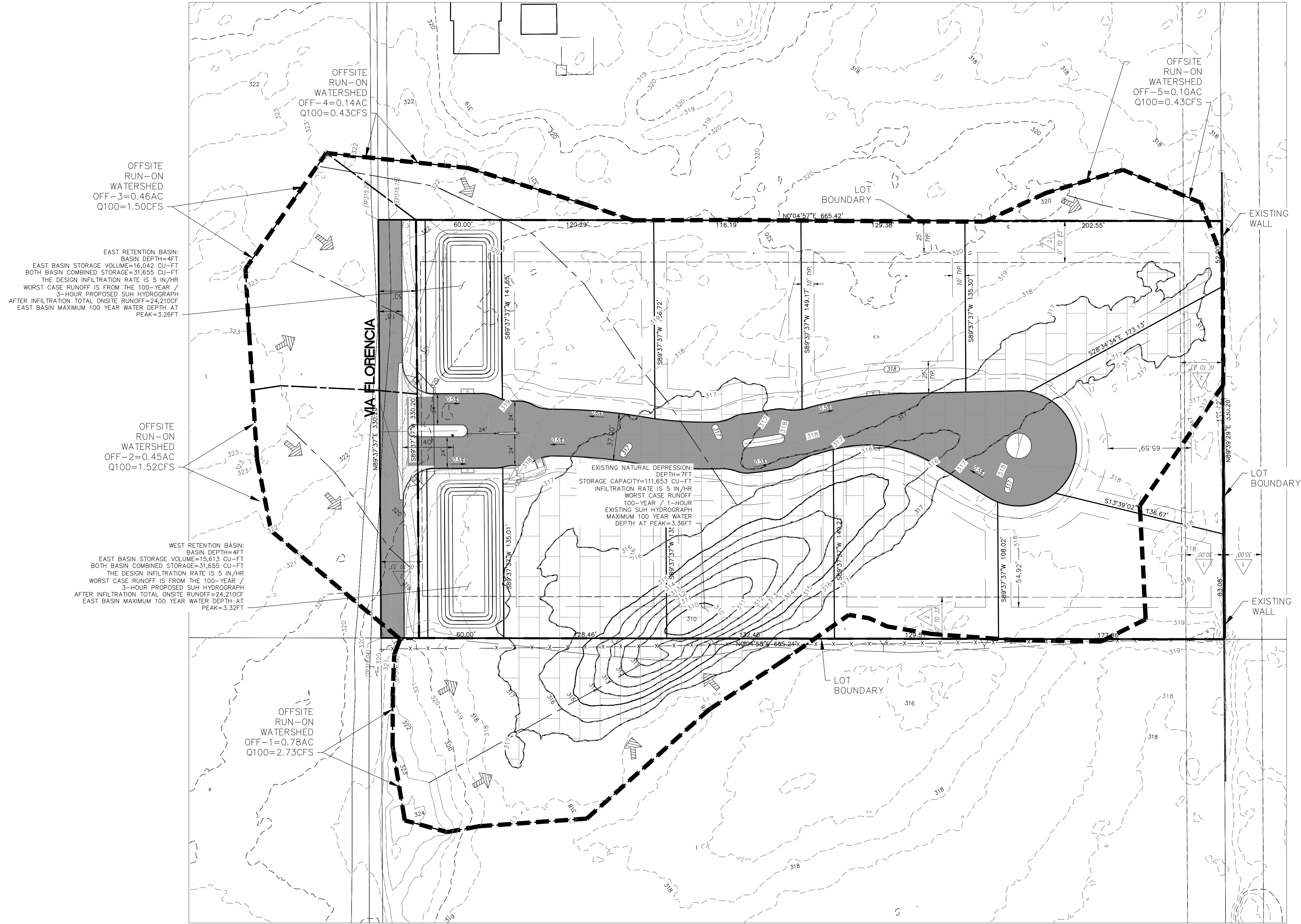
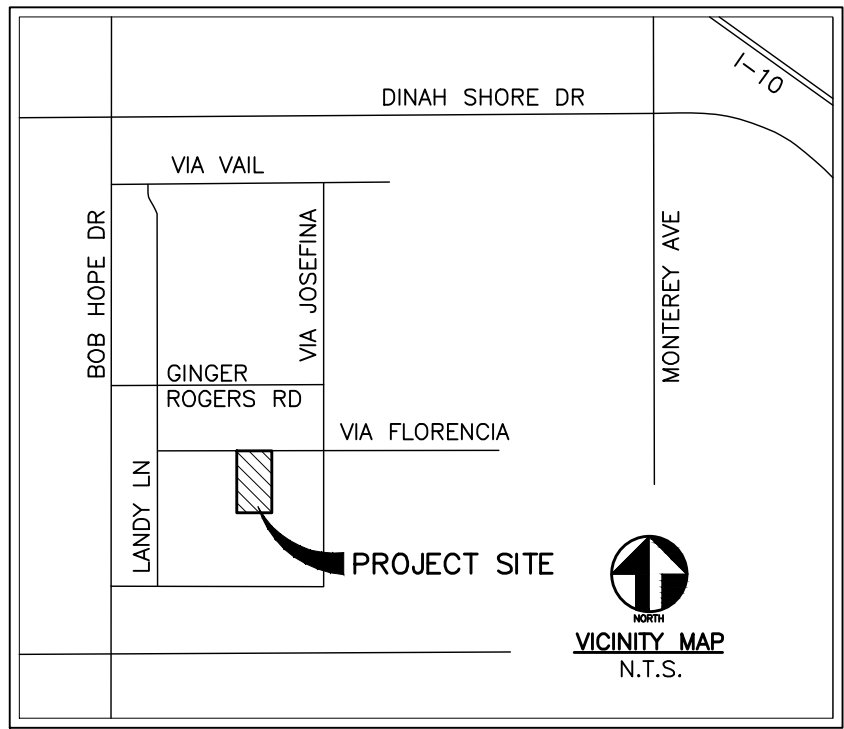
IN THE CITY OF RANCHO MIRAGE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

PRELIMINARY HYDROLOGY PLAN

FOR

TENTATIVE TRACT MAP NO.38273

APN: 685-100-011



- LEGEND**
- SUB-WATERSHED FLOW PATH
 - ONSITE PROPOSED WATERSHED AREA
 - EXISTING DEPRESSION WATERSHED AREA
 - - - EXISTING FLOW PATHS
 - OFFSITE RUN-ON FLOW DIRECTION
 - xxx EXISTING CONTOUR ELEVATION
 - EXISTING DEPRESSION AREA