PC EXHIBIT J

MND ATTACHMENT 8

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

June 4, 2021

Regulatory Division (SPK-2020-00625)

SVLC 23, LLC
c/o Sierra View Land Company
Attn: Mr. John Welch
105 Alta Vista Drive
Roseville, CA 95678

Dear Mr. Welch:

We are responding to your August 13, 2020, request for an approved jurisdictional determination for the SVLC 23 Property site. The approximately 23-acre project site is located adjacent to, and just north of Shasta Street and south of Diamond Oaks Road and to the east of the Sierra View Country Club, at coordinates (NAD83) Latitude 38.7643°, Longitude -121.2830°, Roseville, Placer County, California.

Based on available information, we concur with your aquatic resources delineation for the site, as depicted on the enclosed July 23, 2020, *Aquatic Resources Delineation SVLC 23 Property* drawing(s) prepared by N. Bente of Madrone Ecological Consulting (enclosure 1). Approximately 2.047 acres of aquatic resources, consisting of 0.199 acres of seasonal wetlands, 0.024 acres of seasonal wetland swale, 0.871 acres of vernal pools, 1,801 linear feet of ephemeral drainages, and 2,006 linear feet of intermittent drainage are present within the survey area. This letter verifies that the location and boundaries of wetlands were delineated consistent with the wetland definition at 33 CFR §328.3(c)(16), the 1987 *Corps of Engineers Wetlands Delineation Manual* (Wetlands Research Program Technical Report Y-87-1) and the applicable regional supplements; the location and boundaries of tidal waters conform with the high tide line defined at 33 CFR §328.3(c)(4); and the location and boundaries of non-tidal waters conform with the ordinary high water mark definition at 33 CFR §328.3(c)(7), Regulatory Guidance Letter 05-05, and any applicable regional guide.

Of these aquatic resources, we have determined that those features identified as SWS-1, IDR-1, and IDR-2, totaling 0.992 acres are waters of the United States pursuant to 33 CFR Part 328 and are regulated under Section 404 of the Clean Water Act; and**,** features DD-1, 2, 3, and SW-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and VP-1, 2, 3, totaling 1.055 acres are not waters of the U.S., regulated under Section 404 of the Clean Water Act or under Section 10 of the Rivers and Harbors Act.

We are enclosing a copy of the *Approved Jurisdictional Determination Form* for your site (enclosure 2).

This approved jurisdictional determination is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 Code of Federal Regulations (CFR) Part 331. A *Notification of Appeal Process (NAP) and Request for Appeal (RFA) Form* is enclosed (enclosure 3). If you request to appeal this

determination, you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDO, 1455 Market Street, 2052B, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, we must determine that the form is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that the form was received by the Division Office within 60 days of the date of the NAP. It is not necessary to submit an RFA form to the Division Office unless you object to the determination in this letter.

We recommend that you provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

We appreciate feedback, especially about interaction with our staff and our processes.

Please refer to identification number SPK-2020-00625 in any correspondence concerning this project. If you have any questions, please contact Mr. Nathaniel Duyck at U.S. Army Corps of Engineers, Regulatory Division, 1325 J Street, Room 1350, Sacramento, California 95814, by email at nathaniel.f.duyck@usace.army.mil, or telephone at (916) 557-6883. For program information or to complete our Customer Survey, visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

Chandra Jenkins
Chief, California Delta Section
Regulatory Division

Enclosures

cc:
Ms. Sarah VanderOhe; Madrone Ecological Services, svonderohe@madroneEco.com
Ms. Stephanie Tadlock, California Regional water Quality Control Board, stephanie.tadlock@waterboards.ca.gov
Mr. Joseph Morgan, U.S. EPA, morgan.joseph@epamail.epa.gov

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: John Welch, Sierra View Land Company Attn: Mr. John Welch	File No.: SPK-2020-00625	Date: June 1, 2021

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
→	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/cecw/pages/reg_materials.aspx* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

U.S. Army Corps of Engineers

Phone: (916) 557-6883, FAX 916-557-7803
Email: Nathaniel.F.Duyck@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

Thomas J. Cavanaugh
Administrative Appeal Review Officer
U.S. Army Corps of Engineers
South Pacific Division
1455 Market Street, 2052B
San Francisco, California 94103-1399
Phone: 415-503-6574, FAX: 415-503-6646)
Email: Thomas.J.Cavanaugh@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

Revised Cultural Resources Inventory and Evaluation Report

Sierra View Country Club
Placer County, California

Prepared For:

Westpark Communities
1420 Rocky Ridge Drive, Suite 265
Roseville, California 95661

Prepared By:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
2525 Warren Drive
Rocklin, California 95677

Revised June 2021

MANAGEMENT SUMMARY

In 2020, ECORP Consulting, Inc. was retained by Westpark Communities to conduct a cultural resources inventory for the proposed Sierra View Country Club Project in Placer County, California. Westpark Communities proposes to develop approximately 23.1 acres located east of the Sierra View Country Club Golf Course in Roseville, Placer County, California.

The inventory included a records search, literature review, and field survey conducted in two phases. The records search results indicated that four previous cultural resources studies have been conducted within a portion of the Project Area. As a result of those studies, one historic-period resource has previously been recorded within the Project Area: the historic-era Western Area Power Administration transmission line (P-31-3280), which has previously been determined not eligible for the National Register of Historic Places (NRHP).

As a result of the survey, two cultural resources were recorded: SV-001, a Sacramento Municipal Utilities District (SMUD) 230-kilovolt (kV) transmission line; and SV-002, a SMUD 115-kV distribution line. These historic-age built environment resources were evaluated based on survey-level data and archival research relative to the criteria for inclusion in the NRHP and the California Register of Historical Resources (CRHR). Both resources were determined not eligible under any criteria for the NRHP or CRHR and, therefore, they are not considered Historical Resources for purposes of the California Environmental Quality Act or Historic Properties for the purposes of Section 106 of the National Historic Preservation Act. Until the lead agencies concur with these cultural resource identification and evaluation, no ground-disturbing activities should occur. Recommendations for the management of unanticipated discoveries are also provided.

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LIST OF ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AC	Alternating Current
APE	Area of Potential Effects
APN	Assessor Parcel Number
BLM	Bureau of Land Management
BP	Before present

LIST OF ACRONYMS AND ABBREVIATIONS

CCR	California Code of Regulations
CCTS	Central California Taxonomic System
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
DC	Direct Currents
DPR	Department of Parks and Recreation
GLO	General Land Office
MLD	Most Likely Descendant
NAHC	Native American Heritage Commission
NCIC	North Central Information Center
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PFE	Pacific Fruit Express
PRC	Public Resources Code
Project	Sierra View Country Club Project
RPA	Registered Professional Archaeologist
SHPO	State Historic Preservation Officer
SMUD	Sacramento Municipal Utilities District
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USGS	U.S. Geological Survey
WAPA	Western Area Power Administration

1.0 INTRODUCTION

In 2020, ECORP Consulting, Inc. was retained by Westpark Communities to conduct a cultural resources inventory of the proposed Sierra View Country Club Project located in the city of Roseville, Placer County, California. A survey of the property was required to identify potentially eligible cultural resources (archaeological sites and historic buildings, structures, and objects) that could be affected by the Project.

1.1 Project Location

The Project Area consists of approximately 23.1 acres of property located in the northwestern quarter of Section 35, the northeastern quarter of Section 34, the southeastern quarter of Section 27, and the southwestern quarter of Section 26 of Township 11 North, Range 6 East, Mount Diablo Base and Meridian as depicted on the 1992 Roseville, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Figure 1). It is also known as Assessor Parcel Number (APN) 015-011-029. The Project Area is located east of the Sierra View Country Club golf course, north of Shasta Street, and south of Diamond Oaks Road in Roseville, California.

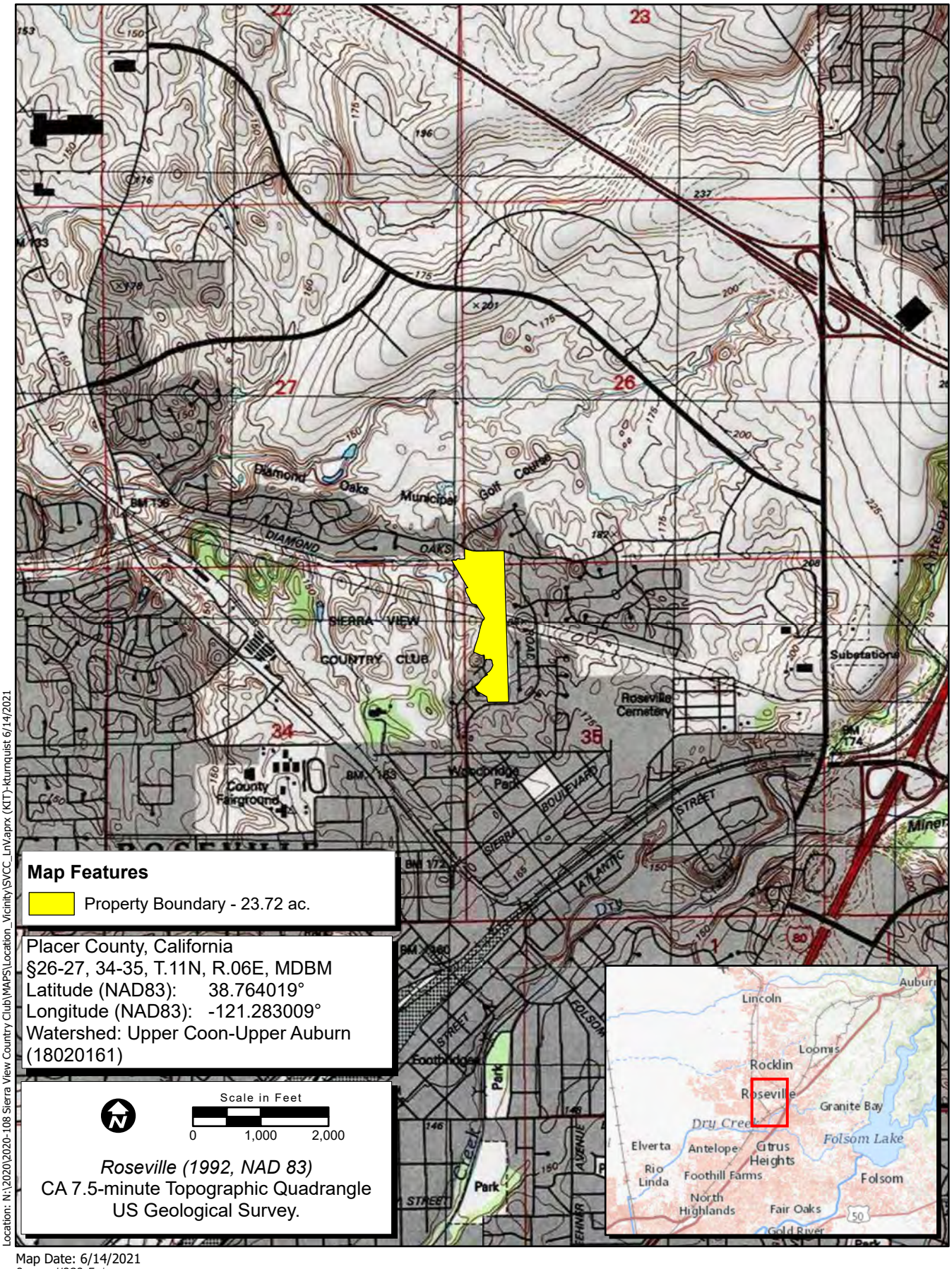
1.2 Project Description and Area of Potential Effects

The Proposed Project entails the construction of infill development and related infrastructure for single-family residences. No additional Project details were available at the time of the study, but sufficient information about the nature and type of the Project was available to inform this cultural resources inventory, including the potential for subsurface resources.

The Area of Potential Effects (APE) consists of the horizontal and vertical limits of a project and includes the area within which significant impacts or adverse effects to Historical Resources or Historic Properties could occur as a result of the project. The APE is defined for projects subject to regulations implementing Section 106 (federal law and regulations). For projects subject to the California Environmental Quality Act (CEQA), the term Project Area is used rather than APE. For the purpose of this document, the terms Project Area and APE are interchangeable.

The horizontal APE consists of all areas where activities associated with a project are proposed and in the case of the current Project, equals the Project Area subject to environmental review under the National Environmental Policy Act (NEPA) and CEQA. This includes areas proposed for construction, vegetation removal, grading, trenching, stockpiling, staging, paving, and other elements described in the official Project description. The horizontal APE is illustrated on Figure 1 and represents the survey coverage area. It measures approximately 0.42 mile in length (north-south) by 800 feet in width (east-west).

The vertical APE is described as the maximum depth below the surface to which excavations for project foundations and facilities will extend. Therefore, the vertical APE includes all subsurface areas where archaeological deposits could be affected. The subsurface vertical APE varies across the Project. This study assumes the vertical APE will not extend 20 feet below the current surface, and therefore, review of geologic and soils maps was necessary to determine the potential for buried archaeological sites that cannot be seen on the surface.



Location: N:\2020\2020-108 Sierra View Country Club\MAPS\Location_Vicinity\SVCC_LnV.aprx (KIT)-kturnquist 6/14/2021

Map Date: 6/14/2021
Sources: USGS, Esri

Figure 1. Project Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

The vertical APE also is described as the maximum height of structures that could impact the physical integrity and integrity of setting of cultural resources, including districts and traditional cultural properties. This study assumes the vertical APE will not exceed 30 feet above the ground surface.

1.3 Regulatory Context

To meet the regulatory requirements of this Project, this cultural resources investigation was conducted pursuant to the provisions for the treatment of cultural resources contained within Section 106 of the National Historic Preservation Act (NHPA) and in CEQA (Public Resources Code [PRC] § 21000 et seq.) The goal of NHPA and CEQA is to develop and maintain a high-quality environment that serves to identify the significant environmental effects of the actions of a proposed project and to either avoid or mitigate those significant effects where feasible. CEQA pertains to all proposed projects that require state or local government agency approval, including the enactment of zoning ordinances, the issuance of conditional use permits, and the approval of development project maps. The NHPA pertains to projects that entail some degree of federal funding or permit approval.

The NHPA and CEQA (Title 54 U.S. Code [USC] Section 100101 et seq. and Title 14, California Code of Regulations [CCR], Article 5, § 15064.5) apply to cultural resources of the historical and pre-contact periods. Any project with an effect that may cause a substantial adverse change in the significance of a cultural resource, either directly or indirectly, is a project that may have a significant effect on the environment. As a result, such a project would require avoidance or mitigation of impacts to those affected resources. Significant cultural resources must meet at least one of four criteria that define eligibility for listing on either the California Register of Historical Resources (CRHR; PRC § 5024.1, Title 14 CCR, § 4852) or the National Register of Historic Places (NRHP) (36 Code of Federal Regulations [CFR] 60.4). Cultural resources eligible for listing on the NRHP are considered Historic Properties under 36 CFR Part 800 and are automatically eligible for the CRHR. Resources listed on or eligible for inclusion in the CRHR are considered Historical Resources under CEQA.

Tribal Cultural Resources are defined in Section 21074 of the California PRC as sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either included in or determined to be eligible for inclusion in the CRHR, or are included in a local register of historical resources as defined in subdivision (k) of Section 5020.1, or are 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 Section 5024.1. Section 1(b)(4) of Assembly Bill (AB) 52 established that only California Native American tribes, as defined in Section 21073 of the California PRC, are experts in the identification of Tribal Cultural Resources and impacts thereto. Because ECORP does not meet the definition of a California Native American tribe, this report only addresses information for which ECORP is qualified to identify and evaluate, and that which is needed to inform the cultural resources section of CEQA documents. This report, therefore, does not identify or evaluate Tribal Cultural Resources. Should California Native American tribes ascribe additional importance to or interpretation of archaeological resources described herein, or provide information about non-archeological Tribal Cultural Resources, that information is documented separately in the AB 52 tribal consultation record between the tribe(s) and lead agency, and summarized in the Tribal Cultural Resources section of the CEQA document, if applicable.

In addition, in the event that the Project may affect Waters of the U.S., thereby requiring the Project proponent to meet the requirements of Section 404 of the Clean Water Act and obtain a permit from the U.S. Army Corps of Engineers (USACE) Sacramento District Regulatory Division, this report was prepared to contribute to compliance with the 2014 *Sacramento District Regulatory Branch Guidelines for Compliance with Section 106 of the National Historic Preservation Act of 1966, as amended*. Moreover, because the Project may qualify as a federal undertaking, regulations (36 CFR 800) implementing Section 106 of the NHPA require that cultural resources be identified and then evaluated using NRHP eligibility criteria.

1.4 Report Organization

The following report documents the study and its findings and was prepared in conformance with the California Office of Historic Preservation's (OHP) *Archaeological Resource Management Reports: Recommended Contents and Format*. Attachment A includes a confirmation of the records search with the California Historical Resources Information System (CHRIS) and historical society coordination. Attachment B contains documentation of a search of the Sacred Lands File. Attachment C presents photographs of the Project Area, and Attachment D contains confidential cultural resource site locations and site records.

Sections 6253, 6254, and 6254.10 of the California Code authorize state agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code § 6250 et seq.) and California's open meeting laws (The Brown Act, Government Code § 54950 et seq.) protect the confidentiality of Native American cultural place information. Under Exemption 3 of the federal Freedom of Information Act (5 USC 5), because the disclosure of cultural resources location information is prohibited by the Archaeological Resources Protection Act of 1979 (16 USC 470hh) and Section 307103 of the NHPA, it is also exempted from disclosure under the Freedom of Information Act. Likewise, the Information Centers of the CHRIS maintained by the OHP prohibit public dissemination of records search information. In compliance with these requirements, the results of this cultural resource investigation were prepared as a confidential document, which is not intended for public distribution in either paper or electronic format.

2.0 SETTING

2.1 Environmental Setting

The Project Area is located in the transition zone between the Central Valley and the Sierra Nevada foothills. It is located to the east of an active golf course and is surrounded by suburban residential development to the north and east, and an elementary school to the south. The terrain is relatively flat, and elevations range from 150 to 170 feet above mean sea level. The south fork of Pleasant Grove Creek splits to the northwest and tributaries run 0.4 mile to the north and 0.4 mile to the west of the Project Area.

2.2 Geology and Soils

Rosenthal and Willis (2017) describe the geology of the Sacramento Valley as a large, asymmetric, structural trough (syncline) formed by westward-tilting blocks of plutonic and metamorphic rocks on the eastern side, and highly folded and faulted blocks of metamorphic rocks (Franciscan) on the western side. This basin has been partially filled by a thick sequence (up to 12.4 miles [20 kilometers] thick) of sedimentary rocks and alluvial deposits that range from late Jurassic to Historical in age. During the Pleistocene, erosion of the Sierra Nevada led to the deposition of large alluvial fans at the base of the foothills along the eastern side of the Sacramento Valley. Glacial conditions are generally credited for the deposition of these fans, while subsequent interglacial periods are marked by landscape stability, soil formation, and channel incision. Subsequent depositional cycles during the Holocene progressively buried downstream sections of many older alluvial fans and led to the formation of inset stream terraces and nested alluvial fans along the foothills (Rosenthal and Willis 2017).

According to the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Web Soil Survey website (NRCS 2020), two soil types are located within the Project Area: Cometa-Ramona sandy loam (142) consist of fine loamy mixed, thermic, moderately deep, moderately well-drained soils found on older stream terraces that formed in alluvium from granitic rock sources; and Cometa-Fiddyment complex (141), 1 to 5 percent slopes, consists of moderately deep moderately well-drained to well-drained soils formed in consolidated sediments from mixed rock sources and alluvium from granitic rock sources; found on older stream terraces and nearly level to rolling terraces.

The potential exists for buried pre-contact archaeological sites in the Project Area due to the presence of alluvium along the tributaries to the south fork of Pleasant Grove Creek to the north and west of the Project Area and the likelihood of pre-contact archaeological sites existing along perennial waterways.

2.3 Vegetation and Wildlife

The Project Area is within an oak woodland setting. Annual grassland represents the dominant vegetation community within the Project Area. Representative plant species that may be present in this general area include medusahead grass (*Taeniatherum caput-medusae*), little quaking grass (*Briza minor*), ryegrass (*Lolium multiflorum*), slender wild oat (*Avena barbata*), soft brome (*Bromus hordeaceus*), vulpia (*Vulpia* sp.), Mediterranean barley (*Hordeum marinum*), sticky tarweed (*Holocarpha virgata*), rose clover (*Trifolium hirtum*), Fremont's tidy-tips (*Layia fremontii*), and yellow star-thistle (*Centaurea solstitialis*).

Wildlife species that have the potential to occur in the Project Area include black-tailed jackrabbit (*Lepus californicus*), rabbit (*Sylvilagus* sp.), gray squirrel (*Sciurus griseus*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), red-tailed hawk (*Buteo jamaicensis*), prairie falcon (*Falco mexicanus*), California quail (*Callipepla californica*), mourning dove (*Zenaidura macroura*), Western scrub-jay (*Aphelocoma californica*), rattlesnake (*Crotalus viridus*), Pacific tree frog (*Pseudacris regilla*), and western fence lizard (*Sceloporus occidentalis*).

3.0 CULTURAL CONTEXT

3.1 Regional Pre-contact History

It is generally believed that human occupation of California began at least 10,000 years before present (BP). The archaeological record indicates that between approximately 10,000 and 8,000 BP, a predominantly hunting economy existed, characterized by archaeological sites containing numerous projectile points and butchered large animal bones. Animals that were hunted probably consisted mostly of large species still in existence today. Bones of extinct species have been found but cannot definitively be associated with human artifacts. Although small animal bones and plant grinding tools are rarely found within archaeological sites of this period, small game and floral foods were probably exploited on a limited basis. A lack of deep cultural deposits from this period suggests that groups included only small numbers of individuals who did not often stay in one place for extended periods (Wallace 1978).

Around 8,000 BP, there was a shift in focus from hunting towards a greater reliance on plant resources. Archaeological evidence of this trend consists of a much greater number of milling tools (e.g., metates and manos) for processing seeds and other vegetable matter. This period, which extended until around 5,000 years BP, is sometimes referred to as the Millingstone Horizon (Wallace 1978). Projectile points are found in archaeological sites from this period, but they are far fewer in number than from sites dating to before 8,000 BP. An increase in the size of groups and the stability of settlements is indicated by deep, extensive middens at some sites from this period (Wallace 1978).

In sites dating to after about 5,000 BP, archaeological evidence indicates that reliance on both plant gathering and hunting continued as in the previous period, with more specialized adaptation to particular environments. Mortars and pestles were added to metates and manos for grinding seeds and other vegetable material. Flaked-stone tools became more refined and specialized, and bone tools were more common. During this period, new peoples from the Great Basin began entering southern California. These immigrants, who spoke a language of the Uto-Aztecan linguistic stock, seem to have displaced or absorbed the earlier population of Hokan-speaking peoples. During this period, known as the Late Horizon, population densities were higher than before and settlement became concentrated in villages and communities along the coast and interior valleys (Erlandson 1994; McCawley 1996). Regional subcultures also started to develop, each with its own geographical territory and language or dialect (Kroeber 1925; McCawley 1996; Moratto 1984). These were most likely the basis for the groups encountered by the first Europeans during the eighteenth century (Wallace 1978). Despite the regional differences, many material culture traits were shared among groups, indicating a great deal of interaction (Erlandson 1994). The introduction of the bow and arrow into the region sometime around 2,000 BP is indicated by the presence of small projectile points (Wallace 1978; Moratto 1984).

3.2 Local Pre-contact History

This section provides a regional overview with contextual elements drawn from California's Central Valley Region, the Western Foothills Region, and from the transition zone itself where the Project is located. There has been more extensive research and study of Central Valley prehistory than the prehistory of the Sierra Nevada foothill zone, but a fair amount of cultural overlap exists within these regions. This section

includes the most recent and readily available research of both regions (Rosenthal et al. 2007) and includes some reference to the climactic changes that swept the Sierra Nevada being a catalyst for population movement that led to cultural change in the foothills.

California's Great Central Valley has long held the attention of archaeologists and was a focus of early research in California. Archaeological work during the 1920s and 1930s led to the cultural chronology for central California presented by Lillard, Heizer, and Fenenga in 1939. This chronology was based on the results of excavations conducted in the lower Sacramento River Valley. This chronology identified three archaeological cultures, named Early, Transitional, and Late (Lillard et al. 1939).

Heizer (1949) redefined the description of these three cultures. He subsumed the three cultural groups into three time periods, designated the Early, Middle, and Late Horizons. He primarily focused his research and reexamination of Lillard et al. (1939) on the Early Horizon, which he named Windmiller. He also intimated that new research and a reanalysis of existing data would be initiated for cultures associated with the Middle and Late Horizons; however, he did not complete this work and other research filled in the gaps.

Following years of documenting artifact similarities among sites in the San Francisco Bay region and the Delta, Beardsley (1948, 1954) formatted his findings into a cultural model known as the Central California Taxonomic System (CCTS). This system proposed a linear, uniform sequence of cultural succession in Central California, and explicitly defined Early, Middle, and Late Horizons for cultural change. Archaeological researchers have subsequently refined and redefined aspects of the CCTS. For instance, Fredrickson (1973, 1974, and 1994) reviewed general economic, technological, and mortuary traits between archaeological assemblages across the region. He separated cultural, temporal, and spatial units from each other and assigned them to six chronological periods: Paleo-Indian (12,000 to 8,000 BP); Lower, Middle, and Upper Archaic (8,000 BP to AD 500); and Upper and Lower Emergent (AD 500 to 1800).

Fredrickson further defined three cultural patterns: The Windmiller (named after Heizer 1949 and Lillard et al. 1939), the Berkeley, and the Augustine patterns, and assigned them to the Early, Middle, and Late horizons of the CCTS. These patterns were defined to reflect the general sharing of lifeways within groups in a specific geographic region. The Windmiller pattern of the Early Horizon included cultural patterns dating from 5,000 to 3,000 BP; the Berkeley Pattern of the Middle Horizon (also known as the Cosumnes cultural pattern after Ragir 1972), included cultural patterns dating from 3,000 BP to AD 500, and the Augustine Pattern of the Late Horizon included the cultural patterns from AD 500 to the historic period.

Fredrickson's (1974) Paleo-Archaic-Emergent cultural sequence was redefined by Rosenthal, White, and Sutton (2007). Rosenthal et al.'s recalibrated sequence is divided into three broad periods: The Paleoindian Period (11,550 to 8,550 cal. BC); the three-staged Archaic period, consisting of the Lower Archaic (8,550 to 5,550 cal. BC), Middle Archaic (5,550 to 550 cal. BC), and Upper Archaic (550 cal. BC to cal. AD 1100); and the Emergent Period (cal. AD 1100 to Historic) (Rosenthal et al. 2007). The three divisions of the Archaic Period correspond to climate changes. This is the most recently developed sequence and is now commonly used to interpret Central California prehistory. The aforementioned periods are characterized by the following:

3.2.1 Paleo-Indian Period

This period began when the first people began to inhabit what is now known as the California culture area. It was commonly believed these first people subsided on big game and minimally processed foods, (i.e., hunters and gatherers), presumably with no trade networks. More recent research indicates these people may have been more sedentary, relied on some processed foods, and traded (Rosenthal et al. 2007). Populations likely consisted of small groups traveling frequently to exploit plant and animal resources.

3.2.2 Archaic Period

This period was characterized by an increase in plant exploitation for subsistence, more elaborate burial accoutrements, and increase in trade network complexity (Bennyhoff and Fredrickson 1994). The three divisions that correspond to pre-contact climate change are characterized by the following aspects (Rosenthal et al. 2007):

3.2.2.1 Lower Archaic Period

This period is characterized by cycles of widespread floodplain and alluvial fan deposition. Artifact assemblages from this period include chipped stone crescents and early wide-stemmed points, marine shell beads, eastern Nevada obsidian, and obsidian from the north Coast Ranges. These types of artifacts found on sites dating to this period indicate trade was occurring in multiple directions. A variety of plant and animal species were also utilized, including acorns, wild cucumber, and manzanita berries.

3.2.2.2 Middle Archaic Period

This period is characterized by a drier climate period. Rosenthal et al. (2007) identified two distinct settlement/subsistence patterns in this period: the Foothills Tradition and the Valley Tradition. Functional artifact assemblages consisting primarily of locally sourced flaked stone and groundstone cobbles characterize the Foothills Tradition, while the Valley Tradition was generally characterized by diverse subsistence practices and extended periods of sedentism.

3.2.2.3 Upper Archaic Period

This period is characterized by abrupt change to wetter and cooler environmental climate conditions. Much greater cultural diversity is evident from this period. More specialized artifacts, such as bone tools, ceremonial blades, polished and groundstone plummets, saucer and saddle *Olivella* shell beads, *Haliotis* shell ornaments, and a variety of groundstone implements are characteristic of this period.

3.2.3 Emergent Period

This period is most notably marked by the introduction of the bow and arrow, the emergence of social stratification linked to wealth, and more expansive trade networks signified by the presence of clam disk beads that were used as currency (Moratto 1984). The Augustine pattern (the distinct cultural pattern of the Emergent Period) is characterized by the appearance of small projectile points (largely obsidian),

rimmed display mortars, flanged steatite pipes, flanged pestles, and chevron-designed bird-bone tubes. Large mammals and small seeded resources appear to have made up a larger part of the diet during this period (Fredrickson 1968; Meyer and Rosenthal 1997).

The following discussion summarizes the cultural patterns and the different local developments that are represented in archaeological deposits in the region surrounding the current Project Area.

The Windmiller Pattern of the Early Horizon (as defined by Beardsley 1948), dates to the Middle Archaic (as defined by Rosenthal et al. 2007) and may be the most extensively studied of all the cultural patterns defined for the Central Valley. In fact, the similarity noted between elements of Windmiller and materials from other sites may have been the catalyst for early archaeologists identifying the material cultural "blending" of groups in the Central Valley during this period. The temporal span for Windmiller has been updated and reanalyzed several times in the archaeological literature (Fredrickson 1973, 1974; Heizer 1949; Moratto 1984; Ragir 1972). The date originally proposed for the emergence of Windmiller was 4,500 BP (Lillard et al. 1939; Ragir 1972), because the culture at 4,000 years ago appeared to have been fully developed and seemed to have been well integrated into the regional economic system.

Characteristics to identify the Windmiller pattern have been presented by multiple authors over time (Fredrickson 1973, 1974; Heizer 1949; Moratto 1984; Ragir 1972). Most notable characteristics are:

- large, heavy stemmed and leaf-shaped projectile points commonly made of a variety of materials other than obsidian;
- perforate charmstones;
- *Haliotis* and *Olivella* shell beads and ornaments;
- trident fish spears;
- baked clay balls (presumably for cooking in baskets);
- flat slab milling stones;
- small numbers of mortars; and
- ventrally extended burials oriented toward the west.

The subsistence pattern of Windmiller groups probably emphasized hunting and fishing, with supplemental seed collecting (possibly including acorns) (Heizer 1949; Moratto 1984; Ragir 1972).

Windmiller groups acquired obsidian from at least two Coast Ranges and three trans-Sierran sources, *Haliotis* and *Olivella* shells and ornaments from the coast, and quartz crystals from the Sierra Nevada foothills (Heizer 1949; Ragir 1972). It is widely hypothesized that the bulk of these materials were acquired through trade; however, some may have been acquired as part of seasonal movements between the Central Valley and the Sierra Nevada foothills.

There is evidence for seasonal transhumance in the distribution of Windmiller artifacts, sites, and burial patterns. Johnson's work (1967, 1970) along the edge of the Sierra Nevada foothills at Camanche Reservoir and CA-AMA-56, the Applegate site, suggests a link between Windmiller groups of the Central

Valley and the Sierra Nevada mortuary caves. Johnson (1970) suggested that his data reveals a pattern of gradual change from the Early through the Middle Horizon (as defined by Beardsley 1948), rather than a displacement of local groups by foreign populations as theorized by Baumhoff and Olmsted (1963) based on ethnolinguistic evidence. Rondeau (1980), also working at the edge of the Central Valley at CA-ELD-426, the Bartleson Mound, identified components of the Early Horizon (as defined by Beardsley 1948). He (1980) even postulated a potential relationship between the Early Horizon cultures and the Martis Complex (a basalt preferring culture in the Martis Valley of the Sierra Nevada). In addition, analysis of Windmiller burial orientation (Schulz 1970) and skeletal analyses (e.g., Harris Lines) by McHenry (1968) suggest a high percentage of winter death among Windmiller groups. Incorporating all of this data, Moratto (1984) postulated that Windmiller groups were exploiting the foothills of the Sierra Nevada during the summer and returning in the winter to villages in the Central Valley as early as 4,000 BP.

Excavations at CA-PLA-500 (Wohlgemuth 1984), the Sailor Flat site located near CA-PLA-101, sites at the Twelve Bridges Golf Course now known as Catta Verdera Country Club in Lincoln, and Spring Garden Ravine site CA-PLA-101 provide examples of Windmiller sites that had items in their cultural assemblages similar to the material culture of groups elsewhere in California and the foothills.

The succeeding Middle Horizon, namely the Cosumnes Culture after Ragir (1972), the Berkeley Pattern after Fredrickson (1974), and absorbed into the Middle and Upper Archaic designations by Rosenthal et al. (2007) was first recognized at site CA-SAC-66. Much less published material discusses the patterns defined for this era than does Windmiller; none the less, some of the most notable characteristics are:

- tightly flexed burials with variable orientation;
- red ochre stains in burials;
- distinctive *Olivella* and *Haliotis* beads and ornaments;
- distinctive charmstones;
- cobble mortars and evidence of wooden mortars;
- numerous bone tools and ornaments;
- large, heavy foliate and lanceolate concave base projectile points made of materials other than obsidian; and
- objects of baked clay.

Further classification of the Middle Archaic (as defined by Rosenthal et al. 2007) into the Foothills Tradition and Valley Tradition helped to clarify the different types of cultural sequences which occurred during these time periods. Functional artifact assemblages consisting primarily of locally sourced flaked stone and groundstone cobbles characterize the Foothills Tradition, with very few trade goods. Sites that represent the Valley Tradition are much fewer in number and are generally characterized by much more diverse subsistence practices and extended periods of sedentism. Specialized tools, trade goods, and faunal refuse that indicate year-round occupation are evident on sites of the Valley Tradition (Rosenthal et al. 2007). Distinct artifacts attributed to this tradition include one of the oldest dated shell bead lots in

Central California (4,160 BP) and a particular type of pestle used with a wooden mortar (Meyer and Rosenthal 1997).

The Sierra Nevada experienced significant climactic shifts and concomitant vegetation change throughout the Holocene, but pollen analysis and climactic records indicate that the current climate pattern and primary constituents of vegetation communities were in place by the Middle Archaic around 1,000 BC (Hull 2007). Seasonal transhumance practiced by indigenous populations of the Sierra may have become more consistent during this period of relative environmental stasis.

Paleobotanical analysis from sites of the Foothills Tradition including CA-CAL-789, CA-CAL-629, and CA-CAL-630 confirm that acorns and pine nuts were preferred for subsistence (Rosenthal and McGuire 2004; Wohlgemuth 2004) Sites near the Project Area associated with the Valley Tradition are rare in the early Middle Archaic (ca. 5,550 to 2,050 cal. BC) but include the Reservation Road site (CA-COL-247), and two buried sites in the northern Diablo Range (CA-CCO-637 and CA-CCO-18/548). Sites associated with later portions of the Middle Archaic (post-2,050 cal. BC) near the Project Area include CA-SAC-107 and CA-BUT-233, both of which produced elaborate material culture and diverse dietary and technological assemblages.

The next era in the region is identified as the Late Horizon by Beardsley (1948, 1954), the Hotchkiss Culture by Ragir (1972), and the Augustine Pattern by Fredrickson (1974). The culture was formed by populations during the later Upper Archaic and Emergent Periods, as defined by Rosenthal et al. (2007), and ranges in age from around 550 cal. BC to contact (dates vary between the different models of prehistory developed for the region). The Upper Archaic, as discussed above, corresponds with the late Holocene change in environmental conditions to a wetter and cooler climate. The Emergent Period and Late Horizon are markedly represented by the introduction of bow-and-arrow technology, as well as more pronounced cultural diversity as reflected in diversity of burial posturing, artifact styles, and material culture. Cultural patterns for this era are represented in the northern Sacramento Valley, namely within the Whiskeytown Pattern, at sites CA-SHA-47, CA-SHA-571/H, CA-SHA-890, CA-SHA-891, and CA-SHA-892 (Sundahl 1982, 1992).

This era primarily represents both local innovation and the blending of new cultural traits introduced into the Central Valley. The Emergent Occupation (as defined by Rosenthal et al. 2007) coincides with the Augustine Pattern (Fredrickson 1974) in the lower Sacramento Valley/Delta region, and with the Sweetwater and Shasta complexes in the northern Sacramento Valley (Fredrickson 1974; Kowta 1988; Sundahl 1982). The emergence of the Augustine Pattern appears to have been associated with the expansion of Wintun populations from the north, which appears to have led to an increase in settlements in the area after 550 BP (Bennyhoff 1994; Moratto 1984).

During this period in the Sierra Nevada, paleoenvironmental data suggests severe droughts occurred from around AD 892 to 1112 and AD 1210 to 1350 (Hull 2007; Lindström 1990; Stine 1994). These drier conditions surely affected the seasonal resource procurement rounds of the native populations during this time, and likely led to an influx of population movement and cultural blending into the foothills zone and Central Valley by Sierra Nevada groups.

Despite the varying designations, this emergent era is distinguished in the archaeological record by intensive fishing, extensive use of acorns, elaborate ceremonialism, social stratification, and cremation of the dead. Artifacts associated with the defined patterns (Augustine, Emergent, Hotchkiss) include bow-and-arrow technology (evidenced by small projectile points), mortars and pestles, and fish harpoons with unilaterally or bilaterally placed barbs in opposed or staggered positions (Bennyhoff 1950). Mortuary patterns include flexed burials and cremations, with elaborate material goods found in association with prestigious individuals. A local form of pottery, Cosumnes brownware, emerged in the lower Sacramento Valley (Rosenthal et al. 2007). Sites contain this ceramic type in their artifact assemblage near the Project Area include CA-SAC-6, CA-SAC-67, CA-SAC-107, CA-SAC-265, and CA-SAC-329. Human animal effigies are also a marker of this emergent era around the Project Area and are present at sites CA-SAC-6, CA-SAC-16, CA-SAC-29, CA-SAC-267, and CA-SAC-267.

3.3 Ethnography

Prior to the arrival of European-Americans in the region, indigenous groups speaking more than 100 different languages and occupying a variety of ecological settings inhabited California. Kroeber (1925, 1936), and others (i.e., Driver 1961; Murdock 1960), recognized the uniqueness of California's indigenous groups and classified them as belonging to the California culture area. Kroeber (1925) further subdivided California into four subculture areas: Northwestern, Northeastern, Southern, and Central.

When the first European explorers entered the regions between 1772 and 1821, an estimated 100,000 people, about 1/3 of the state's native population, lived in the Central Valley (Moratto 1984). At least seven distinct languages of Penutian stock were spoken among these populations: Wintu, Nomlaki, Konkow, River Patwin, Nisenan, Miwok, and Yokuts. Common linguistic roots and similar cultural and technological characteristics indicate that these groups shared a long history of interaction (Rosenthal et al. 2007). The Central area (as defined by Kroeber 1925) encompasses the current Project Area and includes the Nisenan or Southern Maidu.

Ethnographically, the Project Area is in the southwestern portion of the territory occupied by the Penutian-speaking Nisenan. Nisenan inhabited the drainages of the Yuba, Bear, and American rivers, and also the lower reaches of the Feather River, extending from the east banks of the Sacramento River on the west to the mid to high elevations of the western flank of the Sierra Nevada to the east (Wilson and Towne 1978). The territory extended from the area surrounding the current city of Oroville on the north to a few miles south of the American River in the south. The Sacramento River bounded the territory on the west, and in the east, it extended to a general area located within a few miles of Lake Tahoe.

As a language group, Nisenan (meaning "from among us" or "of our side") are members of the Maiduan Family of the Penutian stock and are generally divided into three groups based on dialect differences: the Northern Hill (mountain) Nisenan in the Yuba River drainage; the Valley Nisenan along the Sacramento River; and the Southern Hill (foothills) Nisenan along the American River (Beals 1933; Kroeber 1925; Wilson and Towne 1978). Individual and extended families "owned" hunting and gathering grounds, and trespassing was discouraged (Kroeber 1925; Wilson and Towne 1978). Residence was generally patrilocal, but couples actually had a choice in the matter (Wilson and Towne 1978).

The basic social and economic group for the Nisenan was the family or household unit. The nuclear or extended family formed a corporate unit. These basic units were combined into distinct village or hamlet groups, each largely composed of consanguine relatives (Beals 1933; Littlejohn 1928). Lineage groups were important political and economic units that combined to form tribelets, which were the largest sociopolitical unit identified for Nisenan (Wilson and Towne 1978). Each tribelet had a chief or headman who exercised political control over all villages within it. Villages typically included family dwellings, acorn granaries, a sweathouse, and a dance house, owned by the chief. The role of chief seems to have been an advisory role with little direct authority (Beals 1933) but with the support of the shaman and the elders, the word of the chief became virtually the law (Wilson and Towne 1978). Tribelets assumed the name of the head village where the chief resided (Beals 1933; Levy 1978).

The office of tribelet chief was hereditary, with the chieftainship being the property of a single patrilineage within the tribelet. Tribelet populations of Valley Nisenan were as large as 500 persons (Wilson and Towne 1982), while foothill and mountain tribelets ranged between 100 and 300 persons (Levy 1978; Littlejohn 1928). Each tribelet owned a bounded tract of land and exercised control over its natural resources (Littlejohn 1928). Beals (1933) estimated that Nisenan tribelet territories averaged approximately 10 miles along each boundary, or 100 square miles, with foothill territories tending to encompass more area than mountain territories. Littlejohn (1928) noted that in many instances, these boundaries were indicated by piles of stones. Regardless, Nisenan groups tended to stay within their village areas except during the summer season when groups of people would sojourn into the mountains to hunt and gather (Littlejohn 1928).

Nisenan practiced seasonal migration, a subsistence strategy involving moving from one area or elevation to another to harvest plants, fish, and hunt game across contrasting ecosystems that were in relatively close proximity to each other. Valley Nisenan generally did not range beyond the valley and lower foothills, while foothill and mountain groups ranged across a more extensive area that included jointly shared territory whose entry was subject to traditional understandings of priority of ownership and current relations between the groups (d'Azevedo 1963).

During most of the year, Nisenan usually lived in permanent villages located below 2,500 feet that generally had a southern exposure, were surrounded by an open area, and were located above, but close to watercourses (Littlejohn 1928). The rather large uninhabited region between the 3,000-foot contour and the summit of the Sierra Nevada was considered "open ground" that was only used by communities living along its edge (Littlejohn 1928). Beals (1933) noted that permanent villages in the foothills and mountains were usually located on high ground between rivers. Valley villages were also usually located on raised areas to avoid flooding. Littlejohn (1928) stated that at one time or another there were settlements located on every small stream within Nisenan territory, but permanent villages were not located in steep, dark, narrow canyons of large rivers, or at altitudes where deep snows persisted throughout the winter. In fact, permanent occupation sites above 3,500 feet were only located in protected valleys (Littlejohn 1928).

The availability of resources influenced the location of Nisenan permanent villages, since they acquired a proportion of their food resources from the general area surrounding them (Littlejohn 1928; Wilson and Towne 1978). Other essential and critical food resources were obtained during the summer, when small

base camps were established at higher altitudes in proximity to a water source. Individuals would stage expeditions to acquire natural, faunal, and plant resources from these camps (Littlejohn 1928; Wilson and Towne 1978).

Communally organized Nisenan task groups exploited a wide variety of resources. Communal hunting drives were undertaken to obtain deer, quail, rabbits, and grasshoppers. Bears were hunted in the winter when their hides were at their best condition. Runs of salmon in the spring and fall provided a regular supply of fish, while other fish such as suckers, pike, whitefish, and trout were obtained with snares, fish traps, or with various fish poisons such as soaproot (Beals 1933; Faye 1923; Wilson and Towne 1978). Birds were caught with nooses or large nets and were also occasionally shot with bow and arrow. Game was prepared by roasting, baking, or drying. In addition, salt was obtained from a spring near modern-day Rocklin (Wilson and Towne 1978).

Acorns were gathered in the fall and stored in granaries for use during the rest of the year. Although acorns were the staple of the Nisenan diet, they also harvested roots like wild onion and "Indian potato," which were eaten raw, steamed, baked, or dried and processed into flour cakes to be stored for winter use (Wilson and Towne 1978). Buckeye, pine nuts, hazelnuts, and other edible nuts further supplemented the diet. Key resources such as acorns, salmon, and deer were ritually managed through ceremonies to facilitate successful exploitation and equitable distribution of resources (Beals 1933; Swezey 1975; Swezey and Heizer 1977).

Trade was important with goods traveling from the coast and valleys up into the Sierra Nevada mountains and beyond to the east, and vice versa. Coastal items like shell beads, salmon, salt, and foothill pine nuts were traded for resources from the mountains and farther inland, such as bows and arrows, deer skins, and sugar pine nuts. In addition, obsidian was imported from the north (Wilson and Towne 1978).

Nisenan built residential dwellings, ceremonial structures, semi-subterranean sweat lodges, and menstruation huts (Wilson and Towne 1978). The typical hill and mountain dwelling was the conical bark house made by overlapping three or four layers of bark with no interior support. A thatched house was used at lower elevations, consisting of a conical framework of poles that was covered by brush, grass, or tules. Semi-subterranean earth lodge roundhouses were also built by hill and mountain groups and used for ceremonial gatherings, assemblies, local feasts, and for housing visitors (Beals 1933; Levy 1978).

Flaked and ground stone tools were common among the Nisenan and included knives, arrow and spear points, club heads, arrow straighteners, scrapers, rough cobble and shaped pestles, bedrock mortars, grinding stones (metates), pipes, charms, and short spears (Barrett 1917; Beals 1933; Voegelin 1942; Wilson and Towne 1978). Beals (1933) also noted that certain colored stone points were considered "lucky," and could be traded for four or five other projectile points. In addition, obsidian was highly valued and imported. Nisenan informants stated that obsidian only came from a place to the north, outside of Nisenan territory (Littlejohn 1928). Littlejohn (1928) also noted that soapstone was used for bowl mortars, although informants of Wilson and Towne (1978) claimed that neither they nor their ancestors made mortars.

Wood was used for a variety of tools and weapons, including both simple and sinew-backed bows, arrow shafts and points, looped stirring sticks, flat-bladed mush paddles, pipes, and hide preparation tools

(Wilson and Towne 1978). Cordage was made from plant material and was used to construct fishing nets and braided and twined tumplines. Soaproot brushes were commonly used during grinding activities to collect meal or flour. Specialized food processing and cooking techniques included the grinding and leaching of ground acorn and buckeye meal; burning of umbelliferae, a plant with cabbage-like leaves, to obtain salt; and roasting various foods in earth ovens (d'Azevedo 1986; Wilson and Towne 1978). Both hill and valley groups used the bedrock mortar and pestle (both rough cobble and shaped) to grind acorns, pine nuts, seeds, other plant foods, and meat. A soaproot brush was used to sweep ground meal into mortar cups and collect flour. Fist-sized, heated stones were used to cook or warm liquid-based foods such as acorn gruel and pine nut meal. Whole acorns were stored in granaries, and pine nuts were stored in large pine bough covered caches (Wilson and Towne 1978).

Nisenan groups managed many wild plants, primarily by controlled burning which removed underbrush and encouraged growth of edible grasses, seed producing plants, and other useful plant resources (e.g., basketry materials) (Blackburn and Anderson 1993). The use of fire for environmental modification and as an aid in hunting is frequently mentioned in the ethnographic literature relating to the Nisenan. Littlejohn (1928) noted that the lower foothills in the valley oak zone were thickly covered with herbaceous vegetation that was annually burned by the Nisenan to remove and limit its growth while facilitating the growth of oaks for harvesting acorns. The annual fires destroyed seedlings but did not harm established oak trees. Beals (1933) also noted that the Nisenan regularly burned the land, primarily for the purpose of driving game, and consequently created much more open stands of timber than currently exist in the area. Beals (1933) informants stated that before their traditional burning regimes were halted by European-Americans, "it was often a mile or more between trees on the ridges." In addition to removing underbrush, improving travel conditions, and facilitating plant growth, burning may also have improved areas of deer forage, potentially altering migratory patterns of deer populations by lessening their need to seek fresh forage on a seasonal basis (Matson 1972).

Nisenan used baskets for a variety of tasks, including storage, cooking, serving and processing foods, traps, cradles, hats, cages, seed beaters, and winnowing trays. Basket manufacturing techniques included both twining and coiling, and baskets were decorated with a variety of materials and designs. Other woven artifacts include tule matting and netting made of milkweed, sage fibers, or wild hemp (Wilson and Towne 1978).

Like most indigenous cultures, Nisenan groups had a holistic epistemology; a theorem of holistic knowledge in which any subject is a composite of all other subjects, and every aspect of knowledge is interconnected. The Nisenan world contained many ineffable supernatural beings and spirits, and all natural objects were endowed with potential supernatural powers (Beals 1933).

Stories about world creation and human origins vary amongst different ethnographic accounts as well as amongst different groups. Some expressed the idea that the world has always existed, but in different forms; some told that everything was made by someone, and that all birds and animals were once human; others told of a flood that killed the first people because they were bad (Kroeber 1929). In creation stories there was a culture hero, usually who created earth, and Coyote the trickster who introduced death and conflict to a once utopian existence (Beals 1933; Kroeber 1929).

Ethnographic accounts of specific religious practices were stymied by several factors, including reluctance on behalf of Nisenan groups to discuss their religion, many variations in cultural practices, and disease epidemics during contact period. Certain central themes were identified by Gifford (1927), who divided Nisenan religious ceremonies into three chronological strata: indigenous dances (early); northern-influenced dances of the *Kuksu* or god-impersonating cult performed in dance houses; and a *Kuksu* religious revival circa 1870 adapted to the Ghost Dance religion.

The *Kuksu* cult was the major religious system in Central California and was practiced by the Nisenan in various forms. Cult membership was reserved for initiated few, who danced disguised as the spirits of deities (Heizer 1962). Other religious ceremonies included a mourning ceremony, an annual ritual for the dead performed in the fall in which dancers covered their faces with ash and wailed and cried around a central brush pyre (Gifford 1927). This ceremony was observed and documented among mountain groups but little is known about whether valley and foothills groups performed similar rites (Wilson and Towne 1978). Other ceremonial dances included a *Kamin* dance celebrated in late March to mark the beginning of spring; the *Weda* or Flower dance of late April; a *Dappe* or Coyote Dance; and a *Nemulsa* or "Big Festival" to which people came from a distance to celebrate (Gifford 1927).

The Nisenan had two types of doctors or shamans, curing and religious, both of whom performed their rituals publicly in the village dance house (Wilson and Towne 1978). The curing shamans could be of either sex and possessed certain charms and medicines. They diagnosed feeling and sucked out the area of pain to remove the offending object (such as dead fly, a small bone, a blood clot), which was displayed, and then buried immediately. Curing shamans were only paid if they cured the afflicted patient (Wilson and Towne 1978). The religious shaman, or *oshpe*, represented the supernatural and was a dominant figure in dance house rituals. He gained control over spirits by dreams or esoteric encounters, and it was believed he could conjure up spirits and voices of the deceased (Wilson and Towne 1978).

The Spanish arrived on the Central California coast in 1769. Early contact with the first Spanish explorers to enter California was limited to the peripheries of Nisenan territory; they occurred mainly to the south on lands of the Miwok which had been explored by José Canizares in 1776, with only ephemeral explorations into Nisenan lands. There are no records of Nisenan groups being removed to the missions. They did, however, receive escapees from the missions, as well as pressure of displaced Miwok populations on their southern borders. The first known occupation by European-Americans was marked by American and Hudson Bay Company fur trappers in the late 1820s establishing camps in Nisenan territories. This occupation was thought to have been peaceful (Wilson and Towne 1978).

In 1833 a deadly epidemic (probably malaria) swept through the Sacramento Valley and had a devastating effect on Nisenan populations. Entire villages were lost and surviving Nisenan retreated into the hills. An estimated 75 percent of their population was wiped out, and only a handful were left to face the gold miners and settlers who were soon to follow (Cook 1955). Captain John Sutter settled in Nisenan territory in 1839, and through force and persuasion he coerced most of the remaining Valley Nisenan to be on peaceful terms (Wilson and Towne 1978).

The mountain Nisenan groups encountered Europeans in their territory but were not adversely affected by the epidemics and early settlers. The discovery of gold, however, led to their territory being overrun

within a matter of a few years. James Marshal's 1848 gold discovery was in the middle of Nisenan territory, and thousands of miners were soon living in the area. This dynamic led to widespread killing, destruction, and persecution of the Nisenan and their culture. The few survivors were relegated to working in agriculture, logging, ranching, or domestic pursuits (Wilson and Towne 1978). A native culture resurgence occurred around 1870 with influence from the Ghost Dance revival, but by 1890s the movement had all but ended in dissolution. By the time of the Great Depression, it was said that no living Nisenan could remember a time before European-American contact (Wilson and Towne 1978).

The turn of the century was fraught with deplorable conditions for the surviving Nisenan populations, marked by low educational attainment, high unemployment, poor housing and sanitation, and prevalence of alcoholism. The 1960 U.S. census (California State Advisory Commission of Indian Affairs 1966 as cited in Wilson and Towne 1978) reported 1,321 Native Americans resided in the counties originally held as Nisenan territory, but none had tribal affiliation. Sacramento County listed 802 Native Americans, of which only four were known descendants of the Valley Nisenan. El Dorado, Placer, Yuba, and Nevada counties had several Nisenan families in the 1970s who are descended from mountain groups and could speak the language and retained knowledge of traditional lifeways (Wilson and Towne 1978).

A few people still practiced Nisenan customs through the turn of the twenty-first century, but the old ways have been largely lost. Despite the hardships on their people through the past few centuries, many modern Native American populations participate in pan-Indian activities and celebrations. Nisenan descendants continue to be active in social movements and organizations that seek to improve the Native American situation in the dominant America culture.

3.4 Regional History

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. Cabrillo was sent north by the Viceroy of New Spain (Mexico) to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English adventurer Francis Drake visited the Miwok Native American group at Drake's Bay or Bodega Bay in 1579. Sebastian Vizcaíno explored the coast as far north as Monterey in 1602. He reported that Monterey was an excellent location for a port (Castillo 1978).

Colonization of California began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay Area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and pueblos (towns) were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California) beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. No missions were established in the Central Valley. The nearest missions were in the vicinity of San Francisco Bay and included Mission San Francisco de Asis (Dolores) established in 1776 on the San Francisco peninsula, Mission Santa Clara de Asis at the south end of San Francisco Bay in 1777, Mission San Jose in 1797, Mission San Rafael, established as an *asistencia* in 1817 and a full mission in 1823, and Mission San Francisco Solano in Sonoma in 1823 (Castillo 1978;

California Spanish Missions 2011). Presidios were established at San Francisco and Monterey. The Spanish took little interest in the area and did not establish any missions or settlements in the Central Valley.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California with its capital at Monterey. In 1827, American trapper Jedediah Smith traveled along the Sacramento River and into the San Joaquin Valley to meet other trappers of his company who were camped there, but no permanent settlements were established by the fur trappers (Thompson and West 1880).

The Mexican government closed the missions in the 1830s and former mission lands, as well as previously unoccupied areas, were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or "ranchos" (Robinson 1948). During the Mexican period there were small towns at San Francisco (then known as Yerba Buena) and Monterey. The rancho owners lived in one of the towns or in an adobe house on the rancho. The Mexican Period includes the years 1821 to 1848.

John Sutter, a European immigrant, built a fort at the confluence of the Sacramento and American rivers in 1839 and petitioned the Mexican governor of Alta California for a land grant, which he received in 1841. Sutter built a flour mill and grew wheat near the fort (Bidwell 1971). Gold was discovered in the flume of Sutter's lumber mill at Coloma on the South Fork of the American River in January 1848 (Marshall 1971). The discovery of gold initiated the 1849 California Gold Rush, which brought thousands of miners and settlers to the Sierra foothills east and southeast of Sacramento.

The American period began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the U.S. in 1848. As a result of the treaty, Alta California became part of the U.S. as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by U.S. courts, but usually with more restricted boundaries, which were surveyed by the U.S. Surveyor General's office. Land outside the land grants became federal public land that was surveyed into sections, quarter-sections, and quarter-quarter sections. The federal public land could be purchased at a low fixed price per acre or could be obtained through homesteading (after 1862) (Robinson 1948).

3.5 Project Area History

Roseville was originally named Junction because it was located where the California Central Railroad crossed the proposed route of the Central Pacific Railroad, a segment of the First Transcontinental Railroad. The name Roseville was given to the Central Pacific Railroad station and was named either for the most popular girl at a picnic (Gudde 1969) or was named for the nearby ranch of Rose Spring, owned by Judge James McGinley (Thompson and West 1882).

On April 25, 1864, the Central Pacific Railroad was completed from Sacramento to Roseville and soon trains were traveling to and from Sacramento on a daily basis (Department of Parks and Recreation [DPR] 1979). The Central Pacific Railroad connected with the Union Pacific Railroad at Promontory Point, Utah, in 1869 to form the First Transcontinental Railroad. The Central Pacific Railroad later merged with the Southern Pacific Railroad and was known as the Southern Pacific Railroad after 1885. The town served as a

stopping point for the transportation needs of the local farmers and ranchers. Between 1906 and 1909, Roseville became one of the fastest growing towns in the area when the Southern Pacific Railroad repair facilities and roundhouse, originally located in the neighboring city of Rocklin, were moved to Roseville. By the 1920s, Roseville had one of the largest freight yards west of the Mississippi River. During the early to mid-1900s, the town remained an important railroad depot; however, once Interstate 80 was completed, and other means of transportation became available, the depot was finally closed in 1972 (Davis 1993). Although Roseville was hit hard by the decline in railroad transportation, the town has proceeded to grow due to the introduction of many industrial headquarters and the central location of the city within the Sacramento Valley.

Roseville had its beginnings in the aftermath of the California Gold Rush when discouraged gold seekers left the mineral regions to take up farming along rich creek bottom lands. These pioneers formed the nucleus of what was to become the "first families" of Roseville. One of the first sections of southwestern Placer County to be settled was the rich lands of the Dry Creek District, located approximately three miles southwest of the Project Area (City of Roseville 2020; Davis 1964).

Among the European settlers of the Dry Creek District was Martin A. Schellhous who came to California with his wife and acquired a 240-acre ranch. Having brought a number of cattle with him from Michigan, Schellhous turned his attention to raising stock. Later diversifying and expanding his agricultural pursuits, he planted vineyards, orchards, and fields of grain on his property (City of Roseville 2020).

Between 1870 and 1879, Roseville experienced slow but steady development. New construction already underway and reported in the Placer Herald of January 1, 1870 included a new hotel, known as the Roseville Hotel, being erected by Daniel S. Neff, who had formerly operated the 17 Mile House on the old Auburn Road located in Sacramento County. The Roseville Hotel became one of the more prominent businesses in Roseville during the 1870s (Davis 1964). By 1890, though growth had not spiked, a movement toward a more industrial base had begun and business activity increased (City of Roseville 2020).

Fruit shipping became an important factor in the economy of Roseville at the beginning of the twentieth century. Figures compiled by the Roseville Board of Trade for 1901 revealed that during that year alone, more than 781,000 pounds of fresh deciduous fruits had been shipped from Roseville, along with 3,000 boxes of oranges, 22,380 pounds of pickled olives, and 8,000 pounds of olive oil. Hand-in-hand with the increased activity of shipping fruit was a great upsurge in viticulture. Historic records indicate that a total of 1,195,436 boxes of grapes were shipped from the Roseville depot in 1901 (City of Roseville 2020; Davis 1964).

The new State Highway was routed through Roseville in 1912. Roads were paved commencing at the lower end of Riverside Avenue and connecting to the State Highway on Lincoln Road. While Roseville was launching its new government and contributing its share to the war effort during World War I, the city continued to grow. In a 2.5-year period (September 1911 to January 1914), more than 110 new buildings were erected. Population increased from 2,608 in 1910 to 4,477 in 1920. By 1924, the Southern Pacific Railroad purchased 200 acres of land between Roseville and Antelope for relocation of Pacific Fruit

Express (PFE) shops and construction of 77 miles of new tracks to be used by both Southern Pacific and PFE. By June 1927, the new facilities were in operation (City of Roseville 2020).

The considerable building and commercial development that characterized Roseville throughout the 1920s was curbed drastically by the Great Depression; however, municipal improvements continued to progress in spite of the Depression. Although Roseville had become a "city" in 1909, it was not until 1935 that voters, by a 443 to 194 count, permitted the community to become a "charter city," which gave residents the ability to change how their city is governed. Between 1941 and 1942, no major building activity was reported in the columns of The Press Tribune. By the latter date, however, approximately 1,000 new residents had moved to Roseville; most of them worked in nearby defense installations or for the railroad (City of Roseville 2020).

The population boom, which hit southern California with sudden swiftness in the late 1940s and spread quickly to northern California in the following decades, focused on southwestern Placer County after 1960. George Buljan served as mayor during this period of rapid growth and great change. Buljan served on the City Council for 24 years. The city, among other things, named a middle school after him, which is located off Washington Boulevard, north of the Project Area. The population boom of the 1960s continued through the 1970s, and commercial and residential development continued through the turn of the twenty-first century.

3.5.1 Historical Context of Transmission Lines

The following broad historical overview of electric transmission is included to provide a sense of the historical developments, techniques, and significant events associated with electric transmission systems. Specific historical accounts and important information about electric transmission systems are often not documented in the historical record because these types of systems primarily serve a utilitarian function and their historical developments through time are linked to the service they provide. In order to assess whether or not a specific electric transmission line is relevant within the historical developments of these types of utilities, it is important to identify the major significant events of electric transmission, important companies, and other developments through time in addition to the property-specific information identified during focused archival research.

3.5.1.1 Electric Transmission in California

The number of electric utility companies in California significantly increased in the 1880s to meet the demand of the growing population and widespread use of Thomas Edison's new version of the incandescent light bulb (Adams 2010). Electric utility companies prior to the 1880s typically used low-voltage direct currents (DC), also invented by Edison, which transmitted electricity only about three miles. Because the electricity could not travel a long distance, only urban, densely populated areas could economically be served by these electric companies. Despite the limitations of DC systems, the California Electric Light Company of San Francisco was the first to begin installing long-distance electric transmission lines in California in 1879 (Adams 2010).

The alternating current (AC) system was developed later by Nikola Tesla and William Stanley (of the Westinghouse Company) and was more powerful than the DC system, with the capability of transmitting

higher voltages of electricity a significantly further distance (Adams 2010). California first saw use of the AC system when electrical engineer Almerian Decker and his partners opened the San Antonio Light and Power Company and in 1892 transmitted electricity over 14 miles in Pomona (JRP Historical Consulting, LLC 2007). In 1895 the Folsom power plant, designed by James Lighthipe of General Electric, produced and transmitted power to Sacramento approximately 22 miles away (JRP 2007). By the end of the 1890s, several cities in California began to use AC systems in their power plants because of the capability to transmit electricity longer distances. Another new invention in electrical transmission and distribution was the "converter," also called the transformer. Transformers are designed to reduce high electrical voltages passing along transmission lines to lower voltages to be safely distributed to residences and businesses (Adams 2010).

Electric transmission lines throughout California continued to grow in length significantly into the twentieth century. In 1899, the Edison Electric Company, predecessor of Southern California Edison, used glazed porcelain insulators to hold the conductor wire, which allowed construction of an 83-mile-long electric transmission line from the Santa Ana River to Los Angeles, the longest line at the time (Adams 2010). The length of electric transmission lines continued to increase over the next decade. In 1901, the Bay Counties Power Company constructed a 142-mile-long electric transmission line from the Colgate Powerhouse in the Sierra Nevada to Oakland. John Debo Galloway was the engineer who designed the 142-mile-long transmission line, which is given credit for being the longest in the world at the time. Galloway was a major pioneer in the design of electric transmission lines in California (Adams 2010).

Pacific Gas and Electric (PG&E) is one of the oldest electric utility companies in California. The California Electric Light Company was originally founded in 1879 by George Roe. The California Electric Light Company later opened the Folsom Powerhouse to develop hydroelectric power and distribute it to the area. This event was significant because it required the transmission of electricity over a long distance, a range achieved by only a few at the time. At this time, several electric utility companies were springing up throughout California, all competing in the electricity sales market. The Folsom Powerhouse and long-distance electric transmission capabilities of the California Electric Light Company gave them a significant advantage over competitors. Eventually, PG&E was formed in 1905 as a merger of the San Francisco Gas and Electric Company and the California Gas and Electric Corporation. Since formation, the company has expanded operations throughout the U.S. Currently, PG&E operates thousands of miles of electric transmission systems in California powering millions of homes (PG&E 2014).

3.5.2 Engineering

In order to adequately determine the eligibility of SV-001, Sacramento Municipal Utilities District (SMUD) 230-kV transmission line and SV-002, SMUD 115-kV distribution line for inclusion on the NRHP and CRHR, it is essential to understand the mechanical and physical components of the tower structures and poles supporting the conductor wires. All of the components and technologies of electric transmission lines discussed below are currently in use by PG&E, SMUD, and other electric utility companies in California and were included in this report to assist in the evaluation of the historic-age transmission lines within the Project Area.

The basic considerations of electric transmission tower and distribution pole construction focus on safety and structural load requirements. Towers and poles are designed to be able to withstand specific loads depending on environmental surroundings. A tower built in a valley must be able to withstand the structural loads of heavy winds while a tower built on a high mountain must be able to withstand the structural loads of heavy ice. A structure also has to withstand heavy stresses that are imposed on it, such as the tension of the wires it is supporting, the weight of conductors, stresses from guy wires stabilizing the towers, and the angles in the lines (Gonen 2009). Transmission towers span a variety of environments in long transmission systems, and therefore, tower foundations are selected depending on the characteristics of the ground at the location of a particular tower. Since towers typically stand on four angled legs, the foundation they sit on is generally designed to cover a small surface. These foundations are called spread foundations and contain steel plates and grillages set in concrete (Adams 2010).

Conductor wires are typically made of copper or aluminum metals (Sevick 2001). Aluminum is a lighter metal and is stronger than copper, but not as conductive of electricity. Insulators are used as separators between the conductor and the structure holding the wire. Insulators are typically made of porcelain, glass treated with epoxy resins, or fiberglass, though porcelain is the most commonly used (Gonen 2009). There are several types of insulators commonly used on today's electric transmission lines. These are the pin type, suspension type, and strain type insulators. Pin insulators are designed and commonly used for small-voltage transmission lines under 44 kV. Suspension insulators hold the conductor wire suspended from an arm of a tower and are typically seen on high-voltage transmission lines (Gonen 2009). Strain insulators are designed to withstand heavy stress and are typically used where a transmission line system turns a curve or crosses an obstruction or where a system closes off a circuit. In addition, high-voltage electric transmission lines typically support overhead grounding wire. Overhead grounding wires are designed to absorb electrical impulses in the atmosphere that could interfere with electrical currents in the conductor wire or damage the transmission line (Gonen 2009).

4.0 METHODS

4.1 Personnel Qualifications

All phases of the cultural resources investigation were conducted or supervised by Registered Professional Archaeologist (RPA) Lisa Westwood, who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historical archaeology. Staff archaeologist Laurel Zickler-Martin, RPA, conducted the background research and Senior Archaeologist Theadora Fuerstenberg, RPA, prepared the report with assistance from Staff Archaeologist Megan Webb. Fieldwork was conducted in two phases by Megan Webb, Senior Archaeologist Brian S. Marks, and Project Assistant Shannon Joy. The architectural history evaluation and analysis of the transmission towers was conducted by Senior Architectural Historian Jeremy Adams, who meets the Secretary of the Interior's Professional Qualifications Standards for architectural history and built environment. Lisa Westwood provided technical report review and quality assurance.

Lisa Westwood, the Principal Investigator, has 26 years of experience. She holds a B.A. in Anthropology and an M.A. in Anthropology (Archaeology). She has participated in or supervised numerous survey, testing, and data recovery excavations, has recorded and mapped hundreds of pre-contact and historical

sites, and has cataloged, identified, and curated hundreds of thousands of artifacts. She has conducted evaluations of cultural resources for eligibility to the NRHP and CRHR and is well versed in impact assessment and development of mitigation measures for CEQA and Section 106 (NHPA) projects. She is the Director of Cultural Resources for ECORP.

Theadora Fuerstenberg is a Senior Archaeologist for ECORP. She holds a B.A. in Anthropology and an M.A. in Cultural Resources Management, and has more than 16 years of experience, specializing in historic-era California, pre-contact central, southeastern, northern coastal California, and the Great Basin. Her principal professional abilities include identification and treatment of cultural resources and preparation of technical documents as required for compliance with CEQA, NEPA, and Sections 106 and 110 of the NHPA; conducting archival and background research; directing large and complex archaeological survey and archaeological excavations; directing and performing laboratory analysis of pre-contact and historic-era collections; and writing research designs, management plans, and reports for archaeological and cultural resource management projects.

Jeremy Adams meets the Secretary of the Interior's Standards for Architectural History and History, holding a B.A. in History and a M.A. in History (Public History). Mr. Adams has more than 11 years of experience specializing in historic resources of the built environment. He is skilled in carrying out historical research at repositories such as city, state, and private archives, libraries, CHRIS information centers, and historical societies. He has experience conducting field reconnaissance and intensive surveys. Mr. Adams has conducted evaluations of cultural resources for eligibility to the NRHP and CRHR.

Megan Webb is a Staff Archaeologist for ECORP and has more than five years of experience in cultural resources management, primarily in California. She holds a B.A. in Anthropology and has participated in all aspects of archaeological fieldwork, including survey, test excavation, and data recovery, in addition to months of archaeological laboratory experience.

Brian S. Marks has been an archaeologist since 1997, and has been working in cultural resources management in California since 2010 following eight years of archaeological work in the southeast U.S. Dr. Marks holds a Ph.D. and an M.S. in Anthropology. He has participated or supervised well over 200 survey, testing, and data recovery excavations; has recorded and mapped a multitude of pre-contact and historical sites including Civil War battlefields, Gold Rush boom towns, submerged pre-contact sites, and others. He has conducted evaluations of cultural resources for eligibility to the NRHP and CRHR and is well versed in impact assessment and development of mitigation measures for CEQA and Section 106 (NHPA) projects. He is a Senior Archaeologist for ECORP.

Shannon Joy is a Project Assistant and has more than two years of experience in cultural resources management in California. She is currently completing her B.A. in Anthropology (Archaeology) and has participated in all aspects of archaeological fieldwork, including survey, test excavation, and data recovery.

Laurel Zickler-Martin is a Staff Archaeologist at ECORP with over 10 years of experience in cultural resources management in California and the Great Basin, as well as project experience in Washington state and Oregon. Ms. Zickler-Martin has conducted all aspects of archaeological fieldwork, laboratory work, and reporting, including survey, site recording, test excavation, data recovery, and monitoring; cataloging, artifact analysis, curation, and collections and database management; CHRIS records searches,

archival research, preparation of DPR and IMACS site forms, determinations of NRHP and CRHR eligibility for archaeological and built environment resources, and preparation of and contributions to numerous technical reports. Faunal and human osteology analysis are Ms. Zickler-Martin's areas of specialization.

4.2 Records Search Methods

ECORP requested a records search for the property with the North Central Information Center (NCIC) of the CHRIS at California State University, Sacramento on June 17, 2020 (NCIC search #PLA-20-71; Attachment A). The purpose of the records search was to determine the extent of previous surveys within a 0.5-mile (800-meter) radius of the Proposed Project location, and whether previously documented pre-contact or historic archaeological sites, architectural resources, or traditional cultural properties exist within this area.

In addition to the official records and maps for archaeological sites and surveys in Placer County, the following historic references were also reviewed: Historic Property Data File for Placer County (OHP 2012); The National Register Information System (National Park Service [NPS] 2020); *Office of Historic Preservation, California Historical Landmarks* (OHP 2020); California Historical Landmarks (OHP 1996 and updates); California Points of Historical Interest (OHP 1992 and updates); Directory of Properties in the Historical Resources Inventory (1999); *Caltrans Local Bridge Survey* (Caltrans 2019); *Caltrans State Bridge Survey* (Caltrans 2018); and *Historic Spots in California* (Kyle 2002).

Other references examined include a RealQuest Property Search and historic General Land Office (GLO) land patent records (Bureau of Land Management [BLM] 2020). Historic maps reviewed include:

- 1855 BLM GLO Plat map for Township 11 North Range 6 East;
- 1891 USGS Sacramento, California topographic quadrangle map (1:125,000 scale);
- 1910 USGS Roseville, California topographic quadrangle map (1:31,680 scale);
- 1953 USGS Roseville, California topographic quadrangle map (1:24,000 scale);
- 1967 USGS Roseville, California topographic quadrangle map (1:24,000 scale);
- 1967 photo revised 1981 USGS Roseville, California topographic quadrangle map (1:24,000 scale); and
- 1992 USGS Roseville, California topographic quadrangle map (1:24,000 scale).

Historic aerial photos taken in 1947, 1957, 1964, 1966, and more recent aerial photos from 1993, 1998, 2002, 2005, 2009, 2010, 2012, 2014, and 2016 were also reviewed for any indications of property usage and built environment.

The nearest local historical register is limited to the city of Sacramento and does not extend to the area subject to this assessment.

4.3 Sacred Lands File Coordination Methods

In addition to the records search, ECORP contacted the California Native American Heritage Commission (NAHC) on June 17, 2020 to request a search of the Sacred Lands File for the APE (Attachment B). This search will determine whether or not Sacred Lands have been recorded by California Native American tribes within the APE, because the Sacred Lands File is populated by members of the Native American community who have knowledge about the locations of tribal resources. The responsibility to formally consult with the Native American community, however, lies exclusively with the federal and local agencies under applicable state and federal law. ECORP was not delegated authority by the lead agencies to conduct tribal consultation.

4.4 Other Interested Party Consultation Methods

ECORP mailed letters to the Placer County Historical Society and the Roseville Historical Society on June 17, 2020 to solicit comments or obtain historical information that the repository might have regarding events, people, or resources of historical significance in the area (Attachment A). No response has been received to date.

4.5 Field Methods

On June 23, 2020 and June 14, 2021, ECORP subjected the APE to intensive pedestrian surveys under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (NPS 1983) using transects spaced 15 meters apart (Figure 2). ECORP expended one person-day in the field. At that time, the ground surface was examined for indications of surface or subsurface cultural resources. The general morphological characteristics of the ground surface were inspected for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the locations of subsurface exposures caused by such factors as rodent activity, water or soil erosion, or vegetation disturbances were examined for artifacts or for indications of buried deposits. No subsurface investigations or artifact collections were undertaken during the pedestrian survey.

All cultural resources encountered during the survey were recorded using DPR 523-series forms approved by the California OHP. The resources were photographed, mapped using a handheld Global Positioning System receiver, and sketched as necessary to document their presence using appropriate DPR forms.

Location: N:\2020\2020-108 Sierra View Country Club\MAPS\Cultural_Resources\SVCC_SurveyCoverage_20210611.mxd (KIT)-kturnquist 6/14/2021

Map Date: 6/14/2021
Photo Source: NAIP 2018

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 2. Survey Coverage

2020-108 Sierra View Country Club

5.0 RESULTS

5.1 Records Search

Eighteen previous cultural resource investigations have been conducted within 0.5 mile of the property, covering approximately 20 percent of the total area surrounding the property within the record search radius. The previous studies within the records search radius were conducted between 1979 and 2015. A list of the previous reports is provided in Attachment A. The results of the records search indicated that the transmission line right-of-way (a maximum of 200-foot-wide corridor) located within the property has been previously surveyed for cultural resources in 1986, 2001, and again in 2002; however, these studies were conducted in smaller segments, at different times, by different consultants, as many as 34 years ago under obsolete standards, and did not cover the entire APE. Therefore, a pedestrian survey of the entire 23.1-acre APE was conducted for the current Project under current (2014) USACE protocols. As a result of these studies, no cultural resources other than the Western Area Power Administration (WAPA) transmission line (P-31-3280) were identified in the APE.

The records search also determined that nine previously recorded pre-contact and historic period cultural resources are located within 0.5 mile of the Project Area. Of these, one is believed to be associated with Native American occupation of the vicinity, and eight are historic-period sites, associated with early European-American ranching and mining activities and built environment (railroads, bridges, roads, transmission line, and the Old Roseville Historic District). A list of the previously recorded resources is provided in Attachment A. The only site identified within the APE was the previously recorded 1950s WAPA transmission lines (P-31-3280).

The OHP's *Built Environment Resource Directory for Placer County* (dated March 3, 2020) did not include any resources within the Project Area (OHP 2020).

The National Register Information System (NPS 2020) failed to reveal any eligible or listed properties within the Project Area. The nearest National Register property, The Carnegie Library, is 0.5 mile southwest of the Project Area in downtown Roseville.

Resources listed as *California Historical Landmarks* (OHP 1996) and by the OHP (OHP 2020) were reviewed on June 17, 2020. The nearest listed landmark is #780-1: First transcontinental railroad, Roseville (plaque located 0.7 mile southwest of the Project Area).

A review of *Historic Spots in California* (Kyle 2002) mentions that the track of the Central Pacific Railroad reached the junction at Roseville on April 25, 1864. In 1908 the Southern Pacific Railroad moved its roundhouse to Roseville from neighboring Rocklin, making Roseville one of the largest railroad centers in the U.S.

Historic GLO land patent records from the BLM's patent information database (BLM 2020) showed that the State of California received a patent for the land in the northwestern quarter of Section 35 of Township 11 North, Range 6 East on July 3, 1871, under the California Enabling Act of 1853 (10 Stat. 244). The enabling act granted lands to states to support schools. This encompasses the majority of the Project Area land.

A RealQuest online property search for APN 015-011-029 revealed the property consists of 23.1 acres of vacant land. No other property history information was on record with RealQuest.

The Caltrans Bridge Local and State Inventories (Caltrans 2018, 2019) listed one bridge, Bridge No. 19C0067, (previously recorded as P-31-3747). The bridge carries Sierra Boulevard over the Union Pacific Railroad, and Amtrak, and is located 0.5 mile southwest of the Project Area. It is a concrete continuous arch bridge that was constructed in 1929, and it was evaluated by Caltrans as a Category 2, eligible for the NRHP. No bridges are located within the APE.

The *Handbook of North American Indians* (Wilson and Towne 1978) lists the nearest Native American village as *Pichiku*, located within several miles southwest of the Project Area.

5.2 Map Review and Aerial Photographs

The review of historical aerial photographs and maps of the Project Area provide information on the past land uses of the property and potential for buried archaeological sites. Based on this information, the property has been an undeveloped property since the 1850s. Following is a summary of the review of historical maps and photographs.

- The 1855 BLM GLO Plat map for Township 11 North Range 6 East does not show any features mapped within or in the immediate vicinity of the Project Area. The Project Area land is situated between the south fork of Pleasant Grove Creek and Dry Creek.
- The 1891 USGS Sacramento, California topographic quadrangle map (1:125,000 scale) shows the town of Roseville and the Southern Pacific Railroad going through it, but no features are mapped within or in the immediate vicinity of the Project Area.
- The 1910 USGS Roseville, California topographic quadrangle map (1:31,680 scale) shows that the Project Area land is undeveloped and located north of the town of Roseville. No development is depicted within the Project Area.
- Aerial photographs from 1947 show the Project Area, and land north of Roseville, as undeveloped oak woodland.
- The 1953 USGS Roseville, California topographic quadrangle map (1:24,000 scale) shows the Project Area as being located on property owned by the Sierra View County Club, with one transmission line transecting the Project Area, which is the line that corresponds to previously recorded resource P-31-3280.
- Aerial photographs from 1957 and 1966 show the country club developed adjacent to the west of the Project Area; however, the Project Area remains undeveloped. The WAPA transmission line towers of previously recorded resource P-31-3280 are present on the 1957 photographs.
- The 1967 USGS Roseville, California topographic quadrangle map (1:24,000 scale) shows one transmission line within the Project Area, the Diamond Oaks and the Sierra View golf courses, and the route of today's Shasta Street and Diamond Oaks Road north and south of the APE. Only the transmission line is present within the APE.

- The 1967 photo revised 1981 USGS Roseville, California topographic quadrangle map (1:24,000 scale) shows no changes to the Project Area land.
- Aerial photographs taken in 1981 show the residential properties located directly east of the Project Area in its early stages of construction. The Project Area remains east of the Sierra View golf course and with one historic-period transmission line (P-31-3280).
- The 1992 USGS Roseville, California topographic quadrangle map (7.5-minute) shows the Project Area east of the Sierra View Country Club and with two transmission lines traveling across the APE.
- Aerial photographs from 1993 show a north-south trending drainage through the northern portion of the Project Area. The 1993 aerial shows two transmission lines within the Project Area: the historic-period transmission line (P-31-3280) and a modern line.
- Aerial photographs from 1998 to present show the Project Area as it exists today, undeveloped land situated east of the Sierra View golf course and surrounded by residential development.

In sum, the property has been undeveloped and vacant since at least 1855, and by 1953 a single transmission line is mapped traveling southeast/northwest through the center of the APE. By 1957, the Sierra View County Club constructed a golf course to the west. By 1993, a second, modern transmission line is present within the Project Area.

5.3 Sacred Lands File Results

A search of the Sacred Lands File by the NAHC failed to indicate the presence of Native American cultural resources in the Project Area. A record of all correspondence is provided in Attachment B.

5.4 Other Interested Party Consultation Results

No responses to the letters sent to the Placer County Historical Society and the Roseville Historical Society have been received as of the preparation of this document.

5.5 Field Survey Results

ECORP surveyed the property in two phases. Initially, a survey was performed for the original 21.2-acre Project Area for cultural resources on June 23, 2020. Following a subsequent change to the project footprint, which added additional area that was not previously surveyed, ECORP carried out a supplemental 1.9-acre survey on June 14, 2021.

Ground visibility during the original survey in 2020 was approximately 40 to 60 percent due to low-lying grasses (one to three inches tall) and shrubs covering the majority of the survey area (Figure 3). The Project Area is comprised of undeveloped oak woodland setting located east of the existing Sierra View golf course, bordered by Diamond Oaks Road on the north and Shasta Street on the south. A seasonal drainage with riparian vegetation meanders through the northern and eastern portions of the Project Area (Figure 4). Patches of exposed soil from rodent activity was also inspected, and the exposed soil consisted of a light brown to reddish brown soil with no cultural indications.

The central portion of the Project Area contains a transmission line corridor with two parallel lines. The northern line was built in the 1950s and has been previously recorded as P-31-3280 (WAPA transmission line; Figure 5). The southern line (Roseville – Elverta 230-kV transmission line) was determined to be modern (built in the early 1990s) and therefore not recorded as a cultural resource (Figure 5). During the survey, ECORP confirmed that the 460-foot-wide segment of the WAPA transmission line crosses the property; however, the tower itself is not located within the Project Area.

Ground visibility during the 2021 supplemental survey was approximately 10 to 40 percent due to low-lying grasses, with areas of near 100 percent visibility along the access roads. ECORP archaeologists observed one modern electrical distribution line and two historic-period lines within this newly added acreage: a SMUD 230kV transmission line (SV-001), and a SMUD 115kV distribution line (SV-002). The two historic-period electrical lines are first visible on 1966 aerial photographs, and the modern distribution line is first visible in the 1981 aerial photograph. Site descriptions follow, and confidential DPR site records are provided in Attachment D.

Figure 3. APE overview from south (view north; June 23, 2020).

Figure 4. Riparian vegetation within northern portion of APE (view north; June 23, 2020).

Figure 5. Transmission lines within central portion of APE (view west; June 23, 2020).

Figure 6. Overview of supplemental 1.9-acre Project Area and SV-001 from Diamond Oaks Road (view southeast, June 14, 2021).

5.5.1 Cultural Resources

5.5.1.1 P-31-3280 (WAPA Transmission Line)

This transmission line was originally recorded in July 2001 by Rand Herbert as a lattice-type steel tower transmission line constructed in 1952 and used to distribute power from the Folsom and Nimbus dams. A segment of the transmission line located north of Baseline Road, west of the Project Area, was later updated and evaluated by Mark Beason in December 2006 (JRP 2007). Beason described the transmission towers as retaining integrity; however, they did not appear to meet the criteria for listing on either the CRHR or the NRHP.

During the 2020 survey, ECORP observed the line from the Project Area and the lattice-type steel towers are located outside of the Project Area but the line is situated above the Project Area land. It could not be determined if the towers or lines had been updated or altered since their original construction, but they appeared to be in overall good condition (Figure 7).

Figure 7. P-31-3280 transmission tower (view south; June 23, 2020).

According to Beason, the lines have not made a significant contribution to the broad patterns of history (Criterion A), were not associated with persons known to have made important advancements in high-voltage transmission lines (Criterion B), are not the first of their kind or of unusual or rare design (Criterion C), and did not appear to be a source of information important in history (Criterion D). ECORP did not encounter any new information during the current study to suggest the lines are now eligible and agrees with the prior evaluations that the segment of P-31-3280 within the survey area is not eligible for the NRHP or CRHR under any criteria.

This resource was previously determined not eligible by the USACE, with concurrence from the State Historic Preservation Officer (SHPO) as part of the Placer Vineyards Specific Plan project. On July 29, 2016, the USACE made a determination that P-31-3280 is not a historic property and consulted with the SHPO on that finding. On September 30, 2016, the SHPO concurred with the USACE's finding of not eligible (COE-2012-1022-001; SPK-2003-00670). Site P-31-3280 is neither a historic property under Section 106 of the NHPA nor a historical resource under CEQA.

5.5.1.2 5.5.1.2 SV-001 (SMUD 230kV Transmission Line)

This transmission line has lattice-type steel towers and was constructed between 1957 and 1966, based on historic aerials. The line is used to distribute power between the Folsom and Elverta substations. Electrical line systems often bear names associated with regional landmarks or historically significant individuals; however, archival research yielded no evidence of such nomenclature for this line.

During the current survey, ECORP observed the transmission line and one of its lattice-type steel tower within the Project Area.

Figure 8. Overview: SV-001, SMUD 230kV transmission line; Diamond Oaks Road, right (view west, June 14, 2021).

5.5.1.3 SV-002 (SMUD 115kV Distribution Line)

This distribution line is a typical wood pole line with standard cross arms and porcelain insulators constructed between 1957 and 1966 based on historic aerials; it is used to distribute power within the Roseville area. Electrical line systems often bear names associated with regional landmarks or historically significant individuals; however, archival research yielded no evidence of such nomenclature for this line.

During the current survey, ECORP observed the distribution line and one of its wooden poles within the Project Area (Figure 9). Based on aerial photographs, this pole was relocated approximately 75 feet to the west sometime between 2007 and 2009.

Figure 9. Overview: SV-002, SMUD 115kV distribution line (view southwest, June 14, 2021).

Evaluation Summary for P-31-3280, SV-001 and SV-002 (SMUD 115kV Distribution Line)

The newly recorded electrical lines SV-001 and SV-002 are not significantly associated with any historical events related to economic or population growth or developments in electric transmission in California, the Country, or the region. The transmission lines are common and have not made a significant contribution to the broad patterns of history (Criterion A). No known significant individuals or groups are associated with the lines, and the companies with which they are associated did not make greater historical contribution as a result of the lines (Criterion B). The transmission lines are common, utilitarian, steel lattice and wooden pole construction, are not the first of their kind or of unusual or rare design, do not exhibit any special engineering characteristics, and are not associated with master engineers known to have made important advancements in high-voltage transmission, tower construction, or engineering. These electrical lines and their components are designed to efficiently transmit electricity, but do not include any unique features that exemplify that purpose. (Criterion C). Furthermore, the research potential of these electrical lines is exhausted with archival research and recording efforts herein. The lines are not a source of information important in history (Criterion D).

Resource P-31-003280 (WAPA transmission line) was previously determined not eligible by the USACE, with concurrence from the SHPO; however, SV-001 and SV-002 have not been subject to agency review yet. Based on these assessments, ECORP recommends the three resources within the Project Area, P-31-003280 (WAPA Transmission Line), SV-001 (SMUD 230kV transmission line), and SV-002 (SMUD 115kV distribution line) be considered not eligible for the NRHP or CRHR under any criteria, Further, these sites

do not contribute to any known or suspected historic districts, nor are they considered to be Historic Properties for the purpose of Section 106 NHPA, nor Historical Resources under CEQA.

Lastly, these electrical infrastructure resources are not listed in the local register of historical resources, as defined in PRC 5020.1(k), have not been identified as significant in an historical resources survey, as defined in PRC 5024.1(g), and have not been determined to be historically significant by the CEQA lead agency [CCR Title 14, § 15064.5(a)]. Therefore, it is not a historical resource under CEQA and is not a historic property under Section 106 of the NHPA.

Integrity

The two transmission lines and one distribution line are in overall good condition and remain in their original alignment corridor. It could not be determined whether the towers for the transmission lines had been updated or altered since their original construction, but the distribution line pole within the Project Area had been moved sometime between 2007 and 2009. Therefore, transmission lines P-31-3280 and SV-001 retain integrity of location, setting, feeling, and association, but their integrity of materials, workmanship, and design are uncertain. Distribution line SV-002 retains integrity of association and feeling, but not of location or setting, and its integrity of materials, workmanship, or design is uncertain. Regardless of integrity, none of the three electrical lines recorded during this study are eligible under any criteria to the NRHP or CRHR, (Table 1).

Table 1. Evaluation and Integrity Summary

Resource #	Criterion A	Criterion B	Criterion C	Criterion D	Retains Integrity?
P-31-3280	Not Eligible	Not Eligible	Not Eligible	Not Eligible	Yes
SV-001	Not Eligible	Not Eligible	Not Eligible	Not Eligible	Yes
SV-002	Not Eligible	Not Eligible	Not Eligible	Not Eligible	Yes

6.0 MANAGEMENT CONSIDERATIONS

6.1 Conclusions

As a result of the records search and 2020 inventory, one historic period transmission line was found to have been previously recorded within the Project Area. The historic period transmission line, resource P-31-3280, has previously been determined not eligible for the NRHP or CRHR under any criteria, with SHPO concurrence. As a result of the 2021 supplemental inventory, two additional historic-period SMUD electrical lines (SV-001, 230kV transmission line and SV-002, 115kV distribution line) were recorded within the expanded Project Area. Both of these newly recorded electrical lines were evaluated under NRHP and CRHR criteria and were determined not eligible. Therefore, no Historic Properties under Section 106 of the NHPA or Historical Resources under CEQA will be affected by the Proposed Project. Until the lead agencies concur with the identification and evaluation of eligibility of cultural resources, including archaeological sites, standing structures, no ground-disturbing activity or demolition should occur.

6.2 Likelihood for Subsurface Cultural Resources

Due to the presence of alluvium along Dry Creek and the southern branch of Pleasant Grove Creek and given the likelihood of pre-contact archaeological sites located along perennial waterways, the potential exists for buried pre-contact archaeological sites in the Project Area. ECORP recommends that any unanticipated (or post-review) discoveries found during Project construction be managed through a procedure designed to assess and treat the find as quickly as possible and in accordance with applicable state and federal law.

6.3 Post-Review Discoveries

If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 50-foot radius of the discovery. A qualified professional archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for pre-contact and historic archaeologist shall be retained to evaluate the significance of the find and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required.
- If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, they shall immediately notify the lead federal agency, the lead CEQA agency, and applicable landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures if the find is determined to be a Historical Resource under CEQA or a Historic Property under Section 106. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not a Historical Resource or Historic Property; or 2) that the treatment measures have been completed to their satisfaction.
- If the find includes human remains, or remains that are potentially human, they shall ensure reasonable protection measures are taken to protect the discovery from disturbance (AB 2641). The archaeologist shall notify the Placer County Coroner (per § 7050.5 of the Health and Safety Code). The provisions of § 7050.5 of the California Health and Safety Code, § 5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the Project (§ 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (§ 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§ 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located

(AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

The lead agency is responsible for ensuring compliance with these mitigation measures because damage to significant cultural resources is in violation of CEQA and Section 106. Section 15097 of Title 14, Chapter 3, Article 7 of CEQA, *Mitigation Monitoring or Reporting*, "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

7.0 REFERENCES CITED

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LIST OF ATTACHMENTS

Attachment A – Records Search Confirmation and Historical Society Coordination

Attachment B – Sacred Lands File Coordination

Attachment C – Project Area Photographs

Attachment D – ***Confidential*** Cultural Resource Site Locations and Site Records

ATTACHMENT A

Records Search Confirmation and Historical Society Coordination

California Historical Resources Information System

NORTH CENTRAL INFORMATION CENTER

AMADOR
EL DORADO
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6/18/2020 NCIC File No.: PLA-20-71

Laurel Zickler-Martin
ECORP Consulting, Inc.
2525 Warren Drive
Rocklin, CA 95677

Re: 2020-108_Sierra View

The North Central Information Center received your records search request for the project area referenced above, located on the Roseville USGS 7.5' quad. The following reflects the results of the records search for the project area and a ½-mi radius.

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☒ custom GIS maps ☒ shapefiles

Resources within project area:	P-31-3280
Resources outside project area, within radius:	P-31-77 P-31-560 P-31-773 P-31-816 P-31-964 P-31-3672 P-31-3747 P-31-4240
Reports within project area:	355 2807 7130 9188
Reports outside project area, within radius:	274 367 396 2077 2604 2935 6675 7745 8619 10041 10434 10856 12430 12441

Resource Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed/NA

Resource Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed/NA

Resource Digital Database Records: ☒ enclosed ☐ not requested ☐ nothing listed/NA

Report Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed/NA

Report Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed/NA

Report Digital Database Records: ☒ enclosed ☐ not requested ☐ nothing listed/NA

Resource Record Copies: ☒ enclosed ☐ not requested ☐ nothing listed/NA

Report Copies: ☒ enclosed ☐ not requested ☐ nothing listed/NA

Built Environment Resources Directory:	☒ enclosed	☐ not requested	☐ nothing listed/NA
Archaeological Determinations of Eligibility:	☒ enclosed	☐ not requested	☐ nothing listed/NA
CA Inventory of Historic Resources (1976):	☒ enclosed	☐ not requested	☐ nothing listed/NA
Caltrans Bridge Survey:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Ethnographic Information:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Historical Literature:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Local Inventories:	☐ enclosed	☐ not requested	☒ nothing listed/NA
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Shipwreck Inventory:	☐ enclosed	☒ not requested	☐ nothing listed/NA
Soil Survey Maps:	☐ enclosed	☒ not requested	☐ nothing listed/NA

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Sincerely,

Paul Rendes, Coordinator
North Central Information Center

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
000274		1986	Maniery, James Gary and Mary L. Maniery	Cultural Resources Inventory and Evaluation of Rich, Shenker, and Carlsberg Parcels, Roseville, Placer County, California.	Public Anthropological Research	31-000038, 31-000039, 31-000040, 31-000041, 31-000042, 31-000043, 31-000044, 31-000045, 31-000554
000355		1986	Mikkelsen, Pat	An Archeological Reconnaissance of a 14 Mile Long Transmission Line Corridor Between the Elverta Street Substation, Sacramento County, and the Berry Street Substation, Placer County, California.	Far Western Anthropological Research Group, Inc.	
000367		1982	Foster, John W. and Daniel G. Foster	An Archeological Reconnaissance of the Diamond Oaks North Property, Placer County, California.	Foothill Archaeological Services	31-000075, 31-000076, 31-000077, 31-000078, 31-000079, 31-000080, 31-000081, 31-000082, 31-000083, 31-000084, 31-000085, 31-000086, 31-000087, 31-000088, 31-000089, 31-000090, 31-000556, 31-000557, 31-000558, 31-000559, 31-000560, 31-000773
000396		1979	Peak, Ann S.	Cultural Resource Assessment of Sacramento Municipal Utility District's Project C, Phase I, 230kV Tansmission Line, Tower No. 355, Placer County to Elverta Substation, Sacramento County, California.	Peak & Associates, Inc.	
002077		1990		Cultural Resource Assessment of the Atlantic Street Widening Project, City of Roseville, California.	Peak & Associates	
002604		2001	Self, William	Inspection of Line 64, 48, and 20 in Yuba, Placer and Sacramento Counties, California	William Self Associates	
002807		2001	Hatoff, B. and A. Wesson	Roseville Energy Facility Cultural Resources Appendix J of Application for Certification	URS	31-000263, 31-001254, 31-001255, 31-001256
002935		1999	Jones and Stokes Associates, Inc.	Cultural Resources Inventory Report for Williams Fiber Optic Cable System: Sacramento to CA/NV State Border	Jones and Stokes Associates, Inc.	29-000169, 29-000613, 29-000940, 29-000942, 29-000944, 29-000947, 29-000948, 29-000949, 29-000950, 31-000671, 31-000796, 31-000964, 31-001211, 31-001249, 31-001267, 31-001268, 31-001269, 31-001270, 31-001271, 31-001272, 31-001273, 31-001274, 31-001275, 31-001277, 31-001278, 31-001279, 31-001280, 31-001281, 31-001283, 31-001284, 31-001285, 31-001286, 31-001287, 31-001288, 31-001289, 31-001290, 31-001291, 31-001294, 31-002629, 34-000505, 34-005121

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
006675		2003	Jessica B. Feldman	Caltrans Historic Bridges Inventory Update	Myra L. Frank & Associates, Inc.	03-001482, 03-001620, 03-001786, 03-001787, 09-003308, 09-005046, 09-005050, 09-005231, 09-005425, 09-005426, 09-005427, 09-005428, 29-000814, 29-000815, 29-000945, 29-003146, 29-003155, 31-002962, 31-003747, 31-005380, 31-005381, 31-005382, 31-005383, 31-006344, 34-001291, 34-001374, 34-001375, 34-001376, 34-001377, 34-001610, 34-002396, 34-002434, 34-002469, 34-002470, 34-003386, 34-004293, 34-004294, 34-004295, 34-004296, 34-004297, 34-004298, 34-004299, 58-002552, 58-002624, 58-002625, 58-002627, 58-002628, 58-002629
006675A		2004	Christopher McMorris	Caltrans Historic Bridge Inventory Update: Timber Truss, Concrete Truss, and Suspension Bridges	JRP Historical Consulting	
006675B		2004	Christopher McMorris and Andrew Hope	Caltrans Historic Bridge Inventory Update: Metal Truss, Movable, and Steel Arch Bridges	JRP Historical Consulting (McMorris); Caltrans (Hope)	
006675C		2004	Christopher McMorris	Caltrans Historic Bridge Inventory Update: Concrete Arch Bridges	JRP Historical Consulting	
006675D		2004	Andrew Hope	Caltrans Statewide Historic Bridge Inventory Update Survey and Evaluation of Common Bridge Types	Caltrans	
007130		2002	Brian Hatoff and R. Egherman	Roseville Energy Facility Cultural Resources	URS	31-000964, 31-002679, 31-002681, 31-002682, 31-002683, 31-002684, 31-002685, 31-002686, 31-003280, 34-000440, 34-000455, 34-000490, 34-000491, 34-000505, 34-000507, 34-000508, 34-000606, 34-000698, 34-000746, 34-001550, 34-001551, 34-001552, 34-001666
007745		1987	McCarthy, Helen, Margaret Scully, and Clinton Blount	Cultural Resources Survey of the Proposed Sacramento to Roseville Pipeline Project Contrct SPPL-1994	Theodoratus Cultural Research Inc.	
008619		2006	Cindy Arrington et al	Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project, State of California	SWCA Environmental Consultants	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
009188		2002	Wendy J. Nelson and Kimberley Carpenter	Cultural Resources Survey for Right-of-Way Maintenance Along the Western Area Power Administration Transmission Lines Volumes I, II, and II	Far Western Anthropological Group	31-000964, 31-003280, 34-000066, 34-000121, 34-000335, 34-000343, 34-000441, 34-000445, 34-000455, 34-000490, 34-000491, 34-000505, 34-000508, 34-000606, 34-000625, 34-000746, 34-000858, 34-000860, 34-000861, 34-000862, 34-001302
009188A		2002	Rand F. Herbert and Amanda Blosser	Cultural Resources Survey for Right of Way Maintenance Along the Western Area Power Administration Transmission Lines in Sacramento, Placer, and Sutter Counties, California, Volume III: Historic Properties Report	JRP Historical Consulting Services	
010041		2009	Ric Windmiller	Negative Archaeological Survey Report Washington Boulevard Frontage Improvements Project, City of Roseville, Placer County, California	Private consultant	
010434		1997	John W. Snyder	Central Pacific Transcontinental Railroad, Sacramento to Nevada State Line - HAER CA-196	P.S. Preservation Services	29-000613, 31-000964, 31-003845, 31-003846, 31-003847, 31-003848, 31-003849, 31-003850, 31-003851, 34-000505
010856		2011	Lorna Billat	Sierra View County Club: New Tower ("NT") Submission Packet FCC Form 620	EarthTouch, Inc	
012430		2016	Mary Connell	Tiger Paw	Tetra Tech	
012441		2015	Jana Morehouse and Lance Rom	Archeological & Historic Architecture Records Review for the UP PTC Valley Subdivision, Mileposts 106.70, 108.20, 109.92, 111.50, 114.60, 118.50, 120.40, 124.80, 127.00, Placer County	Quality Services, Inc.	

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-31-000077		Other - IF #3	Other	Historic	AH08	1991 (Marianne L. Russo, NCIC)	000367
P-31-000560	CA-PLA-000434	Other - site 5; Other - IF-6; Other - IF-5; Other - Diamond Oaks {5)	Site	Prehistoric	AP04	1982 (Terry Brown-Sampson, Michael Sampson, D. Foster, J. Foster, C. McKee); 1982 (Terry Brown-Sampson, Michael Sampson, D. Foster, J. Foster, C. McKee, Unknown)	000367
P-31-000773	CA-PLA-000647H	Other - H 3; Other - 28 T; Other - 28 U; Other - 28 V; Other - 28 W; Other - IF #1; Other - IF #2; Other - IF #3; Other - IF #4; Other - IF #5	Site	Historic	AH11; HP46	; 1999 (Chris Morgan, Kelly Long, and Deb Sterling, Pacific Legacy, Inc); 2012 (Stephen Pappas, ECORP Consulting, Inc)	000367, 000368, 000380, 000416, 003827, 003832, 003868, 006945, 007180, 007533, 011047
P-31-000816	CA-PLA-000690H	Resource Name - California Central Railroad; Other - Map Reference #3; Other - Roseville A-1; Other - CCRR 1; Other - Union Pacific Railroad	Structure, Site	Historic	AH07	1990 (Patti Johnson, Sannie Osborn, US Army Corps of Engineers); 1999 (W.L. Norton, S.M. Atchley, Jones & Stokes Associates); 2000 (Unknown, JRP Historical Consulting Services); 2008 (Heidi Koenig); 2012 (Ric Windmiller); 2019 (Dylan Stapleton, Natural Investigations Company)	004058, 004872, 009376, 010998, 013013

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-31-000964	CA-PLA-000841H	Other - First Transcontinental Railroad; Other - Southern Pacific Railroad (now known as the Union Pacific Railroad); Other - Transcontinental Railroad; Other - CIHR 138; Other - CIHR 136; CHL - 780-2; CHL - 780-1; CHL - 780-3; CHL - 780-4; Resource Name - Central Pacific Rail Road Company of California; Resource Name - Central Pacific Railroad Company of California; Other - Site #2 Abandoned Railroad Grade; Other - REF 41-H; Other - WAPA 13	Structure, Site	Historic	AH07; HP39	1979 (Jim Arbuckle); 1979 (Jim Arbuckle); 1979 (Jim Arbuckle); 1979 (Jim Arbuckle); 1998 (W.L. Norton, Jones& Stokes Associates); 1999 (W.L. Norton, S.M. Atchley); 2001 (Rand Herbert, Amanda Blosser, JRP); 2002 (Amanda Blosser, Toni Webb, JRP); 2005 (Cynthia Toffelmier, JRP Historical Consulting Services); 2007 (Staff, David Levy Forestry); 2007 (Denise Jurich, Jesse Martinez, PBS&J); 2007 (Steven Melvin and Joseph Freeman, JRP)	002935, 003874, 007130, 007340, 008967, 009188, 009326, 009362, 010434, 010815, 012125, 012261, 012744
P-31-003280		Resource Name - WAPA Transmission Line; Other - REF 40-H; Other - WAPA 12	Structure	Historic	AH07; HP11	2001 (Rand Herbert, JRP Historical Consulting, LLC); 2001 (Rand Herbert, Amanda Blosser, JRP Historical Consulting Services); 2002 (Amanda Blosser, Andy Walters, JRP Historical Consulting Services); 2006 (Mark A. Beason, JRP Historical Consulting, LLC); 2010 (Stephen Pappas, Jay Baker, ECORP Consulting, Inc); 2012 (Ric Windmiller); 2015 (S. Pappas, M. Webb, ECORP Consulting, Inc.)	007130, 007726, 009188, 010590, 010998, 012443
P-31-003672		Resource Name - Lincoln Road; Other - Route 3; Other - WB-1	Other	Historic	AH07	2008 (Ric Windmiller, Consulting Archaeologist)	
P-31-003747		Resource Name - Sierra Bridge; Other - Bridge #19C-67; Other - Bridge 19C-67	Structure	Historic	HP19; HP80	1985; 1986; 2003 (TW/CT, JRP Historical Consulting)	006675

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-31-004240		Resource Name - Old Town Roseville Historic District; OHP PRN - 5678-0003-9999	District	Historic	HP06	1981 (Edwin S. Astone, Leonard Davis, Astone & Associates)	

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

June 17, 2020

Placer County Historical Society
P.O. Box 5643
Auburn, CA 95604

RE: Cultural Resources Identification Effort for the Sierra View Project, Placer County, California T11N, R6E, Sections 26, 27, 34, 35 (ECORP Project No. 2020-108).

Dear Placer County Historical Society:

ECORP Consulting, Inc. has been retained to assist in the planning of the development on the project indicated above. As part of the identification effort, we are seeking information from all parties that may have knowledge of or concerns with historic properties or cultural resources in the area of potential effect.

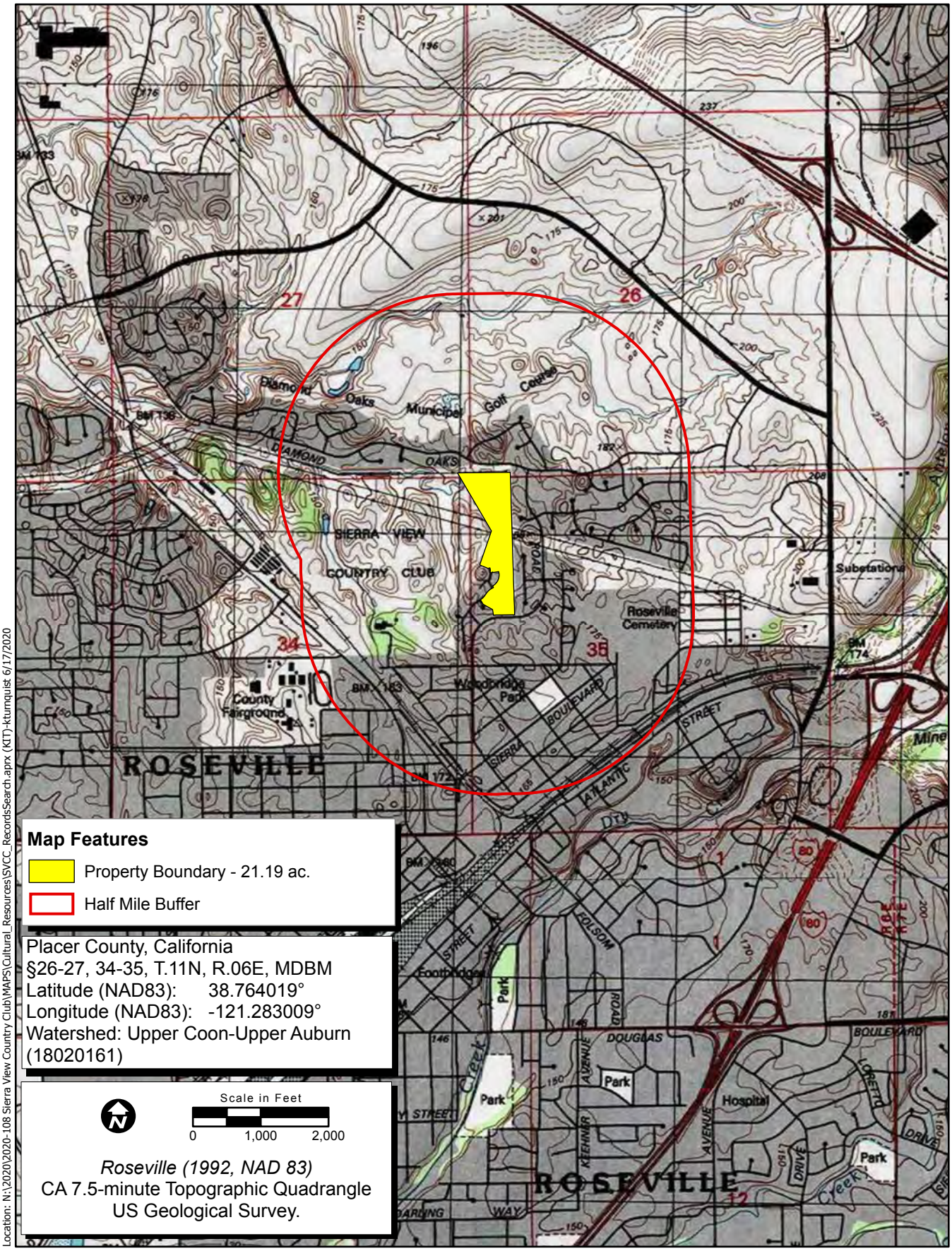
Included is a map showing the project area outlined. We would appreciate input on this undertaking from the historical society with concerns about possible cultural properties or potential impacts within or adjacent to the area of potential effect. If possible, please email or fax your response to my attention at (916) 782-9134 or lzicklermartin@ecorpconsulting.com. If you have any questions, please contact me at (916) 782-9100.

Thank you in advance for your assistance in our cultural resource management study.

Sincerely,

Laurel Zickler-Martin, M.A.
Staff Archaeologist

Attachment



Location: N:\2020\2020-108 Sierra View Country Club\MAPS\Cultural_Resources\SVCC_RecordsSearch.aprx (KIT)-kturnquist 6/17/2020

Map Date:

Sources:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Records Search

2020-108 Sierra View Country Club

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

June 17, 2020

Roseville Historical Society
557 Lincoln Steet
Roseville, CA 95678

RE: Cultural Resources Identification Effort for the Sierra View Project, Placer County, California T11N, R6E, Sections 26, 27, 34, 35 (ECORP Project No. 2020-108).

Dear Roseville Historical Society:

ECORP Consulting, Inc. has been retained to assist in the planning of the development on the project indicated above. As part of the identification effort, we are seeking information from all parties that may have knowledge of or concerns with historic properties or cultural resources in the area of potential effect.

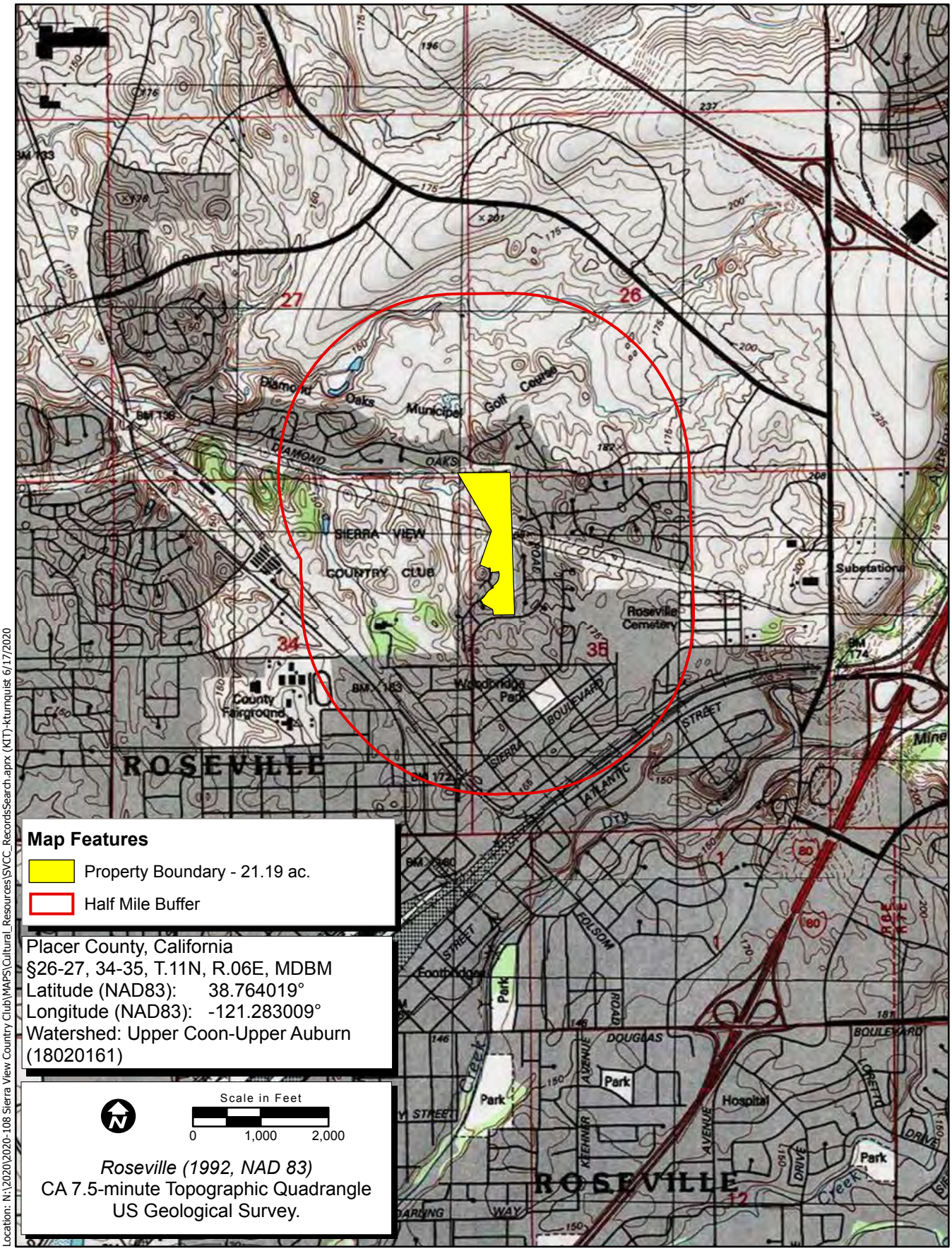
Included is a map showing the project area outlined. We would appreciate input on this undertaking from the historical society with concerns about possible cultural properties or potential impacts within or adjacent to the area of potential effect. If possible, please fax your response to my attention at (916) 782-9134. If you have any questions, please contact me at (916) 782-9100 or lzicklermartin@ecorpconsulting.com.

Thank you in advance for your assistance in our cultural resource management study.

Sincerely,

Laurel Zickler-Martin, M.A.
Staff Archaeologist

Attachment



Location: N:\2020\2020-108 Sierra View Country Club\MAPS\Cultural_Resources\SVCC_RecordsSearch.aprx (KIT)-kturnquist 6/17/2020

Map Date:

Sources:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Records Search

2020-108 Sierra View Country Club

ATTACHMENT B

Sacred Lands File Coordination

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: 2020-108_Sierra View

County: Placer

USGS Quadrangle Name: Roseville

Township: 11N **Range:** 06E **Section(s):** 26, 27, 34, 35

Company/Firm/Agency: ECORP Consulting, Inc.

Street Address: 2525 Warren Drive

City: Rocklin **Zip:** 95677

Phone: 916.782.9100

Fax: 916.782.9134

Email: lzicklermartin@ecorpconsulting.com

Project Description:

See attached letter and map.

June 17, 2020

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
nahc@nahc.ca.gov

RE: Cultural Resources Identification Effort for the Sierra View Project, Township 11N, Range 06E, Sections 26, 27, 34, 35

Dear NAHC Staff:

ECORP Consulting, Inc. has been retained to assist in the planning of the development on the project indicated above. As part of the identification effort, we are seeking information from all parties that may have knowledge of or concerns with historic properties or cultural resources in the area of potential effect.

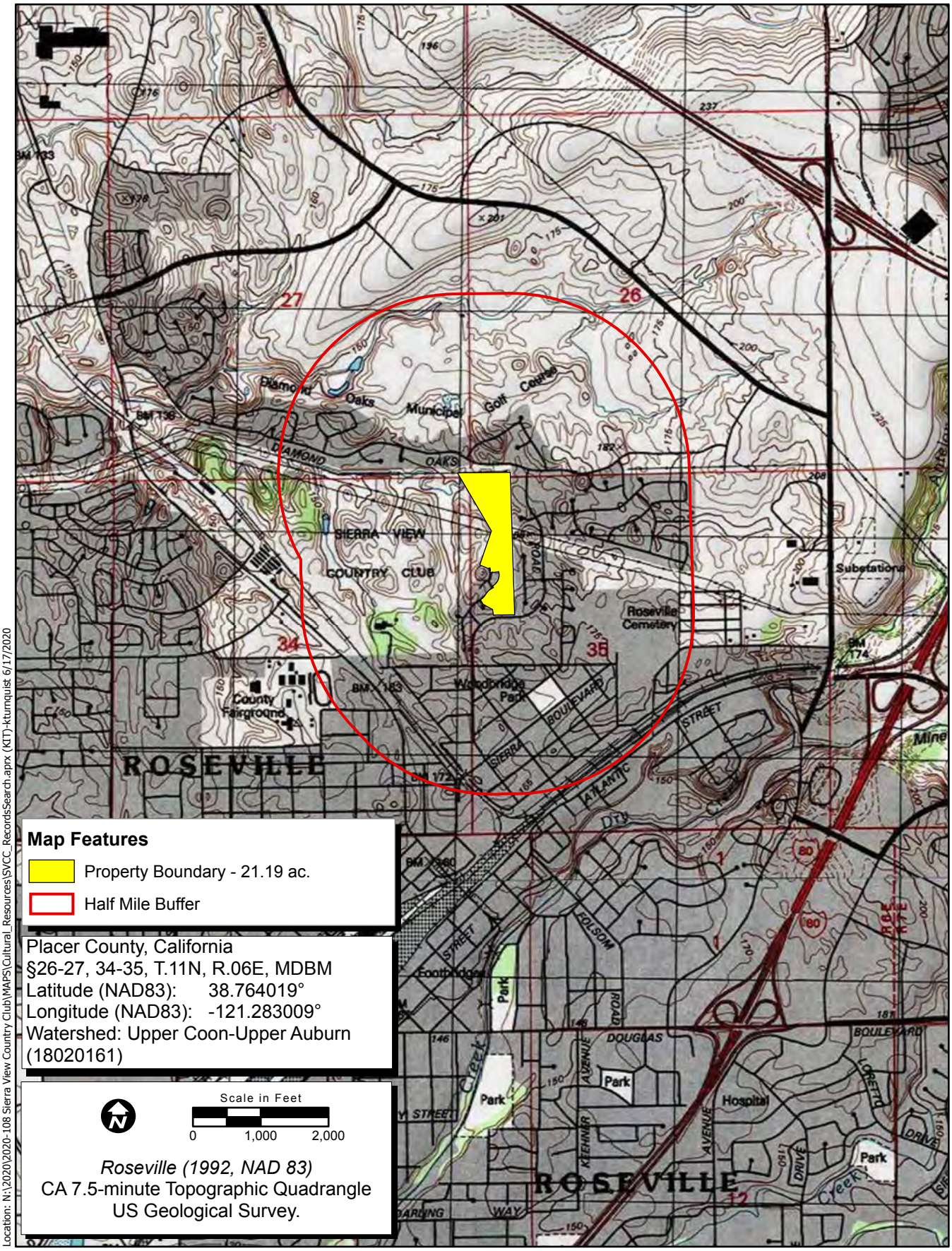
Included is a map showing the project area outlined. We would appreciate the results of your search of the Sacred Lands File and list of tribal contacts who can be contacted to provide input on this undertaking.

Please email or fax your response to my attention at lzicklermartin@ecorpconsulting.com or (916) 782-9134. If you have any questions, please contact me at (916) 782-9100.

Thank you in advance for your assistance.

Sincerely,

Laurel Zickler-Martin, M.A.
Staff Archaeologist



Location: N:\2020\2020-108 Sierra View Country Club\MAPS\Cultural_Resources\SVCC_RecordsSearch.aprx (KIT)-kturnquist 6/17/2020

Map Date:

Sources:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Records Search

2020-108 Sierra View Country Club

NATIVE AMERICAN HERITAGE COMMISSION

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

June 19, 2020

Laurel Zickler-Martin

ECORP Consulting, Inc.

Via Email to: lzicklermartin@ecorpconsulting.com

Re: **Sierra View Project (2020-108), Placer County**

Dear Ms. Zickler-Martin:

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: Nancy.Gonzalez-Lopez@nahc.ca.gov.

Sincerely,

Nancy Gonzalez-Lopez
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Placer County
6/19/2020

Shingle Springs Band of Miwok Indians
Regina Cuellar, Chairperson
P.O. Box 1340 Maidu
Shingle Springs, CA, 95682 Miwok
Phone: (530) 387 - 4970
Fax: (530) 387-8067
rcuellar@ssband.org

Tsi Akim Maidu
Grayson Coney, Cultural Director
P.O. Box 510 Maidu
Browns Valley, CA, 95918
Phone: (530) 383 - 7234
tsi-akim-maidu@att.net

United Auburn Indian Community of the Auburn Rancheria
Gene Whitehouse, Chairperson
10720 Indian Hill Road Maidu
Auburn, CA, 95603 Miwok
Phone: (530) 883 - 2390
Fax: (530) 883-2380
bguth@auburnrancheria.com

Colfax-Todds Valley Consolidated Tribe
Clyde Prout, Chairperson
P.O. Box 4884 none Maidu
Auburn, CA, 95604 Miwok
Phone: (530) 577 - 3558
miwokmaidu@yahoo.com

Colfax-Todds Valley Consolidated Tribe
Pamela Cubbler, Treasurer
P.O. Box 4884 Maidu
Auburn, CA, 95604 Miwok
Phone: (530) 320 - 3943
pcubbler@colfaxrancheria.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 Sierra View Project (2020-108), Placer County.

ATTACHMENT C

Updated Project Area Photographs

State of California — The Resources Agency **Primary #**
DEPARTMENT OF PARKS AND RECREATION **HRI#**

PHOTOGRAPH RECORD

Trinomial

Page 1 of 1 **Resource/Project Name:** Sierra View **Year** 2020
Camera: Lens Size: 35mm
Film Type and Speed: Digital Negatives Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
6	23			APE overview from southeast corner	North	IMG_001
6	23			APE overview from southeast corner	NW	IMG_002
6	23			Dense vegetation surrounding drainage	SE	IMG_003
6	23			Dense vegetation surrounding drainage	East	IMG_004
6	23			Transmission towers within APE	West	IMG_005
6	23			APE overview from center	North	IMG_006
6	23			Eastern APE boundary near residential parcels	South	IMG_007
6	23			Transmission towers within APE	West	IMG_008
6	23			Northern APE boundary overview	West	IMG_009
6	23			Dense vegetation surrounding drainage at north end of property	North	IMG_010
6	23			Northern APE boundary overview	West	IMG_011
6	23			P-31-3280 transmission tower (tower not in APE)	South	IMG_012
6	23			P-31-3280 transmission tower footing (tower not in APE)	North	IMG_013
6	23			P-31-3280 transmission tower (tower not in APE)	West	IMG_014
6	23			Overview of P-31-3280 transmission line	East	IMG_015
6	23			P-31-3280 transmission tower (tower not in APE)	West	IMG_016
6	23			Transmission towers within APE	West	IMG_017
6	23			Modern transmission tower	West	IMG_018
6	23			Modern transmission tower, plague	Detail	IMG_019
6	23			Modern transmission tower footing	North	IMG_020
6	23			Modern transmission tower	North	IMG_021
6	23			Modern transmission tower	North	IMG_022
6	23			Golf course greens near APE	North	IMG_023
6	23			Golf course greens near APE	South	IMG_024
6	23			Overview of APE near townhomes (western edge)	North	IMG_025
6	23			Overview of southern portion of APE	East	IMG_026
6	23			Area north of Shasta Street	East	IMG_027
6	23			Overview of APE from south	North	IMG_028


IMG_0001


IMG_0002


IMG_0003


IMG_0004


IMG_0005


IMG_0006


IMG_0007


IMG_0008


IMG_0009


IMG_0010


IMG_0011


IMG_0012


IMG_0013


IMG_0014


IMG_0015


IMG_0016


IMG_0017


IMG_0018


IMG_0019


IMG_0020


IMG_0021


IMG_0022


IMG_0023

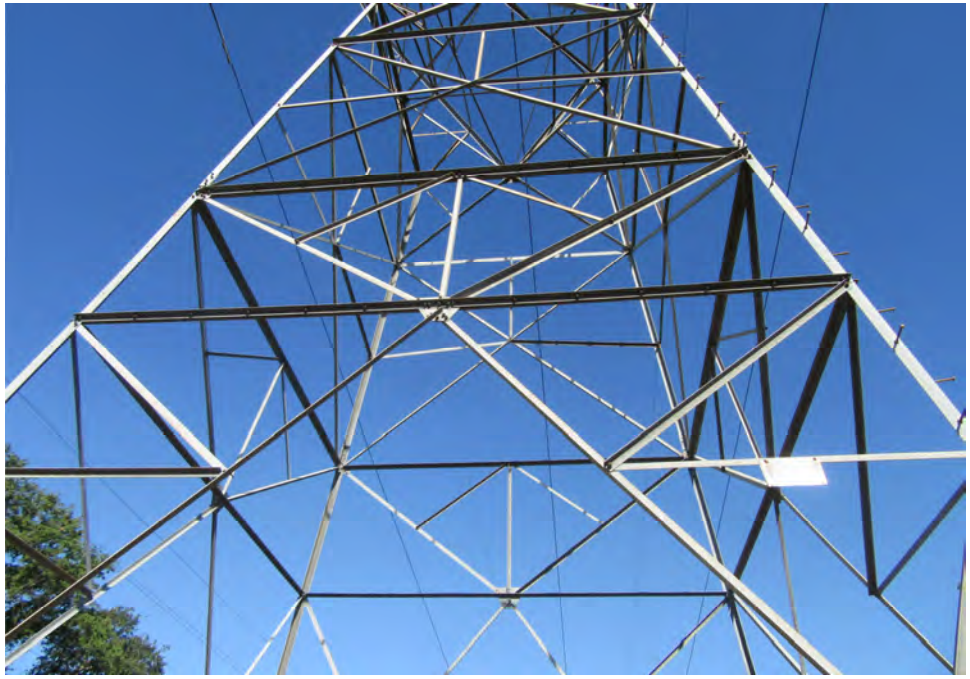

IMG_0024


IMG_0025


IMG_0026


IMG_0027


IMG_0028

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2288-100
POLE 1-1

State of California — The Resources Agency **Primary #**
DEPARTMENT OF PARKS AND RECREATION **HRI#**

PHOTOGRAPH RECORD

Trinomial

Page of **Resource/Project Name: Sierra View Country Club** **Year** June 2021
Camera: Samsung Galaxy S9 Lens Size: 35mm
Film Type and Speed: Cell Phone Originals Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
06	14	9:06am	20210614_090655	Modern transmission line & access road	East	001
06	14	9:12am	20210614_091239	Transmission lines	West	002
06	14	9:12am	20210614_091244	Transmission lines	West	003
06	14	9:14am	20210614_091421	Project APE overview from Diamond Oaks Road	Southeast	004
06	14	9:14am	20210614_091427	Project APE overview from Diamond Oaks Road with transmission line in background	South	005

20210614_090655.jpg

20210614_091239.jpg

20210614_091244.jpg

20210614_091421.jpg

20210614_091427.jpg

State of California — The Resources Agency **Primary #**
DEPARTMENT OF PARKS AND RECREATION **HRI#**

PHOTOGRAPH RECORD

Trinomial

Page of **Resource/Project Name: Sierra View Country Club** **Year** June 2021
Camera: Samsung Galaxy S10 Lens Size: 35mm
Film Type and Speed: Cell Phone Originals Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
06	14	9:06am	20210614_090644	Ground surface overview	East	006
06	14	9:06am	20210614_090647	View of western 20% of APE	West	007
06	14	9:10am	20210614_091033	Overgrown area in eastern portion of APE.	South	008
06	14	9:14am	20210614_091411	Exposed piping and utility access	South	009
06	14	9:14am	20210614_091459	Exposed bedrock in NW portion of APE	North	010
06	14	9:15am	20210614_091554	Buried Utility access	North	011
06	14	9:19am	20210614_091934	Wooden transmission pole	Southwest	012

20210614_090644.jpg

20210614_090647.jpg

20210614_091033.jpg

20210614_091411.jpg

20210614_091459.jpg

20210614_091554.jpg

20210614_091934.jpg

Confidential Cultural Resource Site Locations and Site Records

This Attachment contains information on the specific location of cultural resources. This information is not for publication or release to the general public. It is for planning, management and research purposes only. Information on the specific location of pre-contact and historic sites is exempt from the Freedom of Information Act and California Public Records Act.

Map Features

- Project Boundary - 23.72 ac.
- Site Boundary

Sources: NAIP 2018

ECORP- N:\2020\2020-108 Sierra View Country Club\MAPS\Cultural_Resources\SVCC_CRM_OV_20210615.mxd (KIT) -kturnquist 6/15/2021

Map Date: 6/15/2021

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 250

Attachment D. Cultural Resources Overview

2020-108 Sierra View Country Club

1. Impacts observed since site formation/use:
☐ Constructed trail ☐ Wildlife path ☐ Grading ☐ Recreational use by humans (campfire ring, etc.) ☐ Fire
☐ Erosion ☐ Vandalism/pothunting/artifact collection ☐ New vegetation growth ☐ Modern trash deposits
☐ Fire break ☐ Construction ☐ Vegetation removal ☒ None ☐ Other (explain):

2. Is the site location narrative accurate?
☒ Yes ☐ No (explain):

3. Is the site description narrative accurate?
☒ Yes ☐ No (explain):

4. Were new photos taken? Attach photograph record and paste representative photo below.
☒ Yes ☐ No (explain):

5. Date of site revisit: June 23, 2020

6. Revisited by: M. Webb; ECORP Consulting, Inc., 2525 Warren Drive, Rocklin, CA 55677

7. Reason for revisit (check all that apply):
☐ USACE 2-year requirement ☐ Collect GPS data/Impact Mapping ☐ Evaluation of Eligibility
☐ Change in project area conditions (fire, flood, etc.) ☒ Other (explain): Inventory of property

8. Report citation: ECORP Consulting, Inc. 2020 *Cultural Resources Inventory Report for the Sierra View Country Club Project, Placer County, California.* Prepared for Westpark Communities.

9. Were survey grade UTM coordinates gathered?
☒ Yes ☐ No (explain):

10. Remarks: This transmission line was originally recorded in July 2001 by Rand Herbert as a lattice-type steel tower transmission line constructed in 1952 and used to distribute power from the Folsom and Nimbus dams. A segment of the transmission line located north of Baseline Road, west of the Project Area, was later updated and evaluated by Mark Beason in December 2006 (JRP 2007). Beason described the transmission towers as retaining integrity; however, they did not appear to meet the criteria for listing on either the CRHR or the NRHP.

During the current survey, ECORP observed the line from the Project Area and the lattice-type steel towers are located outside of the Project Area but the line is situated above the Project Area land. It could not be determined if the towers or lines had been updated or altered since their original construction, but they appeared to be in overall good condition.

According to Beason, the lines have not made a significant contribution to the broad patterns of history (Criterion A), were not associated with persons known to have made important advancements in high-voltage transmission lines (Criterion B), are not the first of their kind or of unusual or rare design (Criterion C), and did not appear to be a source of information important in history (Criterion D). ECORP did not encounter any new information during the current study to suggest the lines are now eligible. Therefore, the segment of P-31-3280 within the survey area is not eligible for the NRHP or CRHR under any criteria. In addition, on July 29, 2016, the USACE made a determination that P-31-3280 is not a historic property and consulted with the SHPO on that finding. On September 30, 2016, the SHPO concurred with the USACE's finding of not eligible (COE-2012-1022-001; SPK-2003-00670). Site P-31-3280 is neither a historic property under NHPA nor a historical resource under CEQA.

P-31-3280 transmission tower (view south; June 23, 2020).

P-31-3280 transmission tower and modern line (view west; June 23, 2020).

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # P-31-3280
HRI #
Trinomial

Page 3 **of** 3

***Resource Name or #:** WAPA Transmission Line

***Map Name:** Roseville and Citrus Heights, CA

***Scale:** 1:24,000

***Date of Map:** 1992

Location: N:\2020\2020-108 Sierra View Country Club\MAPS\Cultural_Resources\SVCC_CRM_DPR_LOCATION_20200629.mxd (j-kurnquist 6/29/2020

***Required Information**

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

DPR 523J (1/95)

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**		Primary # HRI # Trinomial NRHP Status Code
Other Listings Review Code	Reviewer	Date

 *__Resource Name or #:__ SV-001

P1. Other Identifier: SMUD 230kV

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Placer

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Roseville **Date:** 1992 **T** 11N; **R** 06E; SW ¼ **of Sec** 26**;** M.D.**B.M.**

c. Address: N/A City: Roseville Zip:

d. UTM: Zone: 10; 649063 mE / 4292289 mN (western end); 649234 mE / 4292289 mN (eastern end)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 150 – 170ft AMSL

The resource is located 55 feet south of Diamond Oaks Road and 225 feet west-northwest of Shasta Street in Roseville, CA.

***P3a. Description:**

Resource SV-001 is a SMUD 230kV transmission line located on the southern side of Diamond Oaks Road, within a proposed addition to Sierra View Country Club in the City of Roseville. This transmission line is of lattice-type steel tower construction, built between 1957 and 1966 based on review of historic aerials. The line is used to transmit power between the Folsom and Elverta substations. It could not be determined whether the towers or lines had been updated or altered since their original construction, but they appeared to be in overall good condition.

***P3b. Resource Attributes:** (List attributes and codes) HP39 Other (utility line)

***P4. Resources Present:** ☐Building ☒Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: Overview of SV-001 (SMUD 230kV transmission line) from Diamond Oaks Road (view southeast, Acc# 004 (20210614_091421)

***P6. Date Constructed/Age and Sources:** ☒Historic

***P7. Owner and Address:**
Sacramento Municipal Utility District
6301 S Street
Sacramento, CA 95817

***P8. Recorded by:**
Brian S. Marks and Shannon Joy
ECORP Consulting, Inc.
2525 Warren Drive
Rocklin, CA 95677

***P9. Date Recorded:** 6/14/2021

***P10. Survey Type:** Intensive pedestrian

***P11. Report Citation:** ECORP. 2021. *Revised Cultural Resources Inventory and Architectural History Evaluation Report, Sierra View Country Club, Placer County, California*. Prepared For: Westpark Communities, 1420 Rocky Ridge Drive, Suite 265 Roseville, California 95661.

***Attachments:** ☐NONE ☒Location Map ☐Sketch Map ☐Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code

*Resource Name or # SV-001

B1. Historic Name: N/A
B2. Common Name: N/A
B3. Original Use: Electrical transmission
B4. Present Use: same
***B5. Architectural Style:** N/A
***B6. Construction History:** (Construction date, alterations, and date of alterations)

***B7. Moved?** ☐No ☐Yes ☒Unknown **Date:** **Original Location:**
***B8. Related Features:**

B9a. Architect:
b. Builder:
***B10. Significance: Theme:**
Area:
Period of Significance: **Property Type:** **Applicable Criteria:**
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Transmission line SV-001 is not significantly associated with any historical events related to economic or population growth or developments in electric transmission in California, the Country, or the region. The transmission line is common and has not made a significant contribution to the broad patterns of history (Criterion A). No known significant individuals or groups are associated with the line, and the companies it is associated with did not make greater historical contribution as a result of the construction or use of the line (Criterion B). Resource SV-001 is ofcommon, utilitarian, steel lattice construction, is not the first of its kind or of unusual or rare design, nor does it exhibit any special engineering characteristics, and it is not associated with master engineers known to have made important advancements in high-voltage transmission, tower construction, or engineering. This electrical line and its components are designed to efficiently transmit electricity, but do not include any unique features which exemplify that purpose. (Criterion C). Furthermore, the research potential of this electrical line is exhausted with archival research and recording efforts herein; the resource is not a source of information important in history (Criterion D).

The transmission line SV-001is in overall good condition and remains in its original alignment corridor. It could not be determined whether the towers had been updated or altered since their original construction.Therefore, transmission line SV-001 retains integrity of location, setting, feeling, and association, but its integrity of materials, workmanship, and design are uncertain. Regardless of integrity,this electrical line is not eligible to the NRHP or CRHR under any criteria.

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

B13. Remarks: None

***B14. Evaluator:** L. Zickler-Martin; J. Adams

***Date of Evaluation:** 06/15/2021

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

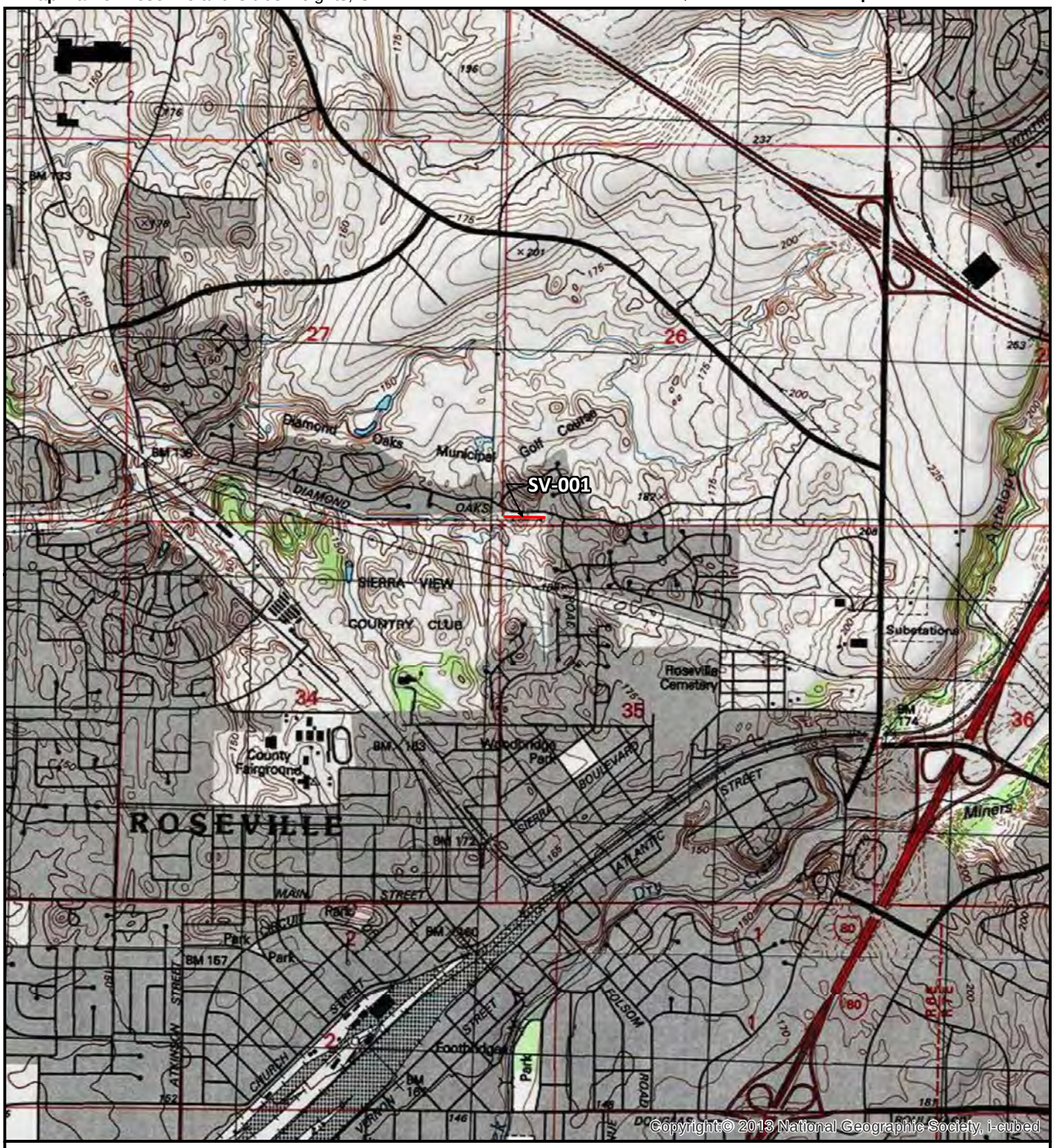
State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI #
Trinomial

Page 3 **of** 3 ***Resource Name or #:** SV-001

***Map Name:** Roseville and Citrus Heights, CA ***Scale:** 1:24,000 ***Date of Map:** 1992



Location: N:\2021\2020-108 Sierra View Country Club\MAPS\Cultural_Resources\SVCC_CRM_DPR_LOCATION_20210615.mxd (j.kumquist 6/15/2021

***Required Information**

0 1,000 2,000 4,000 Feet
0 250 500 1,000 Meters

DPR 523J (1/95)

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**	Primary # HRI # Trinomial NRHP Status Code	
Other Listings Review Code	Reviewer	Date

 *__Resource Name or #:__ SV-002

P1. Other Identifier: SMUD 115kV

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Placer

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Roseville **Date:** 1992 **T** 11N; **R** 06E; SW ¼ **of Sec** 26; M.D.**B.M.**

c. Address: N/A City: Roseville Zip:

d. UTM: Zone: 10; 649063 mE / 4292289 mN (western end); 649234 mE / 4292289 mN (eastern end)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 150 – 170ft AMSL

The resource is located 55 feet south of Diamond Oaks Road and 225 feet west-northwest of Shasta Street in Roseville, CA.

***P3a. Description:**

This distribution line is a typical wood pole line with standard cross arms and porcelain insulators, constructed between 1957 and 1966 based on review of historic aerial photographs. The line is used to distribute power within the Roseville area. The pole within the current Project Area was relocated approximately 75 feet to the west sometime between 2007 and 2009, based also on review of aerial photographs. It could not be determined if the remaining poles or lines had been updated or altered since their original construction, but they appeared to be in overall good condition.

***P3b. Resource Attributes:** (List attributes and codes) HP39 Other (utility line)

***P4. Resources Present:** ☐Building ☒Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: Overview: SV-002, SMUD 115kV distribution line (view southwest, Acc# 012 (20210614_091934)

***P6. Date Constructed/Age and Sources:** ☒Historic

***P7. Owner and Address:**
Sacramento Municipal Utility District
6301 S Street
Sacramento, CA 95817

***P8. Recorded by:**
Brian S. Marks and Shannon Joy
ECORP Consulting, Inc.
2525 Warren Drive
Rocklin, CA 95677

***P9. Date Recorded:** 6/14/2021

***P10. Survey Type:** Intensive pedestrian

***P11. Report Citation:** ECORP. 2021. *Revised Cultural Resources Inventory and Architectural History Evaluation Report, Sierra View Country Club, Placer County, California*. Prepared For: Westpark Communities, 1420 Rocky Ridge Drive, Suite 265 Roseville, California 95661.

***Attachments:** ☐NONE ☒Location Map ☐Sketch Map ☐Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code**

***Resource Name or #** SV-002

B1. Historic Name: N/A
B2. Common Name: N/A
B3. Original Use: Electrical distribution B4. Present Use: same
***B5. Architectural Style:** N/A
***B6. Construction History:** (Construction date, alterations, and date of alterations)

***B7. Moved?** ☐**No** ☒**Yes** (one pole) ☐**Unknown** **Date:** 2007 - 2009 **Original Location:** ~75 feet east
***B8. Related Features:**

B9a. Architect: b. Builder:
***B10. Significance: Theme:** **Area:**
Period of Significance: **Property Type:** **Applicable Criteria:**
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Distribution line SV-002 is not significantly associated with any historical events related to economic or population growth or developments in electric transmission in California, the Country, or the region. The distribution line is common and has not made a significant contribution to the broad patterns of history (Criterion A). No known significant individuals or groups are associated with the line, and the companies it is associated with did not make greater historical contribution as a result of the construction or use of the line (Criterion B). Resource SV-002 is of common, utilitarian, wooden pole construction, is not the first of its kind or of unusual or rare design, nor does it exhibit any special engineering characteristics, and it is not associated with master engineers known to have made important advancements in electrical distribution or engineering. This electrical line and its components are designed to efficiently transmit electricity, but do not include any unique features which exemplify that purpose (Criterion C). Furthermore, the research potential of this electrical line is exhausted with archival research and recording efforts herein; the resource is not a source of information important in history (Criterion D).

The The transmission line SV-002 is in overall good condition, but the distribution line pole within the current Project Area was moved sometime between 2007 and 2009. Therefore, SV-002 retains integrity of association and feeling, but not of location or setting, and its integrity of materials, workmanship, or design is uncertain. Regardless of integrity, none of the three electrical lines recorded during this study are eligible to the NRHP or CRHR, under any criteria.

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

B13. Remarks: None

***B14. Evaluator:** L. Zickler-Martin; J. Adams

***Date of Evaluation:** 06/15/2021

(Sketch Map with north arrow required.)

(This space reserved for official comments.)

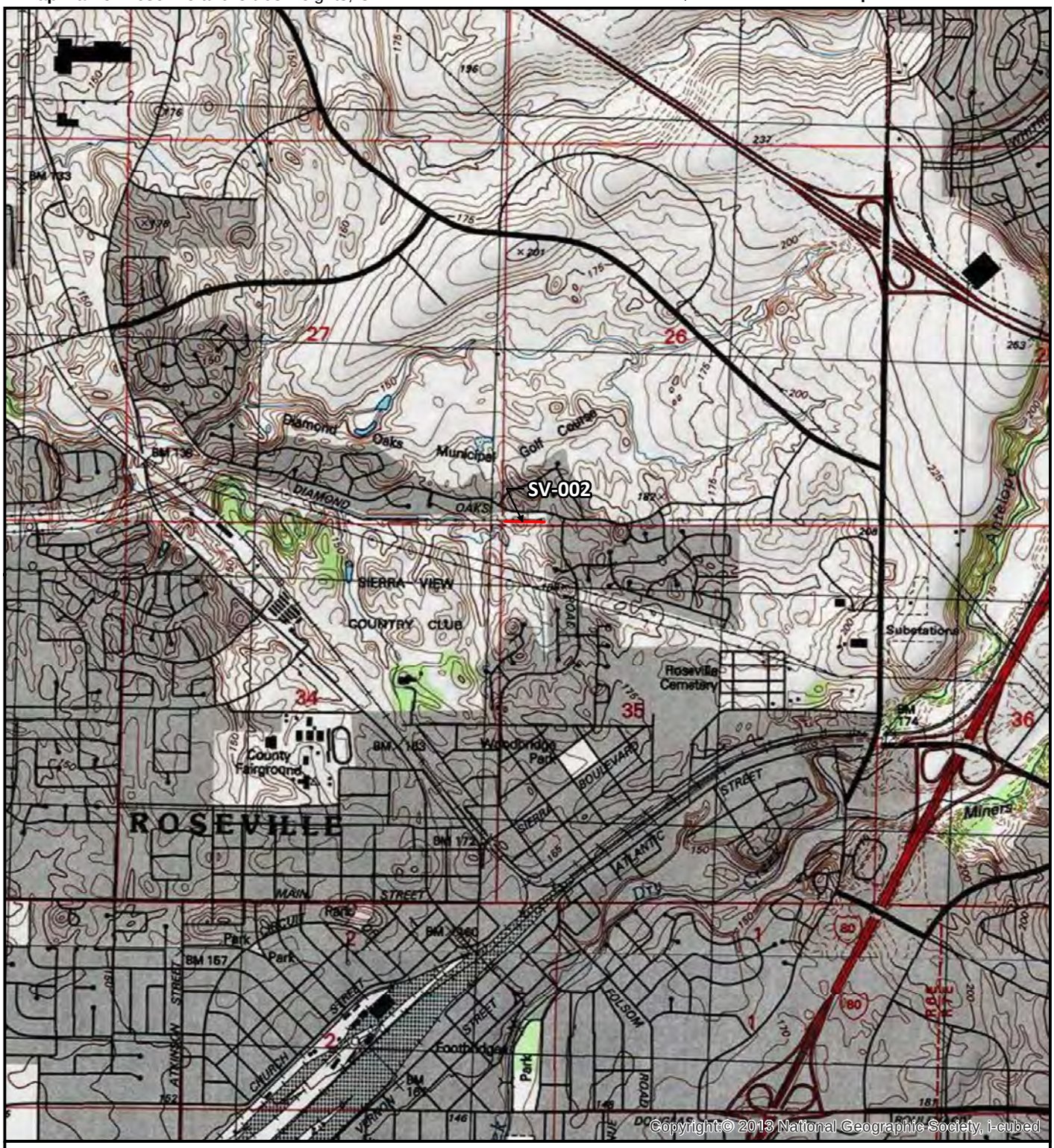
State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI #
Trinomial

Page X **of** X ***Resource Name or #:** SV-002

***Map Name:** Roseville and Citrus Heights, CA ***Scale:** 1:24,000 ***Date of Map:** 1992



Location: N:\2021\2020-108 Sierra View Country Club\MAPS\Cultural_Resources\SVCC_CRM_DPR_LOCATION_002_20210615.mxd (-)kumquist 6/15/2021

***Required Information**

0 1,000 2,000 4,000 Feet
0 250 500 1,000 Meters

DPR 523J (1/95)

RANEY PLANNING & MANAGEMENT, INC. 20 years

WWW.RANEYMANAGEMENT.COM

NORTHERN CALIFORNIA
1501 SPORTS DRIVE, SUITE A
SACRAMENTO, CA 95834
TEL: 916.372.6100 · FAX: 916.419.6108

October 13, 2021

Casey Shorrock
Remy Moose Manley, LLP
555 Capitol Mall, Suite 800
Sacramento, CA 95814

Subject: Greenhouse Gas Emissions Calculations for the Sierra View Project

Dear Ms. Shorrock:

At your request, Raney has prepared the following memorandum to present the anticipated greenhouse gas (GHG) emissions associated with construction and operation of the Sierra View Project (proposed project), and to compare such estimates to the applicable thresholds of significance.

Project Summary

The approximately 23.10-acre project site is located east of the Sierra View Country Club, at 360 Diamond Oaks Road, in Roseville, California (see Figure 1). The site is comprised of two parcels: Infill Planning Parcel 3 and Infill Planning Parcel 100. The project site is bound by Shasta Street to the north and Diamond Oaks Road to the south. Surrounding land uses primarily consist of single-family housing to the north, east, and south. The project site is currently undeveloped and ungraded, but has been subject to previous disturbance from maintenance and emergency access roads. The majority of the project site, identified as Infill Planning Parcel 100, is designated in the City of Roseville General Plan for Medium Density Residential and zoned for R3 (Multi-Family Housing). The northernmost portion of the project site, identified as Infill Parcel 3, is designated in the City's General Plan as Low Density Residential and zoned for R1 (Single-Family Residential).

The proposed project would consist of amending the General Plan land use designation and modifying the zoning for the project site in order to reduce the property's existing planned housing density. The majority of Infill Planning Parcel 100 would be redesignated from Medium Density Residential to Low Density Residential and rezoned from R3 (Multi-Family Housing) to RS/DS (Small Lot Residential with Development Standards). A portion of Infill Planning Parcel 3 would be rezoned from R1 (Single-Family Residential) to RS/DS. A Tentative Subdivision Map is proposed to divide the project site into 86 total lots for future development of 75 low density residential units (see Figure 2).

The proposed project would require the following approvals and entitlements:

- Approval of the Mitigated Negative Declaration;
- General Plan Amendment for a portion of Infill Planning Parcel 100 from Medium Density Residential to Low Density Residential;
- Rezoning for a portion of Infill Planning Parcel 100 from R3 to RS/DS and a portion of Infill Planning Parcel 3 from R1 to RS/DS;
- Tentative Subdivision Map including 75 single-family residential lots; and
- Tree Permit.

Figure 1
Project Site Location

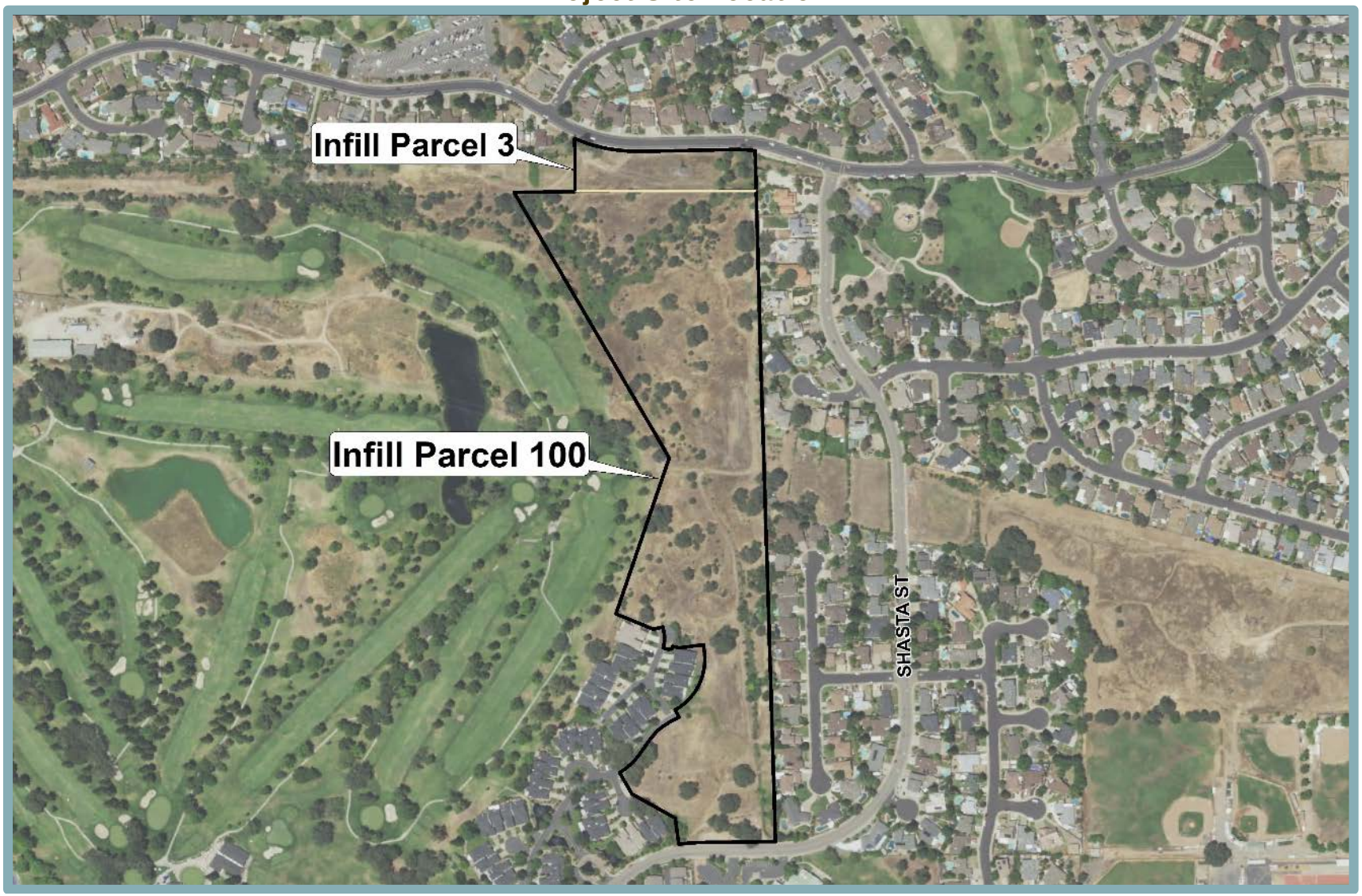
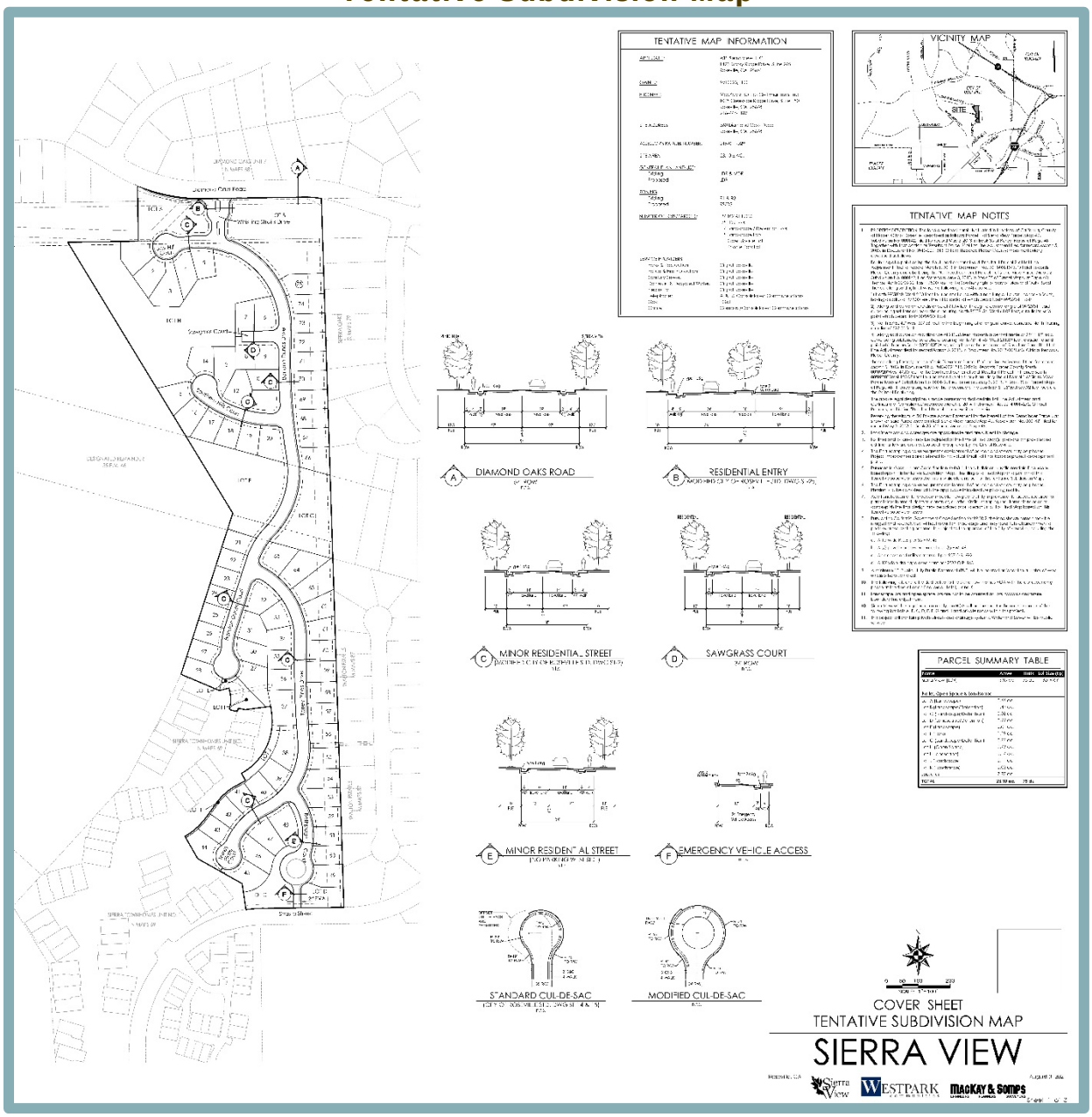


Figure 2
Tentative Subdivision Map



Background

GHGs are gases that absorb and emit radiation within the thermal infrared range, trapping heat in the earth's atmosphere. Some GHGs occur naturally and are emitted into the atmosphere through both natural processes and human activities. Other GHGs are created and emitted solely through human activities. The principal GHGs that enter the atmosphere due to human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated carbons. Other common GHGs include water vapor, ozone, and aerosols. The increase in atmospheric concentrations of GHG due to human activities has resulted in more heat being held within the atmosphere, which is the accepted explanation for global climate change.

The project site is located within the Sacramento Valley Air Basin and is under the jurisdiction of the Placer County Air Pollution Control District (PCAPCD). On October 13, 2016, the PCAPCD adopted GHG emissions thresholds. The thresholds were designed to analyze a project's compliance with applicable State laws including Assembly Bill (AB) 32 and Senate Bill (SB) 32.[1] As noted in Appendix A, Implementation Measures (Operational Air Quality and Greenhouse Gas Emissions), of the City's General Plan, the City of Roseville relies on PCAPCD thresholds for determining significance conclusions.[2] As a result, this analysis uses PCAPCD thresholds of significance.

The PCAPCD's GHG thresholds include a bright-line threshold for the construction and operational phases of land use projects and stationary source projects, a screening level threshold for the operational phase of land use projects, and efficiency thresholds for the operational phase of land use projects that result in GHG emissions that fall between the bright-line threshold and the screening level threshold. Any project with GHG emissions below the screening level threshold of 1,100 $MTCO_2e$/yr is judged by the PCAPCD as having a less-than-significant impact related to GHG emissions, and would not conflict with any State or regional GHG emissions reduction goals.

Construction GHG Emissions

The unmitigated maximum annual construction-related emissions from the proposed project were estimated to be 719.07 $MTCO_2e$/yr over the approximately two-year construction period. In total, construction of the proposed project would generate approximately 1,467.67 $MTCO_2e$.

As compared to the PCAPCD's bright-line threshold of 10,000 $MTCO_2e$/yr, the maximum annual emissions related to implementation of the proposed project would be well below the PCAPCD's threshold, and project construction would not be considered to result in a cumulatively considerable contribution to global climate change.

Operational GHG Emissions

The estimated operational GHG emissions in the first year of full buildout (2024), are presented in Table 1. As shown in the table, the proposed project would result in operational GHG emissions below the PCAPCD's 1,100 $MTCO_2e$/yr operational screening threshold of significance. Thus, operations of the proposed project would not be considered to result in a cumulatively considerable contribution to global climate change.

---

1 Placer County Air Pollution Control District. *California Environmental Quality Act Thresholds of Significance: Justification Report*. October 2016.

2 City of Roseville. *City of Roseville General Plan 2035, Appendix A: Implementation Measures* [page A-21]. August 2020.

Table 1 Unmitigated Operational GHG Emissions (Year 2024)	
Emission Source	**GHG Emissions ($MTCO_2e$/yr)**
Area	54.41
Energy	95.25
Mobile	705.26
Solid Waste	38.92
Water	12.80
TOTAL ANNUAL GHG EMISSIONS	**906.65**
PCAPCD Threshold of Significance	**1,100**
Exceeds Threshold?	**NO**
Source: CalEEMod, October 2021 (see Attachment).	

Conclusion

Based on the information presented above, construction and operations of the proposed project would not be considered to generate GHG emissions that would have a significant impact on the environment and, therefore, would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Consequently, the project would not result in a cumulatively considerable incremental contribution to impacts related to GHG emissions or climate change and the project's impact would be less than significant.

If you have any questions regarding the contents of this document, please do not hesitate to contact me at (916) 372-6100, or via email at rods@raneymanagement.com.

Best Regards,

Rod Stinson

Vice President

phone. (916) 372-6100 1501 Sports Drive, Suite A Sacramento, CA 95834

fax. (916) 419-6108 www.raneymanagement.com

RANEY PLANNING & MANAGEMENT, INC. 20 years

Attachment 1
CalEEMod Results

Sierra View Project - Placer County APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Sierra View Project

Placer County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	75.00	Dwelling Unit	23.10	135,000.00	215

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	2			**Operational Year**	2024
Utility Company	Roseville Electric				
CO2 Intensity (lb/MWhr)	384.66	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 intensity factor adjusted per the RPS projections used in City's GP EIR.

Land Use - Lot acreage adjusted per site plan.

Construction Phase - Architectural coating assumed to occur concerrent to building construction.

Trips and VMT -

Grading -

Area Mitigation - Only natural gas hearth and low VOC paints per PCAPCD regulations

Energy Mitigation -

Water Mitigation - Outdoor water conservation strategy applied to reflect complaince with MWELO.

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstructionPhase	NumDays	20.00	370.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblGrading	MaterialExported	0.00	65,000.00
tblGrading	MaterialImported	0.00	23,000.00
tblLandUse	LotAcreage	24.35	23.10
tblProjectCharacteristics	CO2IntensityFactor	471.98	384.66

2.0 Emissions Summary

Sierra View Project - Placer County APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

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	tons/yr										MT/yr					
2022	0.4315	3.1062	2.4513	7.6500e-003	0.4057	0.1148	0.5204	0.1534	0.1069	0.2603	0.0000	700.1845	700.1845	0.0979	0.0552	719.0709
2023	0.9794	3.4737	4.4481	7.7900e-003	0.1309	0.1674	0.2983	0.0340	0.1567	0.1906	0.0000	682.8449	682.8449	0.1594	7.4200e-003	689.0393
2024	0.1048	0.2813	0.3846	6.7000e-004	0.0113	0.0130	0.0242	2.9300e-003	0.0121	0.0151	0.0000	59.0427	59.0427	0.0135	6.1000e-004	59.5633
Maximum	**0.9794**	**3.4737**	**4.4481**	**7.7900e-003**	**0.4057**	**0.1674**	**0.5204**	**0.1534**	**0.1567**	**0.2603**	**0.0000**	**700.1845**	**700.1845**	**0.1594**	**0.0552**	**719.0709**

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	tons/yr										MT/yr					
2022	0.4315	3.1062	2.4513	7.6500e-003	0.4057	0.1148	0.5204	0.1534	0.1069	0.2603	0.0000	700.1842	700.1842	0.0979	0.0552	719.0705
2023	0.9794	3.4737	4.4481	7.7900e-003	0.1309	0.1674	0.2983	0.0340	0.1567	0.1906	0.0000	682.8442	682.8442	0.1594	7.4200e-003	689.0386
2024	0.1048	0.2813	0.3846	6.7000e-004	0.0113	0.0130	0.0242	2.9300e-003	0.0121	0.0151	0.0000	59.0426	59.0426	0.0135	6.1000e-004	59.5633
Maximum	**0.9794**	**3.4737**	**4.4481**	**7.7900e-003**	**0.4057**	**0.1674**	**0.5204**	**0.1534**	**0.1567**	**0.2603**	**0.0000**	**700.1842**	**700.1842**	**0.1594**	**0.0552**	**719.0705**

Sierra View Project - Placer County APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule 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	N20	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**6-1-2022**	**8-31-2022**	1.9137	1.9137
2	**9-1-2022**	**11-30-2022**	1.1709	1.1709
3	**12-1-2022**	**2-28-2023**	1.1315	1.1315
4	**3-1-2023**	**5-31-2023**	1.1253	1.1253
5	**6-1-2023**	**8-31-2023**	1.1247	1.1247
6	**9-1-2023**	**11-30-2023**	1.1138	1.1138
7	**12-1-2023**	**2-29-2024**	0.7569	0.7569
		Highest	1.9137	1.9137

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule 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	tons/yr										MT/yr					
Area	5.3344	0.0983	6.3657	0.0106		0.8176	0.8176		0.8176	0.8176	77.4718	33.4002	110.8720	0.0724	6.0900e-003	114.4971
Energy	9.5700e-003	0.0818	0.0348	5.2000e-004		6.6100e-003	6.6100e-003		6.6100e-003	6.6100e-003	0.0000	198.1647	198.1647	0.0107	2.8100e-003	199.2700
Mobile	0.3859	0.5758	3.6589	7.3900e-003	0.7372	6.6100e-003	0.7438	0.1975	6.2100e-003	0.2037	0.0000	693.2450	693.2450	0.0432	0.0367	705.2599
Waste						0.0000	0.0000		0.0000	0.0000	15.7115	0.0000	15.7115	0.9285	0.0000	38.9246
Water						0.0000	0.0000		0.0000	0.0000	1.5503	6.4947	8.0450	0.1598	3.8300e-003	13.1801
Total	**5.7299**	**0.7558**	**10.0594**	**0.0185**	**0.7372**	**0.8308**	**1.5680**	**0.1975**	**0.8304**	**1.0279**	**94.7336**	**931.3046**	**1,026.0382**	**1.2146**	**0.0494**	**1,071.1317**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

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	tons/yr										MT/yr					
Area	0.6338	0.0523	0.5762	3.2000e-004		6.8000e-003	6.8000e-003		6.8000e-003	6.8000e-003	0.0000	54.0760	54.0760	1.8900e-003	9.7000e-004	54.4138
Energy	9.5700e-003	0.0818	0.0348	5.2000e-004		6.6100e-003	6.6100e-003		6.6100e-003	6.6100e-003	0.0000	94.6893	94.6893	1.8100e-003	1.7400e-003	95.2520
Mobile	0.3859	0.5758	3.6589	7.3900e-003	0.7372	6.6100e-003	0.7438	0.1975	6.2100e-003	0.2037	0.0000	693.2450	693.2450	0.0432	0.0367	705.2599
Waste						0.0000	0.0000		0.0000	0.0000	15.7115	0.0000	15.7115	0.9285	0.0000	38.9246
Water						0.0000	0.0000		0.0000	0.0000	1.5503	6.1184	7.6687	0.1598	3.8200e-003	12.8019
Total	**1.0293**	**0.7098**	**4.2699**	**8.2300e-003**	**0.7372**	**0.0200**	**0.7572**	**0.1975**	**0.0196**	**0.2171**	**17.2618**	**848.1287**	**865.3905**	**1.1352**	**0.0432**	**906.6521**

	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	N20	CO2e
Percent Reduction	**82.04**	**6.09**	**57.55**	**55.42**	**0.00**	**97.59**	**51.71**	**0.00**	**97.64**	**78.88**	**81.78**	**8.93**	**15.66**	**6.54**	**12.55**	**15.36**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2022	6/14/2022	5	10	
2	Grading	Grading	6/15/2022	8/2/2022	5	35	
3	Paving	Paving	8/3/2022	8/30/2022	5	20	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Building Construction	Building Construction	8/31/2022	1/30/2024	5	370	
5	Architectural Coating	Architectural Coating	9/14/2022	2/13/2024	5	370	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 105

Acres of Paving: 0

Residential Indoor: 273,375; Residential Outdoor: 91,125; 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
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Pavers	2	8.00	130	0.42
Building Construction	Paving Equipment	2	8.00	132	0.36
Building Construction	Rollers	2	8.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	11,000.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	15	27.00	8.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	15	27.00	8.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2022

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	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0983**	**8.0600e-003**	**0.1064**	**0.0505**	**7.4200e-003**	**0.0579**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2022

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	tons/yr										MT/yr					
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	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	0.0000
Worker	2.5000e-004	1.8000e-004	2.2000e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5730	0.5730	2.0000e-005	2.0000e-005	0.5783
Total	**2.5000e-004**	**1.8000e-004**	**2.2000e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5730**	**0.5730**	**2.0000e-005**	**2.0000e-005**	**0.5783**

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	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0983**	**8.0600e-003**	**0.1064**	**0.0505**	**7.4200e-003**	**0.0579**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Site Preparation - 2022

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	tons/yr										MT/yr					
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	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	0.0000
Worker	2.5000e-004	1.8000e-004	2.2000e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5730	0.5730	2.0000e-005	2.0000e-005	0.5783
Total	**2.5000e-004**	**1.8000e-004**	**2.2000e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5730**	**0.5730**	**2.0000e-005**	**2.0000e-005**	**0.5783**

3.3 Grading - 2022

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	tons/yr										MT/yr					
Fugitive Dust					0.1660	0.0000	0.1660	0.0647	0.0000	0.0647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0634	0.6798	0.5082	1.0900e-003		0.0286	0.0286		0.0263	0.0263	0.0000	95.4356	95.4356	0.0309	0.0000	96.2072
Total	**0.0634**	**0.6798**	**0.5082**	**1.0900e-003**	**0.1660**	**0.0286**	**0.1947**	**0.0647**	**0.0263**	**0.0910**	**0.0000**	**95.4356**	**95.4356**	**0.0309**	**0.0000**	**96.2072**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2022

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	tons/yr										MT/yr					
Hauling	0.0215	0.8742	0.1780	3.4800e-003	0.0926	8.1500e-003	0.1008	0.0255	7.8000e-003	0.0333	0.0000	333.6929	333.6929	9.1000e-004	0.0524	349.3433
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	0.0000
Worker	9.7000e-004	6.8000e-004	8.5600e-003	2.0000e-005	2.7500e-003	1.0000e-005	2.7600e-003	7.3000e-004	1.0000e-005	7.4000e-004	0.0000	2.2282	2.2282	7.0000e-005	6.0000e-005	2.2490
Total	**0.0224**	**0.8749**	**0.1865**	**3.5000e-003**	**0.0954**	**8.1600e-003**	**0.1035**	**0.0262**	**7.8100e-003**	**0.0340**	**0.0000**	**335.9210**	**335.9210**	**9.8000e-004**	**0.0525**	**351.5923**

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	tons/yr										MT/yr					
Fugitive Dust					0.1660	0.0000	0.1660	0.0647	0.0000	0.0647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0634	0.6798	0.5082	1.0900e-003		0.0286	0.0286		0.0263	0.0263	0.0000	95.4354	95.4354	0.0309	0.0000	96.2071
Total	**0.0634**	**0.6798**	**0.5082**	**1.0900e-003**	**0.1660**	**0.0286**	**0.1947**	**0.0647**	**0.0263**	**0.0910**	**0.0000**	**95.4354**	**95.4354**	**0.0309**	**0.0000**	**96.2071**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Grading - 2022

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	tons/yr										MT/yr					
Hauling	0.0215	0.8742	0.1780	3.4800e-003	0.0926	8.1500e-003	0.1008	0.0255	7.8000e-003	0.0333	0.0000	333.6929	333.6929	9.1000e-004	0.0524	349.3433
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	0.0000
Worker	9.7000e-004	6.8000e-004	8.5600e-003	2.0000e-005	2.7500e-003	1.0000e-005	2.7600e-003	7.3000e-004	1.0000e-005	7.4000e-004	0.0000	2.2282	2.2282	7.0000e-005	6.0000e-005	2.2490
Total	**0.0224**	**0.8749**	**0.1865**	**3.5000e-003**	**0.0954**	**8.1600e-003**	**0.1035**	**0.0262**	**7.8100e-003**	**0.0340**	**0.0000**	**335.9210**	**335.9210**	**9.8000e-004**	**0.0525**	**351.5923**

3.4 Paving - 2022

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	tons/yr										MT/yr					
Off-Road	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0110**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0276**	**20.0276**	**6.4800e-003**	**0.0000**	**20.1895**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Paving - 2022

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	tons/yr										MT/yr					
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	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	0.0000
Worker	4.2000e-004	2.9000e-004	3.6700e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1800e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9549	0.9549	3.0000e-005	3.0000e-005	0.9639
Total	**4.2000e-004**	**2.9000e-004**	**3.6700e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1800e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9549**	**0.9549**	**3.0000e-005**	**3.0000e-005**	**0.9639**

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	tons/yr										MT/yr					
Off-Road	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0110**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0275**	**20.0275**	**6.4800e-003**	**0.0000**	**20.1895**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Paving - 2022

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	tons/yr										MT/yr					
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	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	0.0000
Worker	4.2000e-004	2.9000e-004	3.6700e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1800e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9549	0.9549	3.0000e-005	3.0000e-005	0.9639
Total	**4.2000e-004**	**2.9000e-004**	**3.6700e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1800e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9549**	**0.9549**	**3.0000e-005**	**3.0000e-005**	**0.9639**

3.5 Building Construction - 2022

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	tons/yr										MT/yr					
Off-Road	0.1236	1.1766	1.3615	2.1900e-003		0.0606	0.0606		0.0565	0.0565	0.0000	190.0804	190.0804	0.0529	0.0000	191.4035
Total	**0.1236**	**1.1766**	**1.3615**	**2.1900e-003**		**0.0606**	**0.0606**		**0.0565**	**0.0565**	**0.0000**	**190.0804**	**190.0804**	**0.0529**	**0.0000**	**191.4035**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

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	tons/yr										MT/yr					
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	0.0000
Vendor	1.3100e-003	0.0379	0.0113	1.5000e-004	7.8200e-003	3.5000e-004	8.1700e-003	2.1200e-003	3.3000e-004	2.4500e-003	0.0000	14.1473	14.1473	6.0000e-005	2.1400e-003	14.7866
Worker	6.6000e-003	4.6400e-003	0.0581	1.6000e-004	0.0348	1.0000e-004	0.0349	8.9200e-003	9.0000e-005	9.0100e-003	0.0000	15.1260	15.1260	4.7000e-004	4.4000e-004	15.2678
Total	**7.9100e-003**	**0.0425**	**0.0694**	**3.1000e-004**	**0.0426**	**4.5000e-004**	**0.0430**	**0.0110**	**4.2000e-004**	**0.0115**	**0.0000**	**29.2734**	**29.2734**	**5.3000e-004**	**2.5800e-003**	**30.0544**

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	tons/yr										MT/yr					
Off-Road	0.1236	1.1766	1.3615	2.1900e-003		0.0606	0.0606		0.0565	0.0565	0.0000	190.0801	190.0801	0.0529	0.0000	191.4033
Total	**0.1236**	**1.1766**	**1.3615**	**2.1900e-003**		**0.0606**	**0.0606**		**0.0565**	**0.0565**	**0.0000**	**190.0801**	**190.0801**	**0.0529**	**0.0000**	**191.4033**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2022

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	tons/yr										MT/yr					
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	0.0000
Vendor	1.3100e-003	0.0379	0.0113	1.5000e-004	7.8200e-003	3.5000e-004	8.1700e-003	2.1200e-003	3.3000e-004	2.4500e-003	0.0000	14.1473	14.1473	6.0000e-005	2.1400e-003	14.7866
Worker	6.6000e-003	4.6400e-003	0.0581	1.6000e-004	0.0348	1.0000e-004	0.0349	8.9200e-003	9.0000e-005	9.0100e-003	0.0000	15.1260	15.1260	4.7000e-004	4.4000e-004	15.2678
Total	**7.9100e-003**	**0.0425**	**0.0694**	**3.1000e-004**	**0.0426**	**4.5000e-004**	**0.0430**	**0.0110**	**4.2000e-004**	**0.0115**	**0.0000**	**29.2734**	**29.2734**	**5.3000e-004**	**2.5800e-003**	**30.0544**

3.5 Building Construction - 2023

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	tons/yr										MT/yr					
Off-Road	0.3387	3.1950	4.0077	6.4700e-003		0.1573	0.1573		0.1466	0.1466	0.0000	561.6954	561.6954	0.1559	0.0000	565.5926
Total	**0.3387**	**3.1950**	**4.0077**	**6.4700e-003**		**0.1573**	**0.1573**		**0.1466**	**0.1466**	**0.0000**	**561.6954**	**561.6954**	**0.1559**	**0.0000**	**565.5926**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

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	tons/yr										MT/yr					
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	0.0000
Vendor	2.3900e-003	0.0961	0.0305	4.2000e-004	0.0231	5.8000e-004	0.0237	6.2700e-003	5.5000e-004	6.8200e-003	0.0000	40.3939	40.3939	1.2000e-004	6.1100e-003	42.2170
Worker	0.0181	0.0122	0.1597	4.7000e-004	0.1027	2.8000e-004	0.1030	0.0264	2.5000e-004	0.0266	0.0000	43.5324	43.5324	1.2700e-003	1.2000e-003	43.9210
Total	**0.0205**	**0.1082**	**0.1902**	**8.9000e-004**	**0.1258**	**8.6000e-004**	**0.1267**	**0.0326**	**8.0000e-004**	**0.0334**	**0.0000**	**83.9264**	**83.9264**	**1.3900e-003**	**7.3100e-003**	**86.1380**

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	tons/yr										MT/yr					
Off-Road	0.3387	3.1950	4.0077	6.4700e-003		0.1573	0.1573		0.1466	0.1466	0.0000	561.6948	561.6948	0.1559	0.0000	565.5920
Total	**0.3387**	**3.1950**	**4.0077**	**6.4700e-003**		**0.1573**	**0.1573**		**0.1466**	**0.1466**	**0.0000**	**561.6948**	**561.6948**	**0.1559**	**0.0000**	**565.5920**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2023

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	tons/yr										MT/yr					
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	0.0000
Vendor	2.3900e-003	0.0961	0.0305	4.2000e-004	0.0231	5.8000e-004	0.0237	6.2700e-003	5.5000e-004	6.8200e-003	0.0000	40.3939	40.3939	1.2000e-004	6.1100e-003	42.2170
Worker	0.0181	0.0122	0.1597	4.7000e-004	0.1027	2.8000e-004	0.1030	0.0264	2.5000e-004	0.0266	0.0000	43.5324	43.5324	1.2700e-003	1.2000e-003	43.9210
Total	**0.0205**	**0.1082**	**0.1902**	**8.9000e-004**	**0.1258**	**8.6000e-004**	**0.1267**	**0.0326**	**8.0000e-004**	**0.0334**	**0.0000**	**83.9264**	**83.9264**	**1.3900e-003**	**7.3100e-003**	**86.1380**

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	tons/yr										MT/yr					
Off-Road	0.0271	0.2527	0.3387	5.5000e-004		0.0119	0.0119		0.0111	0.0111	0.0000	47.5326	47.5326	0.0132	0.0000	47.8615
Total	**0.0271**	**0.2527**	**0.3387**	**5.5000e-004**		**0.0119**	**0.0119**		**0.0111**	**0.0111**	**0.0000**	**47.5326**	**47.5326**	**0.0132**	**0.0000**	**47.8615**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2024

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	tons/yr										MT/yr					
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	0.0000
Vendor	2.0000e-004	8.0800e-003	2.5400e-003	3.0000e-005	1.9600e-003	5.0000e-005	2.0000e-003	5.3000e-004	5.0000e-005	5.8000e-004	0.0000	3.3504	3.3504	1.0000e-005	5.1000e-004	3.5017
Worker	1.4300e-003	9.2000e-004	0.0127	4.0000e-005	8.6900e-003	2.0000e-005	8.7100e-003	2.2300e-003	2.0000e-005	2.2500e-003	0.0000	3.5908	3.5908	1.0000e-004	9.0000e-005	3.6215
Total	**1.6300e-003**	**9.0000e-003**	**0.0152**	**7.0000e-005**	**0.0107**	**7.0000e-005**	**0.0107**	**2.7600e-003**	**7.0000e-005**	**2.8300e-003**	**0.0000**	**6.9412**	**6.9412**	**1.1000e-004**	**6.0000e-004**	**7.1231**

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	tons/yr										MT/yr					
Off-Road	0.0271	0.2527	0.3387	5.5000e-004		0.0119	0.0119		0.0111	0.0111	0.0000	47.5325	47.5325	0.0132	0.0000	47.8614
Total	**0.0271**	**0.2527**	**0.3387**	**5.5000e-004**		**0.0119**	**0.0119**		**0.0111**	**0.0111**	**0.0000**	**47.5325**	**47.5325**	**0.0132**	**0.0000**	**47.8614**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Building Construction - 2024

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	tons/yr										MT/yr					
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	0.0000
Vendor	2.0000e-004	8.0800e-003	2.5400e-003	3.0000e-005	1.9600e-003	5.0000e-005	2.0000e-003	5.3000e-004	5.0000e-005	5.8000e-004	0.0000	3.3504	3.3504	1.0000e-005	5.1000e-004	3.5017
Worker	1.4300e-003	9.2000e-004	0.0127	4.0000e-005	8.6900e-003	2.0000e-005	8.7100e-003	2.2300e-003	2.0000e-005	2.2500e-003	0.0000	3.5908	3.5908	1.0000e-004	9.0000e-005	3.6215
Total	**1.6300e-003**	**9.0000e-003**	**0.0152**	**7.0000e-005**	**0.0107**	**7.0000e-005**	**0.0107**	**2.7600e-003**	**7.0000e-005**	**2.8300e-003**	**0.0000**	**6.9412**	**6.9412**	**1.1000e-004**	**6.0000e-004**	**7.1231**

3.6 Architectural Coating - 2022

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	tons/yr										MT/yr					
Archit. Coating	0.1781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9800e-003	0.0549	0.0707	1.2000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	9.9577	9.9577	6.5000e-004	0.0000	9.9739
Total	**0.1861**	**0.0549**	**0.0707**	**1.2000e-004**		**3.1900e-003**	**3.1900e-003**		**3.1900e-003**	**3.1900e-003**	**0.0000**	**9.9577**	**9.9577**	**6.5000e-004**	**0.0000**	**9.9739**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2022

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	tons/yr										MT/yr					
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	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	0.0000
Worker	5.4000e-004	3.8000e-004	4.7700e-003	1.0000e-005	1.5300e-003	1.0000e-005	1.5400e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2414	1.2414	4.0000e-005	4.0000e-005	1.2530
Total	**5.4000e-004**	**3.8000e-004**	**4.7700e-003**	**1.0000e-005**	**1.5300e-003**	**1.0000e-005**	**1.5400e-003**	**4.1000e-004**	**1.0000e-005**	**4.2000e-004**	**0.0000**	**1.2414**	**1.2414**	**4.0000e-005**	**4.0000e-005**	**1.2530**

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	tons/yr										MT/yr					
Archit. Coating	0.1781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9800e-003	0.0549	0.0707	1.2000e-004		3.1900e-003	3.1900e-003		3.1900e-003	3.1900e-003	0.0000	9.9577	9.9577	6.5000e-004	0.0000	9.9739
Total	**0.1861**	**0.0549**	**0.0707**	**1.2000e-004**		**3.1900e-003**	**3.1900e-003**		**3.1900e-003**	**3.1900e-003**	**0.0000**	**9.9577**	**9.9577**	**6.5000e-004**	**0.0000**	**9.9739**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2022

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	tons/yr										MT/yr					
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	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	0.0000
Worker	5.4000e-004	3.8000e-004	4.7700e-003	1.0000e-005	1.5300e-003	1.0000e-005	1.5400e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2414	1.2414	4.0000e-005	4.0000e-005	1.2530
Total	**5.4000e-004**	**3.8000e-004**	**4.7700e-003**	**1.0000e-005**	**1.5300e-003**	**1.0000e-005**	**1.5400e-003**	**4.1000e-004**	**1.0000e-005**	**4.2000e-004**	**0.0000**	**1.2414**	**1.2414**	**4.0000e-005**	**4.0000e-005**	**1.2530**

3.6 Architectural Coating - 2023

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	tons/yr										MT/yr					
Archit. Coating	0.5936					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0249	0.1694	0.2355	3.9000e-004		9.2100e-003	9.2100e-003		9.2100e-003	9.2100e-003	0.0000	33.1923	33.1923	1.9900e-003	0.0000	33.2419
Total	**0.6185**	**0.1694**	**0.2355**	**3.9000e-004**		**9.2100e-003**	**9.2100e-003**		**9.2100e-003**	**9.2100e-003**	**0.0000**	**33.1923**	**33.1923**	**1.9900e-003**	**0.0000**	**33.2419**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2023

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	tons/yr										MT/yr					
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	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	0.0000
Worker	1.6800e-003	1.1300e-003	0.0148	4.0000e-005	5.1000e-003	3.0000e-005	5.1300e-003	1.3600e-003	2.0000e-005	1.3800e-003	0.0000	4.0308	4.0308	1.2000e-004	1.1000e-004	4.0668
Total	**1.6800e-003**	**1.1300e-003**	**0.0148**	**4.0000e-005**	**5.1000e-003**	**3.0000e-005**	**5.1300e-003**	**1.3600e-003**	**2.0000e-005**	**1.3800e-003**	**0.0000**	**4.0308**	**4.0308**	**1.2000e-004**	**1.1000e-004**	**4.0668**

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	tons/yr										MT/yr					
Archit. Coating	0.5936					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0249	0.1694	0.2354	3.9000e-004		9.2100e-003	9.2100e-003		9.2100e-003	9.2100e-003	0.0000	33.1923	33.1923	1.9900e-003	0.0000	33.2419
Total	**0.6185**	**0.1694**	**0.2354**	**3.9000e-004**		**9.2100e-003**	**9.2100e-003**		**9.2100e-003**	**9.2100e-003**	**0.0000**	**33.1923**	**33.1923**	**1.9900e-003**	**0.0000**	**33.2419**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2023

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	tons/yr										MT/yr					
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	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	0.0000
Worker	1.6800e-003	1.1300e-003	0.0148	4.0000e-005	5.1000e-003	3.0000e-005	5.1300e-003	1.3600e-003	2.0000e-005	1.3800e-003	0.0000	4.0308	4.0308	1.2000e-004	1.1000e-004	4.0668
Total	**1.6800e-003**	**1.1300e-003**	**0.0148**	**4.0000e-005**	**5.1000e-003**	**3.0000e-005**	**5.1300e-003**	**1.3600e-003**	**2.0000e-005**	**1.3800e-003**	**0.0000**	**4.0308**	**4.0308**	**1.2000e-004**	**1.1000e-004**	**4.0668**

3.6 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	tons/yr										MT/yr					
Archit. Coating	0.0731					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8900e-003	0.0195	0.0290	5.0000e-005		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	4.0852	4.0852	2.3000e-004	0.0000	4.0910
Total	**0.0760**	**0.0195**	**0.0290**	**5.0000e-005**		**9.7000e-004**	**9.7000e-004**		**9.7000e-004**	**9.7000e-004**	**0.0000**	**4.0852**	**4.0852**	**2.3000e-004**	**0.0000**	**4.0910**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2024

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	tons/yr										MT/yr					
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	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	0.0000
Worker	1.9000e-004	1.2000e-004	1.7000e-003	1.0000e-005	6.3000e-004	0.0000	6.3000e-004	1.7000e-004	0.0000	1.7000e-004	0.0000	0.4836	0.4836	1.0000e-005	1.0000e-005	0.4877
Total	**1.9000e-004**	**1.2000e-004**	**1.7000e-003**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**6.3000e-004**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.4836**	**0.4836**	**1.0000e-005**	**1.0000e-005**	**0.4877**

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	tons/yr										MT/yr					
Archit. Coating	0.0731					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8900e-003	0.0195	0.0290	5.0000e-005		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	4.0852	4.0852	2.3000e-004	0.0000	4.0910
Total	**0.0760**	**0.0195**	**0.0290**	**5.0000e-005**		**9.7000e-004**	**9.7000e-004**		**9.7000e-004**	**9.7000e-004**	**0.0000**	**4.0852**	**4.0852**	**2.3000e-004**	**0.0000**	**4.0910**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Architectural Coating - 2024

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	tons/yr										MT/yr					
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	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	0.0000
Worker	1.9000e-004	1.2000e-004	1.7000e-003	1.0000e-005	6.3000e-004	0.0000	6.3000e-004	1.7000e-004	0.0000	1.7000e-004	0.0000	0.4836	0.4836	1.0000e-005	1.0000e-005	0.4877
Total	**1.9000e-004**	**1.2000e-004**	**1.7000e-003**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**6.3000e-004**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.4836**	**0.4836**	**1.0000e-005**	**1.0000e-005**	**0.4877**

Sierra View Project - Placer County APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule 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	tons/yr										MT/yr					
Mitigated	0.3859	0.5758	3.6589	7.3900e-003	0.7372	6.6100e-003	0.7438	0.1975	6.2100e-003	0.2037	0.0000	693.2450	693.2450	0.0432	0.0367	705.2599
Unmitigated	0.3859	0.5758	3.6589	7.3900e-003	0.7372	6.6100e-003	0.7438	0.1975	6.2100e-003	0.2037	0.0000	693.2450	693.2450	0.0432	0.0367	705.2599

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	708.00	715.50	641.25	2,003,850	2,003,850
Total	708.00	715.50	641.25	2,003,850	2,003,850

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	10.80	7.30	7.50	42.60	21.00	36.40	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	0.466187	0.061512	0.210180	0.153350	0.034639	0.008391	0.014417	0.011935	0.000556	0.000412	0.031993	0.000977	0.005450

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Percent of Electricity Use Generated with Renewable 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	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	103.4754	103.4754	8.8800e-003	1.0800e-003	104.0180
NaturalGas Mitigated	9.5700e-003	0.0818	0.0348	5.2000e-004		6.6100e-003	6.6100e-003		6.6100e-003	6.6100e-003	0.0000	94.6893	94.6893	1.8100e-003	1.7400e-003	95.2520
NaturalGas Unmitigated	9.5700e-003	0.0818	0.0348	5.2000e-004		6.6100e-003	6.6100e-003		6.6100e-003	6.6100e-003	0.0000	94.6893	94.6893	1.8100e-003	1.7400e-003	95.2520

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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	tons/yr										MT/yr					
Single Family Housing	1.77441e+006	9.5700e-003	0.0818	0.0348	5.2000e-004		6.6100e-003	6.6100e-003		6.6100e-003	6.6100e-003	0.0000	94.6893	94.6893	1.8100e-003	1.7400e-003	95.2520
Total		**9.5700e-003**	**0.0818**	**0.0348**	**5.2000e-004**		**6.6100e-003**	**6.6100e-003**		**6.6100e-003**	**6.6100e-003**	**0.0000**	**94.6893**	**94.6893**	**1.8100e-003**	**1.7400e-003**	**95.2520**

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	tons/yr										MT/yr					
Single Family Housing	1.77441e+006	9.5700e-003	0.0818	0.0348	5.2000e-004		6.6100e-003	6.6100e-003		6.6100e-003	6.6100e-003	0.0000	94.6893	94.6893	1.8100e-003	1.7400e-003	95.2520
Total		**9.5700e-003**	**0.0818**	**0.0348**	**5.2000e-004**		**6.6100e-003**	**6.6100e-003**		**6.6100e-003**	**6.6100e-003**	**0.0000**	**94.6893**	**94.6893**	**1.8100e-003**	**1.7400e-003**	**95.2520**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	593054	103.4754	8.8800e-003	1.0800e-003	104.0180
Total		**103.4754**	**8.8800e-003**	**1.0800e-003**	**104.0180**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Sierra View Project - Placer County APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	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	tons/yr										MT/yr					
Mitigated	0.6338	0.0523	0.5762	3.2000e-004		6.8000e-003	6.8000e-003		6.8000e-003	6.8000e-003	0.0000	54.0760	54.0760	1.8900e-003	9.7000e-004	54.4138
Unmitigated	5.3344	0.0983	6.3657	0.0106		0.8176	0.8176		0.8176	0.8176	77.4718	33.4002	110.8720	0.0724	6.0900e-003	114.4971

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule 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	tons/yr										MT/yr					
Architectural Coating	0.0845					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5272					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.7060	0.0919	5.8090	0.0105		0.8145	0.8145		0.8145	0.8145	77.4718	32.4906	109.9624	0.0715	6.0900e-003	113.5657
Landscaping	0.0167	6.4100e-003	0.5567	3.0000e-005		3.0900e-003	3.0900e-003		3.0900e-003	3.0900e-003	0.0000	0.9097	0.9097	8.7000e-004	0.0000	0.9315
Total	**5.3344**	**0.0983**	**6.3657**	**0.0106**		**0.8176**	**0.8176**		**0.8176**	**0.8176**	**77.4718**	**33.4002**	**110.8720**	**0.0724**	**6.0900e-003**	**114.4971**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule 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	tons/yr										MT/yr					
Architectural Coating	0.0845					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5272					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.3700e-003	0.0459	0.0195	2.9000e-004		3.7100e-003	3.7100e-003		3.7100e-003	3.7100e-003	0.0000	53.1664	53.1664	1.0200e-003	9.7000e-004	53.4823
Landscaping	0.0167	6.4100e-003	0.5567	3.0000e-005		3.0900e-003	3.0900e-003		3.0900e-003	3.0900e-003	0.0000	0.9097	0.9097	8.7000e-004	0.0000	0.9315
Total	**0.6338**	**0.0523**	**0.5762**	**3.2000e-004**		**6.8000e-003**	**6.8000e-003**		**6.8000e-003**	**6.8000e-003**	**0.0000**	**54.0760**	**54.0760**	**1.8900e-003**	**9.7000e-004**	**54.4138**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	7.6687	0.1598	3.8200e-003	12.8019
Unmitigated	8.0450	0.1598	3.8300e-003	13.1801

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	4.88655 / 3.08065	8.0450	0.1598	3.8300e-003	13.1801
Total		**8.0450**	**0.1598**	**3.8300e-003**	**13.1801**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	4.88655 / 2.46452	7.6687	0.1598	3.8200e-003	12.8019
Total		**7.6687**	**0.1598**	**3.8200e-003**	**12.8019**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	15.7115	0.9285	0.0000	38.9246
Unmitigated	15.7115	0.9285	0.0000	38.9246

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	77.4	15.7115	0.9285	0.0000	38.9246
Total		**15.7115**	**0.9285**	**0.0000**	**38.9246**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	77.4	15.7115	0.9285	0.0000	38.9246
Total		**15.7115**	**0.9285**	**0.0000**	**38.9246**

9.0 Operational Offroad

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS

TECHNICAL MEMORANDUM

DATE: August 3, 2021

TO: City of Roseville

FROM: Cindy Gwaltney

CC: Ryan O'Keefe, WP Sierra View, LLC.; Allison Wathen, Eric Crow

SUBJECT: Preliminary Storm Drainage Evaluation for Sierra View

Introduction & Overview

This Technical Memorandum (TM) is a technical drainage assessment for a proposed development project on the ±23.1-acre Sierra View site in the City of Roseville, which documents the existing (current) conditions prior to construction of the Sierra View development and the proposed drainage conveyance and mitigation systems. The existing conditions modeled herein will establish performance criteria for the proposed conditions to pose no impact on the surrounding properties. This Technical Memorandum provides a tentative map level of analysis.

The contributary area analyzed for Sierra View is comprised of offsite development area including low density residential, medium density residential, a school, park, golf course, and undeveloped land. The site is located north of Shasta Street, east of Sierra View Country Club Golf Course, south of Diamond Oaks Road, and west of Shasta Street (Figure 1). The Sierra View site lies between an existing golf course and previously developed residential areas. The existing topography drains to both the north and south, eventually finding a release path north of the Sierra View Country Club golf course into the Pleasant Grove Creek South Branch Sierra View Tributary (Exhibit 1, Appendix A).

Purpose

This TM is a drainage evaluation that supports the project entitlements for Sierra View. This TM evaluates the site's existing conditions, proposed project conditions, and provides a preliminary assessment of the storm drainage infrastructure as well as mitigation measures for flood control, hydromodification, and storm water quality.

Previous Studies

No previous studies were utilized in the preparation of this report.

Topography

The topography for the site is from two sources: aerial topography which was specifically flown for the Sierra View site and LiDAR topography provided by the City of Roseville. The aerial topography covers the future development site and the LiDAR covers areas outside of the flown topography. The datum for the survey is based on NAD83 California Zone II in US-FT. The LiDAR topography was received in grid and was converted to ground to correspond with the project's horizontal positioning. The factor used for the conversion from grid to ground is 1.000072779. These topographies were combined in AutoCAD Civil 3D to create a surface for input into HEC-RAS. The topography was exported from AutoCAD with a 1-foot grid spacing for detailed mapping accuracy within HEC-RAS. Both sources of topography are in the North American Vertical Datum of 1988 (NAVD88).

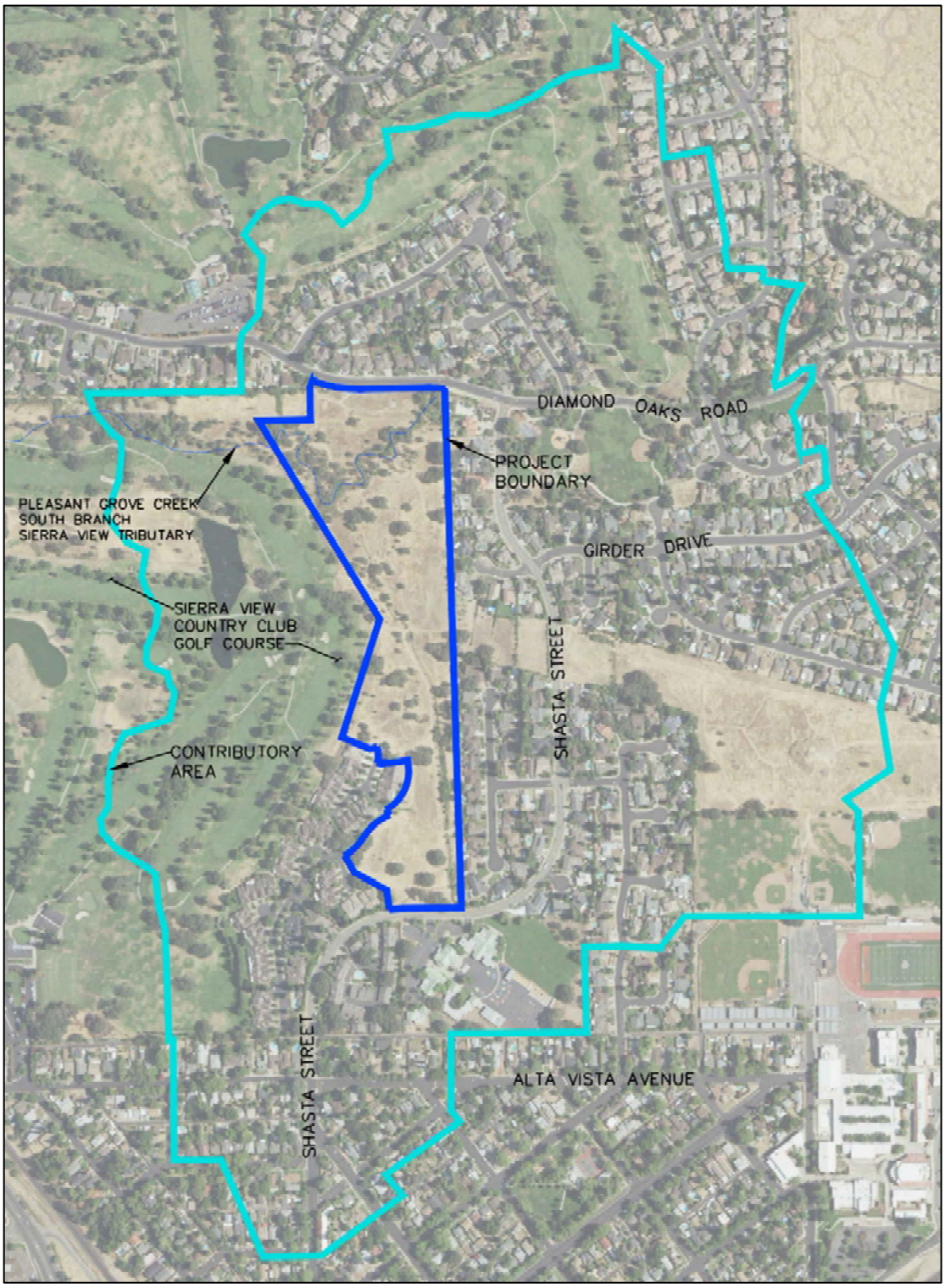


Figure 1. Project Boundary, Contributory Area, and Site Location

Soils Information

The soil type for the study area is entirely D type soil. D type soil has a low infiltration rate which will produce the greatest runoff for the hydraulic model and is therefore the most conservative soil type for mapping purposes. The USGS Web Soil Survey for the project site and surrounding area can be seen below in Figure 2. Areas highlighted in red are D type soil.

Figure 2. Project Soil Map

ULOP

In 2007, the State of California enacted six bills to improve flood management, one of which pertains to the Sacramento and San Joaquin river basins. Senate Bill 5 (SB5) is intended to bolster the relationship between local land use planning decisions and flood management practices. The requirement of SB5 is that an Urban Level of Flood Protection (ULOP) be given in specific areas of the Sacramento and San Joaquin river basins. ULOP is defined as the level of protection necessary to withstand a 1-in-200 chance of flooding in any given year. There are five location criteria that all must be met in order for the ULOP to apply. The site was evaluated to ascertain the applicability of the ULOP criteria and determined that the proposed project does not meet the criterion of having watersheds with a contributing area of 10 or more square miles (6400 acres), and therefore, the project is not subject to SB5 legislation.

FEMA Information

The Federal Emergency Management Agency's (FEMA) Flood Insurance Study (FIS) Flood Insurance Rate Map (FIRM) encompassing the project area is FIRM Panel ID# 06061C0943H, effective November 2, 2018. As is shown in Figure 2 below, no established regulatory floodplains are located within, or adjacent to, the subject site. A Letter of Map Revision for the existing conditions floodplain is not required for this project due to having less than 1 square mile of contributary area to a conveyance system on or adjacent to the property.

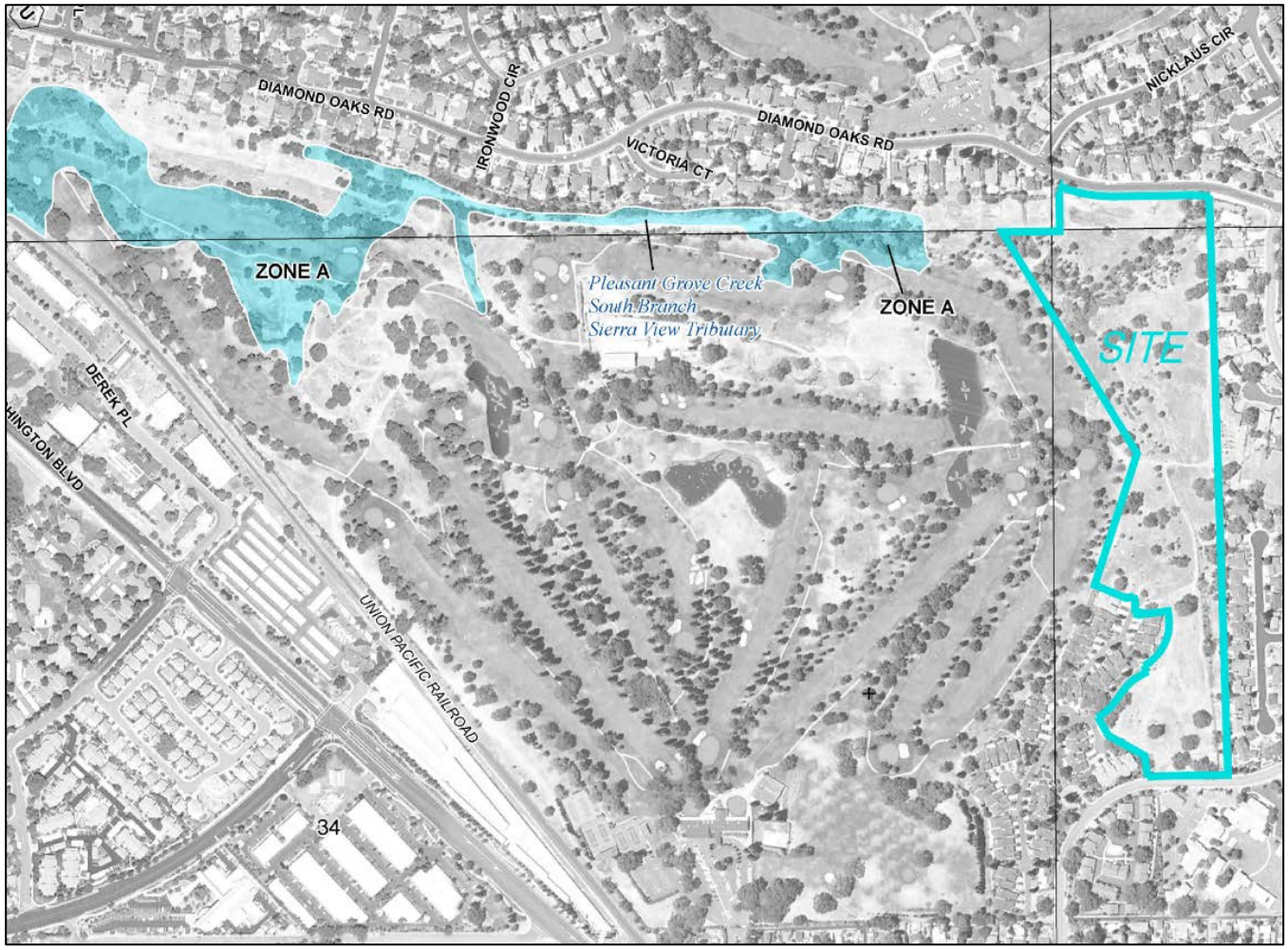


Figure 3. Portion of FEMA FIRM 06061C0943H

Methodologies and Assumptions

Model Selections and Standards

In accordance with the City and County standards, several hydrologic and hydraulic models were utilized to evaluate the impacts of the proposed development. Section 10 Drainage of the City's Design Standards was referenced for the development of the analysis herein. In addition to the City's standards, the hydrologic and hydraulic methods and standards included in the Placer County Flood Control and Water Conservation District Stormwater Management Manual (SWMM) were referenced as needed. The following report subsections provide an overview of the software, data, and parameters used in the modeling presented herein.

Floodplain Hydrologic and Hydraulic Modeling

Several hydrologic and hydraulic models were utilized to evaluate the floodplain in the existing and proposed conditions. For the floodplain analysis, this TM utilizes a two-step modeling process:

1. **Hydrology.** The runoff for each watershed was determined by using the US Army Corps of Engineers' Hydrologic Engineering Center HEC-1 Flood Hydrograph Package and Placer County's preprocessor PDP2 software for generating design event precipitation. The HEC-1 model was created without precipitation data (PI) cards to be run through the Placer County PDP2 Preprocessor. The Preprocessor takes elevation data,

project location, recurrence interval, and storm centering as input and produces a set of PI cards for each watershed. The project location is set west of the Sierras, the recurrence intervals modeled are the 1% or the 100-year storm, 10% or the 10-year storm, and the 50% or the 2-year storm. After the Preprocessor runs, the HEC-1 program is run normally and a data storage system (dss) file is produced which contains all hydrographs for the study area. The HEC-1 file, including results and input, can be found in Appendix B.

2. **Hydraulics.** The hydrographs generated in HEC-1 were incorporated into a US Army Corps of Engineers' Hydraulic Engineering Center (HEC) River Analysis System (RAS) software package (HEC-RAS 2D program version 5.0.7). Due to the site's topography, a 2D model was chosen instead of a 1D model to better capture the multiple flow paths for the site. An unsteady state analysis was used to determine the peak flow and water surface elevations using the geometry of the respective existing and proposed topographies. The results of this step are the stage and flow hydrographs at the compliance points identified on Exhibits 1 and 2 (Appendix A). Also resulting are 100-year 24-hour inundation boundaries shown on Exhibits 1 and 2, respectively.

These two steps were utilized in a comprehensive, iterative approach for both flood control and hydromodification analyses. First, the existing conditions hydrology was prepared. Then existing conditions hydraulic analysis was prepared to evaluate the existing conditions floodplain information—the baseline for existing flooding conditions. In parallel, HEC-1 and HEC-RAS modeling for the existing conditions 2-year 24-hour event was analyzed to determine the hydromodification baseline information.

Next, the proposed conditions hydrology and hydraulics were established. This information was then used to verify that sufficient flood control and hydromodification mitigation is proposed onsite.

HEC-1 Modeling Parameters

Impervious Cover

Impervious cover for the offsite watersheds was determined using the parcel map for the surrounding development. Areas with low density residential lots were assumed to be 40% impervious cover, medium density residential lots and school sites were assumed to have 50% impervious cover, parks and golf course assumed to have 5% impervious cover, and open space assumed to be 2% cover. While most sheds fall into a single impervious cover type, some sheds cover multiple impervious conditions. In sheds that contain more than one condition, the area of each land use type was measured in AutoCAD and a composite rate was established for the watershed.

The impervious cover for the proposed onsite watersheds consists of low density residential at 40% impervious cover, roadway corridor at 85% impervious cover, park and graded areas at 5% impervious cover, and open space at 2%. The offsite watershed impervious rates remain unchanged for the proposed conditions modeling.

Watershed Routing

Watershed routing is performed in HEC-1 using the Muskingum-Cunge routing method. UK and RD cards were used to model the sheet flow and channel flow of each watershed to its terminus. The UK card for sheet flow is input with a maximum length of 300-feet for natural conditions and an average lot depth length for proposed conditions watersheds. The RD card was used to model the remaining watercourse length to the end of the watershed. For piped systems, the largest diameter pipe was used to avoid constricting the flow and the slope of the overland route was used for the pipe slope if the slope was unknown. For natural sheds EX08 and EX10, the RD card for the watercourse length ended in the middle of the watershed. This is done due to the method in which the resultant hydrograph would be input into HEC-RAS. The hydrograph input location in HEC-RAS would be over many cells in the center of the watershed. By this method, if the HEC-1 routing were to be taken to the terminus of the watershed, it would overestimate the time of concentration of the watershed. Watershed routing is depicted on Exhibits 1 and 2 included in Appendix A.

In the proposed conditions, there are a couple of clarifications regarding how some sheds were modeled. Small sheds consisting of rear draining lots were combined with adjacent sheds to ensure that sheds are large enough for HEC-1 to properly process whilst preserving the flood control element of the watershed. Additionally, the existing shed, EX04, which discharges to the site in a 21-inch pipe on the eastern boundary of the project in the existing conditions is routed in HEC-1 through shed DEV09 and then combined with DEV09 prior to discharging into the detention basin DBC proposed to be located at roughly the center of the project.

In both the existing conditions and proposed conditions, sheds EX02 and EX03, discharge to a natural channel in the northeast corner of the project. No detailed drainage study is available for this offsite area. It is assumed, through study of the topography, that the runoff of these sheds, both piped and from overland release, discharge to the same location.

Storm Centering

Storm centering is not applied since the contributary shed area is under 0.5-square miles. Per Table 5-1 in the SWMM, an area of 0.5-square miles and less for the 10-year and larger events do not require storm centering. Although storm centering would influence the 2-year 24-hour event, this event is for comparison purposes only so there is no risk in removing the storm centering aspect of the hydrology.

HEC-RAS Modeling Parameters

2D Cell Spacing

Once the topography was imported into HEC-RAS, a 2D surface area was established which covered the open space from Shasta Street north to the golf course. The 2D area was set to a cell spacing of 4-feet. This spacing captures the low-flow channel onsite while allowing for timely model runs. A decreased cell size would greatly increase the computational time required for the model without adding increased accuracy. While an increased cell size would decrease the time required to run the model, increased cell sizes run the risk of not fully capturing the low-flow channel. With these considerations, a 4-foot cell spacing was used in the model.

The 2D area limits are higher in elevation than what is inundated by the 100-year event with the exception of two locations. The first location is the downstream limit of the model where a boundary condition is used to end the model. The second location is at the southwest corner of the Sierra View property near the existing 18-inch storm drain system. Shasta Street was prevented from flooding to establish a conservative floodplain onsite. If Shasta Street were to flood, there is an overland release route down Sierraview Drive to the same location as the 18-inch culvert discharges.

Manning's 'n' Values

The model contains a single composite manning's 'n' value of 0.06. The existing floodplain conditions are grasses with occasional trees or brush, consistent with a 'n' value of 0.06 in the overbank. The channel itself could be considered to have a lower 'n' value due to the straight and uniform nature of the channel, as well as the limited vegetation in stretches of the channel. However, portions of the channel do exhibit brushy growth which will inhibit flows of all stages. Due to the sporadic areas of increased vegetation the channel was also modeled with a 'n' value of 0.06. This roughness value is carried through in the proposed conditions modeling.

Hydrograph Input

There are two types of hydrographs input into the HEC-RAS model: point discharge hydrographs and natural area discharge hydrographs. The point discharge hydrographs are hydrographs which are applied at a single (or few) cell(s). They are input as flow hydrographs and are a result of a storm drain outfall entering the HEC-RAS model at one location. The second type of hydrograph input, the natural area hydrographs, are input over many cells in HEC-RAS. These hydrographs are also input as flow hydrographs but they cover many cells in the open space and simulate that rainfall occurs over a large area, not at a single point.

Downstream Conditions

The downstream condition of the HEC-RAS model is a normal depth of 0.0065. This was calculated using the slope of the downstream channel.

Existing Conditions

The existing Sierra View site has four contributing storm drain outfalls from the adjacent previously developed residential areas. The model area contains an additional three existing storm drain outfalls outside of the Sierra View property boundary. Each outfall has a contributing watershed which was developed from the existing storm drain system maps and topography. The drainage system map and Exhibit 1, which shows the topography, are included in Appendix A. Further detail on the watersheds and their characteristics is discussed in the Hydrology section below.

The Sierra View site itself is a moderately sloped site which drains to a central channel. The existing man-made channel conveys flow from south to north, eventually turning west towards the golf course. There is an additional drainage path in the southwest corner of the site which drains a small portion of the land area to a low point and an 18-inch storm drain which drains the site west through an existing development. The southern drainage eventually releases towards the north and re-joins the main conveyance path north of the golf course. Just downstream of the confluence is the end of the hydrologic and hydraulic models. This location was chosen as a boundary condition due to the topography creating a single discharge location which could be easily compared to the proposed condition for compliance.

Existing Watersheds

A total of 10 watersheds were established for the hydrologic analysis of the site's existing conditions. Seven of these watersheds are already developed and contribute to the site through their existing storm drain systems. The remaining three watersheds are primarily open space watersheds, two of which are onsite and one of which is downstream of the Sierra View site. Exhibit 1 included with this TM depicts the hydrologic data utilized herein.

HEC-RAS Model Hydraulic Features

The existing conditions HEC-RAS model contains limited hydraulic features, three culverts. The first two culverts, culvert 1 and culvert 2, are small culverts in the man-made channel for off-road crossings. These culverts are both short in length and are inserted into the model at the channel invert. The culverts are modeled with a Manning's 'n' value of 0.02 to account for sedimentation and overgrowth. Both culverts have limited capacity and overtop in the 100-year event. The third culvert is the storm drain system which conveys flow from the southwest portion of the Sierra View property west through an existing residential development. The storm drain system was modeled as a single full-length culvert of the smallest diameter pipe, 18-inch. An initial model run with a 'n' value of 0.015 was performed but was later changed in the final model run to a value of 0.02 to account for bend losses through manholes. The 18-inch culvert drains the low point in the topography and discharges to the west into the golf course.

Proposed Conditions

The proposed Sierra View development site consists of 23.1-acres of which 18.9-acres are proposed to have an increase in imperviousness. The overall watershed analyzed herein consists of 255.2-acres at an impervious rate of 25% of which the proposed project site is a part of. The proposed development includes the addition of 76 low density residential lots, supporting roadways, a park site, and detention facilities which, since the proposed development is a small fraction of the overall watershed, the impervious rate minimally increases from 25% to 28% in the proposed conditions.

Proposed Watersheds

The offsite watersheds shown on Exhibits 1 and 2 remain unchanged from the existing conditions analysis. The watersheds within the project boundary are adjusted to reflect the development and grading proposed with the Sierra View project. Exhibit 2 depicts the proposed conditions watersheds.

Proposed Storm Drain Infrastructure

The proposed project would utilize surface and subsurface infrastructure to convey flows to storm water quality facilities and detention basins before discharging from the site. For the onsite storm drainage infrastructure, a spreadsheet was used to calculate runoff and to perform hydraulic calculations for the proposed development. The Unit Peak Discharge Method was used to calculate the 10-year and the 100-year events' peak flows while Manning's equations were used for the hydraulic calculations. The drainage system is analyzed assuming full buildout of all contributary areas and includes upstream contributary areas as applicable. The impervious rates for the contributary watersheds are the same as utilized in the HEC-1 hydrologic modeling.

The modeling parameters for the onsite storm drainage infrastructure utilize a Manning's 'n' value of 0.015 and a minimum pipe flowing full velocity of 2.0 feet-per-second. The 10-year hydraulic grade line shall stay at a minimum 1-foot below all manhole rims and inlet grates. For the 100-year event, local streets shall not have more than 4-inches above the top back of curb. The design tailwater for each outfall is the water surface elevation developed in the HEC-RAS model at the outfall pipe location.

The existing offsite sheds, EX02 and EX03, discharge to a natural channel in the northeast corner of the project upstream of a proposed roadway crossing. These sheds are conveyed to this location via pipes and overland release grading. To convey the flows under the proposed roadway crossing without creating an adverse impact to the existing upstream systems, large box culverts are proposed under the roadway. The intent of the culvert crossing, as sized, is to not raise water surface elevations further upstream at the existing pipes' outfalls above the existing conditions elevations.

Two existing offsite sheds, EX04 and EX05, are proposed to be conveyed in pipes through the proposed project. The analysis shows that the proposed development can adequately convey offsite discharges through the project with no adverse effects. Pipes proposed are sized to avoid increased backwater effect on the existing storm drain systems which discharge to the site.

Existing shed EX04 discharges to the proposed project on the east boundary via a 21-inch existing outfall pipe. This outfall pipe is proposed to directly connect to proposed infrastructure and conveyed north before being discharged.

Existing shed EX05 discharges from a 24-inch pipe in the south that will be allowed to pond onsite before getting picked up and conveyed north in pipes. A portion of this flow goes to the existing 18-inch pipe in the southwest corner of the proposed project site. Flows contributing to the existing 18-inch pipe and to the proposed pipe that discharges to the north, are split so that water surface elevations and discharges in the proposed condition are less than or equal to that in the existing conditions for the events analyzed herein. Results at this location are included in Appendix C. Exhibit 3 shows the proposed storm drain system, sheds, and pertinent results.

HEC-RAS Model Hydraulic Features

The proposed conditions HEC-RAS model includes the proposed grading for the site as well as several pipes and culverts. The topography outside of the project boundary remain the same as in existing conditions. The changes to the HEC-RAS model for the proposed conditions geometry include the proposed roadway crossings, areas of fill, and excavation for detention mitigation basins. Pipes were added for conveyance and to achieve the timing from routing through pipes for the sheds that do not include the routing within the HEC-1 hydrologic modeling. The splitting of flows between the existing conditions 18-inch pipe in the southwest and the proposed 36-inch pipe is an example of flows routed within pipes in HEC-RAS. The 18-inch pipe in the proposed conditions remains the same as it is

modeled in the existing conditions. In that same area, a 36-inch pipe is proposed to pickup the discharges from the offsite shed EX05 which were previously split between the existing 18-inch pipe and an existing ditch that flowed north through the project. The proposed 36-inch pipe is intended to convey flows that previously were conveyed in the existing ditch. These flows, as in the existing conditions, will be conveyed north through the project. The length and slope are the total pipe run length proposed with a composite slope determined by the outfall invert downstream, the most upstream invert and the total length of pipe.

Proposed Project Detention Mitigation

With the addition of impervious area and infrastructure to a site without mitigation measures in place, peak flows, volumes, and velocities are anticipated to increase. While the proposed project would add impervious area and would use conveyance systems that concentrate flows, it would also utilize features to mitigate the predicted increases in flows, volumes, and velocities. Increases in peak flows and volumes would be mitigated by detention basins for the 10-year and 100-year 24-hour events. Increases in velocities may be mitigated with rock outfall protection or other dissipation features suitable to site conditions. The conversion of sheet flows to concentrated flows can also reduce the natural infiltration of runoff into the soil. Adding landscaped areas and storm water quality measures, discussed later in this TM, can increase infiltration of a developed site. The rates used in Placer County per the County's Stormwater Management Manual show that the infiltration rates for landscaping such as lawns and shrubs is higher than that of open space for all soil types. This includes areas such as parks and planted roadsides. Although the total area available for infiltration would decrease due to the addition of impervious cover, these landscaped areas can assist, along with the addition of storm water quality measures, in balancing the overall infiltration for a developed site. The criteria used for the development of detention within this study are summarized below.

- Detention facilities shall be used to control the post-development 2-year, 10-year, and 100-year 24-hour event peak flow.
- All storage facilities shall drawdown within 72-hours.
- Basins shall have a minimum of 1-foot of freeboard above the high water level on the emergency spillway or 2-feet of freeboard above the 100-year high water level in the basin, whichever is more stringent.

To attenuate the proposed conditions peak flow rates to be less than existing conditions peak flow rates, detention for the 2-year 24-hour, 10-year 24-hour, and 100-year 24-hour events is needed. One basin is necessary to mitigate the flood control events for the proposed project. Basin DBC located in the central portion of the project detains flows by way of a road crossing and a discharge culvert. The discharge culvert is sized to detain sufficient flows to mitigate for flood control for the proposed site.

Detention is also occurring due to the proposed road crossing of the floodplain in the northern part of the proposed site. To not create a backwater effect on the existing outfall pipes from sheds EX02 and EX03, the culverts crossing under the roadway in the northern part of the site are sized to minimize the amount of water detained, however, some detention does occur. Grading upstream of these culverts is proposed to provide volume due to the reduction of the floodplain from the road crossing. The preliminary results of these areas are shown below in Table 1.

Table 1: Preliminary Detention Facility Results

Detention Facility	DBC	DBN
10-Yr Peak Inflow (cfs)	56	200
100-Yr Peak Inflow (cfs)	120	347
10-Yr Peak Outflow (cfs)	29	171
100-Yr Peak Outflow (cfs)	46	294
10-Yr Water Surface Elev. (ft)	162.6	158.7
100-Yr Water Surface Elev. (ft)	163.9	159.3

Storm Water Quality & Hydromodification

Storm water is a valuable resource and it is the intention of the proposed project to maintain storm water quality using source controls and Low Impact Development (LID) measures. These measures, through structures and operations, infiltration, evapotranspiration, and biotreatment can provide water quality treatment and recharge groundwater supplies, protect and enhance natural habitat and biodiversity, and add aesthetic value to new development.

The proposed project would create more than one acre of impervious surface. Due to this, it is considered a Hydromodification Management Project per the Phase II MS4 Permit and is required to provide storm water treatment for the 85th percentile event and hydromodification for the 2-year event. A multi-layered approach is taken to ensure that these requirements are met per the SWQDM. The discussion below outlines the types of measures that could be incorporated into the project to meet the requirements of the SWQDM.

To evaluate the storm water quality provisions and hydromodification management for the development, the West Placer Storm Water Quality Design Manual (SWQDM) was referenced and utilized in this analysis. While the storm water quality calculations follow the procedures outlined within that manual by utilizing the provided templates, hydromodification compliance was proven by comparing the existing conditions to the proposed conditions peak flows at the project boundary as determined in the HEC-RAS model for the 2-year 24-hour event.

The first line of defense in maintaining storm water quality is to keep urban runoff from commingling with clean water through the use of Source Controls. This can be done using structural and operational measures at the pollutant source. At this level of analysis, source control measures are not included however, measures may be specified at the improvement plan level of design and implemented with construction.

Potential structural measures may include covering of trash receptacles and using efficient irrigation to reduce overspray. Operational measures may include using good housekeeping measures to minimize the generation of pollutants, make stormwater pollution prevention measures a part of standard operating procedures, and employee training programs.

Storm water runoff into local creeks could introduce pollutants and could cause hydromodification, which would be mitigated by implementing various LID features including trees, soil amendments, disconnected impervious areas, vegetated swales, and bioretention. These LID measures not only treat runoff through natural physical and biological treatment processes but also reduce the amount of runoff through infiltration and evapotranspiration. This will keep developed flows from degrading downstream creek systems due to erosion; while, at the same time, capture and remove urban pollutants from runoff flows from the developed areas prior to discharging the treated flows from the site.

The proposed project would also incorporate tree plantings throughout the site. Trees, at a minimum, decrease storm water runoff volume, reduce amount of pollutants to reach downstream, are aesthetically pleasing, as well as have a cooling effect through shade and evapotranspiration.

Soil quality amendments would also be added at a rate of 9 square-feet of 1-foot deep soil amendment per each tree planting, thus assisting the trees in becoming established as well as improving the soil. Additional soil amendments of 200 square-feet at 1-foot deep per rear draining lot is also proposed. Soil quality amendments improve soil infiltration rates, reduce surface runoff quantities and erosion, improve soil filtration capabilities and pollutant removal, enhance plant survival rates and health, and decrease the need for landscape irrigation and fertilization.

Disconnecting impervious areas is another technique that would be implemented with the project. This includes rooftops or other hard surfaces such as streets/parking lots or sidewalks that drain directly to pervious areas such as landscape. The rooftop disconnection is achieved through disconnected roof drains that route the rooftop flows into pervious areas. The design parameter of twice the area of impervious to pervious area is used. For the proposed project, an estimated amount of 1500 square-feet of rooftop per lot is assumed. Disconnected impervious areas

have the following benefits of decreasing runoff volume, reducing peak flow rates, and encouraging groundwater recharge.

A vegetated swale would also be implemented with this project. Vegetated swales are known to reduce peak flows, decrease total runoff volume, and trap, filter and infiltrate particulates and associated pollutants. Figure 4 shows a typical vegetated swale cross-section.

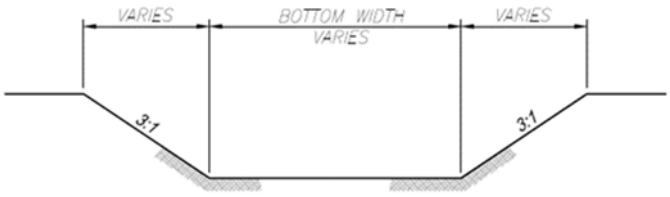


Figure 4. Typical Vegetated Swale Cross-Section

Bioretention facilities would also be constructed to protect and improve water quality by removing pollutants from stormwater runoff, reduce surface runoff volume, attenuate peak flows, improve air quality and reduce heat island effects, increase groundwater recharge, and increase biodiversity. The key design parameters for the bioretention facilities proposed herein are a 3.5-foot bottom layer of coarse gravel, covered by 3-inches of pea gravel which is then topped with 1.5-feet of bioretention soil mix. Plants are an integral part of a bioretention facility. A list of plants appropriate for planting within a bioretention facility are listed within the West Placer Storm Water Quality Design Manual in Fact Sheet TR-1. The bioretention facilities require irrigation to establish the plantings and may require irrigation to maintain the health of the plantings during the dry season.

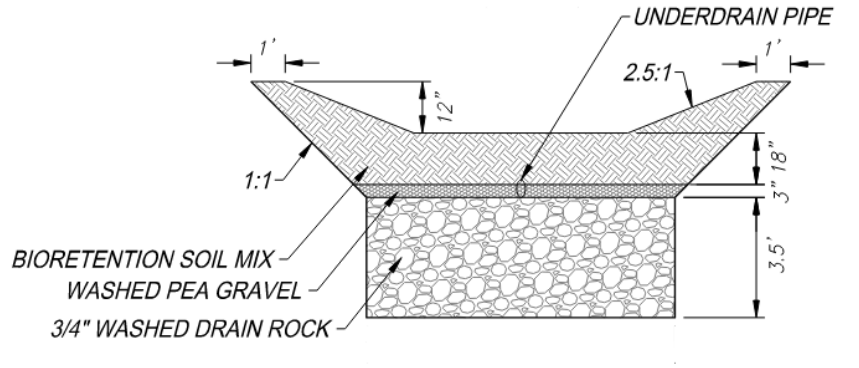


Figure 5. Typical Bioretention Cross-Section

The SWQDM Template was completed using the preliminary shed information presented herein and is included with this assessment in Appendix E. The SWQ sheds correspond to the sheds depicted on Exhibit 3. Storm water quality compliance is demonstrated on Form 3-5 with having zero water quality volume and flow in Items 5 and 6 or on Form 3-6 with having zero untreated volume in Item 14.

Hydromodification for the 2-year 24-hour event was analyzed with the inclusion of Low Impact Development (LID) measures. To meet stormwater quality requirements outlined within the West Placer Storm Water Quality Design Manual, a sufficient amount of LID features and facilities must be incorporated into a proposed site to bring the 85th percentile and 2-year event to at or below that of existing conditions. Therefore, to assess this event with LID measures applied, the percent imperviousness for proposed development within the Sierra View boundaries were reduced to

that of existing conditions. Hydrographs for the 2-year event showing compliance with hydromodification are included in Appendix C.

Existing and Proposed Project Analysis

In addition to stormwater quality and hydromodification compliance requirements, the traditional requirement for no adverse downstream impacts due to increasing peak storm drainage flows from a development must be met. Two points of discharge are identified to aid in the comparison of the existing site to the proposed site conditions. These two comparison points are at locations close to the property boundary and allow for the assessment of the mitigation measures needed to assuage the potential impacts of the proposed project on the downstream properties. Exhibits 1 and 2 show the locations of the comparison points. The comparison point locations in the proposed project conditions are in the same location as identified for the existing project conditions. This was done for ease in identifying the proposed project's potential impacts on the downstream conveyance systems.

Compliance Point 1 (CP1) is located at the southeast corner of the project and Compliance Point 2 (CP2) is located just downstream of the confluence of the major conveyance systems in the existing conditions (Exhibits 1 and 2). At these locations, the existing and proposed site conditions' peak flow rates and water surface elevations are compared. Shown in Figure 6 are the flow hydrographs for the existing and proposed conditions at the downstream limit of the model for the 100-year 24-hour event.

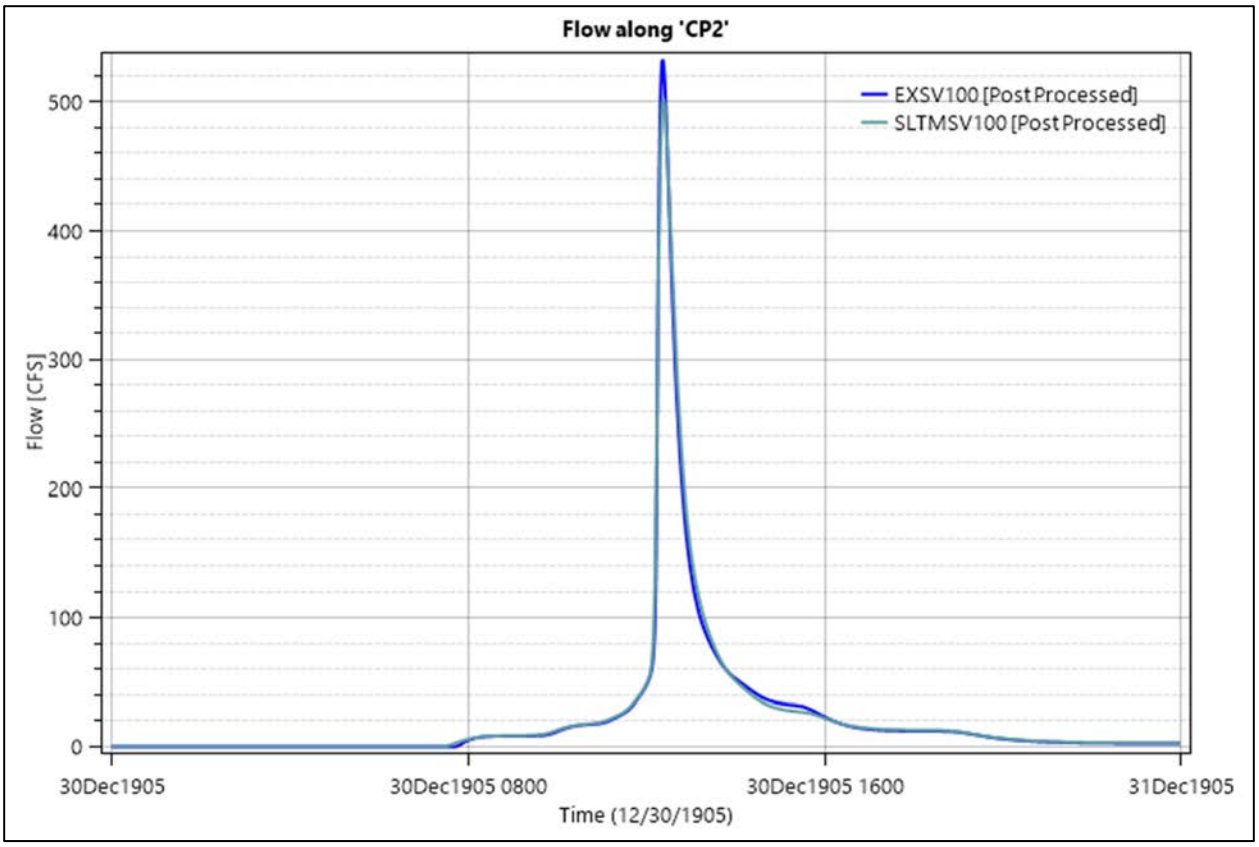


Figure 6. Flow at Downstream Limit of Model

Tables 2 and 3 summarize the comparative results for the 2-year 24-hour, 10-year 24-hour, and 100-year 24-hour events at the compliance points. As can be observed below, the post-development peak flow rates and water surface

elevations are lower than the existing conditions. Inundation boundaries for the 100-year 24-hour event for both the existing conditions and proposed conditions are shown on Exhibits 1 and 2, respectively (Appendix A). Stage and flow hydrographs for each compliance point are in Appendix C.

Table 2: Existing vs. Proposed Project Peak Flows at Comparison Points

Comparison Point	Existing Condition			Proposed Project		
	2-Year 24-Hour (cfs)	10-Year 24-Hour (cfs)	100-Year 24-Hour (cfs)	2-Year 24-Hour (cfs)	10-Year 24-Hour (cfs)	100-Year 24-Hour (cfs)
CP1	6	13	11	4	6	8
CP2	112	227	532	101	210	502

Table 3: Existing vs. Proposed Project Water Surface Elevations at Comparison Points

Comparison Point	Existing Condition			Proposed Project		
	2-Year 24-Hour (ft)	10-Year 24-Hour (ft)	100-Year 24-Hour (ft)	2-Year 24-Hour (ft)	10-Year 24-Hour (ft)	100-Year 24-Hour (ft)
CP1	163.8	165.0	165.9	162.3	163.0	164.4
CP2	149.7	150.1	151.0	149.6	150.1	150.9

Conclusion

This TM provides a preliminary assessment for the proposed project to identify potential mitigation measures for storm water quality, hydromodification, and flood control. The drainage solutions for the site include a combination of LID, bioretention, and detention basins which treat and mitigate the small increase in impervious area with the proposed project. The LID measures and bioretention facilities provide storm water quality treatment and hydromodification for the 85th percentile event and the 2-year 24-hour event, respectively. The detention basins are sized to mitigate for the peak flow increases as a result of the minimal amount of increased runoff from the proposed project.

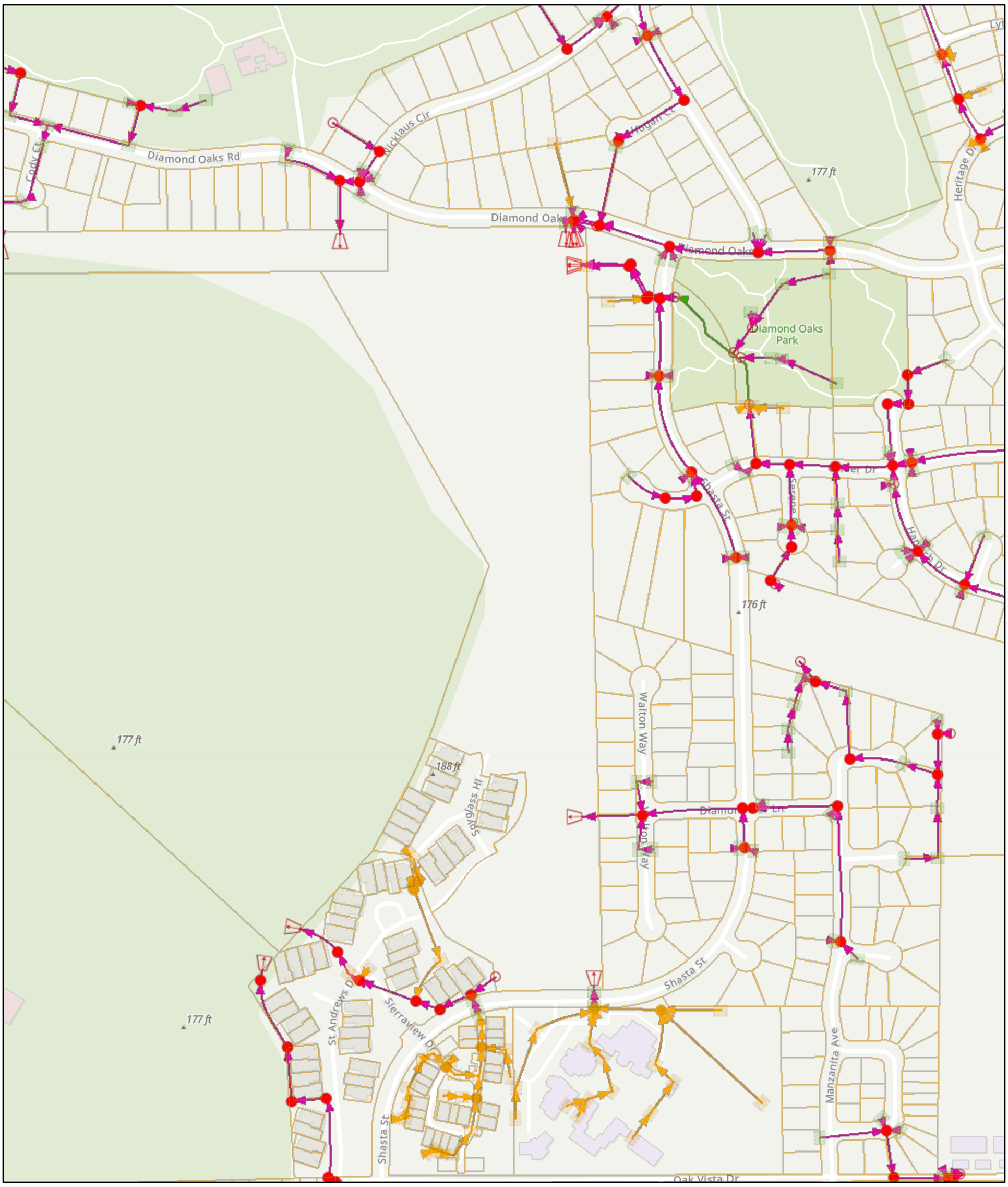
This technical memorandum establishes the existing conditions model and floodplain as well as demonstrates a developed conditions solution at a tentative map level for storm water quality, hydromodification, and flood control. Modeling of the existing conditions floodplain through the Sierra View project area results in a narrow floodplain through most of the development. Only the southernmost and northernmost portions of the property contain widened floodplain conditions. For the southern portion of the development, the proposed drainage solution includes a combination of LID, storm water quality features, and detention pond, DBC, which could treat and mitigate the proposed contributory area. At the northern end of the project the post-development drainage solutions propose LID and storm water quality measures distributed throughout the project to provide treatment prior to discharge into the open space elements of the project. For flood control and peak flow attenuation in the northern part of the project, volume created via grading adjacent to the creek system is utilized to mitigate for peak flow increases as a result of the increased runoff from development as well as reduced natural floodplain storage as a result of the development.

The analyses presented in this TM shows that the proposed site can be sufficiently conveyed, treated, and mitigated without adverse impacts upstream or downstream. It adequately details the development's drainage characteristics and is suitable for submittal to the City of Roseville.

Appendix A

Exhibits

Storm Drainage



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0 0.04 0.07 0.15 mi

0 0.05 0.1 0.2 km

Placer Parcel
- <all other values>
- Roseville

Main
- No
- Yes

Fitting
- No
- Yes

Low Impact Dev Feature
- No
- Yes

Proprietary Device
- No
- Yes

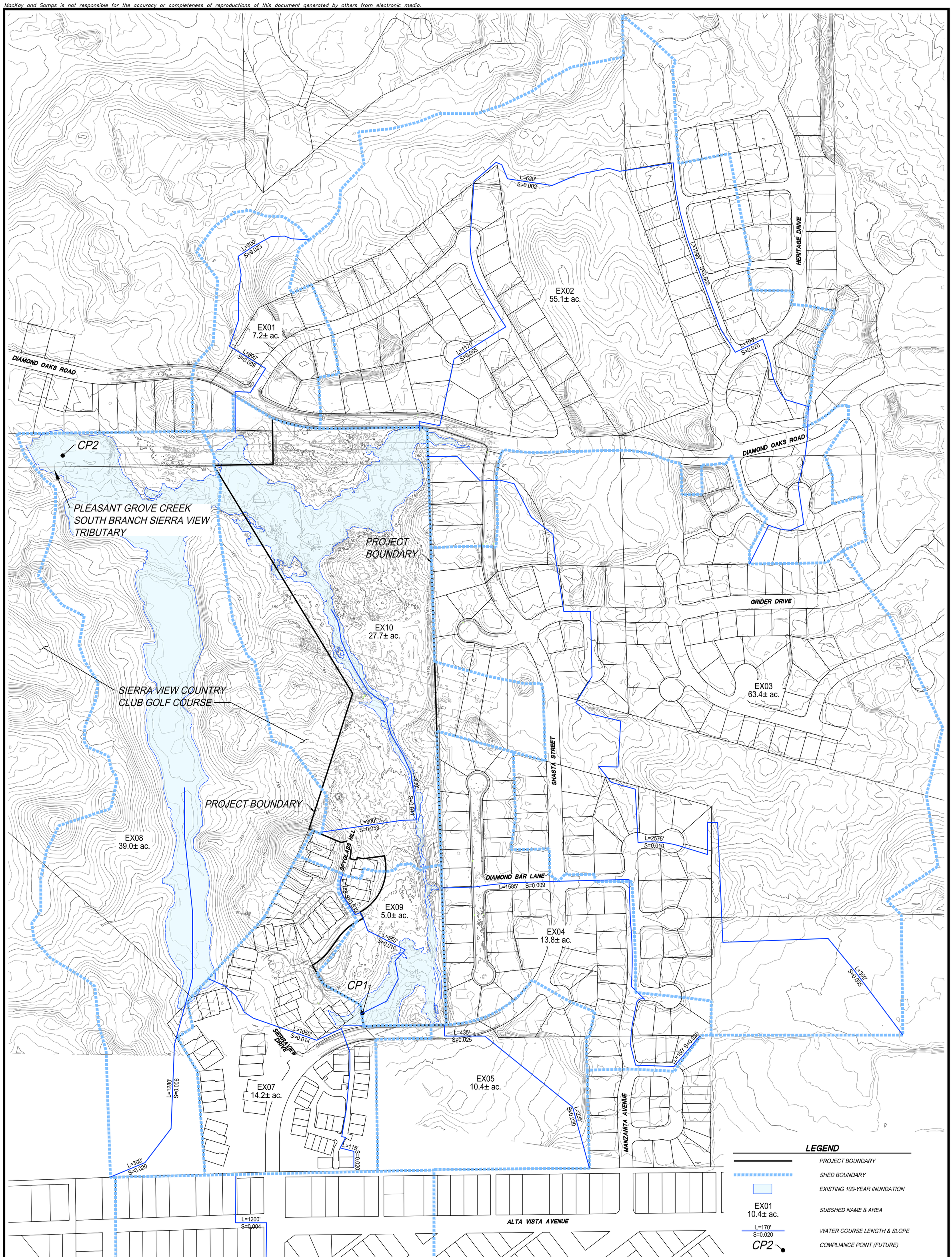
Manhole
- No
- Yes

Channel
- <all other values>
- No
- Yes

Outfall
- No
- Yes

Drainage Inlet
- No
- Yes

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
City of Roseville



LEGEND

- PROJECT BOUNDARY
- SHED BOUNDARY
- EXISTING 100-YEAR INUNDATION
- EX01 10.4± ac. — SUBSHED NAME & AREA
- L=170' S=0.020 — WATER COURSE LENGTH & SLOPE
- CP2 — COMPLIANCE POINT (FUTURE)

EXHIBIT 1

Existing Conditions

Hydrology & 100-Year Floodplain

Sierra View

City of Roseville
Scale: 1"=160'
Datum: NAVD88

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

California
July 2021
18512.000

PRELIMINARY - Subject to Revision

EX01
7.2± ac.

EX02
55.1± ac.

EX03
65.9± ac.

EX04
13.8± ac.

EX05
10.4± ac.

EX06
19.4± ac.

EX07
14.2± ac.

EX08
39.0± ac.

EX10
10.4± ac.

DEV01
0.6± ac.

DEV02
0.8± ac.

DEV03
0.3± ac.

DEV04
1.1± ac.

DEV05
4.4± ac.

DEV06
0.8± ac.

DEV07
0.9± ac.

DEV08
3.1± ac.

DEV09
9.8± ac.

DEV10
0.5± ac.

CP1

CP2

PROJECT BOUNDARY

PLEASANT GROVE CREEK
SOUTH BRANCH SIERRA VIEW
TRIBUTARY

SIERRA VIEW COUNTRY
CLUB GOLF COURSE

DIAMOND OAKS ROAD

GRIDER DRIVE

HERITAGE DRIVE

SHASTA STREET

SPYGLASS HILL

DIAMOND BAR LANE

SIERRA VIEW DRIVE

MANZANITA AVENUE

ALTA VISTA AVENUE

L=620' S=0.002
L=1895' S=0.005
L=800' S=0.009
L=1170' S=0.005
L=180' S=0.020
L=32' S=0.02
L=32' S=0.02
L=347' S=0.018
L=121' S=0.007
L=54' S=0.01
L=198' S=0.040
L=110' S=0.010
L=850' S=0.005
L=16' S=0.02
L=333' S=0.012
L=105' S=0.01
L=105' S=0.01
L=497' S=0.027
L=200' S=0.05
L=80' S=0.01
L=125' S=0.005
L=1245' S=0.001
L=2575' S=0.010
L=1585' S=0.009
L=100' S=0.02
L=35' S=0.33
L=435' S=0.025
L=215' S=0.004
L=1050' S=0.014
L=1280' S=0.006
L=300' S=0.020
L=115' S=0.020
L=235' S=0.030
L=150' S=0.020
L=1200' S=0.004
L=85' S=0.020
L=300' S=0.005

157.3
159.7
161.1
161.2

N

0 80 160 320
SCALE: 1"=160'

LEGEND

- PROJECT BOUNDARY
- SHED BOUNDARY
- PROPOSED 100-YEAR INUNDATION
- EX01 10.4± ac. — SUBSHED NAME & AREA
- L=170' S=0.020 — WATER COURSE LENGTH & SLOPE
- CP2 — COMPLIANCE POINT

EXHIBIT 2

Proposed Conditions

Hydrology & 100-Year Floodplain

Sierra View

City of Roseville
Scale: 1"=160'
Datum: NAVD88

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

California
July 2021
18512.000

PRELIMINARY - Subject to Revision

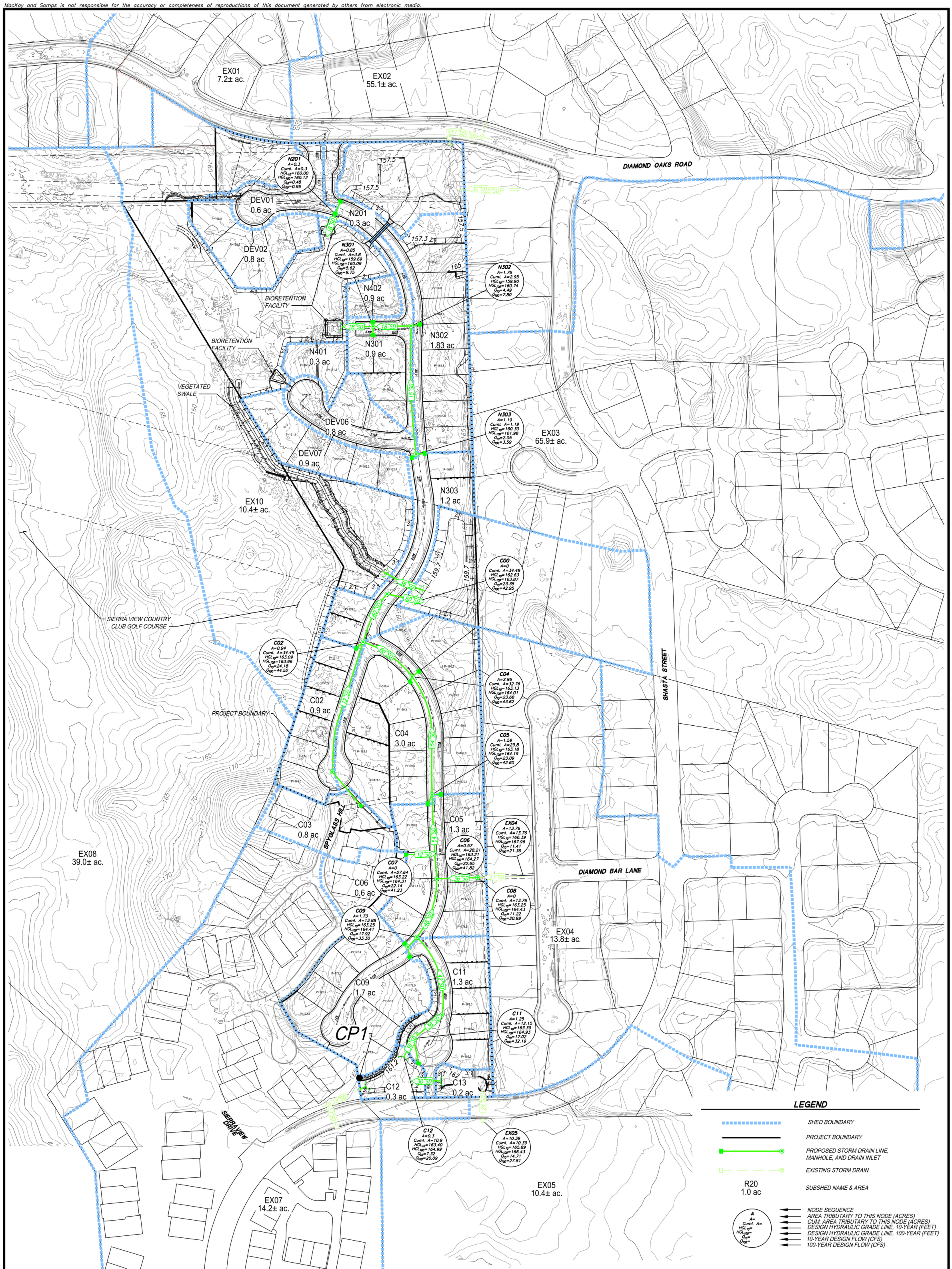


EXHIBIT 3

On-Site Proposed Conditions

Sierra View

City of Roseville
Scale: 1"=100'
Datum: NAVD88

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

California
July 2021
18512.000

PRELIMINARY - Subject to Revision

Appendix B

HEC-1

Existing Conditions

```
IDSIERRA VIEW WATERSHED MODEL
IDSIERRA VIEW HYDROLOGICAL STUDY MAY 2021
IDModel created by MacKay & Somps
IDfor City of Roseville
IDMuskingum-Cunge hydrograph method used
IDMuskingum-Cunge routing
IDNo storm centering applied
IDEXISTING CONDITIONS - TRIB TO SOUTH BRANCH PGC SIERRA VIEW TRIB
*DIAGRAM
IT     1 30DEC05       0    1440
IO     1
KK  EX02
KMSubshed EX02
* 55.13 Ac
BA0.0861
PB
* pi e=167
BF0.0861       0       0
LU     0    0.07      27
UK   100    0.02    0.11     100
RD  1895  0.0047   0.015       1    CIRC     2.5       0
RD   620  0.0016   0.045       2    TRAP      10      10
RD  1170  0.0034   0.015       3    CIRC       3
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX02  C=FLOW   F=0YR
*
KK  EX03
KMSubshed EX03
* 63.44 Ac
BA0.0991
PB
* pi e=174.5
BF0.0991       0       0
LU     0    0.07   26.04
UK   300    0.01    0.11     100
RD  1936   0.009    0.06            TRAP      10      10
RD  1631   0.001   0.015            CIRC    3.33
```

```
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX03  C=FLOW   F=0YR
*
KK JCN23
KMCOMBINE EX02-03
HC     2
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=JCN23  C=FLOW   F=0YR
*
KK  EX04
KMSubshed EX04
* 13.76 Ac
BA0.0215
PB
* pi e=176.5
BF0.0215       0       0
LU     0    0.07      40
UK   150    0.02    0.11     100
RD  1585   0.008   0.015            CIRC    1.75       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX04  C=FLOW   F=0YR
*
KK  EX10
KMSubshed EX10
* 27.69 Ac
BA0.0433
PB
* pi e=168
BF0.0433       0       0
LU     0    0.07    3.14
UK   300    0.05    0.11     100
RD   927   0.011    0.08            TRAP      10      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX10  C=FLOW   F=0YR
```

```
*
KK  JEXN
KMCOMBINE EX02-04, 10
HC     3
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=JEXN  C=FLOW   F=0YR
*
KK  EX05
KMSubshed EX05
* 10.39 Ac
BA0.0162
PB
* pi e=175
BF0.0162       0       0
LU     0    0.07      50
UK   235    0.03    0.11     100
RD   435   0.009   0.015            CIRC       2       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX05  C=FLOW   F=0YR
*
KK  EX09
KMSubshed EX09
* 5.03 Ac
BA0.0079
PB
* pi e=169.5
BF0.0079       0       0
LU     0    0.07    6.77
UK   188    0.03   0.025     100
RD   560   0.016    0.08            TRAP      15      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX09  C=FLOW   F=0YR
*
KK JCN59
KMCOMBINE EX05 AND EX09
```

```
HC     2
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=JCN59  C=FLOW   F=0YR
*
KK  EX06
KMSubshed EX06
* 19.41 Ac
BA0.0303
PB
* pi e=161
BF0.0303       0       0
LU     0    0.07      50
UK    85    0.02   0.025     100
RD  1200   0.004   0.015            CIRC     3.5       0
RD   730   0.015   0.015            CIRC     3.5
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX06  C=FLOW   F=0YR
*
KK  EX07
KMSubshed EX07
* 14.17 Ac
BA0.0221
PB
* pi e=158
BF0.0221       0       0
LU     0    0.07      50
UK   115    0.02    0.11     100
RD  1050   0.014   0.015            CIRC     3.5       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX07  C=FLOW   F=0YR
*
KK  EX08
KMSubshed EX08
* 38.97 Ac
BA0.0609
```

```
PB
* pi e=154
BF0.0609       0       0
LU     0    0.07       5
UK   300    0.02    0.11     100
RD  1280   0.006    0.08            TRAP      10      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX08  C=FLOW   F=0YR
*
KKJCNOFF
KMCOMBINE EX06-08
HC     3
*
* WRITE AS HYDROGRAPH TO DSS
ZW      B=JCNOFF  C=FLOW   F=0YR
*
KK  EX01
KMSubshed EX01
* 7.2 Ac
BA0.0113
PB
* pi e=167
BF0.0113       0       0
LU     0    0.07   25.66
UK   300    0.02    0.11     100
RD   330   0.009    0.06            TRAP      10      10
RD   470  0.0055   0.015            CIRC     1.5
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX01  C=FLOW   F=0YR
*
KK   CP2
KMCOMBINE EX06-08
HC     4
*
* WRITE AS HYDROGRAPH TO DSS
ZW         B=CP2  C=FLOW   F=0YR
```

Existing Conditions

*

ZZ

Proposed Conditions

```
IDSIERRA VIEW WATERSHED MODEL
IDSIERRA VIEW HYDROLOGICAL STUDY MARCH 2021
IDModel created by MacKay & Somps
IDfor City of Roseville
IDMuskingum-Cunge hydrograph method used
IDMuskingum-Cunge routing
IDNo storm centering applied
IDDEVELOPED CONDITIONS - TRIB TO SOUTH BRANCH PGC SIERRA VIEW TRIB
*DIAGRAM
IT     1 30DEC05       0    1440
IO     1
KK  EX01
KMSubshed EX01
* 7.2 Ac
BA0.0113
PB
* pi e=167
BF0.0113       0       0
LU     0    0.07   25.66
UK   300    0.02    0.11     100
RD   330   0.009    0.06            TRAP      10      10
RD   470  0.0055   0.015            CIRC     1.5
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX01  C=FLOW   F=0YR
*
KK  EX02
KMSubshed EX02
* 55.13 Ac
BA0.0861
PB
* pi e=167
BF0.0861       0       0
LU     0    0.07      27
UK   100    0.02    0.11     100
RD  1895  0.0047   0.015       1    CIRC     2.5       0
RD   620  0.0016   0.045       2    TRAP      10      10
RD  1170  0.0034   0.015       3    CIRC       3
```

```
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX02  C=FLOW   F=0YR
*
KK  EX03
KMSubshed EX03
* 63.44 Ac
BA0.0991
PB
* pi e=174.5
BF0.0991       0       0
LU     0    0.07   26.04
UK   300    0.01    0.11     100
RD  1936   0.009    0.06            TRAP      10      10
RD  1631   0.001   0.015            CIRC    3.33
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX03  C=FLOW   F=0YR
*
KK  EX05
KMSubshed EX05
* 10.39 Ac
BA0.0162
PB
* pi e=175
BF0.0162       0       0
LU     0    0.07      50
UK   235    0.03    0.11     100
RD   435   0.009   0.015            CIRC       2       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX05  C=FLOW   F=0YR
*
KK  EX06
KMSubshed EX06
* 19.41 Ac
BA0.0303
PB
```

```
* pi e=161
BF0.0303       0       0
LU     0    0.07      50
UK    85    0.02   0.025     100
RD  1200   0.004   0.015            CIRC     3.5       0
RD   730   0.015   0.015            CIRC     3.5
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX06  C=FLOW   F=0YR
*
KK  EX07
KMSubshed EX07
* 14.17 Ac
BA0.0221
PB
* pi e=158
BF0.0221       0       0
LU     0    0.07      50
UK   115    0.02    0.11     100
RD  1050   0.014   0.015            CIRC     3.5       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX07  C=FLOW   F=0YR
*
KK  EX08
KMSubshed EX08
* 39.01 Ac
BA 0.061
PB
* pi e=154
BF 0.061       0       0
LU     0    0.07       5
UK   300    0.02    0.11     100
RD  1280   0.006    0.08            TRAP      10      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX08  C=FLOW   F=0YR
*
```

```
KK  EX10
KMSubshed EX10
* 10.42 Ac
BA0.0163
PB
* pi e=163.5
BF0.0163       0       0
LU     0    0.07    2.32
UK   200    0.05    0.11     100
RD   705   0.014    0.08            TRAP      10      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX10  C=FLOW   F=0YR
*
KK   JEX
KMCombine Ex
HC     8
*
KK DEV01
KMSubshed DEV01
* 0.55 Ac
BA0.0009
PB
* pi e=160.5
BF0.0009       0       0
LU     0    0.07   55.91
UK    32    0.02    0.11     100
RD   347   0.018   0.015            TRAP       3       3
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV01  C=FLOW   F=0YR
*
KK DEV02
KMSubshed DEV02
* 0.84 Ac
BA0.0013
PB
* pi e=161
```

```
BF0.0013       0       0
LU     0    0.07      40
UK    90    0.01    0.24     100
RD    20    0.01    0.04            TRAP       3      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV02  C=FLOW   F=0YR
*
KK DEV03
KMSubshed DEV03
* 0.3 Ac
BA0.0005
PB
* pi e=163.6
BF0.0005       0       0
LU     0    0.07      77
UK    32    0.02    0.11     100
RD   121   0.007   0.015            TRAP       0      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV03  C=FLOW   F=0YR
*
KK DEV04
KMSubshed DEV04
* 1.12 Ac
BA0.0018
PB
* pi e=161
BF0.0018       0       0
LU     0    0.07    2.75
UK    54    0.01     0.4     100
RD   198    0.04    0.06            TRAP      20      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV04  C=FLOW   F=0YR
*
KK DEV05
KMSubshed DEV05
```

Proposed Conditions

```
* 4.36 Ac
BA0.0068
PB
* pi e=164.75
BF0.0068       0       0
LU     0    0.07   45.37
UK    80    0.01    0.24     100
RD   850   0.005   0.015            CIRC     1.5       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV05  C=FLOW   F=0YR
*
KK DEV06
KMSubshed DEV06
* 0.76 Ac
BA0.0012
PB
* pi e=160.35
BF0.0012       0       0
LU     0    0.07   57.17
UK    16    0.02    0.11     100
RD   333   0.012   0.015            TRAP       0      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV06  C=FLOW   F=0YR
*
KK DEV07
KMSubshed DEV07
* 0.85 Ac
BA0.0013
PB
* pi e=162.2
BF0.0013       0       0
LU     0    0.07      40
UK    85    0.01    0.24     100
RD    20    0.01    0.04            TRAP       3      10
*
* WRITE AS HYDROGRAPH TO DSS
```

```
ZW       B=DEV07  C=FLOW   F=0YR
*
KK DEV08
KMSubshed DEV08
* 3.14 Ac
BA0.0049
PB
* pi e=166
BF0.0049       0       0
LU     0    0.07    2.63
UK   125    0.05     0.4     100
RD   497   0.027    0.04            TRAP      10      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV08  C=FLOW   F=0YR
*
KK  JDEV
KMCombine Dev
HC     9
*
KK DEV10
KMSubshed DEV10
* 0.51 Ac
BA0.0008
PB
* pi e=164.5
BF0.0008       0       0
LU     0    0.07       5
UK    35    0.33     0.4     100
RD   215   0.004    0.04            TRAP       3      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV10  C=FLOW   F=0YR
*
KK  EX04
KMSubshed EX04
* 13.76 Ac
BA0.0215
```

Proposed Conditions

```
PB
* pi e=176.5
BF0.0215       0       0
LU     0    0.07      40
UK   150    0.02    0.11     100
RD  1585   0.008   0.015            CIRC    1.75       0
*
KK REX04
KMRoute EX04 thru DEV09
RD   952  0.0004   0.015            CIRC       3
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=REX04  C=FLOW   F=0YR
*
KK DEV09
KMSubshed DEV09
* 9.83 Ac
BA0.0154
PB
* pi e=170.3
BF0.0154       0       0
LU     0    0.07   42.16
UK   100    0.02    0.24     100
RD  1245   0.001   0.015            CIRC       5       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV09  C=FLOW   F=0YR
*
KK  JCNC
KMEX04 and DEV09
HC     2
*
KK RJCNC
KMRoute EX04 and DEV09
RD   113  0.0208   0.015            CIRC       5
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=RJCNC  C=FLOW   F=0YR
```

Proposed Conditions

*

ZZ

Proposed Conditions LID

```
IDSIERRA VIEW WATERSHED MODEL
IDSIERRA VIEW HYDROLOGICAL STUDY MARCH 2021
IDModel created by MacKay & Somps
IDfor City of Roseville
IDMuskingum-Cunge hydrograph method used
IDMuskingum-Cunge routing
IDNo storm centering applied
IDDEVELOPED CONDITIONS - TRIB TO SOUTH BRANCH PGC SIERRA VIEW TRIB
*DIAGRAM
IT     1 30DEC05       0    1440
IO     1
KK  EX01
KMSubshed EX01
* 7.2 Ac
BA0.0113
PB
* pi e=167
BF0.0113       0       0
LU     0    0.07   25.66
UK   300    0.02    0.11     100
RD   330   0.009    0.06            TRAP      10      10
RD   470  0.0055   0.015            CIRC     1.5
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX01  C=FLOW   F=0YR
*
KK  EX02
KMSubshed EX02
* 55.13 Ac
BA0.0861
PB
* pi e=167
BF0.0861       0       0
LU     0    0.07      27
UK   100    0.02    0.11     100
RD  1895  0.0047   0.015       1    CIRC     2.5       0
RD   620  0.0016   0.045       2    TRAP      10      10
RD  1170  0.0034   0.015       3    CIRC       3
```

```
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX02  C=FLOW   F=0YR
*
KK  EX03
KMSubshed EX03
* 63.44 Ac
BA0.0991
PB
* pi e=174.5
BF0.0991       0       0
LU     0    0.07   26.04
UK   300    0.01    0.11     100
RD  1936   0.009    0.06            TRAP      10      10
RD  1631   0.001   0.015            CIRC    3.33
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX03  C=FLOW   F=0YR
*
KK  EX05
KMSubshed EX05
* 10.39 Ac
BA0.0162
PB
* pi e=175
BF0.0162       0       0
LU     0    0.07      50
UK   235    0.03    0.11     100
RD   435   0.009   0.015            CIRC       2       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX05  C=FLOW   F=0YR
*
KK  EX06
KMSubshed EX06
* 19.41 Ac
BA0.0303
PB
```

```
* pi e=161
BF0.0303       0       0
LU     0    0.07      50
UK    85    0.02   0.025     100
RD  1200   0.004   0.015            CIRC     3.5       0
RD   730   0.015   0.015            CIRC     3.5
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX06  C=FLOW   F=0YR
*
KK  EX07
KMSubshed EX07
* 14.17 Ac
BA0.0221
PB
* pi e=158
BF0.0221       0       0
LU     0    0.07      50
UK   115    0.02    0.11     100
RD  1050   0.014   0.015            CIRC     3.5       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX07  C=FLOW   F=0YR
*
KK  EX08
KMSubshed EX08
* 39.01 Ac
BA 0.061
PB
* pi e=154
BF 0.061       0       0
LU     0    0.07       5
UK   300    0.02    0.11     100
RD  1280   0.006    0.08            TRAP      10      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX08  C=FLOW   F=0YR
*
```

```
KK  EX10
KMSubshed EX10
* 10.42 Ac
BA0.0163
PB
* pi e=163.5
BF0.0163       0       0
LU     0    0.07    2.32
UK   200    0.05    0.11     100
RD   705   0.014    0.08            TRAP      10      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW        B=EX10  C=FLOW   F=0YR
*
KK   JEX
KMCombine Ex
HC     8
*
KK DEV01
KMSubshed DEV01
* 0.55 Ac
BA0.0009
PB
* pi e=160.5
BF0.0009       0       0
LU     0    0.07       2
UK    32    0.02    0.11     100
RD   347   0.018   0.015            TRAP       3       3
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV01  C=FLOW   F=0YR
*
KK DEV02
KMSubshed DEV02
* 0.84 Ac
BA0.0013
PB
* pi e=161
```

```
BF0.0013       0       0
LU     0    0.07       2
UK    90    0.01    0.24     100
RD    20    0.01    0.04            TRAP       3      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV02  C=FLOW   F=0YR
*
KK DEV03
KMSubshed DEV03
* 0.3 Ac
BA0.0005
PB
* pi e=163.6
BF0.0005       0       0
LU     0    0.07       2
UK    32    0.02    0.11     100
RD   121   0.007   0.015            TRAP       0      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV03  C=FLOW   F=0YR
*
KK DEV04
KMSubshed DEV04
* 1.12 Ac
BA0.0018
PB
* pi e=161
BF0.0018       0       0
LU     0    0.07       2
UK    54    0.01     0.4     100
RD   198    0.04    0.06            TRAP      20      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV04  C=FLOW   F=0YR
*
KK DEV05
KMSubshed DEV05
```

```
* 4.36 Ac
BA0.0068
PB
* pi e=164.75
BF0.0068       0       0
LU     0    0.07       2
UK    80    0.01    0.24     100
RD   850   0.005   0.015            CIRC     1.5       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV05  C=FLOW   F=0YR
*
KK DEV06
KMSubshed DEV06
* 0.76 Ac
BA0.0012
PB
* pi e=160.35
BF0.0012       0       0
LU     0    0.07       2
UK    16    0.02    0.11     100
RD   333   0.012   0.015            TRAP       0      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV06  C=FLOW   F=0YR
*
KK DEV07
KMSubshed DEV07
* 0.85 Ac
BA0.0013
PB
* pi e=162.2
BF0.0013       0       0
LU     0    0.07       2
UK    85    0.01    0.24     100
RD    20    0.01    0.04            TRAP       3      10
*
* WRITE AS HYDROGRAPH TO DSS
```

```
ZW       B=DEV07  C=FLOW   F=0YR
*
KK DEV08
KMSubshed DEV08
* 3.14 Ac
BA0.0049
PB
* pi e=166
BF0.0049       0       0
LU     0    0.07       2
UK   125    0.05     0.4     100
RD   497   0.027    0.04            TRAP      10      10
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV08  C=FLOW   F=0YR
*
KK  JDEV
KMCombine Dev
HC     9
*
KK DEV10
KMSubshed DEV10
* 0.51 Ac
BA0.0008
PB
* pi e=164.5
BF0.0008       0       0
LU     0    0.07       5
UK    15    0.33     0.4     100
RD   215   0.004    0.04            TRAP       3      20
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV10  C=FLOW   F=0YR
*
KK  EX04
KMSubshed EX04
* 13.76 Ac
BA0.0215
```

```
PB
* pi e=176.5
BF0.0215       0       0
LU     0    0.07      40
UK   150    0.02    0.11     100
RD  1585   0.008   0.015            CIRC    1.75       0
*
KK REX04
KMRoute EX04 thru DEV09
RD   952  0.0004   0.015            CIRC       3
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=REX04  C=FLOW   F=0YR
*
KK DEV09
KMSubshed DEV09
* 9.83 Ac
BA0.0154
PB
* pi e=170.3
BF0.0154       0       0
LU     0    0.07    8.64
UK   100    0.02    0.24     100
RD  1245   0.001   0.015            CIRC       5       0
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=DEV09  C=FLOW   F=0YR
*
KK  JCNC
KMEX04 and DEV09
HC     2
*
KK RJCNC
KMRoute EX04 and DEV09
RD   113  0.0208   0.015            CIRC       5
*
* WRITE AS HYDROGRAPH TO DSS
ZW       B=RJCNC  C=FLOW   F=0YR
```

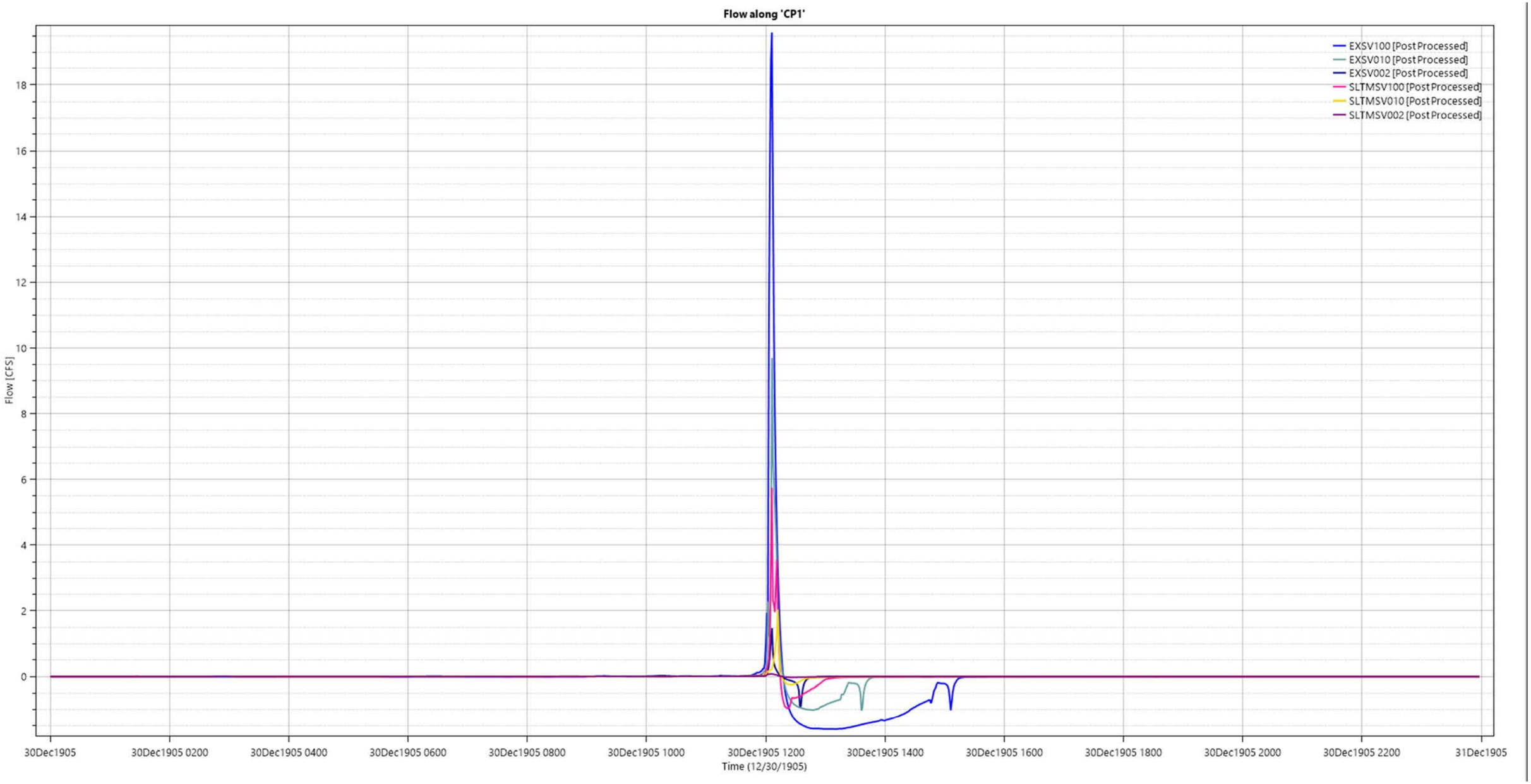
Proposed Conditions LID

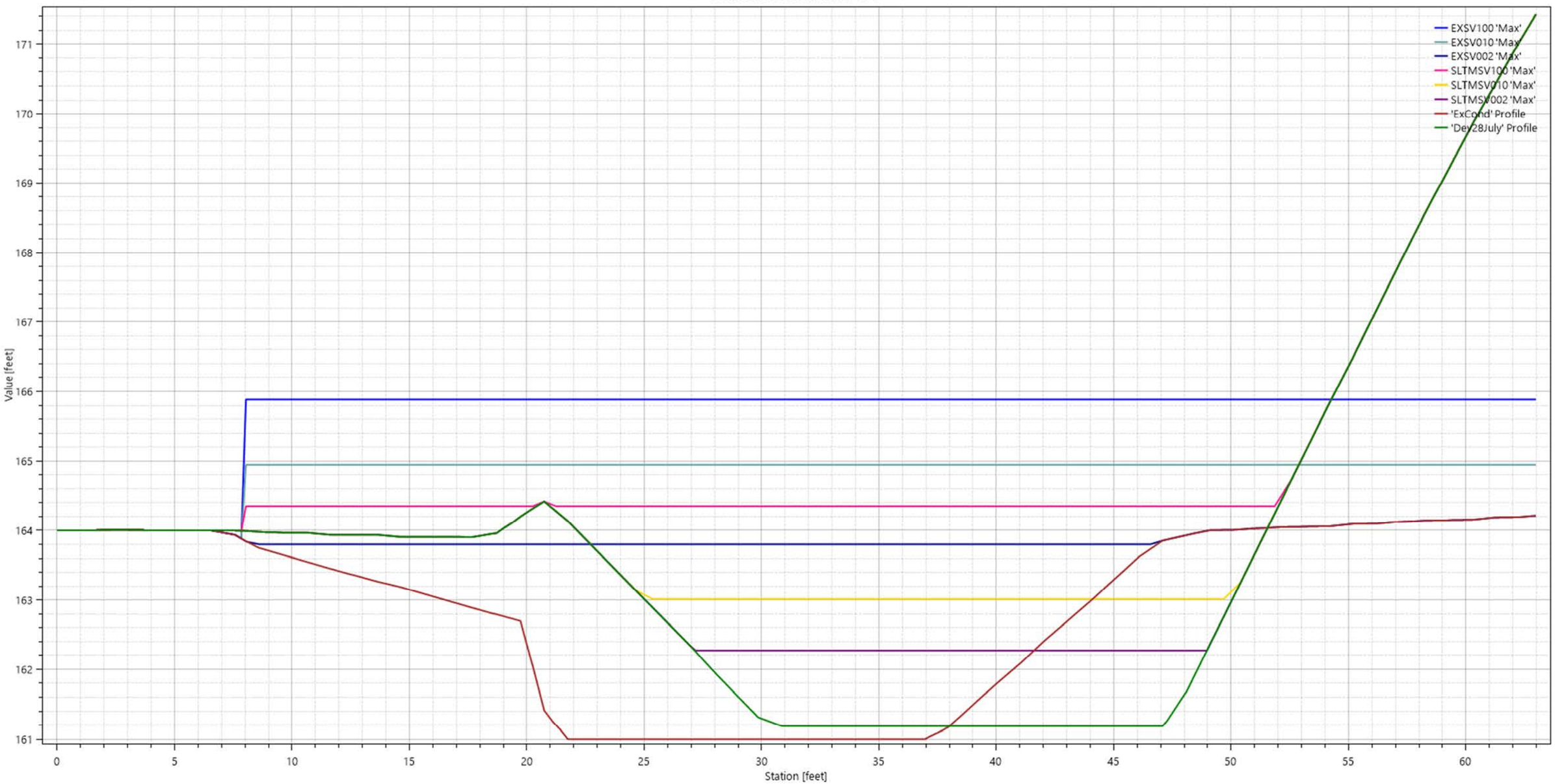
*

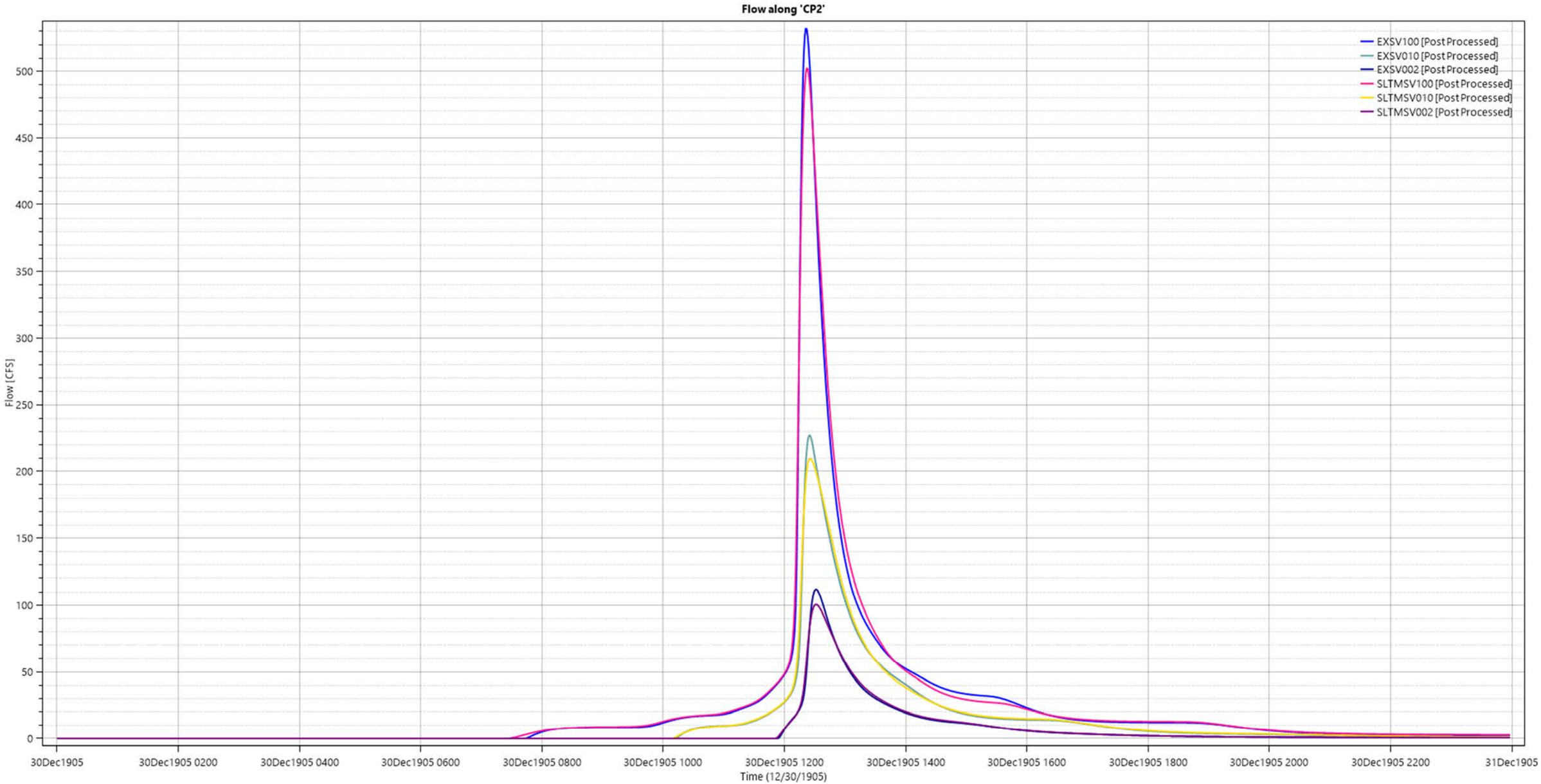
ZZ

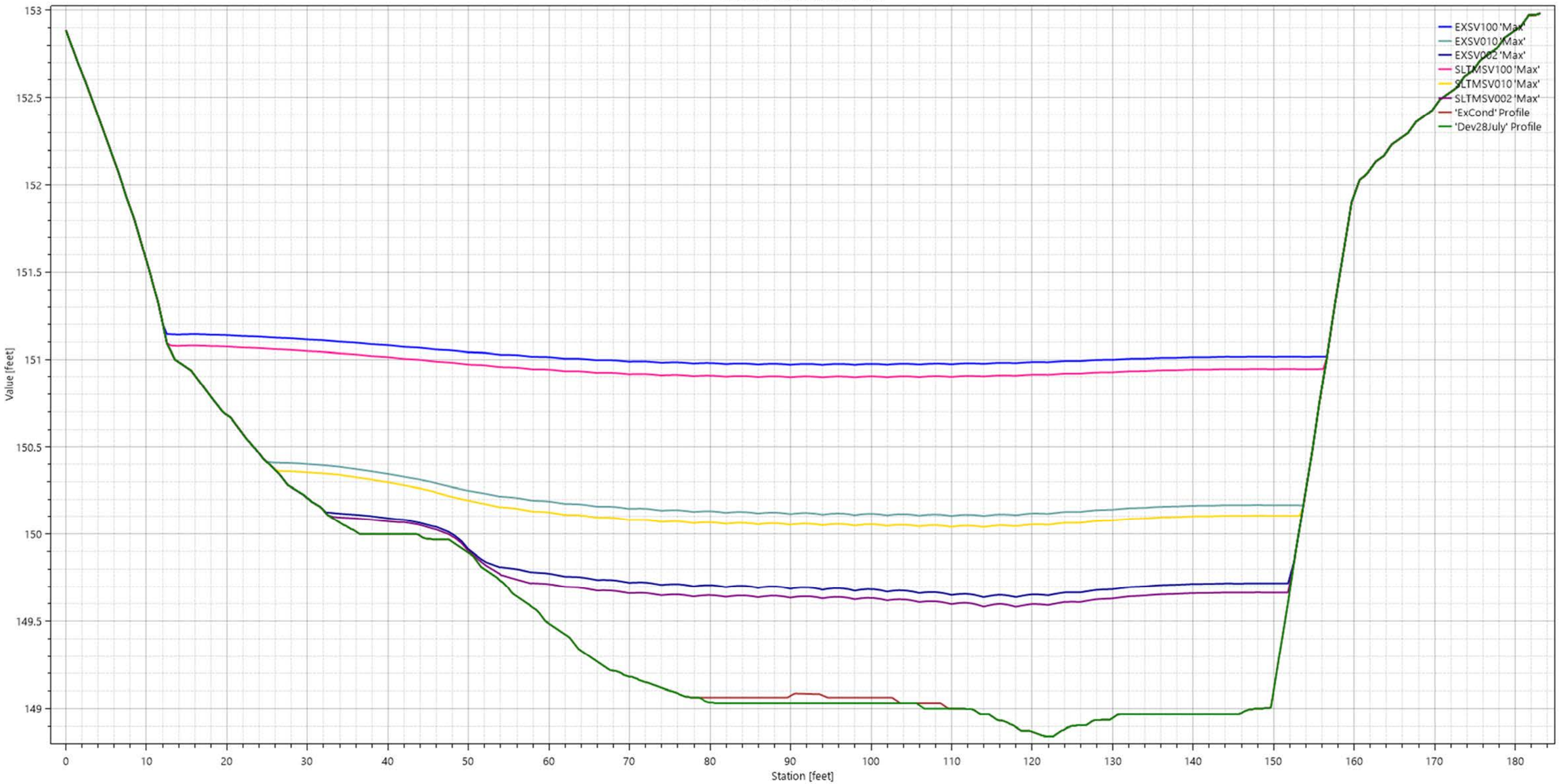
Appendix C

HEC-RAS

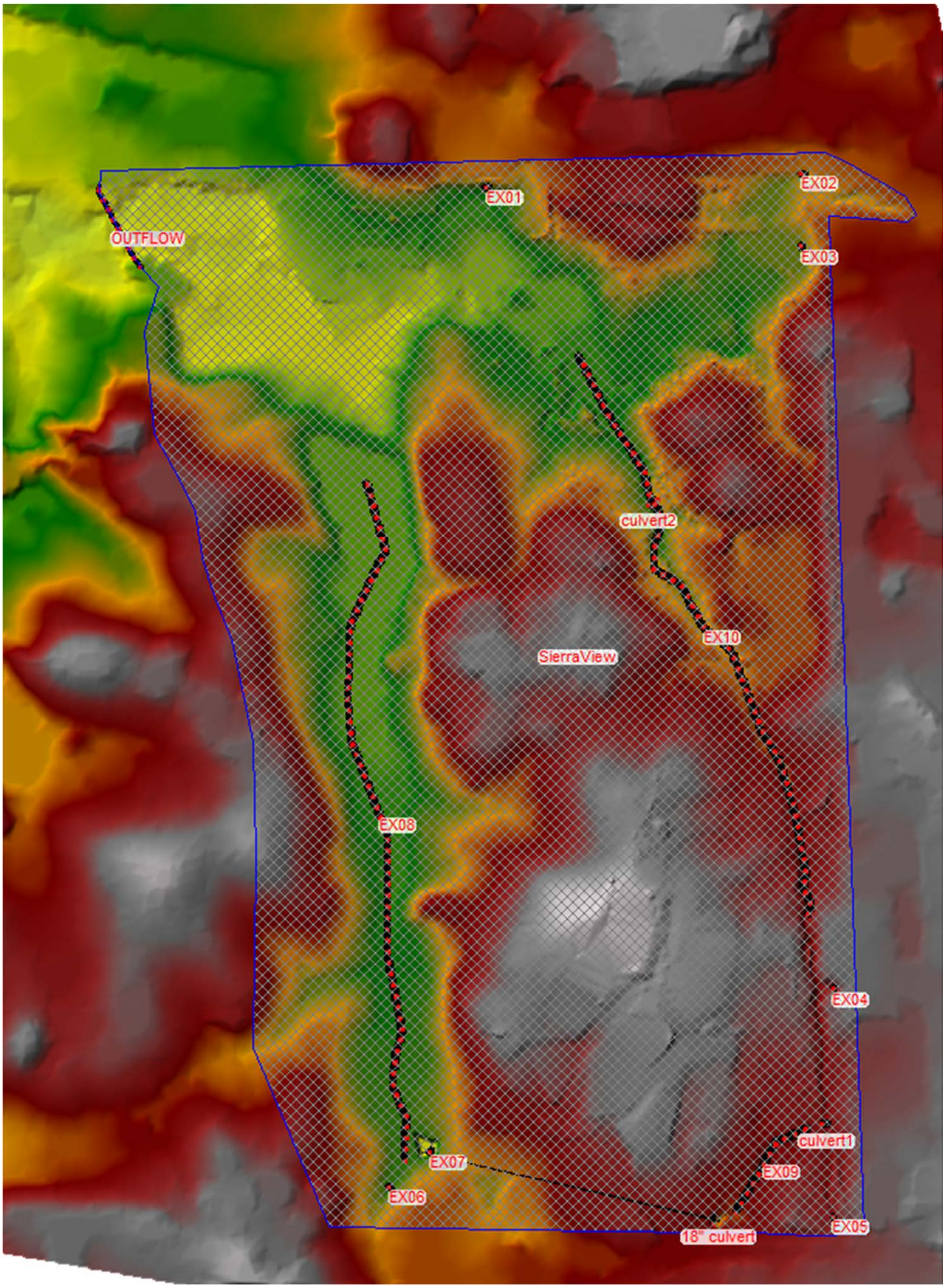

Flow along 'CP1'
EXSV100 [Post Processed]
EXSV010 [Post Processed]
EXSV002 [Post Processed]
SLTMSV100 [Post Processed]
SLTMSV010 [Post Processed]
SLTMSV002 [Post Processed]
Flow [CFS]
18
16
14
12
10
8
6
4
2
0
30Dec1905
30Dec1905 0200
30Dec1905 0400
30Dec1905 0600
30Dec1905 0800
30Dec1905 1000
30Dec1905 1200
30Dec1905 1400
30Dec1905 1600
30Dec1905 1800
30Dec1905 2000
30Dec1905 2200
31Dec1905
Time (12/30/1905)


Water Surface Elevation on 'CP1'
EXSV100 'Max'
EXSV010 'Max'
EXSV002 'Max'
SLTMSV100 'Max'
SLTMSV010 'Max'
SLTMSV002 'Max'
'ExCond' Profile
'Dev28July' Profile
Value [feet]
171
170
169
168
167
166
165
164
163
162
161
0
5
10
15
20
25
30
35
40
45
50
55
60
Station [feet]

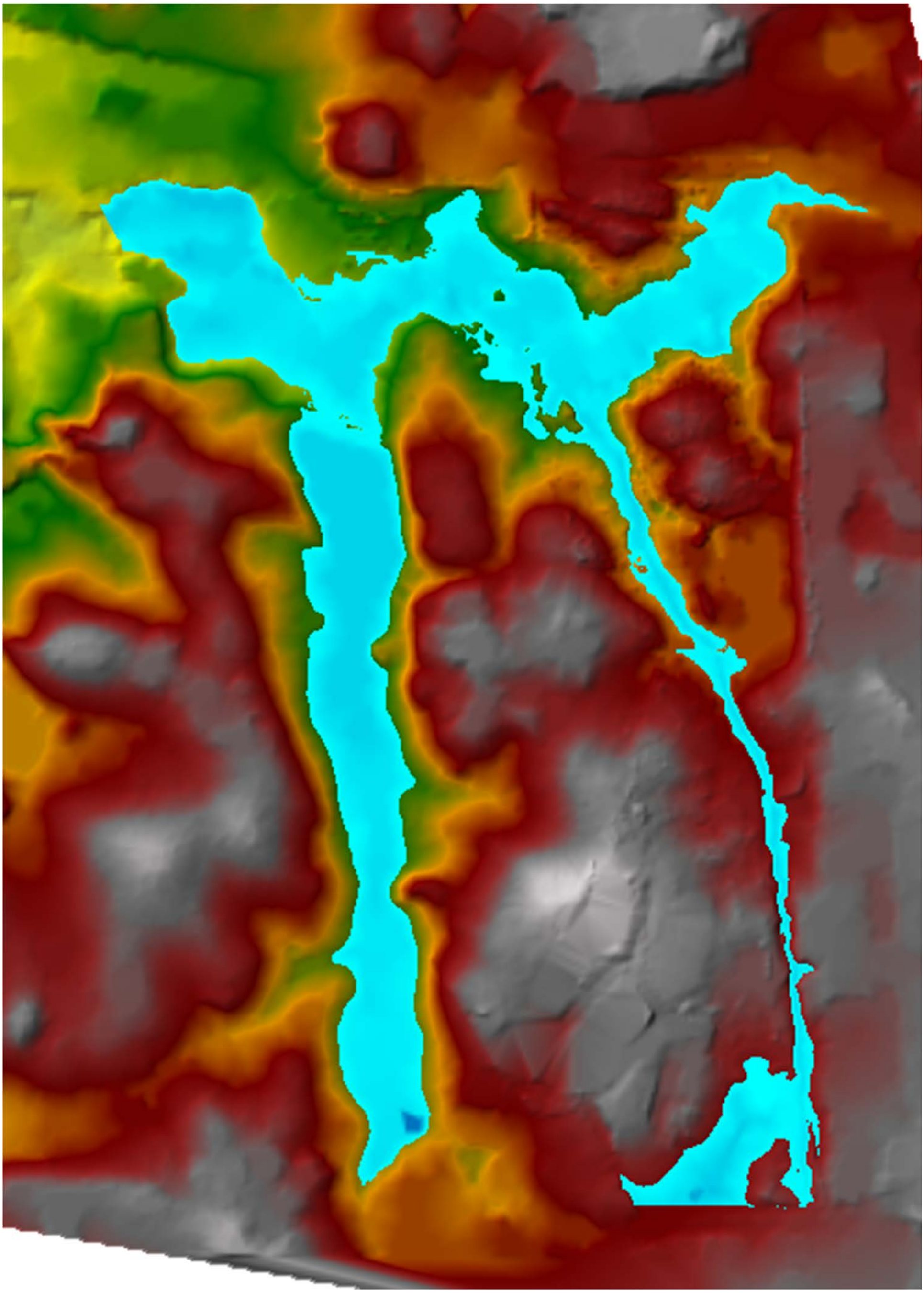

Flow along 'CP2'
EXSV100 [Post Processed]
EXSV010 [Post Processed]
EXSV002 [Post Processed]
SLTMSV100 [Post Processed]
SLTMSV010 [Post Processed]
SLTMSV002 [Post Processed]
Flow [CFS]
500
450
400
350
300
250
200
150
100
50
0
30Dec1905
30Dec1905 0200
30Dec1905 0400
30Dec1905 0600
30Dec1905 0800
30Dec1905 1000
30Dec1905 1200
30Dec1905 1400
30Dec1905 1600
30Dec1905 1800
30Dec1905 2000
30Dec1905 2200
31Dec1905
Time (12/30/1905)


Water Surface Elevation on 'CP2'
EXSV100 'Max'
EXSV010 'Max'
EXSV002 'Max'
SLTMSV100 'Max'
SLTMSV010 'Max'
SLTMSV002 'Max'
'ExCond' Profile
'Dev28July' Profile
Value [feet]
153
152.5
152
151.5
151
150.5
150
149.5
149
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
Station [feet]

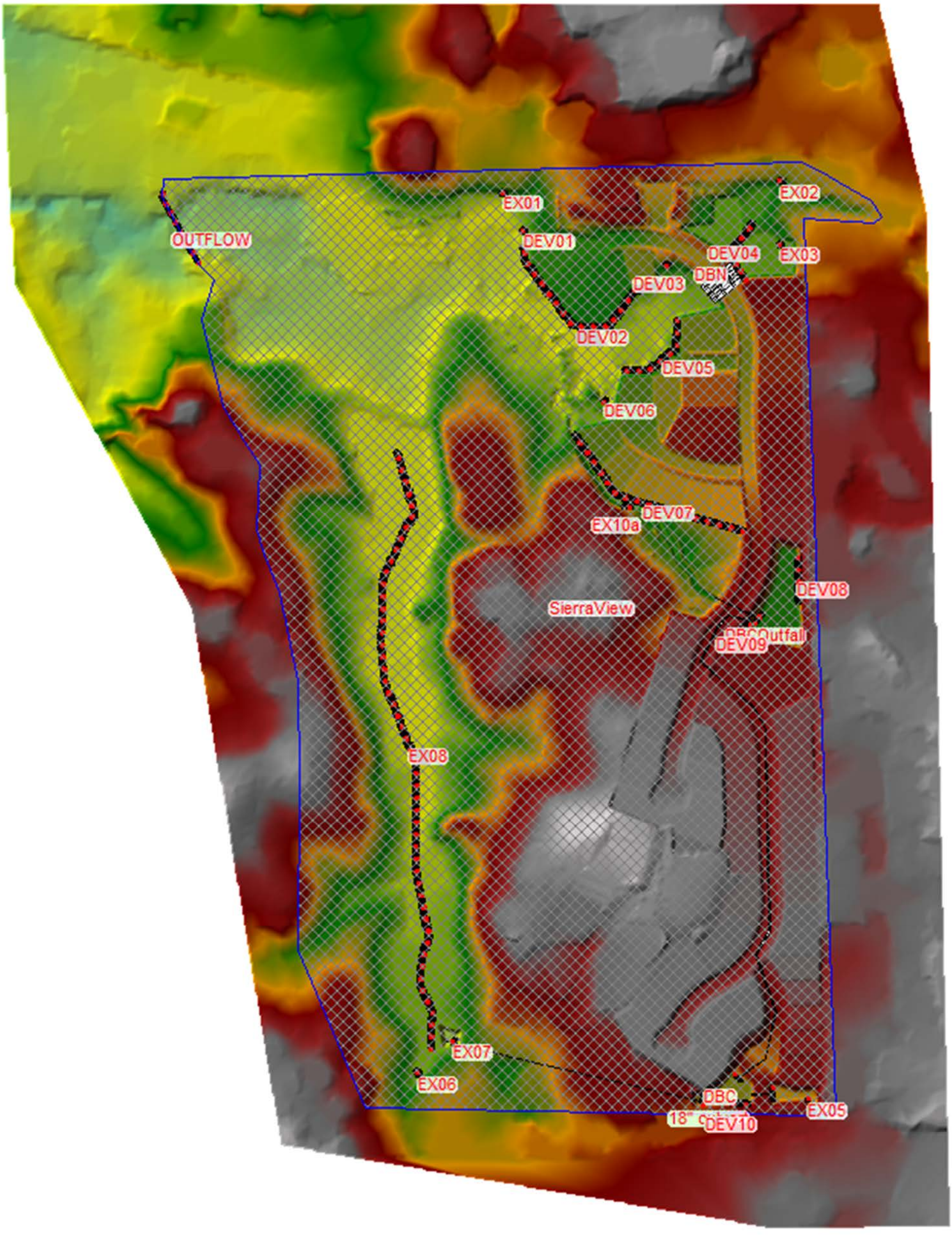
Existing Conditions HEC-RAS Model



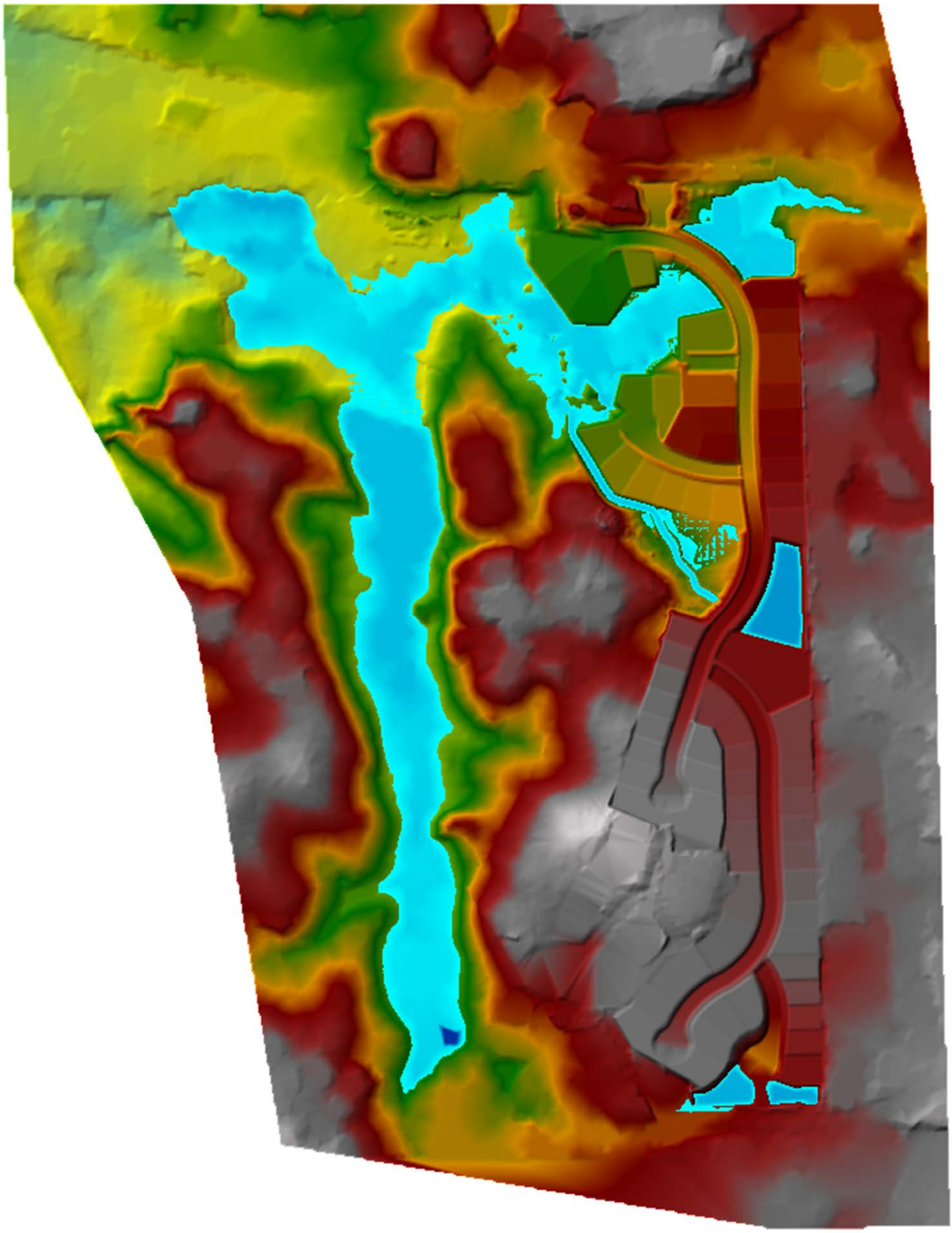
Existing Conditions 100-Year Floodplain



Proposed Conditions HEC-RAS Model



Proposed Conditions 100-Year Floodplain



Appendix D

Pipe Analysis

Land Use

Shed/ SubShed	Area	Percent Impervious Calculator			Percent Impervious Values				
		Land Use Description	Soils Group	Composite % Imperv.	Highway, Street, Parking	Resdntl. 6-8 du/ac, MDR, School, PQP	Resdntl. 4-6 du/ac, LDR	Resdntl. <0.2 du/ac, Recreation, Landscape, Park	Open space Grassland, Ag
	AC		D Soils %		85%	50%	40%	5%	2%
Pipe Subsheds (Ultimate built-out conditions)									
EX04	13.76	Residential	100%	40.0%			13.76		
EX05	10.39	Residential, School	100%	50.0%		10.39			
C03	0.79	Existing Residential (4.5 lots)	100%	50%		0.79			
C06	0.57	Existing Residential (2.5 lots)	100%	50%		0.57			
Total Offsite	**25.51**	**Composite % Imperv.:**		**45%**					
C02	0.94	Proposed Residential	100%	40%			0.94		
C04	2.96	Proposed Residential	100%	40%			2.96		
C05	1.59	Proposed Residential	100%	40%			1.59		
C09	1.73	Proposed Residential	100%	40%			1.73		
C11	1.25	Proposed Residential	100%	46%	0.17		1.08		
C12	0.30	graded area	100%	5%				0.30	
C13	0.21	graded area	100%	5%				0.21	
Total C Sheds	**8.98**	**Composite % Imperv.:**		**39%**					
N201	0.30	Roadway and overbank	100%	77%	0.27			0.03	
Total N2 Sheds	**0.30**	**Composite % Imperv.:**		**77%**					
N301	0.85	Proposed Residential, roadway, and landscape	100%	51.6%	0.22		0.63		
N302	1.76	Proposed Residential	100%	40.0%			1.76		
N303	1.19	Proposed Residential, roadway, and landscape	100%	51.3%	0.30		0.89		
Total N3 Sheds	**3.80**	**Composite % Imperv.:**		**46%**					

Peak Discharge and Pipe Calculations
10-Year

Nodes		Hydrologic Data & Results																	Hydraulic Data & Results													
U/S Node Name	D/S Node Name	Area (ac)	Cumul. Area (ac)	10-yr Adjusted 'Qp' (Eqn 10-5) (cfs)	Composite % Imperv.	Cumul. Composite % Imperv.	10-yr Unit Peak Runoff 'q' (Eqn 10-3) (cfs/ac)	10-yr Cumul. Response Time 'tr' (min)	10-yr Response Time 't$_r$' (min)	Surface Collector Response Time 't$_{tc}$' (Eqn 5-4) (min)	Manning's 'V' (ft/s) (Eqn 7-35a Brater & King)	Surface Collector Flow Length (ft)	Surface Collector Slope 's' (ft/ft)	Surface Collector Roughness Factor (n value)	10-yr Overland Response Time 't$_{to}$' (Eqn 10-2) (min)	Average Overland Flow Length (ft)	Overland Slope 's' (ft/ft)	Overland Roughness Factor (n value)	Total Infiltration (cfs)	Pipe Length (ft)	Calculated Pipe Diameter (ft) (Eqn 6-26e Brater & King)	Design Pipe Diameter (ft)	Pipe Slope (ft/ft)	Design Pipe Capacity (cfs) (Eqn 6-26b Brater & King)	Design Velocity (ft/s) (Eqn 6-26a Brater & King)	Pipe Response Time[1] (L/V/60s) (min)	10-yr HGL Slope (ft/ft) (Eqn 6-26d Brater & King)	Calc'd U/S HGL (ft)	HGL$_{10}$	U/S Rim/Grate Elevation (ft)	U/S Pipe Invert Elevation (ft)	D/S Pipe Invert Elevation (ft)	Freeboard (ft)	10-Year Depth in Pipe (ft)
C01	C00	0.00	34.49	23.35	0%	48%	0.79	36.12	0.00	0.00	0.00				0.00				3.74	65	3.90	5.00	0.0004	45.13	2.3	0.47	0.0001	162.64	162.99	168.1	159.03	159.00	5.11	3.96
C02	C01	0.94	34.49	24.18	40%	48%	0.81	34.88	10.14	2.89	2.02	350	0.019	0.015	7.25	90	0.020	0.240	3.74	171	3.96	5.00	0.0004	45.13	2.3	1.24	0.0001	163.00	163.09	168.8	159.10	159.03	5.71	3.99
C03	C02	0.79	0.79	1.64	50%	50%	2.18	7.08	7.08	0.80	2.93	140	0.040	0.015	6.28	100	0.020	0.170	0.08	312	1.02	1.00	0.0026	1.57	2.0	2.59	0.0028	163.97	163.97	173.4	159.92	159.10	9.43	1.02
C04	C02	2.96	32.76	23.68	40%	48%	0.83	33.86	11.21	3.71	2.02	450	0.019	0.015	7.49	95	0.020	0.240	3.54	141	3.93	5.00	0.0004	45.13	2.3	1.02	0.0001	163.11	163.13	168.1	159.16	159.10	4.97	3.97
C05	C04	1.59	29.80	23.09	40%	49%	0.88	31.64	13.88	6.15	0.87	320	0.004	0.015	7.73	100	0.020	0.240	3.17	285	3.89	4.50	0.0004	34.07	2.1	2.22	0.0002	163.18	163.18	169.2	159.28	159.16	6.02	3.84
C06	C05	0.57	28.21	22.65	50%	50%	0.91	30.57	8.96	2.31	0.87	120	0.004	0.024	6.65	110	0.020	0.170	2.97	138	3.86	4.50	0.0004	34.07	2.1	1.07	0.0002	163.21	163.21	169.8	159.34	159.28	6.59	3.82
C07	C06	0.00	27.64	22.14	0%	43%	0.92	30.12	0.00	0.00	0.00				0.00				3.29	58	3.83	4.50	0.0004	34.07	2.1	0.45	0.0002	163.22	163.22	171.0	159.37	159.34	7.78	3.79
C08	C07	0.00	13.76	11.22	0%	40%	0.94	29.35	0.00	0.00	0.00				0.00				1.73	93	2.75	3.00	0.0006	14.15	2.0	0.77	0.0004	163.25	163.25	170.0	159.43	159.37	6.75	2.69
EX04	C08	13.76	13.76	11.41	40%	40%	0.95	28.86	28.86	19.00	1.39	1585	0.009	0.015	9.86	150	0.020	0.240	1.73	146	1.72	1.75	0.0076	11.97	5.0	0.49	0.0069	164.26	166.39	168.20	164.72	163.61	1.81	1.67
C09	C07	1.73	13.88	17.92	40%	47%	1.40	17.08	12.63	4.91	1.04	305	0.005	0.015	7.73	100	0.020	0.240	1.55	147	3.39	4.00	0.0005	27.83	2.2	1.11	0.0002	163.25	163.25	170.4	159.45	159.37	7.15	3.36
C10	C09	0.00	12.15	16.59	0%	48%	1.48	15.45	0.00	0.00	0.00				0.00				1.34	199	3.29	3.50	0.0005	19.49	2.0	1.64	0.0004	163.32	163.32	167.4	159.55	159.45	4.08	3.21
C11	C10	1.25	12.15	17.02	46%	48%	1.51	14.74	10.44	2.71	1.97	320	0.018	0.015	7.73	100	0.020	0.240	1.34	85	3.21	3.00	0.0006	14.15	2.0	0.71	0.0009	163.39	163.39	165.7	159.61	159.55	2.31	3.21
C12	C11	0.30	10.90	7.32	5%	48%	1.51	14.68	2.77	1.61	1.04	100	0.005	0.024	1.16	15	0.250	0.240	1.19	49	1.11	3.00	0.0324	104.09	14.7	0.06	0.0002	163.40	163.40	164.5	161.20	159.61	1.10	1.46
C12	Ex18in	0.30	10.90	7.98	5%	48%	1.51	14.68	2.77	1.61	1.04	100	0.005	0.024	1.16	15	0.250	0.240	1.19	675	1.34	1.50	0.0141	10.80	6.1	1.84	0.0077	163.40	163.40	164.5	161.2	151.7	1.10	1.31
C13	C12	0.21	10.60	14.96	5%	49%	1.52	14.60	2.77	1.61	1.04	100	0.005	0.024	1.16	15	0.250	0.240	1.13	48	1.64	2.50	0.0167	45.88	9.4	0.09	0.0018	163.49	163.75	166.2	162.00	161.20	2.45	1.75
EX05	C13	10.39	10.39	14.71	50%	50%	1.52	14.55	14.55	3.13	2.32	435	0.025	0.015	11.43	235	0.030	0.240	1.09	15	1.84	2.00	0.0087	18.25	5.8	0.04	0.0056	163.84	165.89	167.52	164.09	163.96	1.63	1.80
N201	N200	0.30	0.30	0.48	77%	77%	1.65	12.38	12.38	4.65	0.87	242	0.004	0.015	7.73	100	0.020	0.240	0.01	31	0.70	1.50	0.0016	3.64	2.1	0.25	0.0000	158.40	160.00	163.50	159.15	159.10	3.50	0.85
N301	N300	0.85	3.80	5.62	52%	46%	1.59	13.26	12.01	4.28	1.04	266	0.005	0.015	7.73	100	0.020	0.240	0.43	73	1.77	1.50	0.0016	3.64	2.1	0.59	0.0038	157.43	159.69	162.80	157.92	157.80	3.11	1.77
N302	N301	1.76	2.95	4.49	40%	45%	1.64	12.54	12.52	4.79	1.05	301	0.005	0.015	7.73	100	0.020	0.240	0.34	89	1.62	1.50	0.0016	3.64	2.1	0.72	0.0024	159.90	159.90	163.10	158.07	157.92	3.20	1.62
N303	N302	1.19	1.19	2.05	51%	51%	1.83	10.09	10.09	5.94	1.23	437	0.007	0.015	4.15	50	0.020	0.170	0.12	300	1.16	1.25	0.0020	2.50	2.0	2.45	0.0013	160.30	160.30	164.90	158.92	158.32	4.60	1.13

			Tailwater:
C00		162.63	162.63
Ex18in		158.21	158.21
N200		158.40	158.40
N300		157.15	157.15

Notes:
1. Collector Response time for the pipes is based upon a pipe flowing full.

Constants used in calculations:	
Infiltration Rate for D soils:	0.12
Infiltration Factor 'Fi' (cfs/acre)	0.21
Average Elevation:	167

Peak Discharge and Pipe Calculations
100-Year

Nodes		Hydrologic Data & Results																	Hydraulic Data & Results															
U/S Node Name	D/S Node Name	Area (ac)	Cumul. Area (ac)	100-yr Adjusted 'Qp' (Eqn 10-5) (cfs)	Composite % Imperv.	Cumul. Composite % Imperv.	100-yr Unit Peak Runoff 'q' (Eqn 10-3) (cfs/ac)	100-yr Cumul. Response Time 'tr' (min)	100-yr Response Time 'tr' (min)	Surface Collector Response Time 't_{tc}' (Eqn 5-4) (min)	Manning's 'V' (ft/s) (Eqn 7-35a Brater & King)	Surface Collector Flow Length (ft)	Surface Collector Slope 's' (ft/ft)	Surface Collector Roughness Factor (n value)	100-yr Overland Response Time 't_{to}' (Eqn 10-2) (min)	Average Overland Flow Length (ft)	Overland Slope 's' (ft/ft)	Overland Roughness Factor (n value)	Total Infiltration (cfs)	Pipe Length (ft)	Calculated Pipe Diameter (ft) (Eqn 6-26e Brater & King)	Design Pipe Diameter (ft)	Pipe Slope (ft/ft)	Design Pipe Capacity (cfs) (Eqn 6-26b Brater & King)	Design Velocity (ft/s) (Eqn 6-26a Brater & King)	Pipe Response Time[1] (L/V/60s) (min)	100-yr HGL Slope (ft/ft) (Eqn 6-26d Brater & King)	Calc'd U/S HGL (ft)	HGL_{100}	U/S Rim/Grate Elevation (ft)	U/S Pipe Invert Elevation (ft)	D/S Pipe Invert Elevation (ft)	Freeboard (ft)	100-Year Depth in Pipe (ft)
C01	C00	0	34.49	42.95	0%	48%	1.35	33.16	0.00	0.00	0.0	0	0.0000	0	0.00	0	0.00	0	3.74	65	4.91	5.00	0.0004	45.13	2.30	0.47	0.0004	163.89	163.89	168.1	159.03	159.00	4.21	4.78
C02	C01	0.94	34.49	44.52	40%	48%	1.40	31.92	7.97	2.89	2.0	350	0.0190	0.015	5.08	90	0.02	0.24	3.74	171	4.97	5.00	0.0004	45.13	2.30	1.24	0.0004	163.96	163.96	168.8	159.10	159.03	4.84	4.86
C03	C02	0.79	0.79	3.13	50%	50%	4.07	5.19	5.19	0.80	2.9	140	0.0400	0.015	4.40	100	0.02	0.17	0.08	312	1.29	1.00	0.0026	1.57	2.01	2.59	0.0103	167.17	167.17	173.4	159.92	159.10	6.23	1.29
C04	C02	2.96	32.76	43.62	40%	48%	1.44	30.90	8.96	3.71	2.0	450	0.0190	0.015	5.25	95	0.02	0.24	3.54	141	4.94	5.00	0.0004	45.13	2.30	1.02	0.0004	164.01	164.01	168.1	159.16	159.10	4.09	4.81
C05	C04	1.59	29.8	42.60	40%	49%	1.54	28.69	11.56	6.15	0.9	320	0.0035	0.015	5.41	100	0.02	0.24	3.17	285	4.89	4.50	0.0004	34.07	2.14	2.22	0.0006	164.19	164.19	169.2	159.28	159.16	5.01	4.89
C06	C05	0.57	28.21	41.82	50%	50%	1.59	27.62	6.96	2.31	0.9	120	0.0035	0.024	4.66	110	0.02	0.17	2.97	138	4.86	4.50	0.0004	34.07	2.14	1.07	0.0006	164.27	164.27	169.8	159.34	159.28	5.53	4.86
C07	C06	0	27.64	41.23	0%	43%	1.61	27.16	0.00	0.00	0.0	0	0.0000	0	0.00	0	0.00	0	3.29	58	4.83	4.50	0.0004	34.07	2.14	0.45	0.0006	164.31	164.31	171.0	159.37	159.34	6.69	4.83
C08	C07	0	13.76	20.99	0%	40%	1.65	26.39	0.00	0.00	0.0	0	0.0000	0	0.00	0	0.00	0	1.73	93	3.48	3.00	0.0006	14.15	2.00	0.77	0.0013	164.43	164.43	170.0	159.43	159.37	5.57	3.48
EX04	C08	13.76	13.76	21.36	40%	40%	1.68	25.90	25.90	19.00	1.4	1585	0.0090	0.015	6.90	150	0.02	0.24	1.73	146	2.17	1.75	0.0076	11.97	4.98	0.49	0.0242	167.96	167.96	168.2	164.72	163.61	0.24	2.17
C09	C07	1.73	13.88	33.30	40%	47%	2.51	13.65	10.32	4.91	1.0	305	0.0050	0.015	5.41	100	0.02	0.24	1.55	147	4.28	4.00	0.0005	27.83	2.22	1.11	0.0007	164.41	164.41	170.4	159.45	159.37	5.99	4.28
C10	C09	0	12.15	31.19	0%	48%	2.68	12.02	0.00	0.00	0.0	0	0.0000	0	0.00	0	0.00	0	1.34	199	4.17	3.50	0.0005	19.49	2.03	1.64	0.0013	164.67	164.67	167.4	159.55	159.45	2.73	4.17
C11	C10	1.25	12.15	32.19	46%	48%	2.76	11.31	8.12	2.71	2.0	320	0.0180	0.015	5.41	100	0.02	0.24	1.34	85	4.08	3.00	0.0006	14.15	2.00	0.71	0.0031	164.93	164.93	165.7	159.61	159.55	0.77	4.08
C12	C11	0.3	10.9	20.09	5%	48%	2.77	11.26	2.42	1.61	1.0	100	0.0050	0.024	0.81	15	0.25	0.24	1.19	49	1.62	3.00	0.0324	104.09	14.74	0.06	0.0012	164.99	164.99	164.5	161.20	159.61	0.00	1.85
C12	Ex18in	0.3	10.9	8.87	5%	48%	2.77	11.26	2.42	1.61	1.0	100	0.0050	0.024	0.81	15	0.25	0.24	1.19	675	1.39	1.50	0.0141	10.80	6.11	1.84	0.0095	164.99	164.99	164.5	161.20	151.70	0.00	1.36
C13	C12	0.21	10.6	28.30	5%	49%	2.78	11.17	2.42	1.61	1.0	100	0.0050	0.024	0.81	15	0.25	0.24	1.13	48	2.09	2.50	0.0167	45.88	9.35	0.09	0.0063	165.29	165.29	166.2	162.00	161.20	0.91	2.08
EX05	C13	10.39	10.39	27.81	50%	50%	2.78	11.13	11.13	3.13	2.3	435	0.0250	0.015	8.00	235	0.03	0.24	1.09	15	2.34	2.00	0.0087	18.25	5.81	0.04	0.0201	165.60	166.43	167.5	164.09	163.96	1.09	2.34
N201	N200	0.3	0.3	0.86	77%	77%	2.93	10.06	10.06	4.65	0.9	242	0.0035	0.015	5.41	100	0.02	0.24	0.01	31	0.87	1.50	0.0016	3.64	2.06	0.25	0.0001	158.50	160.12	163.5	159.15	159.10	3.38	0.97
N301	N300	0.85	3.8	9.75	52%	46%	2.68	12.01	9.69	4.28	1.0	266	0.0050	0.015	5.41	100	0.02	0.24	0.43	73	2.17	1.50	0.0016	3.64	2.06	0.59	0.0115	158.35	160.09	162.8	157.92	157.80	2.71	2.17
N302	N301	1.76	2.95	7.80	40%	45%	2.76	11.29	10.20	4.79	1.0	301	0.0051	0.015	5.41	100	0.02	0.24	0.34	89	2.00	1.50	0.0016	3.64	2.06	0.72	0.0073	160.74	160.74	163.1	158.07	157.92	2.36	2.00
N303	N302	1.19	1.19	3.59	51%	51%	3.12	8.84	8.84	5.94	1.2	437	0.0070	0.015	2.90	50	0.02	0.17	0.12	300	1.43	1.25	0.0020	2.50	2.04	2.45	0.0041	161.98	161.98	164.9	158.92	158.32	2.92	1.43
																												Tailwater	Tailwater:					

C00		163.87	163.87
Ex18in		158.59	158.59
N200		158.50	158.50
N300		157.51	157.51

Notes:
1. Collector Response time for the pipes is based upon a pipe flowing full.

Constants used in calculations:	
Infiltration Rate for D soils:	0.12
Infiltration Factor 'Fi' (cfs/acre)	0.21
Average Elevation:	167

Appendix E

Storm Water Quality Template

Post-Construction
Storm Water Quality Plan

For:

Sierra View Small Lot Tentative Map
City of Roseville

Prepared by:

MacKay & Somps Civil Engineering, Inc.
1025 Creekside Ridge Dr., Ste 150
Roseville, CA 95678
916-773-1189

Preparation Date: July 2021

Approval Date:_____

Section 1 General Project Information

The undersigned owner of the subject property, is responsible for the implementation of the provisions of this plan, including ongoing operations and maintenance (O&M), consistent with the requirements of the West Placer Storm Water Quality Design Manual and the State of California Phase II Small MS4 General Permit (Order No: 2013-0001-DWQ). If the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement the SWQP.

For all Regulated Projects (As identified in Form 1-2 below), the undersigned owner hereby grants access to all representatives of the Jurisdictional Agency for the sole purpose of performing O&M inspections of the installed treatment system(s) and hydromodification control(s) if any.

A copy of the final signed and fully approved SWQP shall be available on the subject site for the duration of construction and then stored with the project approval documentation and improvement plans in perpetuity.

Form 1-1 Project Identification and Owner's Certification

Project Site Address:	360 Diamond Oaks Road	
Owner Name:	Ryan O'Keefe	
Title		
Company	WP Sierra View, LLC	
Address	1420 Rocky Ridge Drive, Suite 265	
City, State, Zip Code	Roseville, CA 95661	
Email	ryan@wpcommunities.com	
Telephone #	916-990-1071	
Signature	Date	
Engineer:*	Steve Smith	PE Stamp* (Required for all Regulated Projects)
Title	Project Manager	
Company	MacKay & Somps Civil Engineering, Inc.	
Address	1025 Creekside Ridge Dr., Ste 150	
City, State, Zip Code	Roseville, CA 95678	
Email	ssmith@msce.com	
Telephone #	916-773-1189	
Signature		
Brief Description of Project: (Attach additional sheets as necessary)	+/- 23.1 acre project	

* Not required for Small Projects as determined in Form 1-2 below. Project owners are responsible for ensuring that all storm water facilities are designed by an appropriately licensed and qualified professional.

Form 1-2 Project Category	
Development Category (Select all that apply)	
[1]**Small Project** – All projects, except LUPs, that create and/or replace between 2,500-5,000 ft^2 of impervious surface or detached single family homes that create and/or replace 2,500 ft^2 or more of impervious surface and are not part of a larger plan of development.	
[2]Enter total new and/or replaced impervious surface (ft^2)	
[3]**Regulated Project** – All projects that create and/or replace 5,000 ft^2 or more of impervious surface.	X
[4]**Regulated Redevelopment Project** with equal to, or greater than 50 percent increase in impervious area	X
[5]**Regulated Redevelopment Project** with less than 50 percent increase in impervious area	
[6]Enter total pre-project impervious surface (ft^2)	0
[7]Enter total new and/or replaced impervious surface (ft^2)	310,252
[8]**Regulated Road or linear underground/overhead project (LUP)** creating 5,000 ft^2 or more of newly constructed contiguous impervious surface.	
[9]Enter total new and/or replaced impervious surface (ft^2)	
[10]**Regulated Hydromodification Management Project** – Regulated projects that create and/or replace 1 acre or more of impervious surface. A project that does not increase impervious surface area over the pre-project condition is not a hydromodification management project.	X
[11]Enter total new and/or replaced impervious surface (ft^2)	310,252

Section 3 Regulated Projects

Section 3 forms are to be completed for all Regulated Projects.

Form 3-1 Site Location and Hydrologic Features

Site coordinates: *Take GPS measurement at approximate center of site*	[1] Latitude	[2] Longitude	[3] Elevation (ft. above sea level)	[4] 85th Percentile, 24 Hour Design Storm Depth (in):
	38°45'51"N	121°16'58"W	167	0.9

[5] Receiving waters *Name of stream, lake or other downstream waterbody to which the site runoff eventually drains*	Pleasant Grove Creek South Branch Sierra View Tributary
[6] 303(d) listed pollutants of concern *Refer to State Water Resources Control Board website* www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired	Bifenthrin, cyfluthrin, cypermethrin, toxicity
[7] Is Project going to be phased? *If yes, ensure that the SWQP evaluates each phase with distinct DMAs, requiring LID BMPs to address runoff at time of completion*	No

[8] *Use this form to show a conceptual schematic depicting DMAs and conveyance features connecting DMAs to the site outlet(s). An example is provided below that can be modified for the proposed project or a drawing clearly showing DMAs and flow routing may be attached.*

Example only
Modify for project specific SWQP
Use separate sheet if necessary

See Exhibit

Form 3-2 Site Assessment and Layout Documentation

	Has this Item been considered in the Site Layout and depicted in the Site Plan?	
	Yes	**Not Applicable (Include brief explanation)**
Define the development envelope and protected areas, identifying areas that are most suitable for development areas to be left undisturbed.	X	
Concentrate development on portions of the site with less permeable soils and preserve areas that can promote infiltration.		N/A, all of the site is on Type D soils
Limit overall impervious coverage of the site with paving and roofs.		N/A, conforming to local impervious coverage ordinances
Set back development from creeks, wetlands, and riparian habitats.	X	
Preserve significant trees.	X	
Conform site layout along natural landforms.	X	
Avoid excessive grading and disturbance of vegetation and soils.		N/A, site has previously been disturbed
Replicate the site's natural drainage patterns.	X	
Detain and retain runoff throughout the site.	X	

Attach a Site Plan that incorporates the applicable considerations above. Ensure that the following items are included in the Site Plan:

Site Boundary
Soil types and areal extents, test pit and infiltration test locations
Topographic data with 1 ft. contours
Existing natural hydrologic features (depressions, watercourses, wetlands, riparian corridors)
Environmentally sensitive areas and areas to be preserved.
Proposed locations and footprints of improvements creating new, or replaced, impervious surfaces
Potential pollutant sources and locations
Entire site divided into separate DMAs with unique identifiers
Existing and proposed site drainage network with flow directions and site run-on and discharge locations
Proposed design features and surface treatments used to minimize imperviousness and reduce runoff
Proposed locations and footprints of treatment and hydromodification management facilities
Design features for managing authorized non-stormwater discharges
Areas of soil and/or groundwater contamination
Existing utilities and easements
Maintenance areas

Form 3-3 Source Control Measures

Potential Pollutant Generating Activity or Source	Check One		Describe the source control measures to be implemented for each potential pollutant generating activity or source present on the project as listed in Appendix C and in the CASQA Fact Sheets. Include any special features, materials, or methods of construction that will be used.
	Present	Not Applicable	
Accidental spills or leaks	☐	☑	
Interior floor drains	☐	☑	
Parking/storage areas and maintenance	☐	☑	
Indoor and structural pest control	☐	☑	
Pools, spas, ponds, decorative fountains, and other water features	☐	☑	
Landscape/outdoor pesticide use	☑	☐	All manufacturer recommendations and regulations will be followed. Minimum amounts will be used.
Restaurants, grocery stores, and other food service operations	☐	☑	
Refuse areas	☐	☑	
Industrial Processes	☐	☑	
Outdoor storage of equipment or materials	☐	☑	
Vehicle and equipment cleaning	☐	☑	
Vehicle and equipment repair and maintenance	☐	☑	
Fuel dispensing areas	☐	☑	
Loading docks	☐	☑	
Fire sprinkler test water	☐	☑	
Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources	☐	☑	
Unauthorized non-storm water discharges	☐	☑	
Building and grounds maintenance	☐	☑	

The source control measures identified in this table shall be designed consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment[1], or from another equivalent manual.

[1] California Stormwater BMP Handbook New Development and Redevelopment. California Stormwater Quality Association (CASQA). January 2003.

Form 3-4 Runoff Reduction Calculator for Site Design Measures on Regulated Projects

[1]DMA ID No.			DEV01		DEV02		N201	
Site Design Measure	**Runoff Reduction Parameters**			**Runoff Reduction (ft3)**		**Runoff Reduction (ft3)**		**Runoff Reduction (ft3)**
[2] Adjacent/On-Site Stream Setbacks and Buffers	A_{imp} (ft^2)	*impervious drainage area*	-	-	-	-	-	-
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.81		0.8		0.8	
[3] Soil Quality Improvement and Maintenance	A_{pond} (ft^2)	*ponding area*	0	-	0	372.8	0	-
	D_{pond} (ft)	*ponding depth*						
	A_{sa} (ft^2)	*soil amendment area*	0		1065		0	
	D_{sa} (ft)	*depth of amended soil*	1.0		1.0		1.0	
	n	*porosity of amended soil*	0.35		0.35		0.35	
[4] Tree Planting and Preservation	n_e	*number of new evergreen trees*	0	-	5	110.4	0	-
	n_d	*number of new deciduous trees*	0		5		0	
	A_{tc} (ft^2)	*canopy area of existing trees to remain on the property*						
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8	
[5] Rooftop and Impervious Area Disconnection	A_{imp} (ft^2)	*impervious drainage area*	-	-	7,500	506.3	-	-
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8	
[6] Porous Pavement	A_{res} (ft^2)	*area of gravel storage layer*		-	0	-		-
	D_{res} (ft)	*depth of gravel storage layer*						
	n_{agg}	*porosity of aggregate*						
	C	*efficiency factor*						
[7] Vegetated Swales	A_{imp} (ft^2)	*impervious drainage area*		-		-		-
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8	
[8] Rain Barrels and Cisterns	N	*number of rain barrels and/or cisterns*		-	0	-	0	-
	V_a (ft^3)	*volume of each rain barrel and/or cistern*						
[9] Do all Site Design Measures meet the design requirements outlined in the Fact Sheets?					Yes	X	No	
[10] Total Volume Reduction (ft^3)			-		989		-	
[11] Effective Treated Impervious Area (ft^2)			-		14,657		-	

Form 3-4 Runoff Reduction Calculator for Site Design Measures on Regulated Projects

[1]DMA ID No.			N3 Sheds		N4 Sheds		DEV06	
Site Design Measure	**Runoff Reduction Parameters**			**Runoff Reduction (ft3)**		**Runoff Reduction (ft3)**		**Runoff Reduction (ft3)**
[2] Adjacent/On-Site Stream Setbacks and Buffers	A_{imp} (ft^2)	*impervious drainage area*		-		-		-
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8	
[3] Soil Quality Improvement and Maintenance	A_{pond} (ft^2)	*ponding area*		107.1		172		9
	D_{pond} (ft)	*ponding depth*						
	A_{sa} (ft^2)	*soil amendment area*	306		492		27	
	D_{sa} (ft)	*depth of amended soil*	1.0		1.0		1.0	
	n	*porosity of amended soil*	0.35		0.35		0.35	
[4] Tree Planting and Preservation	n_e	*number of new evergreen trees*	17	375.2	4	88	2	33
	n_d	*number of new deciduous trees*	17		4		2	
	A_{tc} (ft^2)	*canopy area of existing trees to remain on the property*						
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8	
[5] Rooftop and Impervious Area Disconnection	A_{imp} (ft^2)	*impervious drainage area*	25,500	1,721.3	6,000	405	2,250	152
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8	
[6] Porous Pavement	A_{res} (ft^2)	*area of gravel storage layer*		-		-		-
	D_{res} (ft)	*depth of gravel storage layer*						
	n_{agg}	*porosity of aggregate*						
	C	*efficiency factor*						
[7] Vegetated Swales	A_{imp} (ft^2)	*impervious drainage area*		-		-		-
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8	
[8] Rain Barrels and Cisterns	N	*number of rain barrels and/or cisterns*		-		-		-
	V_a (ft^3)	*volume of each rain barrel and/or cistern*						
[9] Do all Site Design Measures meet the design requirements outline								
[10] Total Volume Reduction (ft^3)				**2,204**		**665**		**194**
[11] Effective Treated Impervious Area (ft^2)				**32,646**		**9,859**		**2,881**

Form 3-4 Runoff Reduction Calculator for Site Design Measures on Regulated Projects

[1]DMA ID No.			DEV07 + C Sheds w/o Swale		DEV07 + C Sheds w/ Swale	
Site Design Measure	**Runoff Reduction Parameters**			**Runoff Reduction (ft3)**		**Runoff Reduction (ft3)**
[2] Adjacent/On-Site Stream Setbacks and Buffers	A_{imp} (ft^2)	*impervious drainage area*		-		-
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8	
[3] Soil Quality Improvement and Maintenance	A_{pond} (ft^2)	*ponding area*		306		306
	D_{pond} (ft)	*ponding depth*				
	A_{sa} (ft^2)	*soil amendment area*	873		873	
	D_{sa} (ft)	*depth of amended soil*	1.0		1.0	
	n	*porosity of amended soil*	0.35		0.35	
[4] Tree Planting and Preservation	n_e	*number of new evergreen trees*	48	1,067	48	1,067
	n_d	*number of new deciduous trees*	49		49	
	A_{tc} (ft^2)	*canopy area of existing trees to remain on the property*				
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8	
[5] Rooftop and Impervious Area Disconnection	A_{imp} (ft^2)	*impervious drainage area*	72,750	4,911	72,750	4,911
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8	
[6] Porous Pavement	A_{res} (ft^2)	*area of gravel storage layer*		-		-
	D_{res} (ft)	*depth of gravel storage layer*				
	n_{agg}	*porosity of aggregate*				
	C	*efficiency factor*				
[7] Vegetated Swales	A_{imp} (ft^2)	*impervious drainage area*		-	167,366	11,297
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8	
[8] Rain Barrels and Cisterns	N	*number of rain barrels and/or cisterns*		-		-
	V_a (ft^3)	*volume of each rain barrel and/or cistern*				
[9] Do all Site Design Measures meet the design requirements outline						
[10] Total Volume Reduction (ft^3)				**6,283**		**17,580**
[11] Effective Treated Impervious Area (ft^2)				**93,082**		**260,448**

Form 3-5 Computation of Water Quality Design Criteria for Stormwater Treatment and Baseline Hydromodification Measures

DMA ID No.	DEV01	DEV02	N201	N3 Sheds	N4 Sheds	DEV06	DEV07 + C Sheds w/o Swale	DEV07 + C Sheds w/ Swale
[1]Total impervious area requiring treatment	13,416	14,636	10,062	76,143	9,757	18,870	167,366	167,366
[2] Impervious area untreated by Site Design Measures (ft^2) *Item 1 – Form 3-4 Item 11*	13,416	-	10,062	43,497	-	15,990	74,285	-
[3]Additional pervious area draining to BMP (ft^2)	10,542	21,954	3,006	89,385	14,636	14,235	260,829	260,829
[4] Composite DMA Runoff Coefficient (Rc) *Enter area weighted composite runoff coefficient representing entire DMA*	0.34	0.00	0.53	0.17	0.00	0.29	0.12	0.00
[5] Water Quality Volume (WQV) (ft^3) *WQV = 1/12 * [Item 2 + Item 3) *Item 4] * Unit WQV*	441	-	372	1,188	-	472	2,093	-
[6] Water Quality Flow (WQF) (cfs) *WQF = 1/43,200 * [0.2* (Item 2 + Item 3) * Item4]*	0.038	0.000	0.032	0.102	0.000	0.040	0.179	0.000

Form 3-6 Volume-Based Infiltrating Bioretention Measures			
[1]**DMA ID No.** *If combining multiple DMAs from Form 3-5, enter a new unique DMA ID No.*	**N201**	**N3 Sheds**	**DEV06**
[2]WQV (ft^3) *Item 5 in Form 3-5* *If combining multiple DMAs from Form 3-5, enter the sum of their respective WQVs.*	372	1188	472
[3]Surface Loading Rate *Maximum 5.0 in/hr*	5	5	5
[4]BMP Surface Area (ft^2) *Top of BMP*	258	950	347
[5]Infiltration rate of underlying soils (in/hr)	0.07	0.07	0.07
[6]Maximum ponding depth (ft) *BMP specific, see BMP design details*	0.5	0.5	0.5
[7]Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 5 * 48 hrs) or Item 6*	0.28	0.28	0.28
[8]Infiltrating surface area, SA_{BMP} (ft^2) *Bottom of BMP*	215	792	289
[9]Planting media depth, d_{media} (ft)	1.5	1.5	1.5
[10]Planting media porosity	0.35	0.35	0.35
[11]Gravel depth, d_{media} (ft) *Only included in certain BMP types*	3.5	3.5	3.5
[12]Gravel porosity	0.30	0.30	0.30
[13]Retention Volume (ft^3) $V_{retention}$ *= Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (1.5* (Item 5 / 12))]*	401	1,476	539
[14]Untreated Volume (ft^3) $V_{untreated}$ *= Item 2 – Item 13* *If greater than zero, adjust BMP sizing variables and re-compute retention volume*	0	0	0
[15] Treated Flow Rate (ft^3/s) $Q_{treated}$ *= 1/43,200*(Item 3 * Item 4)*	0.0299	0.1100	0.0401
[16]Total Treated Flow Rate for Project (ft^3/s) Q_{total} *= Sum of Item 15 for all DMAs*	0.217		
[17]Is WQV for each DMA treated on-site?	**X**	**No**	

Form 5-1 BMP Inspection and Maintenance		
BMP	**Inspection Point and Frequency**	**Maintenance Activity Required**
Veg Swale	Embankments and channel/Twice a year or as needed	Repair erosion problems, remove debris and sediment
	Channel/Annual or as needed	Mow grass to no shorter than 6-inches, reseed to maintain dense turf
Bioretention Facilities	Inlets and outlets/ Twice a year	Remove debris, sediment, and litter
	Plants/Monthly or as needed	Irrigate, weed control, replace dead plants
	Standing water in excess of 72-hours/Annual or as needed	Remove accumulated sediment and flush drainage including underdrain
	Erosion, holes or voids/Annual or as needed	Repair erosion and stabilize, inspect underdrain and replace soil if needed
Trees	At each tree/as necessary	Irrigate to establish and maintain
	At each tree/annually	Remove fallen leaves and debris
	At each tree/regularly	Prune dead vegetation from trees
	At each tree/as needed	Minimize the use of chemical fertilizers
	At each tree/as necessary	Maintain lawn and turf at least 24-inches from trunk of tree
	At each tree/as necessary	Remove and replace dead trees
Soil Amended Areas	At each amended soil area/annually	Inspect for signs of compaction, waterlogging. Add soil amendments or mechanically aerate as needed.
	At each amended soil area/annually	Inspect for loss of vegetative cover and erosion. Repair eroded areas and replant vegetation as needed.

Form 6-1 Post-Construction Stormwater BMPs

Following is a summary of all BMPs included in the Project design. This checklist must be included on the cover sheet of the Improvement Plans for all Regulated Projects.

BMP		Plan Sheet Number(s)
Structural Source Controls (list BMPs)		
Site Design Measures	Stream Setbacks and Buffers	
	Soil Quality Improvement and Maintenance	**Sierra View SLTM**
	Tree Planting and Preservation	**Sierra View SLTM**
	Rooftop and Impervious Area Disconnection	**Sierra View SLTM**
	Porous Pavement	
	Vegetated Swales	**Sierra View SLTM**
	Rain Barrels and Cisterns	
Stormwater Treatment and Baseline Hydromodification Measures	Bioretention with Infiltration	**Sierra View SLTM**
	Flow-Through Planters, Tree Box Filters and Media Filters	
Hydromodification Management Measures	Supplemental Detention	**Sierra View SLTM**

Vegetated Swale
Data and Results

Swale Name	Contributing Area (ac)	SWQ Flow[1] (cfs)	Slope (ft/ft)	Manning's 'n'	Maximum Depth (ft)	Side Slope (ft:ft)	Minimum Bottom Width of each bay (ft)	No. of Bays	Minimum Length (ft)	Area per Bay (ft^2)	Wetted Perimeter per Bay (ft)	Hydraulic Radius per Bay (ft)	Velocity (fps)	Contact Time (min)	Overall Bottom Width (ft)
DEV07 + C Sheds	9.83	0.179	0.005	0.25	0.33	3	3	1	104	1.33	5.05	0.26	0.17	10.05	3.0