HISTORICAL RESOURCES EVALUATION REPORT FOR THE NEWELL CREEK DAM INLET/OUTLET REPLACEMENT PROJECT

City of Santa Cruz, Santa Cruz County, California

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ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
APE	area of potential effect
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
City	City of Santa Cruz
CRHR	California Register of Historical Resources
DPR	Department of Parks and Recreation
EIR	Environmental Impact Report
GPS	Global Positioning System
MLD	most likely descendant
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PRC	California Public Resources Code
PVC	polyvinyl chloride
SCWD	Santa Cruz Water Department

EXECUTIVE SUMMARY

The City of Santa Cruz Water Department (SCWD) retained Dudek to complete a historical resources inventory and evaluation of the Newell Creek Dam and Loch Lomond Reservoir for the Newell Creek Dam Inlet-Outlet Replacement Project in Santa Cruz, California.

This historical resources inventory and evaluation study includes a California Historical Resources Information System (CHRIS) records search of the project site and a pedestrian survey of a 0.5-mile radius study area around the project site for historic built-environment resources, building development and archival research, recordation and evaluation of built resources on the project site over 45 years of age, and an assessment of project-related impacts to historical resources in conformance with the California Environmental Quality Act (CEQA), project effects to historic properties in conformance with Section 106 of the NHPA, and in consideration of all applicable local municipal code and planning documents.

The Newell Creek Dam, associated features, and the Loch Lomond Recreation Area were recorded and evaluated in consideration of the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and Santa Cruz City regulations. The evaluation finds that the subject property appears eligible for the NRHP and CRHR under Criterion A/1 at the local level of significance and eligible for local listing under Santa Cruz County Criterion 2 for its associations with local water development. Therefore, it is considered an historic property under Section 106 of the NHPA and an historical resource under CEQA. Preparation of a detailed impacts assessment determined that the proposed project would have a less than significant impact on historical resources/no adverse effect on historic properties.

1 INTRODUCTION

Dudek was retained by the City of Santa Cruz Water Department (SCWD) to complete a historical resources inventory and evaluation report for a project that proposes to replace the inlet/outlet at Newell Creek Dam (Project) in an unincorporated area of Santa Cruz County near Ben Lomond, California (Figures 1 and 2). The study involved completion of a California Historical Resources Information System (CHRIS) records search, pedestrian survey of the Project site for historic built environment resources, archival and building development research, preparation of a historic context statement, and evaluation of the Newell Creek Dam and Loch Lomond for the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and local designation criteria and integrity considerations. Finally, this study includes an impacts assessment to determine if the proposed project has the potential to impact historical resources/historic properties. This study was conducted in accordance with Section 106 of the National Historic Preservation Act (NHPA) and Section 15064.5(a)(2)–(3) of the California Environmental Quality Act (CEQA) Guidelines, and the Project site was evaluated in consideration of NRHP, CRHR, and applicable Santa Cruz County regulations.

1.1 Project Location

The Newell Creek Dam is located in Santa Cruz County approximately 10 miles north of the City of Santa Cruz (City). The Project site is located at the northeast extent of Newell Creek Road, in the County of Santa Cruz, California. The site is bounded by Loch Lomond on the northeast, rolling hills to the east and west, and the Newell Creek drainage to the south. The town of Ben Lomond is approximately 1 mile to the southwest.

1.2 Project Description

The Newell Creek Dam is an earthen dam approximately 195 feet high with a crest length of about 750 feet. Built in 1961, the dam forms Loch Lomond Reservoir (Reservoir), which has a maximum storage capacity of approximately 8,646 acre-feet. The City owns the reservoir, and the SCWD operates it as the primary storage facility for the City's water supply system.

The proposed Project would consists of replacement of the existing aging inlet/outlet works in new locations at the Reservoir and other associated improvements. The proposed project would be comprised of the following primary components (Figure 3):

- Three new inlets located within the Reservoir that function to control and convey flows in and out of the Reservoir;
- A new outlet structure and valves and controls at the toe of the dam to convey flows in and out of the inlet/outlet works;
- A new dam seepage collection and monitoring system;

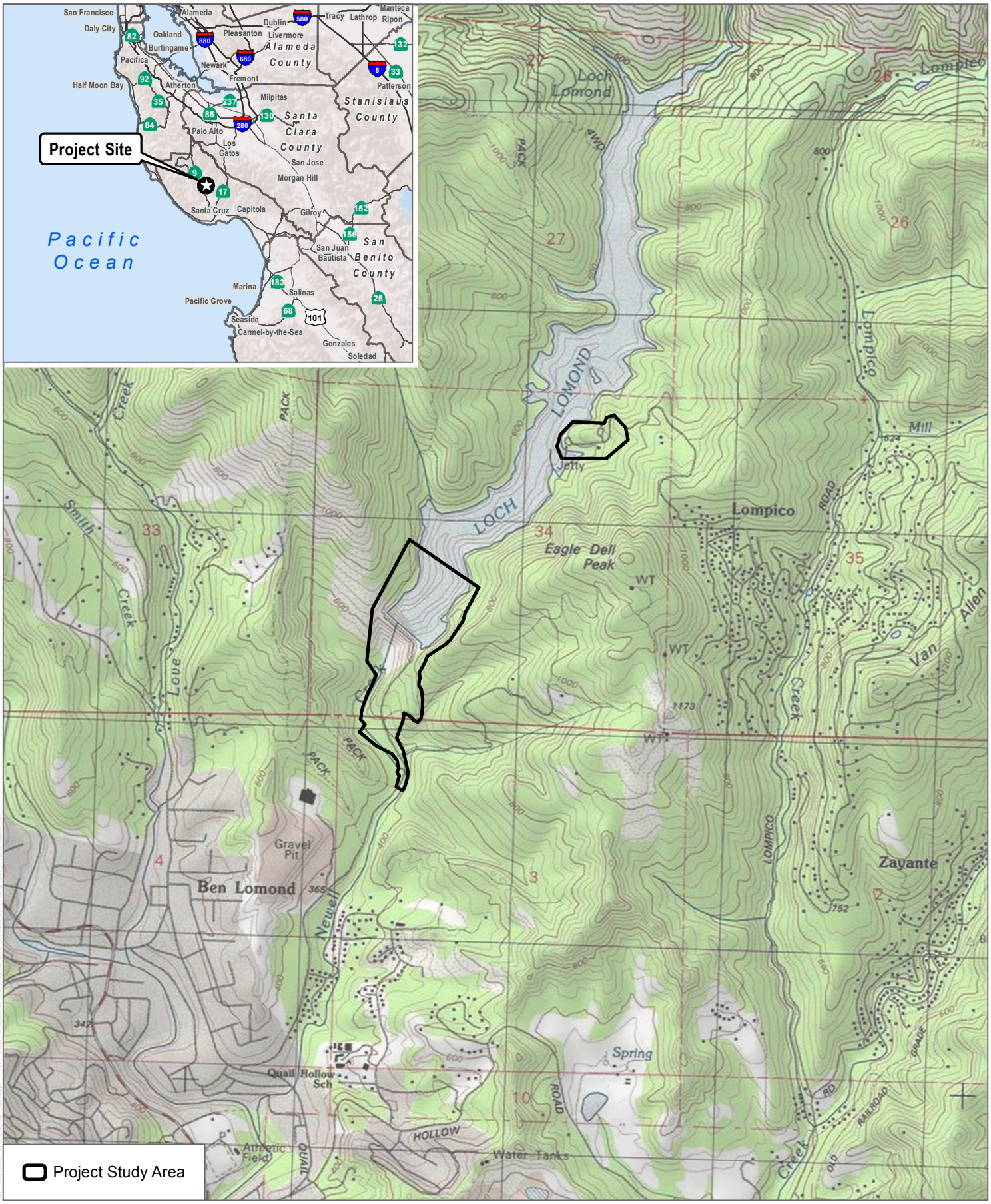
- A new 14-foot-diameter tunnel containing 48-inch and 10-inch inlet/outlet pipelines through the right (west) abutment and under the dam;
- Replacement of an approximate 2,000-linear-foot section of Newell Creek Pipeline between the outlet structure and the first isolation valve;
- A new control house on the dam crest to house controls for the inlets;
- Improvements along the dam's access roads to improve access for construction, including a new culvert crossing at the spillway plunge pool ;
- Decommissioning of the existing inlet/outlet works once the replacement inlet/outlet system is operational.

The Project site includes an area of 83.5 acres. Of this total, the area of potential effect (APE) encompasses a total of 60 acres; the remaining 23.5 acres include a northern parcel that is an entirely paved boat launch and parking area within the Loch Lomond Recreational Area. The only Project activity at the paved area would likely be a one-time launch and retrieval of a construction barge and/or material and equipment to create a temporary boat launch near the dam face.

The duration of construction would be approximately 2 years and span two full construction seasons (April through November each year). Nine preliminary sites adjacent to Newell Creek Dam and the Loch Lomond Reservoir have been identified as potential construction staging areas, and other areas may be identified for storage of construction equipment and materials, as well as storage and/or permanent placement of excavated materials (spoils).

Major construction elements include grading to create an approximate 0.5-acre construction "platform" at the toe of the dam, excavation of a tunnel under the dam to house the inlet/outlet conduit, and subsurface dredging and installation of the new intakes in the Loch Lomond Reservoir. A temporary boat launch facility would be installed near the intake construction area for equipment and materials during construction within the reservoir.

The proposed Project would be constructed independently of the existing inlet/outlet works with minimal disruption to the reservoir and current water delivery operations. There are no proposed changes to existing operations at the Newell Creek Dam and Loch Lomond Reservoir upon completion of the Project.



SOURCE: USGS 7.5-Minute Series Felton Quadrangle

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0 1,000 2,000 Feet

FIGURE 1

Project Location

Newell Creek Dam Inlet/Outlet Replacement Project

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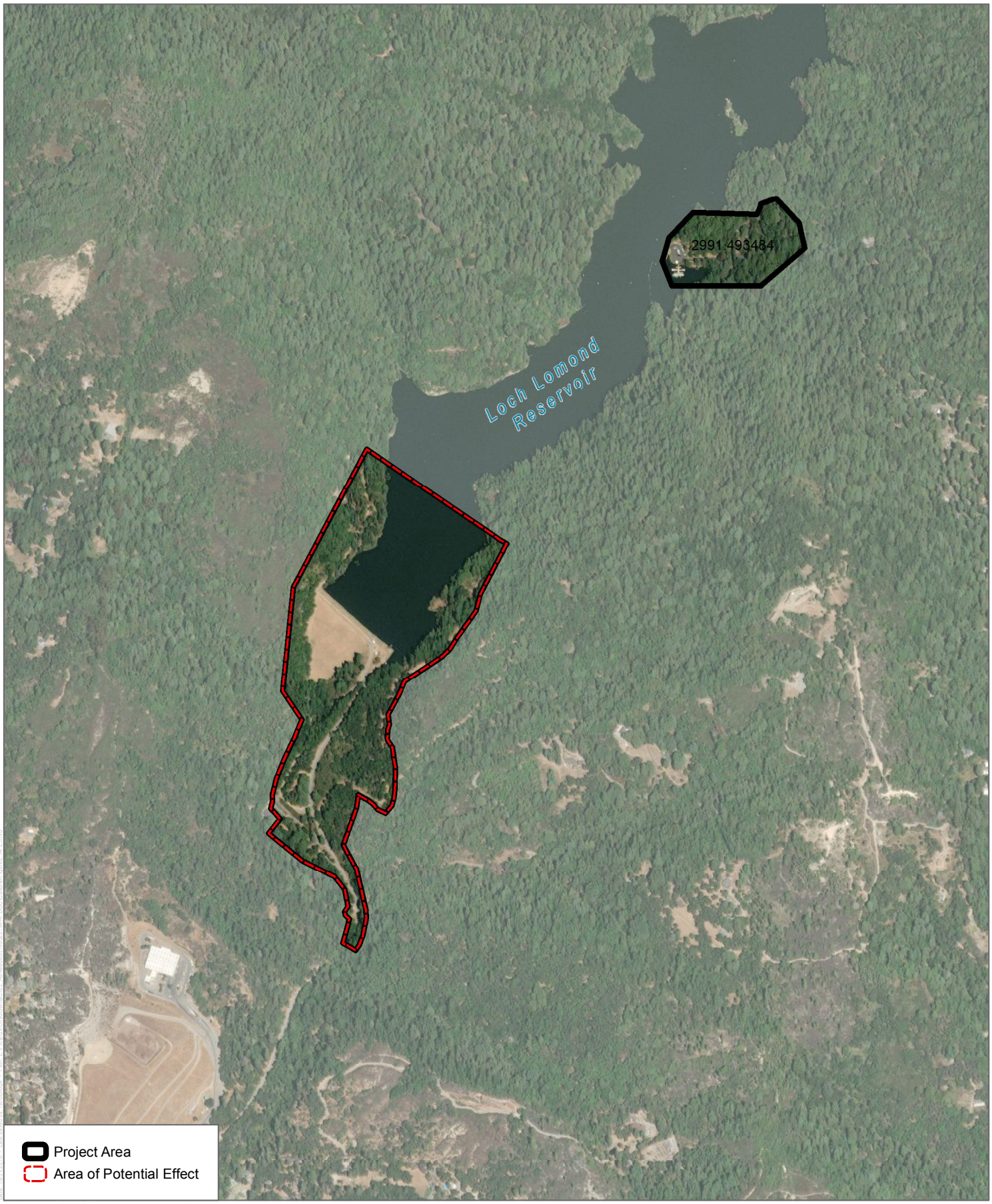

SOURCE: Bing Maps 2018

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0 500 1,000 Feet

FIGURE 2

Area of Potential Effect

Newell Creek Dam Inlet/Outlet Replacement Project

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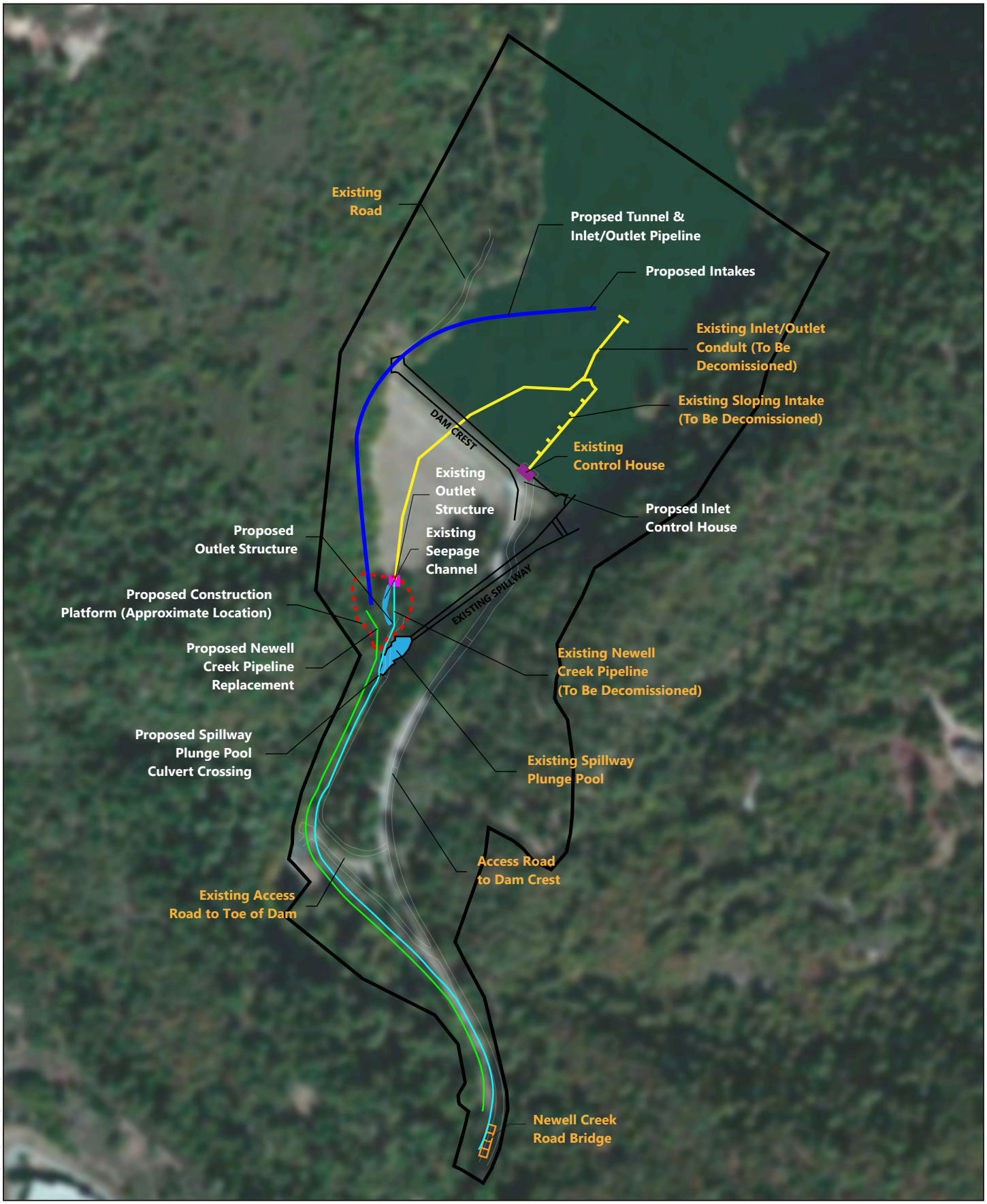

FIGURE 3

Project Overview

Newell Creek Dam Inlet/Outlet Replacement Project

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1.3 Area of Potential Effect

The APE is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. Determination of the APE is influenced by a project's setting, the scale and nature of the undertaking, and the different kinds of effects that may result from the undertaking (36 CFR 800.16(d)). The Project includes a single direct APE (Figure 2), which considers both direct and indirect effects of the proposed Project.

The APE consists of the existing Newell Creek Dam, the southern portion of the Loch Lomond Reservoir where the existing and proposed intakes are located, the spillway plunge pool and plunge pool crossing, the existing outlet and seepage channel at the toe of the of the dam, the control house on the crest of the dam, Newell Creek Road and access roads to the toe and crest of the dam, a portion of the Newell Creek Pipeline a portion of an emergency access (Haul) road along the west bank of the reservoir, the Loch Lomond recreation area boat launch, and areas surrounding the dam and reservoir that would be used for construction staging and/or storage of excavated spoils.

1.4 Regulatory Setting

This study was completed in compliance with federal cultural resources laws and regulations, including Section 106 of the NHPA. Under Section 106, historic and archaeological districts, sites, buildings, structures, and objects are assigned significance based on their exceptional value or quality in illustrating or interpreting history, architecture, archaeology, engineering, and culture. A number of criteria are used in demonstrating resource importance and are described below.

Federal

The NHPA established the NRHP and the President's Advisory Council on Historic Preservation (ACHP), and provided that states may establish State Historic Preservation Officers to carry out some of the functions of the NHPA. Most significantly for federal agencies responsible for managing cultural resources, Section 106 of the NHPA directs that

> [t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP.

Section 106 also affords the ACHP a reasonable opportunity to comment on the undertaking (16 U.S.C. 470f).

Title 36 of the Code of Federal Regulations, Part 800 (36 CFR 800) implements Section 106 of the NHPA. It defines the steps necessary to identify historic properties (those cultural resources listed in or eligible for

listing in the NRHP), including consultation with federally recognized Native American tribes to identify resources with important cultural values; to determine whether or not they may be adversely affected by a proposed undertaking; and the process for eliminating, reducing, or mitigating the adverse effects.

The content of 36 CFR 60.4 defines criteria for determining eligibility for listing in the NRHP. The significance of cultural resources identified during an inventory must be formally evaluated for historic significance in consultation with the ACHP and the California State Historic Preservation Officer to determine if the resources are eligible for inclusion in the NRHP. Cultural resources may be considered eligible for listing if they possess integrity of location, design, setting, materials, workmanship, feeling, and association.

Regarding criteria A through D of Section 106, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, cultural resources, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (36 CFR 60.4):

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or

B. Are associated with the lives of persons significant in our past; or

C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. have yielded or may be likely to yield, information important in prehistory or history.

The 1992 amendments to the NHPA enhance the recognition of tribal governments' roles in the national historic preservation program, including adding a member of an Indian tribe or Native Hawaiian organization to the ACHP.

The NHPA amendments:

- Clarify that properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined eligible for inclusion in the National Register
- Reinforce the provisions of the Council's regulations that require the federal agency to consult on properties of religious and cultural importance.

The 1992 amendments also specify that the ACHP can enter into agreement with tribes that permit undertakings on tribal land and that are reviewed under tribal regulations governing Section 106. Regulations implementing the NHPA state that a federal agency must consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking.

State

California Register of Historical Resources

In California, the term "historical resource" includes "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (PRC Section 5020.1(j)). In 1992, the California legislature established the CRHR "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1(a)). The criteria for listing resources in the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP, enumerated below. According to PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

To understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource younger than 50 years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 CCR 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

California Environmental Quality Act

As described further below, the following CEQA statutes and guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- PRC Section 21083.2(g) defines "unique archaeological resource."

- PRC Section 21084.1 and CEQA Guidelines Section 15064.5(a) defines "historical resources." In addition, CEQA Guidelines Section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource"; it also defines the circumstances when a project would materially impair the significance of an historical resource.
- PRC Section 21074(a) defines "tribal cultural resources."
- PRC Section 5097.98 and CEQA Guidelines Section 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- PRC Sections 21083.2(b)–(c) and CEQA Guidelines Section 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context, and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

Under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource" (PRC Section 21084.1; CEQA Guidelines Section 15064.5(b)). If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of PRC Section 5024.1(q)), it is a "historical resource" and is presumed to be historically or culturally significant for the purposes of CEQA (PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption (PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)).

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1); PRC Section 5020.1(q)). In turn, the significance of a historical resource is materially impaired when a project does any of the following (CEQA Guidelines Section 15064.5(b)(2)):

(1) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or

(2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

(3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA.

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any historical resources, then evaluates whether that project would cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

Local

Santa Cruz County

Santa Cruz County Historic Resources Inventory

Cultural Landmarks in the County of Santa Cruz are termed Historic Resources and are under the aegis of the Planning Department, County of Santa Cruz. A list of Historic Resources is maintained in the County's Historic Resources Inventory, which identifies those Historic Resources located in the unincorporated areas of the County. Historic Resource is defined in Chapter 16:42 Historic Preservation within Title 16: Environmental and Resource Protection as follows (County Code 16.42.030 (I) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008])

> … means any structure, object, site, property, or district which has a special historical, archaeological, cultural or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the County, State, or nation, and which either has been referenced in the County General Plan, or has been listed in the historic resources inventory adopted pursuant to SCCC 16.42.050 and has a rating of significance of NR-1, NR-2, NR-3, NR-4, or NR-5.

In order to be placed on the County Historic Resources Inventory, a property must first be evaluated for its ability to meet one or more of the following criteria: (County Code 16.42.050 Historic Resource Designation [Ord. 4922 § 1, 2008]).

(1) The resource is associated with a person of local, State or national historical significance.

(2) The resource is associated with an historic event or thematic activity of local, State or national importance.

(3) The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.

(4) The resource has yielded, or may likely yield, information important to history.

Santa Cruz County Historic Districts

The County of Santa Cruz defines Historic District as (County Code 16.42.030 (E) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008])

> …an area designated as an historic resource and which contains improvements that:
>
> (1) Have character of special historic or aesthetic interest or value; and
>
> (2) Represent one or more periods or styles of architecture typical of one or more eras in the history of the County; and
>
> (3) Cause such area, by reason of these factors, to constitute a geographically definable area possessing a significant concentration or continuity of sites, buildings, structures, or objects that are unified by past events, or aesthetically by plan or physical development.

1.5 Project Personnel

Dudek Architectural Historian Fallin Steffen, MPS, is the chief author of this report and evaluated the Newell Creek Dam features affected by this Project. Dudek Architectural Historian Kate Kaiser, MSHP, co-authored this report and conducted the intensive-level survey. Dudek Senior Architectural Historian Samantha Murray, MA, served as the principal architectural historian for the Project. Ms. Murray, Ms. Steffen, and Ms. Kaiser meet the Secretary of the Interior's Professional Qualification Standards (36 CFR Part 61) for architectural history. Resumes for Ms. Murray, Ms. Steffen, and Ms. Kaiser are provided in Appendix A.

2 SETTING

2.1 Environmental Setting

Newell Creek is a tributary of the San Lorenzo River. It comprises a series of small, tributary, seasonal drainages originating near Bear Creek Road at the Summit in the Santa Cruz Mountains that converge and flow southerly towards the San Lorenzo River. Newell Creek is fed by rainfall runoff from the steep canyons of the Newell watershed. Newell Creek Dam, built in 1960, regulates the unrestricted flow of the creek approximately 3 miles from the source and forms Loch Lomond Reservoir, which is approximately 2.5 miles long and 1,500 feet wide at its broadest point. Downstream from the reservoir, Newell Creek resumes, flowing for an additional two miles southwest before its confluence with the San Lorenzo River. The San Lorenzo River continues approximately 10 miles before it reaches the Monterey Bay (SCWD 2018; Harmon and McPherson 1998, Brown and Dunlap 1956; Harmon and McPherson 1998).

2.2 Historic Setting

Loch Lomond Reservoir is situated in the Santa Cruz Mountains. It provides surface water storage as part of the SCWD's drinking water system. While settlement in the Santa Cruz Mountains began in the 1860s, the land use adjacent to the unregulated portion of Newell Creek and the Loch Lomond Reservoir remains predominately rural.

Historical Overview

Spanish Period (1769–1822)

The earliest known European exploration of the Monterey Bay was a Spanish envoy mission led by Sebastián Vizcaíno in 1602. The purpose of the voyage was to survey the California coastline to locate feasible ports for shipping, and Vizcaíno had explicit instructions prohibiting the creation of settlements and interacting with local Native Americans. Finding the bay to be commodious, fertile, and extremely favorable for anchorage between Manila and Acapulco, Vizcaíno named the Bay "Monterey" after the Conde de Monterey, the present Viceroy in Mexico (Chapman 1920; Kyle 2002).

Despite being mapped as an advantageous berth for Spanish shipping efforts, the epicenter of Spanish settlement in Alta California did not make its way to the Monterey Bay until the second half of the eighteenth century. In an effort to prevent the establishment of English and Russian colonies in northern Alta California, Don Gaspar de Portolá, the Governor of Baja, embarked on a voyage in 1769 to establish military and religious control over the area. This overland expedition by Portolá marks the beginning of California's Historic period, occurring just after King Carlos III of Spain installed the Franciscan Order to direct religious colonization in assigned territories of the Americas. With a band of 64 soldiers, missionaries, Baja (lower) California Native Americans, and Mexican civilians, Portolá established the Presidio of San Diego, a

fortified military outpost, as the first Spanish settlement in Alta California. In July of 1769, Padre-Presidente Franciscan Fr. Junípero Serra, founded Mission San Diego de Alcalá at Presidio Hill, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823, including Mission Santa Cruz (Kyle 2002; Lehmann 2000; Koch 1973).

On their quest to locate the Monterey Bay from the 160-year-old accounts of Sebastián Vizcaíno, the Portolá expedition first reached the present-day territory of Santa Cruz on October 17, 1769. On this day, the Catholic calendar celebrates Saint Lawrence, so the large river the party camped alongside was deemed the "San Lorenzo." After mistakenly circumventing the Monterey Bay and reaching the San Francisco Bay, the expedition backtracked to San Diego. The following year on May 31, 1770, a second expedition was organized by Portolá resulting in a successful location of the Monterey Bay. However, it would be an additional 21 years before the Franciscan order would establish Mission Santa Cruz in the area near the San Lorenzo River (Koch 1973).

Father Fermín Lasuén, Corporal Luis Peralta, and five soldiers established Mission Santa Cruz on August 28, 1791, as the twelfth mission in the California Mission system. Native Americans were forced to build the mission church and auxiliary structures from local timber, limestone, and adobe, as well as cultivate wheat, barley, beans, corn, and lentils for the mission Padres and soldiers. The forced conversion of the local native population proved continuously problematic as Mission Santa Cruz was overwhelmed by rebellions, pestilence, and building failure. The land taken by the Spanish was eventually repatriated to the Native tribes, but the a massive decline in the population as a result of disease and abandonment meant that by the time of this decree, few eligible recipients remained alive and in the area (Lehmann 2000; Koch 1973).

The expansion of Spanish control in the Santa Cruz region was not limited to the development of religious infrastructure. In 1795, Spain called for the establishment of three self-governing *Pueblos* in Alta California that would remain free from military and religious oversight. Villa de Branciforte was established in 1797 on the opposite bank of the San Lorenzo River from Mission Santa Cruz. The 40 initial settlers were not provided with the resources promised to them by Spain to build housing or cultivate the land, but instead made due with crude dwellings of their own design. Despite the Villa de Branciforte project being deemed a failure almost immediately by Spain, the population grew quickly in the initial years. By 1803, there were 107 enlisted inhabitants in Villa de Branciforte. However, the population mainly derived from former soldiers, artisans, and criminals who lacked the apposite skill to farm and sustain themselves. By 1817, the population dwindled back to 52 as people followed new opportunities (Lehmann 2000; Koch 1973).

Mexican Period (1822–1848)

After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants (Cleland 2005; Dallas 1955).

Extensive land grants were established in the interior during the Mexican Period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated its colonization efforts. Land grants to citizens covered over 150,000 acres of present-day Santa Cruz County, including *Rancho Aptos* (1833), *Rancho Los Corrilitos* (1844), *Rancho Soquel & Soquel Augmentacion* (1833 and 1844). Three land grants covered the lower regions of the densely forested Santa Cruz Mountains, including *Rancho Zayante* (1841), *Rancho Cañada del Rincon en el Rio de San Lorenzo* (1843) (Figure 4), and *Rancho Carbonera* (1838) (Lehmann 2000; Koch 1973; Robinson 2012).

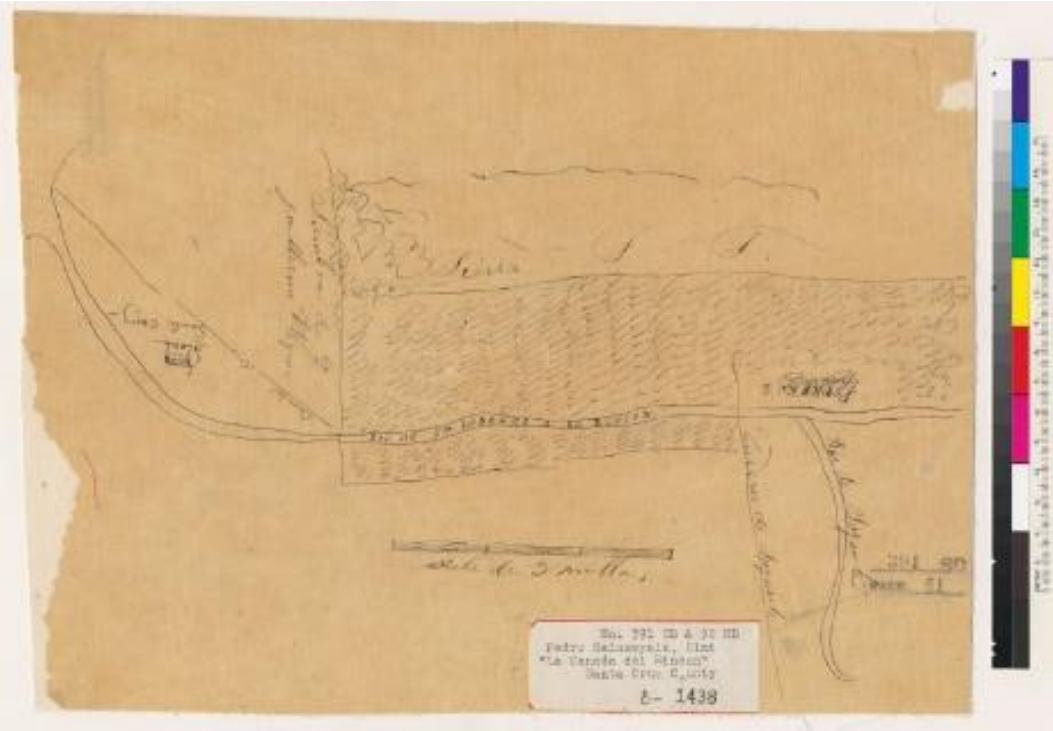

Figure 4. Design of Rancho Cañada del Rincon en el Rio de San Lorenzo de Santa Cruz. 1840s. (OAC 2018)

American Period (1848–Present)

The Mexican–American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American Period. Santa Cruz was designated as one of the 27 original counties of California on February 18, 1850, shortly before California officially became a state with the Compromise of 1850 that also designated Utah and New Mexico (with present-day Arizona) as U.S. territories. The new state of California recognized the ownership of lands in the state distributed under the Mexican Land Grants of the previous several decades (Cleland 2005; Waugh 2003; Koch 1973).

As the Gold Rush was picking up steam in 1849, a massive influx of people seeking gold steadily flooded the rural counties of California. Insightful entrepreneurs in Santa Cruz also saw the arrival of opportunity-seeking laborers as a means to harvest the abundant natural resources found throughout the area. The lumber, fishing, lime, cement, and leisure industries formed the economic foundation of the County of Santa Cruz (Lehmann 2000).

2.3 Historic Context Statement

Development in the San Lorenzo Valley

Several miles north of the evolving city center at the base of the Santa Cruz Mountains, the San Lorenzo River carves a deep valley through the dense redwood and oak timberlands. The communities located in these outer reaches of present-day Santa Cruz County owe their existence to the various industries that sought to profit from the wealth of raw resources found here. The extent of the virgin forests in the San Lorenzo Valley and the rich underground deposits of lime attracted opportunistic settlers and purveyors who sought to harness the power of the San Lorenzo River and its many tributaries to move their goods to market locally, throughout California, and the world.

The earliest men to profit from the land in the area were the owners of the various Mexican Land Grants that divided the San Lorenzo Valley. The first power sawmill in California was built on Rancho Zayante by owner Isaac Graham and was driven by the waters of Zayante Creek (SCEN 1936; Robinson 2012). Isaac E. Davis and Albion P. Jordan of the Davis and Jordan Lime Company purchased *Rancho Cañada del Rincon* in 1859 as a promising quarry site. They also utilized the falling water on the property to process local lumber into fuel for their many kilns (Brown 2011). The California Powder Works was established in 1861 on the bank of the San Lorenzo River on a portion of Rancho Carbonera. The location was chosen for its proximity to lumber, the harbor, and the river, which was harnessed to operate the water-powered machinery needed to process raw materials into explosive powder (Brown 2011; Robinson 2012).

The California Gold Rush of 1848 accelerated the desirability of land in the state and before long, access to water in the drought-prone region took on the highest level of importance. Instead of adopting an equal water access structure in the fashion of the eastern United States, the wealth potential of waterways during the Gold Rush shaped California water law into a "first in time, first in right" system known as Prior Appropriation. Under this system, riparian rights were granted to the first person to use a river or tributary for beneficial consumption like mining, farming, milling or as-needed domestic use. When the original Ranchos in the San Lorenzo Valley were subdivided and sold, access to the rivers and streams was enormously important. Not only did it mean that the initial use set out for a waterway was the primary use, it also meant that any subsequent uses could not supersede or negatively affect the chief use. The order that claims were recognized during this period established the foundation of the complicated system of water allocation rights still in use today in Santa Cruz County (Pisani 1984).

The number of lumber operations in the county was growing rapidly, and by 1868 there were 12 water-powered lumber mills, 10 steam-powered lumber mills, and 9 shingle mills in operation that needed to transport goods down from remote processing locations. Early roads such as Big Trees Road (now Highway 9) and Graham's Grade Road (now Graham Hill Road) winding from the upper reaches of the San Lorenzo Valley to the wharf were arduous and subject to seasonal weather complications. Navigating the steep angled roads while driving a train of lumber-filled wagons was a dangerous undertaking for even the most experienced teamster (Robinson 2011). In 1873, plans were made for a flume along the San Lorenzo River to easily move the lumber to port. The original plan was for the flume to stretch over 20 miles to the coast, but the dearth of feeder creeks in the lower San Lorenzo basin meant that the river was subject to seasonal dry spells. Instead, when work began on the flume in 1875, a small-gauge railroad from the flume end to the harbor started simultaneously.

The massive projects were completed within a year. The terminus of the 9-mile flume and the new rail line was in Felton, California, where the lumber originating as far as 2 miles north of Boulder Creek, floated down the water-driven flume, and could be loaded onto the train and hauled safely downhill to shore (Figure 5). Overall, the water-powered gravity flume drastically increased the availability of Santa Cruz lumber to a wider market, while the rail line opened up the San Lorenzo Valley to tourism.

Figure 5. San Lorenzo Flume Terminus in Felton, circa 1875–80. (San Lorenzo Valley Museum)

Plans for the flume and the general development of the far reaches of the Santa Cruz Mountains meant that pioneers were staking claim to areas that previously had seen little activity. Many of the tributary creeks in these

areas bear the names of the first men that settled beside them. Newell Creek was a remote tributary of the San Lorenzo River that was named for an early pioneer, Addison Newell. He established a farm in the steep, v-shaped valley on the banks of the creek in 1870.

The Newell Creek Dam and Loch Lomond

The San Lorenzo River, its tributaries, and the other creeks that wind through the greater Santa Cruz area, has historically been subject to seasonal droughts and floods.

In 1860, two innovative pioneers involved with the early development of Santa Cruz, Fredrick A. Hihn and Elihu Anthony, implored the Board of Supervisors to allow them to dig trenches and lay hollowed 12-inch redwood pipes to transport water throughout the City. Due to Santa Cruz's proximity to vast lumber fields in the San Lorenzo Valley, the redwood pipes were chosen as an inexpensive alternative to iron pipes. The source of the water was to be an 8,000-gallon reservoir on the Mission Santa Cruz hill, and eager recipients of the water could gain access for a fee. By the 1870s, the Hihn-Anthony Water Company was the largest provider of water in Santa Cruz, and Doderero and Carbonero Creeks constituted their primary sources (Brown 2011; Brown and Dunlap 1956).

San Lorenzo Valley Water District

By 1899, Boulder Creek in the San Lorenzo Valley (SLV) was the fifth largest shipper of timber in the country. As the SLV was settled in the mid-1800s, populations in Ben Lomond, Brookdale and Boulder Creek formed their own water systems (San Lorenzo Valley Water District, 2009.). As vacation homes increased in the early 1900s, many small subdivisions in the SLV developed their own water systems. These water systems were designed to serve the needs of Bay Area residents who occupied their vacation homes only a few weeks a year. Nearby springs and creeks supplied these water systems through flumes or pipelines. Santa Cruz County population more than doubled from 1900 to 1940; as more people moved into the valley, the existing water systems became inadequate (San Lorenzo Valley Water District, 2009).

Frequent droughts between 1912 and 1939 convinced Valley leaders to form a water district to better control water, to serve the needs of the valley. After one failed attempt to form a county water district by election in 1939, the San Lorenzo Valley County Water District (SLVWD) was formed by the voters on April 3, 1941. Negative voter returns from the towns of Felton and Scotts Valley left those areas out of the district boundaries, which included Bear Creek, Boulder Creek, Alba, and Ben Lomond school districts, and part of the Sequoia school district (San Lorenzo Valley Water District, 2009.).

After securing unclaimed water rights in Newell Creek and Bear Creek in 1942, the SLVWD developed a master plan that included storage dams on Boulder, Newell, and Bear Creeks, and the upper San Lorenzo River (San Lorenzo Valley Water District, 2009). In 1945, voters failed to approve a bond proposed to pay for the Boulder Creek dam, and when the District again proposed a bond measure to the voters to fund the construction of a

dam at Waterman Gap, a citizens group organized to oppose it. The citizens group also opposed the proposed dam at Newell Creek, and another bond measure was defeated in December 1946. The District purchased the 3,400 acre Newell Creek property, but also pursued purchasing additional water supplies (Ibid.). In 1957, the District proposed a bond issue for purchase of Citizen Utilities, and a Newell Creek dam project was approved by the voters. The District continued negotiating with Citizens Utilities, and also approached the City of Santa Cruz about partnering in construction of a dam on Newell Creek. Negotiations with Citizens Utilities failed, but the City of Santa Cruz agreed to partner with the District in building the Newell Creek dam (San Lorenzo Valley Water District, 2009). In 1959, the District signed an agreement with the City of Santa Cruz, in which the District sold the City its timber and mineral rights to the Newell Creek watershed, in exchange for one-eighth of the water rights from the water stored by Newell Creek Dam (Ibid).

City of Santa Cruz Water Department

When the steam-powered pumping plant installed on the San Lorenzo River in 1880 became the source of repeated water-quality concerns, the Duke Morgan Water Company abandoned the plant and then combined with the Hihn-Anthony Water Company in 1888, forming the Santa Cruz Water Company. This company set about increasing supplies by creating a diversion on Laguna Creek and constructing the Cowell Street Reservoir on Empire Grade. The reservoir was built to hold 60 million gallons, but it was carved into a porous limestone formation known as karst that caused approximately one million gallons of leakage daily. Despite combining sources and creating new ones, it was apparent that seasonal fluctuations in the water supply and inadequate storage facilities were not capable of supporting the population needs. Just two years later, the city started its own water system in 1890. The City's water sources consisted of diversions along Laguna Creek, a pipeline from Laguna Creek to town, and the Cowell Street Reservoir. The City and the Santa Cruz Water Company competed to provide the city's water for a few years, until the City of Santa Cruz purchased the Santa Cruz Water Company in 1916, along with all of its sources and infrastructure (SCMU Review 2016; Brown and Dunlap 1956).

After the City acquired the Santa Cruz Water Company's holdings, the City sought to update their water infrastructure. Although upgrades and additions were added to the several major facilities to increase the quality of municipal water, the overall output was not widely increased between 1916 and 1930. The Bay Street Reservoir was built in 1924 to replace the sieve-like Cowell Street Reservoir. The Lorenzo River Pumping Plant filtered the water from the San Lorenzo and treated it with chlorine, making it safer to drink (Brown and Dunlap 1956).

In the period following the installation of the Bay Street Reservoir, Santa Cruz sought many short-term fixes to the repeated droughts and floods. The Santa Cruz Sentinel featured articles pertaining to water shortages and flood damage throughout the county, despite the Water Departments' "…consistent policy of doing the best [they] could with what [they] have…"(SCS 1939). Low rainfall in winter 1931, prompted the City to drill four wells, "one at the pumping plant and three directly across the river" (Brown and Dunlap 1956:14), to

supplement water, but it was not sufficient. Further shortages due to drought meant that the coastal creek sources were not available for delivery to the city system. (Brown and Dunlap 1956).

The years following World War II provoked westward migration and an increase in birth rates, causing the population of California to increase from 6.95 million to 10.65 million between 1940 and 1950. The influx of people put stress on the infrastructure throughout the state, but in Santa Cruz, the growth of the community from 27,430 to 41,680 between 1940 and 1950 meant the familiar seasonal water shortages now presented a serious problem. Articles from the Santa Cruz Sentinel during this time highlight the difficulties the shortages caused during the dry, summer months, when water merely dribbled from municipal taps. In 1945, the state recognized a water shortage and authorized an investigation of available water resources, but the movement was slow to start (SWRB 1953). In 1946, the acute nature of the water crisis prompted the community to request a survey to determine an inventory of the available groundwater supply and plan for growth in the future. In 1948, the survey ordered by Water Superintendent John C. Luthin was completed and the findings were submitted to the City Council. The survey determined that although the San Lorenzo pumping plant was running at full capacity, 24 hours per day during the dry summer of 1947, the river was so low that the entire run was being diverted through the pumps and into the city mains for consumption.

In 1953, the State Water Resources Board finally released a report based on their investigations in Santa Cruz and Monterey Counties, which inventoried available surface and underground water sources in Santa Cruz County, and projected increased water utilization that exceeded the available water in Pajaro Valley, the Soquel Creek area, and the coastal area around and including Santa Cruz. The report identified requirements for supplemental water for Santa Cruz and areas served by the City of Santa Cruz Water Department; 16 possible alternative water resources including a dam site alternative on Newell Creek The report noted that "the present water problem is not due to a shortage of total seasonal supply, but rather to lack of facilities for regulating that supply" (SWRB 1953: 57) due to peak demands during times of minimum stream flows. Deficiencies in seasonal rains would necessitate water rationing by the City; such deficiencies were reported to have occurred in five seasons since 1895, a period of nearly 60 years at the time the report was issued. (U.S. Census Bureau 1940; U.S. Census Bureau 1950; Brown and Dunlap 1956; SCS 1946a; SCS 1946b; SCS 1948; SWRB 1953).

As a direct result of the State Water Resources Board publication, in 1954, the City commissioned a report investigating four of the Water Resource Board's suggested reservoir sites at Laguna Creek, San Lorenzo River, Soquel Creek, and Scott Creek. The report cited the City's current water sources as "barely sufficient to keep pace with the demand imposed by a steadily increasing population" (Brown and Dunlap 1956: 1). These sources, as of 1956, included Laguna Creek, the original City's water resource since 1890, Liddell Spring, Reggiardo Creek, Majors Creek, the San Lorenzo River, and two unnamed wells. Newell Creek Dam and Loch Lomond Reservoir were not among the suggested sites in Brown and Caldwell's 1956 water supply report, and the report suggested Doyle Gulch as the ideal location for a new city water source (Brown and Dunlap 1956; SWRB 1953).

The City Water Superintendent began to investigate reservoir projects at Zayante Creek, Newell Creek, Doyle Gulch, Scott Creek, and Aptos Creek. Meanwhile, the County formed the Santa Cruz County Flood Control and Water Conservation district in 1955 and hired Creegan & D'Angelo Civil Engineers in 1956 to complete an extensive survey identifying dam sites, groundwater sources, and additional steps to improve control of the water supply throughout the county to compete with the City's proposals. The report asserted that population growth was a major concern for the water supply in the City because "the City of Santa Cruz has current water requirements which equal the capacity of the existing water supply system during a relatively dry era. Should an exceptionally dry season be experienced, there would be a serious water shortage in the City of Santa Cruz." (Creegan and D'Angelo 1957:8). Present supplies were determined to be insufficient for standard rates of population growth, including years that rainfall was considered more plentiful. Despite the rate of water consumption in the service area tripling between the mid-1920s and mid-1950s, there had been no additions to the City municipal water supply during that time. Creegan & D'Angelo would also serve as the engineers for the Santa Cruz County Flood Control and Water Conservation District Advisory Committee, and ultimately, their recommendations to the council to remedy the current water crisis in the City was a dam on Newell Creek (Figure 6) (SCS 1953, 1954a, CSC 2007; SCS 1958).

As a surface water storage on Newell Creek became a distinct reality following the recommendations of Creegan and D'Angelo, City Water Department Director, Weston Webber, voiced his support for the project in 1957 claiming that "A dry winter or a spurt in population might well throw Santa Cruz on water rationing in the future...The San Lorenzo River and the coast sources are not only fixed, but too limited…Surface storage is the only way out." (SCS 1957) Creegan & D'Angelo's proposal at Newell Creek competed with multiple other proposals throughout the region. Ultimately, of the five proposed dams (see Figure 7), only the Newell Creek Dam would come to fruition. The reasons behind why the remaining dams were not completed are unknown, although frequent discussions about the overall cost of the projects in the SCS suggest budgetary restraints (Brown 2011; 1957a, 1957b, 1957c).

In 1958, the University of California Regents announced that they were considering the Cowell Ranch in the City of Santa Cruz as the site of a future University of California Campus. The City would be required to provide services and facilities for the prospective University community, which early figures suggested was to include around 2,500 students. In anticipation of the Water Revenue Bond Election in November 1958 to approve the bonds necessary to construct the Newell Creek Dam, a new water treatment plant, and pipelines to transport the water, the Santa Cruz Sentinel published an article outlining the impact of the proposed bonds. In reference to the speculative University in the City, the closing paragraph of the article states that "University officials know that the present water supply of Santa Cruz is inadequate, even for normal needs. Failure to correct this situation could end all chance of the selection of Santa Cruz as the University site." (SCS 1961b; SCS 1961a; SCS 1958).

Figure 6. Newell Creek prior to Dam, Circa 1950s. (SCPL 2018)

On November 5, 1958, the voters of the City of Santa Cruz approved $5.5 million in water revenue bonds necessary for the City to purchase 2,162 acres of land in the Newell Creek watershed from the San Lorenzo Valley Water District and build a dam on the site. Creegan & D'Angelo designed the earthfill dam. Additional improvements included a pipeline, a treatment plant on Graham Hill Road, and two pumping stations. (SCWD 1986; Brown 2011; SPH Associates Consulting Engineers 2010; SCS 1958).

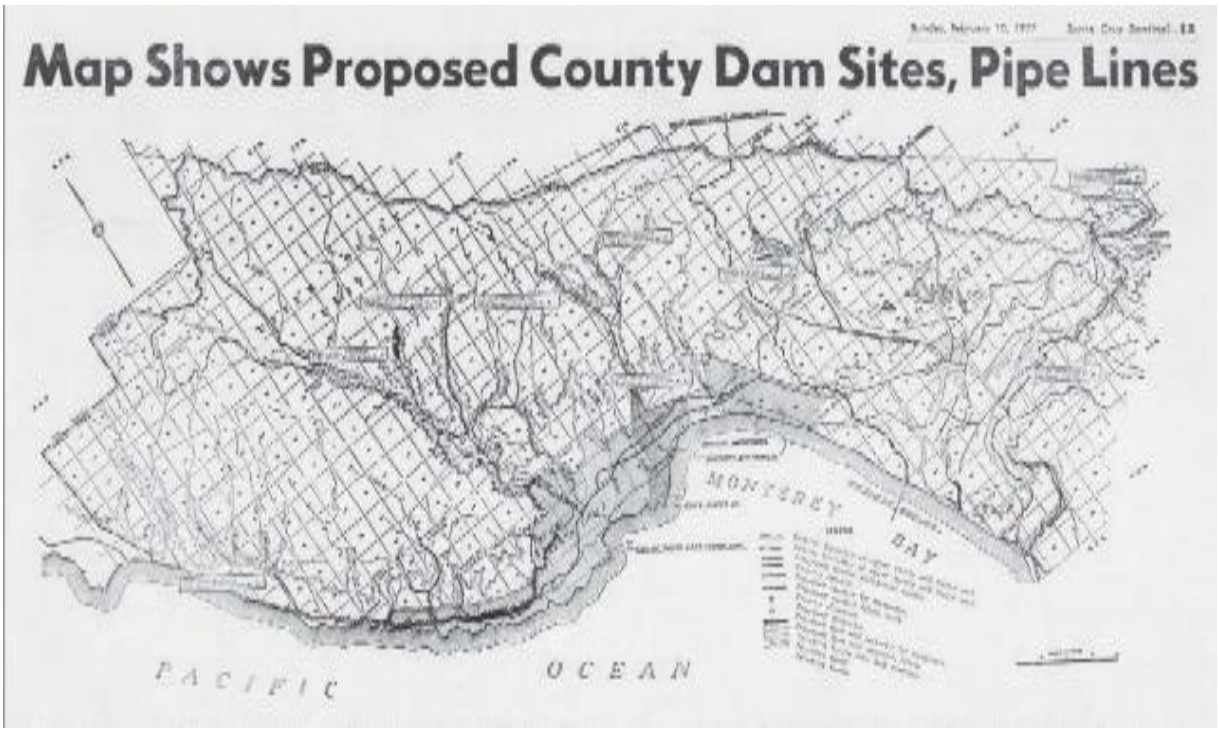

Figure 7. Proposed County Water Projects in Addition to the Newel Creek Dam. (SCS 1957b)

Construction of Newell Creek Dam

Contractors Williams and Burrows Inc. of Belmont, California, began the construction of the Newell Creek Dam and preparation for the creation of Loch Lomond in 1960. The early stages of planning and execution were made more difficult by the narrow valley, allowing only one road for ingress and egress for equipment and supplies (Figure 8). The construction of the 195-foot-tall earthfill dam began with a "grout curtain" that pushed concrete 100 feet into the bedrock to fill any fissures or imperfections, ensuring a structurally sound base. The height and width of the dam's crest was first determined by the reinforced concrete ends (Figure 9). The embankment was then built up using successive layers of random fill from the immediate area, compacted with sheepsfoot tampers above and around the 300 feet of impervious material at the core of the embankment. Four construction personnel lost their lives in October 1960 during the layered construction of the embankment. While the men were drilling out soft areas in the rock to be filled with concrete to prevent water seepage, an abutment sheer wall collapsed and a massive avalanche slid down onto them. A brass plaque commemorating these men was commissioned and remains today on the southwest elevation of the Control House (SCS 1960a; SCS 1960b; SCWD 2015).

Figure 8. Beginning of Newell Creek Dam Construction, 1960. (SCPL 2018)

Figure 9. Construction of the Newell Creek Dam, 1960. (SCPL 2018)

The Newell Creek Dam was completed and filling steadily with water by 1961; however, the recreation area on the resulting reservoir was yet to be built. Keeping with the Scottish naming tradition started by Scotsman John Burns when he christened the mountain Ben Lomond in the 1850s, the reservoir was dedicated Loch Lomond during two days of festivities on July 27 and 28, 1963 (SCS 1963).

By 1964, the City distributed a notice to bid on the construction of the Loch Lomond Recreation Development. With the help of a $149,000 state grant, the Loch Lomond Recreation Area was completed by the spring of 1965. It included picnic areas, a concessions building, parking areas, two docks, and a boat launch. An all-weather road leading from Lompico to the Recreation Area was a crucial improvement constructed during this phase of the Project. It allowed visitors to experience the new recreation activities available at Loch Lomond, while simultaneously comprehending the realities of water storage and use in the county (SCS 1964).

In January of 1982, a powerful storm caused flooding throughout the Santa Cruz County. It was discovered that a main pipeline from Loch Lomond had burst and was leaking at an alarming rate. Although the damaged section of pipeline was relocated and repaired by the end of the year, it renewed community attention to the 20-year-old dam and the potential for its components to fail under stress (SCS 1982; Cardona and Associates 1982).

In 1984, the Santa Cruz Water Department received $11.7 million dollars through private Certificates of Participation in order to fund upgrades and modernizations to the water infrastructure system throughout the City. A Division of Safety of Dams survey had recently demonstrated that the spillway at Newell Creek Dam did not meet the newest safety criteria for probable maximum flood conditions, so a portion of the funds were allotted toward upgrade to the dam's spillway wall. The upgrades implemented in 1985, included heightening the Newell Creek Dam spillway wall and the installation of a permanent aerator system. The spillway wall helps to protect the dam embankment in the event of an overflow by directing water safely through the spillway channel and away from the earthfill embankment, and heightening the walls ensures that it could withstand damage from a probable maximum flood equal to approximately five times the intensity of the 1982 flood (SCWD 1986; SCS 1984a).

Property Type: Earthen Dams

For thousands of years, people have stored water and altered their natural environment to their benefit. The oldest known dams date back to 6,000 years ago in present-day Jordan, where farmers constructed earthen mounds to capture rainfall. Dams are typically constructed to serve three main purposes: to hold back or store water, to produce energy, and to control flooding. While technological advancements have improved capacity, safety, and reduced failures, the design of dams has not deviated from several successful engineering methods (Billington et al. 2005).

Dams are classified in terms of materials and form. In California, dams are typically one of several construction methodologies: rockfill, earthen, masonry, and/or concrete. In California, the topography and geology of a

region often drives the construction of a dam, resulting in a vernacular design that often does not adhere to one specific method. Earthen dams were a common choice for dams planned and implemented throughout Northern California during the 1930s, 40s, and 50s. The customizable principles of the design suited many terrains in the varied landscape and additionally reduced transportation and materials costs to remote, inaccessible areas by utilizing local soil for fill. North of Santa Cruz County in Santa Clara County, 9 of 10 dams built between 1935 and 1957 to impound water for municipal use are earthfill dams. Both of the dams located south of Santa Cruz in Monterey County are earthfill dams as well (Corns et al. 1988; SCVWD 2018; MCWRA 2018).

Keeping with the predominant trend in the area at the time it was designed, the Newell Creek Dam is a zoned earthen embankment dam that rests on a pervious foundation. Earthen dams have been employed in communities throughout the world for centuries as a method to control and store the flow of waterways. They are the most common variety of dam because their construction exploits local resources for structure and materials. An earthfill or earthen dam is a type of dam comprised of appropriate soils borrowed from either a local area and/or the result of preparatory excavations. These soils are layered and compacted to form an embankment. There are three principle embankment types: homogenous, diaphragm, and zoned. The suitability of one over the other is determined by site-specific factors including geographic setting, geologic substrate, and availability of local fill material. Homogenous embankments consist of one impervious material throughout the whole embankment mound. Diaphragm embankments are comprised of a layers of pervious material(s) with either an impermeable blanket on the upstream side or an impermeable diaphragmatic layer of earth, cement, or concrete. Zoned embankment types have an impervious central core that is flanked by pervious material zones of sand, gravel, rocks, or a combination of several. In order to control the level of reservoirs created by earthen dams, supplemental structures are required to house the outlet(s) and spillway (USDIBR 1987; USACE 2004).

Creegan & D'Angelo Civil Engineers

Patrick Creegan & Elmer D'Angelo established Creegan & D'Angelo Civil Engineers in 1956 in San Jose, California. The company still operates today under the name Creegan + D'Angelo Infrastructure Engineers from their offices in Monterey, California, and Fairfield, California. The foundation of their business is in civil engineering, covering structural engineering for residential and commercial buildings. They also specialize in water management including planning, design, storage, and disposal strategies; land planning; development and management services; and transportation and public works infrastructure planning.

In addition to Newell Creek Dam and Loch Lomand in Santa Cruz, Creegan + D'Angelo has planned and implemented successful water management projects in multiple Monterey Bay Area locations and throughout California. The following projects demonstrate the range of their projects within the field of water management and distribution:

- Round Hill-Douglas County Sewer Improvement Project. Tahoe, California.

- Davenport Sanitation District Wastewater Management System. Davenport, California.
- Aquifer Storage and Recovery. Monterey Peninsula, California.
- Sand City Desalination Water Supply Project. Sand City, California.
- San Benito Water Distribution System. San Benito County, California.
- North San Jose / Alviso Reservoir. San Jose, California.
- Yosemite Sanitary Sewer Replacement. Yosemite National Park, California.

3 BACKGROUND RESEARCH

As part of the cultural resources study prepared for the Project, Dudek staff requested a CHRIS records search on January 9, 2018, from the Northwest Information Center, which houses cultural resources records for Santa Cruz County. Dudek staff received the results on January 31, 2018, for the Project site and surrounding 0.5 miles. This search included their collection of mapped prehistoric, historic, and built-environment resources; Department of Parks and Recreation Site Records; technical reports; and ethnographic references. Additional consulted sources included historical maps of the Project site, the NRHP, the CRHR, the California Historic Property Data File, and the lists of California State Historical Landmarks, California Points of Historical Interest, and the Archaeological Determinations of Eligibility. Confidential Appendix B provides the confidential results of the records search and a bibliography of prior cultural resources studies.

3.1 Previous Cultural Resources Studies

Results of the CHRIS search indicate that one study was previously conducted within the Project site (S-13507), and four studies were identified within the 0.5-mile records search radius (Table 1). The following paragraph provides a brief summary of the study.

Table 1. Previous Cultural Resources Investigations within 0.5 Miles of the Area of Potential Affect

Report	Author	Year	Title	On Project Site?
S-003822	Allan Lonnberg	1973	Archaeological Reconnaissance of the Rancho Rio Subdivision No. 5, File No.17254-1	No
S-003836	Joseph W. Morris	1974	Preliminary Archaeological Reconnaissance for Environmental Impact Report on a 70 acre parcel of land in the Newell Creek Drainage of Santa Cruz County, Ca	No
S-013507	Steven M. Butler	1992	Archaeological and Historical Resources Survey and Impact Assessment, SCWD 92 Selective Harvest	Yes
S-017630	Robert Cartier	1995	Cultural Resource Evaluation, Quail Hollow Ranch Environmental Impact Report Project, Felton, CA	No
S-028321	Gary Paul	1994	Archaeological and Historical Resources Survey and Impact Assessment, a Supplemental Report for a Timber Harvesting Plan, Dunworth THP, THP #1-94-566	No

S-13507

Archaeological and Historical Resources Survey and Impact Assessment: A Supplemental Report for a Timber Harvesting Plan (Butler 1992) documents the results of an archaeological survey conducted in relation to a selective timber harvest in the eastern portion of the Project site. No cultural resources were identified in the Project site as a result of the study.

3.2 Previously Recorded Cultural Resources

No previously recorded cultural resources were identified within the Project site or 0.5-mile-radius of the Project site as a result of the Northwest Information Center records search.

3.3 Building Development Research

Santa Cruz Public Library

Dudek staff reviewed a number of online resources available through the Santa Cruz Public Library. These tools include accessing online Sanborn Maps, online photo collections, online historical photograph collections, and online historical newspaper collections, which were all used in the preparation of the Historic Context (Section 2.3).

City of Santa Cruz Water Department

Dudek visited the City of Santa Cruz Water Department on February 21, 2018, and met with Sarah Easley Perez. During this visit, Dudek architectural historian Kate Kaiser was given access to the archive of historical material relating to Newell Creek Dam including reports, photographs, drawing sets, engineer's journals, contracts, and change orders related to the dam and its associated structures. These materials were used in preparation of the Historic Context (Section 2.3) and Cultural Resources Survey (Section 4).

University of California Santa Cruz Archives

On February 22, 2018, Ms. Kaiser visited the public stacks at the University of California Santa Cruz archives and collected information about the general history of Santa Cruz and its water systems. This material was used in the preparation of the Historic Context (Section 2.3).

San Lorenzo Historical Society

Dudek contacted Lisa Robinson at the San Lorenzo historical Society on February 12, 2018, with a research request for material on the Newell Creek Dam. Ms. Robinson responded that she did not have photographs, letters, or ephemera but did have a book on San Lorenzo Valley water system history for sale if desired. Ms. Kaiser met with and purchased the offered book on February 21, 2018. This book, *The San Lorenzo Valley Water District: A History*, was used in the preparation of the Historic Context (Section 2.3).

Aerial Photograph and Historic Map Review

A review of historic maps and aerial photographs was conducted as part of the archival research effort for the Project. No Sanborn maps were available for the area immediately surrounding Newell Creek or Loch Lomond. Historic aerial photographs were reviewed for the Project site from the following years: 1948, 1953, 1956, 1963, 1968, 1991, 2005, 2009, 2010, 2012, and 2014. Historical topographical maps were reviewed for the Project

site for the following years: 1902, 1943, 1947, 1955, 1956, 1957, 1960, 1961, 1964, 1968, 1969, 1975, 1980, 1982, 1986, 1991, 1995, 1998, 2002, and 2012.

The Project site first appears in an aerial survey in 1948, and it is clear that the area surrounding it remains extremely rural and undeveloped. To the west, the town of Brookdale, and to the southwest, the town of Ben Lomond are visible as clearings in the dense woodland (CDF 1948). In 1953, a clearing that functions as a county dump is visible to the south of the Project site. The cleared area surrounding the county dump dramatically enlarges in the 1956 aerial survey as result of a devastating 1,500-acre fire there in the summer of 1954 (ASC 1956; SCS 1954b).

The Newell Creek Dam and the Loch Lomond Reservoir first appears in the 1963 aerial photograph. Construction on the dam is complete at this time, and the reservoir nearly filled. The recreation facilities at this time are limited. The zone surrounding the dam is exposed, revealing the earthen embankment, the spillway, the spillway-bridge, and dam access roads. By 1968, the reservoir is at full capacity and the Recreation Area is visible, complete with boat launch, two projecting docks, and a defined access road on the east shore of the reservoir. The dam embankment is filled in with shrubby vegetation, but overall the dam and its associated features are not concealed (CAS 1963; NETR 2018).

In 1991, nearly 30 years later, the protected open space owned by the City immediately surrounding the reservoir remains undeveloped. Beyond the open space to the west, east, and north, the land features sparse residential properties barely visible through the trees. Only one of the two original docks from the 1968 Recreation Area remains, and it has been extended and altered to a U-shaped dock. A hexagonal building now sits at the edge of the reservoir beside the dock entrance (NETR 2018).

In 2005, the U-shaped dock in the Recreation Area was expanded further and featured an oval shaped extension at the end of a long dock with a short cross section. The undeveloped area surrounding the dam is forested and partially obscures the spillway and access road. In ensuing years, these features are noticeable from aerial photos, yet the reason for the renewed visibility is unknown (NETR 2018).

4 CULTURAL RESOURCES SURVEY

4.1 Methods

Dudek Architectural Historian Kate Kaiser, MSHP, conducted the intensive-level pedestrian survey on February 19 and 20, 2018. The intensive-level survey methods consisted of a pedestrian survey of the Newell Creek Dam crest and toe, the spillway, and accompanying features including the bridge, picnic area, ford, valve pit, pipeline, control house, dock, boathouse, equipment room, public restrooms, and boat launch area. Portions of the dam are underwater and could not be recorded for this Project. All fieldwork was documented using field notes, a digital camera, Apple iPad technology with close-scale field maps, and aerial photographs. Photographs were taken using a Canon Powershot digital camera with a 16-megapixel resolution and 8x zoom feature. Global Positioning System (GPS) points of landmarks and precise locations of new intake facilities were taken with an iPad (Model No. MP242LL/A) equipped with georeferenced PDF maps of the Project site. Accuracy of this device ranged between 3 and 10 meters. All field notes, photographs, and records related to the current study are on file at Dudek's Pasadena and Santa Cruz, California, offices.

4.2 Survey Conditions

The general vicinity surrounding the Project site is a rural, natural site, dominated by steeply forested hills. The dam and Loch Lomond Recreation Area is owned and operated by the City. The dam and recreation area are surrounded by a natural buffer and by large, private rural properties. The nearest towns are Lompico, roughly 1.1 miles east, and Ben Lomond, roughly 1.25 miles southwest. The elevation of the Project site is roughly 600 feet above sea level. The dam itself is located in a steep drainage basin, heavily vegetated with a mix of redwood, incense cedar, bay laurel, oak, madrone, and sycamore, and a dense understory of native grasses, toyon, ceanothus, ferns, blackberry, and poison oak. Ground visibility is low (Figures 10 and 11).

Figure 10. Newell Creek Dam Crest, Looking Southeast. February 20, 2018. (IMG0282)

Figure 11. Newell Creek Dam Crest Looking Down Face of Dam. February 20, 2018. (IMG0286)

On the crest of Newell Creek Dam, there are several observable features and structures: the spillway, the bridge over the spillway, the control house, the weather station, and a prefabricated storage container (Figures 12 through 19).

Figure 12. Spillway Inlet at Crest, Looking Southeast. February 20, 2018. (IMG0027)

Figure 13. Spillway Near Crest, Looking Northeast. February 20, 2018. (IMG0018)

Figure 14. Control House Main (Southwest) and Southeast Elevations, Looking Northwest. February 20, 2018. (IMG0042)

Figure 15. Control House Northwest and Northeast Elevations, Looking Southeast. February 20, 2018. (IMG0050)

Figure 16. Storage Container Main (Southwest) and Southeast Elevations, Looking Northwest. February 20, 2018. (IMG0074)

Figure 17. Recently Replaced Bridge Over Spillway, Looking Southwest. October 31, 2018. (IMG4622)

Figure 18. Bridge Over Spillway, Looking East. February 20, 2018. (IMG016)

Figure 19. Gated Weather Station, Looking East. February 20, 2018. (IMG0074)

At the toe of the dam there are a number of features including piping/valving to control operations of the reservoir, weirs and weir pools to measure seepage, the spillway plunge pool and concrete ford crossing (partially submerged in plunge pool) (Figures 20 through 25).

Figure 20. Valve Feature and Concrete Housing, Emerging from Toe of Dam, Looking Northeast. February 20, 2018. (IMG0101)

Figure 21. Valve Feature, Weir, and Weir Pool . February 20, 2018. (IMG0113)

Figure 22. Spillway Section above Spillway Plunge Pool, Looking Northeast. February 20, 2018. (IMG0138)

Figure 23. Spillway Plunge Pool, Looking Northeast. February 20, 2018. (IMG0148)

Figure 24. Spillway Plunge Pool, Looking Northeast. February 20, 2018. (IMG0154)

Figure 25. Stream Ford, Re-constructed 1982, Looking Southwest. February 20, 2018. (IMG0142)

Finally, some distance down the access road is another bridge (Figure 26), designed and built at the same time as the Newell Creek Dam (1958).

Figure 26. Access Road Bridge Looking Southwest. February 20, 2018. (IMG0209)

The Recreation Area is located northeast of the Newell Creek Dam on an eastern inlet of Loch Lomond and includes a dock, the park store building, boat launch, restroom facilities, and a motor shop (Figures 27–32).

Figure 27. Recreation Area Looking Northwest from Dock. February 20, 2018. (IMG0217)

Figure 28. Park Store Building Looking East. February 20, 2018. (IMG0214)

Figure 29. Recreation Area Dock Looking South. February 20, 2018. (IMG0220)

Figure 30. Boat Launch Looking Northeast. February 20, 2018. (IMG0251)

Figure 31. Restroom Facilities Building Looking East. February 20, 2018. (IMG0242)

Figure 32. Motor Shop Building Looking Southwest. February 20, 2018. (IMG0224)

4.3 Results

Survey of the Newell Creek Dam and Loch Lomond Recreation Area resulted in identification of seven associated built environment resources functioning together: the Newell Creek Dam (1958) and its associated spillway (1958, altered 1985), control house (1958) bridge over spillway (1958, replaced 2018), valve and outlet works (1958, 1960), access road bridge (1958), and the Recreation Area itself (1965, Replaced 1981, 1985). A detailed description of these resources is provided in the paragraphs that follow. Several features of the dam, such as the outlet conduit, the intake structure, and the closure block are underwater within the earthen structure of the dam, and/or otherwise not readily visible and recordable for the purposes of this evaluation. There are several non-historic resources also associated with the dam: the weather station, the metal storage container, the concrete stream ford, and the recently replaced spillway bridge.

Newell Creek Dam and Loch Lomond Recreation Area

Newell Creek Dam (1958)

Figure 33. View Southeast from Dam Crest to Downstream Slope. February 20, 2018. (IMG0284)

The Newel Creek Dam crest (Figure 33) itself is roughly 15 feet from the centerline for its entire width (approximately 30 feet wide total). The dam height is 195 feet from the ground surface in the drainage basin. The total length of the crest is approximately 750 feet from the spillway to the northwest terminus. Though

not visible during the February field visit, the width of the dam at the toe was originally planned and constructed to be 1,335 feet, not accounting for soil creep and slippage over time. The pitch of the slope on the northeast (upstream/Loch Lomond) side was built at gentle slope of 1 foot drop every 3 feet, or 3:1 ratio. The pitch of the slope on the southwest side (downstream) was much steeper at 2:1 before becoming a gentler slope further downslope at 3:1. The dam is constructed of several different types of fill: impervious fill on the innermost section, random fill over French drain fill in the Loch Lomond side, and pervious fill over upstream-random fill on the downstream side of the dam. The crest of the dam is constructed of the same impervious fill and topped with a prime coat (Creegan & D'Angelo 1961a).

Spillway (1958, Altered 1985)

The spillway consists of several components that work together to only allow water to let out from the dam when the water level reaches over a certain height to prevent overtopping of the dam. The components are an approach channel or approach, which moves water toward the spillway, located at the southeastern terminus of the dam. The spillway tapers from 65.52 feet wide at the weir crest to 14 feet wide for the length. Its total length is 592 feet and drops 154 feet in elevation from the weir crest to the bottom of the outlet footing. Its original height was 11 feet maximum, 5 feet minimum according to Creegan & D'Angelo's drawings. The original spillway walls were constructed of board-formed concrete, while the basin was concrete slab.

In 1985, the height of the spillway wall was raised in response to a large storm that resulted in regional flooding. The 1985 material is cast concrete slab, and this raised the wall height between 2 feet and 6 feet along the top 250 feet of the spillway near the weir crest. The steep slope section of the spillway was left unaltered. The slope of the spillway changes from 5% at the top to 48% down the length of the spillway to the outlet. The spillway outlets several feet above an oblong spillway plunge pool at the toe of the dam's downstream (southwest) side. The spillway plunge pool has worn away the naturally occurring bedrock wall to the southeast, creating a sheer, naturalistic looking wall around a section of the plunge pool. The plunge pool has a concrete ford separating it from of Newell Creek (Creegan & D'Angelo 1961b, 1984).

Control House (1958)

The control house is a rectangular plan, one-story, single-room building with a shed-style roof. The control house building footprint measures 9 feet 4 inches wide by 20 feet long. The building is constructed of concrete masonry units arranged in stack bonds on a concrete foundation. It is the control structure for the intake gates and conduit. The roof is a lightly framed nominal lumber and plywood roof, clad in rolled asphalt shingle. The roof is pierced near the northwest side by a ventilation pipe. Attached to the southwest elevation is a commemorative plaque for workers who died during the construction of the dam. The building is devoid of windows but has a metal door on the southwest (main) elevation and a second metal door on the northeast elevation with the intake structure leading from the Loch Lomond side of the dam up to the doorway (Creegan & D'Angelo 1961c).

Spillway Bridge (1958, Replaced 2018)

The spillway bridge provides access from the access road to the Newell Creek dam crest road over the spillway. The original 1958 spillway bridge was removed prior to completion of this analysis, and replaced with a 20-foot wide, 26-foot span structural concrete bridge supported by precast/pre-stressed slab units. The bridge foundation consists of Cast-In-Drilled-Hole (PIDH) concrete piles. The decking is a poured polymer fiber structural concrete.

The original 1958 spillway bridge was constructed of precast and pre-stressed concrete floor slab units and measured 31 feet 9 inches in length, 20 feet 3 inches wide, and 1 foot thick. (Creegan & D'Angelo 1961d).

Valve and Outlet Works (1958, 1960)

The outlet works at the downstream toe of the dam consists of an outlet conduit valve, housed in a large board-formed concrete box. The outlet works include the surface features of an underground concrete outlet conduit running under the dam and controlled by the intake system in the control box in tandem with the outlet valve. The underground conduit is 1,331 feet and 10.2 inches long. It consists of a 3-foot-diameter pipe housed in a semi-circular concrete collar, measuring 6 feet 6 inches maximum width, 5 feet 3 inches tall, and providing at least a 1-foot thick concrete housing reinforced with longitudinal steel bars for the 3-foot-diameter pipe. The concrete housing for the valve and associated pipes at the downstream toe of the dam are all that was visible of the overall outlet conduit in the February field visit. The concrete valve housing measured 17 feet 10 inches long, 6 feet 6 inches wide, and 8 feet 11 inches tall. A portion of the valve housing's length is under the toe of the dam, so approximately 12 of the originally planned 17 feet length is visible, and approximately 4 feet of the original height. On the top side of the concrete house are two metal doors that open outward and provide access to the valve pit. A large 12-inch polyvinyl chloride (PVC) clad pipe emerges from the southwest side of the metal valve housing and leads to a smaller metal housing, roughly 6 feet by 4 feet by 3 feet high. The second metal housing is not listed in the Creegan & D'Angelo plans or in subsequent plans or change orders, and its use is unknown. Beyond the metal box, Newell Creek emerges from a pipe and continues its natural course through the steep drainage basin. Around the outlet features are several spare pipes, as well as little concrete and river rock retaining walls that appear to have once held small pools of water. (Creegan & D'Angelo 1961e).

Access Road Bridge (1958)

The access road bridge follows the American Association of State Highway Officials Standard Specifications for Highway Bridges 1957 design and construction specifications book. The bridge consists of three spans supported by two pier systems and two abutment systems. It is 135 feet long (45 feet per span), 30 feet wide, and 25 feet high at its maximum height. The roadbed is 26 feet wide (13 feet per lane) with a 1-foot-wide curb on the upstream (north) side and 3 feet wide on the downstream (south) side. Each curb has a metal guardrail on either side, 2 feet 10 inches high, with metal balusters at regular intervals and concrete end-posts atop the abutments on either end of the bridge (Creegan & D'Angelo 1961f).

Recreation Area (1965)

Historic aerial photographs suggests that the buildings which currently stand on the site are not the original shore-side concession structure or docks completed in 1965. The historic docks, three in total, were built from wood and projected from the Recreation Area shoreline. Two of the docks were rectangular in shape and had floor planks that extended lengthwise down the dock. The third dock was more narrow than the others and projected out alongside the boat launch area, terminating in a square platform. Between the boat launch dock and the other docks sat the original Concessions building. It was a one-story building with a large overhanging roof directly on the shore of the lake (NETR 2018; SCS 1979a).

While it is unclear when the original Recreation Area structures were demolished between the 1968 and 1991 historic aerial photos, the City Council agenda announcements suggest that there was a great deal of new construction that took place during that period. The City announced the creation of a new master plan for the Recreation Area in June of 1979. In 1981, the City announced the completion of a new lakeside bathroom. Bids and acceptance of a design proposal were posted in the Santa Cruz Sentinel in 1984 for a new Concessions Building. In 1984, the City requested bids for new docking facilities that were completed and announced again in 1985 (NETR 2018; SCS 1979b; SCS 1981; SCS 1984; SCS 1985).

Presently, there is one large dock in the place of the two, rectangular, wooden ones, and it is constructed of sectional floating polyethylene configured into an 'H' shape. The modern Camp Store building is situated at the head of the dock on the shore of the reservoir to the northeast of where the original Concessions building stood. It is a single-story building clad in wood board-and-batten sided with multiple roll-up door openings. A hexagonal shade structure sits facing the camp store, on the opposite side of the dock entrance. The modern restroom facility building is located to the northeast of the boat launch ramp and is a simple, rectangular, wood-sided building. The Motor Shop is situated further from the edge of the reservoir in the parking lot. It is a rectangular building with a rectangular addition jutting from the rear of the building and appears to be modern construction. Both are clad in tan-colored medium-density fiberboard siding.

Modern Features

There are three modern features, constructed after 1973: the weather station, the metal storage container, and the concrete stream ford.

The weather station is located just northeast of and along the dam crest road between the spillway bridge and the control house. The weather station is within a chain link fence enclosure. Instruments are mounted on a 1 ½" (approximate) diameter metal pipe, set on a tripod mount. There is a small solar panel and data logger enclosure also mounted to the tripod.

The metal storage container (circa 2006) is located on the dam crest beside the control house. It is a metal cargo container, measures 20 foot long by 8 foot wide, and is constructed of corrugated steel, placed directly on the asphalt parking area of the dam crest road. The container features a metal safety door, mounted camera,

and louvered vent on the main elevation; a louvered vent on the northeast elevation; two steel doors with bar closure at the southeast elevation; two turbine vents on the roof, and a cupola vent on the roof.

The stream ford roadbed is located near the valve and outlet works, immediately adjacent to the spillway plunge pool. It was constructed circa 1982, after a flood in 1982 destroyed the previous road. The 1982 road is constructed of concrete slabs, with intermittent expansion joints, atop an exposed, riprap foundation constructed of sacked concrete. The roadbed is roughly 8-10 feet wide and 80-100 feet long, with sections at either end partially buried in dirt. The original road materials were unknown.

5 HISTORICAL SIGNIFICANCE EVALUATION

5.1 Newell Creek Dam Complex

The following presents a description and evaluation of the Newell Creek Dam and Loch Lomond Recreation Area. The complete set of State of California Department of Parks and Recreation 523 Forms (DPR Forms) is located in Appendix C.

Resource Description

The Newell Creek Dam Complex is located within the Project APE. The zoned earthfill dam was designed by Creegan & D'Angelo Civil Engineers and constructed on Newell Creek in 1960. The period of significance for the Newell Creek Dam Complex and its associated features begins in 1958 when the voters of the City of Santa Cruz approved $5.5 million in water revenue bonds necessary for the City to purchase 2,162 acres of land in the Newell Creek watershed from the San Lorenzo Valley Water District and build the Newell Creek Dam site and ends in 1965 when the Loch Loman Recreation Area was completed. It is 195 feet tall with a crest length of approximately 750 feet. The zoned interior is approximately 300 feet wide and is surrounded by random fill that was sourced from the immediate vicinity around the dam.

As per the National Register criteria, the associated features of a subject property are assessed individually on the basis of their historic integrity, followed by a determination of it constituting either a contributing or non-contributing resource. The National Park Service defines contributing and non-contributing thusly:

> **Contributing resources:** Contributing resources are the buildings, objects, sites, and structures that played a role or, more simply, existed at the time the event(s) associated with the proposed National Historic Landmark occurred.
>
> **Non-contributing resources:** Noncontributing resources are the buildings, objects, sites, and structures that did not exist at the time the event(s) associated with the proposed National Historic Landmark occurred or have lost integrity from that historic period (NPS 2014).

Features associated with the Newell Creek Dam Complex include the dam spillway, control house, bridge over the spillway, valve and outlet works, and access road bridge. Several do not retain enough integrity to maintain contributing status for reasons that are outlined in Table 2. The Loch Lomond Recreation Area, completed in 1965, is located north of the dam on the east shore of the Loch Lomond Reservoir. The facilities there include picnic areas, camp store, boat launch, and a polyethylene floating dock.

Table 2. Newell Creek Dam Complex Associated Features

Feature	Built Date	Contributing or Non-Contributing
Newell Creek Dam	1958	Contributing
Spillway	1958, Altered 1985	Non-Contributing (Major 1985 alteration)
Control House	1958	Contributing
Bridge Over Spillway	1958, Replaced 2018	Non-Contributing (Original bridge replaced in 2018)
Valve and Outlet Works	1958, 1960	Non-Contributing (Addition of non-original metal valve housing not listed in original plans is not consistent with original design or evidenced by existing change orders; multiple concrete patch campaigns on original housing suggest repairs and alterations)
Access Road Bridge	1958	Contributing
Recreation Area	1965, Replaced 1981, 1985	Non- Contributing (Original 1965 dock and Concessions building replaced by current structures in early to mid-1980s including Camp store, restroom facilities and dock)

NRHP and CRHR Criteria

NRHP Criterion A: associated with events that have made a significant contribution to the broad patterns of our history.

CRHR Criterion 1: is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

The Newell Creek Dam Complex is directly associated with events that have made a significant contribution to the development history of water infrastructure in the City of Santa Cruz Water Department service area. The Newell Creek Dam is significant under Criterion A/1 for its association with water infrastructure, which was essential to maintaining the municipal water supply during periods of seasonal water shortages and droughts. The availability of water played a critical role in the early planning, development, and sustained growth of the City, including a factor in the choice of Santa Cruz as the site for a University of California Campus. When the Newell Creek Dam was in its elemental planning stages in 1957, it was one of six reservoir projects recommended by the project engineers, Creegan & D'Angelo, for the long-term water supply reliability for the City and Santa Cruz County. However, the Newell Creek Dam was the only such project that was realized. Loch Lomond Reservoir is the resulting impoundment of Newell Creek by the Newell Creek Dam and it is an important supplementary source of drinking water for Santa Cruz City. The period of significance, beginning in 1958 with approval of $5.5 million in water revenue bonds necessary for the City to purchase land to build the Newell Creek Dam site and ends in 1965 when the Loch Loman Recreation Area was completed. In summary, the subject property is directly associated with important events that have made a significant contribution to the development of water infrastructure development in Santa Cruz. These important events include concerns over

local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages. Archival research also revealed that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California, noting that failure to correct water shortage issues could end all chance of the selection of Santa Cruz as the University site (SCS 1961b; SCS 1961a; SCS 1958). Construction of the Newell Creek Dam gave the City control over the seasonal fluctuations in water availability and became a critical component to the water infrastructure, which supported the sustained growth of the City after World War II. **Therefore, the subject property appears eligible at the local level under NRHP/CRHP Criteria A/1 at the local level of significance.**

NRHP Criterion B: associated with the lives of significant persons in our past.

CRHR Criterion 2: is associated with the lives of persons important in our past.

Archival research on the subject property failed to reveal associations with any persons significant in the history of Santa Cruz, the state, or the nation. The property does not appear to be associated with any person(s) whose contributions demonstrate historic importance at the local, state, or national level. Therefore, the subject property does not appear eligible under NRHP/CRHR Criteria B/2.

NRHP Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

CRHR Criterion 3: embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The subject property is a utilitarian, zoned earthfill dam, a common form of dam that is found throughout California, the United States, and the world. It was designed by Creegan & D'Angelo Civil Engineers in 1958 and constructed by William and Burrows Inc. in 1960. Although Creegan & D'Angelo have contributed a large number of designs to the body of engineered municipal water containment projects in California, the creative merit of their designs is not significant enough to have made an impact on the development of the genre as a whole. Contractors William and Burrows Inc. contributed to the field of architecture by erecting structures of various kinds throughout the San Francisco Bay Area, but overall they did not significantly impact the field of dam design or construction techniques. Archival research suggests that the Newell Creek Dam is typical of its construction type for an earthfill dam, and does not embody any distinctive characteristics of a type, period, or method of construction apart from variances dictated by its specific geographical location. There are little inherent artistic or design values associated with the dam or its associated features, and repeated repairs and routine maintenance have replaced original materials, resulting in loss of integrity. For all of the reasons described herein, the subject property does not appear eligible under NRHP/CRHR Criteria C/3.

NRHP Criterion D: have yielded, or may be likely to yield, information important in history or prehistory.

CRHR Criterion 4: has yielded, or may be likely to yield, information important in prehistory or history.

There is no evidence to indicate that the subject property is likely to yield and additional information important to prehistory or history beyond what is already know. The subject property is also not associated with an archaeological site or a known subsurface cultural component. Therefore, the subject property does not appear eligible under NRHP/CRHP Criteria D/4.

County of Santa Cruz Criteria

For the same reasons already discussed in application of NRHP and CRHR criteria, the Newell Creek Dam Complex appears eligible under Criterion 2 of the County of Santa Cruz criteria, as described in Section 16.42.050(C) of the Title 16 Environment and Resource Protection, Chapter 16.42 Historic Preservation.

1. **The resource is associated with a person of local, State or national historical significance;**

   As stated in Criterion B/2, archival research did not reveal an association between the Newell Creek Dam and any persons who significantly contributed to the development of the city, state, or nation.

2. **The resource is associated with an historic event or thematic activity of local, State or national importance.**

   As stated in Criterion A/1, the Newell Creek Dam is associated with events that have made a significant contribution to the development history of water infrastructure in Santa Cruz County, including local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages. Archival research also revealed that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California, noting that failure to correct water shortage issues could end all chance of the selection of Santa Cruz as the University site (SCS 1961b; SCS 1961a; SCS 1958). Construction of the Newell Creek Dam gave the City control over the seasonal fluctuations in water availability and became a critical component to the water infrastructure, which supported the sustained growth of the City after World War II. Therefore, it qualifies under County of Santa Cruz Criterion 2.

3. **The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.**

   As discussed in Criterion C/3, the Newell Creek Dam is an archetypical, zoned earthfill dam. Its design does not possess any special aesthetic merit because it was constructed simply and lacks distinctive characteristics beyond those dictated by the surrounding terrain.

Creegan & D'Angelo Civil Engineers designed the Newell Creek Dam in 1958, 2 years after starting their firm in 1956. Although it is representative of an early Creegan & D'Angelo project, archival research did not reveal that the designers/engineers exercised any degree of influence over their peers within the time period associated with the dam and its features.

4. **The resource has yielded, or may likely yield, information important to history.**

   As discussed under Criterion D/4, there is no evidence to indicate that the subject property is likely to yield and additional information important to prehistory or history beyond what is already know. The subject property is also not associated with an archaeological site or a known subsurface cultural component.

Integrity

In accordance with the NRHP guidelines, properties that are eligible for listing in the NRHP must be significant under one or more of the criteria and must have sufficient integrity to convey their significance. These rules apply whether the property is considered for individual listing or as a contributing resource within a historic district. In assessing historic integrity, the NRHP recognizes seven aspects or qualities that, in various combinations, define integrity. In order to retain historic integrity "a property will always possess several, and usually most, of the aspects" (NPS 2002).

The CRHR generally follows the integrity guidelines for the NRHP, but it recognizes that it is possible that historical resources that may not retain sufficient integrity to meet the criteria for listing in the NRHP may still be eligible for listing in the CRHR. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if it maintains the potential to yield significant scientific or historical information or specific data.

The seven aspects of integrity are:

- **Location** – the location where the historic property was constructed or the place where the historic event occurred.
- **Design** – the combination of elements that create the form, plan, space, structure, and style of a property.
- **Setting** – the physical environment of a historic property or the character of the place in which the property played its historic role.
- **Materials** – the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- **Workmanship** – the physical evidence of crafts of a particular culture or people during any given period in history or prehistory.
- **Feeling** – a property's expression of the aesthetic or historic sense of a particular period of time.

- **Association** – the direct link between an important historic event or person and a historic property.

The subject property was found to retain sufficient integrity to convey significance in the areas of location, design, setting, feeling, and association. The property retains integrity of location, setting, and feeling, as the vicinity surrounding the Newell Creek Dam Complex has retained its rural presence and character. Although the dam and its associated features does not exhibit distinctive artistic characteristics, the integrity of the original design endures as an archetypal earthen embankment dam. The Newell Creek Dam and the resultant Loch Lomond reservoir remains an important source of drinking water storage for the City and therefore maintains its association with the development of water infrastructure in Santa Cruz.

5.2 Evaluation Findings

After thorough consideration of NRHP, CRHR, and County evaluation criteria, the Newell Creek Dam and its associated features appear eligible for the NRHP and CRHR under Criterion A/1 at the local level of significance and eligible for local listing under Santa Cruz County Criterion 2 for its associations with local water development. Therefore, it is considered an historic property under Section 106 of the NHPA and an historical resource under CEQA.

6 PROJECT EFFECTS/IMPACTS ASSESSMENT

The Newell Creek Dam Complex and its associated features appear eligible for the NRHP and CRHR under Criterion A/1, and for local listing under County of Santa Cruz Criterion 2 for its associations with local water development. Therefore, it is considered an historic property under Section 106 of the NHPA and an historical resource under CEQA.

Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on historic properties, assess the effects, and seek ways to avoid, minimize, or mitigate any adverse effects on such properties (36 CFR 800.1[a]). Likewise, CEQA requires a lead agency to determine whether a project may have a significant effect on historical resources (PRC section 21084.1; CEQA Guidelines section 15064.5(b)).

6.1 Identified Effects/Impacts

Table 3 presents an analysis of all proposed project impacts, and considers the level of impact on the Newell Creek Dam Complex; including the level of impact prior to mitigation, and the level of impact after mitigation is implemented. As demonstrated in the table, all proposed project activities were found to have a less-than-significant impact/no adverse effect on the three resources that contribute to the significance of the Newell Creek Dam Complex (i.e., the dam, control house, and access road bridge), with no mitigation required (see Table 2 in Section 5.1). Therefore, the proposed project will have a less-than-significant impact on historical resources under CEQA and will have no adverse effect on historic properties under Section 106 of the NHPA.

Table 3. Analysis of Project Impacts and Proposed Mitigation

Project Component	Level of Impact Before Mitigation	Analysis of Impacts	Level of Impact After Mitigation
Proposed Dam and Inlet/Outlet Project Components			
New intake structure	Less than Significant	▪ Shaft drilled through reservoir bed will not be visible ▪ New intake will be placed on west abutment of the dam and will not obscure any major components of the dam	Less than significant No mitigation required
New inlet/outlet conduit tunnel	Less than Significant	▪ Tunnel will pass beneath the dam with sufficient bedrock cover and will not be visible	Less than significant No mitigation required
New outlet structure	Less than Significant	▪ The proposed new outlet structure would also be located near the toe of the dam, and will not materially impair any of the dam's contributing elements.	Less than significant No mitigation required
Control house	Less than Significant	▪ Adjacent construction of a new control house will not disturb the existing control house.	Less than significant No mitigation required

Table 3. Analysis of Project Impacts and Proposed Mitigation

Project Component	Level of Impact Before Mitigation	Analysis of Impacts	Level of Impact After Mitigation
Proposed Appurtenant Facilities			
Beneficial instream flow pipeline	Less than Significant	▪ Although the existing system for the beneficial releases will be entirely replaced, no contributing features will be impacted.	Less than significant No mitigation required
Dam seepage discharge	Less than Significant	▪ Will be re-routed with new outlet structure and will not materially impair the resource. No contributing features will be impacted	Less than significant No mitigation required
Newell Creek Pipeline	Less than Significant	▪ The new section of NCP will be located adjacent to and several feet east of the existing pipeline and will not be visible. No contributing features will be impacted	Less than significant No mitigation required
Proposed Site Improvements			
Access road improvements	Less than significant	▪ The project does not include provisions to improve the paved road prior to construction. Post construction, repairs to the pavement will be required to address any damage resulting directly or indirectly from construction. No contributing features will be impacted.	Less than significant No mitigation required
Spillway plunge pool crossing	Less than significant	▪ A new culvert bridge will be constructed that includes 5 box culverts, 4 retaining walls, a parapet/cut-off wall, and corbel pipe supports. The introduction of new construction at this location will not impact the resource's overall significance. Dense vegetation, trees, and limited access obscure the area surrounding the toe of the dam such that it would not be considered intrusive.	Less than significant No mitigation required
Other Improvements			
Utility improvements	Less than significant	▪ Existing power lines will remain in place and the new line will be concealed underground. ▪ Controls for inlets may be located within the existing control house and require new utilities to be run through the existing control house	Less than significant No mitigation required

Table 3. Analysis of Project Impacts and Proposed Mitigation

Project Component	Level of Impact Before Mitigation	Analysis of Impacts	Level of Impact After Mitigation
Decommissioning existing inlet/outlet works	Less than significant	▪ The inlet/outlet will be decommissioned, with the sloping intake abandoned in place. ▪ Pipeline will be decommissioned beneath the dam and will not be visible. No contributing features will be impacted.	Less than significant No mitigation required

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APPENDIX A

Preparer's Qualifications

Samantha Murray, MA

Historic Built Environment Lead / Senior Architectural Historian

Samantha Murray is a senior architectural historian with 13 years' professional experience in in all elements of cultural resources management, including project management, intensive-level field investigations, architectural history studies, and historical significance evaluations in consideration of the California Register of Historical Resources (CRHR), the National Register of Historic Places (NRHP), and local-level evaluation criteria. She meets the Secretary of the Interior's Professional Qualification Standards for both Architectural History and Archaeology.

Education

California State University, Los Angeles
MA, Anthropology, 2013

California State University, Northridge
BA, Anthropology, 2003

Professional Affiliations

California Preservation Foundation

Society of Architectural Historians

National Trust for Historic Preservation

Registered Professional Archaeologist

Ms. Murray is skilled in the recordation, evaluation, and mitigation of adverse effects to historic water resource infrastructure throughout California, including dams, reservoirs, pumping stations, channels, and culverts. Understanding the scale and complexity of this unique resource type, Ms. Murray has guided architects and engineers through the process of adjusting plans to conform with the Secretary of the Interior's Standards for Rehabilitation, and understands the need to strike a balance between preservation and functionality. In addition to her expertise with water resource infrastructure, she has prepared hundreds of historical resource evaluations and developed detailed historic context statements for a multitude of property types and architectural styles, including private residential, commercial, industrial, educational, medical, ranching, mining, airport, and cemetery properties. Ms. Murray also has a strong understanding of consultation with the State Historic Preservation Officer (SHPO), and regularly receives SHPO concurrence with no comments. She has also provided expertise on numerous projects requiring conformance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Finally, Ms. Murray has extensive experience preparing environmental compliance documentation in support of projects that fall under the California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA), and Sections 106 and 110 of the National Historic Preservation Act (NHPA). She also regularly works with local governments and historic preservation ordinance requirements. Ms. Murray has also served as a third-party reviewer and expert witness in court proceedings concerning interpretation and treatment of historical resources under CEQA and local municipal code.

Select Water Infrastructure Project Experience

San Diego PUD Citywide Historic Context Statement and Evaluation of Dam Infrastructure (in progress). Dudek is currently in the process of preparing a citywide historic context statement and significance evaluation of all dam and reservoir infrastructure owned/operated by the City's Public Utilities Department. Dudek is also preparing detailed impacts assessments for proposed modification to dams, as required by DSOD. The project involves evaluation of at least 10 dams for historical significance in consideration of NRHP, CRHR, and City designation criteria and integrity requirements, and requires extensive archival research and pedestrian survey. Upon completion of the project, the City will have a streamlined document for the management of their historic dam

and reservoir infrastructure. To date, Dudek has completed a draft historic context statement and three dam historical significance evaluations.

LADWP Tujunga Spreading Grounds Enhancement Project, City of Los Angeles, Los Angeles County, California (2018). Dudek was retained by Los Angeles Department of Water and Power (LADWP) to complete a cultural resources study for a project that proposes to install two new intake facilities to capture high flows from the Tujunga Flood Control and Pacoima Channels. After thorough consideration of NRHP, CRHR, and City of Los Angeles Historic-cultural Monument (HCM) designation criteria, the Tujunga Flood Control Channel segment addressed in this project does not appear eligible under any designation criteria. Ms. Murray co-authored the significance evaluation and provided QA/QC of the cultural resources report.

LADWP Green Verdugo Reservoir Improvement Project, City of Los Angeles, Los Angeles County, California (2017). Dudek was retained by Los Angeles Department of Water and Power (LADWP) to complete a cultural resources study for a project that proposes facility updates at the reservoir site in order to ensure safe water quality. Ms. Murray evaluated the reservoir for historical significance in consideration of NRHP, CRHR, and City of Los Angeles HCM designation criteria and integrity requirements, and co-authored the cultural resources report.

Tequesquite Creek Maintenance Project, City of Riverside, Riverside County, California (2017). Dudek was retained by the City of Riverside to conduct a cultural resources study for the proposed Tequesquite Creek Maintenance Project. The Tequesquite Creek Channel was constructed circa 1962-1966 and required evaluation for historical significance. The resource was found ineligible under all designation criteria and integrity requirements. Ms. Murray co-authored the significance evaluation and provided QA/QC of the cultural resources report.

LADWP Upper Stone Canyon Reservoir Water Quality Improvement Project, City of Los Angeles, Los Angeles County, California (2016). Dudek was retained by Los Angeles Department of Water and Power (LADWP) to complete a cultural resources study for a project that proposes to maintain and improve the quality, reliability, and stability of the Stone Canyon Reservoir Complex (SCRC) service area drinking water supply in order to continue to meet customer demand. Dudek prepared an updated evaluation of the reservoir in consideration of NRHP, CRHR, and City of Los Angeles HCM criteria and integrity requirements. Ms. Murray conducted the built environment survey, archival research, and co-authored the cultural resources report.

LADWP North Hollywood West Well Field Water Treatment Project, City of Los Angeles, Los Angeles County, California (2016). Dudek was retained by Los Angeles Department of Water and Power (LADWP) to complete a cultural resources study for a project that proposes to implement a response action to address releases of 1,4 dioxane in groundwater that are migrating to the NHW Well Field. This response action would be achieved by installing treatment equipment at the well field capable of removing 1,4-dioxane to below the identified cleanup levels. Ms. Murray provided QA/QC of the cultural resources technical report.

69th and Mohawk Pump Station Project, City of San Diego, California (2015). Ms. Murray served as architectural historian and lead author of the Historical Resource Technical Report for the pump station building on 69th and Mohawk Street. Preparation of the report involves conducting extensive building development and archival research on the pump station building, development of a historic context, and a historical significance evaluation in consideration of local, state, and national designation criteria and integrity requirements.

Pump Station No. 2 Power Reliability and Surge Protection Project, City of San Diego, California (2015). Ms. Murray served as architectural historian and prepared an addendum to the existing cultural resources report in order to evaluate the Pump Station No. 2 property for NRHP, CRHR, and local level eligibility and integrity

requirements. This entailed conducting additional background research, building development research, a supplemental survey, and preparation of a historic context statement.

Bear River Restoration at Rollins Reservoir Project, Nevada Irrigation District, Nevada and Placer Counties, California (2014). Ms. Murray served as architectural historian and co-author of the Cultural Resources Inventory Report. Ms. Murray conducted background research on the 1963 Chicago Park Powerhouse Bridge and prepared a historic context for the Little York Township and Secret Town Mine.

Expert Witness

Robert Salamone vs. The City of Whittier (2016). Ms. Murray was retained by the City of Whittier to serve as an expert witness for the defense. She peer reviewed a historic resource evaluation prepared by another consultant and provided expert testimony regarding the contents and findings of that report as well as historic resource requirements on a local and state level in consideration of the City of Whittier's Municipal Code Section 18.84 and CEQA. Judgement was awarded in favor of the City.

Peer Review

Peer Review of 1106 North Branciforte Avenue, City of Santa Cruz, Santa Cruz County, California (2017). Dudek was retained by the City of Santa Cruz to peer review the revised Department of Parks and Recreation Series 523 forms (DPR forms) for the property located at 1106 North Branciforte Avenue in the City of Santa Cruz. Ms. Murray conducted two rounds of peer review on the original and revised evaluation.

Peer Review of Avenidas Expansion Project, City of Palo Alto, Santa Clara County, California (2016). Ms. Murray peer reviewed a historical resource evaluation report for the property at 450 Bryant Street. The peer review assessed the report's adequacy as an evaluation in consideration of state and local eligibility criteria and assessed the project's conformance with the Secretary of the Interior's Standards for Rehabilitation.

Peer Review of 429 University Avenue Historic Resources Evaluation Report, City of Palo Alto, Santa Clara County California (2014). Ms. Murray conducted a peer review of a study prepared by another consultant, and provided a memorandum summarizing the review, comments, and recommendations, and is currently working on additional building studies for the City of Palo Alto.

Peer Review of 1050 Page Mill Road Historic Resources Evaluation Report, City of Palo Alto, Santa Clara County, California (2014). Ms. Murray conducted a peer review of a study prepared by another consultant, and provided a memorandum summarizing the review, comments, and recommendations.

Presentations

***Historical Resources under CEQA*. Prepared for the Orange County Historic Preservation Planner Working Group. Presented by Samantha Murray, Dudek. December 1, 2016.** Ms. Murray delivered a one-hour PowerPoint presentation to the Orange County Historic Preservation Planner Working Group, which included planners from different municipalities in Orange County, regarding the treatment of historical resources under CEQA. Topics of discussion included identification of historical resources, assessing impacts, avoiding or mitigating impacts, overcoming the challenges associated with impacts to historical resources, and developing effective preservation alternatives.

***Knowing What You're Asking For: Evaluation of Historic Resources*. Prepared for Lorman Education Services. Presented by Samantha Murray and Stephanie Standerfer, Dudek. September 19, 2014.** Ms. Murray and Ms. Standerfer delivered a one-hour PowerPoint presentation to paying workshop attendees from various

cities and counties in Southern California. The workshop focused on outlining the basics of historical resources under CEQA, and delved into issues/challenges frequently encountered on preservation projects.

Relevant Training

- CEQA and Historic Preservation: A 360 Degree View, CPF, 2015
- Historic Designation and Documentation Workshop, CPF, 2012
- Historic Context Writing Workshop, CPF, 2011
- Section 106 Compliance Training, SWCA, 2010
- CEQA Basics Workshop, SWCA, 2009
- NEPA Basics Workshop, SWCA, 2008
- CEQA, NEPA, and Other Legislative Mandates Workshop, UCLA, 2008

Kate Geraghty Kaiser, MSHP

Architectural Historian

Kate Geraghty Kaiser is an architectural historian with more than five years' professional experience as a cultural resource manager specializing in California Environmental Quality Act/National Environmental Quality Act (CEQA/NEPA) compliance, National Historic Preservation Act (NHPA) Section 106 compliance, reconnaissance and intensive level surveys, archival research, cultural landscapes, and GIS.

Education

University of Oregon
M.S. Historic Preservation, 2017
Boston University
B.A. Archaeology, 2009

Professional Affiliations

California Preservation Foundation
Vernacular Architecture Forum
Association for Preservation Technology - Southwest

Ms. Kaiser meets the Secretary of the Interior's Professional Qualification Standards for both Architectural History and Archaeology. She is experienced at managing multidisciplinary projects in the lines of transportation and federal land management. She has experience preparing environmental compliance documentation in support of projects that fall under Sections 106 and 110 of the National Historic Preservation Act (NHPA), and the California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA).

Select Project Experience

Development

Marin Country Club Stream Improvement Project, Marin County, California (2018). Ms. Kaiser served as architectural historian and author of the CEQA-Plus report MCC Stream Improvement Project. Preparation of the report involved site recordation, archival research, historic context development, historical significance evaluations, and updated DPR forms for a golf course designed in 1957.The project proposed to modify sections of the designed watercourse to retain more rainwater to irrigation.

Trail to Crane Creek Project, Sonoma County, California (2018). Ms. Kaiser served as architectural historian and co-author of the cultural resources report for the Trail to Crane Creek Built Environment Report. This involved site recordation, archival research, historic context development, and historical significance evaluations for the project which proposed to modify sections of the historic wall for the completion of a bike path for a Rohnert Park Regional Park.

Floriston Spring Filtration Project, Nevada County, California. 2018 (In progress) Ms. Kaiser served as architectural historian and author of the cultural resources report for the Floriston Spring Filtration Project. Ms. Kaiser contributed building development descriptions, archival research, historical context development, and historical significance evaluations for the Floriston Schoolhouse.

Stickleback Movie Ranch Evaluation Project, Los Angeles County, California (2018). Ms. Kaiser served as architectural historian and author of the cultural resources report for the Stickleback Movie Ranch Report in support of a larger MND project. Ms. Kaiser contributed on-site fieldwork, building development descriptions, archival research, historical context development, and historical significance evaluations for five extant ranch buildings and several other wildfire-damaged resources.

Education

Emerson Hall Replacement Project, University of California Davis, Yolo County, California (2017). Ms. Kaiser served as architectural historian and author of the cultural resources report for the Emerson Hall Replacement Project. Ms. Kaiser contributed building development descriptions, archival research, historical context development, and historical significance evaluations for Emerson Hall. The project proposed to demolish Emerson Hall, a University of California, Davis dormitory, and replace it with a new 180,000 gsf dormitory.

Elkus Ranch Master Plan Project, University of California Davis, San Mateo County, California (2017). Ms. Kaiser served as architectural historian and coauthor of the cultural resources report for the Elkus Ranch Master Plan Project. Ms. Kaiser contributed building development descriptions, archival research, in-field research, GIS data collection, and historical significance evaluations for buildings in the project. The project proposed to create a master plan for the ranch, which includes building improvements, parking improvements, and demolishing select buildings.

Municipal

Los Angeles Department of Water and Power West Los Angeles District Yard Project, City of Los Angeles, Los Angeles County. California (2017). Ms. Kaiser served as architectural historian and author of the cultural resources report for the Los Angeles Department of Water and Power West Los Angeles District Yard Project. Preparation of the report involved extensive archival research, in-field research, historic context development, building development descriptions, historical significance evaluations, and DPR forms for each building of the project.

Publications

Geraghty, Kathryn. 2017. “Colors of the Western Mining Frontier: Painted Finishes in Virginia City, Montana.” Thesis. University of Oregon. June 2017.

Geraghty, Kathryn. 2017. “On the Construction and Rehabilitation of the Southern Pacific Train Depot in Springfield, Oregon.” *Associated Students for Historic Preservation Journal*. Spring/Summer 2017.

Geraghty, Kathryn, Rachel Ellenson, Royce Utterback. 2016.”White River Ranger Station Cultural Landscape Inventory.” *Cultural Landscape Inventory (CLI), National Park Service*. December 2016.

Geraghty, Kathryn and Corey Lentz. 2016. “P. Augustus Peterson House.” Historic City Landmark nomination, City of Eugene, Oregon. May 2016. (Accepted by Eugene Planning Division November 2016)

Geraghty, Kathryn. 2015. “CRP: 15-034: Greenwater Canyon Petroglyph Site Project Report.” National Park Service. May 2015.

Geraghty, Kathryn. 2015. “CRP: 14-010: Cabin Project Report.” National Park Service. February 2015.

Geraghty, Kathryn. 2014. “Pile It High: Five New Borax Archaeological Sites on the Valley Floor” Paper presented to the annual Keeler Conference. July 2014.

Geraghty, Kathryn. 2013. “CRP: 13-046: Resource Advisor Report: Scotty’s Castle Wildland Fire.” National Park Service. December 2013.

Fallin Elizabeth Steffen, MPS

Architectural Historian

Fallin Elizabeth Steffen is an Architectural Historian with over three years of professional experience in building survey, evaluation, documentation, materials analysis, and restoration and conservation in the states of California and Louisiana. Ms. Steffen has evaluated a variety of resource types for historical significance, including water engineering infrastructure, barns, commercial buildings, municipal properties, and residential housing. She also served as a Commissioner on the Santa Cruz City Historic Preservation Commission (2016-2018) and meets the Secretary of the Interior's Professional Qualification Standards for both Architectural History and Historic Preservation.

Education

Tulane University

M. Preservation Studies, 2015

University of California, Santa Cruz

B.A. History of Art & Visual Culture, 2010

Professional Affiliations

National Trust for Historic Preservation

Dudek Project Experience (May 2018-present)

Documentation & Evaluation

Newel Creek Dam Project, Santa Cruz, California. 2018 (In Progress)
As architectural historian, Ms. Steffen evaluated the built features of the site and co-authored the Cultural Resources Report.

Supplemental Report for Santa Monica City Yards, Santa Monica, California. 2018.
Ms. Steffen collated research and assisted in the composition of the Historic Evaluation Report.

Project Experience (2015-2018)

Documentation, Evaluation, Conservation & Archaeological Fieldwork

Haciendas III Housing Project, Salinas, California. April 2018. As architectural historian, Ms. Steffen conducted preliminary archival research and created a documentary research table detailing the history of the site. Ms. Steffen also assisted with the archaeological fieldwork and co-authored the final Archaeological Monitoring and Data Recovery Report.

Silva Ranch Barn, Aptos, California. March 2018. Ms. Steffen severed as architectural historian to record the current condition of the barn, historic integrity and eligibility for inclusion on Santa Cruz County's register of historic resources.

South City Car Wash, South San Francisco, California. November 2017. As architectural historian, Ms. Steffen conducted an evaluation survey of the South City Car Wash located at 988 El Camino Real in South San Francisco to record its current condition, remaining level of historic integrity and eligibility for the National, State and local register of historic resources.

26317 Scenic Road, Carmel-by-the-Sea, California. November 2017. Ms. Steffen assisted in sub-surface auger testing to determine the presence of archaeologically sensitive material and the preparation of the accompanying report.

Graves Residence, Carmel Valley, California. November 2017. As architectural historian, Ms. Steffen conducted a Phase One evaluation to determine if the residence maintained historic integrity.

Graduate Student Housing Project, San Jose, California. October 2017. As architectural historian, Ms. Steffen conducted preliminary archival research and created a documentary research table detailing the history of the site. Ms. Steffen also assisted with the archaeological fieldwork component of the project.

Valpey Apartments Historic Resource Protection Plan, San Jose, California. Summer 2017.As architectural historian, Ms. Steffen conducted archival research, documented and authored the Historic Resource Protection Plan (HRPP) to aid in the conservation of the 1930's Valpey Apartment building during the construction of a six-story complex on several adjacent lots. Additionally, she implemented a Cultural Resource Training curriculum highlighting damage mitigation methods and conducted on-going monitoring and submitted routine monitoring reports to the City of San Jose City Historic Preservation Officer.

Tuchen Residence, Pebble Beach, California. June 2017. Ms. Steffen assisted in sub-surface auger testing to determine the presence of archaeologically sensitive material and the preparation of the accompanying report.

Mid Pen Housing Project, Monterey, California. May 2017. Ms. Steffen assisted in sub-surface auger testing to determine the presence of archaeologically sensitive material and the preparation of the accompanying report.

Pico Blanco Scout Camp, Big Sur, California. December 2016. Conducted a site survey of the Pico Blanco Scout Camp in Big Sur, CA to confirm the existence of built features, documented and evaluate their current condition.

Historic Preservation Commission, Santa Cruz, California. 2016 - 2018. Appointed by the City Council, Ms. Steffen served on the seven-person commission reviewing plans for upcoming residential, commercial and municipal projects that involve historic properties in Santa Cruz.

Historic Wallpaper Conservation, New Orleans, Louisiana. 2016. As conservator, Ms. Steffen led a small team in creating a treatment plan and the conservation of a series of 19th century wallpaper fragments for housing and display in the Historic New Orleans Collection.

Historic Window Restoration & Glazing Compound Study, New Orleans, Louisiana. 2015. As conservator, Ms. Steffen led the same small team on a project about the viability of glazing compounds in New Orleans weather and the restoration of six 19th century wooden, double-hung windows.

Preservation Planning Study of the Former Marine Hospital Campus, New Orleans, Louisiana. 2015. As conservator, Ms. Steffen worked as part of a team conducting paint & materials analysis on two buildings and the historic perimeter wall to better understand the development of the buildings.

Publications

Steffen, Fallin E. 2015. "Micro-Places & Preservation: Studying the Fields Associated with Material Culture in the Architectural Microhabitat". Graduate Practicum. December 2015.

APPENDIX B

CONFIDENTIAL

Records Search Results

APPENDIX C

DPR Forms

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

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 3S/3CS/5S1

Other Listings
Review Code Reviewer Date

Page 1 **of** 23 ***Resource Name or #:** Newell Creek Dam Complex
P1. Other Identifier: Newell Creek Dam; Loch Lomond Recreation Area

*__P2. Location:__ □ **Not for Publication** ■ **Unrestricted**

***a. County** Santa Cruz **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Felton **Date** 2015 **T** 9S ; **R** 2W ; _ □ **of** ___ □ **of Sec** ; **B.M.**

c. Address Loch Lomond City Santa Cruz Zip 95005

d. UTM: Zone 10S, 582329 mE/ 4106694 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate
Elevation 180 ft. amsl.

***P3a. Description:**

The Newell Creek Dam is located in Santa Cruz County approximately 10 miles north of the City of Santa Cruz (City). The Project site is located at the northeast extent of Newell Creek Road, in the County of Santa Cruz, California. The site is bounded by Loch Lomond on the northeast, rolling hills to the east and west, and the Newell Creek drainage to the south. The Newell Creek Dam contains seven associated built environment features: the Newell Creek Dam (1958) and its associated spillway (1958, altered 1985), control house (1958) bridge over spillway (1958, replaced 2018), valve and outlet works (1958, 1960), and access road bridge (1958). (See Continuation Sheet)

***P3b. Resource Attributes:** HP21. Dam

***P4. Resources Present:** □ Building ■ Structure □ Object □ Site □ District □ Element of District □ Other

P5a. Photograph or Drawing

P5b. Description of Photo: Crest of Dam, view looking west (IMG 0266)

***P6. Date Constructed/Age and Source:** ■ Historic □ Prehistoric □ Both: 1960

***P7. Owner and Address:**
City of Santa Cruz
1240 N. Rosecrans Ave., Ste. 120
Manhattan Beach, CA 90266

***P8. Recorded by:** (Name, affiliation, and address) Fallin Steffen, Kate Kaiser, Dudek
725 Front Street, Suite 400
Santa Cruz, CA 95060

***P9. Date Recorded:** 2/19/2018

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation**: (Cite survey report and other sources, or enter "none.")
Steffen, Fallin, Kate Kaiser, and Samantha Murray. 2018. *Historical Resources Evaluation Report for the Newell Creek Dam Inlet-outlet Replacement Project, Santa Cruz, California.* Prepared for City of Santa Cruz by Dudek.

***Attachments:** □NONE ■Location 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):

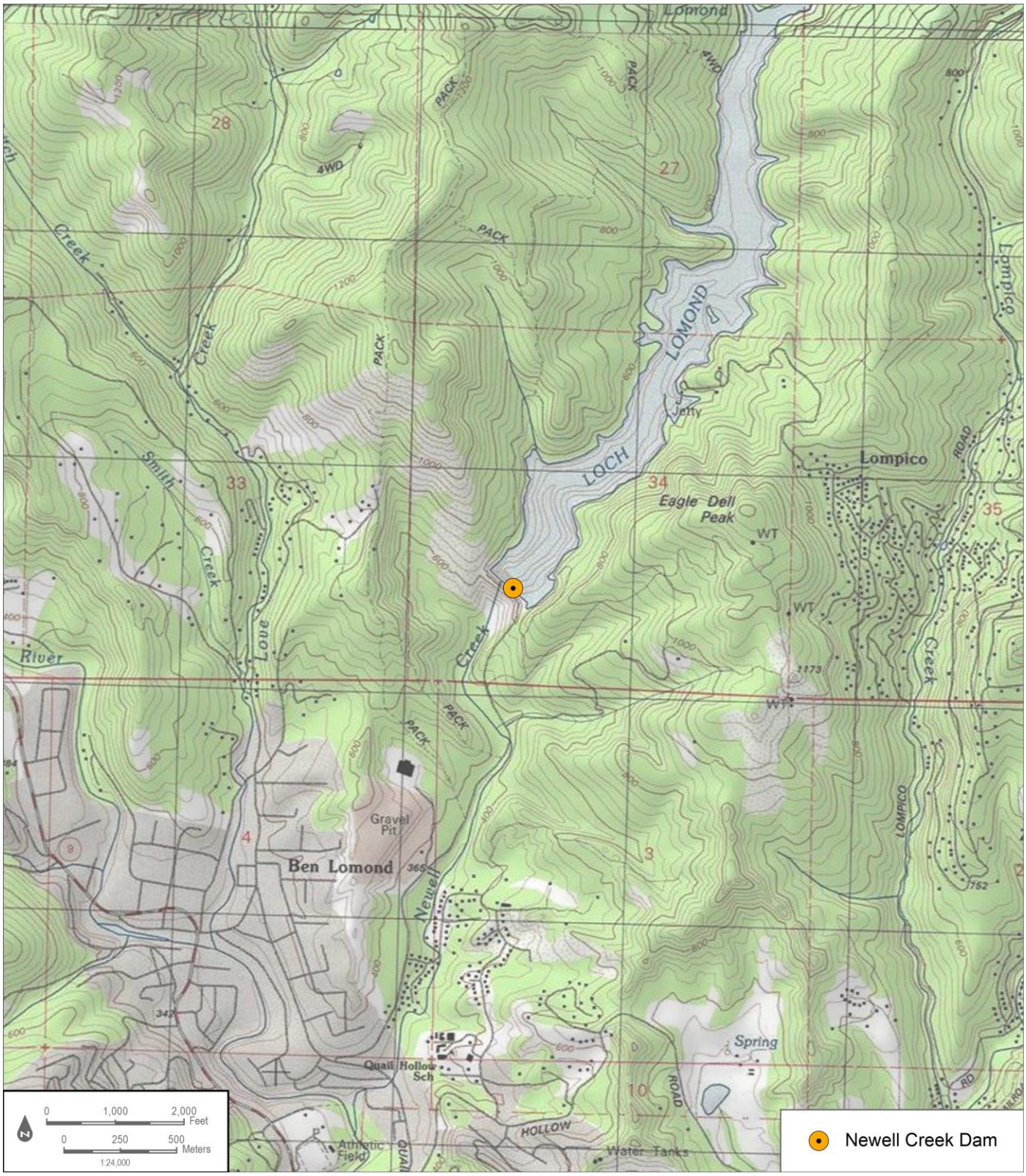
State of California ♁ Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#

Trinomial

Page 2 **of** 23 ***Resource Name or #** (Assigned by recorder) Newell Creek Dam Complex
***Map Name:** Felton, CA, USGS 7.5′ Quad ***Scale:** 1:24,000 ***Date of map:** 2015



BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) Newell Creek Dam Complex ***NRHP Status Code** 3S/3CS/5S1

B1. Historic Name: Newell Creek Dam
B2. Common Name: Newell Creek Dam
B3. Original Use: Dam B4. Present Use: Dam
***B5. Architectural Style:** Earthfill Dam
***B6. Construction History:** (Construction date, alterations, and date of alterations)
Constructed in 1960. Recreation area completed by 1965. A pipeline was relocated in 1984 after a section burst and required repairs. In 1985, the spillway wall was extended to comply with updated safety standards and a permanent aerator was installed. The buildings and the dock in the recreation area were systematically removed and replaced between 1981 and 1984. In 2018, the bridge over the spillway was replaced.

***B7. Moved?** ■**No** □**Yes** □**Unknown** **Date:** **Original Location:**
***B8. Related Features:**
B9a. Architect: Creegan and D'Angelo Civil Engineers b. Builder: William & Burrows Inc.
***B10. Significance: Theme** Local Water Development **Area** Santa Cruz City

Period of Significance 1960 – 1985 **Property Type** Dam **Applicable Criteria** NRHP/CRHR A/1 and City 2

Development in the San Lorenzo Valley

Several miles north of the evolving city center at the base of the Santa Cruz Mountains, the San Lorenzo River carves a deep valley through the dense redwood and oak timberlands. The communities located in these outer reaches of present-day Santa Cruz County owe their existence to the various industries that sought to profit from the wealth of raw resources found here. The extent of the virgin forests in the San Lorenzo Valley and the rich underground deposits of lime attracted opportunistic settlers and purveyors who sought to harness the power of the San Lorenzo River and its many tributaries to move their goods to market locally, throughout California, and the world.

The earliest men to profit from the land in the area were the owners of the various Mexican Land Grants that divided the San Lorenzo Valley. The first power sawmill in California was built on Rancho Zayante by owner Isaac Graham and was driven by the waters of Zayante Creek (SCEN 1936; Robinson 2012). Isaac E. Davis and Albion P. Jordan of the Davis and Jordan Lime Company purchased Rancho Cañada del Rincon in 1859 as a promising quarry site. (See Continuation Sheet)

B11. Additional Resource Attributes:
***B12. References:** See Continuation Sheet
B13. Remarks:
***B14. Evaluator:** Fallin Steffen, Dudek
***Date of Evaluation:** 6/28/2018

(This space reserved for official comments.)

***Required information**

***P3a. Description (Continued):**

Several features of the dam, such as the outlet conduit, the intake structure, and the closure block are underwater within the earthen structure of the dam, and/or otherwise not readily visible and recordable for the purposes of this evaluation. There are several non-historic resources also associated with the dam: the weather station, the metal storage container, and the concrete stream ford.

Newell Creek Dam (1958)

The Newel Creek Dam crest itself is roughly 15 feet from the centerline for its entire width (approximately 30 feet wide total). The dam height was 195 feet from the ground surface in the drainage basin. The total length of the crest was approximately 750 feet from the spillway to the northwest terminus. Though not visible during the February field visit, the width of the dam at the toe was originally planned and constructed to be 1,335 feet, not accounting for soil creep and slippage over time. The pitch of the slope on the northeast (upstream/Loch Lomond) side was built at gentle slope of 1 foot drop every 3 feet, or 3:1 ratio. The pitch of the slope on the southwest side (downstream) was much steeper at 2:1 before becoming a gentler slope further downslope at 3:1. The dam is constructed of several different types of fill: impervious fill on the innermost section, random fill over French drain fill in the Loch Lomond side, and pervious fill over upstream-random fill on the downstream side of the dam. The crest of the dam is constructed of the same impervious fill and topped with a prime coat (Creegan & D'Angelo 1961a).

Spillway (1958, Altered 1985)

The spillway consists of several components that work together to only allow water to let out from the dam when the water level reaches over a certain height, relieving pressure against the extant dam structure and controlling the water that threatens to overtop the dam. The components are an inlet channel, which moves water away from the dam crest and toward the spillway, located at the southeastern terminus of the dam. Water in the inlet channel is stopped by the weir crest of the spillway, a concrete wall rising a few feet above the floor of the approach channel and spillway. There is a rounded concrete feature at the top of this wall called the weir. The weir crest extends the width of the spillway and is 16 feet 4.8 inches feet long. The spillway tapers from 65.52 feet wide at the weir crest to 14 feet wide for the length. Its total length is 592 feet and drops 154 feet in elevation from the weir crest to the bottom of the outlet footing. Its original height was 11 feet maximum, 5 feet minimum according to Creegan & D'Angelo's drawings. The original spillway walls were constructed of board-formed concrete, which the basin was concrete slab.

In 1985, the height of the spillway was raised in response to a large storm and subsequent flooding event. The 1985 material is cast concrete of concrete slab, and raised the wall height long its length between 2 feet and 6 feet at the top 250 feet of the spillway near the weir crest and spillway bridge. The steep slope section of the spillway was left unaltered. The slope of the spillway changes from 5% at the top to 48% down the length of the spillway to the outlet. The spillway outlets several feet above an oblong pond at the foot of the dam's downstream (southwest) side. The pond appears natural but has several road features forming a ford and a barrier separating it from the outlet of Newell Creek, which flows from the outlet conduit (Creegan & D'Angelo 1961b, 1984).

Control House (1958)

The control house is a rectangular plan, one-story, single-room building with a shed-style roof. The control house building footprint measures 9 feet 4 inches wide by 20 feet long. The building is constructed of concrete masonry units arranged in stack

bonds on a concrete foundation. Under the foundation and piercing it is the intake structure and conduit. The roof is a lightly framed nominal lumber and plywood roof, clad in rolled asphalt shingle. The roof is pierced near the northwest side by a ventilation pipe. Attached to the southwest elevation is a commemorative plaque for workers who died during the construction of the dam. The building is devoid of fenestration but has a windowless metal door on the southwest (main) elevation and a second metal door on the northeast elevation with the intake structure leading from the Loch Lomond side of the dam up to the doorway (Creegan & D'Angelo 1961c).

Spillway Bridge (1958)

The spillway bridge provides access from the access road to the Newell Creek dam crest road over the spillway. The bridge is constructed of precast and pre-stressed concrete floor slab units and measures 31 feet 9 inches in length, 20 feet 3 inches wide, and 1 foot thick. The roadbed itself is 18 feet wide and the guardrails are on a concrete curb 1 foot 1.5 inches wide on either side of the bridge. The guardrails are constructed of metal and bolted to the outer edge of the curb. They are 4 feet 8.5 inches from the bottom of the curb to the top of the top railing (Creegan & D'Angelo 1961d).

Valve and Outlet Works (1958, 1960)

The outlet works at the downstream toe of the dam consists of an outlet conduit valve, housed in a large board-formed concrete box. The outlet works are the surface features of an underground concrete outlet conduit running under the dam and controlled by the intake system in the control box in tandem with the outlet valve. The underground conduit is 1,331 feet and 10.2 inches long. It consists of a 3-foot-diameter pipe housed in a semi-circular concrete collar, measuring 6 feet 6 inches maximum width, 5 feet 3 inches tall, and providing at least a 1-foot thick concrete housing reinforced with longitudinal steel bars for the 3-foot-diameter pipe. The concrete housing for the valve and associated pipes at the downstream toe of the dam are all that was visible of the overall outlet conduit in the February field visit. The concrete valve housing measured 17 feet 10 inches long, 6 feet 6 inches wide, and 8 feet 11 inches tall. A portion of the valve housing's length is under the toe of the dam, so approximately 12 of the originally planned 17 feet length is visible, and approximately 4 feet of the original height. On the top side of the concrete house are two metal doors that open outward and provide access to the valve pit. A large 12-inch polyvinyl chloride (PVC) clad pipe emerges from the southwest side of the metal valve housing and leads to a smaller metal housing, roughly 6 feet by 4 feet by 3 feet high. The second metal housing is not listed in the Creegan & D'Angelo plans or in subsequent plans or change orders, and its use is unknown. Beyond the metal box, Newell Creek emerges from a pipe and continues its natural course through the steep drainage basin. Around the outlet features are several spare pipes, as well as little concrete and river rock retaining walls that appear to have once held small pools of water. The use of these pools is unknown and likely decorative (Creegan & D'Angelo 1961e).

Access Road Bridge (1958)

The access road bridge follows the American Association of State Highway Officials Standard Specifications for Highway Bridges according to their 1957 design and construction specifications book. The bridge consists of three spans supported by two pier systems and two abutment systems. It is 135 feet long (45 feet per span), 30 feet wide, and 25 feet high at its maximum height. The roadbed is 26 feet wide (13 feet per lane) with a 1-foot-wide curb on the upstream (north) side and 3 feet wide on the downstream (south) side. Each curb has a metal guardrail on either side, 2 feet 10 inches high, with metal balusters at regular intervals and concrete end-posts atop the abutments on either end of the bridge (Creegan & D'Angelo 1961f).

Recreation Area (1965)
Historic aerial photographs suggests that the buildings which currently stand on the site are not the original shore-side concession structure or docks completed in 1965. The historic docks, three in total, were built from wood and projected from the Recreation Area shoreline. Two of the docks were rectangular in shape and had floor planks that extended lengthwise down the dock. The third dock was more narrow than the others and projected out alongside the boat launch area, terminating in a square platform. Between the boat launch dock and the other docks sat the original Concessions building. It was a one-story building with a large overhanging roof directly on the shore of the lake (NETR 2018; SCS 1979a).

While it is unclear when the original Recreation Area structures were demolished between the 1968 and 1991 historic aerial photos, the City Council agenda announcements suggest that there was a great deal of new construction that took place during that period. The City announced the creation of a new master plan for the Recreation Area in June of 1979. In 1981, the City announced the completion of a new lakeside bathroom. Bids and acceptance of a design proposal were posted in the Santa Cruz Sentinel in 1984 for a new Concessions Building. In 1984, the City requested bids for new docking facilities that were completed and announced again in 1985 (NETR 2018; SCS 1979b; SCS 1981; SCS 1984; SCS 1985).

Presently, there is one large dock in the place of the two, rectangular, wooden ones, and it is constructed of sectional floating polyethylene configured into an 'H' shape. The modern Camp Store building is situated at the head of the dock on the shore of the reservoir to the northeast of where the original Concessions building stood. It is a single-story building clad in wood board-and-batten sided with multiple roll-up door openings. A hexagonal shade structure sits facing the camp store, on the opposite side of the dock entrance. The modern restroom facility building is located to the northeast of the boat launch ramp and is a simple, rectangular, wood-sided building. The Motor Shop is situated further from the edge of the reservoir in the parking lot. It is a rectangular building with a rectangular addition jutting from the rear of the building and appears to be modern construction. Both are clad in tan-colored medium-density fiberboard siding.

***B10. Significance (Continued):**

They also utilized the falling water on the property to process local lumber into fuel for their many kilns (Brown 2011). The California Powder Works was established in 1861 on the bank of the San Lorenzo River on a portion of Rancho Carbonera. The location was chosen for its proximity to lumber, the harbor, and the river, which was harnessed to operate the water-powered machinery needed to process raw materials into explosive powder (Brown 2011; Robinson 2012).

The California Gold Rush of 1848 accelerated the desirability of land in the state and before long, access to water in the drought-prone region took on the highest level of importance. Instead of adopting an equal water access structure in the fashion of the eastern United States, the wealth potential of waterways during the Gold Rush shaped California water law into a "first in time, first in right" system known as Prior Appropriation. Under this system, riparian rights were granted to the first person to use a river or tributary for beneficial consumption like mining, farming, milling or as-needed domestic use. When the original Ranchos in the San Lorenzo Valley were subdivided and sold, access to the rivers and streams was enormously important. Not only did it mean that the initial use set out for a waterway was the primary use, it also meant that any subsequent uses could not supersede or negatively affect the chief use. The order that

claims were recognized during this period established the foundation of the complicated system of water allocation rights still in use today in Santa Cruz County (Pisani 1984).

The number of lumber operations in the county was growing rapidly, and by 1868 there were 12 water-powered lumber mills, 10 steam-powered lumber mills, and 9 shingle mills in operation that needed to transport goods down from remote processing locations. Early roads such as Big Trees Road (now Highway 9) and Graham's Grade Road (now Graham Hill Road) winding from the upper reaches of the San Lorenzo Valley to the wharf were arduous and subject to seasonal weather complications. Navigating the steep angled roads while driving a train of lumber-filled wagons was a dangerous undertaking for even the most experienced teamster (Robinson 2011). In 1873, plans were made for a flume along the San Lorenzo River to easily move the lumber to port. The original plan was for the flume to stretch over 20 miles to the coast, but the dearth of feeder creeks in the lower San Lorenzo basin meant that the river was subject to seasonal dry spells. Instead, when work began on the flume in 1875, a small-gauge railroad from the flume end to the harbor started simultaneously.

The massive projects were completed within a year. The terminus of the 9-mile flume and the new rail line was in Felton, California, where the lumber originating as far as 2 miles north of Boulder Creek, floated down the water-driven flume, and could be loaded onto the train and hauled safely downhill to shore. Overall, the water-powered gravity flume drastically increased the availability of Santa Cruz lumber to a wider market, while the rail line opened up the San Lorenzo Valley to tourism.

Plans for the flume and the general development of the far reaches of the Santa Cruz Mountains meant that pioneers were staking claim to areas that previously had seen little activity. Many of the tributary creeks in these areas bear the names of the first men that settled beside them. Newell Creek was a remote tributary of the San Lorenzo River that was named for an early pioneer, Addison Newell. He established a farm in the steep, v-shaped valley on the banks of the creek in 1870.

The Newell Creek Dam and Loch Lomond

The San Lorenzo River, its tributaries, and the other creeks that wind through the greater Santa Cruz area, has historically been subject to seasonal droughts and floods.

In 1860, two innovative pioneers involved with the early development of Santa Cruz, Fredrick A. Hihn and Elihu Anthony, implored the Board of Supervisors to allow them to dig trenches and lay hollowed 12-inch redwood pipes to transport water throughout the City. Due to Santa Cruz's proximity to vast lumber fields in the San Lorenzo Valley, the redwood pipes were chosen as an inexpensive alternative to iron pipes. The source of the water was to be an 8,000-gallon reservoir on the Mission Santa Cruz hill, and eager recipients of the water could gain access for a fee. By the 1870s, the Hihn-Anthony Water Company was the largest provider of water in Santa Cruz, and Doderero and Carbonero Creeks constituted their primary sources (Brown 2011; Brown and Dunlap 1956).

San Lorenzo Valley Water District

By 1899, Boulder Creek in the San Lorenzo Valley (SLV) was the fifth largest shipper of timber in the country. As the SLV was settled in the mid-1800s, populations in Ben Lomond, Brookdale and Boulder Creek formed their own water systems (San Lorenzo Valley Water District, 2009.). As vacation homes increased in the early 1900s, many small subdivisions in the SLV developed their own water systems. These water systems were designed to serve the needs of Bay Area residents who occupied their vacation homes only a few weeks a year. Nearby springs and creeks supplied these water systems through flumes or pipelines. Santa Cruz County population more than doubled from 1900 to 1940; as more people moved into the

valley, the existing water systems became inadequate (San Lorenzo Valley Water District, 2009).

Frequent droughts between 1912 and 1939 convinced Valley leaders to form a water district to better control water, to serve the needs of the valley. After one failed attempt to form a county water district by election in 1939, the San Lorenzo Valley County Water District (SLVWD) was formed by the voters on April 3, 1941. Negative voter returns from the towns of Felton and Scotts Valley left those areas out of the district boundaries, which included Bear Creek, Boulder Creek, Alba, and Ben Lomond school districts, and part of the Sequoia school district (San Lorenzo Valley Water District, 2009.).

After securing unclaimed water rights in Newell Creek and Bear Creek in 1942, the SLVWD developed a master plan that included storage dams on Boulder, Newell, and Bear Creeks, and the upper San Lorenzo River (San Lorenzo Valley Water District, 2009). In 1945, voters failed to approve a bond proposed to pay for the Boulder Creek dam, and when the District again proposed a bond measure to the voters to fund the construction of a dam at Waterman Gap, a citizens group organized to oppose it. The citizens group also opposed the proposed dam at Newell Creek, and another bond measure was defeated in December 1946. The District purchased the 3,400 acre Newell Creek property, but also pursued purchasing additional water supplies (Ibid.). In 1957, the District proposed a bond issue for purchase of Citizen Utilities, and a Newell Creek dam project was approved by the voters. The District continued negotiating with Citizens Utilities, and also approached the City of Santa Cruz about partnering in construction of a dam on Newell Creek. Negotiations with Citizens Utilities failed, but the City of Santa Cruz agreed to partner with the District in building the Newell Creek dam (San Lorenzo Valley Water District, 2009). In 1959, the District signed an agreement with the City of Santa Cruz, in which the District sold the City its timber and mineral rights to the Newell Creek watershed, in exchange for one-eighth of the water rights from the water stored by Newell Creek Dam (Ibid).

City of Santa Cruz Water Department

When the steam-powered pumping plant installed on the San Lorenzo River in 1880 became the source of repeated water-quality concerns, the Duke Morgan Water Company abandoned the plant and then combined with the Hihn-Anthony Water Company in 1888, forming the Santa Cruz Water Company. This company set about increasing supplies by creating a diversion on Laguna Creek and constructing the Cowell Street Reservoir on Empire Grade. The reservoir was built to hold 60 million gallons, but it was carved into a porous limestone formation known as karst that caused approximately one million gallons of leakage daily. Despite combining sources and creating new ones, it was apparent that seasonal fluctuations in the water supply and inadequate storage facilities were not capable of supporting the population needs. Just two years later, the city started its own water system in 1890. The City's water sources consisted of diversions along Laguna Creek, a pipeline from Laguna Creek to town, and the Cowell Street Reservoir. The City and the Santa Cruz Water Company competed to provide the city's water for a few years, until the City of Santa Cruz purchased the Santa Cruz Water Company in 1916, along with all of its sources and infrastructure (SCMU Review 2016; Brown and Dunlap 1956).

After the City acquired the Santa Cruz Water Company's holdings, the City sought to update their water infrastructure. Although upgrades and additions were added to the several major facilities to increase the quality of municipal water, the overall output was not widely increased between 1916 and 1930. The Bay Street Reservoir was built in 1924 to replace the sieve-like Cowell Street Reservoir. The Lorenzo River Pumping Plant filtered the water from the San Lorenzo and treated it with chlorine, making it safer to drink (Brown and Dunlap 1956).

In the period following the installation of the Bay Street Reservoir, Santa Cruz sought many short-term fixes to the repeated droughts and floods. The Santa Cruz Sentinel featured articles pertaining to water shortages and flood damage throughout the county, despite the Water Departments' "…consistent policy of doing the best [they] could with what [they] have…"(SCS 1939). Low rainfall in winter 1931, prompted the City to drill four wells, "one at the pumping plant and three directly across the river" (Brown and Dunlap 1956:14), to supplement water, but it was not sufficient. Further shortages due to drought meant that the coastal creek sources were not available for delivery to the city system. (Brown and Dunlap 1956).

The years following World War II provoked westward migration and an increase in birth rates, causing the population of California to increase from 6.95 million to 10.65 million between 1940 and 1950. The influx of people put stress on the infrastructure throughout the state, but in Santa Cruz, the growth of the community from 27,430 to 41,680 between 1940 and 1950 meant the familiar seasonal water shortages now presented a serious problem. Articles from the Santa Cruz Sentinel during this time highlight the difficulties the shortages caused during the dry, summer months, when water merely dribbled from municipal taps. In 1945, the state recognized a water shortage and authorized an investigation of available water resources, but the movement was slow to start (SWRB 1953). In 1946, the acute nature of the water crisis prompted the community to request a survey to determine an inventory of the available groundwater supply and plan for growth in the future. In 1948, the survey ordered by Water Superintendent John C. Luthin was completed and the findings were submitted to the City Council. The survey determined that although the San Lorenzo pumping plant was running at full capacity, 24 hours per day during the dry summer of 1947, the river was so low that the entire run was being diverted through the pumps and into the city mains for consumption.

In 1953, the State Water Resources Board finally released a report based on their investigations in Santa Cruz and Monterey Counties, which inventoried available surface and underground water sources in Santa Cruz County, and projected increased water utilization that exceeded the available water in Pajaro Valley, the Soquel Creek area, and the coastal area around and including Santa Cruz. The report identified requirements for supplemental water for Santa Cruz and areas served by the City of Santa Cruz Water Department; 16 possible alternative water resources including a dam site alternative on Newell Creek The report noted that "the present water problem is not due to a shortage of total seasonal supply, but rather to lack of facilities for regulating that supply" (SWRB 1953: 57) due to peak demands during times of minimum stream flows. Deficiencies in seasonal rains would necessitate water rationing by the City; such deficiencies were reported to have occurred in five seasons since 1895, a period of nearly 60 years at the time the report was issued. (U.S. Census Bureau 1940; U.S. Census Bureau 1950; Brown and Dunlap 1956; SCS 1946a; SCS 1946b; SCS 1948; SWRB 1953).

As a direct result of the State Water Resources Board publication, in 1954, the City commissioned a report investigating four of the Water Resource Board's suggested reservoir sites at Laguna Creek, San Lorenzo River, Soquel Creek, and Scott Creek. The report cited the City's current water sources as "barely sufficient to keep pace with the demand imposed by a steadily increasing population" (Brown and Dunlap 1956: 1). These sources, as of 1956, included Laguna Creek, the original City's water resource since 1890, Liddell Spring, Reggiardo Creek, Majors Creek, the San Lorenzo River, and two unnamed wells. Newell Creek Dam and Loch Lomond Reservoir were not among the suggested sites in Brown and Caldwell's 1956 water supply report, and the report suggested Doyle Gulch as the ideal location for a new city water source (Brown and Dunlap 1956; SWRB 1953).

The City Water Superintendent began to investigate reservoir projects at Zayante Creek, Newell Creek, Doyle Gulch, Scott Creek, and Aptos Creek. Meanwhile, the County formed the

Santa Cruz County Flood Control and Water Conservation district in 1955 and hired Creegan & D'Angelo Civil Engineers in 1956 to complete an extensive survey identifying dam sites, groundwater sources, and additional steps to improve control of the water supply throughout the county to compete with the City's proposals. The report asserted that population growth was a major concern for the water supply in the City because "the City of Santa Cruz has current water requirements which equal the capacity of the existing water supply system during a relatively dry era. Should an exceptionally dry season be experienced, there would be a serious water shortage in the City of Santa Cruz." (Creegan and D'Angelo 1957:8). Present supplies were determined to be insufficient for standard rates of population growth, including years that rainfall was considered more plentiful. Despite the rate of water consumption in the service area tripling between the mid-1920s and mid-1950s, there had been no additions to the City municipal water supply during that time. Creegan & D'Angelo would also serve as the engineers for the Santa Cruz County Flood Control and Water Conservation District Advisory Committee, and ultimately, their recommendations to the council to remedy the current water crisis in the City was a dam on Newell Creek (SCS 1953, 1954a, CSC 2007; SCS 1958).

As a surface water storage on Newell Creek became a distinct reality following the recommendations of Creegan and D'Angelo, City Water Department Director, Weston Webber, voiced his support for the project in 1957 claiming that "A dry winter or a spurt in population might well throw Santa Cruz on water rationing in the future...The San Lorenzo River and the coast sources are not only fixed, but too limited…Surface storage is the only way out." (SCS 1957) Creegan & D'Angelo's proposal at Newell Creek competed with multiple other proposals throughout the region. Ultimately, of the five proposed dams, only the Newell Creek Dam would come to fruition. The reasons behind why the remaining dams were not completed are unknown, although frequent discussions about the overall cost of the projects in the SCS suggest budgetary restraints (Brown 2011; 1957a, 1957b, 1957c).

In 1958, the University of California Regents announced that they were considering the Cowell Ranch in the City of Santa Cruz as the site of a future University of California Campus. The City would be required to provide services and facilities for the prospective University community, which early figures suggested was to include around 2,500 students. In anticipation of the Water Revenue Bond Election in November 1958 to approve the bonds necessary to construct the Newell Creek Dam, a new water treatment plant, and pipelines to transport the water, the Santa Cruz Sentinel published an article outlining the impact of the proposed bonds. In reference to the speculative University in the City, the closing paragraph of the article states that "University officials know that the present water supply of Santa Cruz is inadequate, even for normal needs. Failure to correct this situation could end all chance of the selection of Santa Cruz as the University site." (SCS 1961b; SCS 1961a; SCS 1958).

On November 5, 1958, the voters of the City of Santa Cruz approved $5.5 million in water revenue bonds necessary for the City to purchase 2,162 acres of land in the Newell Creek watershed from the San Lorenzo Valley Water District and build a dam on the site. Creegan & D'Angelo designed the earthfill dam. Additional improvements included a pipeline, a treatment plant on Graham Hill Road, and two pumping stations. (SCWD 1986; Brown 2011; SPH Associates Consulting Engineers 2010; SCS 1958).

Construction of Newell Creek Dam

Contractors Williams and Burrows Inc. of Belmont, California, began the construction of the Newell Creek Dam and preparation for the creation of Loch Lomond in 1960. The early stages of planning and execution were made more difficult by the narrow valley, allowing only one road for ingress and egress for equipment and supplies. The construction of the 195-foot-tall earthfill dam began with a "grout curtain" that pushed concrete 100 feet into the bedrock to fill any fissures or imperfections, ensuring a structurally sound

base. The height and width of the dam's crest was first determined by the reinforced concrete ends. The embankment was then built up using successive layers of random fill from the immediate area, compacted with sheepsfoot tampers above and around the 300 feet of impervious material at the core of the embankment. Four construction personnel lost their lives in October 1960 during the layered construction of the embankment. While the men were drilling out soft areas in the rock to be filled with concrete to prevent water seepage, an abutment sheer wall collapsed and a massive avalanche slid down onto them. A brass plaque commemorating these men was commissioned and remains today on the southwest elevation of the Control House (SCS 1960a; SCS 1960b; SCWD 2015).

The Newell Creek Dam was completed and filling steadily with water by 1961; however, the recreation area on the resulting reservoir was yet to be built. Keeping with the Scottish naming tradition started by Scotsman John Burns when he christened the mountain Ben Lomond in the 1850s, the reservoir was dedicated Loch Lomond during two days of festivities on July 27 and 28, 1963 (SCS 1963).

By 1964, the City distributed a notice to bid on the construction of the Loch Lomond Recreation Development. With the help of a $149,000 state grant, the Loch Lomond Recreation Area was completed by the spring of 1965. It included picnic areas, a concessions building, parking areas, two docks, and a boat launch. An all-weather road leading from Lompico to the Recreation Area was a crucial improvement constructed during this phase of the Project. It allowed visitors to experience the new recreation activities available at Loch Lomond, while simultaneously comprehending the realities of water storage and use in the county (SCS 1964).

In January of 1982, a powerful storm caused flooding throughout the Santa Cruz County. It was discovered that a main pipeline from Loch Lomond had burst and was leaking at an alarming rate. Although the damaged section of pipeline was relocated and repaired by the end of the year, it renewed community attention to the 20-year-old dam and the potential for its components to fail under stress (SCS 1982; Cardona and Associates 1982).

In 1984, the Santa Cruz Water Department received $11.7 million dollars through private Certificates of Participation in order to fund upgrades and modernizations to the water infrastructure system throughout the City. A Division of Safety of Dams survey had recently demonstrated that the spillway at Newell Creek Dam did not meet the newest safety criteria for probable maximum flood conditions, so a portion of the funds were allotted toward upgrade to the dam's spillway wall. The upgrades implemented in 1985, included heightening the Newell Creek Dam spillway wall and the installation of a permanent aerator system. The spillway wall helps to protect the dam embankment in the event of an overflow by directing water safely through the spillway channel and away from the earthfill embankment, and heightening the walls ensures that it could withstand damage from a probable maximum flood equal to approximately five times the intensity of the 1982 flood (SCWD 1986; SCS 1984a).

Property Type: Earthen Dams

For thousands of years, people have stored water and altered their natural environment to their benefit. The oldest known dams date back to 6,000 years ago in present-day Jordan, where farmers constructed earthen mounds to capture rainfall. Dams are typically constructed to serve three main purposes: to hold back or store water, to produce energy, and to control flooding. While technological advancements have improved capacity, safety, and reduced failures, the design of dams has not deviated from several successful engineering methods (Billington et al. 2005).

Dams are classified in terms of materials and form. In California, dams are typically one

of several construction methodologies: rockfill, earthen, masonry, and/or concrete. In California, the topography and geology of a region often drives the construction of a dam, resulting in a vernacular design that often does not adhere to one specific method. Earthen dams were a common choice for dams planned and implemented throughout Northern California during the 1930s, 40s, and 50s. The customizable principles of the design suited many terrains in the varied landscape and additionally reduced transportation and materials costs to remote, inaccessible areas by utilizing local soil for fill. North of Santa Cruz County in Santa Clara County, 9 of 10 dams built between 1935 and 1957 to impound water for municipal use are earthfill dams. Both of the dams located south of Santa Cruz in Monterey County are earthfill dams as well (Corns et al. 1988; SCVWD 2018; MCWRA 2018).

Keeping with the predominant trend in the area at the time it was designed, the Newell Creek Dam is a zoned earthen embankment dam that rests on a pervious foundation. Earthen dams have been employed in communities throughout the world for centuries as a method to control and store the flow of waterways. They are the most common variety of dam because their construction exploits local resources for structure and materials. An earthfill or earthen dam is a type of dam comprised of appropriate soils borrowed from either a local area and/or the result of preparatory excavations. These soils are layered and compacted to form an embankment. There are three principle embankment types: homogenous, diaphragm, and zoned. The suitability of one over the other is determined by site-specific factors including geographic setting, geologic substrate, and availability of local fill material. Homogenous embankments consist of one impervious material throughout the whole embankment mound. Diaphragm embankments are comprised of a layers of pervious material(s) with either an impermeable blanket on the upstream side or an impermeable diaphragmatic layer of earth, cement, or concrete. Zoned embankment types have an impervious central core that is flanked by pervious material zones of sand, gravel, rocks, or a combination of several. In order to control the level of reservoirs created by earthen dams, supplemental structures are required to house the outlet(s) and spillway (USDIBR 1987; USACE 2004).

Creegan & D'Angelo Civil Engineers

Patrick Creegan & Elmer D'Angelo established Creegan & D'Angelo Civil Engineers in 1956 in San Jose, California. The company still operates today under the name Creegan + D'Angelo Infrastructure Engineers from their offices in Monterey, California, and Fairfield, California. The foundation of their business is in civil engineering, covering structural engineering for residential and commercial buildings. They also specialize in water management including planning, design, storage, and disposal strategies; land planning; development and management services; and transportation and public works infrastructure planning.

In addition to Newell Creek Dam and Loch Lomand in Santa Cruz, Creegan + D'Angelo has planned and implemented successful water management projects in multiple Monterey Bay Area locations and throughout California. The following projects demonstrate the range of their projects within the field of water management and distribution:

- Round Hill-Douglas County Sewer Improvement Project. Tahoe, California.
- Davenport Sanitation District Wastewater Management System. Davenport, California.
- Aquifer Storage and Recovery. Monterey Peninsula, California.
- Sand City Desalination Water Supply Project. Sand City, California.
- San Benito Water Distribution System. San Benito County, California.
- North San Jose / Alviso Reservoir. San Jose, California.
- Yosemite Sanitary Sewer Replacement. Yosemite National Park, California.

NRHP and CRHR Criteria

NRHP Criterion A: associated with events that have made a significant contribution to the broad patterns of our history.

CRHR Criterion 1: is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

The Newell Creek Dam Complex is directly associated with events that have made a significant contribution to the development history of water infrastructure in the City of Santa Cruz Water Department service area. The Newell Creek Dam is significant under Criterion A/1 for its association with water infrastructure, which was essential to maintaining the municipal water supply during periods of seasonal water shortages and droughts. The availability of water played a critical role in the early planning, development, and sustained growth of the City, including a factor in the choice of Santa Cruz as the site for a University of California Campus. When the Newell Creek Dam was in its elemental planning stages in 1957, it was one of six reservoir projects recommended by the project engineers, Creegan & D'Angelo, for the long-term water supply reliability for the City and Santa Cruz County. However, the Newell Creek Dam was the only such project that was realized. Loch Lomond Reservoir is the resulting impoundment of Newell Creek by the Newell Creek Dam and it is an important supplementary source of drinking water for Santa Cruz City. The period of significance, beginning in 1958 with approval of $5.5 million in water revenue bonds necessary for the City to purchase land to build the Newell Creek Dam site and ends in 1965 when the Loch Loman Recreation Area was completed. In summary, the subject property is directly associated with important events that have made a significant contribution to the development of water infrastructure development in Santa Cruz. These important events include concerns over local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages. Archival research also revealed that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California, noting that failure to correct water shortage issues could end all chance of the selection of Santa Cruz as the University site (SCS 1961b; SCS 1961a; SCS 1958). Construction of the Newell Creek Dam gave the City control over the seasonal fluctuations in water availability and became a critical component to the water infrastructure, which supported the sustained growth of the City after World War II. **Therefore, the subject property appears eligible at the local level under NRHP/CRHP Criteria A/1 at the local level of significance.**

NRHP Criterion B: associated with the lives of significant persons in our past.

CRHR Criterion 2: is associated with the lives of persons important in our past.

Archival research on the subject property failed to reveal associations with any persons significant in the history of Santa Cruz, the state, or the nation. The property does not appear to be associated with any person(s) whose contributions demonstrate historic importance at the local, state, or national level. Therefore, the subject property does not appear eligible under NRHP/CRHR Criteria B/2.

NRHP Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

CRHR Criterion 3: embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The subject property is a utilitarian, zoned earthfill dam, a common form of dam that is found throughout California, the United States, and the world. It was designed by Creegan & D'Angelo Civil Engineers in 1958 and constructed by William and Burrows Inc. in 1960. Although Creegan & D'Angelo have contributed a large number of designs to the body of engineered municipal water containment projects in California, the creative merit of their designs is not significant enough to have made an impact on the development of the genre as a whole. Contractors William and Burrows Inc. contributed to the field of architecture by erecting structures of various kinds throughout the San Francisco Bay Area, but overall they did not significantly impact the field of dam design or construction techniques. Archival research suggests that the Newell Creek Dam is typical of its construction type for an earthfill dam, and does not embody any distinctive characteristics of a type, period, or method of construction apart from variances dictated by its specific geographical location. There are little inherent artistic or design values associated with the dam or its associated features, and repeated repairs and routine maintenance have replaced original materials, resulting in loss of integrity. For all of the reasons described herein, the subject property does not appear eligible under NRHP/CRHR Criteria C/3.

NRHP Criterion D: have yielded, or may be likely to yield, information important in history or prehistory.

CRHR Criterion 4: has yielded, or may be likely to yield, information important in prehistory or history.

There is no evidence to indicate that the subject property is likely to yield and additional information important to prehistory or history beyond what is already know. The subject property is also not associated with an archaeological site or a known subsurface cultural component. Therefore, the subject property does not appear eligible under NRHP/CRHP Criteria D/4.

County of Santa Cruz Criteria

For the same reasons already discussed in application of NRHP and CRHR criteria, the Newell Creek Dam Complex appears eligible under Criterion 2 of the County of Santa

Cruz criteria, as described in Section 16.42.050(C) of the Title 16 Environment and Resource Protection, Chapter 16.42 Historic Preservation.

1. The resource is associated with a person of local, State or national historical significance;

   As stated in Criterion B/2, archival research did not reveal an association between the Newell Creek Dam and any persons who significantly contributed to the development of the city, state, or nation.

2. The resource is associated with an historic event or thematic activity of local, State or national importance.

   As stated in Criterion A/1, the Newell Creek Dam is associated with events that have made a significant contribution to the development history of water infrastructure in Santa Cruz County, including local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages. Archival research also revealed that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California, noting that failure to correct water shortage issues could end all chance of the selection of Santa Cruz as the University site (SCS 1961b; SCS 1961a; SCS 1958). Construction of the Newell Creek Dam gave the City control over the seasonal fluctuations in water availability and became a critical component to the water infrastructure, which supported the sustained growth of the City after World War II. Therefore, it qualifies under County of Santa Cruz Criterion 2.

3. The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.

   As discussed in Criterion C/3, the Newell Creek Dam is an archetypical, zoned earthfill dam. Its design does not possess any special aesthetic merit because it was constructed simply and lacks distinctive characteristics beyond those dictated by the surrounding terrain.

   Creegan & D'Angelo Civil Engineers designed the Newell Creek Dam in 1958, 2 years after starting their firm in 1956. Although it is representative of an early Creegan & D'Angelo project, archival research did not reveal that the designers/engineers exercised any degree of influence over their peers within the time period associated with the dam and its features.

4. The resource has yielded, or may likely yield, information important to history.

   As discussed under Criterion D/4, there is no evidence to indicate that the subject property is likely to yield and additional information important to prehistory or history beyond what is already know. The subject property is also

not associated with an archaeological site or a known subsurface cultural component.

Integrity

In accordance with the NRHP guidelines, properties that are eligible for listing in the NRHP must be significant under one or more of the criteria and must have sufficient integrity to convey their significance. These rules apply whether the property is considered for individual listing or as a contributing resource within a historic district. In assessing historic integrity, the NRHP recognizes seven aspects or qualities that, in various combinations, define integrity. In order to retain historic integrity "a property will always possess several, and usually most, of the aspects" (NPS 2002).

The CRHR generally follows the integrity guidelines for the NRHP, but it recognizes that it is possible that historical resources that may not retain sufficient integrity to meet the criteria for listing in the NRHP may still be eligible for listing in the CRHR. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if it maintains the potential to yield significant scientific or historical information or specific data.

The seven aspects of integrity are:

- **Location** – the location where the historic property was constructed or the place where the historic event occurred.
- **Design** – the combination of elements that create the form, plan, space, structure, and style of a property.
- **Setting** – the physical environment of a historic property or the character of the place in which the property played its historic role.
- **Materials** – the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- **Workmanship** – the physical evidence of crafts of a particular culture or people during any given period in history or prehistory.
- **Feeling** – a property's expression of the aesthetic or historic sense of a particular period of time.
- **Association** – the direct link between an important historic event or person and a historic property.

The subject property was found to retain sufficient integrity to convey significance in the areas of location, design, setting, feeling, and association. The property retains integrity of location, setting, and feeling, as the vicinity surrounding the Newell Creek Dam Complex has retained its rural presence and character. Although the dam and its associated features does not exhibit distinctive artistic characteristics, the integrity of the original design endures as an archetypal earthen embankment dam. The Newell Creek Dam and the resultant Loch Lomond reservoir remains an important source of drinking water storage for the City and therefore maintains its association with the development of water infrastructure in Santa Cruz.

Evaluation Findings

After thorough consideration of NRHP, CRHR, and County evaluation criteria, the Newell

Creek Dam and its associated features appear eligible for the NRHP and CRHR under Criterion A/1 at the local level of significance and eligible for local listing under Santa Cruz County Criterion 2 for its associations with local water development. Therefore, it is considered an historic property under Section 106 of the NHPA and an historical resource under CEQA.

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