Appendix G2

Lassen Water Supply Assessment

DRAFT

Water Supply Assessment

653-800 Washington Avenue Project

APRIL 2024

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Table of Contents

SECTION **PAGE NO.**

Acronyms and Abbreviations iii

1 Introduction 1
- 1.1 Purpose of Document 1
- 1.2 Project Location and Description 1
- 1.3 Water Supply Assessment Applicability 2
  - 1.3.1 Identification of a Public Water System 3
  - 1.3.2 Urban Water Management Plan Coverage 3
  - 1.3.3 Groundwater as a Component of Project Water Supply 3
  - 1.3.4 Sufficiency of Supplies Over the Next 20 Years 3

2 Water Demand 5
- 2.1 Existing Water Demand 5
- 2.2 Project Water Demand 5

3 Climate 7

4 Water Resources 9
- 4.1 Surface Water 9
- 4.2 Groundwater 9
  - 4.2.1 On-Site Well Inventory 9
  - 4.2.2 Groundwater Levels 10
  - 4.2.3 Groundwater Quality 10
- 4.3 Imported Water 11
- 4.4 Wastewater/Recycled Water 11

5 Water Management Plans and Programs 13
- 5.1 Sustainable Groundwater Management Act 13
- 5.2 Lassen County Water Well Ordinance 13

6 Water Supply Assessment 15
- 6.1 On-Site Well Testing 15
- 6.2 Projected Water Supply 15

7 Conclusion 17

8 References 19

TABLES

1 Project Water Demand 5

2 Anticipated Project Construction Schedule 5

3 Groundwater Well Information 10
4 Average Projected Total Basin Water Budget 2019-2068 (Future Baseline) 15
5 Average Projected Total Basin Water Budget 2019-2068 (Climate Change) 16

FIGURES

1 Project Location 21
2 Public Water Systems and Groundwater Basins 23
3 Watersheds and Surface Water Features 25
4 Geologic Setting 27
5 Groundwater Well Sites 29
6 Well 38N07E32A002M Hydrograph 31
7 Constant Rate Test – Depth to Water - Well 1 33

APPENDICES

A Site Grading Plans
B Construction Water Demand Estimate

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AF	acre-feet
AFY	acre-feet per year
APN	assessor's parcel number
CEQA	California Environmental Quality Act
CWC	California Water Code
DWR	California Department of Water Resources
GPD	gallons per day
GPM	gallons per minute
GAMA	Groundwater Ambient Monitoring and Assessment Program
GSA	groundwater sustainability agency
GSP	groundwater sustainability plan
SB	senate bill
SGMA	Sustainable Groundwater Management Act
SWRCB	California State Water Resources Control Board
UWMP	urban water management plan
WSA	water supply assessment

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1 Introduction

1.1 Purpose of Document

Senate Bill (SB) 610 was passed on January 1, 2002, amending the California Water Code (CWC) to require detailed analysis of water supply availability for certain types of development projects. The primary purpose of SB 610 is to improve the linkage between water and land use planning by ensuring greater communication between water providers and local planning agencies, and to ensure that land use decisions for certain large development projects are fully informed as to whether a sufficient water supply is available to meet project demands. SB 610 requires preparation of a water supply assessment (WSA) for a project that is subject to the California Environmental Quality Act (CEQA) and meets certain requirements.

The 653-800 Washington Avenue Project (Project) has been determined to be subject to CEQA with Lassen County (County) acting as the CEQA lead agency. The lead agency will make an independent determination as to whether there is adequate water supply for the proposed Project, having considered the entire administrative record. In compliance with SB 610, this WSA examines the availability of the identified water supply under normal, single dry, and multiple dry year conditions over a 20-year projection. This WSA also accounts for the projected water demand of the Project plus other existing and planned future uses of the identified water supply.

1.2 Project Location and Description

The Project will be sited within assessor's parcel number (APN) 001-270-80 located at 653-800 Washington Avenue in Lassen County, California (Figure 1). Development associated with the Project would occur on approximately 62 acres. The majority of the undeveloped areas of the Project site consist of non-native grassland with a mix of annual grasses and forbs. Mowed agricultural fields are present in the northern portion of the Project site. The Project site is surrounded by widely scattered rural development and open space, generally composed of cropland, sagebrush scrub, and wet meadow. The Project site is located within the U.S. Geological Survey 7.5-minute Bieber, California quadrangle and the following three public land survey system sections of the Mount Diablo Base and Meridian:

- Township 38 North, Range 07 East, Section 28
- Township 38 North, Range 07 East, Section 33

The proposed Project would consist of a new wood pellet processing facility and associated development including a woodyard, green processing area, drying area, pellet mill, project storage, and loadout area (Appendix A). New internal roads for truck access and facility personnel access will be added, including a new road for truck access from Babcock Road at the southwest corner of the site. A new rail spur connecting to the adjacent BNSF Railway line would be added for finished product load out as well as additional rail siding tracks on-site for the storage of full and empty railcars. Other improvements would include new truck scales and a graded area for overflow raw material storage. The Project serves as an opportunity to restore California forests to a condition that is necessary for the health of the forests and to improve the broader well-being of the state by processing excess biomass into a pelletized fuel source. Phases of the Project include feedstock, wood pellet processing, and transport to market.

Feedstock consists of the forest material used to produce industrial wood pellets. There would be two primary feedstocks: virgin roundwood and local sawmill residuals. Roundwood consists of logs that are not suitable for use

as commercial lumber, due to their condition (e.g. age, fire damage), size, or economic factors (e.g. wood type, transportation costs). Sawmill residuals include material (bark, shavings, sawdust and wood chips) leftover from the milling process. Residuals may also include "forest slash" which is material left on the ground from timber harvesting, such as the limbs and the tops of trees. The feedstock is transported by truck to the wood pellet processing facility. Once the feedstock is received at the wood pellet processing facility, the logs are processed through a debarker and chipper. The processed chips are conveyed to a stacker reclaimer where they will be combined with sawmill residuals for the next processing phase. The bark from the logs is conveyed separately to a storage pile for use as fuel for the dryer. The wood chips are screened for the appropriate size and continue to the dryer. Chips that do not pass through the screens are directed to an array of hammer mills to be reduced to the appropriate size. The chips are then dried and sent through the pellet mill. The pellets are cooled and sent through a final screen. The finished pellets are stored in silos. The finished pellets are loaded onto rail cars for transport to the Port of Stockton. At the port, the pellets are unloaded and stored in domes. From the domes, the pellets are loaded into dedicated cargo ships for deliver to overseas markets.

1.3 Water Supply Assessment Applicability

SB 610 amended CWC Sections 10910 and 10912 to create a direct relationship between water supply and land use. SB 610 establishes the legal framework for assessing the sufficiency of water supply for new development which qualify as a "project". Per California Water Code Section 10912(a), a "project" means any of the following:

- Proposed residential development of more than 500 dwelling units.
- Proposed shopping center or business establishment employing more than 1,000 persons, or having more than 500,000 square-feet of floor space.
- Proposed commercial office building employing more than 1,000 persons or having more than 250,000 square-feet of floor space.
- Proposed hotel or motel or both, having more than 500 rooms.
- Proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square-feet of floor area.
- Proposed mixed-use project that includes one or more of the above components.
- Proposed project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

The CWC, as amended by SB 610, requires that a WSA include a discussion of whether:

- The project will be served by a public water system (CWC Section 10910(b)).
- The project water demand is included in a current Urban Water Management Plan (UWMP) (CWC Section 10910(c)).
- There are any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project (CWC Section 10910(d)).
- Groundwater will serve as a source of water supply for the project (CWC Section 10910(f)).

Based on the characterization of these water supplies and constraints, the WSA is required to provide a discussion of whether the total projected water supplies available during normal, single dry, and multiple dry years during a 20-year

projection will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses (CWC Section 10910(b)(3) and (4)).

As an industrial development that covers more than 40 acres of land, the 653-800 Washington Avenue Project qualifies as a "project" under CWC Section 10912(a). Accordingly, the proposed Project is subject to SB 610 and requires preparation of a WSA.

1.3.1 Identification of a Public Water System

Section 10912 of the CWC defines a "public water system" as a system that has 3,000 or more service connections and provides piped water to the public for human consumption. The Project is located in unincorporated Lassen County and is not within the service area of a public water system (Figure 2).

1.3.2 Urban Water Management Plan Coverage

Every urban water supplier that either delivers more than 3,000 acre-feet (AF) of water annually or serves more than 3,000 connections is required to submit an UWMP to the California Department of Water Resources (DWR) every five years for review and approval.[1] The Project site is located in unincorporated Lassen County and is not within the service area of a public water system (Figure 2). There is no UWMP that accounts for the water demand of the Project.

1.3.3 Groundwater as a Component of Project Water Supply

Groundwater from an on-site well(s) will be the sole source of water supply for the Project. The Project site overlies the Big Valley Groundwater Basin (DWR Basin No. 5-4), as mapped by DWR. The underlying geology at the Project site is mapped as marine and nonmarine (continental) sedimentary rocks. The groundwater resources at the Project site are described in greater detail in Section 4, Water Resources, and water supply availability is discussed in Section 6, Water Supply Assessment.

1.3.4 Sufficiency of Supplies Over the Next 20 Years

As described in Section 4, Water Resources, and Section 6, Water Supply Assessment, there is adequate water available to supply the proposed Project during normal, single dry, and multiple dry years during a 20-year projection, in addition to existing and planned future uses of the identified water supply.

[1] One acre-foot is equal to 325,851 gallons.

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2 Water Demand

2.1 Existing Water Demand

The Project site was historically part of a sawmill operation and was also used to load logs onto railcars. The mill's water demands were reportedly satisfied by on-site groundwater; however, no water usage records are available.

As described in Section 4, Water Resources, there is one existing groundwater well at the Project site. The well is active and is currently used to fill water trucks for dust suppression.

2.2 Project Water Demand

The Project consists of the construction and operation of a wood pellet manufacturing facility. The Project is anticipated to require approximately 20 AF for construction (Appendix B) over a one-year period and approximately 47 AFY for operation (Nexus 2023). Based on this, the total Project water demand is estimated to be approximately 913 AF over a 20-year period, or 45.65 AFY.[2] The estimated water demand for each phase of the Project is provided in Table 1.

Table 1. Project Water Demand

Phase / Activity	Duration	Annual Water Demand (AF)	Total Water Demand (AF)
Construction			
Grading and dust suppression	1 year	20	20
Operation			
Pellet production	19 years	47	893
		Total	**913**

Source: Appendix B; Nexus 2023.
Notes: AF = acre-feet.

Construction of the Project is anticipated to commence in the fourth quarter of 2024 and be completed by the fourth quarter of 2025. Construction will include site preparation, grading, building, paving, and architectural coating (Table 2). Water for grading and dust suppression are expected to be the primary water demands during construction and are estimated to require approximately 20 AF (Appendix B). Twenty (20) AFY is an approximate estimate and does not include water required for concrete mixing, paving, or other construction activities.

Table 2. Anticipated Project Construction Schedule

Construction Phase	Start Date	Finish Date
Site Preparation	10/1/2024	11/1/2024
Grading (Including Utilities)	10/15/2025	5/15/2025
Building/Vertical Construction	1/16/2025	12/16/2025

[2] SB 610 requires assessment of the availability of the identified water supply over a 20-year projection.

Table 2. Anticipated Project Construction Schedule

Construction Phase	Start Date	Finish Date
Rail Spurs Construction	2/15/2025	8/15/2025
Paving	1/16/2025	3/15/2025
Architectural Coating	9/16/2025	11/30/2025

Source: Nexus 2023.

3 Climate

The Project site is characterized by a Mediterranean climate with hot, dry summers and cold, wet winters. The average maximum temperature in the Project vicinity, based on temperature data recorded at the Fall River Mills, California weather station (station no. 042964), for the period from 1923 to 2016 is 65.0°F and the average minimum temperature is 34.6°F (WRCC 2024). Maximum temperatures in the summer typically reach the high-80s degrees Fahrenheit and minimum temperatures in the winter reach the low-20s degrees Fahrenheit. The average annual rainfall at the Fall River Mills weather station for the period from 1923 to 2016 is approximately 18 inches and the average annual snowfall is approximately 20 inches (WRCC 2024).

Projected future climate conditions in California indicate gradual warming, with an increase in extremely hot days relative to historical norms, and greater year-to-year precipitation variability. Warming of approximately 3.6°F to 12.6°F is expected by the end of the century (Pierce et al. 2018). Additionally, there will be fewer wet days, but increased precipitation on the wettest days (i.e., wetter winters and drier spring and autumn), resulting in modest annual precipitation changes but an increase in the frequency of dry years (Pierce et al. 2018).

The influence of climate on water supply availability is considered in Section 6, Water Supply Assessment, when assessing whether the total projected water supplies available during normal, single dry, and multiple dry years during a 20-year projection will meet the projected water demand of the proposed project, in addition to existing and planned future uses.

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4 Water Resources

4.1 Surface Water

The Project site is located in the Modoc Plateau. The topography of the Project site consists of flat land that exists at approximately 4,120 feet above mean sea level (USGS 2024). The Project site is located within the Bull Run Slough - Pit River Hydrologic Unit Code 12 watershed (Figure 3). The Project is located approximately 0.75 miles west of Bull Run Slough, which flows into the Pit River and terminates in Lake Shasta to the southwest. The Pit River and Ash Creek are the two primary sources of surface water within the Big Valley Groundwater Basin (Lassen County GSA & Modoc County GSA 2023).

In water year 2022, the estimated volume of surface water used in the Basin was 82,000 AF, accounting for approximately 62% of the total water used in the Basin. The mainstem of the Pit River is 303(d) listed as impaired for temperature, dissolved oxygen, and nutrients (Sacramento River Watershed Program 2024). Surface water is not anticipated to be a source of Project water supply.

4.2 Groundwater

The Project site overlies the Big Valley Groundwater Basin (Figure 2). The Basin covers approximately 195 square miles and is located in both Lassen and Modoc Counties. The Basin is bounded to the north and south by Pleistocene and Pliocene basalt and Tertiary pyroclastic rocks of the Turner Creek Formation, to the west by Tertiary rocks of the Big Valley Mountain volcanic series, and to the east by Turner Creek (Figure 4; DWR 2004).[3] The underlying geology at the Project site is mapped as marine and nonmarine (continental) sedimentary rocks, and numerous northwest-southeast trending fault traces are documented near the Project site (Figure 4).

Primary sources of recharge in the Basin include Butte Creek, Willow Creek, and Ash Creek, as well as water diverted into unlined drainage ditches, canals, and agricultural farmland. In water year 2022, the estimated volume of groundwater extracted from the Basin was 50,400 AF, accounting for approximately 38% of the total water used in the Basin (Lassen County GSA & Modoc County GSA 2023).

Based on a review of well completion reports for wells drilled near the Project site, well yields are reported to range from 5 gallons per minute (GPM) to 1,500 GPM. Groundwater from onsite well(s) will be the sole source of water supply for the Project.

4.2.1 On-Site Well Inventory

Dudek performed a desktop study and site reconnaissance of the Project site in October 2023 to identify and inspect existing on-site groundwater wells (Dudek 2023). Following the initial desktop study and site reconnaissance, Dudek performed a pumping test at one of the on-site wells (Dudek 2024). The pumping test methods and results are summarized below in Section 6, Water Supply Assessment.

[3] The Pleistocene epoch lasted from about 2.6 million years ago to 11,700 years ago, the Pliocene epoch lasted from about 5.3 million to 2.6 million years ago, and the Tertiary Period lasted from about 66 million to 2.6 million years ago.

The desktop study and site reconnaissance identified one existing groundwater well at the Project site, referred to as Well 1, and one existing off-site well located near the Project site, referred to as Well 2 (Figure 5). Well 1 is an active well that was onsite 20 years ago when the property was purchased. Well 2 is also an active well that is currently used for domestic drinking water supply use for a neighboring property. Well 2 was not tested and will not be used for water supply for the Project. Information about the wells gathered during the site reconnaissance and well condition assessment is presented in Table 3.

Table 3. Groundwater Well Information

Well Name	Use Type	Casing Diameter (inches)	Casing Material Type	Depth (feet bgs)	Yield (GPM)	Depth to Water (feet bgs)	Status
Well 1	Industrial	12,10[a]	Steel	337	180	63.93, 47.00[b]	Active
Well 2	Domestic	6	Steel	N/A	N/A	N/A	Active

Source: Dudek 2023, 2024
Note: bgs = below ground surface, GPM = gallons per minute; N/A = not available.
[a] Well 1 was observed with 72.5 feet of 12-inch internal diameter steel casing from ground surface to 72.5 feet bgs, and 264.3 feet of approximately 10-inch steel casing from 72.5 feet to 336.8 feet bgs.
[b] Depths to water as measured in September 2023 (63.93 feet bgs) and March 2024 (47.00 feet bgs).

4.2.2 Groundwater Levels

The static depth to groundwater measured in Well 1 in September 2023 was 63.93 feet below ground surface (bgs) and in March 2024 was 47.00 feet bgs. This rise in the groundwater level in Well 1 between September 2023 and March 2024 indicates seasonal variability in the water table.

There is one well (Well 38N07E32A002M) located to the west of the Project site with a long-term groundwater level measurement record (Figure 5). Based on data recorded between 1959 and 2023, groundwater levels in Well 38N07E32A002M have generally ranged from near ground surface to approximately 12 feet bgs, with the lower groundwater levels recorded in the fall and higher groundwater levels recorded in the spring following winter precipitation. The hydrograph for Well 38N07E32A002M indicates a stable, long-term trend in groundwater levels (Figure 6).

Groundwater levels within the Basin have generally risen overall in recent years in response to significant recharge in water years 2022 and 2023 (Lassen County GSA & Modoc County GSA 2023).

4.2.3 Groundwater Quality

Groundwater within the Basin is considered to be of good to excellent quality (Lassen County GSA & Modoc County GSA 2021). Naturally occurring constituents such as sodium bicarbonate and sodium magnesium bicarbonate do exist at slightly elevated levels. These constitutes are associated with volcanic formations and thermal waters found throughout the Basin. Groundwater quality data for the Project site is not available at this time.

4.3 Imported Water

Imported water is not currently available in the vicinity of the Project site and is not anticipated to be a source of Project water supply. All water used within the Basin originates in the Pit River Watershed (Lassen County GSA & Modoc County GSA 2021).

4.4 Wastewater/Recycled Water

Recycled water infrastructure does not exist in the vicinity of the Project site and is not anticipated to be a source of Project water supply.

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5 Water Management Plans and Programs

5.1 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) of 2014 is a package of three bills (Assembly Bill 1739, SB 1168, and SB 1319) that provides local agencies with a framework for managing groundwater basins in a sustainable manner. SGMA establishes minimum standards for sustainable groundwater management; roles and responsibilities for local agencies that manage groundwater resources; and timelines to achieve sustainable groundwater management within 20 years of adoption of a groundwater sustainability plan (GSP). Central to SGMA are the identification of critically overdrafted basins, prioritization of groundwater basins, establishment of groundwater sustainability agencies (GSA), and preparation and implementation of GSPs for medium- and high priority basins. SGMA required GSAs to be formed by June 30, 2017. GSPs must consider all beneficial uses and users of groundwater in the basin, as well as include measurable objectives and interim milestones that ensure basin sustainability. A basin may be managed by a single GSP or multiple coordinated GSPs. At the state level, DWR has the primary role in the implementation, administration, and oversight of SGMA, with the State Water Resources Control Board stepping in should a local GSA be found to not be managing groundwater in a sustainable manner. GSAs must follow DWR's approved regulations and guidelines for implementation of SGMA.

The DWR has designated the Big Valley Groundwater Basin as a medium priority basin. Based on this determination, both Lassen and Modoc Counties were required to fulfill their mandated roles as Groundwater Sustainability Agencies (GSAs) and prepare a GSP by the year 2022. The GSP was adopted by both GSA's and submitted to DWR in December 2021. According to the official 2023 DWR review letter (DWR 2023), the GSP was marked as incomplete in October 2023 due to three main factors:

- The GSP Does not include a reasonable assessment of overdraft conditions and reasonable means to mitigate overdraft.
- The GSP does not establish sustainable management criteria for chronic lowering of groundwater levels in a manner sustainably complaint with the GSP Regulations. The GSP lacks a thorough explanation and justification regarding the selection of the sustainable management criteria for groundwater levels, particulariryundesia5rgble results and minimum thresholds. The GSP also lacks quantitative descriptions of the effects of those criteria on the interest of beneficial uses and users of groundwater.
- The GSP does not develop sustainable management criteria for degraded water quality.

The Basin's GSA's must resubmit the revised GSP for evaluation no later than April 23, 2024.

5.2 Lassen County Water Well Ordinance

Lassen County adopted a water well ordinance in 1988 that specifies minimum requirements for the construction, repair, modification, and destruction of wells. The ordinance was developed to protect the groundwater of Lassen County aquifers from contamination/pollution and to ensure that water obtained from wells will be suitable for beneficial use (Lassen County GSA & Modoc County GSA 2021).

Additionally, in 1999, Lassen County adopted an ordinance requiring a permit for export of groundwater outside the county (Lassen County GSA & Modoc County GSA 2021).

The Project would comply with Lassen County's water well and groundwater export ordinances. The Project would not export groundwater for use outside of Lassen County and any well construction and/or reconstruction would be completed in accordance with Lassen County and state standards.

6 Water Supply Assessment

6.1 On-Site Well Testing

A 24-hour constant rate pumping test was performed at Well 1 in March 2024 (Dudek 2024). Well 1 was pumped at an average rate of 180 GPM. The discharge rate was selected based on the reasonable operating capacity of the existing well pump. The static groundwater level measured in Well 1 before the constant rate test was approximately 47.00 feet bgs and at the end of the test was 74.15 feet bgs for a total groundwater level drawdown of 27.15 feet (Figure 6). Approximately 24 hours after the pump was shut off, the recovered water level in Well 1 was measured at 48.30 feet bgs. There was 1.30 feet of residual drawdown and 95.2% recovery to the pre-test static water level 24 hours after shutdown (Figure 6; Dudek 2024).

In order to estimate long term supply projections, drawdown data was plotted on a semi-log plot of depth to water vs elapsed time in minutes and a straight line was fit to the semi-log drawdown curve to project drawdown over time (Figure 7). The straight line was extended to 59 days and 1 year. The extension of the line to 59 days represents the number of days the well would need to be pumped continuously at the tested rate of 180 GPM to achieve the total annual water demand of 46.85 AFY. The straight-line drawdown projection estimates that the depth to water would drop to approximately 76.20 feet bgs (approximate drawdown of 29.20 feet) after 59 days of continuous pumping at 180 GPM and approximately 77.00 feet bgs (approximate drawdown of 30.00 feet) after 1 year of continuous pumping at 180 GPM (Figure 7; Dudek 2024).

6.2 Projected Water Supply

As indicated above in Section 6.1, On-Site Well Testing, Well 1 has sufficient yield to satisfy the water demand of the Project. However, because of the presence of other groundwater users in the Basin, their associated pumping demands, and the fact that groundwater recharge can vary from year-to-year due to climatic variability, an analysis of the long-term availability of the groundwater resource is presented below.

Typical 20-year water supply and demand projections are lacking due to the Project existing outside of a public water system; however, the GSP prepared for the Basin does provide long-term forecasting of inflows and outflows within the Basin (Lassen County GSA & Modoc County GSA 2021). A spreadsheet-based water budget was developed for the Basin as part of the GSP development. Tables 4 and 5 show the average projected total Basin water budget for 2019 to 2068 for both the future baseline condition (Table 4) and the future condition when factoring in climate change (Table 5). Both projections use climate data from 1962 to 2011 as an estimate of future conditions. Data sources used to develop the budget included the Parameter-Elevation Regression on Independent Slopes Model for precipitation, California Irrigation Management Information System for evaporation data, the National Water Information System for surface water flows, and DWR land-use surveys for land use data.

Table 4. Average Projected Total Basin Water Budget 2019-2068 (Future Baseline)

Flow Type	Origin	Component	Estimated (AFY)
Inflow	Into Basin	Precipitation on Land System	+143,200
Inflow	Into Basin	Precipitation on Reservoirs	+500
Inflow	Into Basin	Stream Inflow	+430,200

Table 4. Average Projected Total Basin Water Budget 2019-2068 (Future Baseline)

Flow Type	Origin	Component	Estimated (AFY)
Inflow	Into Basin	Subsurface Inflow	+1
		Total Inflow	*+574,000*
Out of Basin	Out of Basin	Evapotranspiration	-156,900
Out of Basin	Out of Basin	Stream Evaporation	-400
Out of Basin	Out of Basin	Reservoir Evaporation	-700
Out of Basin	Out of Basin	Conveyance Evaporation	-50
Out of Basin	Out of Basin	Stream Outflow	-418,000
Out of Basin	Out of Basin	Subsurface Outflow	—
		Total Outflow	*-576,000*
		Change in Total System Storage	-2,000

Source: Lassen County GSA & Modoc County GSA 2021.
Notes: AFY = acre-feet per year; (—) = not applicable.

The future baseline projections with climate change (Table 5) result in an average overdraft of 1,000 AF less than baseline conditions due to climate models forecasting weather in the Basin will be warmer with increased precipitation and more precipitation falling in the form of rain than snow (Lassen County GSA & Modoc County GSA 2021). As shown in Tables 4 and 5, the analysis predicts that the Basin will be nearly in balance, with overdraft of only about 1,000 to 2,000 AFY.

Table 5. Average Projected Total Basin Water Budget 2019-2068 (Climate Change)

Flow Type	Origin	Component	Estimated (AFY)
Inflow	Into Basin	Precipitation on Land System	+152,200
Inflow	Into Basin	Precipitation on Reservoirs	+600
Inflow	Into Basin	Stream Inflow	+450,400
Inflow	Into Basin	Subsurface Inflow	—
		Total Inflow	*+603,000*
Out of Basin	Out of Basin	Evapotranspiration	-165,800
Out of Basin	Out of Basin	Stream Evaporation	-400
Out of Basin	Out of Basin	Reservoir Evaporation	-800
Out of Basin	Out of Basin	Conveyance Evaporation	—
Out of Basin	Out of Basin	Stream Outflow	-436,700
Out of Basin	Out of Basin	Subsurface Outflow	—
		Total Outflow	*-604,000*
		Change in Total System Storage	-1,000

Source: Lassen County GSA & Modoc County GSA 2021.
Notes: AFY = acre-feet per year; (—) = not applicable.

7 Conclusion

A WSA is required to identify and describe the water supply source(s) that will serve a proposed project. CWC Section 10910(d) requires a WSA to include an identification of any existing water supply entitlements, water rights, and water service contracts relevant to the identified water supply for a proposed project, and a description of the quantities of water received in prior years if the source is a public water supplier.

Groundwater from an on-site well(s) will be the sole source of water supply for the Project. The Project site overlies the Big Valley Groundwater Basin. As an overlying landowner, the Project has the right to extract percolating groundwater for reasonable and beneficial use without limitation. Based on the results of a 24-hour pumping test conducted at existing on-site Well 1, the well has sufficient capacity to satisfy the estimated Project demand of 46.85 AFY. Additionally, based on the results of the Basin water budget analysis, the Basin is projected to be nearly in balance through 2068. Groundwater levels in Well 38N07E32A002M located near the Project site have remained stable since the beginning of the measurement record in 1959 indicating a stable groundwater supply. Implementation of the GSP will ensure that the groundwater Basin is managed sustainably for existing and future beneficial uses of the groundwater supply.

Based on the information, analysis, and findings documented in this WSA, local groundwater supplies are available during normal, single dry, and multiple dry years during a 20-year projection and will meet the projected water demand associated with the proposed Project, in addition to existing and planned future uses of the groundwater supply.

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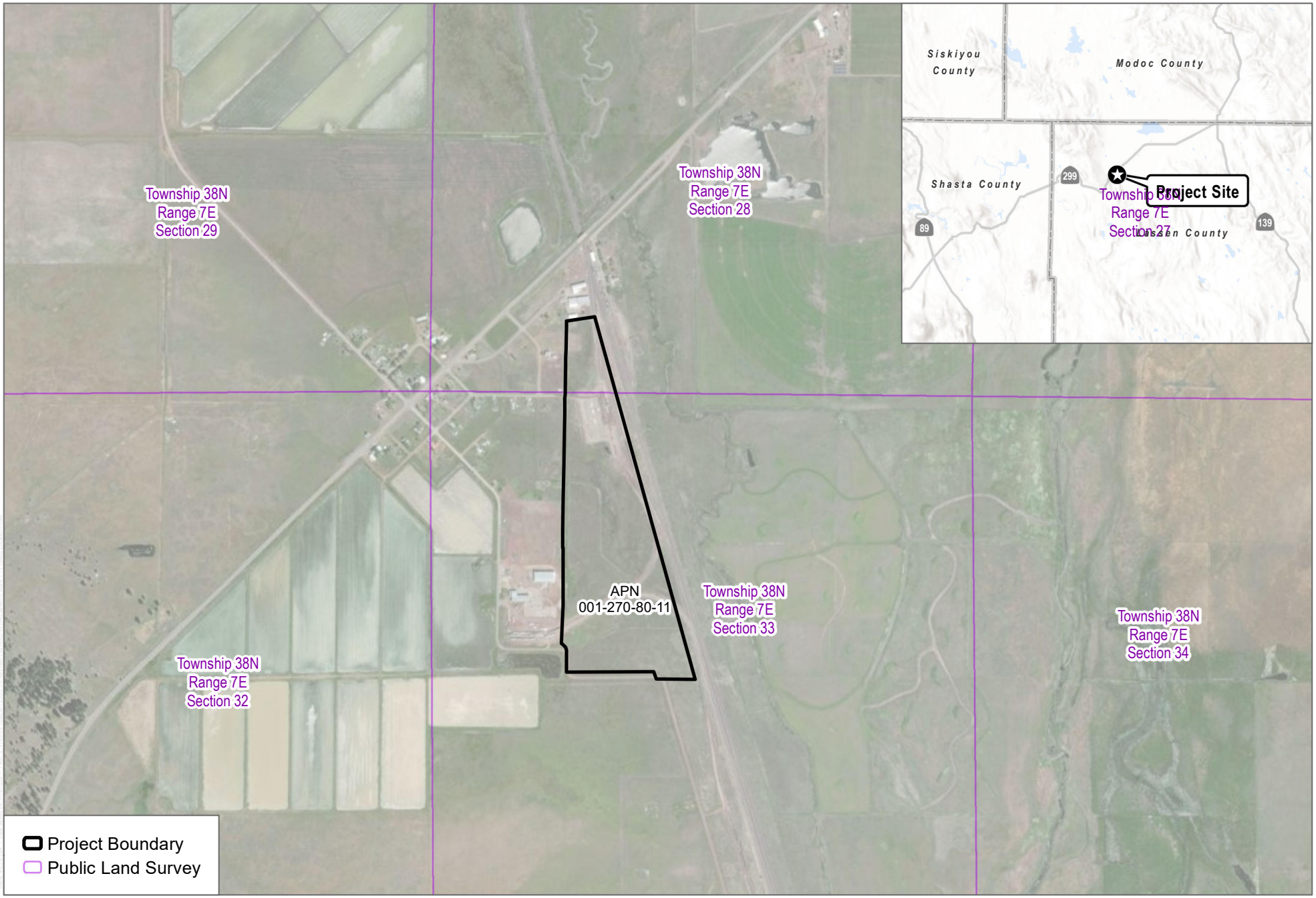

SOURCE: ESRI

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Site

653-800 Washington Avenue Project

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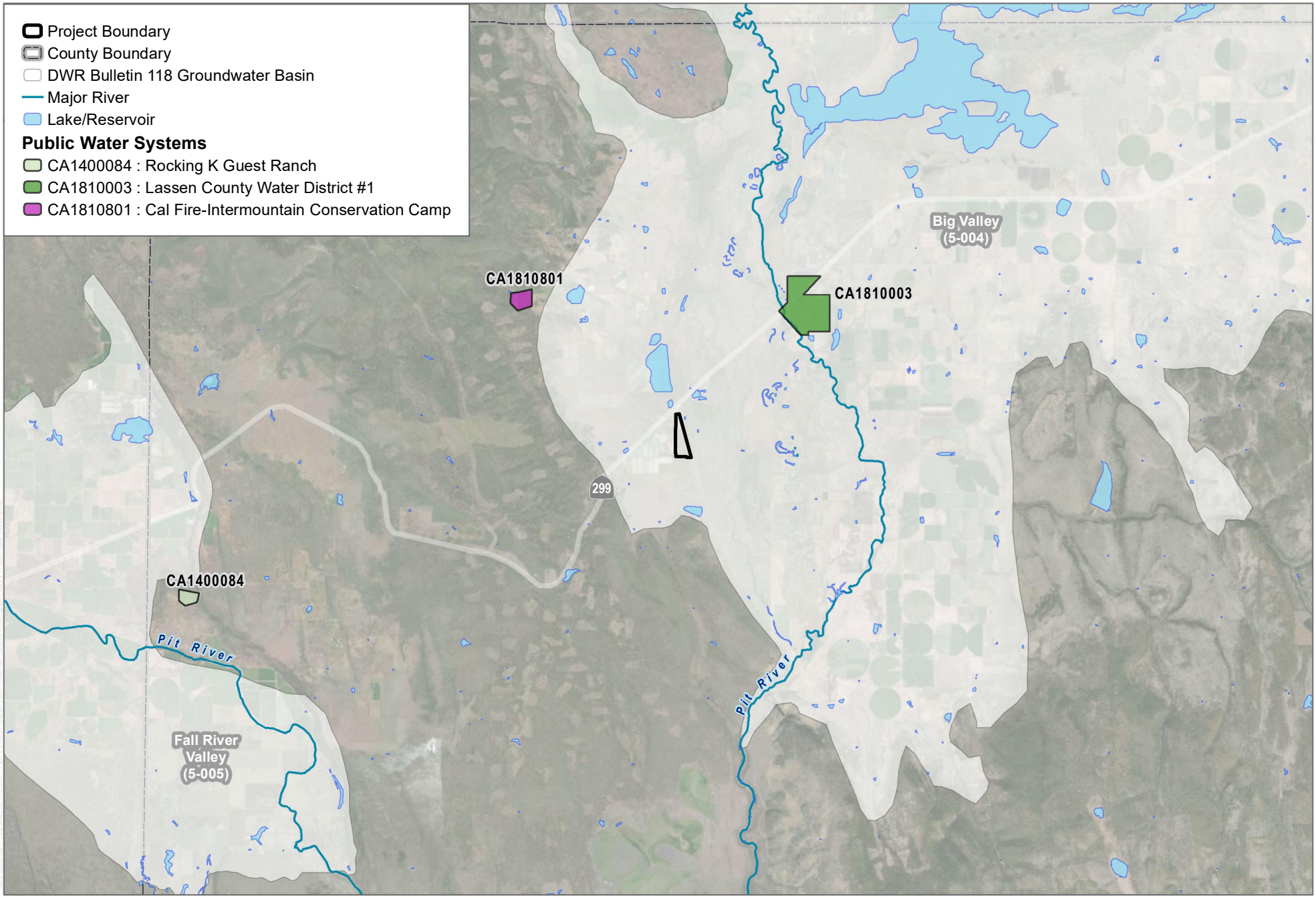

SOURCE: ESRI; SWRCB; DWR

DUDEK

0 0.75 1.5 Miles

FIGURE 2

Public Water Systems and Groundwater Basins

653-800 Washington Avenue Project

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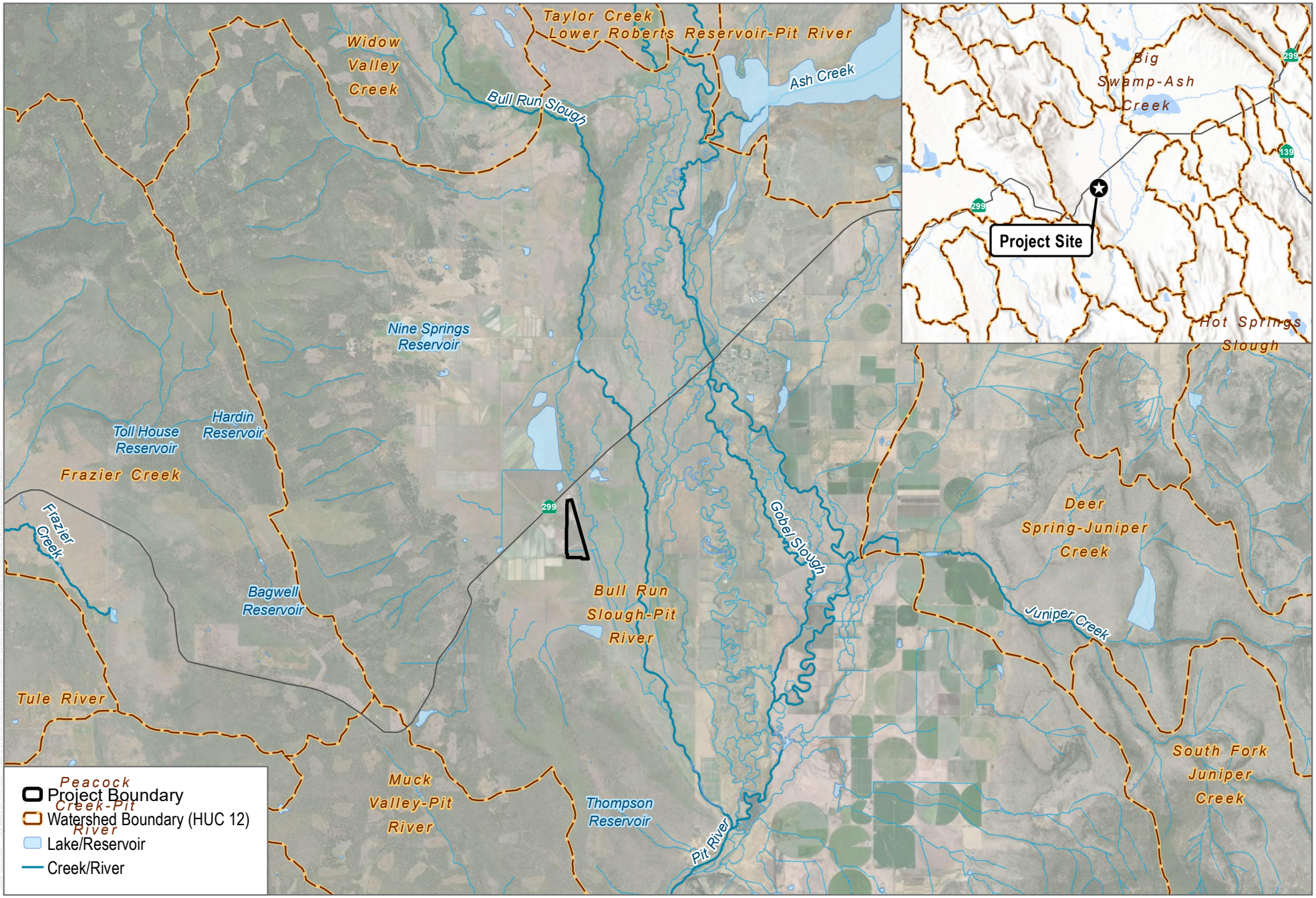

SOURCE: ESRI; USGS

DUDEK

0 0.5 1 Miles

FIGURE 3

Watersheds and Surface Water Features

653-800 Washington Avenue Project

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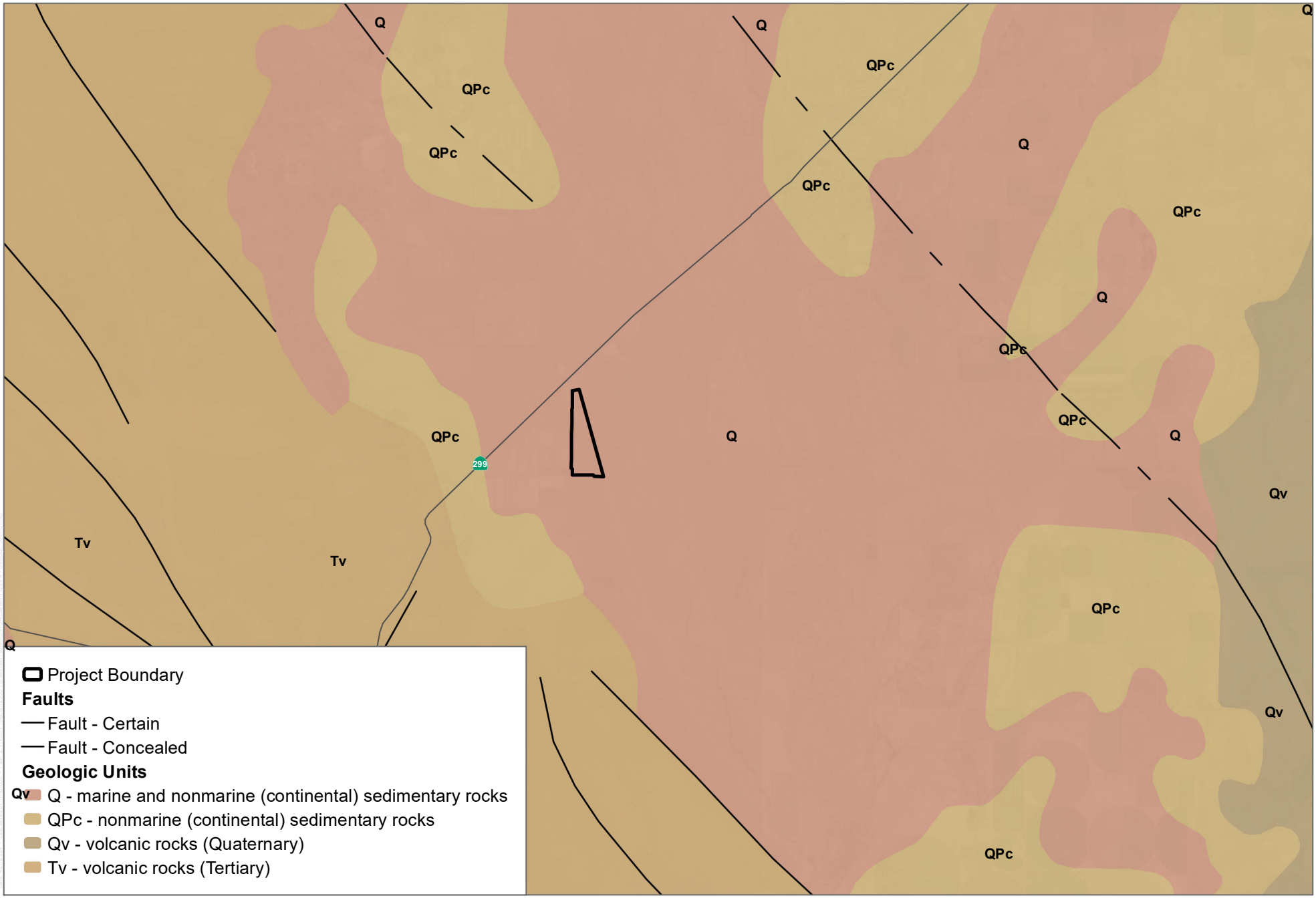

SOURCE: ESRI; CA Department of Conservation

DUDEK

0 0.475 0.95 Miles

FIGURE 4

Geologic Setting

653-800 Washington Avenue Project

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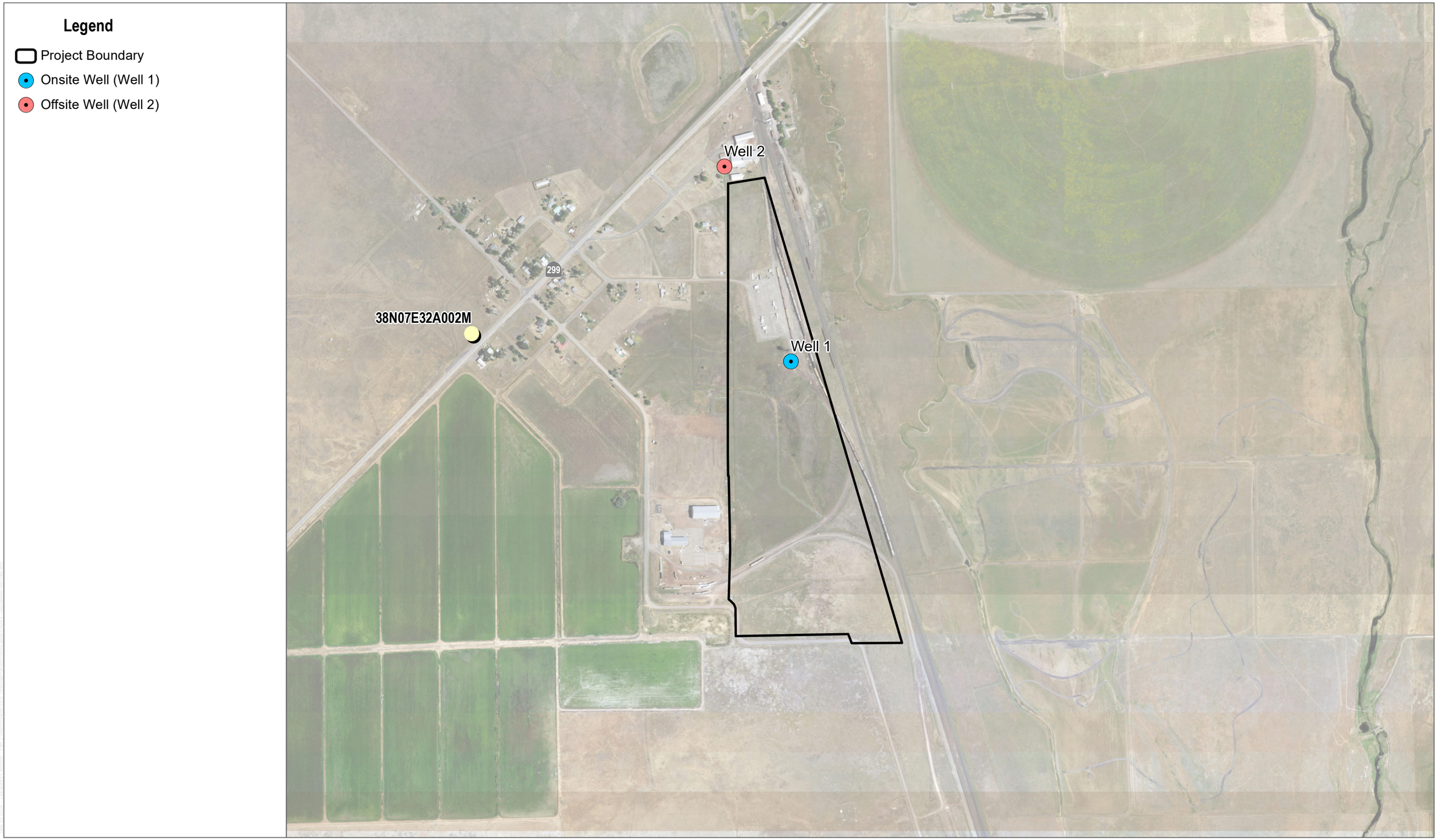

SOURCE: ESRI; DWR

DUDEK

0 410 820 Feet

FIGURE 5

Groundwater Well Sites

653-800 Washington Avenue Project

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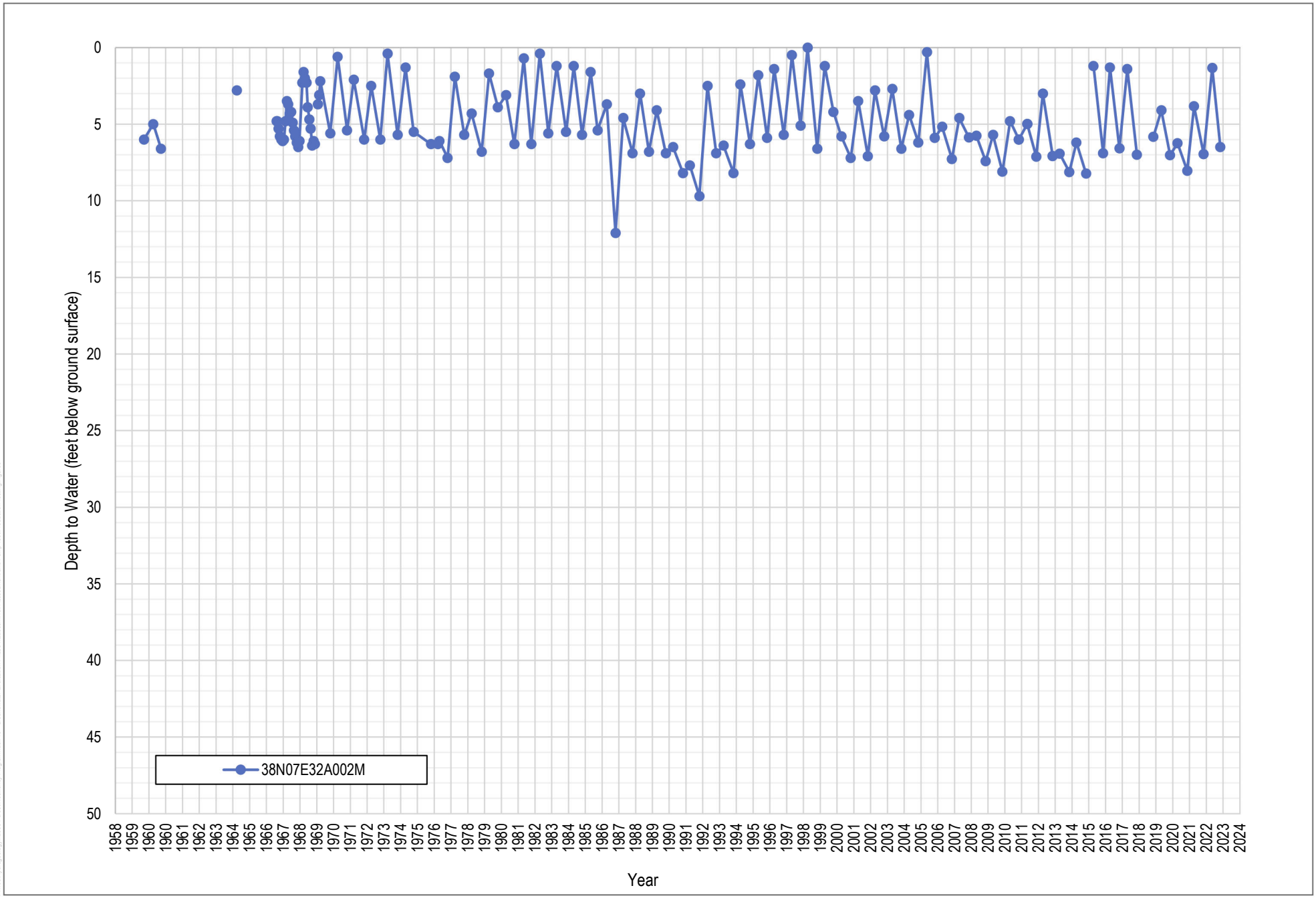

SOURCE: SGMA Data Viewer

DUDEK

FIGURE 6

Well 38N07E32A002M Hydrograph

653-800 Washington Avenue Project

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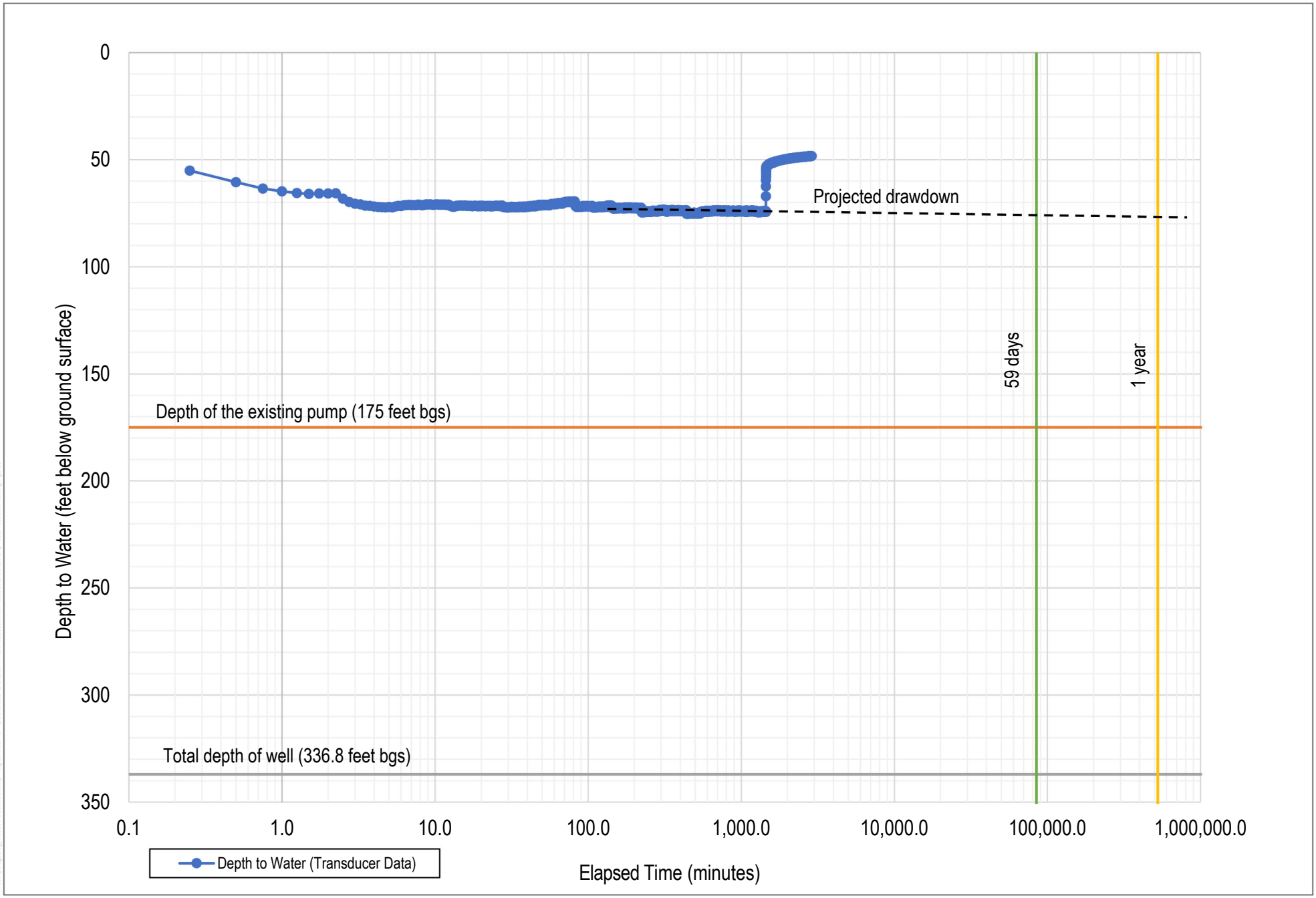


FIGURE 7

Constant Rate Test - Depth to Water - Well 1

653-800 Washington Avenue Project

DUDEK

INTENTIONALLY LEFT

Appendix A
Site Grading Plans

PROJECT TEAM

CIVIL ENGINEER
BROOKS BADDELEY, PE
KIMLEY-HORN AND ASSOCIATES, INC.
555 CAPITOL MALL, SUITE 300
SACRAMENTO, CA 95814
(916) 859-3609
BROOKS.BADDELEY@KIMLEY-HORN.COM

DEVELOPER
GOLDEN STATE NATURAL RESOURCES, INC
1215 K STREET, SUITE 1650
SACRAMENTO, CA 95814

PROJECT DESCRIPTION

APN: 001-270-086-000; 001-270-026-000

FEMA FLOOD ZONE

FLOOD ZONE: ZONE A – SPECIAL FLOOD HAZARD AREA
NO BASE FLOOD ELEVATION DETERMINED
FIRM PANEL NO.: 06035C0335D
EFFECTIVE DATE: 09/03/2010

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
1	CONCEPTUAL GRADING PLAN COVER SHEET
2	CONCEPTUAL GRADING PLAN
3	CONCEPTUAL GRADING PLAN

ASSUMPTIONS

1. THIS IS A CONCEPTUAL DESIGN THAT IS INTENDED TO PROVIDE PROJECT DESCRIPTION INFORMATION FOR ENVIRONMENTAL IMPACT ANALYSES.
2. THE EXISTING TOPOGRAPHICAL SURFACE DATA DERIVED FROM THE USGS IS SUFFICIENT FOR THE CONCEPTUAL GRADING PLANS. KIMLEY-HORN DOES NOT GUARANTEE THE COMPLETENESS OR ACCURACY OF THIS DATA.
3. THE CONCEPTUAL GRADING PLANS ARE NOT MEANT TO PRODUCE ANY DOCUMENT TO BE SUBMITTED FOR AGENCY REVIEW AND/OR APPROVAL.
4. THE EARTHWORK QUANTITY ESTIMATIONS ACCOUNT ONLY FOR THE COMPARISON BETWEEN THE EXISTING TOP SURFACE PER USGS DATA AND THE PROPOSED FINISHED GRADE SURFACE.
5. THE USGS DATA HAS NOT BEEN VERIFIED BY MEANS OF A SURVEY OR ANY FIELD WORK.
6. KIMLEY-HORN RELIED ON INFORMATION PROVIDED BY DUDEK FOR THE REQUIRED AMOUNT OF VOLUMETRIC FILL TO RAISE THE PROPOSED PELLET PROCESSING PLANT SITE ABOVE REQUIRED FLOOD PLAIN ELEVATION IN LIEU OF NO BASE FLOOD ELEVATIONS DEFINED ON THE FEMA MAP.
7. KIMLEY-HORN ASSUMES THE REQUIRED AMOUNT OF VOLUMETRIC FILL TO RAISE THE PELLET PROCESSING PLANT TO BE APPROXIMATELY 238,000 CY ±10,000 CY.
8. ALL VOLUMETRIC QUANTITIES PRODUCED AS A PART OF THIS CONCEPTUAL DESIGN ARE PRELIMINARY.
9. BASIN SIZING IS BASED ON THE TOTAL DISTURBED AREA.
10. THE EXISTING SPI DECK IS TO BE REMOVED AND REPLACED TO RAISE ELEVATIONS.
11. GEOTECHNICAL REPORT WILL BE REQUIRED FOR FINAL DESIGN AND ANALYSIS. THE RESULTS MAY MODIFY THE DESIGN APPROACH.

ABBREVIATION

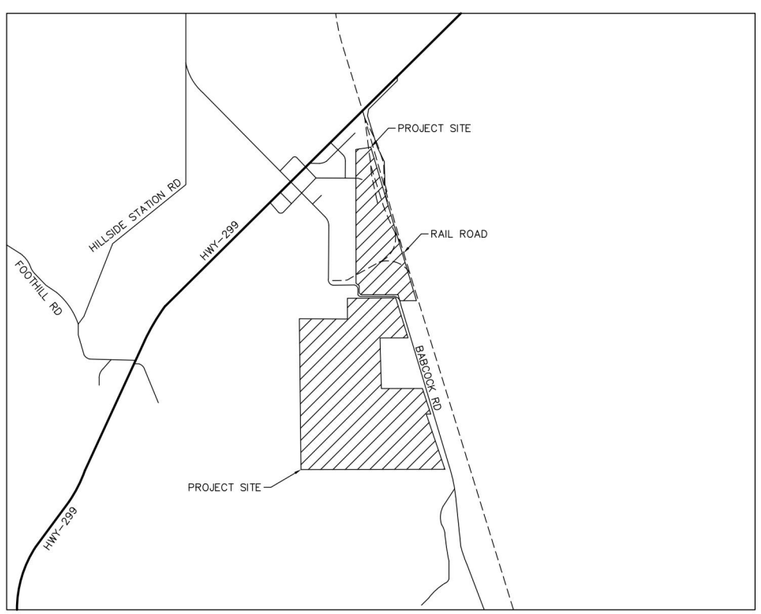
P	TOP OF PAVEMENT
FG	FINISHED GRADE
LP	LOW POINT
ME	MATCH EXISTING
HP	HIGH POINT
GB	GRADE BREAK
R	RIDGE
TB	TOP OF BERM

LEGEND

- PROPERTY LINE
- EASEMENT/SETBACK
- GRADING LIMITS/MATCH EXISTING
- EXISTING CONTOURS (SHOWN AS 2' INTERVALS)
- PROPOSED CONTOURS (SHOWN AS 1' INTERVALS)
- STORMWATER BIO-TREATMENT AREA
- PROPOSED STORAGE YARD AREA
- PROPOSED ASPHALT
- 108.34 P — PROPOSED ELEVATION
- 2.05% — PROPOSED SLOPE

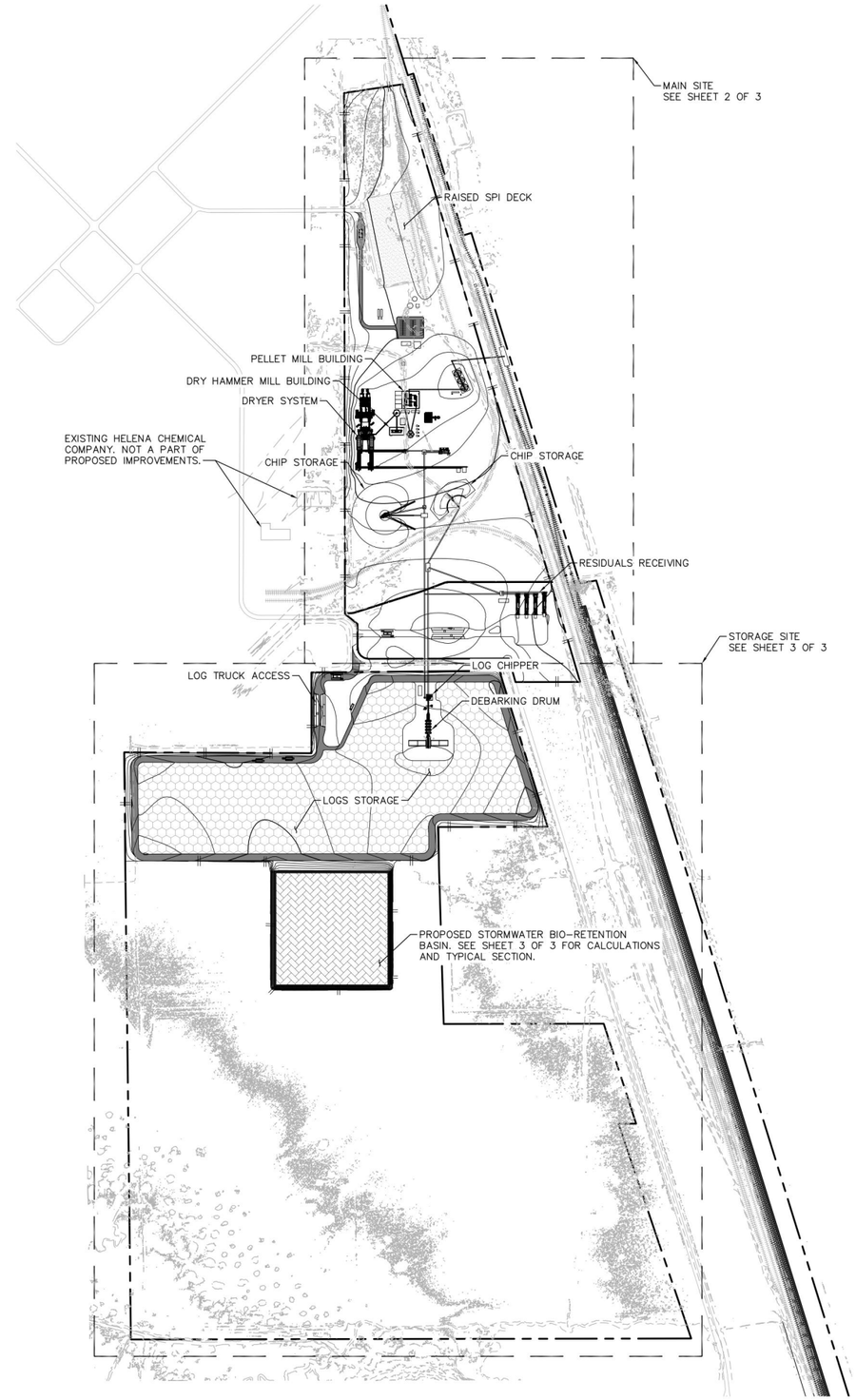
SITE DATA

TOTAL AREA	298 AC
DISTRUBED AREA	173 AC
BIO-RETENTION AREA	10.61 AC



VICINITY MAP

SCALE: NTS



OVERALL SITE PLAN

SCALE: 1" = 150'

NORTH

GRAPHIC SCALE IN FEET
0 200 400 800

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SACRAMENTO, CA 95814
PHONE: 916-858-5800
WWW.KIMLEY-HORN.COM

LICENSED PROFESSIONAL

NOT FOR CONSTRUCTION

KHA PROJECT 197697001
DATE 02/12/24
SCALE AS SHOWN
DESIGNED GES
DRAWN PSS
CHECKED BNB

NUBIEBER, CA 96068
LASSEN COUNTY
FOREST RESILIENCY PROJECT
CONCEPTUAL GRADING PLAN
COVER SHEET

SHEET NUMBER
1 OF 3

Plotted By:Szorecki, Piotr Sheet Set:Kha Layout:PRELIMINARY GRADING PLAN COVER SHEET February 12, 2024 11:00:13am K:\SAC_PLAN\197697001.3 - Forest Resiliency Project\09 CADD\GSNR - Lassen\Plan Sheets\Grading Plan\overall02.dwg
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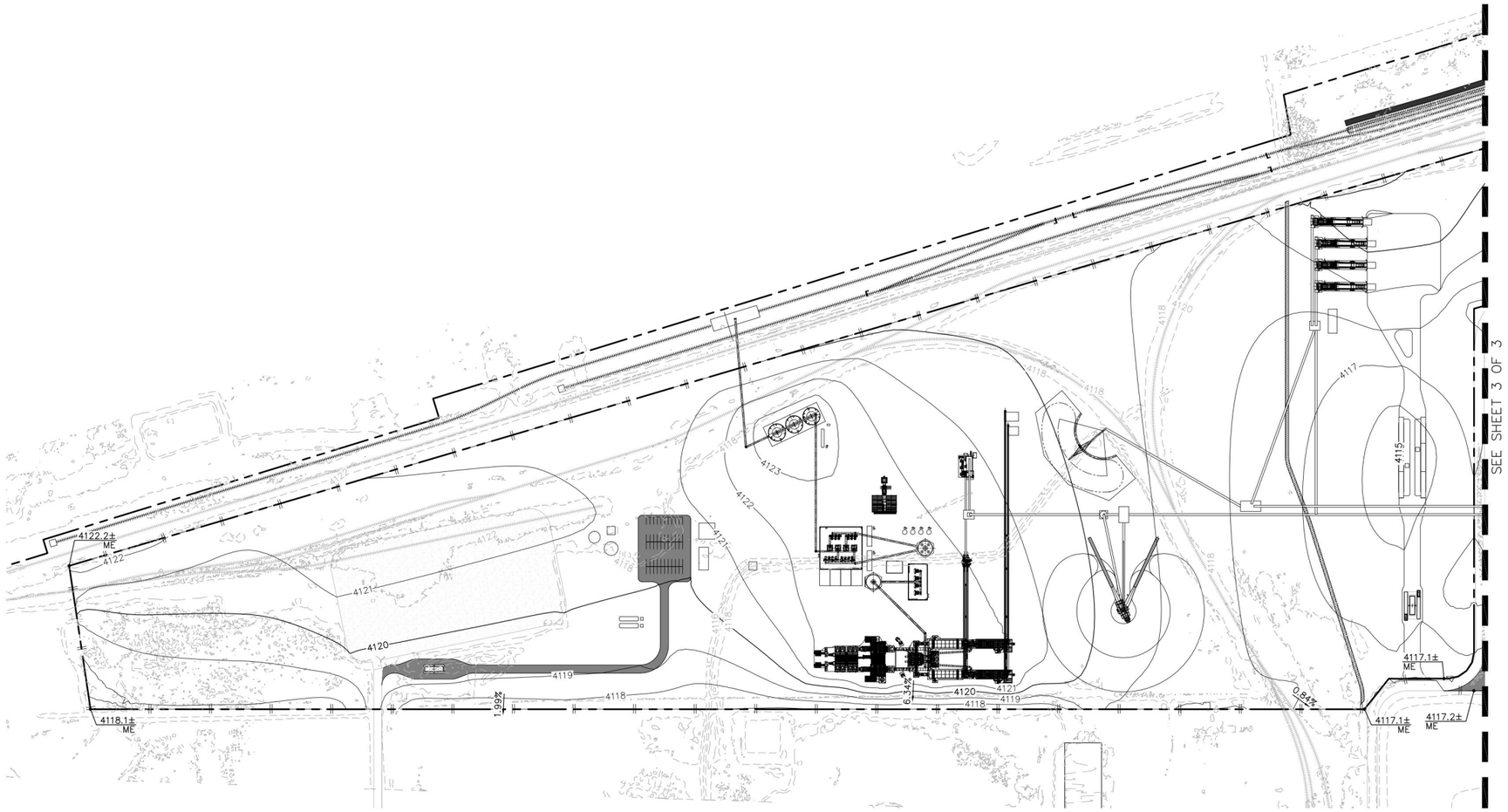

LEGEND

- PROPERTY LINE
- EASEMENT/SETBACK
- GRADING LIMITS/MATCH EXISTING
- EXISTING CONTOURS (SHOWN AS 2' INTERVALS)
- PROPOSED CONTOURS (SHOWN AS 1' INTERVALS)
- STORMWATER BIO-TREATMENT AREA
- PROPOSED STORAGE YARD AREA
- PROPOSED ASPHALT
- 108.34 P — PROPOSED ELEVATION
- 2.05% — PROPOSED SLOPE

GENERAL NOTES

1. ALL EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.
2. SITE LAYOUT AND LINEWORK BY NEXUS PMG AND TOPOGRAPHIC INFORMATION PER USGS DATA, RESPECTIVELY. GRADING AND DRAINAGE DESIGN IS BASED OFF OF FILES RECEIVED FROM AFOREMENTIONED CONSULTANTS AND USGS DATA. THE ENGINEER ASSUMES NO RESPONSIBILITIES FOR SITE ELEMENTS NOT SHOWN IN THEIR PROPER LOCATION.
3. ALL SPOT ELEVATIONS ARE MATCH EXISTING (ME), FINISHED FLOOR (FF), FLOW BASIN TOP (BT), OR BASIN BOTTOM (BB) ELEVATIONS UNLESS OTHERWISE NOTED.

CONCEPTUAL DRAINAGE STATEMENT

THE ANTICIPATED STORMWATER RUNOFF ASSOCIATED WITH THE LASSEN COUNTY DESIGN STORM EVENT ON THE PROJECT SITE WILL BE CONVEYED VIA COMBINATION OF OVERLAND FLOW AND UNDERGROUND STORM DRAIN PIPES (NOT SHOWN) TO ABOVE GROUND BIORETENTION PONDS. THIS CONCEPTUAL DESIGN IS GRAVITY BASED AND DOES NOT REQUIRE A PUMP.

PRELIMINARY EARTHWORK CALCULATIONS

CUT: 262,785 CY

FILL: 277,057 CY

NET: 14,272 CY (CUT)

NOTE: THE ABOVE QUANTITIES ARE APPROXIMATE IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISHED GRADE. EXISTING GROUND IS DEFINED BY THE CONTOURS AND SPOT GRADES ON THE BASE SURVEY. PROPOSED FINISHED GRADE IS DEFINED AS THE FINAL GRADE AS INDICATED ON THE PRELIMINARY GRADING PLAN(S).

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NORTH

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SACRAMENTO, CA 95814
PHONE: 916-858-5800
WWW.KIMLEY-HORN.COM

LICENSED PROFESSIONAL
REGISTERED PROFESSIONAL ENGINEER
BROOKS BANNISTER
No. 74247
CIVIL
STATE OF CALIFORNIA
NOT FOR CONSTRUCTION

KHA PROJECT 197697001	
DATE	02/12/24
SCALE AS SHOWN	
DESIGNED	GES
DRAWN	PSS
CHECKED	BNB

NUBIEBER, CA 96068
LASSEN COUNTY
FOREST RESILIENCY PROJECT

CONCEPTUAL GRADING PLAN

SHEET NUMBER
2 OF 3

Plotted By:Szarecki, Piotr Sheet Set:Kha Layout:MAIN SITE February 12, 2024 11:00:45am K:\SAC_PLAN\197697001.3 - Forest Resiliency Project\09 CADD\GSNR - Lassen\Plan Sheets\Grading Plan\G0.dwg
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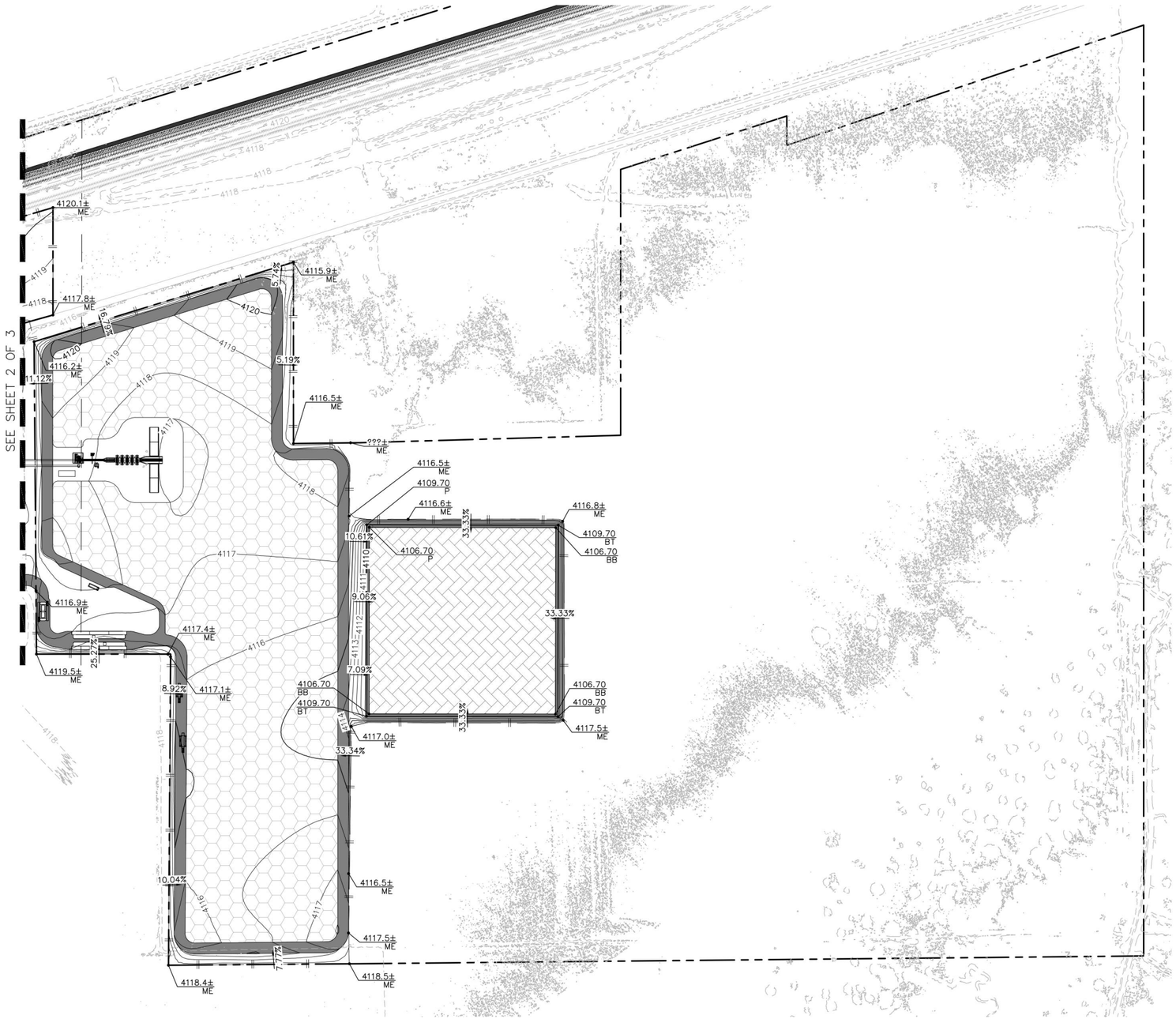

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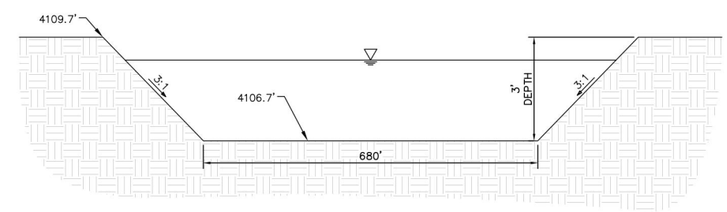

1 TYPICAL BIORETENTION BASIN SECTION

N.T.S.

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DMA Name	DMA Area (sq ft)	Post-project Surface Type	DMA Runoff Factor	Equivalent Impervious Surface Area (sq ft)	10% Technical Infeasibility Factor	Minimum Facility Size (sq ft)	Area Provided (sf)
1	2,276,086	Impervious	1.0	2,276,086	0.10	280,620	462,400
	5,301,144	Pervious	0.1	530,114	0.10		
Total				2,806,200	0.10	**280,620**	**462,400**
Proposed Project Site Bioretention Surface Area:				462,400			
Minimum Required Bioretention Surface Area:				280,620			

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NOT FOR CONSTRUCTION

KHA PROJECT 197697001
DATE 02/12/24
SCALE AS SHOWN
DESIGNED GES
DRAWN PSS
CHECKED BNB

NUBIEBER, CA 96068
LASSEN COUNTY
FOREST RESILIENCY PROJECT

CONCEPTUAL GRADING PLAN

SHEET NUMBER
3 OF 3

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Appendix B

Construction Water Demand Estimate

CONSTRUCTION WATER DEMAND ESTIMATION SHEET

Project
653-800 Washington Avenue Project

Subject
Construction Water Demand

Methodology		
Estimated Mass grading		
Input quantity of on-site fill used to balance site	277,057	CUBIC YARDS
Input optimum moisture content	15	%
Input observed moisture content	12	%
Input dry unit weight of on-site fill	110	PCF
Weight of water to reach saturation	3.300	PCF
Water required to hydrate and gain compaction	12	GAL/CY
Input contingency to account for evaporation during summer months	1.00	
Water required to hydrate and gain compaction	12	GAL/CY
Water for grading	**3,300,238**	**GAL**
Conversion to gallons per acre-foot	325,851	
Water required for grading	**10.1**	**ACRE-FT**
Daily Dust Control		
Construction days	260	Days
Number of 3,000-gallon water trucks per day	2	Trucks
	12,000	**GAL/DAY**
Total water use for daily dust control	**3,120,000**	**GAL**
Total Estimated Construction Demand		
Total Project Water Usage	**6,420,238**	Gallons
	20	ACRE-FT