Appendix G4

Tuolumne Water Supply Assessment

Water Supply Assessment

12001 La Grange Road Project

APRIL 2024

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Table of Contents

SECTION **PAGE NO.**

TABLES

FIGURES

APPENDICES

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AF	acre-feet
AFY	acre-feet per year
bgs	below ground surface
btoc	below top of casing
CEQA	California Environmental Quality Act
County	County of Tuolumne
CWC	California Water Code
DWR	California Department of Water Resources
GPM	gallons per minute
IRWMP	Integrated Regional Water Management Plan
SB	Senate Bill
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 12001 La Grange Road Project (Project) has been determined to be subject to CEQA with Tuolumne 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, accounting for the projected water demand of the Project in addition to 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 063-190-056 located at 12001 La Grange Road in unincorporated Tuolumne County, California (Figure 1). Development associated with the Project would occur on approximately 58.6 acres. The Project site is southeast of California State Route 108/120 and is currently comprised of a mixture of partially developed land including 9.6 acres of paved area, as well as large undeveloped areas of annual grassland and wetlands. The Project site is located within the U.S. Geological Survey 7.5-minute Keystone, California quadrangle and the following two public land survey system sections of the Mount Diablo Base and Meridian:

- Township 1 South, Range 13 East, Section 14
- Township 1 South, Range 13 East, Section 23

The Project consists of the construction of a wood pellet manufacturing facility and associated development including a woodyard, green processing area, drying area, pellet mill, project storage, and loadout area (Appendix A). 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: unmerchantable roundwood and forest 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). Residuals include material (bark, shavings, sawdust, and wood chips) leftover from other in-forest work (such as timber harvests or vegetation management) or the milling process. 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 developments that qualify as a "project". Per CWC 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 id0entified 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 12001 La Grange Road 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 Tuolumne 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. The Project site is located in unincorporated Tuolumne 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 is not located within a DWR Bulletin 118 alluvial groundwater basin. The surficial geology at the Project site consists of metavolcanic rocks. Groundwater is found within the fractures of the underlying bedrock. 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.

2 Water Demand

2.1 Existing Water Demand

The Project site was historically used as a sawmill. 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 are three existing groundwater wells at the Project site, one of which is currently used to fill a water storage tank for fire supply. There are no other existing water uses at the Project site.

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 10 AF for construction (Appendix B) over a one-year period and approximately 25 AFY for operation (Nexus 2023). Based on this, the total Project water demand is estimated to be approximately 485 AF over a 20-year period, or 24.25 AFY.[1] 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	10	10
Operation			
Pellet production	19 years	25	475
		Total	**485**

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 demolition, 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 10 AF (Appendix B). Ten (10) AFY is an approximate estimate and does not include water required for concrete mixing, paving, or other construction activities.

Table 2. Project Construction Schedule

Construction Phase	Start Date	End Date
Demolition	10/1/2024	12/1/2024
Site Preparation	11/15/2024	12/1/2024
Grading (Including Utilities)	12/1/2024	4/1/2025

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

Building/Vertical Construction	2/1/2025	12/1/2025
Rail Spurs Construction	1/1/2025	5/1/2025
Paving	2/1/2025	4/1/2025
Architectural Coating	11/1/2025	11/30/2025

Source: Nexus 2023.

Once construction is complete, the operational water demand is estimated to be 25 AFY and is anticipated to remain constant over the life of the Project. This estimate is based on the volume of water required to produce 300,000 metric tons of pellets per year (8,033,731 gallons per year), plus the sanitary and drinking water demands of 51 employees at 10 gallons per employee per shift (132,600 gallons per year), as well as a one-time demand to fill a 180,000-gallon water storage tank for fire supply (EPA 2023; Nexus 2023). This equates to an amortized pumping rate of approximately 16 gallons per minute (GPM), assuming the well is pumped 24 hours per day seven days per week, or approximately 65 GPM, assuming the well is pumped eight hours per day five days per week.

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 Sonora, California weather station (station no. 048353), for the period from 1903 to 2024 is 73 °F and the average minimum temperature is 45 °F (WRCC 2024). Maximum temperatures in the summer typically reach the low-100s degrees Fahrenheit and minimum temperatures in the winter reach the mid-20s degrees Fahrenheit. The average annual precipitation at the Sonora weather station for the period from 1903 to 2024 is approximately 31 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).

Climate change is expected to alter the predictability of water supply for the predominantly snow-fed watersheds in the region, including a reduction of water supply in the form of snow storage with an overall increase in precipitation (TSIRWMA 2017). Tuolumne County is expected to see an increase in overall average precipitation from 2035 to 2064 (Tuolumne County 2021).

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.

4 Water Resources

4.1 Surface Water

The Project site is located in the foothills of the Sierra Nevada. The topography of the Project site consists of flat land that gently slopes to the northwest with the highest point along the eastern boundary at approximately 1,140 feet above mean sea level and the lowest point in the northwest corner at approximately 1,070 feet above mean sea level (USGS 2024a).

The Project site is located in the Green Spring Run watershed (Figure 3). Tulloch Reservoir is located approximately 4 miles to the northwest of the Project site and Don Pedro Reservoir is located approximately 5 miles southeast. An unnamed intermittent stream that is a tributary to Green Spring Run flows through the northern portion of the Project site (Figure 3). Green Spring Run is a perennial tributary of Tulloch Reservoir and the Stanislaus River (USGS 2024a).

Surface water is the primary water supply for many public water systems in the Project vicinity and is a critical source of energy for hydroelectric power generation facilities (TSIRWMA 2017). However, surface water is not anticipated to be a source of Project water supply.

4.2 Groundwater

The surficial geology at the Project site is mapped as the Copper Hill Formation, which consists of andesitic to basaltic metavolcanic rocks (Figure 4) (Higgins 1997). The area around the Project site includes similar hard rock geology consisting of metasedimentary rocks, the Gopher Ridge Formation, the Penon Blanco Formation, metavolcanic rocks, granitic rocks, ultramafic rocks, and mélange (Figure 4) (Higgins 1997). Three fault traces that trend northwest-southeast are documented near the Project site (Figure 4). There is no alluvial material mapped on or near the Project site. The Project site is not located within a DWR Bulletin 118 alluvial groundwater basin. The closest groundwater basin is the San Joaquin Valley – Modesto Groundwater Basin (DWR Basin No. 5-022.02) located approximately 6 miles west of the Project site (Figure 2).

The lithology documented in well completion reports from wells drilled near the Project site consists of fractured “greenstone”, slate, and schist. Groundwater is contained within the fractures of these hard rocks. The presence and connectivity of water-bearing fractures are unpredictable and the yields from these fractures can vary dramatically. Based on a review of well completion reports for wells drilled near the Project site, well yields are reported to range from 1 GPM to 60 GPM, with the exception of one well located at the Project site, Well 1, which had an estimated yield of 400 GPM (Dudek 2023).

Groundwater is the primary water supply for small communities and private property owners not located within the service area of a public water system in the Project vicinity (TSIRWMA 2017). Groundwater from an on-site 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 conducted a well condition assessment (Dudek 2024a) and performed a pumping test at one of the on-site wells (Dudek 2024b). The pumping test methods and results are summarized below in Section 6, Water Supply Assessment.

The desktop study and site reconnaissance identified three existing groundwater wells at the Project site, referred to as Wells 1, 2, and 3 (Figure 5). Well 1 is currently used to fill a water storage tank for fire supply, Well 2 is inactive, and Well 3 is assumed to be actively used by the adjacent parcel owner to the west (Dudek 2024b). Information about the wells gathered during the site reconnaissance and well condition assessment is presented in Table 3.

Table 3. On-Site Groundwater Well Information

Well Name	Use Type	Casing Diameter (inches)	Casing Material Type	Depth (feet bgs)	Yield (GPM)	Pump Size (horsepower)	Depth to Water (feet btoc)[a]	Status
Well 1	Industrial	8	Steel	412	137	15	23.70	Active
Well 2	N/A	6	Steel	N/A	N/A	N/A	9.74	Inactive
Well 3	N/A	6	PVC	N/A	N/A	N/A	16.59	Active

Source: Dudek 2023, 2024a, 2024b.
Note: bgs = below ground surface, GPM = gallons per minute; btoc = below top of casing; N/A = not available.
[a] Depths to water as measured in February 2024 (at Wells 1 and 2) and November 2023 (at Well 3).

4.2.2 Groundwater Levels

Groundwater level data for wells located on and nearby the Project site is limited. Based on a review of well completion reports for wells drilled within the two public land survey system sections the Project site falls within, depth to groundwater ranges from approximately 10 feet below ground surface (bgs) to 95 feet bgs (Dudek 2023a). One well completion report (Legacy Log Number 247908) showed matching characteristics to construction features observed during the site reconnaissance at Well 1. The static depth to groundwater measured in Well 1 when the well was drilled in February 1984 was 35 feet bgs. The static depth to groundwater measured during the pumping test in February 2024 was 23.7 feet bgs. Based on these two data points, it appears that the groundwater table has remained stable over time (Dudek 2023a, 2024).

4.2.3 Groundwater Quality

Groundwater quality data for wells located on and nearby the Project site is also limited. The quality of groundwater from wells in the Project vicinity is reported to vary significantly depending on a number of factors including well depth, geology, and proximity to point sources of contamination (TSIRWMA 2017). Iron and manganese are naturally occurring constituents that are commonly detected at elevated concentrations (TSIRWMA 2017). Based on groundwater quality results for two nearby public water systems (CA5500148 and CA550360; Figure 2), groundwater in the Project vicinity is of good quality with all constituents below drinking water maximum contaminant levels, except for iron which has been detected at slightly elevated levels (SWRCB 2024).

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.

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.

5 Water Management Plans and Programs

5.1 Tuolumne-Stanislaus Integrated Regional Water Management Plan

Integrated Regional Water Management is an initiative led by DWR that seeks to support collaborative efforts among agencies, non-governmental organizations, tribes, and stakeholders within a region that identify and implement water management solutions to increase regional self-reliance, reduce conflict, and manage water to achieve multiple objectives. The Project site is located within the Tuolumne-Stanislaus Integrated Regional Water Management Plan (IRWMP) area which covers approximately 2,700 square miles including the Upper Tuolumne River, Upper Stanislaus River, and Upper Rock Creek-French Camp Slough watersheds. The Tuolumne-Stanislaus IRWMP is intended to provide a framework to address the many major water-related needs/challenges and conflicts within the region including water quality, local water supply reliability, better integration of water and land use management, and resource stewardship and ecosystem protection.

The proposed Project supports the objectives of the Tuolumne-Stanislaus IRWMP as it will help to maintain a sustainable and resilient forest ecosystem by reducing excess biomass. The Project is a beneficial use of the local groundwater resource and will not interfere with the objectives of the Tuolumne-Stanislaus IRWMP.

5.2 Tuolumne County Ordinance Code

As mentioned above in Section 4, Water Resources, the on-site wells are fractured rock wells located outside of a DWR Bulletin 118 alluvial groundwater basin and therefore groundwater use at the Project site is not subject to the requirements of the Sustainable Groundwater Management Act of 2014. Groundwater use at the Project site must comply with the County's Ordinance Code, including the Groundwater Management Ordinance (Tuolumne County Ordinance Code Chapter 13.20) and Water Wells Ordinance (Tuolumne County Ordinance Code Chapter 13.16).

The Tuolumne County Groundwater Management Ordinance prohibits groundwater extraction within the County for use outside of County boundaries except by permit. The purpose of Groundwater Management Ordinance is to assure that the environment and economy of the County are protected from the impacts of exportation of groundwater out of the County.

The Tuolumne County Water Wells Ordinance specifies minimum requirements for construction, reconstruction, modification, abandonment, and destruction of domestic and agricultural wells, cathodic protection wells, industrial wells, geothermal heat exchange wells, monitoring and observation wells, test wells and test holes and exploration holes. Individuals are required to obtain a permit from the County Environmental Health Division prior to the construction and/or reconstruction of a groundwater well. Work must be completed by a licensed C-57 well contractor and all work shall conform to the standards contained in DWR Bulletin 74-81, and subsequent supplements or amendments. Such standards include setback criteria from potential contaminant sources like septic tanks, proper sanitary sealing requirements, standards for materials, and well completion report requirements, among others. In addition to the permit requirement, construction of most groundwater wells

requires an inspection to verify correct seal preparation and placement. Additionally, all new wells which provide water for domestic use or food processing shall be tested for bacteriological and chemical levels by a state certified laboratory prior to placing the well into service.

The Project would comply with the County's Ordinance Code. The Project would not export groundwater for use outside of the County and any well construction and/or reconstruction would be completed in accordance with 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 February 2024 (Dudek 2024b). Well 1 was pumped at an average rate of 137 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 23.7 feet bgs and at the end of the test was 85.5 feet bgs for a total groundwater level drawdown of 61.8 feet (Figure 6). The rate of groundwater level drawdown during the last two hours of the pumping test was approximately 0.15 feet per hour. Groundwater level recovery was monitored for several days after the pump was shut off. The groundwater level in Well 1 recovered to 26.7 feet bgs (89% recovery) after 24 hours of recovery and to 25.1 feet bgs (95% recovery) after 66 hours of recovery (Figure 6).

The specific capacity of a well is the pumping rate divided by the total drawdown measured at the end of a pumping test. Specific capacity can be used to estimate the maximum pumping rate of a well and to identify potential well production problems such as scaling (i.e., the accumulation of dissolved minerals on the casing of a well). The specific capacity of Well 1 calculated based on results of the pumping test is 2.2 GPM per foot of drawdown.

Based on the 24-hour pumping test and current groundwater conditions at the Project site, Well 1 has sufficient capacity to satisfy the estimated Project demand of 16 GPM (assuming the well is pumped 24 hours per day seven days per week) or approximately 65 GPM (assuming the well is pumped eight hours per day five days per week). At the Project pumping rate, there would only be an estimated 7.3 feet to 29.5 feet (depending on the pumping schedule) of drawdown in Well 1 based on the specific capacity of the well.

6.2 Groundwater Budget

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 Project contributing watershed, 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 in this WSA. The following provides an analysis of the availability of groundwater supplies during normal, single dry, and multiple dry years over a 20-year projection.

Contributing Watershed Area

The Project site contributing watershed area, which is the upslope area that contributes recharge to the Project site, includes the southeastern part of the Green Spring Run watershed. Green Spring Run flows near the southwestern boundary of the Project site and is a perennial tributary of Tulloch Reservoir and the Stanislaus River (Figure 3). The contributing watershed area is approximately 1,802 acres. The contributing watershed was delineated using the U.S. Geological Survey's StreamStats application and edited to only include those areas that are generally upslope of the Project site (USGS 2024b).

Groundwater in Storage

The groundwater in storage underlying the Project site contributing watershed was calculated using conservative estimates of the saturated thickness and specific yield of the fractured rock aquifer. The saturated thickness of the fractured rock was assumed to be uniform across the 1,802-acre contributing watershed at 500 feet (approximate average depth of wells drilled in Project vicinity). Specific yield values for fractured rock generally range from approximately 0.1% to 8% depending on rock type, degree of weathering, and other factors (Heath 1983). For this analysis, the specific yield of the fractured rock was conservatively assumed to be 0.25%. By multiplying the acreage of the contributing watershed by the assumed saturated thickness and specific yield, the total groundwater in storage in the Project site contributing watershed is estimated to be 2,253 acre-feet.

Recharge from Precipitation

The percentage of precipitation that becomes recharge is spatially and temporally variable, depending on the geologic units, land use, and other factors, and can range from less than 10% to as much as 90% (USGS 2007). For this study, the groundwater recharge rate was assumed to be 10% of the mean annual precipitation as measured at the Sonora weather station (station no. 048353). The average annual precipitation at the Sonora weather station for the period from 1903 to 2024 is approximately 31 inches (WRCC 2024). Assuming a conservative recharge rate of 10%, the average annual recharge within the 1,802-acre contributing watershed is approximately 466 AFY. This estimate does not take into account underflow, recharge from septic systems, and other potential sources of aquifer recharge.

Groundwater Demand

Groundwater demand within the contributing watershed was estimated by identifying all existing groundwater users in the contributing watershed using aerial imagery and well completion reports. Based on available information, there are eight domestic groundwater users, one agricultural user, and one industrial user (Figure 7). The agricultural user appears to be a turkey ranch and the industrial user is a sawmill.

One residential dwelling typically consumes approximately 0.5 AFY (DWR 2003). Therefore, the eight domestic groundwater users are estimated to require a total of 4 AFY. The sawmill and turkey ranch water use is more difficult to estimate. For this analysis, the sawmill was assumed to require 25 AFY, the same amount of water as the proposed Project, and the turkey ranch was assumed to require 100 AFY, based on Dudek's professional judgement from working on agricultural water use projects throughout California. Thus, the combined total groundwater demand within the contributing watershed, including the proposed Project, is estimated to be 154 AFY. This estimate does not take into account groundwater discharge to streams, evapotranspiration by phreatophytes, and other potential sources of aquifer discharge.

Projected Groundwater Supplies

The long-term availability of groundwater supplies during normal, single dry, and multiple dry years over a 20-year projection is summarized in Table 4. The precipitation values used in the analysis are measured values for the most recent 20-year period as recorded at the Sonora weather station (WRCC 2024).

Table 4. Groundwater Budget for the Project Site Contributing Watershed

Year	Precipitation (inches)	Groundwater Recharge (AF)	Groundwater Extraction (AF)	Recharge - Groundwater Extraction (AF)	Volume of Groundwater in Storage (AF)
2004	25.69	385.78	-154	231.78	2,253
2005	45.39	681.61	-154	527.61	2,253
2006	43.05	646.47	-154	492.47	2,253
2007	24.61	369.56	-154	215.56	2,253
2008	25.17	377.97	-154	223.97	2,253
2009	26.81	402.60	-154	248.60	2,253
2010	45.64	685.36	-154	531.36	2,253
2011	29.12	437.29	-154	283.29	2,253
2012	32.80	492.55	-154	338.55	2,253
2013	9.53	143.11	-154	-10.89	2,242
2014	24.56	368.81	-154	214.81	2,253
2015	17.40	261.29	-154	107.29	2,253
2016	34.53	518.53	-154	364.53	2,253
2017	41.51	623.34	-154	469.34	2,253
2018	28.64	430.08	-154	276.08	2,253
2019	42.57	639.26	-154	485.26	2,253
2020	16.82	252.58	-154	98.58	2,253
2021	16.67	250.33	-154	96.33	2,253
2022	13.35	200.47	-154	46.47	2,253
2023	22.17	332.92	-154	178.92	2,253

Source: USGS 2007; WRCC 2024.
Notes: AF = acre-feet.

As shown in Table 4, groundwater recharge exceeds groundwater extraction in all years except years where the total annual precipitation is less than 33% of the average, or approximately 10.26 inches, such as in 2013. It should be noted that this is a simplified groundwater budget that does not take into account all budget components such as underflow, recharge from septic systems, groundwater discharge to streams, evapotranspiration by phreatophytes, etc. and actual conditions may vary. However, considering that groundwater levels in the Project vicinity have generally remained stable over the past few decades, the groundwater budget shown above presents a reasonable demonstration of sufficient groundwater availability for the project over a 20-year period.

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. As an overlying landowner, the Project has the right to extract percolating groundwater for reasonable and beneficial use without limitation. The Project site is not located within a DWR Bulletin 118 alluvial groundwater basin. The surficial geology at the Project site consists of metavolcanic rocks. Groundwater is found within the fractures of this bedrock formation. 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 25 AFY. Additionally, based on the results of the groundwater budget analysis for the Project site contributing watershed, there is sufficient groundwater recharge and groundwater in storage to satisfy the Project water demand and the demands of all other groundwater users in the watershed during normal, single dry, and multiple dry years over a 20-year projection.

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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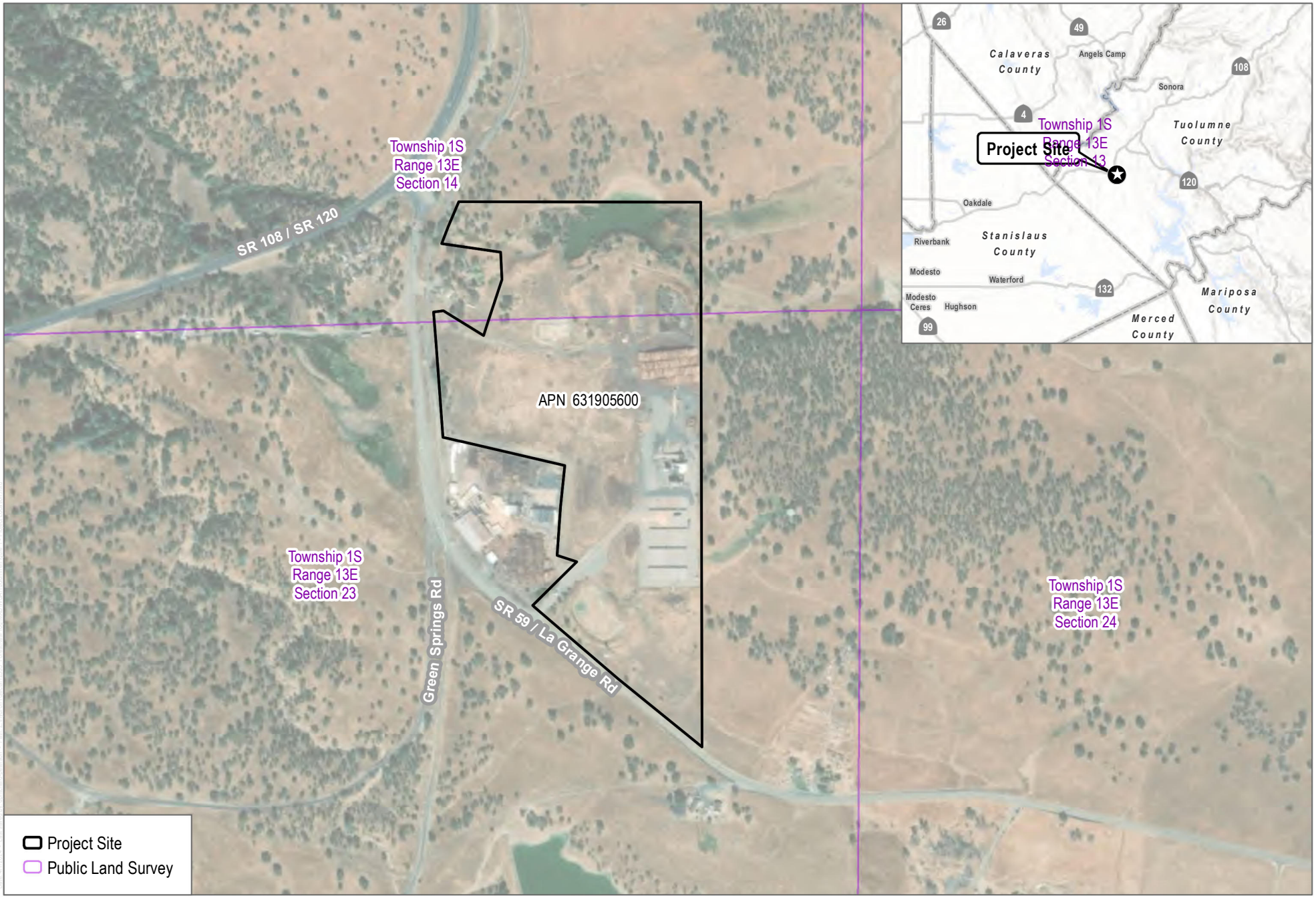

SOURCE: ESRI; Tuolumne County

DUDEK

0 500 1,000 Feet

FIGURE 1

Project Site

12001 La Grange Road Project

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SOURCE: ESRI; SWRCB

DUDEK

0 0.75 1.5 Miles

FIGURE 2

Public Water Systems

12001 La Grange Road Project

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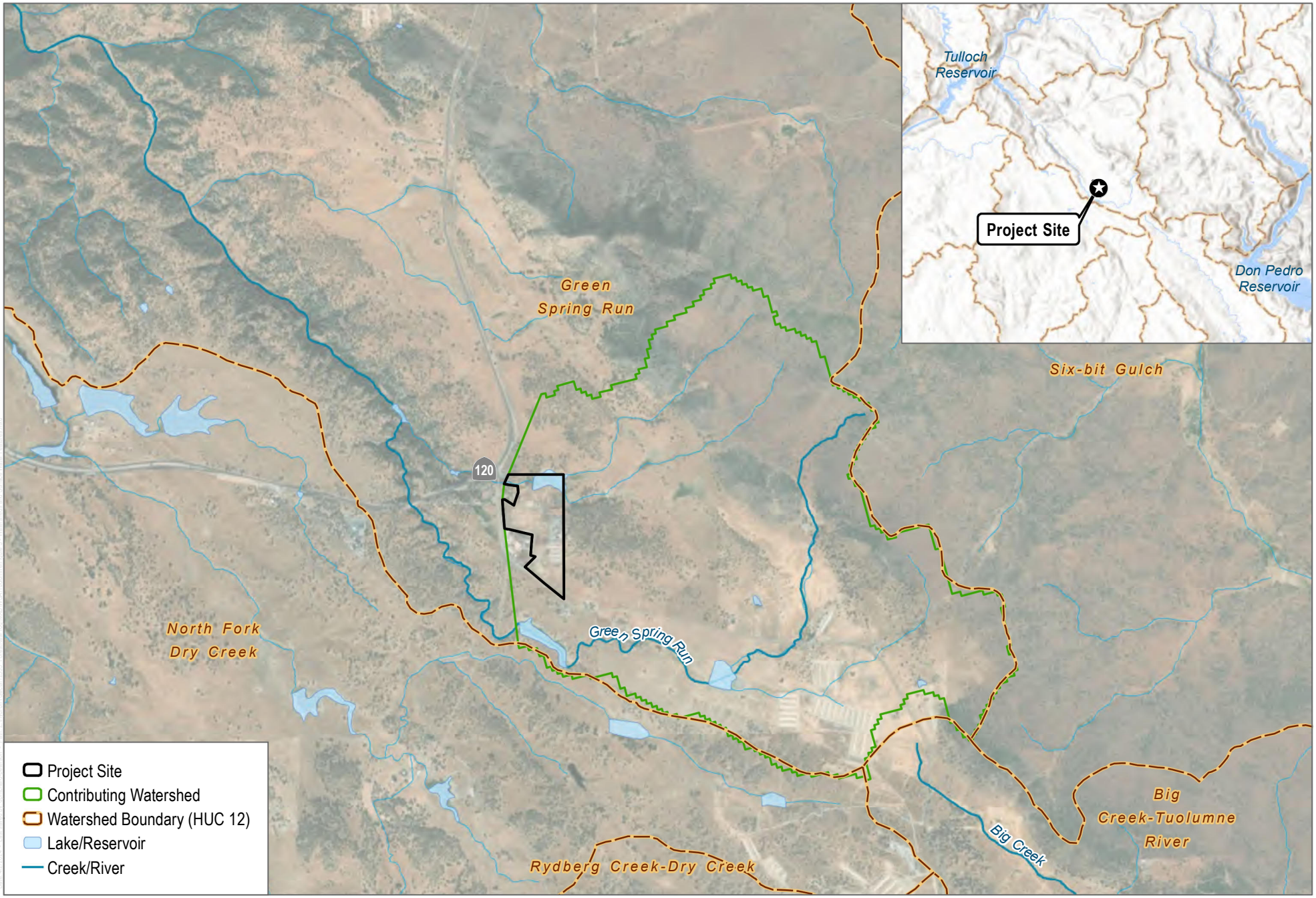

SOURCE: ESRI; USGS

DUDEK

0 0.25 0.5 Miles

FIGURE 3

Watersheds and Surface Water Features

12001 La Grange Road Project

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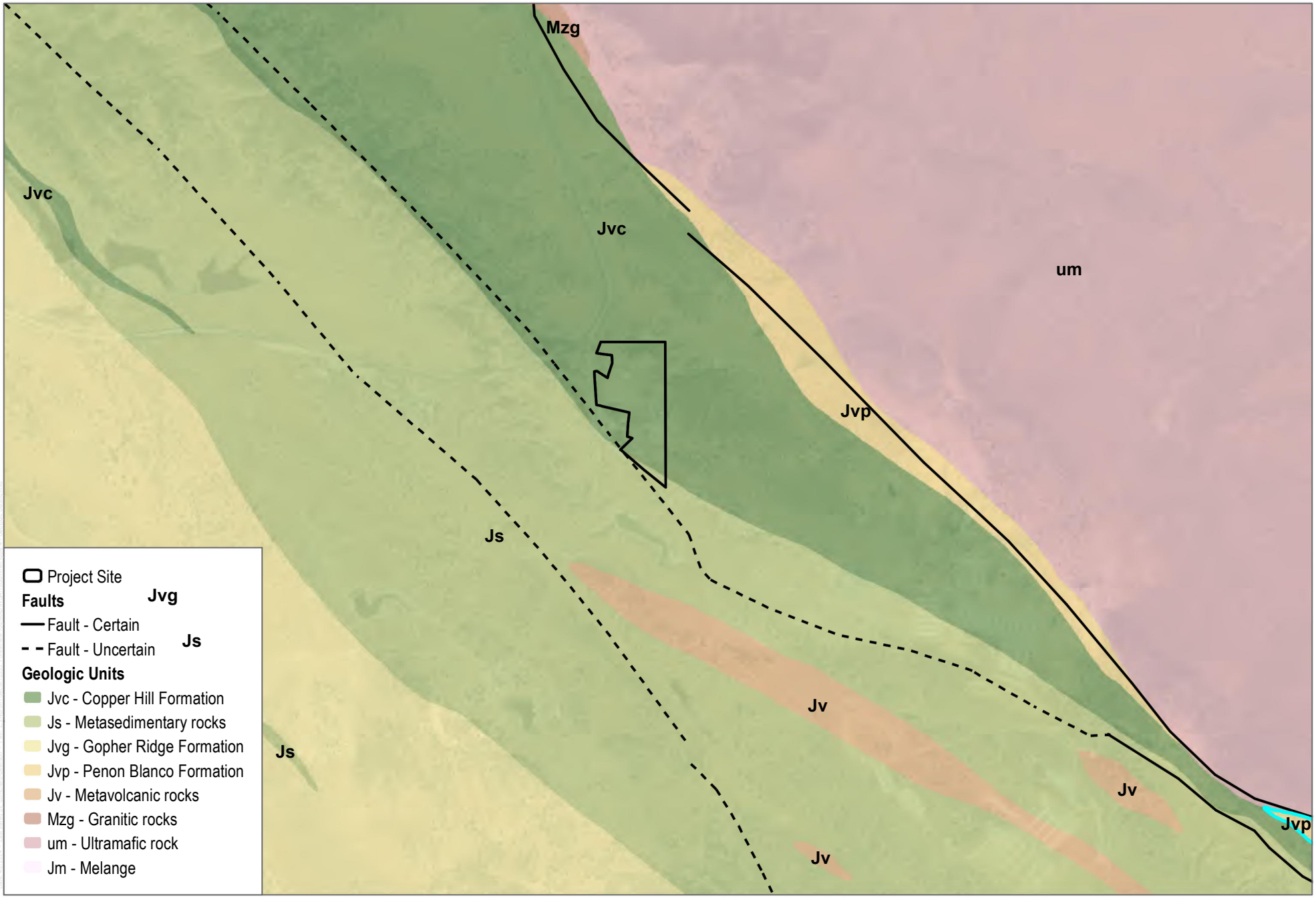

SOURCE: ESRI; Tuolumne County

DUDEK

0 1,250 2,500 Feet

FIGURE 4

Geologic Setting

12001 La Grange Road Project

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SOURCE: ESRI; Tuolumne County

DUDEK

0 375 750 Feet

FIGURE 5

On-Site Wells

12001 La Grange Road Project

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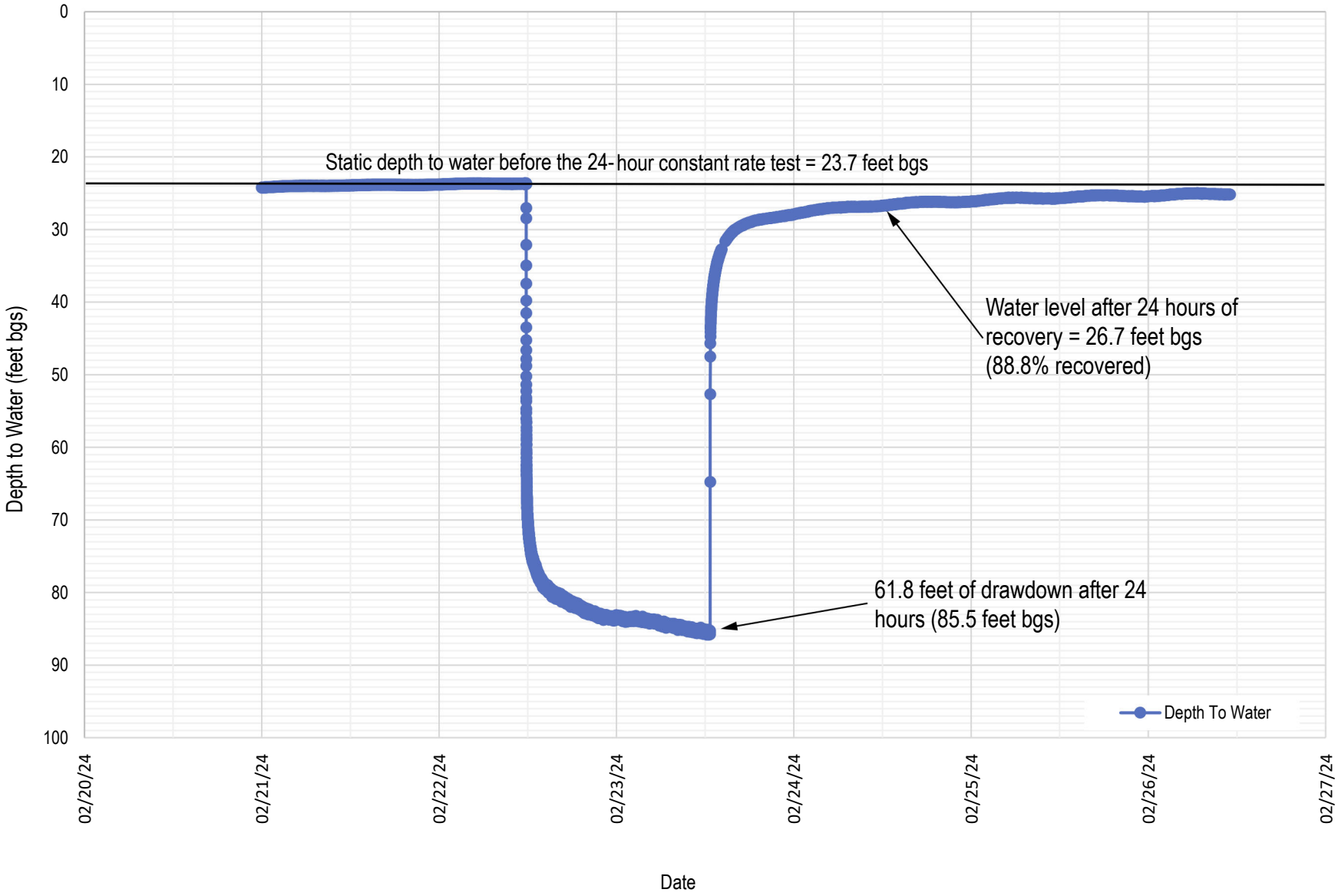

bgs = below ground surface

FIGURE 6

Well 1 Pumping Test

12001 La Grange Rd Project

DUDEK

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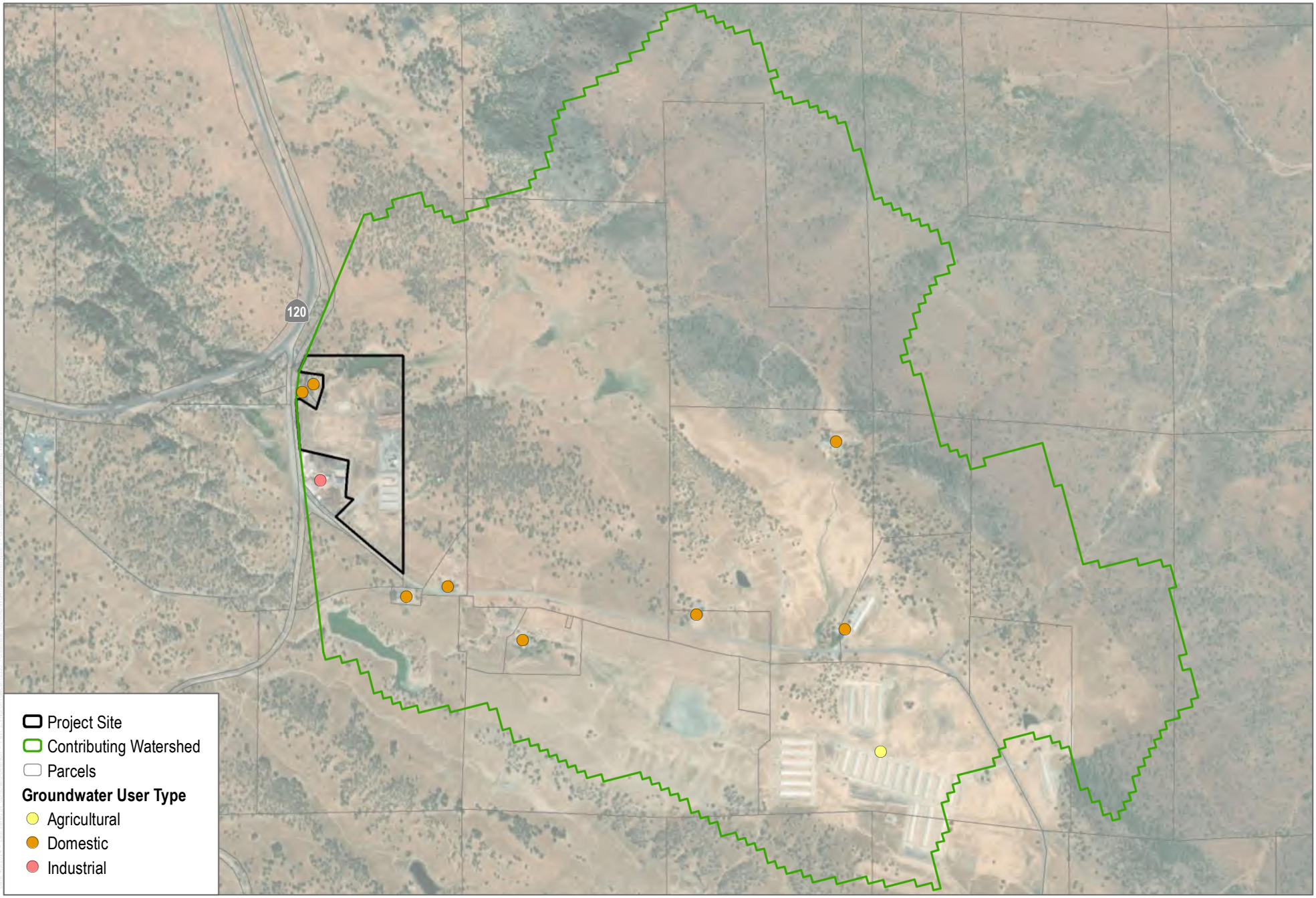

SOURCE: ESRI; Tuolumne County

DUDEK

0 1,250 2,500 Feet

FIGURE 7

Groundwater Users in the Contributing Watershed

12001 La Grange Road Project

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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

SURVEYOR
STEVE HOCHART
DUDEK
(808) 202-0022
SHOCHART@DUDEK.COM

PROJECT DESCRIPTION

APN #063-190-056-000

FEMA FLOOD ZONE

FLOOD ZONE: ZONE X - AREA OF MINIMAL FLOOD HAZARD
FIRM PANEL NO.: 06109C1150C
EFFECTIVE DATE: 04/16/2009

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
1	PRELIMINARY GRADING PLAN COVER SHEET
2	GRADING & DRAINAGE NOTES
3	PRELIMINARY GRADING PLAN

ABBREVIATION

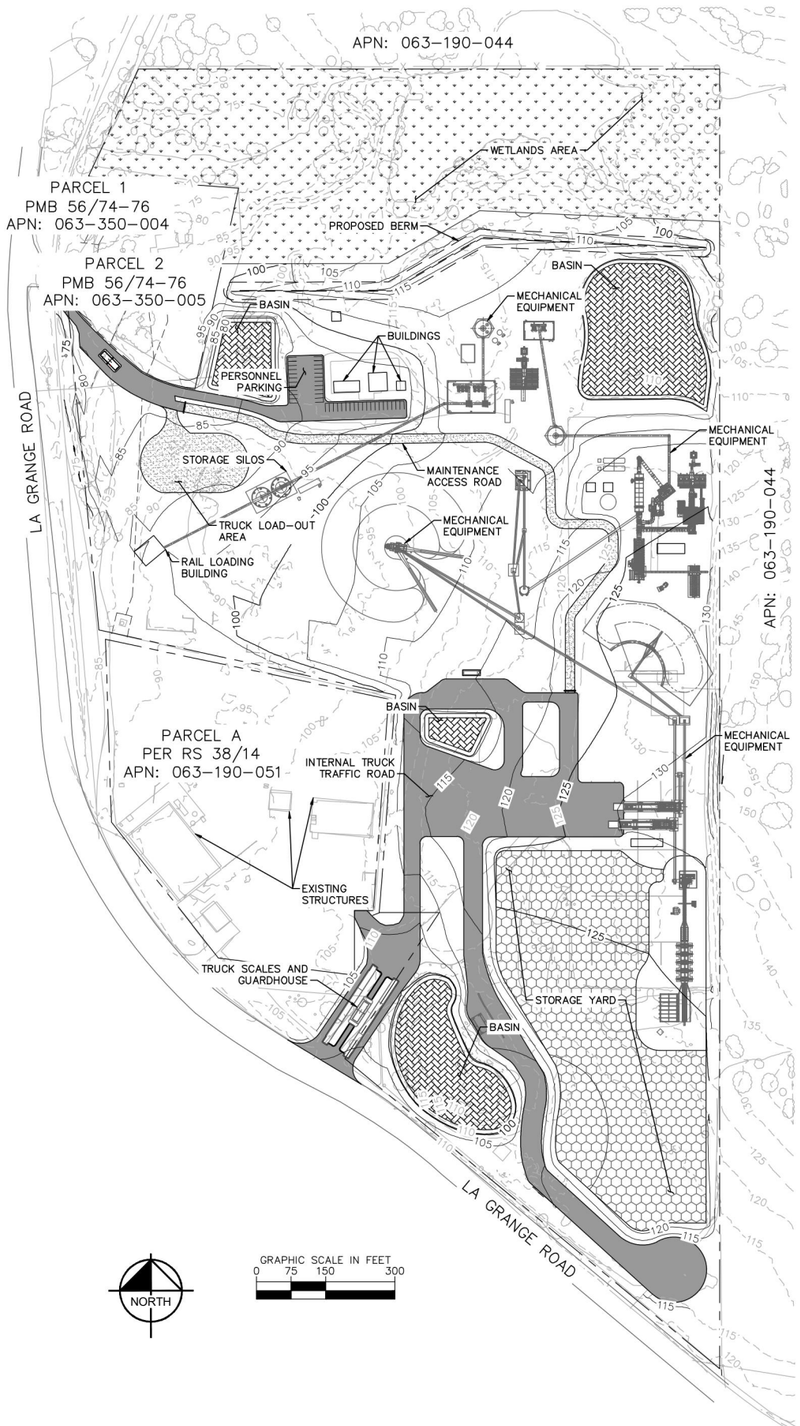
P	TOP OF PAVEMENT
FG	FINISHED GRADE
LP	LOW POINT
ME	MATCH EXISTING
HP	HIGH POINT
GB	GRADE BREAK
R	RIDGE
TB	TOP OF BERM

LEGEND

- PROPERTY LINE
- EASEMENT/SETBACK
- GRADE BREAK LINE (GB)
- RIDGE LINE (R)
- GRADING LIMITS/MATCH EXISTING
- LOW POINT LINE (LP)
- EXISTING CONTOURS (41)
- PROPOSED CONTOURS (41)
- STORMWATER BASIN
- PROPOSED GRAVEL
- PROPOSED ASPHALT
- PROPOSED STORAGE YARD AREA
- WETLANDS AREA
- PROPOSED ELEVATION (108.34 P)
- PROPOSED SLOPE (2.05%)

VICINITY MAP

SCALE: NTS



OVERALL SITE PLAN

SCALE: 1" = 150'

811 Know what's below. Call before you dig.

NO.	REMARKS	DATE

Kimley»Horn
© 2023 KIMLEY-HORN AND ASSOCIATES, INC.
555 CAPITOL MALL, SUITE 300
SACRAMENTO, CA 95814
PHONE: 916-858-2900
WWW.KIMLEY-HORN.COM

LICENSED PROFESSIONAL
REGISTERED PROFESSIONAL ENGINEER BROOKS BADDELEY No. 24743 CIVIL STATE OF CALIFORNIA
NOT FOR CONSTRUCTION

KHA PROJECT	197697001
DATE	09/11/23
SCALE	AS SHOWN
DESIGNED	BNB
DRAWN	PSS
CHECKED	BNB

JAMESTOWN, CA 95327
TOULOMNE COUNTY

FOREST RESILIENCY PROJECT

PRELIMINARY GRADING PLAN COVER SHEET

SHEET NUMBER
1 OF 3

DESIGN ENGINEER NOTES

1. THE TERM "DESIGN ENGINEER" USED HEREIN SHALL MEAN THE ENGINEER WHO HAS SIGNED AND SEALED HIS/HER RESPECTIVE PLAN SHEETS AND IS IN RESPONSIBLE CHARGE OF THE ENGINEERING DESIGN ON THOSE SHEETS. THE TERM "CONTRACTOR" USED HEREIN SHALL MEAN ANY GENERAL CONTRACTOR OR SUBCONTRACTOR USING THESE PLANS.
2. THE DESIGN ENGINEER SHALL NOT PROVIDE, OBSERVE, COMMENT ON NOR ENFORCE ANY SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL DESIGN, IMPLEMENT, AND MAINTAIN ALL SAFETY MEASURES AND SHALL BE SOLELY RESPONSIBLE FOR ALL REQUIRED SAFETY MEASURES, PROCEDURES AND PROGRAMS AND COMPLYING WITH ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS, AND REGULATIONS. THE CONTRACTOR AGREES THAT SHE/HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOBSITE CONDITIONS AND SAFETY OF ALL PERSONS AND PROPERTY DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
3. THE DESIGN ENGINEER SHALL HAVE NO RESPONSIBILITY FOR ANY OF THE CONTRACTOR'S MEANS AND METHODS OF CONSTRUCTION, TECHNIQUES, EQUIPMENT CHOICE AND USAGE, SEQUENCE, SCHEDULE, SAFETY PROGRAMS, OR SAFETY PRACTICES, NOR SHALL THE DESIGN ENGINEER HAVE ANY AUTHORITY OR RESPONSIBILITY TO DIRECT OR STOP THE WORK OF ANY CONTRACTOR.
4. ANY CHANGES MADE BY THE CONTRACTOR TO THE CONTRACTUALLY AGREED UPON SCOPE, SCHEDULE AND/OR FEE, WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF THE OWNER, IS THE SOLE RESPONSIBILITY AND LIABILITY OF THE CONTRACTOR. THE DESIGN ENGINEER IS NOT RESPONSIBLE FOR DIRECTING, IMPLICITLY OR EXPLICITLY ANY SUCH CHANGES AND THE CONTRACTOR ASSUMES ALL RISK OF UNDERTAKING ANY SUCH CHANGES.
5. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE DESIGN ENGINEER AND OWNER, THEIR OFFICERS, AGENTS AND EMPLOYEES, HARMLESS FROM ANY AND ALL CLAIMS, DEMANDS, JUDGMENTS, LOSS, DAMAGES, COSTS, EXPENSES, FEES OR LIABILITY WHATSOEVER, REAL OR ALLEGED, IN CONNECTION WITH, IN WHOLE OR IN PART, DIRECTLY OR INDIRECTLY, THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE DESIGN ENGINEER.
6. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE DESIGN ENGINEER AND OWNER, THEIR OFFICERS, AGENTS AND EMPLOYEES, HARMLESS FROM ANY AND ALL CLAIMS, DEMANDS, JUDGMENTS, LOSS, DAMAGES, COSTS, EXPENSES, FEES OR LIABILITY WHATSOEVER, REAL OR ALLEGED, IN CONNECTION WITH, IN WHOLE OR IN PART, DIRECTLY OR INDIRECTLY, THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE DESIGN ENGINEER.
7. IF THERE ARE ANY QUESTIONS REGARDING THESE PLANS, THE CONTRACTOR SHALL REQUEST IN WRITING FROM THE DESIGN ENGINEER AND THE OWNER, AN INTERPRETATION BEFORE PERFORMING ANY RELATED OR IMPACTED WORK. ANY ELECTRONIC FILES ARE PROVIDED ONLY FOR THE CONVENIENCE OF THE RECEIVING PARTY AND ARE INTENDED SOLELY FOR THE EXCLUSIVE USE BY THAT PARTY FOR THE PURPOSES EXPRESSLY AUTHORIZED. IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICE, ONLY PRINTED COPIES OF DOCUMENTS MAY BE RELIED UPON.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PREPARING ITS BID, IN WHOLE AND IN PART, BASED UPON THE DESIGN SHOWN ON THESE PLANS. THE CONTRACTOR IS NOT AUTHORIZED TO USE ANY QUANTITIES SHOWN ON THESE PLANS WITHOUT THE EXPLICIT WRITTEN PERMISSION OF THE ENGINEER OF RECORD. THE DESIGN ENGINEER MAKES NO WARRANTY OR REPRESENTATION AS TO THE SUITABILITY OF ANY INFORMATION SHOWN HEREON FOR DETERMINING A CONTRACTOR BID.
9. ANYTHING MENTIONED IN THE SPECIFICATIONS, IF ANY, AND NOT SHOWN ON THE DRAWINGS, OR SHOWN ON THE DRAWINGS AND NOT MENTIONED IN THE SPECIFICATIONS, SHALL BE OF LIKE EFFECT AS IF SHOWN OR MENTIONED IN BOTH.
10. THE EXISTENCE, LOCATION, TYPE, CONDITION AND SIZE OF UNDERGROUND UTILITIES, FACILITIES OR STRUCTURES ('FACILITIES") SHOWN ON THESE PLANS WAS OBTAINED FROM A SEARCH OF READILY AVAILABLE RECORDS, OR AS PROVIDED BY OTHERS. NO REPRESENTATION IS MADE AS TO THE ACCURACY OR COMPLETENESS OF SAID INFORMATION. THE CONTRACTOR SHALL CONFIRM SAID INFORMATION BY FIELD MEASUREMENTS, OBSERVATIONS AND WHATEVER MEANS NECESSARY, PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL IMMEDIATELY INFORM THE DESIGN ENGINEER IN WRITING IF ANY DISCREPANCIES OR CONFLICTING INFORMATION IS FOUND. THE CONTRACTOR SHALL PROTECT THE FACILITIES SHOWN HEREON AND ANY OTHERS NOT OF RECORD OR NOT SHOWN ON THESE PLANS, AS NEEDED. ALL DAMAGES THERETO CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE APPROPRIATE SPECIFICATIONS AND STANDARDS AT THE SOLE EXPENSE OF THE CONTRACTOR.
11. THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE EXISTING UNDERGROUND FACILITIES AS NEEDED, SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF REVISIONS ARE NECESSARY DUE TO THE ACTUAL LOCATION, SIZE, TYPE, OR CONDITION OF EXISTING FACILITIES DIFFERING FROM WHAT IS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR ALL DAMAGES DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ALL SUCH FACILITIES WHETHER NOTED ON THESE PLANS OR NOT. THE DESIGN ENGINEER ASSUMES NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING FACILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ANY DAMAGE TO THE EXISTING IMPROVEMENTS AND REPLACEMENT TO THE SATISFACTION OF THE OWNER AND/OR AUTHORITY HAVING JURISDICTION AS NEEDED.
12. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO STARTING WORK ADJACENT TO, ABOVE OR BELOW THEIR FACILITIES AND SHALL COORDINATE ALL WORK WITH UTILITY COMPANY REPRESENTATIVES.
13. THE CONTRACTOR SHALL VERIFY ALL EXISTING AND PROPOSED GRADING ELEMENTS BEFORE THE START OF CONSTRUCTION AND SHALL IMMEDIATELY NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES.
14. UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THE EARTHWORK QUANTITIES SHOWN ON THESE PLANS 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 GRADING PLAN(S) AS FINISHED GROUND, FINISHED SURFACE, AND FINISHED FLOOR ELEVATIONS. NO REPRESENTATIONS OF SUCH QUANTITIES OR A BALANCED SITE CONDITION ARE MADE BY THE ENGINEER OF RECORD. THE EARTHWORK QUANTITIES SHOWN ON THESE PLANS ARE FOR PERMITTING PURPOSES ONLY. UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THEY HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, SUBSIDENCE, OVER-EXCAVATION AND RE-COMPACTION, AND CONSTRUCTION METHODS. NOR DO THEY ACCOUNT FOR THE THICKNESS OF PAVEMENT SECTIONS, STORMWATER QUALITY MEDIA SECTIONS, UTILITY PIPES, TRENCHING AND BEDDING MATERIALS, BUILDING OR WALL FOOTINGS, BUILDING SLABS THICKNESSES AND UNDERLYING BASE OR SAND LAYERS, REUSE OF PULVERIZED MATERIALS THAT WILL UNDERLIE PAVEMENTS, ETC. THE CONTRACTOR IS NOT AUTHORIZED TO USE THE ESTIMATES HEREIN FOR BIDDING AND CONSTRUCTION PURPOSES WITHOUT THE EXPLICIT WRITTEN PERMISSION OF THE ENGINEER OF RECORD
15. PROPOSED BUILDING PAD ELEVATIONS, IF SHOWN, ARE BASED ON INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS. CONTRACTOR SHALL CONFIRM SLAB STRUCTURAL SECTION THICKNESSES AND PAD PREPARATION REQUIREMENTS PRIOR TO GRADING FINISHED PADS.
16. THE CONTRACTOR SHALL THOROUGHLY CHECK COORDINATION OF CIVIL, LANDSCAPE, MEP, ARCHITECTURAL AND ALL OTHER PLANS PRIOR TO COMMENCING CONSTRUCTION. SHOULD DISCREPANCIES OR CONFLICTING INFORMATION BE FOUND ON ANY PLANS, OR IN ANY SPECIFICATIONS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND DESIGN ENGINEER IN WRITING BEFORE PROCEEDING WITH THE WORK IN QUESTION.
17. THE PROPOSED BUILDING FOOTPRINT(S) AND OTHER STRUCTURE FOOTPRINTS SHOWN IN THESE PLANS WERE PROVIDED TO THE DESIGN ENGINEER BY THE PROJECT ARCHITECT AT THE TIME OF PREPARATION OF THESE PLANS. THE DESIGN ENGINEER MAKES NO REPRESENTATION AS TO THE ACCURACY OF THESE FOOTPRINTS AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFIRMING WITH THE RELEVANT DESIGN TEAM PROFESSIONALS, AND USING

DESIGN ENGINEER NOTES CONT.

THE FINAL, CORRECT VERSION OF THE FOOTPRINTS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFIRMING THE STRUCTURE'S FINAL POSITION ON THE SITE BASED UPON THE FINAL ARCHITECTURAL FOOTPRINT, CIVIL PLANS, SURVEY AND ANY OTHER RELEVANT DOCUMENTS. ANY DIFFERENCES FOUND SHALL BE IMMEDIATELY REPORTED TO THE DESIGN ENGINEER AND OWNER/PROJECT ARCHITECT.

18. THE CONTRACTOR SHALL TAKE ALL NECESSARY STEPS TO PROTECT THE PROJECT PROPERTY FROM ANY EROSION AND SILTATION THAT RESULT FROM CONTRACTOR OPERATIONS, BY APPROPRIATE MEANS, OR BY SPECIFIC MEANS DESCRIBED IN THE PROJECT'S PLANS, SPECIFICATIONS OR STORM WATER POLLUTION PREVENTION REPORT, UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY WHOMEVER IS TO BE ULTIMATELY RESPONSIBLE FOR MAINTENANCE AND THE AGENCY HAVING JURISDICTION. THE DESIGN ENGINEER SHALL HAVE NO RESPONSIBILITY TO DIRECT THE CONTRACTOR REGARDING THE MEANS AND METHODS OF STORMWATER POLLUTION PREVENTION, SEQUENCE, OR SCHEDULE.
19. ALL SHOP DRAWINGS, RFIS AND ANY OTHER DOCUMENTS THAT REQUIRE DESIGN ENGINEER REVIEW SHALL BE SUBMITTED BY THE CONTRACTOR SUFFICIENTLY IN ADVANCE OF CONSTRUCTION OF THAT ITEM, TO ALLOW ADEQUATE REVIEW, COORDINATION AND RESPONSE. SAID DOCUMENTS ARE NOT A DIRECTION FROM THE DESIGN ENGINEER TO MODIFY THE CONTRACTORS SCOPE, SCHEDULE OR PRICE, AND THE CONTRACTOR WARRANTS NOT TO USE THEM AS SUCH.
20. THE CONTRACTOR SHALL ENSURE APPROPRIATE LICENSED PROFESSIONALS HAVE BEEN RETAINED BY THE CONTRACTOR TO PROVIDE ANY/ALL REQUIRED PROJECT CERTIFICATIONS AS MAY BE REQUIRED BY ANY AUTHORITY HAVING JURISDICTION. THE DESIGN ENGINEER WILL NOT PROVIDE ANY PROJECT CERTIFICATIONS UNLESS SPECIFICALLY RETAINED BY THE OWNER TO PROVIDE LIMITED SERVICES.
21. CONTRACTOR SHALL RETAIN A LICENSED SURVEYOR TO DOCUMENT ALL CHANGES TO THE APPROVED CONSTRUCTION DOCUMENTS DURING CONSTRUCTION. THE LICENSED SURVEYOR SHALL PREPARE A SIGNED AND SEALED "AS-BUILT' DRAWING UPON COMPLETION OF CONSTRUCTION. THE DESIGN ENGINEER IS NOT RESPONSIBLE FOR THE PREPARATION IN WHOLE OR IN PART OF THE "AS-BUILT" DRAWINGS.
22. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MONUMENTATION AND BENCHMARKS WHICH WILL BE DISTURBED OR DESTROYED BY CONSTRUCTION. SUCH POINTS SHALL BE REFERENCED AND REPLACED WITH APPROPRIATE MONUMENTATION BY A LICENSED LAND SURVEYOR OR REGISTERED CIVIL ENGINEER AUTHORIZED TO PRACTICE LAND SURVEYING. A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILED BY THE LICENSED LAND SURVEYOR OR REGISTERED CIVIL ENGINEER AS REQUIRED BY THE MOST CURRENT VERSION OF THE LAND SURVEYORS ACT.

ENGINEER'S GRADING AND DRAINAGE NOTES

1. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
2. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS TO NEARBY STORM DRAIN CATCH BASIN/RETENTION BASIN FOR ALL NATURAL AND PAVED AREAS.
3. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORD OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL GOVERNING AUTHORITY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
4. ALL CUT OR FILL SLOPES SHALL BE 2:1 OR FLATTER UNLESS OTHERWISE NOTES.
5. EXISTING GRADE CONTOUR INTERVALS SHOWN AT 2 FOOT INTERVALS.
6. PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 2 FOOT INTERVALS.
7. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
8. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE GENERAL CALIFORNIA CONSTRUCTION GENERAL PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES.
9. CONTRACTOR IS RESPONSIBLE FOR VERIFYING HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES AND NOTIFYING THE APPROPRIATE UTILITY COMPANY PRIOR TO BEGINNING CONSTRUCTION.
10. TOPOGRAPHIC INFORMATION WAS TAKEN FROM SURVEY FILE BY DUDEK, DATED MARCH 12TH, 2021, AND RECEIVED ON 08/29/2023 BY THE CLIENT. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHIC AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THE CONTRACTOR SHALL HAVE MADE, AT THEIR OWN EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW.
11. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
12. THE CONTRACTOR SHALL SALVAGE, STRIP, REMOVE, OR PROTECT IN PLACE (AS APPLICABLE) ALL EXISTING TREES, FILLS, STRUCTURES, UNDERGROUND UTILITIES OR OBSTRUCTIONS, VEGETATION, ORGANIC TOPSOIL, DEBRIS, AND ANY OTHER DELETERIOUS MATERIALS FROM THE PROPOSED BUILDING AND PAVEMENT AREAS. ALL EXPOSED SURFACES SHOULD BE FREE OF MOUNDS AND DEPRESSIONS THAT COULD PREVENT UNIFORM COMPACTION.
13. ALL PROPOSED ELEVATIONS ARE TO FINISHED SURFACE.
14. PROPOSED ELEVATIONS AND CONTOURS REPRESENT PAVEMENT SURFACE ELEVATION, UNLESS OTHERWISE STATED.
15. ADD 0.5 FEET TO PROPOSED ELEVATIONS FOR TOP OF CURB ELEVATION, UNLESS OTHERWISE NOTED.
16. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY ELEVATION DISCREPANCIES DISCOVERED DURING CONSTRUCTION. ANY DEMOLITION AND REWORK ASSOCIATED WITH ELEVATION DISCREPANCIES NOT REPORTED TO THE ENGINEER, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR.
17. ALL HORIZONTAL SITE DESIGN LINEWORK WAS TAKEN FROM THE SITE BASE LAYOUT PROVIDED BY NEXUS PMG, RECEIVED ON AUGUST 21ST, 2023.

TUOLUME COUNTY GENERAL NOTES

1. IT IS INTENDED THAT THESE PLANS AND SPECIFICATIONS REQUIRE ALL LABOR AND MATERIALS NECESSARY AND PROPER FOR THE WORK CONTEMPLATED AND THAT THE WORK BE COMPLETED IN ACCORDANCE WITH THEIR TRUE INTENT AND PURPOSE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY REGARDING ANY DISCREPANCIES OR AMBIGUITIES WHICH MAY EXIST IN THE PLANS OR SPECIFICATIONS. THE ENGINEER'S INTERPRETATION THEREOF SHALL BE CONCLUSIVE.
2. THE CONTRACTOR SHALL BE SKILLED AND REGULARLY ENGAGED IN THE GENERAL CLASS AND TYPE OF WORK CALLED FOR IN THE PLANS AND SPECIFICATIONS.
3. APPROVAL OF THESE PLANS BY THE COUNTY OR ITS AGENTS SHALL NOT RELIEVE THE CONTRACTOR OR THE APPLICANT FROM THE RESPONSIBILITY FOR THE CORRECTION OF ERRORS OR OMISSIONS DISCOVERED DURING CONSTRUCTION. UPON REQUEST, THE APPROPRIATE REVISIONS SHALL BE SUBMITTED TO THE ENGINEER AND COUNTY FOR REVIEW AND APPROVAL.
4. PRIOR TO BEGINNING ANY CONSTRUCTION ON SITE, A PRE-CONSTRUCTION MEETING IS REQUIRED WITH THE COUNTY, DEVELOPER, CONTRACTORS, AND AFFECTED AGENCIES. CONTACT THE PUBLIC WORKS ENGINEERING DIVISION AT (209) 533-5601.
5. CALL UNDERGROUND SERVICE ALERT (USA) AT 800-642-2444 OR 811 TO LOCATE UNDERGROUND UTILITIES BEFORE GRADING ON THE SITE.
6. CONTACT CAL-OSHA FOR PERMIT REQUIREMENTS PRIOR TO BEGINNING WORK. (209) 576-6260.
7. NOTIFY THE PUBLIC WORKS ENGINEERING DIVISION AT (209) 533-5601 AT LEAST TWO WORKING DAYS BEFORE WORK STARTS.
8. WORK IN EASEMENT AND/OR RIGHTS-OF-WAY IS SUBJECT TO THE APPROVAL AND ACCEPTANCE OF THE REGULATORY AGENCY RESPONSIBLE FOR OPERATION AND/OR MAINTENANCE OF SAID EASEMENT AND/OR RIGHTS-OF-WAY.
9. FOR ALL WORK WITHIN PUBLIC RIGHTS-OF-WAY OR EASEMENTS, THE CONTRACTOR SHALL PRESERVE THE INTEGRITY AND LOCATION OF ANY AND ALL PUBLIC UTILITIES AND PROVIDE THE NECESSARY CONSTRUCTION TRAFFIC CONTROL. CONTRACTOR SHALL, THROUGH THE ENCROACHMENT PERMIT PROCESS, VERIFY WITH THE NECESSARY REGULATORY AGENCIES, THE NEED FOR ANY TRAFFIC ROUTING PLAN.
10. HOURS OF EXTERIOR CONSTRUCTION ON THE PROJECT SITE SHALL BE LIMITED TO 7:00 A.M. TO 7:00 P.M. MONDAY THROUGH FRIDAY. ON-SITE WORK MAY OCCUR ON SATURDAY, BUT NOT WITHIN THE COUNTY RIGHT-OF-WAY AND NOT ON ITEMS OR AREAS THAT REQUIRE INSPECTION BY THIS DEPARTMENT. EXTERIOR CONSTRUCTION SHALL BE PROHIBITED ON SUNDAY AND COUNTY HOLIDAYS.
11. ANY PROJECT WITH A SET OF CONDITIONS OF APPROVAL FROM THE COUNTY OF TUOLUMNE OR ANY OTHER AGENCY (I.E., CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE, REGIONAL WATER QUALITY BOARD, ETC.) MUST ADHERE TO ALL CONDITIONS OF THOSE PERMITS.
12. PRIOR TO THE GRADING ON THE SITE, ALL PROPERTY CORNERS SHALL BE MONUMENTED AND CLEARLY VISIBLE. WHERE A CLEAR LINE OF SIGHT BETWEEN LOT CORNERS IS NOT POSSIBLE, APPROPRIATE MARKERS SHALL BE SET ALONG THE PROPERTY LINE TO MARK THE BOUNDARIES WHILE CONSTRUCTION IS IN PROGRESS.
13. ALL CULTURAL AND BIOLOGICALLY SENSITIVE AREAS SHALL BE DELINEATED PRIOR TO THE START OF CLEARING OR GRADING OPERATIONS.
14. THE CONTRACTOR SHALL EXERCISE DUE CAUTION AND SHALL CAREFULLY PRESERVE BENCHMARKS, CONTROL POINTS, REFERENCE POINTS AND ALL SURVEY STAKES.
15. ALL MATERIALS FURNISHED AND THE METHODS OF PERFORMING ANY PROPOSED WORK SHALL CONFORM TO AND BE DONE IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF THE CALTRANS STANDARD SPECIFICATIONS AND TUOLUMNE COUNTY ORDINANCE CODE, TITLE 11 AND 12.
16. THE STRUCTURAL SECTION SHOWN ON THE DETAILS SHALL BE FOR ESTIMATING PURPOSES ONLY. IT SHALL BE THE APPLICANT'S RESPONSIBILITY AND EXPENSE TO OBTAIN "R" VALUES TAKEN FROM SAMPLES AT LOCATIONS IN THE PRESENCE OF A PUBLIC WORKS INSPECTOR. COPIES OF CERTIFIED TEST RESULTS AND STRUCTURAL SECTION CALCULATIONS SHALL BE SUBMITTED TO THE DEPARTMENT. THE COUNTY MINIMUM TRAFFIC INDEX (T.I.) SHALL BE PER TUOLUMNE COUNTY ORDINANCE CODE, TITLE 11, OR NOT LESS THAN 5.0.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY SCHEDULING INSPECTION AND TESTING OF ALL FACILITIES CONSTRUCTED UNDER THIS APPROVED PLAN. ALL TESTING SHALL CONFORM TO THE REGULATORY AGENCY'S STANDARD SPECIFICATIONS.
18. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY FIELD CHANGES MADE WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE OWNER AND/OR ENGINEER AND APPROVED BY THE COUNTY.
19. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, BARRICADES, SIGNS, FLAGMEN OR OTHER DEVICES NECESSARY FOR PUBLIC SAFETY.
20. THE CONTRACTOR /OWNER AGREES:
    (A) THE JOB SITE SHALL BE CLEAN AT THE END OF EACH PHASE OF WORK.
    (B) TO BE RESPONSIBLE TO REMOVE AND DISPOSE OF ALL TRASH, SCRAP AND UNUSED MATERIAL IN A TIMELY MANNER.
    (C) TO MAINTAIN THE SITE IN A NEAT, SAFE AND ORDERLY MANNER AT ALL TIMES.
    (D) TO KEEP MATERIALS, EQUIPMENT, AND TRASH OUT OF THE WAY OF OTHER CONTRACTORS SO AS NOT TO DELAY THE JOB.
    (E) TO BE RESPONSIBLE FOR THEIR OWN SAFETY, TRAFFIC CONTROL, PERMITS, RETESTING, USA AND RE-INSPECTIONS.
    (F) UNLESS OTHERWISE NOTED, ALL EXCESS SOILS AND MATERIALS SHALL BE LAWFULLY DISPOSED OF OFF SITE.
21. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
22. STRUCTURES, PARKING LOTS, OTHER TRAFFIC RELATED APPURTENANCES AND ROADWAYS (BELOW 2.5 FEET) SHALL BE COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DENSITY PER ASTM D-1557-78. ALL FILLS ON WHICH ROADWAYS ARE TO BE PLACED SHALL BE COMPACTED TO A MINIMUM OF 95% M.R.D.D. FOR THE TOP 2.5 FEET. THE OWNER OR DEVELOPER SHALL PROVIDE CERTIFICATE OF COMPLIANCE ON COMPACTION FROM AN APPROVED SOILS LABORATORY.
23. WHENEVER EXISTING FACILITIES ARE DAMAGED, BROKEN, OR CUT IN THE INSTALLATION OF THE WORK COVERED BY THESE PLANS OR SPECIFICATIONS, SAID FACILITIES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE, AFTER PROPER BACKFILLING AND/OR CONSTRUCTION, WITH MATERIALS EQUAL TO OR BETTER THAN THE MATERIALS USED IN THE ORIGINAL EXISTING FACILITIES. THE FINISHED PRODUCT SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER, THE ENGINEER, AND THE RESPECTIVE REGULATORY AGENCY.
24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST ABATEMENT DURING CONSTRUCTION AND DEVELOPMENT OPERATIONS. A WATER TRUCK OR OTHER WATERING DEVICE SHALL BE ON THE PROJECT SITE ON ALL WORKING DAYS WHEN NATURAL PRECIPITATION DOES NOT PROVIDE ADEQUATE MOISTURE FOR COMPLETE DUST CONTROL. SAID WATERING DEVICE SHALL BE USED TO SPRAY WATER ON THE SITE AT THE END OF EACH DAY

TUOLUME COUNTY GENERAL NOTES CONT.

AND AT OTHER INTERVALS, AS NEED DICTATES, TO CONTROL DUST.

25. EXPOSED SERPENTINE GRAVEL IS PROHIBITED ON THE CONSTRUCTION SITE AND ACCESS ROADS, UNLESS EXEMPTED PURSUANT TO SECTIONS 93106 AND 93106 (F) OF THE CALIFORNIA HEALTH AND SAFETY CODE UNLESS IT HAS BEEN TESTED AND DETERMINED TO HAVE AN ASBESTOS CONTENT THAT IS LESS THAN 0.25%. PAVEMENT OR OTHER APPROVED COVER MATERIAL SHALL BE REQUIRED FOR ANY ROAD UTILIZING SERPENTINE GRAVEL. (CALIFORNIA HEALTH AND SAFETY CODE, SECTIONS 93105 AND 93106).
26. ALL AREAS OF NEW PAVEMENT WILL BE WATER TESTED IN THE PRESENCES OF THE COUNTY INSPECTOR TO VERIFY PROPER DRAINAGE.
27. IF SUBSURFACE CULTURAL RESOURCES ARE DISCOVERED ON THE PROJECT SITE DURING THE CONSTRUCTION PROCESS, ALL WORK IN THE RESOURCE FEATURE AREAS SHALL CEASE UNTIL THE PROJECT PLANNER FROM THE TUOLUMNE COUNTY COMMUNITY DEVELOPMENT DEPARTMENT HAS BEEN CONTACTED AND A QUALIFIED ARCHAEOLOGIST OR HISTORIAN HAS BEEN HIRED BY THE APPLICANT TO EVALUATE SAID RESOURCES AND ESTABLISH BOUNDARIES AROUND THEM. IF THE RESOURCES ARE FOUND TO BE SIGNIFICANT, MITIGATION MEASURES SHALL BE FORMULATED AND IMPLEMENTED IN ACCORDANCE WITH APPENDIX K OF CEQA.

*28. THE CONTRACTOR AND ALL PERSONS WHO WILL BE OPERATING EQUIPMENT OR RESPONSIBLE FOR GRADING ON THE PROPERTY SHALL BE INFORMED THAT NO GRADING OR EARTH MOVING SHALL BE CONDUCTED WITHIN THE SENSITIVE AREAS (SEE ASTERISK) IDENTIFIED IN THE INITIAL STUDY, UNTIL A QUALIFIED ARCHAEOLOGIST APPROVED BY THE TUOLUMNE COUNTY COMMUNITY DEVELOPMENT DEPARTMENT IS PRESENT.

*29. THE APPROVED ARCHAEOLOGIST SHALL BE PRESENT DURING ALL GRADING OR EARTH MOVING OPERATIONS WITHIN THE FLAGGED BOUNDARIES.

30. ALL SOIL DISTURBED BY GRADING SHALL BE RESEEDED AND MULCHED OR HYDRO MULCHED AS SOON AS POSSIBLE. EMERGENCY EROSION CONTROL MEASURES SHALL BE UTILIZED AS REQUESTED BY COUNTY OFFICIALS.
31. THE CONTRACTOR SHALL MAINTAIN A NEATLY MARKED SET OF FULL-SIZE AS-BUILT RECORD DRAWINGS SHOWING THE FINAL LOCATION AND LAYOUT OF ALL PIPING AND CONDUITS, STRUCTURES AND OTHER FACILITIES. THE AS-BUILTS OF THE ELECTRICAL SYSTEM SHALL INCLUDE THE STREETLIGHT LAYOUT PLAN SHOWING LOCATION OF LIGHTS, CONDUITS, CONDUCTORS, POINTS OF CONNECTIONS TO SERVICES, PULL BOXES, AND WIRE SIZES. AS-BUILT RECORD DRAWINGS SHALL REFLECT CHANGE ORDERS, ACCOMMODATIONS AND ADJUSTMENTS TO ALL IMPROVEMENTS CONSTRUCTED. WHERE NECESSARY, SUPPLEMENTAL DRAWINGS SHALL BE PREPARED AND SUBMITTED BY THE CONTRACTOR.
32. PRIOR TO ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL DELIVER TO THE ENGINEER, ONE SET OF NEATLY MARKED AS-BUILT RECORD DRAWINGS SHOWING THE INFORMATION REQUIRED ABOVE. AS-BUILT RECORD DRAWINGS SHALL BE REVIEWED, AND THE COMPLETE AS-BUILT RECORD DRAWING SET SHALL BE CURRENT WITH ALL CHANGES AND DEVIATIONS REDLINED AS A PRECONDITION TO FINAL ACCEPTANCE BY THE COUNTY.

* THESE NOTES APPLY ONLY TO PROJECTS WITH ARCHAEOLOGICALLY SENSITIVE AREAS.

Know what's below. Call before you dig.

No.	REVISIONS	DATE

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WWW.KIMLEY-HORN.COM

LICENSED PROFESSIONAL

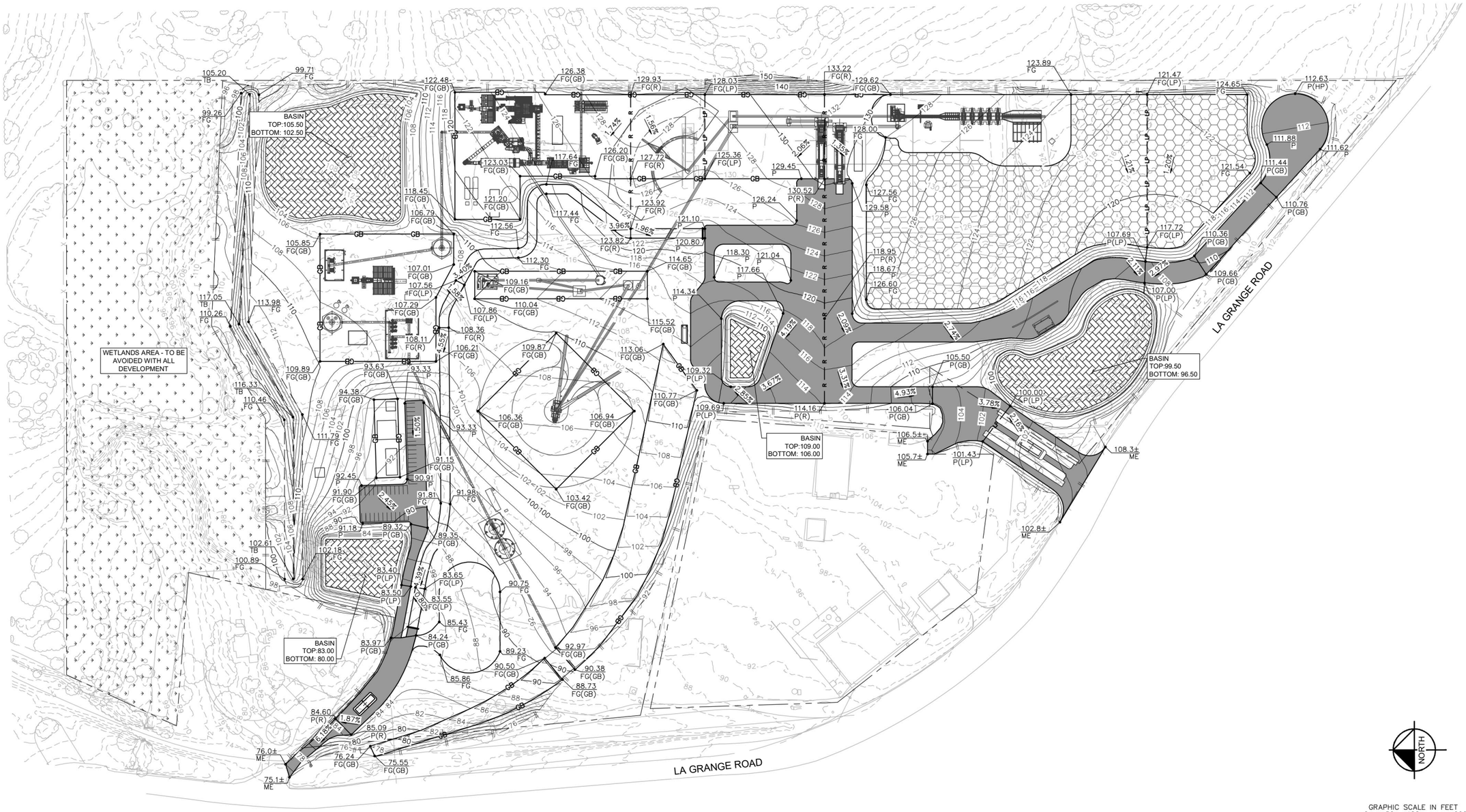
REGISTERED PROFESSIONAL ENGINEER · BROOKS BADLEY · No. 4247 · CIVIL · STATE OF CALIFORNIA · NOT FOR CONSTRUCTION

KHA PROJECT	197697001
DATE	09/11/23
SCALE	AS SHOWN
DESIGNED	BNB
DRAWN	PSS
CHECKED	BNB

JAMESTOWN, CA 95327
TOULOMNE COUNTY
FOREST RESILIENCY PROJECT

GRADING & DRAINAGE NOTES

SHEET NUMBER
2 OF 3



GRAPHIC SCALE IN FEET
0 50 100 200

NORTH

LEGEND

- PROPERTY LINE
- EASEMENT/SETBACK
- GRADE BREAK LINE
- RIDGE LINE
- GRADING LIMITS/MATCH EXISTING
- LOW POINT LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- STORMWATER BASIN
- PROPOSED STORAGE YARD AREA
- PROPOSED ASPHALT
- WETLANDS AREA
- 108.34 P — PROPOSED ELEVATION
- 2.05% — PROPOSED SLOPE

GENERAL NOTES

1. CONTRACTOR SHALL VERIFY AND LOCATE ALL EXISTING UTILITIES AND STRUCTURES PRIOR TO CONSTRUCTION AND SHALL PROTECT IN PLACE UNLESS NOTED ON THE PLANS.
2. ALL GRADING AND EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT BY WALLACE-KUHL & ASSOCIATES, PROJECT NO. 12774.03, DATED JUNE 21ST, 2021.
3. 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.
4. SITE LAYOUT AND LINEWORK BY NEXUS PMG AND TOPOGRAPHIC SURVEY BY DUDEK, RECEIVED ON 08/21/2023 & 08/29/2023, RESPECTIVELY. GRADING AND DRAINAGE DESIGN IS BASED OFF OF FILES RECEIVED FROM AFOREMENTIONED CONSULTANTS. THE ENGINEER ASSUMES NO RESPONSIBILITIES FOR SITE ELEMENTS NOT SHOWN IN THEIR PROPER LOCATION.
4. SPOT ELEVATIONS HAVE BEEN TRUNCATED BY 1000'. EXAMPLE: 59.23=1059.23.
5. ALL SPOT ELEVATIONS ARE FINISHED GRADE PAVEMENT (P), FINISHED FLOOR (FF), FINISHED GRADE (FG), TOP OF BERM (TB), OR MATCH EXISTING (ME) UNLESS OTHERWISE STATED. SPOT ELEVATIONS MAY CARRY ADDITIONAL GRADING INFORMATION SUCH US GRADE BREAK (GB), LOW POINT (LP), HIGH POINT (HP), OR RIDGE (R).

DRAINAGE STATEMENT

THE ANTICIPATED STORMWATER RUNOFF ASSOCIATED WITH THE TUOLUMNE COUNTY DESIGN STORM EVENT ON THE PROJECT SITE WILL BE CONVEYED VIA OVERLAND FLOW TO ABOVE GROUND DETENTION PONDS.

PRELIMINARY EARTHWORK CALCULATIONS

CUT: 256,660 CY

FILL: 141,176 CY

NET: 115,484 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).

THE EARTHWORK QUANTITIES ABOVE ARE FOR PERMIT PURPOSES ONLY. THEY HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, GROUND IMPROVEMENT METHODS SHRINKAGE, OVER- EXCAVATION AND RE-COMPACTION, AND CONSTRUCTION METHODS. NOR DO THEY ACCOUNT FOR THE THICKNESS OF PAVEMENT SECTIONS, FOOTINGS, SLABS, REUSE OF PULVERIZED MATERIALS THAT WILL UNDERLIE NEW PAVEMENTS, ETC. THE CONTRACTOR SHALL RELY ON THEIR OWN EARTHWORK ESTIMATES FOR BIDDING PURPOSES.

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No.	REMSIONS	DATE

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LICENSED PROFESSIONAL
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STATE OF CALIFORNIA
NOT FOR CONSTRUCTION

KHA PROJECT	DESIGNED	DRAWN	CHECKED
197697001	BNB	PSS	BNB
DATE 09/11/23			
SCALE AS SHOWN			

JAMESTOWN, CA 95327
TOULOMNE COUNTY
FOREST RESILIENCY PROJECT

PRELIMINARY GRADING PLAN

SHEET NUMBER
3 OF 3

Appendix B

Construction Water Demand Estimate

CONSTRUCTION WATER DEMAND ESTIAMTION SHEET

Project
12001 La Grange Road Project

Subject
Construction Water Demand

Estimated Mass grading		
Input quantity of on-site fill used to balance site	141,176	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	**1,681,655**	**GAL**
Conversion to gallons per acre-foot	325,851	
Water required for grading	**5.2**	**ACRE-FT**

Daily Dust Control		
Construction days	260	Days
Number of 3,000-gallon water trucks per day	2	Trucks
	6,000	**GAL/DAY**
Total water use for daily dust control	**1,560,000**	**GAL**

Total Estimated Construction Demand		
Total Project Water Usage	**3,241,655**	Gallons
	10	ACRE-FT