

DOCKETED

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Project Title:	Fountain Wind Project
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Filer:	Caitlin Barns
Organization:	Stantec Consulting Services, Inc.
Submitter Role:	Applicant Consultant
Submission Date:	2/6/2024 8:46:18 AM
Docketed Date:	2/6/2024

TECHNICAL MEMORANDUM

Date: February 5, 2024

Re: Fountain Wind Project
Shasta County, California
File #0023714.00

To: Michael Battles, M.P.A.
Associate Transportation Planner
Local Development Review Coordinator
Regional Planning and Local Development Review
Caltrans District 2

From: Paul Villaluz, P.E., PTOE, RSP₁

This technical memorandum provides a safety analysis of the proposed access locations that connect the proposed Fountain Wind Project to State Route 299 (SR 299) in Shasta County, California.

The California Department of Transportation (Caltrans) provided the scope for this Technical Memorandum in an e-mail dated December 4, 2023 (see **Appendix A**). This Technical Memorandum contains the following information at each proposed access location:

- Types of Entering and Exiting Traffic
- Postmile Designations
- Projected Design Peak Hour Volumes
 - Background (No-Build)
 - Construction
 - Post-Construction
- Sight Distance Evaluation
 - Stopping Sight Distance and Intersection Sight Distance
- Safety Assessment
- Exhibits showing road connections, including whether these connections are new or existing road connections.

Proposed Access Locations

The project site is located on the south side of SR 299 in Shasta County, California. The project site is located approximately 35 miles east of Redding, California and approximately 6 miles west of Burney, California.

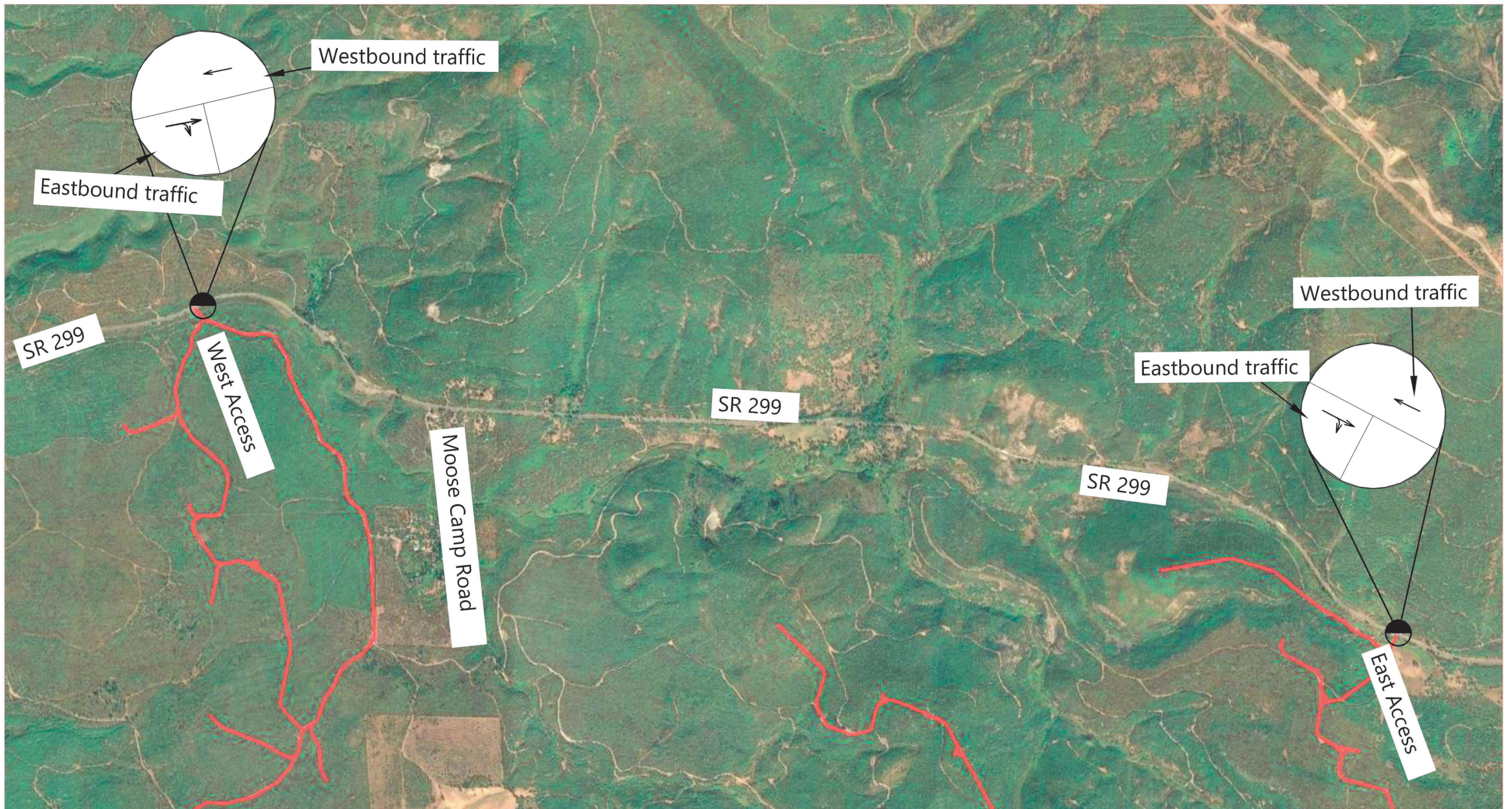
Along the proposed project frontage, SR 299 is a two-lane rural roadway that runs east-west and is classified as a minor arterial. The posted speed limit on SR 299 in the vicinity of the project site is 55 mph.

The proposed west access for the project will be located at Milepost 62.3. The proposed east access for the project will be located at Milepost 67.3. Currently both accesses are existing road connections; but they are gated because they are privately maintained.

During construction, both proposed accesses will facilitate entering and exiting traffic for the following activities:

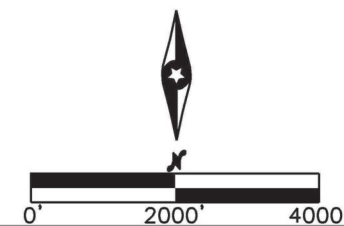
- Deliveries from the east of the site of
 - turbines, nacelles, and other wind power generating equipment, and
 - aggregate.
- Deliveries from the west of the site of
 - batched concrete,
 - water,
 - construction equipment, and
 - miscellaneous items (i.e., mail, food, etc.).
- Commuting worker traffic traveling to and from Redding, California (west of the site) and Burney, California (east of the site).
- Timber removal trucks traveling to the east of the site.

Figure 1 depicts the existing conditions at the proposed access locations. **Figure 2** depicts the proposed lane configuration, traffic control, and types of traffic that will enter and exit the site at each proposed access location.



Legend

LANE DESIGNATION

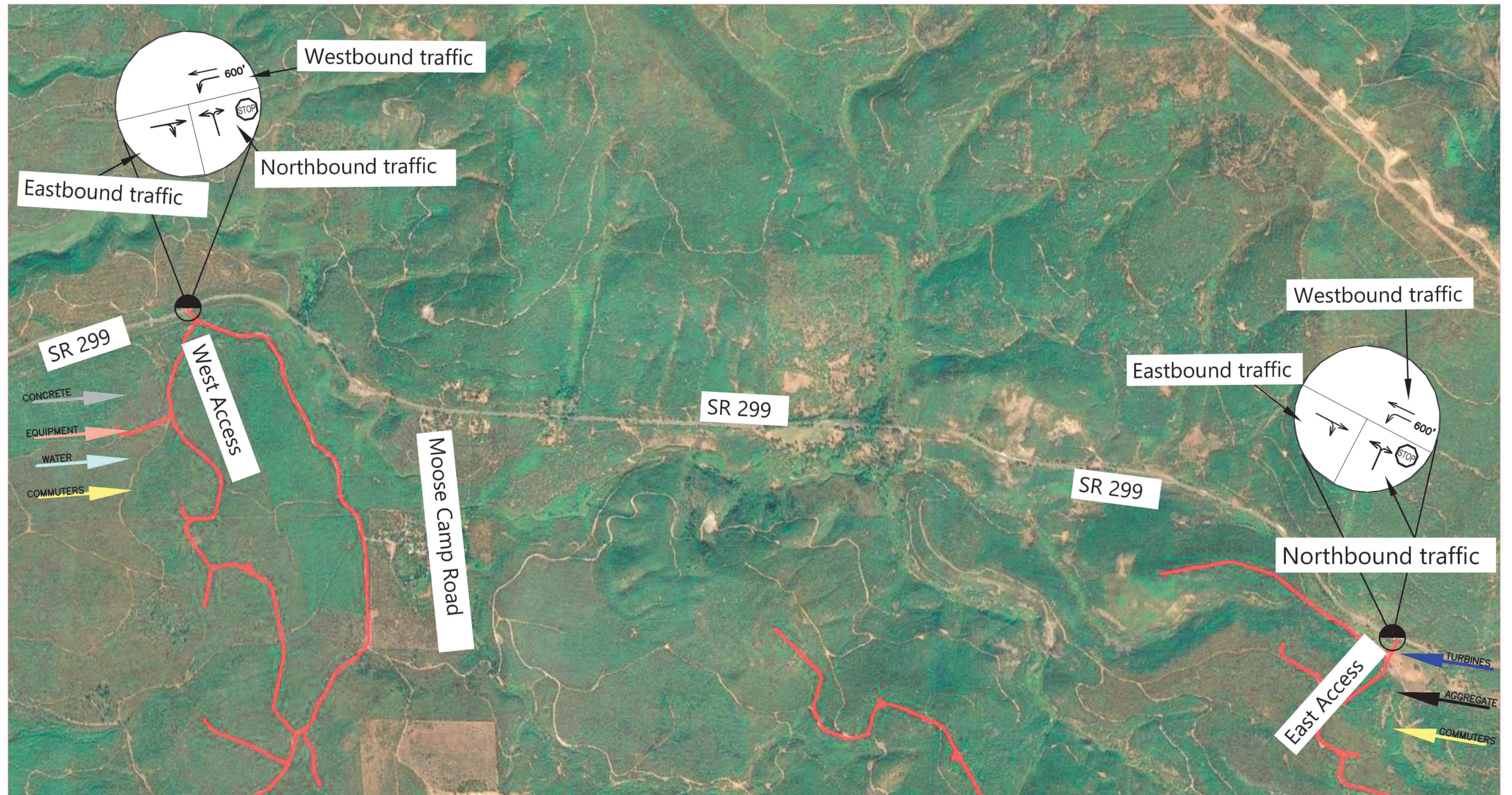


FOUNTAIN WIND POWER - SHASTA COUNTY, CA
ACCESS LOCATIONS (EXISTING CONDITIONS)

FIGURE 1
Westwood

Phone (702) 284-5300
 Fax (702) 284-5399
 westwoodps.com

Westwood Professional Services, Inc.
 5725 W. Badura Avenue, Suite 100
 Las Vegas, NV 89118



Legend

LANE DESIGNATION



FOUNTAIN WIND POWER - SHASTA COUNTY, CA ACCESS LOCATIONS (PROPOSED CONDITIONS)

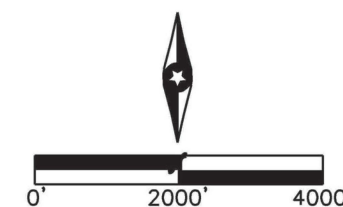


FIGURE 2 Westwood

Phone (702) 284-5300
Fax (702) 284-5399
westwoodps.com

Westwood Professional Services, Inc.
5725 W. Badura Avenue, Suite 100
Las Vegas, NV 89118

Projected Design Peak Hour Volumes

Background (No-Build) Peak Hour Volumes

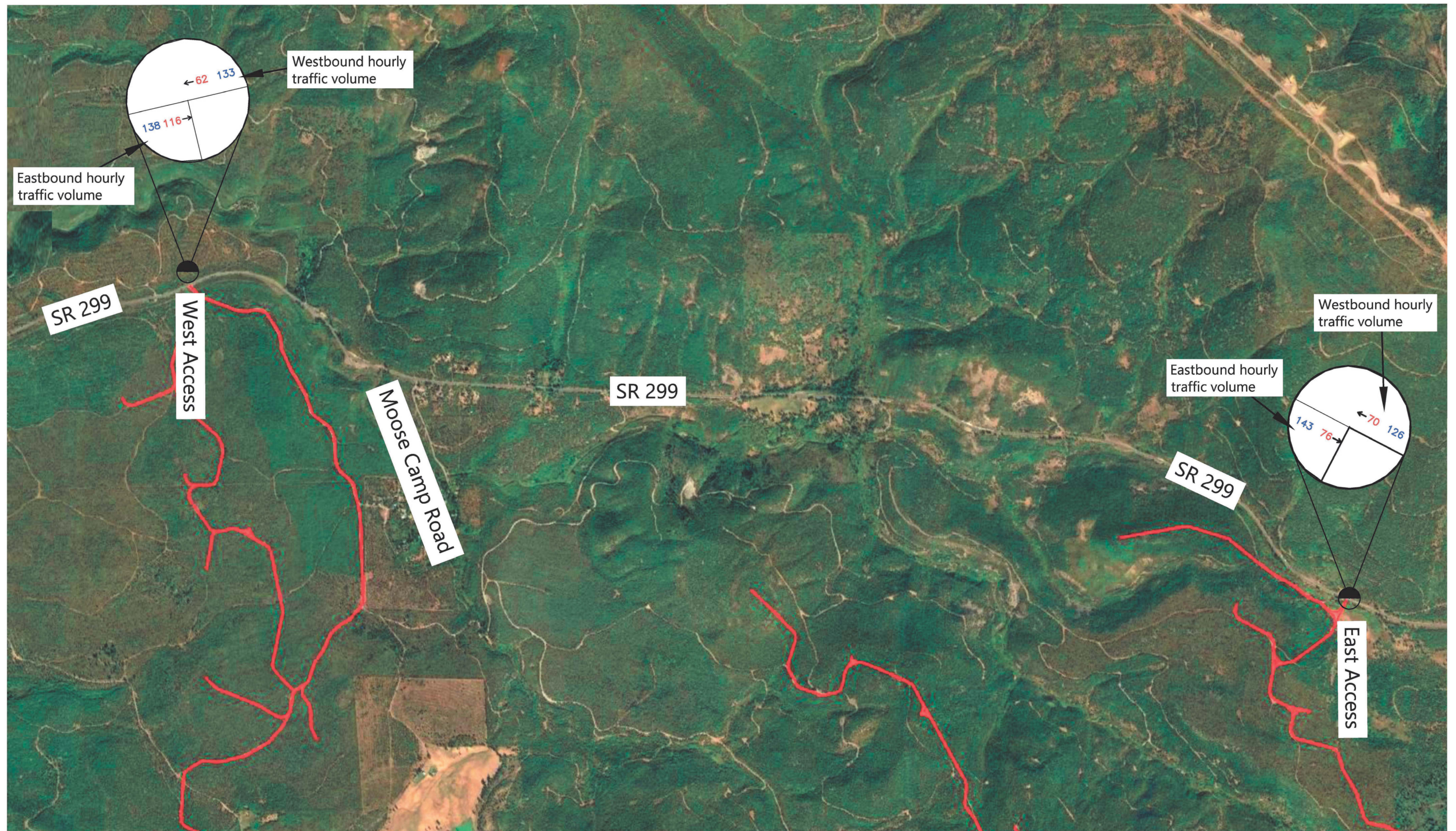
The Background (No-Build) Peak Hour Volumes at each of the proposed project access locations were derived by multiplying the average eastbound and westbound AM and PM peak hour traffic volumes observed on April 4, 5, and 6, 2023 by a factor of 1.55. The AM peak hour of 6am – 7am and the PM peak hour of 5pm – 6pm were selected because those hours were the anticipated peak entry and exit times for the commuting construction workers for this project. The factor of 1.55 that was used to expand these volumes accounted for the significantly lower observed Annual Daily Traffic volumes collected in 2023 in comparison to the Annual Daily Traffic Volumes reported by Caltrans in 2020. The Background (No-Build) Peak Hour Volumes are illustrated on **Figure 3**.

Construction Peak Hour Volumes

The Construction Peak Hour Volumes at each of the proposed project access locations were derived by adding the projected ingressing and egressing commuter traffic to the Background (No-Build) Peak Hour Volumes. The AM peak hour of 6am – 7am and the PM peak hour of 5pm – 6pm were selected because those hours were the anticipated peak entry and exit times for the commuting construction workers for this project. It is assumed that 56% of the projected commuter trips would use the West Access Road and that 44% of the projected commuter trips would use the East Access Road. It is assumed that heavy vehicle delivery trips will occur outside of the peak commuter hours. Construction Peak Hour Volumes are illustrated on **Figure 4**.

Post-Construction Peak Hour Volumes

The Post-Construction Peak Hour Volumes at each of the proposed project access locations were derived by adding the projected ingressing and egressing operations and maintenance traffic to the Background (No-Build) Peak Hour Volumes. In the Post-Construction (i.e., day-to-day operation and maintenance) scenario, there are a minimal number of employees accessing the site for operations and maintenance activities. Therefore, it is conservatively assumed that a total of eight (8) operations and maintenance workers in four (4) commuter vehicles daily would be entering both of the access points during the AM peak hour from the east and west, and that four (4) commuter vehicles would be exiting to the east and west during the PM peak hour. Post-Construction Peak Hour Volumes are illustrated on **Figure 5**.



Legend

LANE DESIGNATION	
AM PEAK HOUR TRAFFIC VOLUME	XX
PM PEAK HOUR TRAFFIC VOLUME	XX
SIGNALIZED INTERSECTION	
UNSIGNALIZED INTERSECTION	

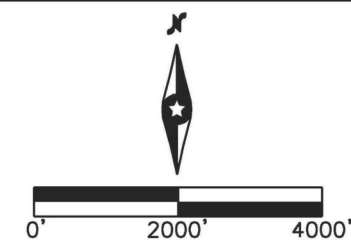
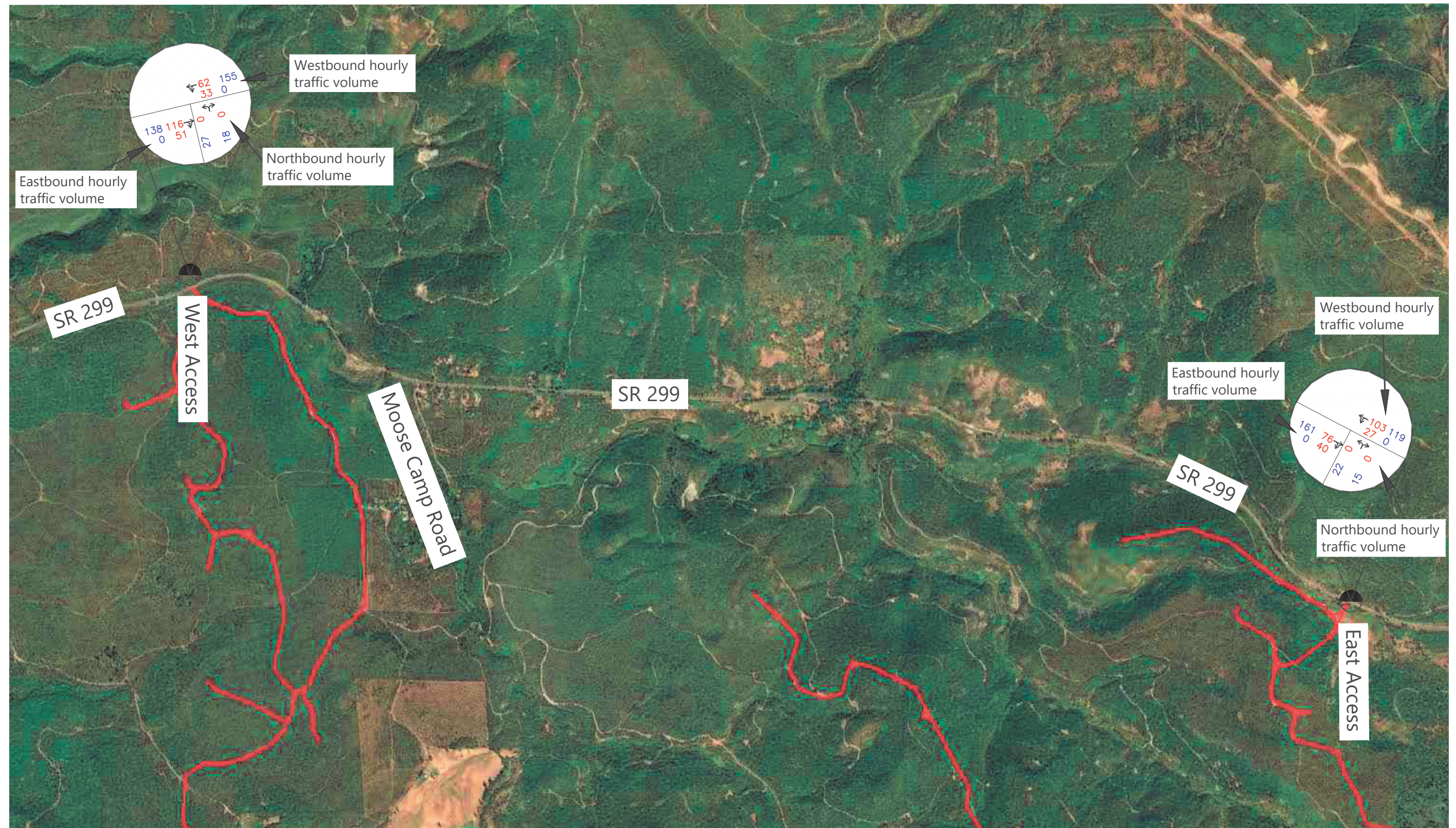


FIGURE 3
Westwood

Phone (702) 284-5300
Fax (702) 284-5399
westwoodps.com

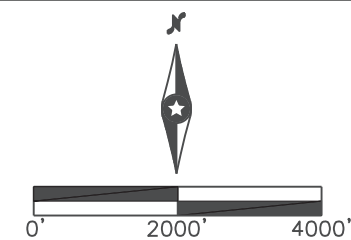
Westwood Professional Services, Inc.
5725 W. Badura Avenue, Suite 100
Las Vegas, NV 89118

FOUNTAIN WIND POWER - SHASTA COUNTY, CA
BACKGROUND(NO-BUILD) PEAK HOUR CONDITIONS



Legend

LANE DESIGNATION	
AM PEAK HOUR TRAFFIC VOLUME	XX
PM PEAK HOUR TRAFFIC VOLUME	XX
SIGNALIZED INTERSECTION	
UNSIGNALIZED INTERSECTION	

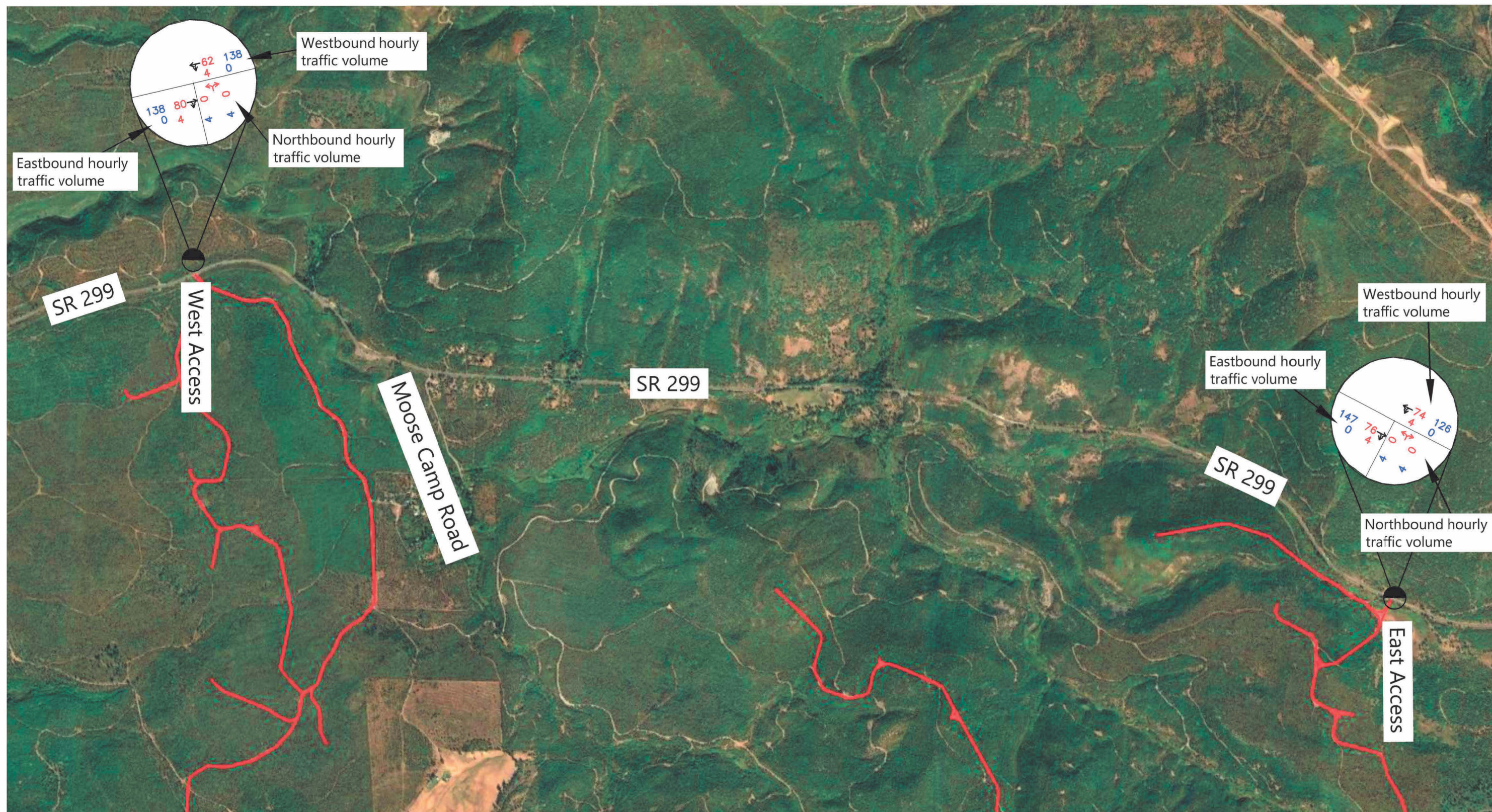


FOUNTAIN WIND POWER - SHASTA COUNTY, CA CONSTRUCTION PEAK HOUR VOLUMES

FIGURE 4 Westwood

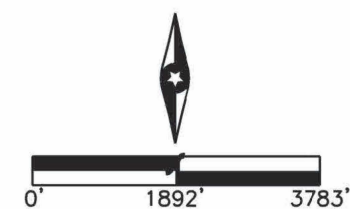
Phone (702) 284-5300
Fax (702) 284-5399
westwoodps.com

Westwood Professional Services, Inc.
5725 W. Badura Avenue, Suite 100
Las Vegas, NV 89118



Legend

LANE DESIGNATION	
AM PEAK HOUR TRAFFIC VOLUME	XX
PM PEAK HOUR TRAFFIC VOLUME	XX
SIGNALIZED INTERSECTION	
UNSIGNALIZED INTERSECTION	



FOUNTAIN WIND POWER - SHASTA COUNTY, CA POST CONSTRUCTION PEAK HOUR VOLUMES

FIGURE 5 Westwood

Phone (702) 284-5300
Fax (702) 284-5399
westwoodps.com

Westwood Professional Services, Inc.
5725 W. Badura Avenue, Suite 100
Las Vegas, NV 89118

Sight Distance Evaluation

Following the procedures outlined by the American Association of State Highway and Transportation Officials (AASHTO) in the 7th Edition of A Policy on Geometric Design of Highways and Streets, AASHTO defines sight distance as “...the length of the roadway ahead that is visible to the driver.” Furthermore, AASHTO recommends that the “...available sight distance on a roadway should be sufficiently long to enable a vehicle traveling at or near the design speed to stop before reaching a stationary object in its path.” Westwood evaluated stopping sight distance and intersection sight distance at each of the project access points.

Stopping Sight Distance

AASHTO defines stopping sight distance as “...the sum of two distances: (1) the distance traversed by the vehicle from the instant the driver sights an object necessitating a stop to the instant the brakes are applied, and (2) the distance needed to stop the vehicle from the instant brake application begins. These are referred to as brake reaction distance and braking distance, respectively.”

A stopping sight distance of 570 feet is recommended by AASHTO for vehicles traveling at the design speed of 60 mph (60 mph design speed = posted speed of 55 mph + 5 mph) along SR 299. Per AASHTO recommendations, “stopping sight distance is provided continuously along each roadway so that drivers have a view of the roadway ahead that is sufficient to allow drivers to stop.” **Figure 6** illustrates the stopping sight distance for vehicles approaching the west access on SR 299. **Figure 7** illustrates the stopping sight distance for vehicles approaching the east access on SR 299.

Intersection Sight Distance

AASHTO states that “Sight Distance is provided at intersections to allow drivers to perceive the presence of potentially conflicting vehicles. This should occur in sufficient time for a motorist to stop or adjust their speed, as appropriate, to avoid colliding in the intersection...To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road. Specific policies for intersection sight distance vary by intersection control type.”

Sight visibility exhibits were prepared using the standards contained in the 7th Edition of A Policy on Geometric Design of Highways and Streets published by AASHTO. Each exhibit contains a table that displays the calculated intersection sight distance lengths as well as the design speed and time gap assumptions that were used for the calculations.

Figure 6 illustrates the intersection sight distances and resulting sight lines (in blue) for Combination Trucks leaving the site via the west access on SR 299. **Figure 7** illustrates the intersection sight distances and resulting sight lines (in blue) for Combination Trucks leaving the site via the east access on SR 299.

D:\00022 - Fountain Wind\11 Fountain Access\Report\FIG 6 - West Access Sight Distance Exhibit.dwg 1/2/2024 10:00 AM

					INTERSECTION SIGHT DISTANCE					
LEGEND	AASHTO INTERSECTION SIGHT DISTANCE CASE	MOVEMENT	MAJOR ROAD	MINOR ROAD	POSTED SPEED - MAJOR ROAD (MPH)	DESIGN SPEED - MAJOR ROAD (MPH)	GRADE - MINOR ROAD APPROACH (%)	TIME GAP (SEC)	ISD (PC)	
									CALCULATED	DESIGN
	B1 - LT FROM MINOR ROAD TO MAJOR ROAD	NB TO WB LT	SR 299	SITE ENTRANCE 2	55	60	3.0	11.5	1014.3'	1015'
	B2 - RT FROM MINOR ROAD TO MAJOR ROAD	NB TO EB RT	SR 299	SITE ENTRANCE 2	55	60	3.0	10.5	926.1'	930'

MAJOR STREET STOPPING SIGHT DISTANCE									
LEGEND	MOVEMENT	MOVEMENT	MAJOR ROAD	MINOR ROAD	POSTED SPEED - MAJOR ROAD (MPH)	DESIGN SPEED - MAJOR ROAD (MPH)	BRAKE REACTION TIME (s)	DECELERATION RATE (ft/s ²)	SSD
									DESIGN
	MAJOR ROAD STOPPING SIGHT DISTANCE	EB	SR 299	SITE ENTRANCE 2	55	60	2.5	11.2	570'
	MAJOR ROAD STOPPING SIGHT DISTANCE	WB	SR 299	SITE ENTRANCE 2	55	60	2.5	11.2	570'



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION AND THAT I AM A
DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS
OF THE STATE OF MINNESOTA

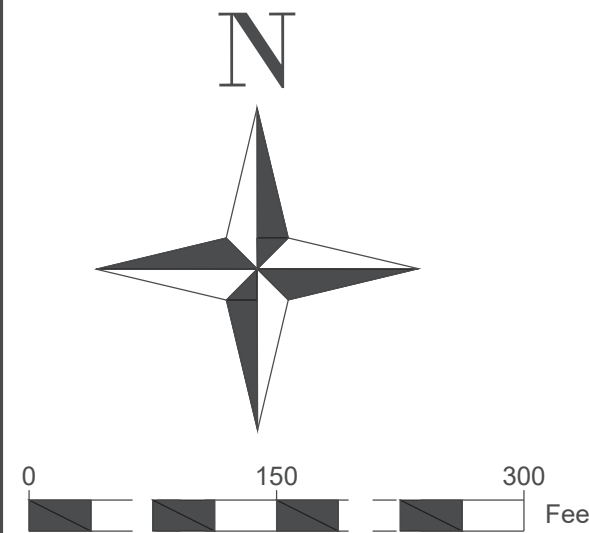
P.E.
DATE: ____ Date ____ LICENSE NO. ____ License ____

PREPARED FOR:

1001 McKinney, Suite 700
Houston, TX 77002

COMMENT

REVISIONS:
DATE



Fountain Wind Project Shasta County, California

Figure 6 -West Access
Sight Distance Exhibit

DATE: 02/02/2024
SHEET: 1/2

Safety Assessment

The Sight Distance Evaluation indicates that sight obstructions may exist for vehicles exiting the site by turning left from the West Access onto SR 299 (see **Figure 6**). The blue shaded area represents an area within the line of sight of a driver traveling northbound from the site to westbound SR 299 that might be obstructed due to the curve in the road and the presence of vegetation. Field reviews at this location should be performed prior to construction to determine if vegetation within the blue shaded area on **Figure 6** should be cleared to provide an unobstructed line of sight.

According to the 11th Edition of the *Manual on Uniform Traffic Control Devices*, the Side Road Intersection Warning Sign (W2-2) can be placed in advance of either access on SR 299 to indicate the presence of an intersection and the possibility of turning or entering traffic.

Figure 8 – Side Road Intersection Warning Sign



The contractor may have to provide specialized flagging/work zone traffic control setups that are compliant with Caltrans and MUTCD standards to facilitate smooth ingress and egress for oversized vehicles that deliver equipment (i.e. turbines, transformers, etc.) to and from the project site.

Providing clear sight lines, installing advance intersection warning signs, and using specialized work zone traffic control setups can minimize potential vehicular conflicts at each of the proposed project accesses during construction and operations.

February 5, 2024

APPENDIX A
SCOPING E-MAIL DATED DECEMBER 4, 2023

DOCKETED

Docket Number:	23-OPT-01
Project Title:	Fountain Wind Project
TN #:	253602
Document Title:	Scoping Input from Caltrans
Description:	N/A
Filer:	Marichka Haws
Organization:	Caltrans
Submitter Role:	Public Agency
Submission Date:	12/13/2023 1:17:10 PM
Docketed Date:	12/13/2023

Caltrans Comments-Fountain Wind Project, NOP of Draft EIR

Battles, Michael@DOT <Michael.Battles@dot.ca.gov>

Mon 12/4/2023 4:05 PM

To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>

Cc: Grah, Kathy M@DOT <kathy.grah@dot.ca.gov>; Babcock, Kelly M@DOT <kelly.babcock@dot.ca.gov>

 1 attachments (618 KB)

Drainage Info-Caltrans.pdf;

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon,

Thank you for the opportunity to review and comment on the Notice of Preparation for the Draft EIR for the proposed Fountain Wind Project in Shasta County. Caltrans District 2 functional units staff have the following comments:

1. If the proposed project contains areas that drain to the State Highway System (SHS) Right-of-Way, a drainage report is required, which shows no increase in flow to Caltrans drainage systems, or that demonstrates that Caltrans drainage systems are adequate to carry the increased flow. Caltrans criteria for a drainage report can be found in the attached document.
2. If appropriate, Caltrans requires plans that show how debris control will be addressed so that Caltrans channels and culvert inlets are not obstructed.
3. The project proponent shall provide a memo style safety analysis of planned State Route access points. This memo shall indicate the types of traffic entering and exiting each access point, the Postmiles of these access points, approximate volumes, sight distance, and a safety assessment. If potential safety concerns are identified, the memo shall include a list of potential mitigations, including revised temporary signing, traffic control, and the clearing of obstructions.
4. Detail showing road connections, including whether these connections are new or existing road connections.
5. A list of Best Management Practices (BPM's) which will be utilized to control dust and mud accumulation onto State Route 299.

Once again, thank you for the opportunity to review and comment on the proposed Fountain Wind Project.

Sincerely,

Michael Battles, M.P.A.

Associate Transportation Planner

Local Development Review Coordinator

Regional Planning and Local Development Review

Caltrans District 2

Required Information for Drainage Review

A Drainage Report shall be submitted that clearly defines the scope of the project related to the existing and proposed drainage. The level of detail in the report should be commensurate to the complexity of the proposed project and should contain summaries of the input parameters as well as the results of calculations. Calculations for each drainage basin, drainage system, and individual drainage unit must accompany the Drainage Report, application and plans. The calculations and report must be signed, checked, dated, and stamped by a registered Civil Engineer. Following is an outline of the items typically included in a Drainage report.

Hydrology:

1. Drainage Basin Maps for the before and after project conditions (contours at a reasonable scale).
 - a. Before Condition (Existing/Pre-Development) – drainage basin(s) delineated and labeled, major features labeled, and flow direction arrows.
 - b. After Condition (Post- Development) – same info as above reflecting project changes in land use and improvements. Submit grading and drainage plans.
 - c. Points of concentrations, and outfalls shall be indicated and include flow direction.
2. Hydrology Summary Tables: Include Pre- Development and Post- Development flow quantities, time of concentration, drainage basin characteristics, area, slopes, soil types, vegetative cover, storage, present usage, runoff coefficient, etc.
3. Applicant shall use California Department of Transportation Drainage Design Standards in Chapter 800 of the Highway Design Manual when connecting or draining to the State Highway Drainage Facilities. The applicant may use local agency standards when they meet or exceed State standards.

Hydraulics: Show all affects of proposed changes on State Highway drainage structures from the “before condition” to the “after condition” including but not limited to:

1. Cross Drains and Storm drain networks in the State Right of Way:

Typically designed for 10-yr (to the soffit) and 100-yr flows (with no objectionable flooding) include headwater or hydraulic grade line produced referenced to the invert of system. Include the available headwater at the culvert or drainage inlet, size, slope, end treatments and type of culvert. Culverts that run longitudinal to the State Highway across a road connection are typically designed for a 25-year flow.

2. Gutters, ditches, and drainage inlets in the State Right of Way:

Typically designed for 25-yr flows (where traffic speed exceeds 45 mph) to not encroach on the traveled way. Include spread, intercept, and bypass information for each drainage inlet. Equations to determine these parameters are in FHWA’s HEC 22.

Required Information for Drainage Review

3. Detention or Retention facility:

Include design storm method, table or graph of the inflow and outflow hydrograph(s), the depth vs. storage of the facility, and the configuration of the outfall structure with its stage discharge relationship. Include a table of volume stored at each time step.

4. “Master” Plan:

State what agencies were contacted and the impacts the project will have on the downstream drainage.

Drainage Report Narrative: The Drainage Report should include a narrative section describing the project and any effects to drainage. State all relevant assumptions. This section can also explain any historical issues or special aspects of the drainage design.

Historic Drainage patterns should be perpetuated, or drainage systems analyzed to show that there are no impacts or the impacts are mitigated (capacity, velocity related to flooding and erosion). Is a Master plan available?

We recommend considering detention facilities be designed to reduce a project’s impact, but the designer should consider that detention facilities low in a watershed could cause detrimental effects if their release increases the peak flow of the overall watershed.

Will the proposed development impact a FEMA-mapped floodplain or other floodplain? Will it cause an increase in floodwater depth that would affect State assets or the assets of others?

Caltrans’ primary concern is the safety of the traveling public and protection of facilities within the State’s right of way. The State is also concerned about the impact to adjacent and downstream properties.