Traffic Addendum for the Petition to Amend

The California Energy Commission Final Decision on Bottle Rock Power Plant (79-AFC-4C)

February 2010

Prepared for:
Bottle Rock Power, LLC
7385 High Valley Road
Cobb, CA 95426

Prepared by:
RMT Inc.
4 West Fourth Avenue, Suite 303
San Mateo, California 94402

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List of Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
BRP	Bottle Rock Power, LLC.
BRPP	Bottle Rock Power Plant
Caltrans	California Department of Transportation
CA-MUTCD	Manual on Uniform Traffic Control Devices – California Supplement
CEC	California Energy Commission
CFR	Code of Federal Regulations
COC	Condition of Certification
CVC	California Vehicular Code
CWPP	Community Wildfire Protection Plan
HCM	Highway Capacity Manual
LORS	Laws, Ordinances, Regulations, and Standards
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
NWPR	North Western Pacific Railroad
PTA	Petition to Amend
RVs	Recreational Vehicles
SWITRS	Statewide Integrated Traffic Records System
TRANS	Transportation
v/c	Volume-to-Capacity

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1: Introduction

1.1 Overview

This report is an addendum to the traffic analysis provided in Section 4.12 Traffic and Transportation in the "Petition to Amend the California Energy Commission Final Decision on Bottle Rock Power Plant (79-AFC-4C)" RMT 2009), herein referred to as the PTA, submitted to the California Energy Commission (CEC) on September 30, 2009. The PTA was submitted to request authorization to implement the Bottle Rock Power Steam Project (project) (described below).

The purpose of this report is to provide supplemental information and environmental impact analysis for the use of an alternative access route, comprised of two options, for the BRP Steam Project. The newly considered routes would be alternatives to using High Valley Road during the construction period only. The alternatives are designed to address concerns raised by residents on Bottle Rock Road and to avoid additional truck traffic on High Valley Road. The alternative routes would use either private roads (Glenbrook Road and Lee Road) and an existing campground road (Option A), or just private roads (Glenbrook Road and Lee Road) (Option B). The applicants have not yet been able to secure access to the private roads. The use of either of these two optional routes remains contingent upon the applicant's ability to obtain agreements with the private land owners. If these agreements are not obtained, then High Valley Road would be used for the construction and drilling related traffic.

1.2 Project Description

The proposed project would be constructed in Lake County, northwest of the community of Cobb and adjacent to the existing Bottle Rock Power Plant (BRPP) (Figure 1.2-1). Project components would be built on two leaseholds known respectively as the Francisco and BRP GeoResource Leaseholds. The development of a new steam field would consist of two well pads, up to 12 wells per pad, an access road that connects the two pads, new steam pipelines, and new injection pipelines. The proposed project components would allow Bottle Rock Power, LLC (BRP) to increase the power output of the plant to approximately 55 MW, with minimal physical changes to BRPP and no changes to the existing electrical transmission facilities.

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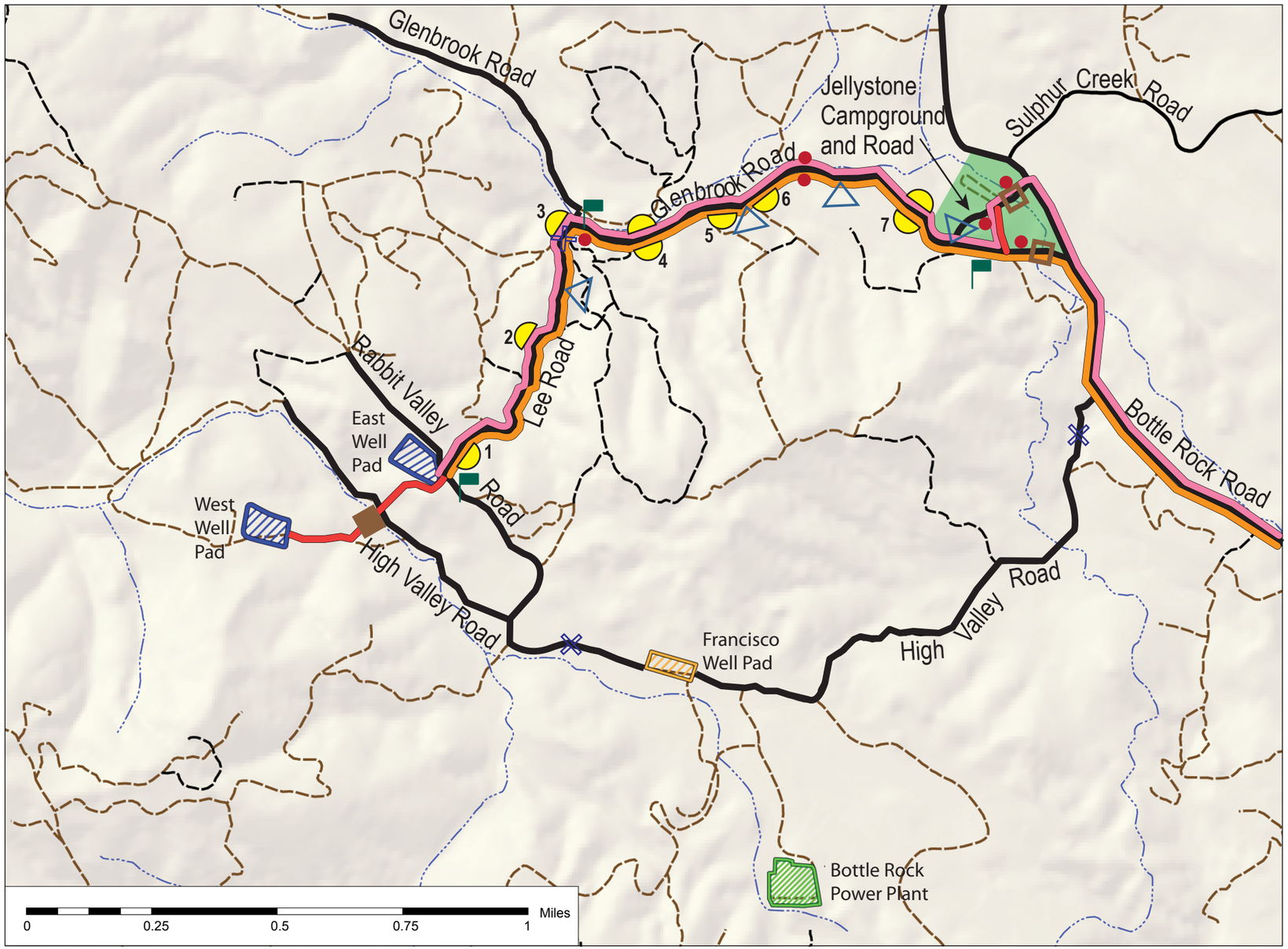
Figure 1.2-1: Project Area and Proposed Construction Phase Traffic Improvements



SOURCE: U.S. Geological Survey, EROS Data Center, Sioux Falls , SD 2009, Lake County Department of Information Technology 2009, Sonoma County GIS Department 2009, and W-Trans 2010

LEGEND

N W E S

- Alternative Access Route Option A
- Alternative Access Route Option B
- Proposed Construction Sign
- # Vehicle Turnout
- Existing Bridge
- Proposed Bridge
- Existing Driveway
- Existing Private Road
- Proposed Access Road
- Existing Gate
- Proposed Flagger Location
- Proposed Well Pad Area
- Existing Francisco Well Pad Area
- Existing Bottle Rock Power Plant
- Paved Road
- Unimproved Road
- Unpaved Road

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2: Traffic and Transportation Setting of the Project Area

2.1 Road Network Overview

2.1.1 PRIVATE ROAD NETWORKS

The project is located in a remote area where access to the regional transportation system, including county roads and state and federal highways, is via a network of private roads. The proposed project area is located in a mountainous region that is currently accessed via four private roads (see Figure 1.2-1):

- High Valley Road
- Glenbrook Road
- Rabbit Valley Road
- Lee Road

High Valley Road and Glenbrook Road connect to Bottle Rock Road, a Lake County road. Glenbrook Road intersects Bottle Rock Road approximately 800 feet north of High Valley Road. Glenbrook Road is used by area residents and others unrelated to the BRP Steam Project and BRPP. The road provides access to Jellystone Camp Resort (an existing campground) as well as to a network of private roads. Glenbrook Road provides an east-west connection in the area

Lee Road intersects Glenbrook Road approximately 1.5 miles from the intersection of Glenbrook Road/Bottle Rock Road and provides access to areas south of Glenbrook Road. Lee Road provides access to the proposed drill pads, as well as a connection to High Valley Road and Rabbit Valley Road.

Local county roads in the project area are generally paved two lane roads. Private roads in the area are predominantly unpaved, single lane roads with a limited and discontinuous shoulder. High Valley Road, Glenbrook Road, Rabbit Valley Road, and Lee Road are all unpaved.

Study Area

The new study area presented in this addendum addresses the use of three private roads and one intersection that would only be used during the construction phase of the proposed project.

Option A includes the use of:

- Jellystone Camp Resort Road between Bottle Rock Road and Glenbrook Road
- Glenbrook Road between Jellystone Camp Resort Road and Lee Road
- Lee Road between Glenbrook Road and the proposed connection with the new East Pad

Option B includes the use of:

- Glenbrook Road between Bottle Rock Road and Lee Road
- Lee Road between Glenbrook Road and the proposed connection with the new East Pad

The project study area and two potential primary access route options are shown in Figure 1.2-1.

Negotiations are currently underway to obtain easements or access agreements for either alternative access route option. This addendum will analyze the impacts of both routes; however, only one route would be used once all necessary permissions and agreements have been obtained.

2.2 Existing Road Network Description

2.2.1 ROAD NETWORKS

Glenbrook Road

Glenbrook Road is a private narrow, unpaved road that connects to the public street network at Bottle Rock Road. It is curvilinear and ranges between 10 and 24 feet wide. The roadway crossing of Kelsey Creek 400 feet west of Bottle Rock Road is 12 feet wide. The creek bed is less than 6 feet below roadway elevation and the bridge is not equipped with any safety railing.

Lee Road

Lee Road connects to Glenbrook Road approximately 1.5 miles west of its intersection with Bottle Rock Road, and is equipped with a gate. Keys to the gate are available to the BRPP personnel and area residents. Lee Road provides a direct connection to the proposed BRP East pad and connects to a network of private roads to the south, including High Valley Road (also known as Rabbit Valley Road) and Saw Mill Road (also known as High Valley Road). Segments of Lee Road are steep, possibly exceeding 15 percent grade, with the width ranging between 15 and 21 feet. Drainage system improvements along Lee Road appear to have been constructed recently, including installation of new cross culverts, with the roadbed re-graded, and re-surfaced with gravel. Two residences have direct access from Lee Road.

Jellystone Camp Resort Road

Jellystone Camp Resort is located on the north side of Glenbrook Road near Kelsey Creek and Bottle Rock Road. Primary access to the campground is provided via Bottle Rock Road; however, there is also access along Glenbrook Road. The Jellystone Camp Resort contains 107 individual campsites served by a network of drive aisles with two driveways connecting to the surrounding street network. Figure 1.2-1 depicts the current signage and access points to the campground. Traffic entering the campground from Bottle Rock Road would cross an existing bridge.

BRP has begun negotiations to obtain an access agreement through the campground for the purpose of routing construction traffic and equipment through the campground in lieu of using a comparable connection via Glenbrook Road near Bottle Rock Road. BRPP currently has an existing emergency access easement which delineates an emergency access route through the campground and does not utilize the primary drive aisle alignment. The use of this easement or additional

permissions obtained by the owner of the Jellystone Camp Resort may be subject to additional conditions.

2.2.2 ROAD CLASSIFICATIONS

Glenbrook Road and Lee Road most closely fit the Lake County's "Substandard Collector" classification, with a design capacity of 3,600 vehicles per day (Lake County 2008). The Highway Capacity Manual (HCM) (2000) is a widely used standard for determining roadway classifications based on traffic capacity; however, the HCM does not provide classifications for very low volume roadways such as Glenbrook Road and Lee Road because capacity is not expected to be an issue.

2.2.3 ROADWAY CHARACTERISTICS

Project roadways already analyzed for potential impacts from the proposed project include two private roads (Rabbit Valley Road and High Valley Road), one public road (Bottle Rock Road), and one intersection (Bottle Rock Road/Glenbrook Road). Descriptions of existing facilities in this traffic addendum will be limited to the description of the alternative access route; however, Table 2.2-1 below provides a summary of the characteristics of the existing roadways within the project area.

Table 2.2-1: Characteristics of Project Area Roadways

Road	Road Classification	Design Capacity (vehicles/day)	Daily Traffic Volumes (vehicles/day)	Width (ft)	Connects to
Glenbrook Road	Local Road	3,600	50	10-24	Bottle Rock Road
Lee Road	Local Road	3,600	10	15-21	Glenbrook Road
Jellystone Camp Resort Road	Local Road – Rural Recreational	3,600	214	11-14	Bottle Rock Road and Glenbrook Road
Bottle Rock Road	Minor Arterial	12,000	1,131	24	High Valley Road and Glenbrook Road
Rabbit Valley Road	Local Road	3,600	20	14-20	East pad
High Valley Road	Local Road	3,600	136	14-20	Proposed access road to the West pad

SOURCE: RMT 2009

2.3 Existing Traffic Conditions

2.3.1 EXISTING TRAFFIC TRIPS

Existing BRPP traffic trips are shown in Table 2.3-1. Employees typically work 40 hours per week on four 10-hour day shifts, usually beginning at 6 a.m. or 8 a.m. Several employees work shifts spanning 24 hours per day to maintain plant operations. Estimated power plant-generated traffic is 136 vehicle trips per day, with 25 percent of traffic assumed to occur during the p.m. peak period.

Area residents contribute an estimated average daily traffic volume of 20 trips. Combined with the 136 site-related trips, the average total weekday traffic volume on High Valley Road is 156 vehicle trips per day. BRPP personnel do not currently use Glenbrook Road or Lee Road for existing plant and/or steam field operations. Vehicular traffic is assumed to be 100 percent passenger vehicles composed of area residents and the occasional camper (due to the difficulty of access for larger vehicles). Traffic volumes for the project area were estimated using data collected from the study intersection and are estimated based on surrounding land uses and observations made in the field.

Table 2.3-1: Summary of Existing Site-Generated Traffic

Use Type	Staffing		Mode				Weekday Daily Trips	PM Peak Hour Trips*
	Employees	*Contract Employees*	*Passenger Vehicles*	*Delivery Trucks*	*10 Wheelers*	*Semi-trucks*		
Steam Field Operations	13	16	29	0	0	0	58	15
Power Plant Operations	11	0	11	0	0	0	22	5
Miscellaneous Site Activities	0	14	14	3	3	8	56	14
Total	**24**	**30**	**54**	**3**	**3**	**8**	**136**	**34**

* 25 percent of the daily traffic is assumed to occur during the p.m. peak hour.

SOURCE: RMT 2009

2.3.2 LEVEL OF SERVICE

Definition of Level of Service

Roadways and intersections are rated at varying levels of service (LOS). LOS is a measure of roadway operating conditions, ranging from LOS A, which represents the best range of operating conditions, to LOS F, which represents the worst. Basic definitions are presented in Table 2.3-2.

Table 2.3-2: LOS Criteria for Roadways

LOS	v/c	Traffic Flow Characteristics
A	0.00-0.60	Free flow; insignificant delays
B	0.61-0.70	Stable operation; minimal delays
C	0.71-0.80	Stable operation; acceptable delays
D	0.81-0.90	Approaching unstable flow; queues develop rapidly (no excessive delays)
E	0.91-1.00	Unstable operation; significant delays
F	>1.00	Forced flow; jammed conditions

SOURCE: Transportation Research Board 2000

LOS can be estimated based on volume-to-capacity (v/c) ratio, the intersection capacity utilization (the ratio of the number of vehicles actually traveling on a roadway to the number of vehicles it was designed to convey), or the average delay experienced by vehicles on the roadway.

The majority of roadways and highways in the project area operate at LOS A or better, meaning that motorists on most roadways do not experience substantial delays, even during peak travel hours. The California Department of Transportation (Caltrans) considers a LOS D or better on state highway segments to be acceptable for planning purposes.

LOS for Bottle Rock Road and Glenbrook Road

The intersection of Bottle Rock Road and Glenbrook Road is a T-intersection with stop controls on the Glenbrook Road approach (Figure 2.3-1. The stop-controlled approach is striped as one lane, but is more than 40 feet wide at the edge of pavement, allowing outbound left- and right-turning vehicles to queue separately. Bottle Rock Road is the major street approach and consists of one travel lane in each direction.

Turning movement counts for p.m. peak weekday periods were collected to assess the existing operating conditions and associated LOS for this intersection. Five vehicles turned at the intersection during the p.m. peak hour. Intersection movements included:

- Two southbound right turns
- One northbound left turn
- Two eastbound turns (one left and one right)

Figure 2.3-1: Lane Configuration and Traffic Volumes

SOURCE: W-Trans 2009

The eastbound minor street approach would be expected to have the highest delay of any intersection approach. Average daily traffic volumes on Glenbrook Road were estimated using this turning movement count together with the percentage of daily trips occurring during the p.m. peak period on Bottle Rock Road (i.e., slightly less than 10 percent), resulting in an estimated 50 vehicles per day using Glenbrook Road. The resulting turning movement volumes are indicated in Figure 2.3-1.

The study intersection is currently operating acceptably at LOS A based on these estimates, with an average delay of 9.0 seconds per vehicle on the stop-controlled eastbound approach. Calculations used to determine the LOS can be found in Appendix A.

2.3.3 PERCENTAGE OF PASSENGER VEHICLES AND TRUCKS

Glenbrook and Lee Roads and the Jellystone Camp Resort are located in a very rugged mountainous setting. Access for trucks would be difficult given their current condition. Trucks associated with BRPP and drilling operations do not use Glenbrook Road or Lee Road. It is assumed that existing vehicular traffic is 100 percent passenger vehicles associated with area residences and occasional campers. The Jellystone Camp Resort Road is assumed to carry mostly passenger vehicle traffic; however, large recreation vehicles (RVs) do use this road and campground.

2.3.4 TRAFFIC SAFETY

The study intersection of Glenbrook Road and Bottle Rock Road had no collisions published in the California Highway Patrol Statewide Integrated Traffic Records System (SWITRS) reports for the period of 2004 to 2008. A similar search of SWITRS reports were reviewed for the project region (and included the intersection of High Valley Road/Bottle Rock Road) from a period of 2003 to 2008 (RMT 2009). No collisions occurred within the intersection of High Valley Road and Bottle Rock Road during this time. The lack of reported collisions indicates no apparent traffic safety hazards exist at either intersection (CHP 2009 and Yung pers. comm. 2010).

2.4 Alternative Transportation

A variety of modes of alternative transportation methods were reviewed to evaluate if such facilities may be affected by or serve the project, including airports, railroads, transit services, bicycle, and pedestrian facilities.

2.4.1 AIRPORT OPERATIONS

The closest airport is Paul Hoberg Airport, located approximately 6 miles east of the project area. Project traffic is not expected to impact operation of this airport. No heliports are located within 5,000 feet of the project area.

2.4.2 RAIL FACILITIES

No railroad lines run through or around Lake County, nor are there plans to install such facilities at this time. The closest railroad alignment is the North Western Pacific Railroad (NWPR), which is located more than 10 miles west of the plant in Sonoma County and is not currently operational.

2.4.3 TRANSIT SERVICES

Public bus services are not provided in the project area, nor are they planned to be added at this time. School buses serve residents on Bottle Rock Road near its southerly intersection with SR 175.

2.4.4 BICYCLE AND PEDESTRIAN FACILITIES

The Lake County Regional Bikeway Plan identifies existing bikeways in the nearby community of Middletown (Lake County/City Area Planning Council 2006). The closest designated bike path to the proposed project area is located in the community of Kelseyville, more than 8 miles southeast of the project area. The proposed project would not affect users.

The Jellystone Camp Resort generates pedestrian and bicycle traffic on Glenbrook Road, especially during the peak summer months. A warning sign, "Slow, Children at Play," is posted approximately 0.25 miles from the Glenbrook Road intersection with Bottle Rock Road. It is assumed that pedestrians and cyclists walk and ride (respectively) along the edges of the roadway. No other visible pedestrian or bicycle trails or areas are located along this roadway.

3: Environmental Impact Analysis

The following section presents an impact analysis specific to the use of the two alternative access route options as an alternative access route for the construction phase of the BRP Steam Project. Additional information pertaining to High Valley Road and Rabbit Valley Road access route may be presented here for the purposes of comparison and context; however, the complete impact analysis of the High Valley Road route is available in the PTA (2009).

3.1 CEQA Significance Criteria

The proposed project would result in a significant impact if it would:

- Create safety hazards on any project area roadway by way of a project vehicle exceeding weight limitations on any transportation facility, or project roadway designs that do not conform to local road design standards, or degrade operation below acceptable county LOS standards
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access
- Result in inadequate parking capacity
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts and bicycle racks)
- Conflict with applicable laws, regulations, ordinances, standards, adopted local, regional, state, and federal plans, leases, and permits related to traffic and transportation

3.2 Project Impacts

Potential Impact: Potential to create safety hazards on any project area roadway by way of a project vehicle exceeding weight limitations on any transportation facility, or project roadway designs that do not conform to local road design standards, or degrade operation below acceptable county LOS standards

Option A: (Jellystone Camp Resort Road, Glenbrook Road, and Lee Road)

Construction of the proposed project would generate a maximum of 232 daily trips, including 55 trips during the p.m. peak period. Table 3.2-1 summarizes the expected traffic for construction of the proposed project and includes baseline traffic conditions.

Level of Service

Construction would generate an additional 55 p.m. peak-hour trips at the intersection of Jellystone Campground Road and Bottle Rock Road, using the same trip distribution assumptions made for

Table 3.2-1: Summary of Maximum Trip Generation During Construction

Use Type	Staffing		Mode				Weekday Daily Trips	PM Peak Hour Trips
	Employees	*Contract Help*	*Passenger Vehicles*	*Delivery Trucks**	*10-Wheelers*	*Trucks/ Trailers*		
Existing								
Steam Field Operations	13	16	29	0	0	0	58	15
Power Plant Operations	11	0	11	0	0	0	22	5
Miscellaneous		14	14	3	3	8	56	14
Sub-total (Existing Traffic Only)	**24**	**30**	**54**	**3**	**3**	**8**	**136**	**34**
Construction								
Drill Pad + Well + Access Road	0	30	30	10	10	36	172	38
Pipeline Construction	0	15	15	0	10	5	60	17
Sub-total (Construction Traffic Only)	0	45	45	10	20	41	232	55
Total (Construction and Existing Traffic)	**24**	**75**	**99**	**13**	**23**	**49**	**368**	**89**

* Includes pilot cars to accompany drill rig component deliveries via extra-legal size loads

SOURCE: RMT 2009

existing traffic volumes. This is a maximum estimate which assumes simultaneous construction of all project components. The resulting turning movement volumes are indicated in Figure 2.2-1.

Turning movements at this intersection were found to be less than the volumes previously evaluated at the intersection of High Valley Road and Bottle Rock Road, which is estimated to

operate at the same LOS or better, LOS A. LOS impacts from the use of the Jellystone Camp Resort Road and Bottle Rock Road intersection during project construction would be less than significant.

Traffic Volume. The proposed project is expected to generate 232 weekday daily trips, including 142 truck trips and 90 passenger vehicle trips. Approximately 24 percent, or 34 truck trips, would be expected during the p.m. peak hour Truck traffic would increase from 0 to 40 percent on Glenbrook Road and Lee Road, which would be considered a potentially significant increase in truck traffic. It is assumed that the increase of truck traffic on Jellystone Camp Resort Road would be less than 40 percent due to the existing volume of large RVs that use the campground.

Safety impacts from the potentially significant increase in truck traffic on Jellystone Camp Resort Road, Glenbrook Road, and Lee Road are addressed below under Traffic Safety.

Existing Road Infrastructure Compatibility. Construction traffic would include extra-legal size (overweight or extra-long) vehicles. Lee Road has recently been resurfaced and the existing roadbed was found to be sufficiently intact to support heavy and large vehicles. Existing grades for Glenbrook and Lee Road do not exceed 15 percent and could accommodate construction vehicles without additional grading or flattening.

Two existing bridges, one located at the entrance to Jellystone Camp Resort, and the other on Glenbrook Road near Bottle Rock Road, may be structurally insufficient to withstand the vehicle weights associated with the transport of drill pad construction equipment, and should be evaluated by a professional structural engineer if the Option A access route is selected. The Glenbrook Road Bridge will be completely replaced under emergency provisions before the project is implemented. Impacts from heavy vehicles using the alternative access route Option A roadways would be less than significant with the implementation of mitigation measure Traffic-1, which requires further evaluation and upgrade, as necessary.

> **Mitigation Measure Traffic-1:** The existing bridge on Jellystone Camp Resort Road would be evaluated by a professional structural engineer prior to project construction. The engineer's findings and recommendations would be implemented prior to use by project traffic.

In the event that repair of the bridge is recommended as a result of this assessment, the in-stream footprint would be avoided as much as possible and any work would be conducted in the driest part of the year. A Streambed Alteration Agreement with the California Department of Fish and Game (and possible authorizations from other regulatory agencies) would be required for any activities that affected the bed bank or channel of the creek. Less than significant impacts to biological resources would occur if the implementation of the Biology-7 (proposed CUP mitigation measure), identified in the PTA for High Valley Creek, is also implemented for Kelsey Creek.

If replacement of the bridge is recommended, a clear-span bridge (one that would span the banks of the creek entirely) would be installed to avoid impacts to the stream bed itself and any riparian vegetation. Additional mitigation in the form of tree replacement, bank re-vegetation and stabilization and appropriate drainage controls may also be required. Less than significant impacts to biological resources would occur with the implementation of the Biology-1 through Biology-8 (proposed CUP mitigation measures) identified in the PTA.

In both cases, bridge repair or bridge replacement, there would also be the potential for impacts to air quality, noise, traffic itself, and public safety. Impacts would all be less than significant with the implementation of: AQ-SC3 Construction Fugitive Dust Control and AQ-SC5 Diesel-Fueled Engines Control Conditions of Certification (COCs) identified in the PTA for construction equipment air emissions; NOISE-1 COC identified in the PTA for traffic-related noise; and TRANS-2 COC Worker Traffic Safety Training identified in the PTA for traffic safety, along with Mitigation Measure Traffic-2 identified below.

Traffic Safety. Proposed use of Jellystone Camp Resort Road, Glenbrook Road, and Lee Road would have the potential to significantly impact the safety of construction workers and the public. Area residents and recreationalists at the nearby Jellystone Camp Resort are particularly at risk for safety hazards given their proximity to the roadway and expected mode of transportation (i.e., pedestrian and bicycle traffic) on Glenbrook Road.

Safety impacts from the potentially significant increase in truck traffic would be reduced to a less than significant level with the implementation of the new mitigation measure Traffic-2, which requires posting additional safety signage and the previously identified Condition of Certification (COC) TRANS-2. Mitigation measure COC TRANS-2[1] in the revised Conditions of Certification (Section 4.4) specifies that the BRPP operator would implement a worker safety program to reduce safety hazards to workers and the travelling public.

> **Mitigation Measure Traffic-2:** Temporary traffic control signing would be installed on Jellystone Campground Road, Glenbrook Road, and Lee Road in conformance with the principles of the Manual on Uniform Traffic Control Devices – California Supplement (CA-MUTCD), Chapter 6 Temporary Traffic Control. Construction traffic routes would be delineated with construction traffic signs, including a G20-1, "Road Work Ahead" sign. Signs would be posted as close as possible to roadway entrances, for eastbound traffic on Jellystone Camp Resort Road near the Bottle Rock Road intersection, on Glenbrook Road approaching the Jellystone Camp Resort, and at the halfway point between Bottle Rock Road and Lee Road. Signs would be installed similarly for westbound traffic.

Implementation of mitigation measure Traffic-2 and COC TRANS-2 would ensure that the traffic safety impacts would be less than significant with mitigation.

Option B (Glenbrook Road, Lee Road only)

The impacts of Option B would be identical to those of Option A, with the once exception that Mitigation Measure Traffic-2 would not be necessary because Option B would not use the Jellystone Camp Resort Road and campers of the resort would not be affected.

[1] Conditions of Certification are measures included in the CEC Staff Decision for the original BRPP authorization. COC TRANS-2 is one of the measures that was updated and presented in the PTA.

Potential Impact: Potential to substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)

Option A (Jellystone Camp Resort Road, Glenbrook Road, and Lee Road)

There would be a temporary increase in the percentage of heavy vehicles on these roadways during construction, which could present a safety hazard to the travelling public and recreationalists. Extra-legal size loads necessary to delivery construction equipment to the project area may create a potentially significant impact on the safety of the traveling public on Jellystone Camp Resort Road, Glenbrook Road, and Lee Road. The implementation of mitigation measures Traffic-1 and COC TRANS-2 would reduce the impacts from safety hazards to a less than significant level.

The use of the campground as a route for construction traffic would introduce various semi truck-trailers. Although these large vehicles do not usually access the campground, they are comparable in size to existing campground traffic (i.e., RVs and camper-trailer-truck combinations). The campground is currently equipped with traffic warning signs, such as the 5 mph posted speed limit sign and a Slow Children at Play sign. These signs increase driver awareness to the potential presence of pedestrians and bicyclists in the area. The construction traffic drivers would be expected to adhere to the posted speed and keep an eye out for children, and the campground users would be expected to be concurrently aware of these large vehicles.

Portions of the existing Jellystone Camp Resort Road would be utilized by construction traffic. These segments are at a minimum 11 feet wide, including where the road passes trees and individual campsites. Vertical clearances exceed 15 feet along this road and are adequate for semi tractor-trailer trucks to access. Construction traffic would exit the campground through an existing campsite and adjoining open space. The removal of the campsite may present a safety hazard to campground users since the traffic route would not be clearly defined and separated from pedestrian uses. Impacts related to safety hazards from the use of the campground as an access route for construction traffic would be reduced to a less than significant level with implementation of mitigation measure Traffic-3.

> **Mitigation Measure Traffic-3:** A well defined access road would be constructed between the existing Jellystone Camp Resort Road and Glenbrook Road. The new access road would maintain a minimum width of 10 feet throughout its approximately 140 foot length. The road right-of-way would be clearly demarked with temporary warning fencing to keep campground users away from the access road during the construction period. Construction of this road would include tree trimming to maintain a 15 foot vertical clearance, creating a compacted roadbed, and removal or relocation of existing campsite amenities and associated landscaping. Vegetation management and minor grading would be implemented to ensure trucks can safely turn onto Glenbrook Road from the campground.

Minor tree trimming, vegetation management, compacting and minor grading in a previously disturbed area, would not affect adjacent habitat values and would constitute a less than significant impact to biological resources with the implementation of the Biology-1 through

Biology-8 (proposed CUP mitigation measures) identified in the PTA. With the potential exception of public safety, there would be no impacts to other resources since this new access road through the Jellystone campground would be constructed on already disturbed land. Potential public safety impacts would be reduced to a less than significant level with the implementation of TRANS-2 COC Worker Traffic Safety Training identified in the PTA for traffic safety, and the new mitigation measure (Mitigation Measure Traffic-2), identified above.

Option B (Glenbrook Road, Lee Road only)

The impacts of Option B would be identical to those of Option A, with the once exception that Mitigation Measure Traffic-3 would not be necessary because Option B would not use the Jellystone Camp Resort Road and campers of the resort would not be affected.

Potential Impact: Potential to result in inadequate emergency access

Option A (Jellystone Camp Resort Road, Glenbrook Road, and Lee Road)

Jellystone Camp Resort Road, Glenbrook Road and Lee Road are often less than 20 feet wide and unable to accommodate two-way travel. Construction traffic would include various size trucks including semi tractor-trailer trucks on all roadways within the project area. Emergency vehicles would be forced to wait until an oncoming vehicle passes or moves out of the way with the increase in traffic volumes and vehicle sizes. In addition, construction vehicles carrying significant loads (e.g., when transporting well drilling equipment) would be traveling below the posted speed of 5 mph. Slow moving construction traffic could potentially significantly impact emergency vehicle access and response times.

Seven existing turnouts have been identified along Glenbrook Road and Lee Road that range from 40 to 100 feet wide. Other turnouts exist along Glenbrook Road and Lee Road, however, only the locations of the seven largest ones are shown on Figure 1.1-1.

Turnouts would enable large vehicles to stop and allow oncoming vehicles to pass construction traffic. The presence of flaggers equipped with radio or telephone communication would ensure construction traffic would stop at turnout locations for emergency vehicles. Turnouts 1, 4, 5, and 7 (Figure 1.1-1) would require additional tree trimming and/or shrubbery removal to maintain a suitable travel path for passing vehicles. Impacts to emergency access would be reduced to a less than significant level with the implementation of mitigation measure Traffic-4.

> **Mitigation Measure Traffic-4:** A minimum of seven vehicle turnouts should be kept clear of obstructions and provide a minimum 20-foot wide by 40-foot long area for two-way traffic to pass construction traffic on Glenbrook Road and Lee Road. A minimum of three flaggers and related traffic control devices would be stationed along the route in accordance with CA-MUTCD, Chapter 6 Temporary Traffic Controls to ensure two-way traffic would be maintained along the access route.

Minor tree trimming and/or shrubbery removal would not affect adjacent habitat values and would constitute a less than significant impact to biological resources with the implementation of the Biology-1 through Biology-8 (proposed CUP mitigation measures) identified in the PTA.

Option B (Glenbrook Road, Lee Road only)

The impacts from Option B would be identical to those identified for Option A above.

Potential Impact: Potential to result in inadequate parking capacity

Option A (Jellystone Camp Resort Road, Glenbrook Road, and Lee Road)

The use of Jellystone Camp Resort Road, Glenbrook Road, and Lee Road, as an access route for construction traffic for the proposed project, would not change impacts to parking. Parking impacts have been analyzed in the PTA (RMT 2009).

Option B (Glenbrook Road, Lee Road only)

Impacts from Option B would be identical to those of Option A.

Potential Impact: Potential to conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts and bicycle racks)

Option A (Jellystone Camp Resort Road, Glenbrook Road, and Lee Road)

The proposed project is not expected to serve alternative modes of transportation including air, rail, transit, bicycle, and pedestrian modes. The use of Jellystone Camp Resort Road, Glenbrook Road, and Lee Road would not conflict with Lake County policies, plans, and programs that support these alternative modes; therefore, the project would have no impact on alternative mode facilities.

Option B (Glenbrook Road, Lee Road only)

Impacts from Option B would be identical to those of Option A.

Potential Impact: Potential to conflict with applicable laws, regulations, ordinances, standards, adopted local, regional, state, and federal plans, leases, and permits related to traffic and transportation

Option A (Jellystone Camp Resort Road, Glenbrook Road, and Lee Road)

Modifications and use of Jellystone Camp Resort Road, Glenbrook Road, and Lee Road, would conform to federal, state or local laws and requirements. Applicable federal, state, and local laws, ordinances, regulations, and standards (LORS) are listed in Section 4.0: Regulatory Setting and Conditions of Certification. No significant impacts would occur.

Option B (Glenbrook Road, Lee Road only)

Impacts from Option B would be identical to those of Option A.

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4: Regulatory Setting and Conditions of Certification

The project would comply with applicable Laws, Ordinances, Regulations, and Standards (LORS) pertaining to traffic and transportation. Applicable LORS are summarized below.

4.1 Applicable LORS

4.1.1 FEDERAL LORS

Code of Federal Regulations

Title 49, Code of Federal Regulations (CFR), Sections 171-173 and 177 include general information, regulations, and definitions pertaining to the transportation of hazardous materials, the types of materials defined as hazardous, shipping requirements, marking of transportation vehicles, training requirements, and carriage by public highways.

Title 49, CFR, Sections 350-399 and Appendices A through G address safety issues for transport of goods, materials, and substances over public highways.

Hazardous Materials Act of 1974

The Hazardous Materials Act of 1974, which is overseen by the Federal Department of Transportation, governs the transportation of hazardous materials in the nation. The main objective of this policy is to improve regulations and enforcement efforts that deal with the transportation of hazardous materials in commerce.

4.1.2 STATE LORS

California Vehicle Code

Section 353 defines hazardous materials.

Sections 31303-31309 include regulations for the transportation of hazardous materials, routes used, and any applicable restrictions.

Section 34500 et seq., regulates the safe operation of vehicles and includes those that are used for the transportation of hazardous materials.

Sections 2500-2505 authorize the issuances of licenses by the Commissioner of CHP for the transportation of hazardous materials, including explosives.

Division 15, Size, Weight, and Load, Chapter 5, Article 6 states transported load regulations. Approvals from the State Department of Transportation are required for transportation of oversized or excessive loads over state highways, including limitations based on axles and wheel base lengths.

California Streets and Highway Code

Sections 117 and 660-672 and California Vehicular Code (CVC) 35780 et. seq., requires permits for the transportation of oversized loads on county roads.

4.1.3 LOCAL LORS

Lake County General Plan

The Lake County General Plan, Transportation and Circulation Element include the following policies and goals applicable to the proposed project:

- Goal T-1, which provides an objective "to plan and provide a unified, coordinated and cost-efficient countywide road and highway system that ensures safety and maintains adequate LOS and efficient movement of people and merchandise."
- Policy T-1.2, which provides guidance for road standards, noting "roads should be improved and constructed to the design standards recommended by the County Department of Public Works…and shall be based on the AASHTO standards, and supplemented by Caltrans and County Standards." Lake County road standards are summarized in Table 4.1-1 below.
- Policy T-1.8 specifies acceptable traffic operation on county roads as LOS C or better where feasible and provides that LOS E is acceptable where "improving the segment to LOS C is deemed infeasible due to cost, negative community and/or environmental impacts, and constructability issues."
- Policy T-1.9 provides guidance on heavy vehicle traffic, including establishing truck routes and otherwise restricting truck traffic routes to limit the impact in residential areas and near noise sensitive land uses.

Table 4.1-1: Lake County Road Standards

Design Parameter	Road Classification			
	Minor Arterial	Major Collector	Minor Collector	Local Street
Design Speed	60 mph	50 mph	40 mph	30 mph
Number of Lanes	2-4	2-4	2	2
Lane Width	12 ft	12 ft	11 ft	11 ft
Right-of-Way Width	60 ft	50 ft (min)	50 ft	50 ft
Maximum Grade	12%	12%	12%	16%

SOURCE: Lake County 2008

The Lake County General Plan, Land Use and Geothermal Resources Elements include the following policies and goals applicable to the proposed project:

- **Policy LU-5.5 Access.** The County shall locate industrial development where there is access from collector or arterial roads, and where industrial/heavy commercial traffic is not routed through residential or other areas with uses not compatible with such traffic.

Lake County Road Design and Construction Standards

The Lake County Road Design and Construction Standards, Section 3, Road Design Standards, provide guidance for design of the structural section and appropriate TI for county roads (Lake County 2007).

Lake County Community Wildfires Protection Plan

The Draft Lake County Community Wildfire Protection Plan (CWPP) provides guidance for private roadways and states, "A clearance of 20 feet (width) and 15 feet (height) is needed along roads and driveways, as well as a turnaround of a minimum of 45-feet radius, or a Hammerhead Turnout measuring 60-feet long, 10-feet wide, and facing perpendicular to the driveway. Maintain good access to your house for fire apparatus (wide enough for two vehicles to pass, built to carry at least 40,000 lbs, less than 15 percent grade, room to turn etc.)"(Lake County 2009).

4.2 Agencies and Agency Contacts

No additional agencies were contacted for the preparation of this traffic addendum.

4.3 Permits Required and Permit Schedule

No permit approvals would be required for the use of Jellystone Camp Resort Road, Glenbrook Road, or Lee Road as an access route to the project area.

4.4 Conditions of Certification

The CEC Conditions of Certification currently applicable to the BRPP were originally adopted by the CEC in 1980, suspended in 1993 in part to modify environmental monitoring and reporting requirements in consideration of BRPP's suspended status (Order 93-0426-02). The COCs were modified again in 2006 in conjunction with the refurbishment and restart of the facility (Order 06-1213-12). Bottle Rock Power intends to comprehensively update the applicable COCs currently in effect for BRPP to reflect CEC's current standards, as well as to amend, add, or strike any COCs necessary to address the proposed project's activities. The following COCs have been updated to include the use of Glenbrook Road.

4.4.1 PROPOSED CONDITIONS OF CERTIFICATION

Currently, there are no existing conditions of certification relating to Traffic and Transportation. The project owner proposes the following conditions considered as standard by the CEC with the use of both alternative access route options.

COCTRANS-2: Worker Traffic Safety Training

The project owner shall brief and train all construction workers that commute to the site, and all truck drivers and delivery drivers that drive to and from the site during construction, on safety awareness and standards with regard to the nearby bus stop(s) and with regard to school children safety. The briefing and training shall be conducted for such workers and drivers before they begin working at the site and shall include, among other safety issues, the following elements:

- California highway and driving laws and regulations that relate to school busses and school children;
- The locations of bus stops and residences along the traffic routes in the vicinity of the site;
- The approximate times that school bus routes are driven to pick up and to drop off students;
- The type of risks to school children that can arrive on rural highways and roads during elevated construction traffic periods;
- The particular risks that can arise during low visibility conditions such as when foggy or at night;
- The need to be exceptionally careful and patient when following a slower moving vehicle to ensure heightened danger activities such as passing do not endanger others; and
- The need to be exceptionally alert and cautious during the morning and afternoon school bus periods and also the need to be alert for shortened days that result in school buses being present at unusual times.

  Verification: The project owner shall report the results of the worker traffic safety training in its monthly compliance reports submitted to the CPM, beginning with the first report after site mobilization and continuing until construction is completed.

5: References

California Department of Transportation (Caltrans). 2006. California Manual on Uniform Traffic Control Devices for Streets and Highways.

California Highway Patrol (CHP). 2009. Statewide Integrated Traffic Records System (SWITRS). Website: http://www.chp.ca.gov/switrs/. Accessed December 21, 2009.

Lake County. 2007. Road Design and Construction Standards.

_____. 2008. Lake County General Plan. Website: http://www.co.lake.ca.us/Government/Directory/Community_Development/Documents/2008FinGP.htm. Accessed September 15, 2009.

_____. 2009. Draft Lake County Community Wildfire Protection Plan (CWPP). 2009. Website: http://www.co.lake.ca.us/Assets/BOS/docs/CHAP+8+ACTION+PLAN.pdf. Accessed December 21, 2009.

Lake County/City Area Planning Council. 2006. Lake County Regional Bikeway Plan. Website: http://www.lakeapc.org/docs/2006%20Lake%20Regional%20Bikeway-Final.pdf. Accessed December 21, 2009. August 2006.

RMT, Inc (RMT). 2009. Petition to Amend the California Energy Commission Final Decision on Bottle Rock Power Plan (79-AFC-4C). September 2009.

Transportation Research Board. 2000. High Capacity Manual.

Yung, Mary Jo. 2010. Professional Engineer at Whitlock and Weinberger Transportation. Personal communication with Allison Lorenzi of RMT, Inc. on January 5, 2010.

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APPENDIX A:
Level of Service Calculations

HCS+: Unsignalized Intersections Release 5.4

TWO-WAY STOP CONTROL SUMMARY

Analyst: V Aguayo
Agency/Co.: W-Trans, Inc
Date Performed: 10/27/2009
Analysis Time Period: 10/27/09
Intersection: Glenbrook Rd/Bottle Rock Rd
Jurisdiction: County of Lake
Units: U. S. Customary
Analysis Year: 2009
Project ID: BRP Steam Project
East/West Street: Glenbrook Road
North/South Street: Bottle Rock Road
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	1	88		2	53	
Peak-Hour Factor, PHF	0.90	0.90		0.90	0.90	
Hourly Flow Rate, HFR	1	97		2	58	
Percent Heavy Vehicles	10	--	--	10	--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes	0	1		0	1	
Configuration		LT			LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				1	0	1
Peak Hour Factor, PHF				0.90	1.00	0.90
Hourly Flow Rate, HFR				1	0	1
Percent Heavy Vehicles				0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Lanes				0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT	LT					LTR	
v (vph)	1	2					2	
C(m) (vph)	1496	1448					901	
v/c	0.00	0.00					0.00	
95% queue length	0.00	0.00					0.01	
Control Delay	7.4	7.5					9.0	
LOS	A	A					A	
Approach Delay							9.0	
Approach LOS							A	

Phone: Fax:
E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: V Aguayo
Agency/Co.: W-Trans, Inc
Date Performed: 10/27/2009
Analysis Time Period: 10/27/09
Intersection: Glenbrook Rd/Bottle Rock Rd
Jurisdiction: County of Lake
Units: U. S. Customary
Analysis Year: 2009
Project ID: BRP Steam Project
East/West Street: Glenbrook Road
North/South Street: Bottle Rock Road
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street Movements	1 L	2 T	3 R	4 L	5 T	6 R
Volume	1	88		2	53	
Peak-Hour Factor, PHF	0.90	0.90		0.90	0.90	
Peak-15 Minute Volume	0	24		1	15	
Hourly Flow Rate, HFR	1	97		2	58	
Percent Heavy Vehicles	10	--	--	10	--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes	0	1		0	1	
Configuration	LT			LT		
Upstream Signal?		No			No	

Minor Street Movements	7 L	8 T	9 R	10 L	11 T	12 R
Volume				1	0	1
Peak Hour Factor, PHF				0.90	1.00	0.90
Peak-15 Minute Volume				0	0	0
Hourly Flow Rate, HFR				1	0	1
Percent Heavy Vehicles				0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage				/		No /
RT Channelized?						
Lanes				0	1	0
Configuration					LTR	

Pedestrian Volumes and Adjustments

Movements	13	14	15	16
Flow (ped/hr)	0	0	0	0

Lane Width (ft)	12.0	12.0	12.0	12.0
Walking Speed (ft/sec)	4.0	4.0	4.0	4.0
Percent Blockage	0	0	0	0

Upstream Signal Data

	Prog. Flow vph	Sat Flow vph	Arrival Type	Green Time sec	Cycle Length sec	Prog. Speed mph	Distance to Signal feet
S2 Left-Turn							
Through							
S5 Left-Turn							
Through							

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

	Movement 2	Movement 5
Shared ln volume, major th vehicles:	97	58
Shared ln volume, major rt vehicles:	0	0
Sat flow rate, major th vehicles:	1700	1700
Sat flow rate, major rt vehicles:	1700	1700
Number of major street through lanes:	1	1

Worksheet 4-Critical Gap and Follow-up Time Calculation

Critical Gap Calculation

Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
t(c,base)	4.1	4.1				7.1	6.5	6.2
t(c,hv)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
P(hv)	10	10				0	0	0
t(c,g)			0.20	0.20	0.10	0.20	0.20	0.10
Percent Grade			0.00	0.00	0.00	0.00	0.00	0.00
t(3,lt)	0.00	0.00				0.70	0.00	0.00
t(c,T): 1-stage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-stage	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
t(c) 1-stage	4.2	4.2				6.4	6.5	6.2
2-stage	4.2	4.2				5.4	5.5	6.2

Follow-Up Time Calculations

Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
t(f,base)	2.20	2.20				3.50	4.00	3.30
t(f,HV)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
P(HV)	10	10				0	0	0
t(f)	2.3	2.3				3.5	4.0	3.3

Worksheet 5-Effect of Upstream Signals

Computation 1-Queue Clearance Time at Upstream Signal

	Movement 2		Movement 5	
	V(t)	V(l,prot)	V(t)	V(l,prot)
V prog				

Total Saturation Flow Rate, s (vph)	
Arrival Type	
Effective Green, g (sec)	
Cycle Length, C (sec)	
Rp (from Exhibit 16-11)	
Proportion vehicles arriving on green P	
g(q1)	
g(q2)	
g(q)	

Computation 2-Proportion of TWSC Intersection Time blocked	Movement 2		Movement 5	
	V(t)	V(l,prot)	V(t)	V(l,prot)
alpha				
beta				
Travel time, t(a) (sec)				
Smoothing Factor, F				
Proportion of conflicting flow, f				
Max platooned flow, V(c,max)				
Min platooned flow, V(c,min)				
Duration of blocked period, t(p)				
Proportion time blocked, p	0.000		0.000	

Computation 3-Platoon Event Periods	Result
p(2)	0.000
p(5)	0.000
p(dom)	
p(subo)	
Constrained or unconstrained?	

Proportion unblocked for minor movements, p(x)	(1) Single-stage Process	(2) Two-Stage Process Stage I	(3) Stage II
p(1)			
p(4)			
p(7)			
p(8)			
p(9)			
p(10)			
p(11)			
p(12)			

Computation 4 and 5 Single-Stage Process								
Movement	1 L	4 L	7 L	8 T	9 R	10 L	11 T	12 R
V c,x	58	97				161	161	58
s								
Px								
V c,u,x								
C r,x								
C plat,x								

Two-Stage Process				
	7	8	10	11

	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2	Stage1	Stage2
V(c,x)					62	99	62	99
s						1500		1500
P(x)								
V(c,u,x)								
C(r,x)								
C(plat,x)								

Worksheet 6-Impedance and Capacity Equations

Step 1: RT from Minor St.	9	12
Conflicting Flows		58
Potential Capacity		1014
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity		1014
Probability of Queue free St.	1.00	1.00
Step 2: LT from Major St.	4	1
Conflicting Flows	97	58
Potential Capacity	1448	1496
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	1448	1496
Probability of Queue free St.	1.00	1.00
Maj L-Shared Prob Q free St.	1.00	1.00
Step 3: TH from Minor St.	8	11
Conflicting Flows		161
Potential Capacity		735
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity		733
Probability of Queue free St.	1.00	1.00
Step 4: LT from Minor St.	7	10
Conflicting Flows		161
Potential Capacity		835
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity		833

Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance

Step 3: TH from Minor St.	8	11
Part 1 - First Stage		
Conflicting Flows		62
Potential Capacity	817	847
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity	816	846
Probability of Queue free St.	1.00	1.00

Part 2 - Second Stage		
Conflicting Flows		99
Potential Capacity	847	817
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity	846	816
Part 3 - Single Stage		
Conflicting Flows		161
Potential Capacity		735
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity		733
Result for 2 stage process:		
a	0.91	0.91
y		1.40
C t		712
Probability of Queue free St.	1.00	1.00
Step 4: LT from Minor St.	7	10
Part 1 - First Stage		
Conflicting Flows		62
Potential Capacity	930	966
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity	929	965
Part 2 - Second Stage		
Conflicting Flows		99
Potential Capacity	966	930
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity	964	929
Part 3 - Single Stage		
Conflicting Flows		161
Potential Capacity		835
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	1.00	
Maj. L, Min T Adj. Imp Factor.	1.00	
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00
Movement Capacity		833
Results for Two-stage process:		
a	0.91	0.91
y		1.40
C t		810

Worksheet 8-Shared Lane Calculations

Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume (vph)				1	0	1
Movement Capacity (vph)				810	712	1014
Shared Lane Capacity (vph)					901	

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement	7	8	9	10	11	12
	L	T	R	L	T	R
C sep				810	712	1014
Volume				1	0	1
Delay						
Q sep						
Q sep +1						
round (Qsep +1)						
n max						
C sh					901	
SUM C sep						
n						
C act						

Worksheet 10-Delay, Queue Length, and Level of Service

Movement	1	4	7	8	9	10	11	12
Lane Config	LT	LT					LTR	
v (vph)	1	2					2	
C(m) (vph)	1496	1448					901	
v/c	0.00	0.00					0.00	
95% queue length	0.00	0.00					0.01	
Control Delay	7.4	7.5					9.0	
LOS	A	A					A	
Approach Delay							9.0	
Approach LOS							A	

Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(il), Volume for stream 2 or 5	97	58
v(i2), Volume for stream 3 or 6	0	0
s(il), Saturation flow rate for stream 2 or 5	1700	1700
s(i2), Saturation flow rate for stream 3 or 6	1700	1700
P*(oj)	1.00	1.00
d(M,LT), Delay for stream 1 or 4	7.4	7.5
N, Number of major street through lanes	1	1
d(rank,1) Delay for stream 2 or 5	0.0	0.0