Mining and Reclamation Plan for the Mark West Quarry Expansion

Draft Environmental Impact Report

State Clearinghouse # 2005062093

May 2013

Prepared for:
Sonoma County Permit and Resource Management Department

Prepared by:
Leonard Charles & Associates

DRAFT ENVIRONMENTAL IMPACT REPORT

MINING AND RECLAMATION PLAN
for the
MARK WEST QUARRY EXPANSION

May 2013

STATE CLEARINGHOUSE NO. 2005062093

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1.0 INTRODUCTION CHAPTER

1.1 PURPOSE OF THE EIR

This Draft Environmental Impact Report (EIR) addresses the potential impacts of the proposed expansion of the Mark West Quarry (hereafter called "the project"). The applicant, BoDean Company, Inc. proposes to expand its existing 87-acre Mark West Quarry that is located about 9 miles north-northeast of the City of Santa Rosa to include an additional 81 acres. The total mined area would increase by approximately 32 acres over the 20-year mining period. The proposed project includes: 1) rezoning of a portion of an 81-acre parcel adjacent to the existing quarry property to add the Mineral Resource Combining District that would allow the mining of this property; 2) approval of a Use Permit to allow the mining of the expanded quarry at the currently allowed maximum production rate of 500,000 cubic yards per year (which is the equivalent of 750,000 tons per year) for a 20-year period; and 3) approval of a revised Reclamation Plan that directs how the proposed expansion site would be reclaimed at the end of the use permit.

Although the existing quarry is currently permitted to produce up to 500,000 cubic yards per year, for the five years prior to the current project application, the average annual production rate was 305,000 cubic yards (457,500 tons), The average annual production rate of 305,000 cubic yards is the environmental baseline that is used in this EIR to determine project impacts. The off-site impacts of the project (e.g., traffic and air quality impacts) are the impacts arising from the 195,000-cubic yard (approximately 293,000-ton) increase in production over the baseline. On-site impacts are those caused by mining and reclamation of the proposed project site.

This EIR has been prepared in conformance with the provisions of the *California Environmental Quality Act (CEQA) Guidelines* as amended to date. CEQA requires that public agencies prepare and certify an EIR before carrying out projects that may have significant effects on the environment (Public Resources Code Section 21080). Preparation of an EIR is the responsibility of the "lead agency," the public agency that has the principal responsibility for carrying out or approving the project (Public Resources Code, Section 21067). Because the County of Sonoma is the agency that would approve the proposed project, it is the lead agency for the project.

The EIR has been prepared under contract to the County of Sonoma (hereafter called "the County"). This EIR is an informational document that is intended to inform the County (the Lead Agency), other public agency decision-makers, and the public of the significant environmental effects of the proposed project, potential mitigation measures that address these impacts, and alternatives to the proposed project. The County will consider the information in this EIR along with other information presented during the decision-making process when determining whether to approve or modify the proposed project or an alternative. The information contained in this EIR does not control the County's ultimate decision on the project. However, if the County decides to approve the project, then the County must respond to each significant effect identified in the EIR by making findings under Section 15091 of the *CEQA Guidelines* and, if necessary, making a Statement of Overriding Consideration under Section 15093.

1.2 CONTENTS OF THE EIR

This EIR has been prepared by the County of Sonoma as Lead Agency in conformance with the California Environmental Quality Act (CEQA). As such, it provides objective information addressing the environmental consequences of the proposed project and possible ways to reduce or avoid these impacts.

This EIR addresses all the areas of potentially significant impact as well as other potential impact areas that CEQA requires an EIR to investigate. The environmental effects of the project are analyzed for each topic. The *CEQA Guidelines* define the effects of a project as changes from the environmental setting (i.e., existing conditions) that are attributable to the project. Particularly pertinent sections of the *CEQA Guidelines* are listed below.

> **Section 15121(a) (Information Document)** states that "an EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts."
>
> **Section 15151 (Standards for Adequacy of an EIR)** states that an EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make an informed decision taking into account the environmental consequences of the project. The evaluation of the environmental effects does not need to be exhaustive. Disagreement among experts does not make an EIR inadequate, though the EIR will summarize the main points of disagreement among the experts.
>
> **Section 15003 (I and j) (Policies)** states that technical perfection is not necessary, but adequacy, completeness, and a good-faith effort at full disclosure are required. "CEQA requires that decisions be informed and balanced. It must not be subverted into an instrument for the oppression and delay of social, economic, or recreational development or advancement."
>
> **Section 15143 (Emphasis)** states that the EIR shall focus on the significant effects on the environment. The significant effects will be discussed with emphasis in proportion to their severity and probability of occurrence. Effects dismissed in the Initial Study as clearly insignificant and unlikely to occur need not be discussed further in the EIR. Discussion of each major topic includes criteria used to evaluate whether an environmental impact is significant or insignificant.
>
> **Section 15002(g) (Significance)** states that a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project. The significance criteria for each topic in this EIR have been developed based on

guidelines set forth in the *CEQA Guidelines* as modified in some cases by standards established by the County. This EIR lists the thresholds of significance for each area of impact and assesses whether the project's impacts exceed these thresholds. If the impact does not exceed the threshold or if the recommended mitigation measures reduce the impact below the thresholds, then the impact is considered to be less-than-significant.

1.3 PUBLIC REVIEW AND COMMENT

A. Notice of Preparation

The County originally issued a Notice of Preparation (NOP) to prepare an EIR on the project on July 21, 2004. This original NOP is on file with the Sonoma County Permit and Resource Management Department County (PRMD). The County received seven written responses to the NOP. These letters are on file with PRMD.

Subsequent to the circulation of this original NOP and inception of preparation of the Draft EIR for the original project, the contract for the EIR was terminated while the applicant redesigned the project. Although environmental review of the revised project began in 2010, a Revised NOP was issued June 15, 2011 for this now revised project; the public review period on the Revised NOP ended on July 14, 2011. The County received five written responses to the second NOP. This NOP and responses to it are on file with PRMD.

B. Public Scoping Meeting

A Public Scoping Meeting was held in Santa Rosa on July 21, 2005. It was attended by approximately 15 people. Three members of the public offered comments on the scope of the EIR and the project.

C. Distribution of the Draft EIR

A public review period of at least 45 days is provided for this Draft EIR. This review period begins on the publication date of the Notice of Completion of the Draft EIR. During the public review period, the County will hold one public hearing on the Draft EIR. In addition, public agencies and interested individuals may submit comments in writing to Rich Stabler, Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, CA 95403-2829.

The information contained in this report is considered to be accurate, but it is subject to review and comment by the County and other responsible agencies. The public is also invited to review the document and comment on its accuracy and completeness.

D. Certification of the Final EIR

Once the public review period is closed, a Final EIR will be prepared. The Final EIR will incorporate this Draft EIR by reference, and it will contain all of the comments on this Draft EIR, responses to those comments, and any necessary revisions to the text of this

Draft EIR. The Final EIR will be considered by the Sonoma County Planning Commission. When the Planning Commission considers the EIR to be complete and accurate, it will make recommendations to the Board of Supervisors (the Board) regarding certification of the EIR and project approval. The Board will then consider the EIR and certify the document if they conclude it meets CEQA requirements. The Final EIR must be certified before any action on the proposed project can occur. After the Board has certified the EIR, it will consider the merits of the project and determine whether to approve the project or a project alternative or deny the project. If it approves the project or a project alternative, a Notice of Determination will be filed with the State Office of Planning and Research and the Sonoma County Clerk.

Before the project is approved, the Board of Supervisors would be required to find (per CEQA Guidelines Section 15091) for each significant impact of the project: that changes in the project would reduce the impact to a level that is less than significant; that such changes are within the jurisdiction of a public agency other than the County; or that mitigation measures and alternatives are infeasible. For impacts that the County determines cannot be mitigated to a less than significant level, it would be necessary for the Board of Supervisors to adopt a Statement of Overriding Considerations (per CEQA Guidelines Section 15093) that describes how benefits of the project outweigh those impacts before approving the project.

1.4 RANGE OF ALTERNATIVES ASSESSED IN THE EIR

CEQA requires that a reasonable range of alternatives be discussed in an EIR. In Chapter 6.0, this EIR identifies and analyzes such a reasonable range of alternatives; discusses the environmental effects of each alternative; compares the environmental effects of each alternative with the environmental setting and with the project; and addresses the relationship of each alternative to the project objectives. The determinations of the County concerning the feasibility, acceptance, or rejection of each and all alternatives considered in this EIR will be addressed and resolved in the County's findings when it considers approval of the project, as required by CEQA.

The alternatives consist of the following:

1. No Project Alternative consisting of 1A, No Project and No Subsequent Development Alternative, and 1B, No Project with Reasonably Foreseeable Development Alternative;

2. Reduced Production Alternative; and

3. Reduced Mining Footprint Alternative.

1.5 INTENDED USES OF THE EIR

A. Lead Agency

The Lead Agency under CEQA for the project is the County of Sonoma. The Sonoma County Board of Supervisors will be responsible for certifying the EIR and making a decision on the proposed rezoning of Assessors Parcel No. 120-21-031 to the Mineral Resource District overlay, approval of a Use Permit to expand the quarry, approval of a Use Permit to allow timberland conversion, and approval of a Reclamation Plan.

If the proposed Use Permit is approved, it would be limited to a 20-year mining duration, the maximum allowed under the County's Aggregate Resource Management Plan (ARM Plan). The required Reclamation Plan would also address the quarrying that would occur during this 20-year time span.

The Sonoma County Planning Commission will review the EIR and make a recommendation to the Board of Supervisors on whether to certify the document. The Planning Commission may also make recommendations on the project itself.

The Sonoma County Permit and Resource Management Department (PRMD) will review project construction plans. PRMD reviews the consistency of the project with the County General Plan, the County Aggregate Resource Management Plan, and the *Sonoma County Surface Mining and Reclamation Ordinance,* and makes recommendations on the project to the Planning Commission. PRMD is responsible for overseeing the preparation of this Environmental Impact Report. PRMD is also responsible for issuing grading permits and building permits; and regulating individual on-site wastewater systems in the County. PRMD also issues encroachment permits for work in County roadways. The County Fire and Emergency Services Department will review the project as regards fire safety and response. The County Sheriff's Department is responsible for issuing the blasting permit for quarry operations.

B. Responsible Agencies

Responsible Agencies are agencies that must issue some form of permit or determination for the project and, thus, rely on the EIR for the environmental documentation required prior to issuing said permit. Potential Responsible Agencies and required approvals for the proposed Mark West Quarry expansion project are listed below.

1. *North Coast Regional Water Quality Control Board (RWQCB)* regulates discharges to waterways through the adoption of Waste Discharge Requirements (WDR) and National Pollution Discharge Elimination System (NPDES) permits.

2. *Department of Fish and Wildlife (CDFW)* is also a Trustee Agency and has authority to oversee work done in streams pursuant to Fish and Game Code 1601 and 1603 In January 2013, the California Department of Fish and Game changed its name to the Department of Fish and Wildlife. However, the legal code has not been changed to reflect this name change, so the code remains called the Fish and Game Code). An applicant who proposes to substantially

divert the natural flow of a stream, substantially alter its bed or bank, or use any material from the streambed must first enter into a “Streambed Alteration Agreement” with CDFW.

3. *California Department of Forestry and Fire Protection (CAL FIRE)* is responsible for approving a Timberland Conversion Permit and a Timber Harvest Permit.

4. *Department of Conservation* is responsible for implementation of the State Surface and Mining Reclamation Act (SMARA). The Department will review the project Reclamation Plan.

5. *Department of Toxic Substances Control* oversees the clean-up of sites where hazardous substances, including asbestos, have been released.

6. *Bay Area Air Quality Management District* must approve an Authority to Construct and a Permit to Operate.

C. Other Agencies

In addition to the Lead and Responsible Agencies, including those that may issue some form of permit for the project, the Draft EIR will be sent to Federal, State, and local agencies that provide services in the area. These include:

1. *Office of Planning and Research* circulates EIRs for review by State agencies

2. *Native American Heritage Commission* is mandated to preserve and protect places of special religious or cultural significance pursuant to Section 5097 et seq. of the Public Resources Code.

3. *Army Corps of Engineers* regulates activities that have the potential to affect navigable waters under Section 10 of the Rivers and Harbors Act of 1899 (Section 10 permits) and waters of the United States under Section 404 of the Clean Water Act (Section 404 permit). The Corps would be responsible for determining its jurisdiction over wetlands and waters of the U.S. that would be removed or filled and determining what level of mitigation would be required for that removal/filling.

4. *Environmental Protection Agency* oversees the analysis of the Army Corps of Engineers regarding the issuance of permits for filling wetlands under Section 404 permits and issues permits for point source discharges to waterways.

5. *U.S. Fish and Wildlife Service* administers the Federal Endangered Species Act and the Marine Mammal Protection Act. The USFWS is an advisory agency to the Army Corps on Section 404 and Section 10 projects. The USFWS reviews mitigation plans for these projects.

6. *National Marine Fisheries Service* administers the Federal Endangered Species Act and the Marine Mammal Protection Act as they pertain to marine and anadromous species.

7. *Association of Bay Area Governments* is a regional agency dealing with land use, housing, environmental quality and economic development in the nine counties and 101 cities within the Bay Area.

8. *Mountain Volunteer Fire Department* is a volunteer fire department that would provide first response to fire-related incidents at the quarry site.

The Draft EIR will also be sent to any identified trustee agencies. The *CEQA Guidelines* (Section 15386) define "trustee agency" as "a State agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California." Trustee Agencies include the California Department of Fish and Wildlife, which has jurisdiction over State fish and wildlife, designated rare or endangered native plants, and game refuges, ecological reserves, and other areas. (See discussion under "Responsible Agencies" above.)

1.6 EIR ORGANIZATION

After this ***Introduction Chapter***, the Draft EIR is organized as follows:

1. ***Chapter 2.0, Summary of Findings***, identifies areas of controversy, highlights the important effects of implementing the project, and identifies the measures available to mitigate significant adverse impacts.

2. ***Chapter 3.0, Project Description***, describes the location of the project site, existing land uses on and near the project site, all aspects of the project as proposed, and the approvals and permits required before the project could be implemented, if approved.

3. ***Chapter 4.0, Environmental Impact Analysis,*** describes existing environmental conditions on the site and within the study area, identifies probable impacts from implementing the project, and describes mitigation measures required to substantially reduce or eliminate potentially significant adverse impacts.

4. ***Chapter 5.0, Other CEQA Considerations,*** discusses growth-inducing impacts, irreversible environmental changes, and cumulative impacts.

5. ***Chapter 6.0, Project Alternatives, a***ssesses the difference in outcome between the project and three alternatives. This chapter also identifies an environmentally superior alternative among the alternatives.

6. ***Chapter 7.0, Report Preparation,*** includes a list of the report preparers and the people and organizations consulted, plus the bibliography.

7. ***Chapter 8, Appendices,*** include technical background material supporting the Draft EIR text.

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2.0 SUMMARY OF FINDINGS CHAPTER

This summary section is provided in accordance with State CEQA Guidelines Section 15123. As stated in the State CEQA Guidelines Section 15123(a), "(a)n EIR shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." State CEQA Guidelines Section 15123(b) states, "(t)he summary shall identify: (1) each significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect; (2) areas of controversy known to the Lead Agency including issues raised by agencies and the public; and (3) issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects." Accordingly, this summary includes a brief synopsis of the project and project alternatives, environmental impacts and mitigations, cumulative effects and mitigation, areas of known controversy, and issues to be resolved in the environmental impact report (EIR). Table 2-1, at the end of this chapter, presents the summary of potential environmental impacts, their level of significance before mitigation, mitigation measures, and levels of significance with mitigation.

2.1. PROPOSED PROJECT

The applicant, BoDean Co., Inc., proposes to expand the existing Mark West Quarry to mine approximately 32.4 acres outside of the area currently being mined. The applicant requests rezoning of a portion of an 81-acre parcel adjacent to the existing quarry property to add the Mineral Resource Combining District to allow the future mining of this property; approval of a Use Permit to allow mining of 500,000 cubic yards (CY) (750,000 tons) per year for a 20-year period within the area proposed for mining on the expansion parcel; and approval of a revised Reclamation Plan that directs how the site would-be reclaimed at the end of the use permit. As mentioned previously, the baseline conditions against which project impacts are assessed is the annual production of 305,000 cubic yards (457,500 tons), which was the quarry's average production rate for the five years prior to the project application. This production rate includes sales of aggregate, recycled material, and overburden (typically sold for fill).

Quarrying of the proposed expansion area would be done using the same procedures and phasing that the applicant currently employs with the quarrying being extended west from the existing active quarry face. As mining moves west on the site, the processing area would expand from about 5 acres to about 10 acres, and about every 5-7 years the primary jaw crusher that is used for initial rock crushing may be moved to the west to be nearer the working face of the quarry. Additional conveyors would be used to transport crushed aggregate from the primary crusher to secondary crushers.

In the past, topsoil and overburden (the material beneath the topsoil and above the greenstone) were stockpiled north of the mining area on the vested rights parcel (APN 120-210-048). Due to a threat of imminent landsliding, this material was removed and placed in what is now called the Overburden Stockpile Area. Additional overburden would be added to the storage area for up to three years after project initiation with a maximum addition of 24,000 cubic yards. Subsequent overburden that is removed would be used to reclaim mined portions of the quarry. The stored materials would be used for reclamation as new reclamation sites are opened up. Once the mine expansion onto the new parcel is underway, overburden would be moved directly to reclamation sites. Over the long term, the overburden already stored in the storage area could be sold (the applicant has historically sold about 20% of the greenstone overburden as general fill) and used for quarry reclamation. The applicant estimates that approximately 1,453,000 CY of overburden would be removed from the expansion area.

Reclamation would be done per all requirements of State law and the County's *Surface Mining and Reclamation Ordinance* (Ordinance 5165). Reclamation would continue to be an ongoing process, with reclamation of previously mined areas occurring as mining expands to the west. The final reclamation would result in five general landscapes. These are: mined rock terraced slopes; filled terrace slopes; filled basin floor (which would include two large ponds); recontoured overburden placement area; and the plant site.

2.2 PROJECT ALTERNATIVES

Two mining alternatives and two No Project Alternatives are analyzed in this Draft EIR. These alternatives are summarized below. To varying degrees the alternatives would reduce impacts identified for the proposed project. See ***Section 6.1, Project Alternatives*** for a full analysis and comparison of the alternatives.

No Project and No Further Development. Under the No Project and No Further Development Alternative, no mining expansion would be allowed, and the proposed expansion site would be left undeveloped. Mining the area currently designated MR on the existing quarry property would continue to be mined under the quarry's existing vested rights and its adopted 1988 Reclamation Plan.

No Project with Reasonably Foreseeable Development. Under the No Project with Reasonably Foreseeable Development Alternative, no mining expansion would be allowed. It is possible that in the future the expansion parcel would be developed with a single-family residence and a possible second unit. Similar to the preceding alternative, mining the area currently designated MR on the existing quarry property would continue to be mined under the quarry's existing vested rights and its adopted 1988 Reclamation Plan.

Reduced Production Alternative. Under the Reduced Production Alternative, the maximum allowable production would be reduced to the production level that is used as the baseline for this EIR, namely 305,000 cubic yards per year. Otherwise, this alternative would be the same as the proposed project.

Reduced Mining Footprint Alternative. Under the Reduced Mining Footprint Alternative, the quarry expansion would be reduced to preserve certain sensitive resources and natural habitat.

2.3 AREAS OF CONTROVERSY/ISSUES TO BE RESOLVED

The proposed project raises issues and some areas of controversy that will be considered by County decision-makers. Controversial issues are known through expressions of public opinion that are documented in the record or obtained through public meetings. Prior to circulating the Draft EIR, the County circulated a Notice of Preparation (NOP) and a Revised NOP to agencies and interested parties. Comments received on the NOP and responses to those comments are on file with the County PRMD.

Some areas of controversy are not within the purview of CEQA because that statute focuses on evaluation of significant effects to the *physical environment*. Those areas of controversy that relate to a physical impact issue are noted in the list below.

1. Residences and lodging enterprises located along Mountain Home Road could be adversely affected by visual and noise impacts of expanded mining.

2. Residents living along Porter Creek Road could be adversely affected by noise and dust caused by quarry activities and haul trucks.

3. Residents living along or using Porter Creek Road and Mark West Springs Road between the project site and Highway 101 could be adversely affected by additional truck traffic increasing the safety hazard along these roads. This is also a concern, though not as substantial, for residents living along and using Calistoga Road and Petrified Forest Road.

4. Residents living at higher elevations to the east and southeast who can presently see the quarry will be exposed to expanded views of mined landscape and noise.

5. Additional mining and storage of overburden could result in erosion and sedimentation of Franz Creek and Porter Creek, thereby adversely affecting water quality and steelhead.

6. Additional mining could replace or damage headwater streams that flow to Franz Creek or Porter Creek.

The main issues to be resolved include:

1. The Sonoma County Board of Supervisors, as the principal decision-making body for the project, will need to consider whether it should adopt the project as proposed or adopt an alternative such as the Reduced Production alternative evaluated in this EIR that would reduce or eliminate project impacts. The EIR identifies Alternative 2, the Reduced Production Alternative as the environmentally superior alternative. When considering the merits of the project, the Board of Supervisors may use data in the EIR to support the approval of a project alternative.

2. Before making a decision on the project, the Board of Supervisors needs to review and consider the Draft EIR evaluations and the mitigation measures recommended to reduce impacts to less-than-significant levels. Mitigation measures for significant effects can be adopted as conditions of approval by the Board of Supervisors.

3. Several of the Draft EIR's mitigation measures require the project to modify the design of certain project components to reduce potentially significant impacts to a less-than-significant level. Based on the information supplied by the project applicant and peer reviewed by the EIR team, these mitigation measures appear to be feasible. The project applicant has reviewed these mitigation measures with its project team to ensure their feasibility from technical and site planning perspectives. If the project applicant continues to believe that a mitigation measure is not feasible, they should provide documentation to the Sonoma County PRMD during the Draft EIR's public review and comment period describing why the mitigation measure may not be feasible and include for review and consideration by the Sonoma County PRMD alternative mitigation measures that would ensure the corresponding significant impact would remain less than significant.

4. The Board will need to determine whether there are economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits that outweigh the remaining significant adverse impacts. These remaining significant adverse impacts include:

    a. Project-generated traffic would increase the risk of traffic accidents involving motorists along the Mark West Springs Road/Porter Creek Road corridor (Impact 4.4-D). Recommended roadway improvements would address these safety hazards, but they are not currently planned nor funded.

    b. Project-generated traffic would increase the risk of traffic accidents involving bicyclists and pedestrians along the Mark West Springs Road/Porter Creek Road corridor (Impact 4.4-E). Recommended roadway improvements would address these safety hazards, but they are not currently planned nor funded.

    c. Implementation of Mitigation Measure 4.4-D.1 (recommended roadway widening) on Mark West Springs Road and Porter Creek Road could result in short-term and/or long-term environmental impacts on geology and soils, hydrology and water quality, hazardous materials, biological resources, transportation and circulation, air quality, noise, aesthetics and cultural resources (Impact 4.4-J).

    d. The project would have a significant impact on visual resources for eastbound travelers on Porter Creek Road (Impact 4.7-A).

    e. The project would make a considerable contribution to a significant cumulative impact on habitat fragmentation and blocking wildlife movement (Impact CI-6).

    f. Project-generated traffic would make a considerable contribution to a significant cumulative impact at the Mark West Springs Road/Riebli Road. Mitigation (traffic signalization) is available but is currently not planned nor funded (Impact 4.4-G). Intersection improvements would address this unacceptable congestion, but they are not currently planned nor funded.

g. Project-generated traffic would make a cumulatively considerable contribution to a significant cumulative traffic safety impact along the Mark West Springs Road/Porter Creek Road corridor (Impact 4.4-I). Roadway improvements would address these safety hazards, but they are not currently planned nor funded.

h. The project would make a cumulatively considerable contribution to a significant cumulative air quality impact regarding emissions of ozone precursors (Impact CI-10).

i. The project would make a considerable contribution to a significant cumulative impact on visual resources for eastbound travelers on Porter Creek Road (Impact CI-11),.

If the Board can make this finding and adopts a Statement of Overriding Considerations, then under CEQA, the impact(s) are considered "acceptable" (CEQA Guidelines Section 15093).

2.4 SUMMARY TABLE OF IMPACTS AND MITIGATIONS

Table 2-1 summarizes the project impacts and the mitigation measures recommended to address those impacts. The first column of Table 2-1 describes the impact that would result from the project. Following that impact is a description of the level of significance of that impact. Levels of significance include "beneficial" (listed as B in the table), "less than significant" (listed as LTS in the table), "potentially significant" (i.e., significant prior to implementation of mitigation measures; listed as PS in the table), or "significant and unavoidable" (listed as SU in the table).

The next column lists the recommended mitigation measures for the impact. Finally, there is a column that describes the significance of the impact after mitigation measures have been implemented.

TABLE 2-1- IMPACT AND MITIGATION SUMMARY

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
4.1	**Geology and Soils**			
4.1-A	In the event of a major earthquake in the region, seismic ground shaking could result in injury to mine personnel, increase the potential for slope instability, and cause damage to equipment and structures.	PS	4.1-A.1 Following discernible seismic shaking at the quarry project, a visual inspection shall be made by experienced, onsite mining personnel of all quarry slopes and slopes above Porter Creek Road. The intent shall be to identify any failure or incipient failures that require correction for safety or ongoing mining. In the event of failures causing substantial damage, or an identified incipient failure that could cause such damage, a Certified Engineering Geologist and/or licensed Geotechnical Engineer shall be immediately retained to characterize the failure(s) and recommend repair procedures. All slope repairs within the active mining area posing a risk to workers shall be completed prior to resuming routine mining activities in the affected area. All slopes above Porter Creek Road posing a risk to road traffic shall be immediately protected or stabilized prior to reopening the road to traffic.	LTS
4.1-B	Mining practices could cause slope failure, landsliding, or rockfalls that could injure on-site workers and travelers on Porter Creek Road.	PS	4.1-B.1 Mining slopes will be graded to meet the following guidelines: 1. In order to reduce the damage created by rock failures, benching is required on active mining slopes over 60 vertical feet in height. 2. The width of the benches shall be no less than half the height of the slope face that is directly above it. 3. Inter-bench mining cuts shall have an average steepness of no more than 0.25 to 0.5:1 (horizontal to vertical) and generally be kept to 60 feet in height or less, and 90-foot cuts shall only be excavated if the rock appears highly stable and shows no signs of failure, such as incipient wedge failures, substantial raveling or sloughing. 4. Overburden at the top of working slopes consisting of soil and severely weathered rock shall be sloped no steeper than 2:1. 5. Minimum 10-foot wide benches shall be constructed every 30 vertical feet or at the middle of the soil/overburden slopes, whichever is less. 4.1-B.2 For the first five years of production, the applicant shall be responsible for annual monitoring and assessment of the mining production slope stability. After 5 years, the monitoring will be done every 3 years; after 10 years the monitoring interval will be extended to every 5 years. This work will be done by a qualified engineering geologist. The geologist shall prepare a written report describing the results of the monitoring and any related subsurface investigation~~s~~, and will specifically note any observed changes in the properties of newly exposed rock that might indicate that large, or otherwise damaging slope failures could	LTS

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			occur. In the event that such changes in rock properties are observed, the geologist will make recommendations for revisions to the Final Grading Plan that may be required to improve slope stability and protect adjacent properties. The geologist's report will be submitted to the Sonoma County Permit and Resource Management Department by June 30th of each year. If the geologist recommends changes to the Final Grading Plan in any area of the quarry, the quarry operator will revise that plan and submit it to the County. Once the County has approved the changes, the Reclamation Plan will be also be revised accordingly. This must be done prior to making further excavations in the area requiring grading. 4.1-B.3 Before production slopes are developed in the quarry expansion area, the large landslide above the quarry driveway (the "Potential Rockfall" on Figure 4.1-2) shall be removed or stabilized. An engineering geologist shall confirm that subsequent mining would not cause additional sliding or rockfall off the site that cannot be contained by the proposed rockfall barrier system. 4.1-B.4 Prior to the initiation of mining on the slopes above Porter Creek Road, the applicant shall develop a blasting program to reduce blasting vibrations on these slopes. This will be done to minimize the potential for blasting-triggered instability above the road. This shall include retaining a blasting engineer to assist in selecting, calibrating, and installing a vibration monitoring system. The purpose of the system would be to determine if recommended vibration limits are being exceeded on the slopes and, if necessary, to reduce them to acceptable levels through modification of blasting practices. 4.1-B.5 The applicant shall prepare a final design for the rockfall barrier system. The final design and supporting geotechnical data shall be submitted to the County for review. The applicant shall pay for any technical review required by the County. The final design shall include the following: 1. The barrier system will be designed to capture rocks that could be dislodged from Landslide A on Figure 4.1-2 as well as from all other sources above Porter Creek Road on the project site. 2. The barrier shall capture rocks of a size that currently exist on the slopes as well as rocks that could be expected (as predicted by an engineering geologist) to be exposed or	

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			dislodged given future blasting, seismic ground shaking, and mining activities. 3. The height of the barriers shall be sufficient to accommodate the predicted bounce height of dislodged rocks. 4. Details specifying when and how to shift the upper temporary removable fence downslope, remove debris, and maintain the fence, shall be included. 5. No road or trail shall be constructed on the slopes above Porter Creek Road to install the rockfall barriers. 4.1-B.6 During the duration of mining the slope above Porter Creek Road, visual inspections shall be made at least once a month by mining personnel to confirm the slopes and slope protection facilities are performing satisfactorily. Any necessary slope maintenance or repairs shall be promptly completed. 4.1-B.7 The temporary fence will be removed once mining of the section of slope being protected ends. 4.1-B.8 The final highwall slopes shall be developed to include the following measures: 1. Final reclaimed cuts in rock slopes shall average no steeper than 1.5:1 from the toe of the overall highwall cut to the top. 2. Fifteen-foot wide drainage/catchment benches shall be constructed every 30 vertical feet and intervening cut slopes shall have a maximum inclination of 1:1. 3. Benches shall be cut to dip into the slope at an angle of no less than 2%. 4. If a zone of weathered rock (overburden) or soil remains at the top of the highwall cut, it shall be sloped no steeper than 2:1. 5. At least 10-foot wide benches shall be constructed every 30 vertical feet or at the middle of the weathered rock zone, whichever is less. 6. A permanent earthen berm (compacted to a minimum of 85% relative compaction) or rock containment fence shall be installed along the outside perimeter of the wide bench that will be constructed beyond the base of the completed highwall. 7. The top of the throughcut backslope facing the base of the completed highwall shall be rounded off to prevent a sharp edge that will be susceptible to accelerated erosion or rock fall.	

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			8. Prior to construction of the final highwall, a Certified Engineering Geologist or licensed Geotechnical Engineer and a blasting engineer shall review the geologic conditions exposed at that time and develop a blasting program appropriate for the construction of the finished highwall slopes. 9. Once final highwall construction starts, the project applicant shall annually survey the highwall benches and maintain them free of loose rock and debris and maintain interbench drainage ditches and culverts in good operating order. This shall be done prior to the onset of the rainy season and following intense rainfall events (3 inches or more in 24-hour period). The engineering geologist conducting monitoring of slopes will determine if the frequency of inspections and maintenance by mine personnel is adequate, will identify incipient failures that require repair, and develop recommendations for their repair. Recommended repairs shall be made, documented, and submitted to County PRMD. 10. Any portions of the final highwall or the proposed location of Detention Basin A that are found to include unstable/compressible landslide material shall be corrected by either removing the debris and/or stabilizing the wall and ground beneath the basin. Stabilization can include one of several geotechnically acceptable methods, and depending on conditions encountered, could include placement of rip rap, gabion structures, reinforced fills, or retaining walls. Additionally, surface runoff from the highwall or nearby areas shall be directed away from the surface of the slide. The monitoring engineering geologist and geotechnical engineer will determine whether additional measures are needed to ensure that the landslide is not reactivated. Alternatively the highwall corner and basin site can be shifted to the east to eliminate intrusion by the landslide. 11. The final highwall shall be inspected on an annual basis for a period of 5 years after final reclamation by an engineering geologist. If more than two damaging failures occur within the five year inspection period, inspections shall be extended in increments of two years until the slopes are free of all but minor failures that constitute routine maintenance. Maintenance and repairs shall be done prior to the following rainy season. Documentation of monitoring and any maintenance/repair shall be submitted to County PRMD.	

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION		MITIGATION	SIGNIFICANCE AFTER MITIGATION
			4.1-B.9	All rock slopes to be capped with fill shall be developed to include the following measures: 1. Fill will be placed on completed rock benches as described in Mitigation Measure 4.1-B.8 (subsections 1-4). 2. The slope ratio of the overall final fill slope shall be no steeper 2.4:1 (H:V). 3. Permanent interbench fill slopes shall be no steeper than 2:1 (H:V), as shown on Figure 8 of Miller Pacific 2003 report (part of the project application). 4. Minimum 10-foot wide benches shall be constructed no more than 30 vertical feet apart. 5. Keyways and subdrains for the fill shall be placed as shown on Figure 8, referenced above. 6. Once it has been determined what the maximum thickness will be of the fill to be placed on constructed rock slopes of the highwall, the project applicant shall retain a geotechnical engineer to provide additional design-level mitigations to insure fill performance. One of the most important of these will be the degree of compaction required for long term stability of the high (300 feet) filled slopes. Other design guidelines to be developed by the geotechnical engineer include guidelines for the placement of fill keyways and installation of subdrains and their outlets.	
4.1-C	If the deep backfill to be placed at the base of the completed highwall is not properly engineered, settlement/differential settlement of the fill beneath the large siltation ponds and any piping connecting them could occur. This could damage the ponds and piping and compromise their intended performance.	PS	4.1-C.1	The applicant shall have a Final Grading Plan for the final reclamation phase prepared by geotechnical and civil engineers. That plan shall include the following requirements regarding fill operations. The final plan shall be submitted to County PRMD for review and comment prior to implementation. 1. Fill with a plasticity index (PI) of less than 30 (non-expansive) may be placed at slopes no steeper than 3:1. 2. Fill with a PI of greater than 30 (moderately to highly expansive) may be placed at slopes no steeper than 4:1. 3. All quarry floor fills shall be moisture conditioned to near optimum and track-walked in lifts to provide initial compaction that will decrease the erosion potential. 4. Any fills that are steeper than described in requirements 1 and 2, above, shall be constructed based on the recommendations for final reclaimed fill slopes presented above. 5. Where catchment dams, ponds, subdrains, or other structures used for drainage or water retention are either buried in or rest on top of reclaimed fill on the quarry floor, the compaction	LTS

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION		MITIGATION	SIGNIFICANCE AFTER MITIGATION
				of the fill under and around these structures shall be designed to minimize the settlement of the fill to limit damage or decreased performance over the long term. 6. Gravity flow storm drains, open channels, or other improvements with minimal slopes toward outfalls shall be designed to accommodate settlement of loosely compacted fill.	
4.1-D	Removal of overburden from the Overburden Stockpile Area could result in slope failure and exposure of the subdrain system.	PS	4.1-D.1	Overburden that was placed in the Overburden Storage Area prior to the initiation of project operations shall not be removed until a geotechnical engineer and a hydrologic engineer prepare a removal plan that identifies what and how materials should be removed to maintain slope stability and control erosion. This plan shall be submitted to the County for review and approval. At final reclamation, any remaining fill will be assessed by a geotechnical engineer to determine what, if any, additional treatment is required to maintain slope stability and erosion control per the requirements of the Reclamation Plan.	LTS
4.2	**Hydrology and Water Quality**				
4.2-A	Quarry expansion, removal of overburden material, and subsequent exposure of bedrock would increase the amount of storm water runoff leaving the site and increase peak flows in Porter Creek. The additional flows caused by the project could lead to downstream flooding, bank erosion, and channel instability in Porter Creek.	PS	4.2-A.1 4.2-A.2	The applicant shall prepare, for the review and approval by the Sonoma County Permit and Resource Management Department, a final Stormwater/Water Quality Protection Program (including appropriate hydrologic and hydraulic calculations). The plan and calculations shall include sizing for all sediment retention/storm water detention facilities (see Mitigation Measure 4.2-B.4) and shall verify the available capacity of existing conveyance facilities (culverts) exiting the project site. The storm water plan and calculations shall ensure that peak storm water flows are managed to the extent that flows entering the existing culverts crossing under Porter Creek Road do not exceed pre-project peak flow estimates for the 10-, 25-, 50, and 100-year flows. Alternative detention strategies could include additional detention basins, expanded use of the quarry floor for detention, or expanded use of infiltration areas for percolation and storage. The drainage plan and accompanying design calculations shall be prepared by a Registered Civil Engineer and in conformance with the Sonoma County Water Agency's Flood Control Design Criteria. The plan shall be approved and detention facilities constructed prior to the onset of mining the expansion area. All on-site drainage facilities shall be constructed according to Sonoma County Water Agency's Flood Control Design Criteria and the County of Sonoma Permit and Resource Management	LTS

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION		MITIGATION	SIGNIFICANCE AFTER MITIGATION
				Department standards and requirements, and shall be operated in accordance with the prepared drainage plan.	
			4.2-A.3	All detention basins and other drainage features shall be maintained (e.g., accumulated sediment shall be removed) pursuant to the standards stated in the approved sediment/erosion control and drainage plan. The sediments shall be stockpiled for use as topsoil in the reclamation process. All detention basins and drainage features shall be cleaned out by October 15 each year. If upon inspection by the County or RWQCB, the basins and drainage system have not been adequately maintained by October 15, the owner of the quarry would be notified that the maintenance must be completed within 30 days or all crushing, screen, grading, and sales of material on site shall immediately cease until the basins and drainage system have been sufficiently maintained.	
			4.2-A.4	All detention basins and other drainage features shall be monitored and maintained for 5 years after completion of site reclamation. At the end of this 5-year period, the applicant shall engage a qualified civil engineer to determine whether the site drainage system can operate without further maintenance. If further maintenance is warranted, it will be done. A new review will be done each year until the engineer determines that the system is self-sustaining for a period of an additional 5 years.	
4.2-B	During quarry expansion and active mining, disturbed and unprotected soil and overburden could erode from contact with wind and water causing an increased amount of sediment and other pollutants to be carried downstream through the proposed drainage system. This could degrade water quality in Porter Creek, Mark West Creek, and the Russian River.	PS	4.2-B.1	The applicant shall develop and implement a final Stormwater/Water Quality Protection Program (the Program) to control sediment and pollutant runoff from the quarry expansion for both interim mining operations and after final reclamation. All erosion control measures listed in the proposed Reclamation Plan shall become conditions of approval for the project. In addition, the following measures are required: 1. All structural elements and drainage features shall be designed and approved by a professional civil engineer experienced in storm water management and sediment control. The design shall meet the standards of the Sonoma County SMARO. All hydrologic and engineering calculations, including sediment retention pond trap efficiency, shall be submitted to the County for review and approval prior to commencement of quarry expansion activities. 2. The existing 2001 Storm Water Pollution Prevention Plan (SWPPP) shall be updated to include the proposed quarry	LTS

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			expansion. The SWPPP shall be regularly updated to reflect current conditions at the quarry. The following recommendations supplement the proposed actions: 3. The applicant shall update the Spill Prevention Control and Countermeasures Plan (SPCCP), which identifies and evaluates sources of pollutants associated with industrial activities at the quarry including the use, storage, and quantity of potential contaminates. The SPCCP shall also include emergency response and notification procedures. 4. As specified by SMARA, sediment retention ponds will be reconstructed or, if needed, new ones constructed so that particles of medium silt (0.32 mm) will be settled out for no less than the 20-year, 1-hour rainfall event before runoff leaves the site. Flocculents and/or filters can be used to enhance the settling process in order to meet this standard. Sediment retention design shall include emergency spillways sized to accommodate larger less frequent storm events (25-, 50-, and 100-year) and concomitant overtopping. Prior to each construction season (May 1), the applicant shall quantify the total proposed drainage area contributing to each sediment retention pond at the beginning of the next winter season (October 15) and verify the ponds provide adequate residence time and design capacity to meet both water quality and flow detention goals. All design and annual pond sizing verification shall be completed by a professional civil engineer experienced in sediment detention basin design and the regulations of SMARA. All hydrologic and engineering calculations, including sediment trap efficiency, shall be submitted to the County for review and approval prior to any additional quarry expansion. 5. If any semi-annual monitoring indicates that the mining of that year exceeded the water quality performance criteria, the applicant shall confer with the Regional Board and propose changes to the sediment control program that will improve its performance sufficiently to meet the performance criteria of the Reclamation Plan and the general permit. The proposed changes shall be submitted to the Regional Board for comment, revised as needed to address their comments, and then implemented by the applicant. If the performance criteria are not met for two consecutive years, the County will confer with the applicant and the Regional Board to determine what	

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			additional changes in the sediment control plan are needed to result in compliance, and these changes shall be made until compliance is reached. 6. Chemical dust suppressants and sediment detention basin enhancement chemicals or polymers shall be used strictly according to the manufacturer's specifications as well as any additional restrictions required by the RWQCB. An accurate accounting of all these materials purchased and used on the site shall be maintained, including kinds and quantities of material. 7. The Basin Plan allows storm water from a project site to increase turbidity in a receiving stream by no more than 20%. However in the case of this project, because of the sensitivity of Porter Creek, the storm water from the project would not be allowed to increase turbidity any more than the runoff from the existing quarry does for an overall no net increase as a result of quarry expansion. The RWQCB shall review the water quality monitoring data and determine the turbidity baseline to be used in the final Stormwater/Water Quality Protection Program. 8. The applicant shall monitor all storms that generate discharge from the active mining portion and overburden stockpiling area of the project site to Porter Creek. However, as a practical measure, it shall not be required that monitoring events occur more frequently than once every two weeks or pursuant to the criteria developed by the RWQCB. The discharge end of each outfall shall be made easily accessible for inspection and water sampling during storm events by the applicant.	
4.2-C	Quarry expansion may result in reduced summer baseflow to salmonid streams (Franz Creek and Porter Creek Tributary).	LTS	No mitigation is required.	LTS
4.2-D	The proposed mine expansion would require additional groundwater pumping. The increased pumping of onsite wells could reduce recharge to the underlying bedrock aquifers and lead to long-term reduction in groundwater availability.	LTS	No mitigation is required.	LTS
4.2-E	The proposed project would increase pumping rates in the four onsite supply wells. The increased use of onsite wells could periodically lower groundwater levels in adjacent domestic wells and potentially lower productive capacity.	LTS	No mitigation is required.	LTS
4.2-F	The proposed mining expansion would reduce the contributing area and potential groundwater recharge to the	PS	4.2-F.1 With the permission of the property owner, the applicant shall monitor the domestic water supply well located on Assessor's	LTS

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION		MITIGATION	SIGNIFICANCE AFTER MITIGATION
	domestic supply well located below Sub-basin A.			Parcel 120-021-032 for significant changes due to quarry expansion and regrading of recharge areas. Monitoring shall include quarterly observations of groundwater levels in the well and shall commence before quarry expansion. Well monitoring shall continue through the length of the project. If it is determined that well levels have deviated statistically from the baseline condition at any time during the expansion and reclamation of the quarry (accounting for rainfall totals), or within five-years following the completion of the expansion and reclamation, and the owner of the property requests, the applicant shall be financially responsible for providing a reliable supply of water to the impacted property, which may include deepening of the existing well and/or drilling a new well.	
4.3	**Biological Resources**				
4.3-A	Future mining of the project site would displace a population of Jepson's linanthus.	PS	4.3-A-1	Prior to ground-disturbing activities in any part of the expansion area, and for several years in succession, conduct annual focused surveys until ground clearing removes all potential habitat to identify all localities of Jepson's linanthus within the project area. Each year that plants are found, collect voucher specimens, mark the locations in the field, and collect seed when mature. Donate voucher specimens to university herbaria and donate cleaned seed to research institutions with facilities for long-term storage. Details are provided below: a. A qualified botanist familiar with Jepson's linanthus and its habitat in Sonoma County shall conduct the focused surveys. b. Each annual survey shall cover 100% of the California annual grassland found within the project area. c. For each locality of Jepson's linanthus that is found, the surveyor shall record the location with a Global Positioning System (GPS) unit; record habitat information (soil type, slope position, elevation, vegetation type, associated species, etc.), and phenology (vegetative, early flowering, etc.); collect herbarium-quality voucher specimens of Jepson's linanthus and its associated species; mark the location in the field using a durable and visible marking system; and photograph Jepson's linanthus and its habitat. d. Voucher specimens shall be collected, dried, stored and distributed according to the requirements of the receiving institution. e. The surveyor shall make a return visit to each Jepson's linanthus locality during the time period when seeds are mature, and shall collect as much mature, dry seed as	LTS

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION		MITIGATION	SIGNIFICANCE AFTER MITIGATION
				possible. Several visits each year may be needed. Seed shall be stored in paper envelopes labeled with the date, location and species name. f. Cleaned seed shall be donated to a university or other research institution located in California that has modern cold-storage or other state-of-the-art facilities for keeping plant seed in good condition over the long term. Any required storage fees shall be paid by the project applicant. g. Location and habitat information for all localities of Jepson's linanthus found during pre-ground-clearing surveys shall be provided to CNDDB during the calendar year that the locality is found. h. Results of each annual survey shall be provided in memo format, and shall include a figure showing the location of all Jepson's linanthus localities found to date within the project site.	
4.3-B	Project construction and grading activities within the proposed aggregate mining area could disturb active nests of special-status birds, as well as roosts of special-status bats.	PS	4.3-B.1	Avoid disturbing active nests of raptors and other special-status birds through preconstruction surveys and creation of no-disturbance buffers during ground-clearing and grading activities associated with initiation of each mining phase. If site preparation activities are scheduled to occur during the general breeding season (February 1 through August 31), the following measures shall be implemented to avoid potential adverse effects to nesting raptors, other special-status birds, and bats: 1. A qualified wildlife biologist shall conduct preconstruction surveys of all potential nesting habitat for raptors and other special-status birds within 300 feet of construction activities where access is available. 2. If active nests of raptors or other special-status birds are found during preconstruction surveys, a no-disturbance buffer acceptable in size to CDFW shall be created around active raptor nests and nests of other special-status birds during the breeding season or until it is determined that all young have fledged. Buffers include 300 feet for raptors and 75 feet for other nesting special-status birds. The size of these buffer zones and types of construction activities restricted in these areas may be further modified through coordination with CDFW and will be based on existing noise and human disturbance levels at each project site. Nests initiated during construction are presumed to be unaffected and no buffer is necessary. However, the "take" of any individual is prohibited.	LTS

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION		MITIGATION	SIGNIFICANCE AFTER MITIGATION
			4.3-B.2	If evidence of special-status bats in trees on the property is observed by the wildlife biologist, the following measure is required. Removal of trees or other suitable habitat showing evidence of special-status bat activity will occur during the period least likely to impact the bats as determined by a qualified bat biologist (generally between February 15 and October 15 if winter hibernacula are observed or between August 15 and April 15 if maternity roosts are present). If known bat roosting habitat is destroyed during tree or other suitable habitat removal activities, artificial bat roosts shall be constructed in an undisturbed area of the property, at least 200 feet from any project activities. The design and location of the artificial bat roost(s) shall be determined by a qualified bat biologist.	
4.3-C	Project construction and grading activities within the proposed aggregate mining area could injure or kill special-status species of frogs and turtles.	PS	4.3-C.1	Prior to vegetation removal or grading on the expansion site, a survey of the site for California red-legged frog shall be conducted per the protocol established by the USFWS. If red-legged frogs are found, a work plan shall be developed addressing how to avoid impacts to this species. This plan shall be submitted to the USFWS and CDFW for review and comment. Until such time that protocol surveys can be completed in their entirety, it is assumed the California red-legged frog inhabits the Wetland A area. Therefore, to protect the potential habitat until such time as the protocol study has been done and, if frogs are present, a work plan has been submitted, a protective buffer and continuing seasonal restrictions will be implemented. A buffer area as shown on Figure 4.3-5 will be maintained and no vegetation or grading will occur there. Seasonal restrictions will be imposed during the winter period (November 15 – April 1). During this time period mining and excavation operations will not be conducted during extended rain events that produce overland flow. California red-legged frog dispersal typically occurs during these rainy periods and therefore, these seasonal restrictions of operations will provide another source of protection to any potentially occurring California red-legged frogs.	LTS
			4.3-C.2	The project shall not injure or destroy habitat used by foothill yellow-legged frogs (on Porter Creek near the confluences with Tributaries D and E), and/or northwestern pond turtle (at Wetland A on the project property and on the Less pond west of the project site). To accomplish this, a qualified biologist, capable of monitoring projects with potential habitat for these three species,	

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			shall conduct a pre-construction survey for these species no more than 14 days prior to grading or construction in suitable aquatic habitats within the project site, including stream crossings, drainage ditches, settling ponds, and culverts. The confluence of project site tributaries with Porter Creek shall also be surveyed for foothill yellow-legged frog and northwestern pond turtle to determine if the species is present near tributaries draining the site. If these species are found near any proposed construction areas, impacts on individuals and their habitat shall be avoided. In addition, if any species are found during pre-construction surveys, a work plan addressing how to avoid impacts to these species shall be submitted to USFWS and CDFW for approval prior to construction. If occupied habitat can be avoided, an exclusion zone shall be established around the habitat and temporary plastic exclusion fencing shall be installed around the buffer area with "Sensitive Habitat Area" signs posted and clearly visible on the outside of the fence. If avoidance is not possible and the species is determined to be present in work areas, a qualified biologist with appropriate permits from USFWS and CDFW may capture frogs and turtles prior to construction activities and relocate them to nearby, suitable habitat out of harm's way (e.g., downstream from the work area or as designated by the agency). Exclusion fencing shall then be installed to prevent these animals from re-entering the work area. For the duration of work in these areas the biologist shall conduct monthly follow-up visits to monitor effectiveness of the mitigations.	
4.3-D	Project construction and grading activities could pollute downstream waterways and adversely affect special-status species of fish, amphibians, and turtles.	PS	Mitigation measures recommended for Impact 4.2-B also apply to this impact.	LTS
4.3-E	Future mining of the project site would remove waters of the U. S.	PS	4.3-E.1 The project applicant shall prepare a formal wetland delineation in accordance with 1987 *Corps of Engineers Wetlands Delineation Manual* and have it verified by the U.S. Army Corps of Engineers (Corps). If the Corps and/or CDFW determine that the potentially affected water-associated feature is jurisdictional, then the applicant shall obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly a Nationwide permit) from the Corps, Section 1603 Streambed Alteration Agreement from CDFW, and/or Section 401 water quality certification from the Regional Water Quality Control Board. 4.3-E.2 The applicant shall compensate for the loss of jurisdictional wetlands at a 2:1 ratio (or as agreed to by the permitting agencies) within the project site boundary, or at a 3:1 ratio (or as	LTS

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			agreed to by the permitting agencies) off-site within the local watershed, by creating, restoring or enhancing waters of the U.S., contributing in-lieu funds to an existing or new restoration project preserved in perpetuity, or purchasing wetland creation credits at an approved wetland mitigation bank. The restoration effort shall require implementation of a five-year monitoring program with applicable performance standards (as agreed to by the permitting agencies), including but not limited to: 80 percent survival rate of restoration plantings; restoration species that are native to the local watershed; absence of invasive plant species; erosion features will be remediated; and a functioning, and self-sustainable wetland system will be maintained. 4.3-E.3 Obtain a Streambed Alteration Agreement from CDFW pursuant to Section 1603 of the California Fish and Game Code for removing on-site ephemeral drainages. Mitigation measures designed to offset streambed-related impacts may include on-site creation of drainage habitats (unlikely) and/or enhancement of existing drainage habitats. Off-site mitigation may also be an option. Mitigations could include conducting stream and riparian enhancement projects identified by CDFW, Sotoyome Resource Conservation District, or Friends of the Mark West, as approved by CDFW. Mitigation measures will be finalized in coordination with the CDFW through the Streambed Alteration Agreement process.	
4.3-F	Blasting activities associated with the proposed project could result in noise disturbance to special-status wildlife species.	LTS	No mitigation is required.	LTS
4.3-G	Proposed expansion activities would cause the loss of wildlife corridors through fragmentation of open space, loss of habitat such as mixed evergreen forest, and new fencing.	LTS	No mitigation is required.	LTS
4.3-H	Proposed expansion activities would result in the loss of trees and conversion of timberland.	LTS	No mitigation beyond complying with existing laws and regulations is needed.	LTS
4.4	**Traffic and Circulation**			
4.4-A	Project-generated traffic would impact study intersections.	LTS	No mitigation is required.	LTS
4.4-B	Project-generated traffic will increase traffic delay at one study intersection in 2015.	LTS	No mitigation is required.	LTS
4.4-C	Project-generated traffic will affect intersection operations at the Porter Creek Road / Project Access Driveway intersection both for Existing Conditions and in 2015.	LTS	No mitigation is required	LTS
4.4-D	The project would add substantial truck traffic to certain primary haul roads that do not meet current County roadway design standards and/or contain limited sight distance.	LTS	4.4-D.1: The applicant shall pay its fair share to improve haul route roads to meet County road standards where such improvements are determined by the County to be feasible. The following roadway	SU

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			segments have minimal shoulders that currently do not meet County roadway standards and would require shoulder and/or lane widening to meet County standards on the Mark West Springs – Porter Creek Road haul corridor: 1. An approximately one-mile segment of Mark West Springs Road between Riebli Road and Mark West Lodge; 2. A 1.6-mile Porter Creek Road segment between Mark West Lodge and Franz Valley Road; and 3. Approximately 2.9 of 3.2 miles of Porter Creek Road between Franz Valley Road and Petrified Forest Road.	
4.4-E	The project would add substantial truck traffic to the Mark West Springs/Porter Creek Road primary haul road that is designated a proposed bikeway and is regularly used by bicyclists or pedestrians, and which do not meet current County roadway design standards.	PS	Mitigation Measure 4.4-D.1 also applies to this impact.	SU
4.4-F	The proposed project could contribute to the degradation of pavement on public roads.	LTS	No mitigation is required.	LTS
4.4-G	Project-generated traffic will cause unacceptable intersection operations at two study intersections in 2035.	PS	4.4-G.1 The applicant will pay its fair share to fund installation of a traffic signal at the Mark West Springs Road / Riebli Road intersection.	SU
4.4-H	Project-generated traffic will impact intersection operations at the Porter Creek Road / Project Access Driveway intersection in the Long-term Base (2035) Plus Project conditions.	LTS	No mitigation is required.	LTS
4.4-I	Project-generated traffic will increase the risk of collisions between haul trucks and other vehicles, pedestrians, and bicyclists, along the Mark West Springs/Porter Creek Road haul corridor under the Long-term (2035) plus Project Condition.	PS	Mitigation Measure 4.4-D.1 (Road widening to County standards) applies to this cumulative impact.	SU
4.4-J	Implementation of Mitigation Measure 4.4-D.1 on Mark West Springs Road and Porter Creek Road could result in short-term and/or long-term environmental impacts on geology and soils, hydrology and water quality, hazardous materials, biological resources, transportation and circulation, air quality, noise, aesthetics and cultural resources.	PS	4.4-J.1 A design level geotechnical investigation shall be required to identify site specific geologic conditions and geotechnical constraints and develop adequate engineering design criteria and remedies to reduce the potential for slope instability from cutting and filling of adjacent slopes along the roadway alignments. Methods for reducing potential slope instability effects could include, but are not limited to, slope reconstruction, earth buttress construction, or retaining structures/walls. All recommendations identified by the licensed geotechnical engineer shall be included in the final design and be incorporated into the roadway widening project. 4.4-J.2 As part of the grading and construction specifications for the roadway widening, implement best management practices (BMPs) to reduce or eliminate soil erosion during construction. The contractor shall implement these BMPs and be responsible for the	SU

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			inspection and maintenance of the BMPs during construction. These measures shall be incorporated into the Storm Water Pollution Prevention Plan (SWPPP) for the proposed roadway widening. 4.4-J.3 Prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) before commencing with roadway widening construction. As part of this process, a Notice of Intent shall be filed with the State Water Resources Regional Control Board, in compliance with the statewide NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). The SWPPP shall specify Best Management Practices (BMPs) to control contamination of surface flows through measures to prevent the potential discharge of pollutants from the construction area. The BMPs shall be designed to minimize erosion of disturbed soil areas. BMPs could include, without limitation, silt fences, gravel or sand bags, stormdrain inlet protection, soil stockpile protection, preservation of existing vegetation where feasible, use of straw mulch, dust control, and other measures. The SWPPP will also include protection and spill prevention measures for any temporary onsite storage of hazardous materials used during construction. 4.4-J.4 The proposed storm drain system for the roadway widening improvements shall be designed in accordance with all applicable County and Sonoma County Water Agency (SCWA) drainage and flood control design standards. The drainage plan for the roadway widening improvements shall ensure the proposed drainage facilities are properly sized to accommodate projected storm flows and prevent any potential project flooding on-site and in downstream areas. 4.4-J.5 To mitigate the filling or excavating of potentially jurisdictional wetlands along the roadway widening alignments, the County shall: 1. Conduct a formal wetland delineation in accordance with 1987 Corps of Engineers Wetlands Delineation Manual and have it verified by the U.S. Army Corps of Engineers (Corps). If the Corps and/or CDFW determine that the potentially affected water-associated features are jurisdictional, then the County shall obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly an Nationwide permit) from the Corps, Section 1603 Streambed Alteration Agreement from CDFW,	

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			and/or Section 401 water quality certification from the Regional Water Quality Control Board. 2. Compensate for the loss of jurisdictional wetlands at a 2:1 ratio (or as agreed to by the permitting agencies) within the project site boundary, or at a 3:1 ratio (or as agreed to by the permitting agencies) off-site within the local watershed, by creating, restoring or enhancing waters of the U.S., or contributing in-lieu funds to an existing or new restoration project preserved in perpetuity. The restoration effort shall require implementation of a five-year monitoring program with applicable performance standards, including but not limited to establishing: 80 percent survival rate of restoration plantings native to local watershed; absence of invasive plant species; absence of erosion features; and a functioning, and self-sustainable wetland system. 4.4-J.6 Avoid all potential jurisdictional wetlands and riparian habitat located along the roadway alignments, as feasible. Prior to construction activities, the County shall take appropriate measures to protect the wetland and riparian habitat located in these areas. 4.4-J.7 The County shall implement measures to minimize and avoid take of CRLF that would additionally benefit pond turtles and FYLF, if present. The following measures are derived from the Programmatic Biological Opinion (PBO) for impacts to California red-legged frog. Projects that impact CRLF or CTS require formal consultation with the USFWS and issuance of a Biological Opinion. The following actions will minimize impacts to these species. 1. A USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and their habitat, and the general measures that are being implemented to protect the CRLF as they relate to the roadway widening improvements. 2. A USFWS-approved biologist shall be present during initial grading activities to monitor roadway construction activities within 100 feet of creek corridors and aquatic habitat that could support CRLF. Thereafter, an onsite person shall be designated to monitor onsite compliance with all minimization measures. The USFWS-approved biologist shall ensure that this individual receives training consistent with that outlined in the Biological Opinion.	

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			4.4-J.8 The following traffic control measures shall be included in the project: 1. To the extent possible, the contractor shall schedule truck trips outside of peak commute hours. 2. Lane closures on Mark West Springs and Porter Creek Roads shall occur only during the hours of 8:30 a.m. and 4:30 p.m. Outside of these hours on Monday through Friday, or on weekends, two lanes of traffic on both roads must be open. 3. If lengthy delays are anticipated, signs shall be posted to notify motorists that traffic will be subject to delay. 4. Traffic safety guidelines compatible with Section 12 of the Caltrans Standard Specifications, "Construction Area Traffic Control Devices" shall be followed during construction. Project plans and specifications shall also require that adequate signing and other precautions for public safety be provided during project construction. 5. For highly sensitive land uses, such as schools, fire and police, the County shall require the construction contractor to develop access plans in consultation with facility owner or administrator. The contractor shall notify the facility owner in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures. 6. The County shall require the contractor to provide for passage of emergency vehicles through the project site at all times. 7. The County shall require the contractor to maintain access to all parcels adjacent to the construction zone during construction. 4.4-J.9 The following dust control measures will be included in the project: 1. Water or dust palliative shall be sprayed on unpaved construction and staging areas during construction as directed by the County. 2. Trucks hauling soil, sand and other loose materials over public roads shall cover the loads, or keep the loads at least two feet below the level of the sides of the container, or shall wet the load sufficiently to prevent dust emissions. 3. Paved roads shall be swept as needed to remove soil that has been carried onto them from the project site. 4. Water or other dust palliative shall be applied to stockpiles of soil as needed to control dust. 4.4-J.10 Roadway widening construction activities for this project shall be restricted as follows: 1. All internal combustion engines used during construction of	

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION		MITIGATION	SIGNIFICANCE AFTER MITIGATION
				this project shall be operated with mufflers that meet the requirements of the State Resources Code, and, where applicable, the Vehicle Code. 2. Except for actions taken to prevent an emergency, or to deal with an existing emergency, all construction activities shall be restricted to the hours of 7:00 a.m. and 7:00 p.m. on weekdays and 9:00 a.m. and 7:00 p.m. on weekends and holidays. Only work that does not require motorized vehicles or power equipment shall be allowed on holidays. If work outside the times specified above becomes necessary, the resident engineer shall notify the PRMD Environmental Review Division as soon as practical.	
			4.4-J.11	Following roadway widening and creation of any cut slopes, the County shall require the contractor to provide landscape improvements. Native shrubs and trees shall be planted to create a landscape that recalls the native landscape of the region. Plants shall be selected that require the least maintenance, and create a sustainable landscape. If retaining walls are required as part of the roadway widening, the use of natural finishes shall be considered, if feasible. A maintenance program, including weeding and summer watering shall be followed until plants have become established (minimum of three years).	
			4.4-J.12	If archaeological materials are discovered during project construction, construction shall cease in the immediate vicinity of the find until a qualified archaeologist is consulted to determine the significance of the find, and has recommended appropriate measures to protect the resource. Further disturbance of the resource will not be allowed until those recommendations deemed appropriate by the County have been implemented.	
			4.4-J.13	If paleontological resources or unique geologic features are discovered during project construction, construction shall cease in the immediate vicinity of the find until a qualified paleontologist or geologist is consulted to determine the significance of the find and has recommended appropriate measures to protect the resource.	
4.5	**Noise**				
4.5-A	Noise from on-site operations of the proposed project would affect three noise sensitive receiving locations (residences) in the vicinity of the project.	PS	4.5-A.1	If overburden is removed in areas that have a clear path to the two residences to the west of the quarry (Residences R1 and R2 on Figure 4.5-5) for longer than a single construction period (an 8-month period), the applicant shall shield the mobile equipment from the two residences. This can be accomplished by removing	LTS

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			overburden starting in the east and retaining a slope between the mobile equipment and the residences to the west. The detailed mining plan required by Mitigation Measure 4.1-D.1 shall delineate the methodology that will be used to maintain a topographical barrier between operating mobile equipment in the overburden area and the receptors to the west.	
4.5-B	Project traffic would increase noise levels at noise sensitive receptors along roadways that carry quarry traffic.	LTS	No mitigation is required.	LTS
4.5-C	The combined noise from operations on the project site plus aggregate haul traffic would affect noise sensitive receptors in the vicinity of the project.	PS	Mitigation Measure 4.5-A.1 applies to this impact.	LTS
4.5-D	Blasting would result in noise and vibration at sensitive receptors.	PS	4.5-D.1 When blasting within 600 feet of a residence limit the charge weight per delay to a maximum of 60 pounds. Monitor vibration levels at the residence to confirm that the vibration level is less than 0.5 inch/sec PPV. If not, further limit the charge weight per delay until that target vibration level is achieved.	LTS
4.6	**Air Quality and Climate Change**			
4.6-A	The quarry project would generate emissions of criteria pollutant emissions (NOx, CO, ROG, PM10, and PM2.5) from on-site and off-site activities during operation of the quarry which could exceed applicable significance levels.	LTS	No mitigation is required.	LTS
4.6-B	The project could violate the ambient air quality standard for carbon monoxide.	LTS	No mitigation is required.	LTS
4.6-C	Emissions of diesel particulate matter and crystalline silica from the project could injure the health of workers and residents living in the area.	LTS	No mitigation is required.	LTS
4.6-D	Naturally Occurring Asbestos could be present at the project site, and mining activities would expose persons to levels of asbestos which would have adverse health effects.	LTS	No mitigation is required.	LTS
4.6-E	The proposed project could result in greenhouse emissions, either directly or indirectly, that may have a significant impact on the environment.	PS	4.6-E.1 The applicant shall offset all remaining GHG emissions above the threshold of 1,100 MT CO2e/year. Any offset of project emissions shall be demonstrated to be real, permanent, verifiable, enforceable, and additional as determined by PRMD at its sole discretion. To the maximum extent feasible, as determined by PRMD, offsets shall be implemented locally. Offsets may include but are not limited to the following (in order of preference): 1. Applicant funding of local projects, subject to review and approval by PRMD, that will result in real, permanent, verifiable, and enforceable, and additional reduction in GHG emissions. If the BAAQMD or Sonoma County develops a GHG mitigation fund, the applicant may instead pay into this fund to offset GHG emissions in	LTS

TABLE 2-1- IMPACT AND MITIGATION SUMMARY (continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			excess of the significance threshold. 2. Purchase of carbon credits to offset emissions below the significance threshold. Only State Air Resource Board carbon offset credits, credits verified and registered with the Climate Action reserve, or available through a County-approved local GHG mitigation bank or fund may be used to offset project emissions.,	
4.7	**Aesthetics**			
4.7-A	The proposed quarry expansion would alter the visual character of the project site and adversely affect views of the site from both public and private vantage points.	PS	The previously described Mitigation Measure 4.1-B.5 also applies to this impact. 4.7-A.1 Within the first year after project approval, Douglas fir trees or alternative evergreen species acceptable to the County shall be planted in the area where the trees are shown screening some of the solar panels in Figure 4.7-4. A certified arborist or landscape architect shall develop a final tree plan for this area. The plan shall meet at least the following requirements unless the arborist can demonstrate that substitute measures would meet the targets listed at the end of this mitigation. At least 30 trees shall be planted. The trees shall be fertilized, irrigated, protected, and maintained until they are five years old. Any trees dying within that period shall be replanted until there are 30 new live trees that have been alive for at least seven years. Compacted ground shall be broken to an area three times the diameter of the root ball prior to planting to allow root growth. Trees shall be watered weekly by the property owner in weeks with no natural precipitation (usually April 15 through October 15 of each year), and for the first three years after planting they shall be watered three times per week when temperatures exceed 100 F°. The plan will be based on the targets of: 1) the trees being at least 20 feet high after seven years; and 2) sufficient trees shall be planted to provide the screening shown on Figure 4.7-4. The plan will be reviewed and approved by the County prior to expansion of mining.	SU
4.7-B	The project could result in the production of new sources of light and/or glare.	LTS	No mitigation is required.	LTS

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
4.8	**Public Services**			
4.8-A	The project would generate increased calls for fire response and emergency medical aid.	LTS	No mitigation is required.	LTS
4.8-B	The project would increase the risk of igniting wildland fires or being affected by a wildland fire.	PS	4.8-B.1 Prior to vegetation removal or mining of the expansion area, the project applicant shall provide to the Sonoma County Fire and Emergency Services Department an affirmative covenant, that includes a vegetation management maintenance agreement approved by the County Fire Marshal, which shall run with the land in perpetuity.	LTS
4.8-C	The proposed project would require police protection and traffic enforcement services of the Sonoma County Sheriff's Department.	LTS	No mitigation is required.	LTS
4.8-D	The proposed project would generate solid waste as well as allow use of recycled materials at the quarry.	LTS	No mitigation is required.	LTS
4.9	**Hazards and Hazardous Materials**			
4.9-A	Hazardous materials transported or used on the project site during proposed mining and reclamation activities (i.e., petroleum products, blasting materials) could be spilled or otherwise released through improper handling or storage.	PS	4.9-A.1 Prior to initiation of the project, the applicant shall prepare a revised Spill Prevention, Control and Counter Measure Plan (SPCCMP) in conformance with the requirements of the Code of Federal Regulations 40CFR112. A copy of the SPCCMP shall be submitted to the Sonoma County Department of Emergency Services to demonstrate completion of the mitigation. 4.9-A.2 If hazardous waste is generated or stored, then the operator shall comply with hazardous waste generator laws and AB2185 requirements and obtain a permit or approval from the C.U.P.A. or the participating agency. The applicant shall submit a copy of a current permit to the Permit and Resource Management Department Health Specialist to verify compliance. 4.9-A.3 All hazardous waste materials shall be stored, handled and managed in accordance with the approved site plan and hazardous materials plan so as to reduce the potential for any spillage. No soil or other material containing hazardous or toxic waste shall be imported to the quarry.	LTS
4.10	**Cultural and Paleontological Resources**			
4.10-A	Land alteration proposed by the project could affect existing	PS	4.10-A.1 If concentrations of prehistoric or historic-period materials	LTS

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
	as well as undiscovered cultural resources.		(other than the GANDA-571-01H resource) are encountered during ground-disturbing work at the project location, all work in the immediate vicinity will be halted until a qualified archaeologist can evaluate the finds and make recommendations. Historic-period features that may be present include backfilled privies, wells, and refuse pits; concrete, stone, or wood structural elements or foundations; and concentrations of metal, glass, and ceramic refuse. Prehistoric cultural remains might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, choppers), midden (culturally darkened soil containing heat-affected rock, artifacts, animal bone, or shellfish remains), and/or stone milling equipment, such as mortars and pestles. 4.10-A.2 If human remains are encountered, work in the immediate vicinity will stop and the Sonoma County Coroner will be notified immediately. At the same time, a qualified archaeologist will be contacted to evaluate the discovery. If the human remains are determined to be of Native American origin, the Coroner must notify the Native American Heritage Commission within 24 hours of this identification.	
4.10-B	Land alteration proposed by the project could affect undiscovered paleontological resources.	PS	4.10-B.1 If paleontological resources are found, all work in the vicinity of the find must cease, and a paleontologist and PRMD staff must be notified to develop proper mitigation measures required for the discovery. No earthwork in the vicinity of the find shall commence until a mitigation plan is approved and completed subject to the review and approval of the paleontologist and Project Review staff. This condition shall be noted on all grading and construction plans and provided to all contractors and superintendents on the job site.	LTS
4.11	**Land Use**			
4.11-A	The proposed project would expand existing quarry operations onto an undeveloped site, The effect of this expansion on compatibility with surrounding land uses would be less than significant.	LTS	No mitigation is required	LTS
4.12	**Energy**			
4.12-A	Expanded quarry production would not result in the wasteful or inefficient use of fuel or energy.	LTS	No mitigation is required	LTS

3.0 PROJECT DESCRIPTION CHAPTER

3.1 PROJECT LOCALE AND SETTING

A. General Setting

Mark West Quarry is located at 4611 Porter Creek Road in Sonoma County near its boundary with Napa County (see Figure 3-1). The area immediately surrounding the project site contains steep slopes with a mix of mainly chaparral scrublands and evergreen forest. Most of the land is undeveloped, though there is scattered rural residential development south of Porter Creek Road, east and west of Calistoga Road, and along Calistoga/Petrified Forest Road. North of the site, there are residences and lodging businesses on Mountain Home Road.

The quarry is located on the north side of Porter Creek Road, approximately 9 miles north-northeast of the City of Santa Rosa, about 7 miles east of the Highway 101/Mark West Springs Road interchange, and one-half mile northwest of the Porter Creek Road/Calistoga Road intersection. Figure 3-2 shows existing and proposed land uses for the property.

The quarry has been in operation since 1910. The applicant, BoDean Co., Inc., currently operates a quarry on APN 120-210-048 under a vested right and approved Reclamation Plan (see Figure 3-3).[1] The operator also has a lease to mine aggregate on APN 120-210-031. If the leased additional parcel is mined, the existing 87-acre quarry would be expanded to include an additional 81 acres. The total actively mined area would expand from the current approximately 58 acres to about 90 acres (i.e., an increase of about 32 acres) during the proposed 20-year mining period

The proposed expansion area is a relatively steep ridge vegetated with chaparral species as well as some mixed evergreen forest and grassland. It has no improvements except unpaved ranch access roads. The east-west ridge on the northern part of the site is the dividing line between the Porter Creek watershed to the south and the Franz Creek watershed to the north.

B. Existing Land Use Controls

The Sonoma County General Plan designates the existing quarry and the proposed expansion area as Resource and Rural Development, 100-acre density (RRD,100). The project site is currently zoned RRD (Resources and Rural Development), 100-acre density. The existing quarry parcel (APN 120-210-048) is also zoned as Mineral Resource Combining District (MR). Properties to the south, east, and west are designated RRD,100, while the property to the north is designated RRD,20 (20-acre density).

The Sonoma County Aggregate Resource Management Plan (ARM Plan) identifies this quarry as one of the sources of aggregate in the County. The ARM Plan shows a likely expansion area for the quarry onto the parcel that contains the applicant's proposed mining expansion.[2]

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[1] "Vested right" means the quarry was operating prior to the State's passage of SMARA. Quarries and mines operating under vested right means the quarry or mine can continue operation without the need to obtain new permits if it was legally and diligently commenced prior to January 1, 1976, and no substantial changes in operation are made.

[2] Sonoma County Aggregate Resource Management Plan and EIR, County of Sonoma, November 1995,p. 5-35.

3.2 PROJECT CHARACTERISTICS[3]

The data describing the proposed project provided in the following section was provided by the applicant and peer reviewed by the EIR consultant team.

A. Approvals Sought

The applicant, BoDean Co., Inc., requests the following:

1. Rezoning a portion of an 81-acre parcel adjacent to the existing quarry property to add the Mineral Resource Combining District that would allow the mining of this property;

2. Approval of a Use Permit to allow mining of 500,000 cubic yards (CY) (750,000 tons) per year for a 20-year period within the "Active Mining Area" and the area within the "20-Year Mining Limit Line" shown on Figure 3-4;

3. Approval of a Use Permit to allow timberland conversion; and

4. Approval of a revised Reclamation Plan that directs how the site would be reclaimed at the end of the use permit.

Existing and proposed zoning are shown Figure 3-4.

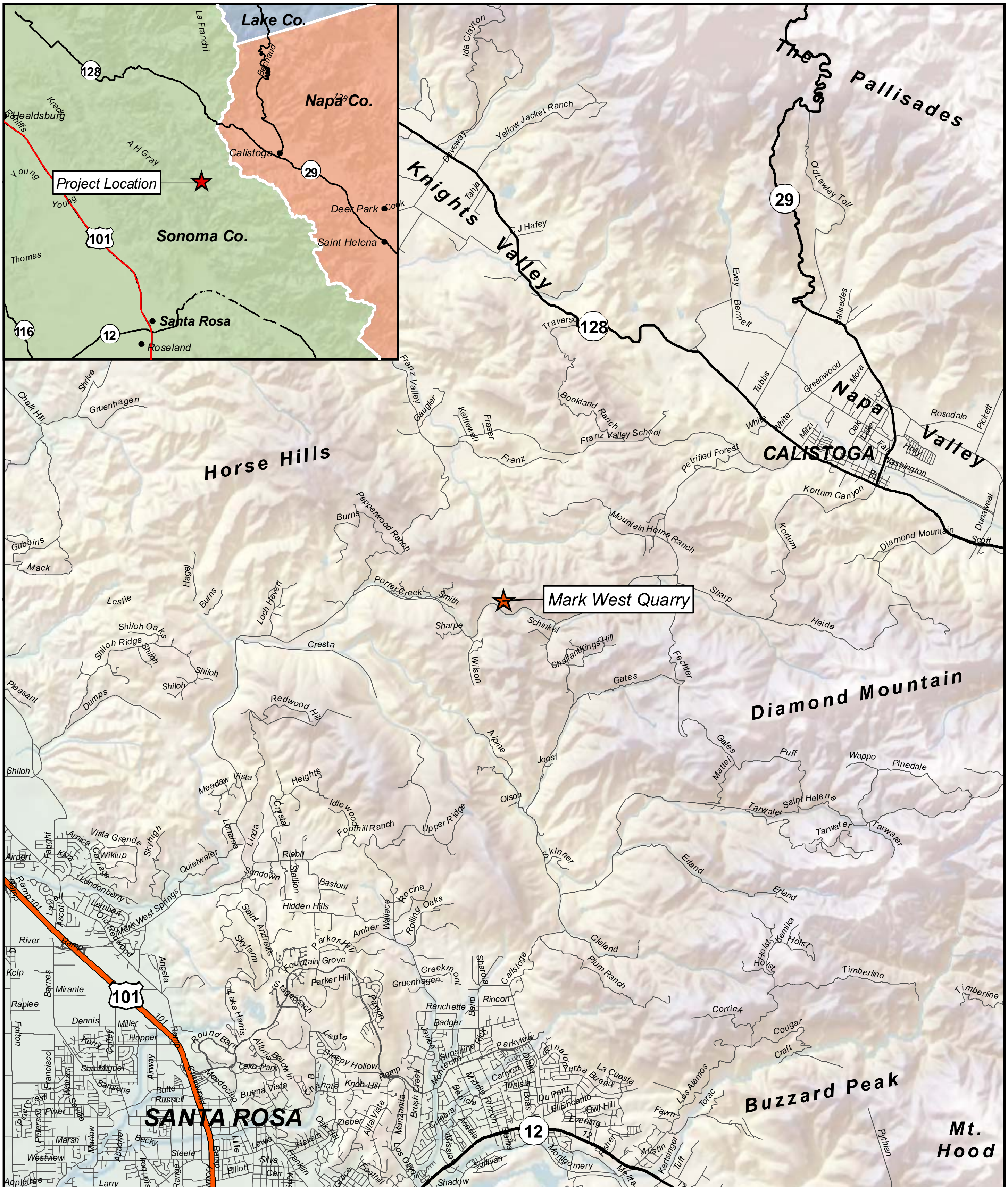
B. Introduction to the Scope of Project

As shown on Figure 3-5, the applicant BoDean Co., Inc., proposes to expand the existing Mark West Quarry to mine approximately 32.4 acres outside of the area currently being mined. The applicant is currently completing the mining the remaining aggregate within the Active Mining Area on the existing quarry so almost all of the future mining would occur on APN 120-210-031.

This EIR addresses the impacts from this proposed mining over the next 20 years to 2033 with an anticipated 2013 start date. Final reclamation of the mined area would continue to 2035 (the County allows ongoing reclamation to extend beyond the end of the active mining period).

The Use Permit and Reclamation Plan would apply to and cover operations on the expansion area and the existing quarry site. A substantial quantity of aggregate would remain on the site after the termination of the Use Permit. After 2033, if the applicant proposes additional mining, the applicant must file a new Permit Application and Reclamation Plan, which would undergo additional environmental review. A new Use Permit and Reclamation Plan would also be required for any future mining of the area currently zoned MR located north of the "Active Mining Area" shown on Figure 3-4. The County will condition the proposed Use Permit (if it is approved) to prohibit any mining on the currently mined quarry parcel located north of the

[3] The applicant has submitted an application for the project dated January 12, 2009. In some places this application incorporates data included in earlier submittals dated December 2003, June 2004, and July 2006. These applications have been further modified by the applicant prior to the completion of this Draft EIR. The project description presented in this EIR is defined as "the project description." In case of any discrepancies between this description and any earlier submittals, the description listed in this EIR takes precedence.



0 0.75 1.5 2.25 3 mi

0 1 2 3 4 5 km

N

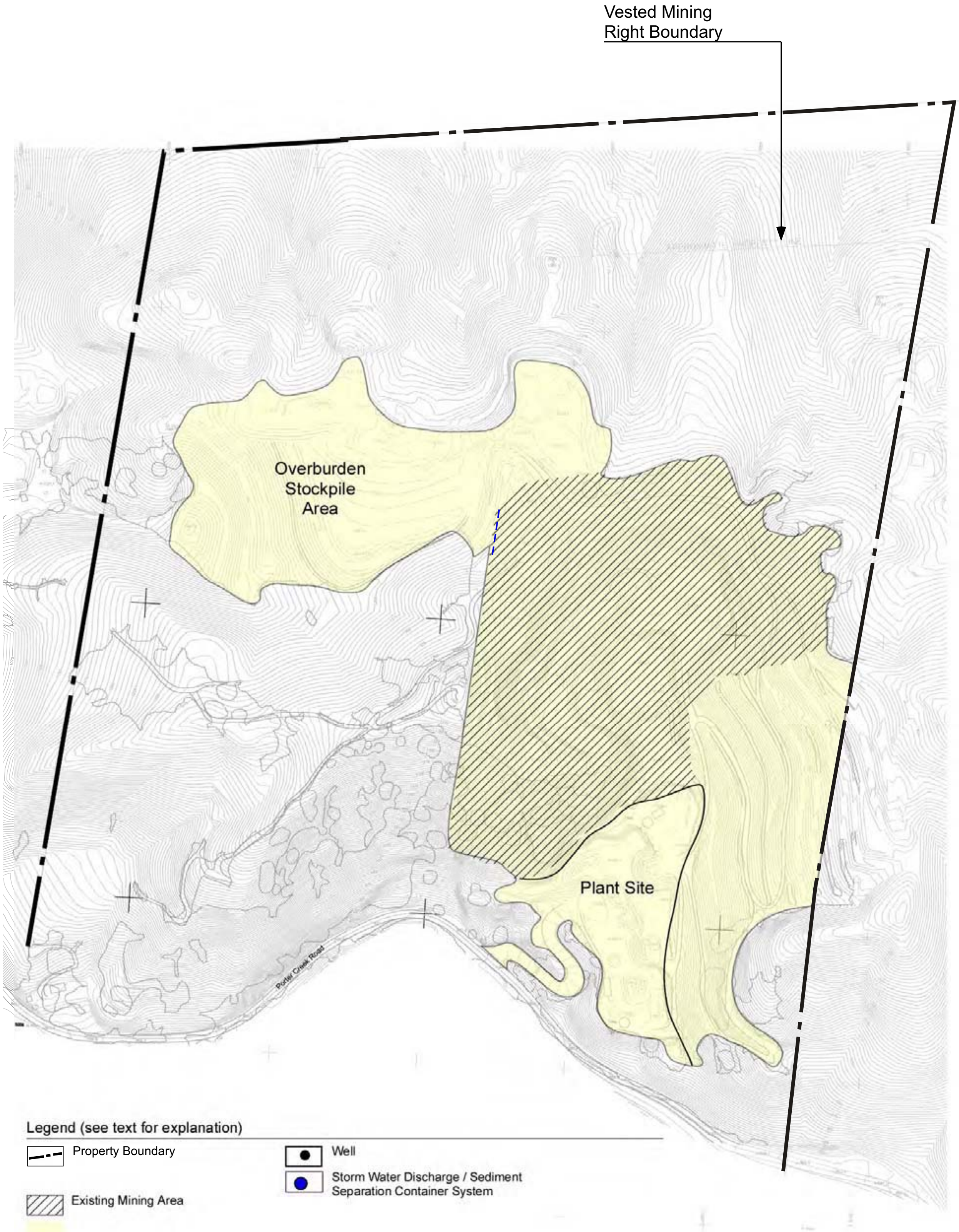
Figure 2-1

Location of Mark West Quarry

USGS 7.5' Quad: MARK WEST SPRINGS (1993)
Legal Description: T08N R07W Sec 08

1:95,040
One in = 1.5 mi

Sonoma County, CA
August 2010



Legend (see text for explanation)

Property Boundary

Existing Mining Area

Well

Storm Water Discharge / Sediment Separation Container System

Mark West Quarry Expansion

Date: 10/15/12

Bodean Company, Inc.
1060 Maxwell Drive
Santa Rosa, CA 95401-5038

Information illustrated is based on the following survey information:

- SOUTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography dated July 23, 2010.
- NORTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography flown in February and March, 2007.

See illustration for match line.

Scale 0' 100' 300'

North

1 Acre

1/4

This drawing is for planning and permit-processing purposes only. Program information, scale, location of areas, and other information shown are subject to field evaluation and modification.

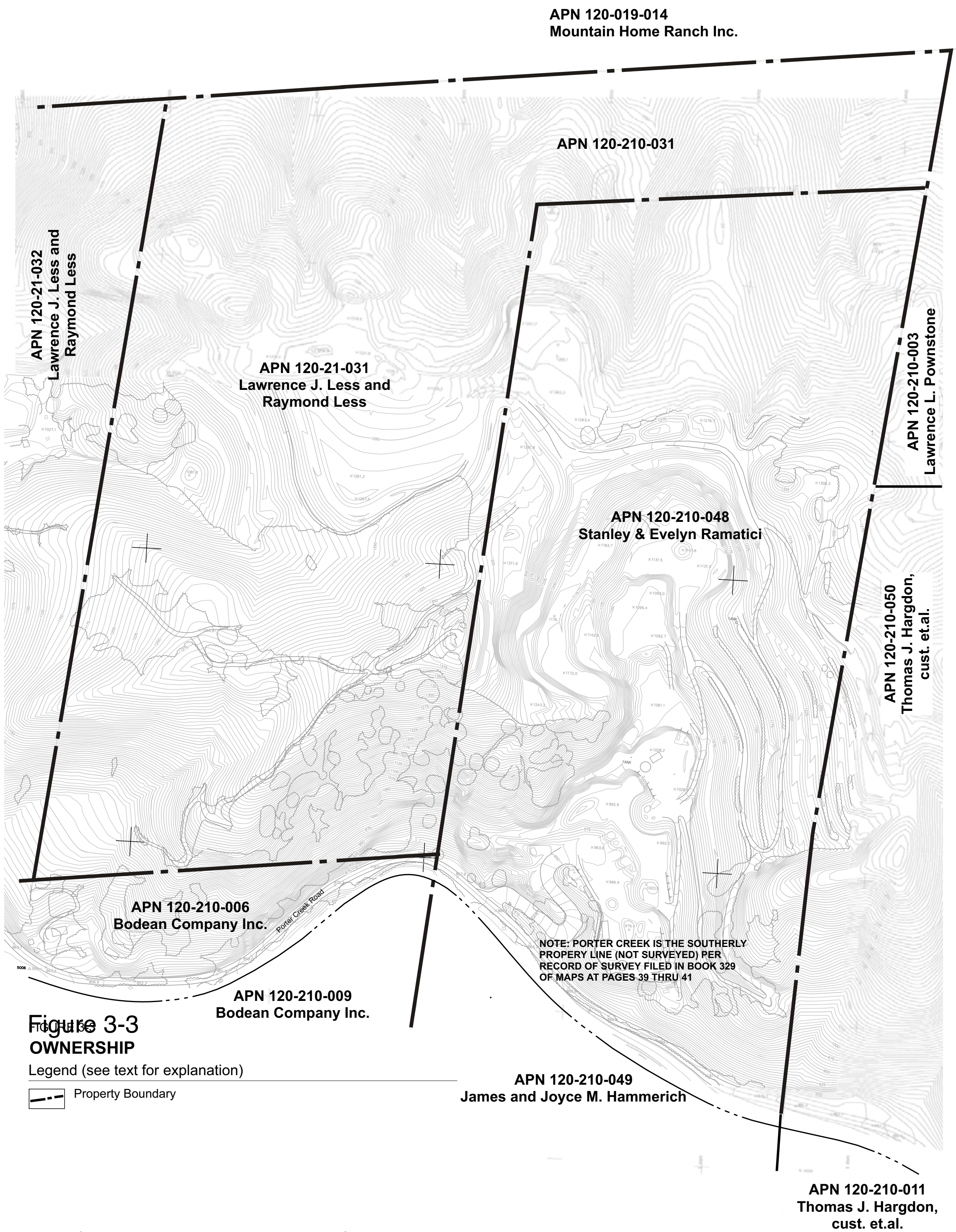


Figure 3-3
OWNERSHIP

Legend (see text for explanation)

Property Boundary

Mark West Quarry Expansion

Date: 10/15/12

Bodean Company, Inc.
1060 Maxwell Drive
Santa Rosa, CA 95401-5038

Information illustrated is based on the following survey information:
- SOUTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography dated July 23, 2010.
- NORTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography flown in February and March, 2007.

See illustration for match line.

Scale 0' 100' 300' North

1 Acre 1/4

This drawing is for planning and permit-processing purposes only. Program information, scale, location of areas, and other information shown are subject to field evaluation and modification.

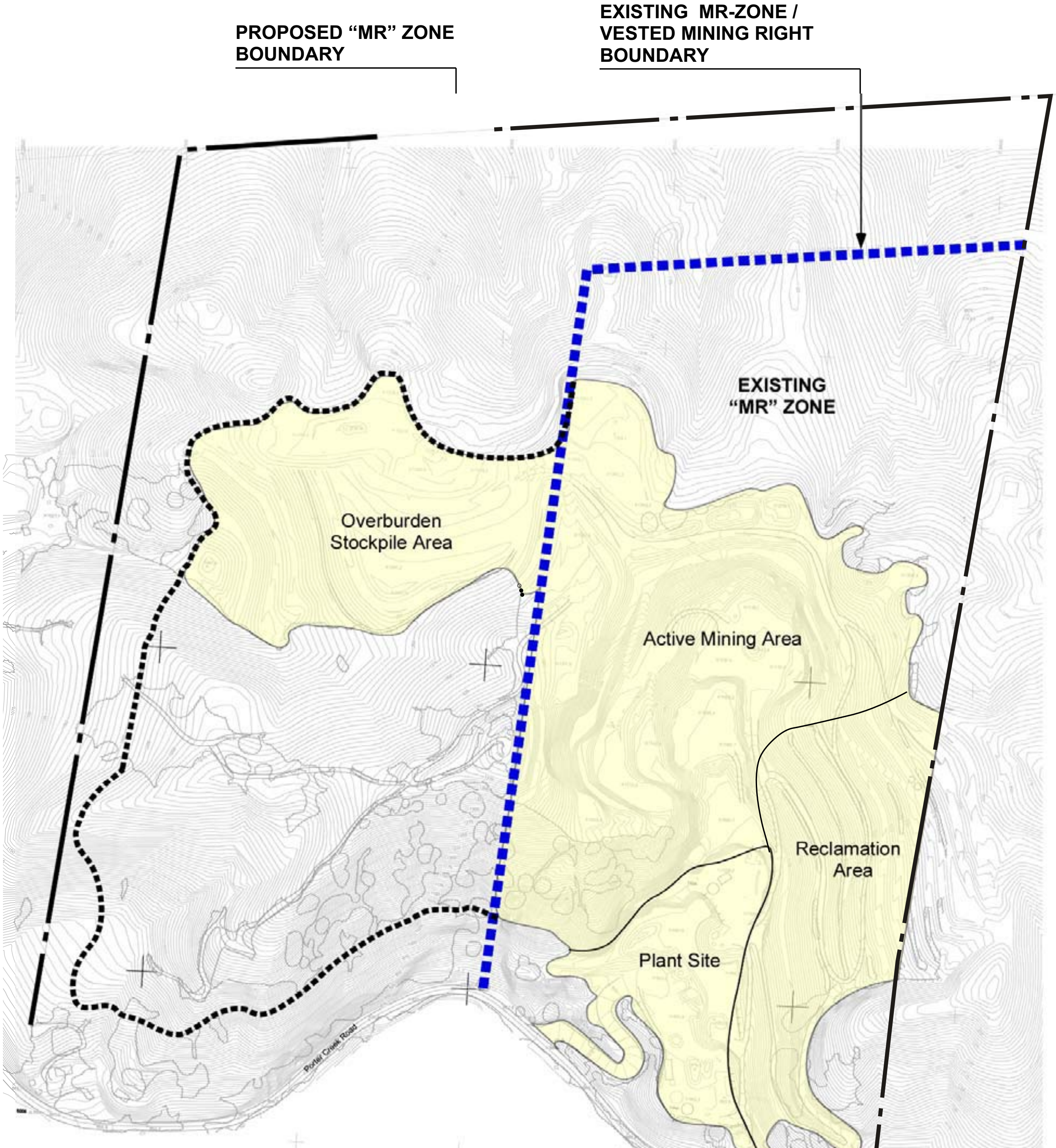


FIGURE 3-4
PROPOSED “MR” ZONE

Legend (see text for explanation)

Property Boundary

Mark West Quarry Expansion

Date: 10/24/12

Bodean Company, Inc.
1060 Maxwell Drive
Santa Rosa, CA 95401-5038

Information illustrated is based on the following survey information:
- SOUTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography dated July 23, 2010.
- NORTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography flown in February and March, 2007.

See illustration for match line.

Scale
0' 100' 300'
North

1 Acre
1/4

This drawing is for planning and permit-processing purposes only. Program information, scale, location of areas, and other information shown are subject to field evaluation and modification.

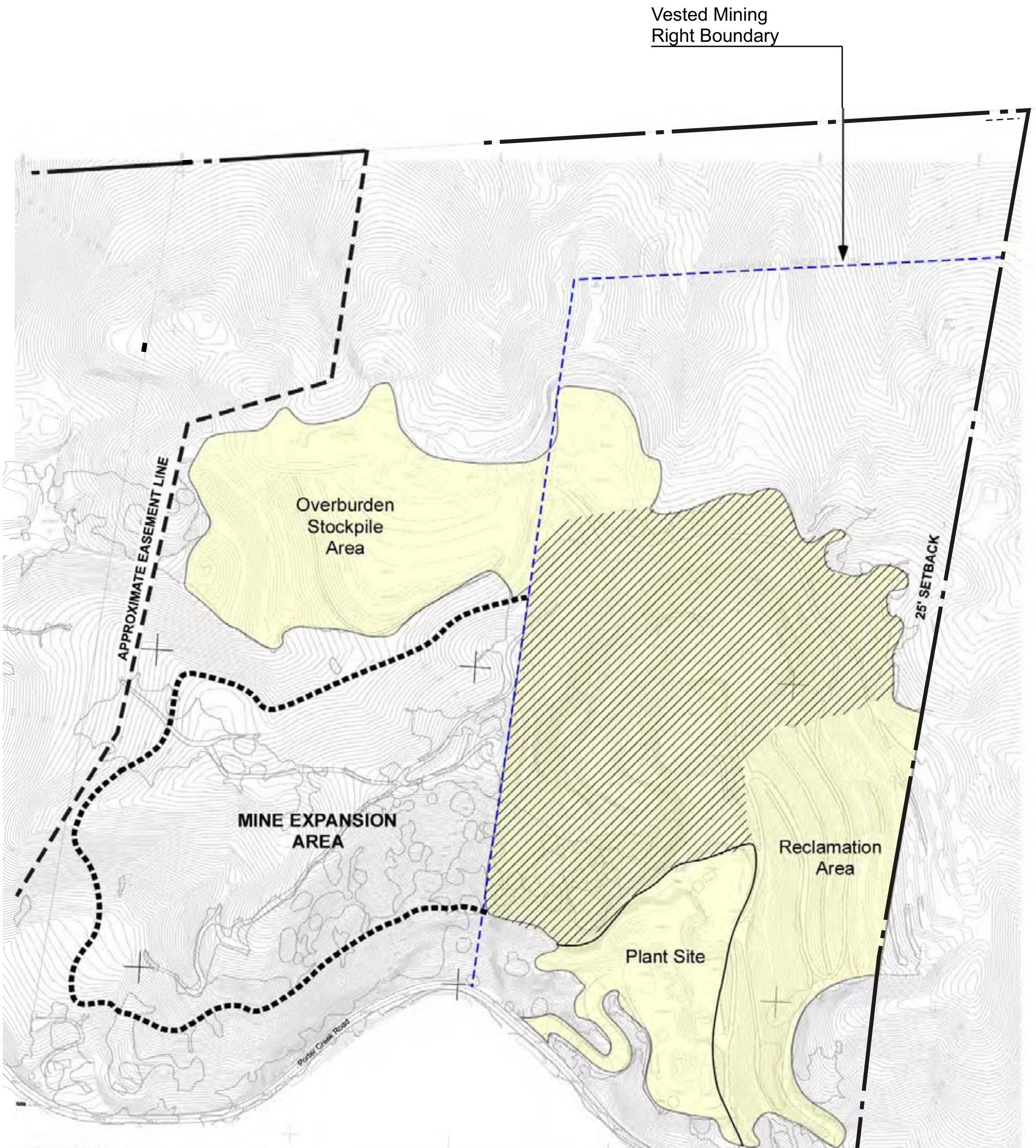


FIGURE 3-5

MINING PLAN AND SETBACKS

(SEE ALSO EXHIBITS G-1 AND G-3)

Legend (see text for explanation)

Property Boundary

Existing Mining Area

Mining Related Activity Area

Mark West Quarry Expansion

Date: 10/15/12

Bodean Company, Inc.
1060 Maxwell Drive
Santa Rosa, CA 95401-5038

Information illustrated is based on the following survey information:
- SOUTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography dated July 23, 2010.
- NORTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography flown in February and March, 2007.

See illustration for match line.

Scale
0' 100' 300'

North

1 Acre

1/4

This drawing is for planning and permit-processing purposes only. Program information, scale, location of areas, and other information shown are subject to field evaluation and modification.

“Active Mining Area” shown on Figure 3-4 until a new Use Permit and Reclamation Plan are approved.

In addition to seeking to expand the quarry to the west, the project includes several changes to the approved Reclamation Plan on the existing quarry site. The current Reclamation Plan for the existing quarry is on file at the offices of the County Permit and Resource Management Department (and summarized on Figures 5-1 and 5-2 in the subsequent section Cumulative Impacts). The reclamation procedures would be amended, as necessary, to be consistent with the reclamation procedures described below for the quarry expansion project.

Table 3-1 describes the existing quarry parcel and the proposed expansion parcel. The table lists the owner of the parcel, its size, and its status.

Table 3-1
Quarry Parcels

Assessor’s Parcel No./Owner	Parcel / Lease Area Acreage	Status/Action
APN 120-210-048 Gary & Michael Ramatici	87 acres	**Status** Leased lands Existing vested right quarry that is currently being mined
APN 120-210-031 Lawrence James Less, et. al. & Raymond Less	Approximately 81 acres	**Status** Leased lands (portion) Proposed quarry expansion parcel; undeveloped except for ranch roads
APN 120-210-006	Approximately 9 acres	**Status** Owned by the applicant and has a residence, Would not be mined but some of the rock fall barriers would be installed on this parcel

Source: BoDean Co., Inc.

The parcel proposed for quarry expansion currently has no dwelling units and no agricultural uses.

Previous Project

The applicant originally submitted a similar proposal for expansion of the quarry in December 2003 as augmented in June 2004. As described previously, work on the EIR for this original proposal was halted at the request of the applicant while they revised the project. The principal differences between the 2004 submittal and the current project are:

1. The applicant originally sought approval for a 60-year permit whereas the current proposal is for 20 years.

2. The applicant has clarified which portions of the property would be rezoned to the Mineral Resource (MR) Combining District

3. The area shown as Overburden Stockpile Area had not been developed in 2004.

4. There are minor differences in boundaries defining activity areas and the description of the mining process.

5. The Reclamation Plan has been updated to address the revised project description.

This original 2003/2004 proposal was amended in July 2006 to seek a 20-year permit. The current proposal also provides additional details on existing and proposed drainage, biological resources, and geology.

C. Project Objectives

Section 15124(b) of the CEQA Guidelines requires that the Project Description of an EIR contain a statement of objectives sought by the proposed project. The project applicant's objectives include:

1. To profitably operate an existing hard rock quarry in reasonable proximity to Highway 101, at a site designated for aggregate production in the Sonoma County ARM Plan.

2. Encourage the use of locally produced aggregates within Sonoma County thereby reducing unsustainable importation, which will aid in the reduction of GHG (Greenhouse Gas) emissions and compliance with AB32.

3. To provide an affordable and reliable source of aggregate suitable for Portland Cement Concrete ("PCC"), Asphalt Concrete ("AC"), Asphalt Concrete Base (ACB) Lean Concrete Base (LCB), and Cement Treated Base (CTB), as well as construction grade aggregates, etc., to customers in Sonoma County and the local area, thus minimizing transport distances and associated costs and impacts and facilitating the State and County policy of meeting local demand for high quality aggregates with local resources.

4. To allow the continuance of an existing quarry to assist the County of Sonoma in meeting its stated goals and policies of shifting aggregate production away from terrace mining to hard rock quarries, thereby avoiding the conversion of prime agricultural land on the terraces of the Russian River.

5. To assist in ameliorating the PCC, AC and ACB aggregate shortage identified in a report of the Department of Conservation titled CGS Special Report 175: Mineral Land Classification of Aggregate Materials in Sonoma County, California, dated 2005.

6. To facilitate new or expanded quarry with resources which can meet the needs for aggregate in an environmentally sound manner.

7. To encourage the extraction and utilization of natural resources in a more sustainable fashion as in this case with the use of renewable energy via photovoltaic solar power.

The County's goals and objectives for aggregate resources were established in the Sonoma County ARM Plan. Relevant objectives from the ARM Plan are presented below:

1. Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.

2. Encourage the retention of locally produced aggregate for use within Sonoma County.

D. Description of Proposed Mining

The following information describing the project was provided by the project applicant. The proposed project is shown on Figure 3-5.

1. Area to Be Mined

Currently, the Mark West Quarry operation, including reclamation work already completed at the site, covers about 58 acres of an 87-acre parcel. An additional area of approximately 15.1 acres on adjacent leased lands was used for stockpiling overburden and storing fill removed during emergency grading repairs in the 2006 winter season. The applicant then continued to place additional overburden in this area until January 2011. Additional stockpiling of overburden in this area will not be permitted until the County approves the MR zoning for this project. The planned mining expansion area is primarily to the west of the existing mining area. Over a 20-year period, the area to be mined would be expanded by approximately 32.4 acres.

2. Depth, Quantity, and Type of Minerals to be Mined

The target resource of the quarry is Franciscan greenstone. The processed rock is sold as various forms of high quality aggregate. Based on logs from four water wells drilled onsite, the greenstone exists to a bottom elevation of at least 650 feet above sea level just east of the expansion area. The bottom elevation proposed for the quarry expansion is 945 feet. Thus, greenstone persists for at least 260 feet below the maximum depth of proposed mining. Observations of continuously exposed greenstone along Porter Creek Road lend support to the conclusion that the greenstone also extends to at least this depth beneath the expansion area.

The applicant has stated that in the future after the proposed mining expansion is completed, it may seek approval to deepen the mining floor to an elevation of 905 feet. If the applicant proposes to excavate below the 945-foot elevation, the applicant would submit an application for the modification of the Use Permit/Reclamation Plan with appropriate engineering plans and technical support documentation as required by the County. This may include review of existing wells and the potential effects on Porter Creek and other water courses, if any. These studies shall be submitted to the County as part of the application for a permit revision, subject to CEQA review. For the purposes of this EIR, impacts resulting from mining below the 945-foot elevation are considered as a possible long-term or cumulative impact of the project (see ***Section 5.2, Cumulative Impacts***). Table 3-2 describes the depth and quantity of materials on the expansion site.

Table 3-2
Depth, Quantity, and Type of Minerals

Depth of Mining	Quantity (approximated)			
	Total Material to be Removed (a)	Greenstone Overburden (a)	Marketable Greenstone	
	cubic yards	cubic yards	cubic yards	tons (b)
To Elevation 945 feet	10,400,000	1,453,000	8,778,000	13,167,000
Additional between Elevation 945 and Elevation 905	169,000		169,000	253,500

Source: BoDean Co., Inc.
Notes:
(1) volume assumes an average greenstone overburden thickness of 30 feet over all undisturbed lands to be mined
(2) 1 cubic yard of material equals 1.5 tons of marketable greenstone

3. Phasing

Quarrying would occur as a continuous operation, with reclamation occurring as mining of a specific area is completed. In general, the work pattern would be to finish the quarrying west of the plant site and south of the active mining area on the vested right parcel and then to proceed into the new expansion area to the west. Quarrying and reclamation would occur in three phases over an estimated 20-year period (with final reclamation inspections and reporting and correcting any problems in the reclaimed areas occurring over an additional three years). The typical sequence of actions for each phase are:

1. Removal of vegetation and overburden
2. Preliminary grading for drainage control
3. Blasting
4. Rock removal using heavy equipment
5. Rock crushing, processing, and sale
6. Implementation of reclamation procedures
7. Repetition of the above actions in the next phase.

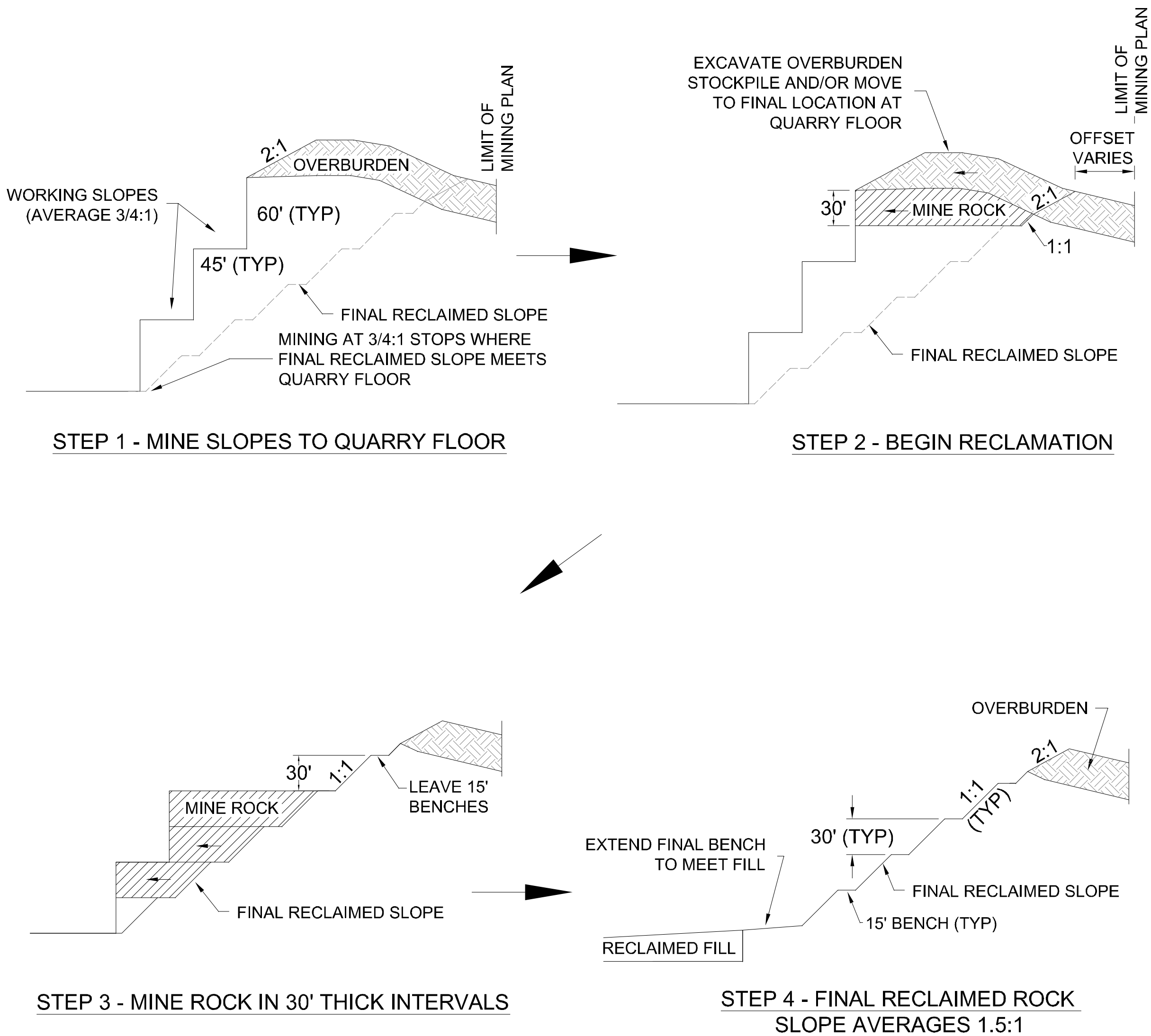
To keep quarry operations continuous, the phases would overlap to some extent, so that as one phase nears completion, the next phase would begin, and the resulting landscape of the previous phase would be reclaimed. The specific timing and sizing/boundaries of each phase would be determined by the applicant based on market demand and on-site conditions.

4. Mining Operations

The sections below describe how the mining actions would be accomplished. Figures 3-6 to 3-11 show the proposed sequence of mining and reclamation. Figure 3-12 shows the expansion area contours at the completion of the 20-year mining period. Figure 3-13 shows the sections through the grading shown in Figure 3-12. Figure 3-14 shows the final grading upon completion of site reclamation.

Figure 3-6
RECLAMATION PLAN: CONSTRUCTION SEQUENCE FOR FINAL TERRACED SLOPES

Note: See also Figures 3-8 through 3-10



Miller Pacific
ENGINEERING GROUP

Date: 10/15/12

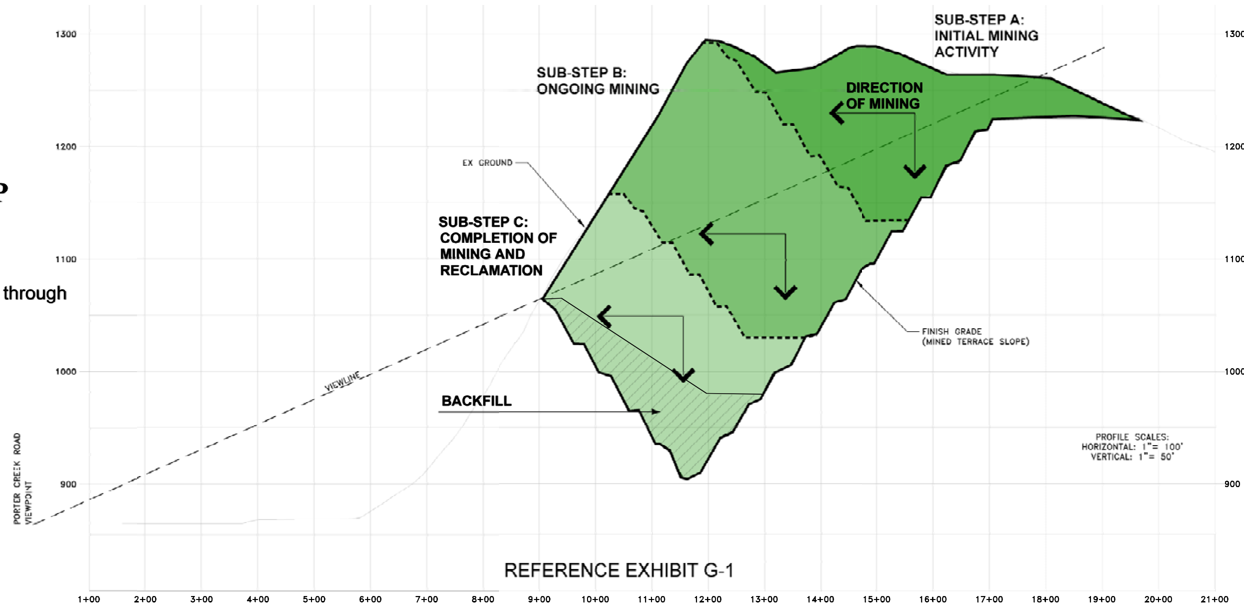
Mark West Quarry Expansion

BoDean Company, Inc.
1060 N. Dutton Avenue
Santa Rosa, CA 95401

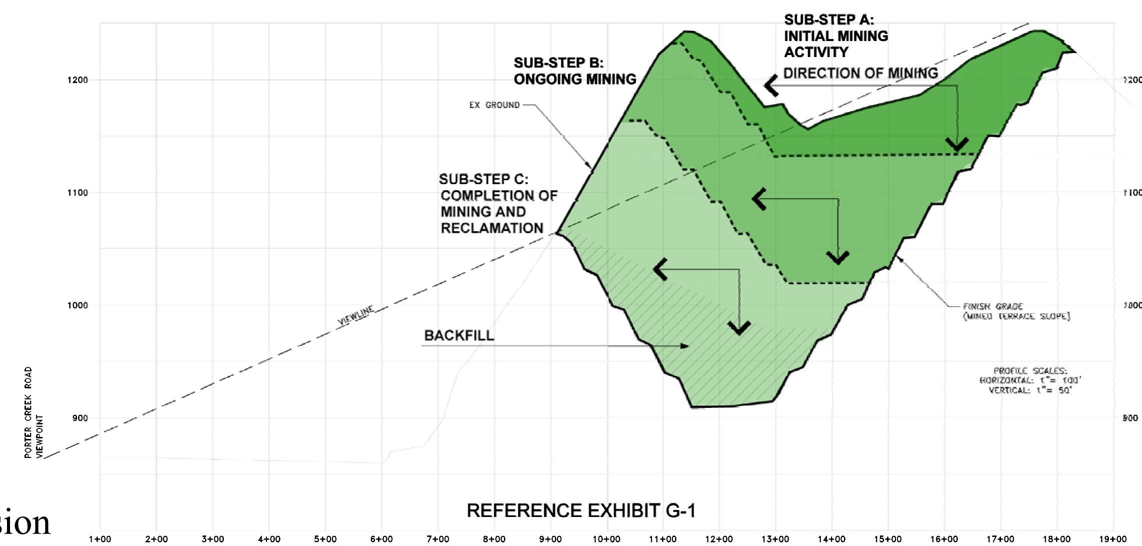
Figure 3-7
Figure 3-7:

MINING AND RECLAMATION SEQUENCE: DIRECTION OF MINING BY STEP

Note: See also Figures 3-8 through 3-10



VIEWLINE SECTION A–A



VIEWLINE SECTION B–B

Mark West Quarry Expansion

Date: 10/15/12

BoDean Company, Inc.
1060 N. Dutton Avenue
Santa Rosa, CA 95401

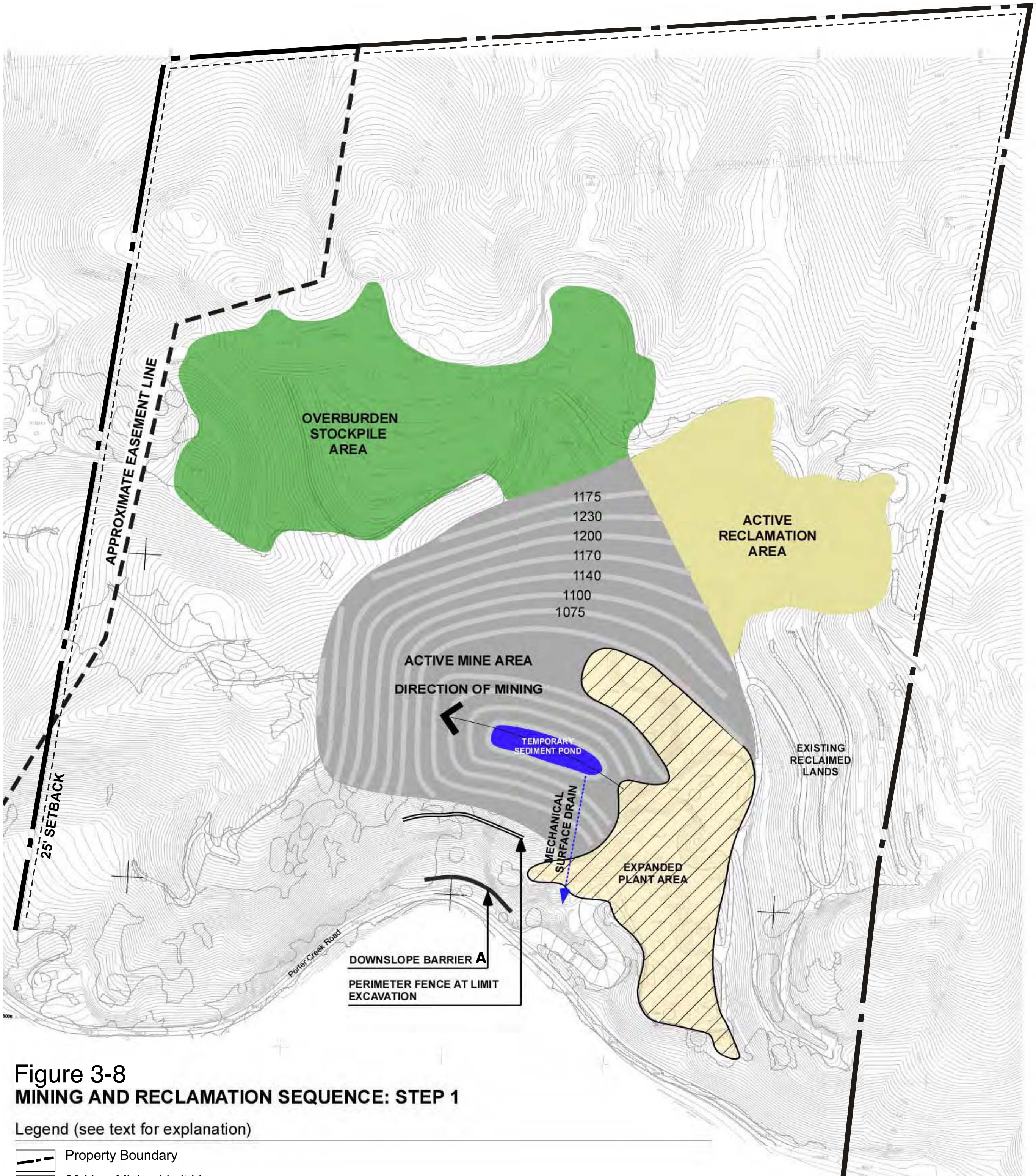


Figure 3-8
MINING AND RECLAMATION SEQUENCE: STEP 1

Legend (see text for explanation)

Property Boundary

20-Year Mining Limit Line

Mark West Quarry Expansion

Date: 10/15/12

Bodean Company, Inc.
1060 Maxwell Drive
Santa Rosa, CA 95401-5038

Information illustrated is based on the following survey information:
- SOUTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography dated July 23, 2010.
- NORTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography flown in February and March, 2007.

See illustration for match line.

Scale
0' 100' 300'
North

1 Acre
1/4

This drawing is for planning and permit-processing purposes only. Program information, scale, location of areas, and other information shown are subject to field evaluation and modification.

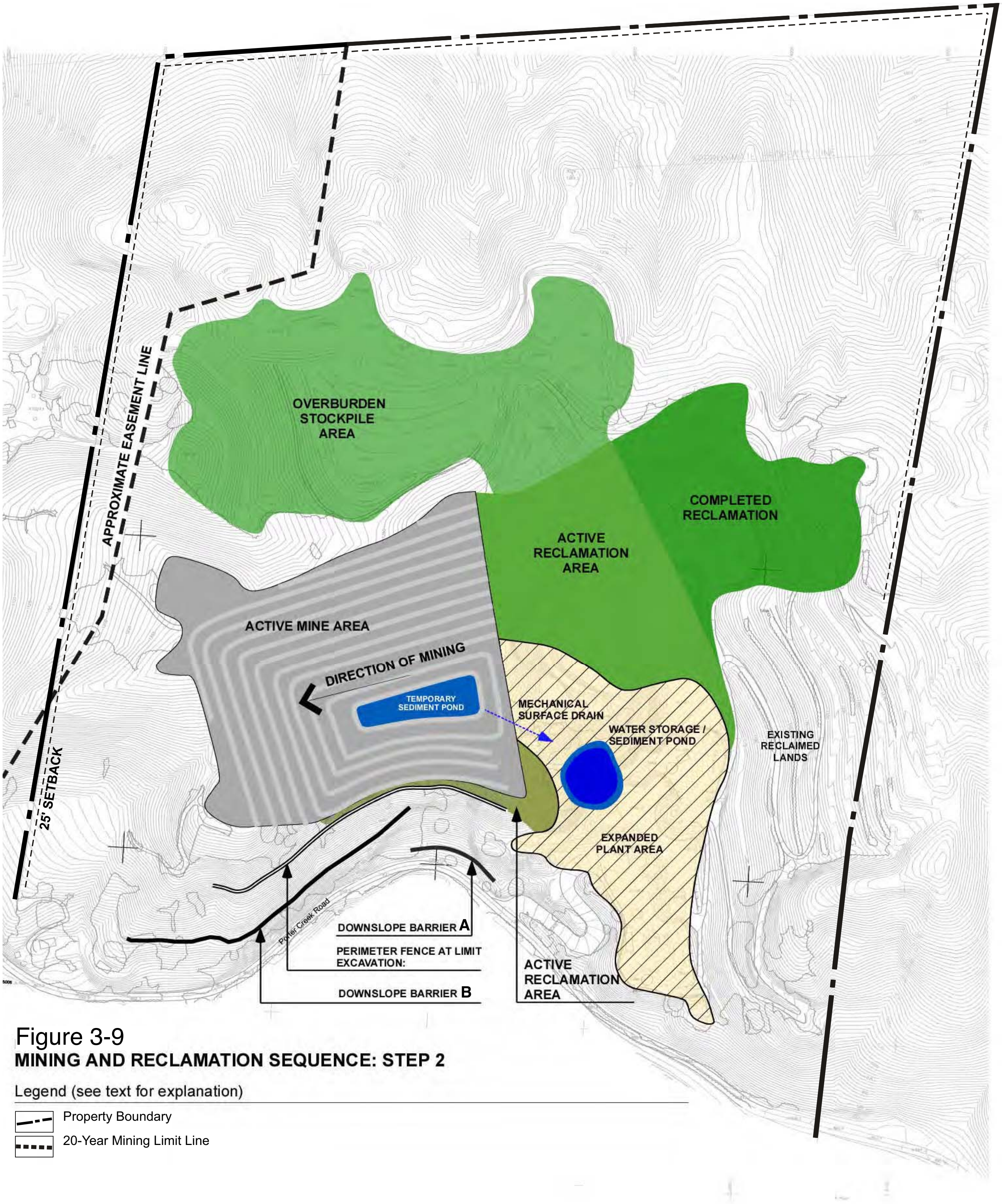


Figure 3-9
MINING AND RECLAMATION SEQUENCE: STEP 2

Legend (see text for explanation)

- Property Boundary
- 20-Year Mining Limit Line

Mark West Quarry Expansion

Date: 10/15/12

Bodean Company, Inc.
1060 Maxwell Drive
Santa Rosa, CA 95401-5038

Information illustrated is based on the following survey information:
- SOUTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography dated July 23, 2010.
- NORTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography flown in February and March, 2007.

See illustration for match line.

Scale
0' 100' 300'
North

1 Acre
1/4

This drawing is for planning and permit-processing purposes only. Program information, scale, location of areas, and other information shown are subject to field evaluation and modification.

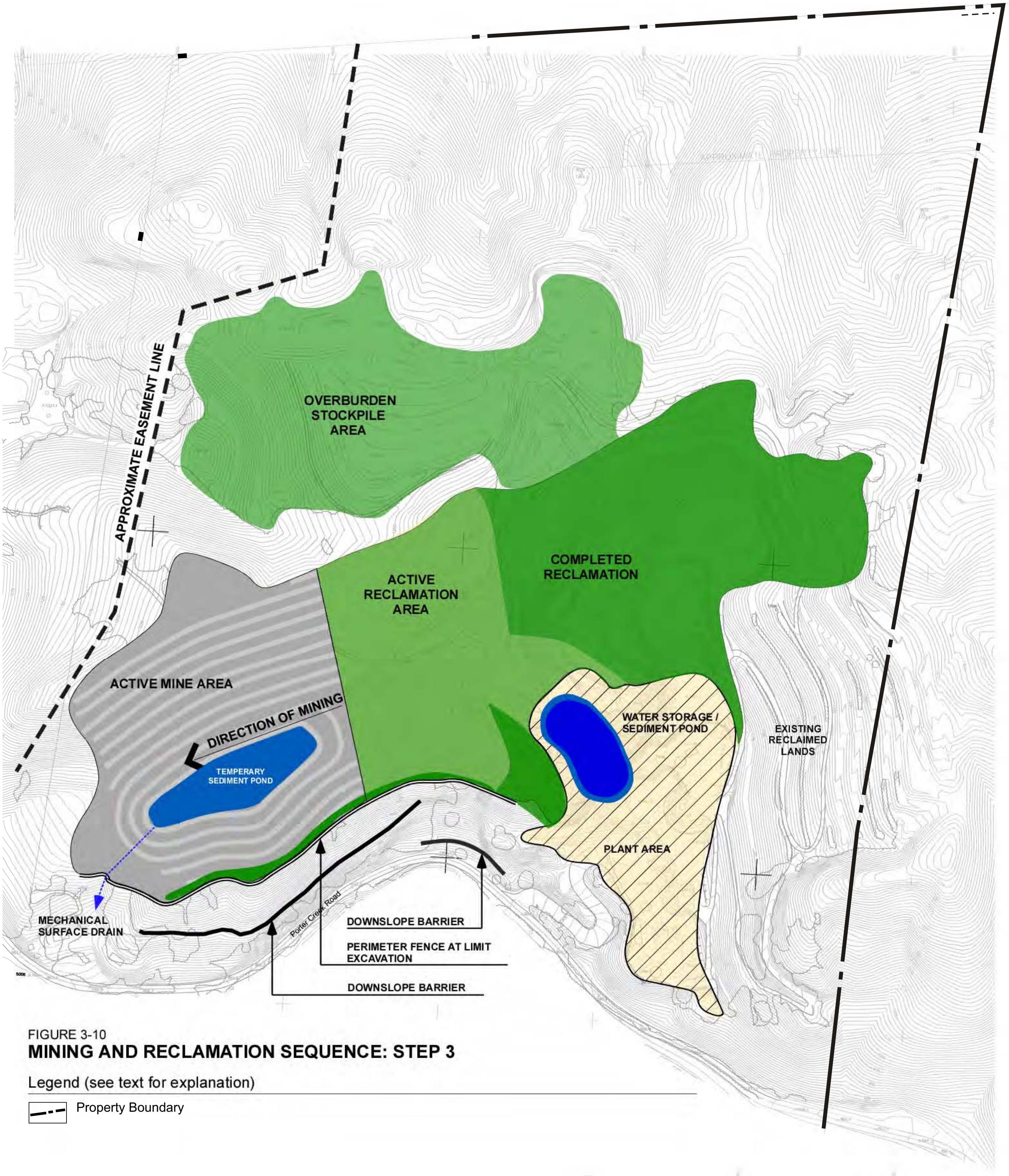


FIGURE 3-10

MINING AND RECLAMATION SEQUENCE: STEP 3

Legend (see text for explanation)

Property Boundary

Mark West Quarry Expansion

Date: 10/15/12

Bodean Company, Inc.
1060 Maxwell Drive
Santa Rosa, CA 95401-5038

Information illustrated is based on the following survey information:
- SOUTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography dated July 23, 2010.
- NORTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography flown in February and March, 2007.

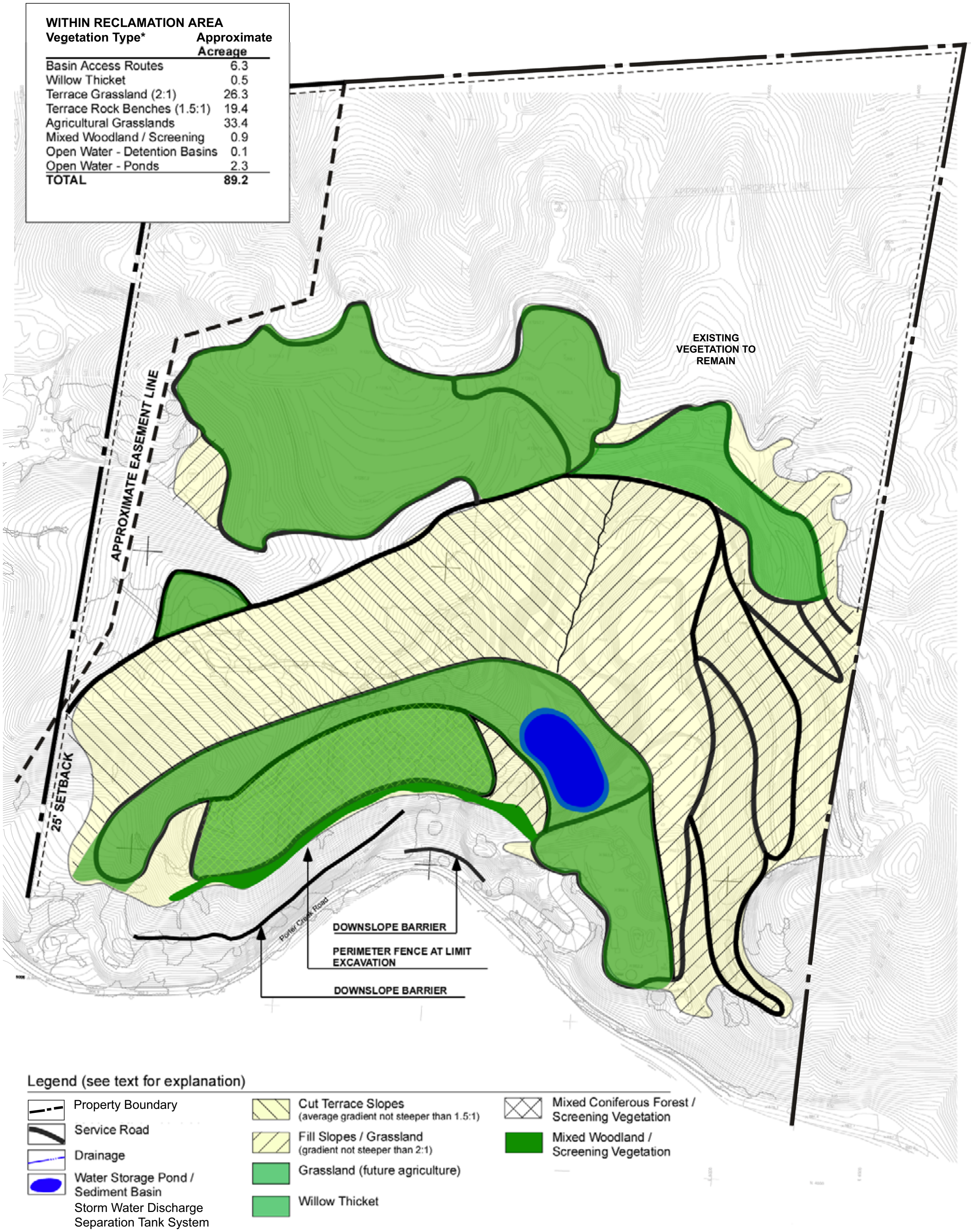
See illustration for match line.

Scale 0' 100' 300' North

1 Acre

1/4

This drawing is for planning and permit-processing purposes only. Program information, scale, location of areas, and other information shown are subject to field evaluation and modification.



WITHIN RECLAMATION AREA

Vegetation Type*	Approximate Acreage
Basin Access Routes	6.3
Willow Thicket	0.5
Terrace Grassland (2:1)	26.3
Terrace Rock Benches (1.5:1)	19.4
Agricultural Grasslands	33.4
Mixed Woodland / Screening	0.9
Open Water - Detention Basins	0.1
Open Water - Ponds	2.3
TOTAL	**89.2**

Mark West Quarry Expansion

Date: 10/15/12

Bodean Company, Inc.
1060 Maxwell Drive
Santa Rosa, CA 95401-5038

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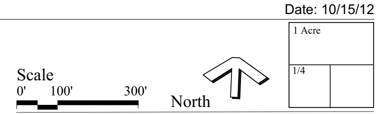
- SOUTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography dated July 23, 2010.
- NORTH PORTION: Base topographic map by Delta Geomatics under the direction of Green Valley Consulting Engineers and based on aerial photography flown in February and March, 2007.

See illustration for match line.



This drawing is for planning and permit-processing purposes only. Program information, scale, location of areas, and other information shown are subject to field evaluation and modification.

Figure 3-12
FINISH GRADING PLAN
AT THE COMPLETION OF MINING

EBA ENGINEERING
825 SONOMA AVENUE
SUITE C
SANTA ROSA, CA 95404
TEL: (707) 544-0784

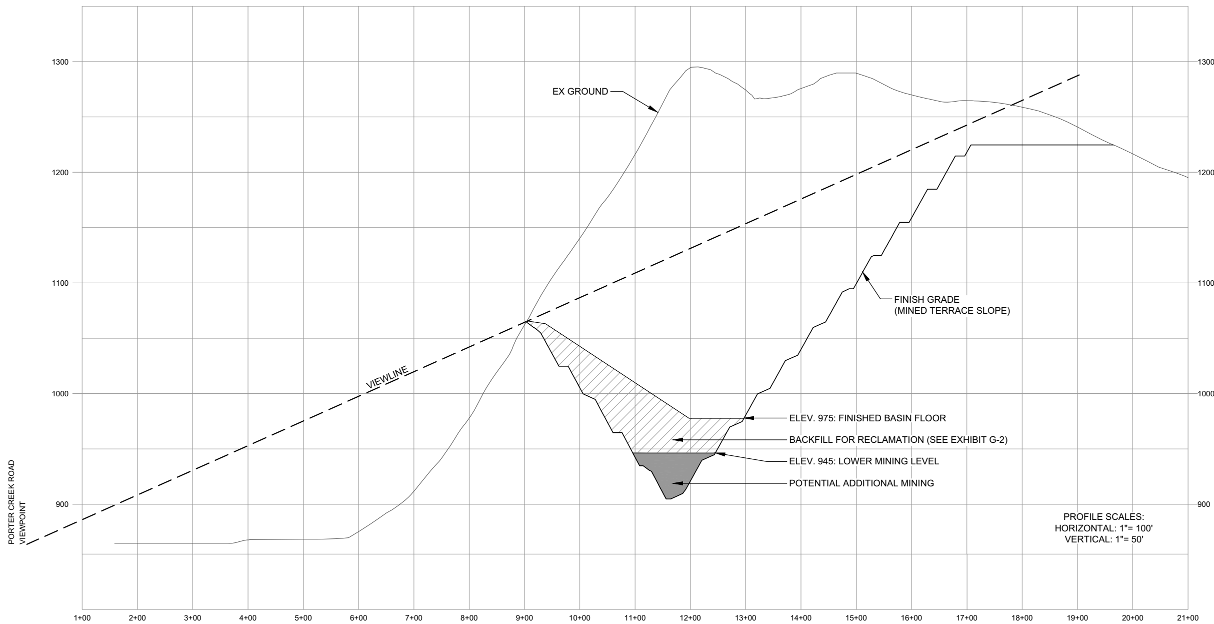
APPROX. 10,400,000 CU YDS CUT (UNADJUSTED)
APPROX. 390,000 CU YDS FILL (UNADJUSTED)

RECLAMATION PLAN - MARK WEST QUARRY
SANTA ROSA, CALIFORNIA

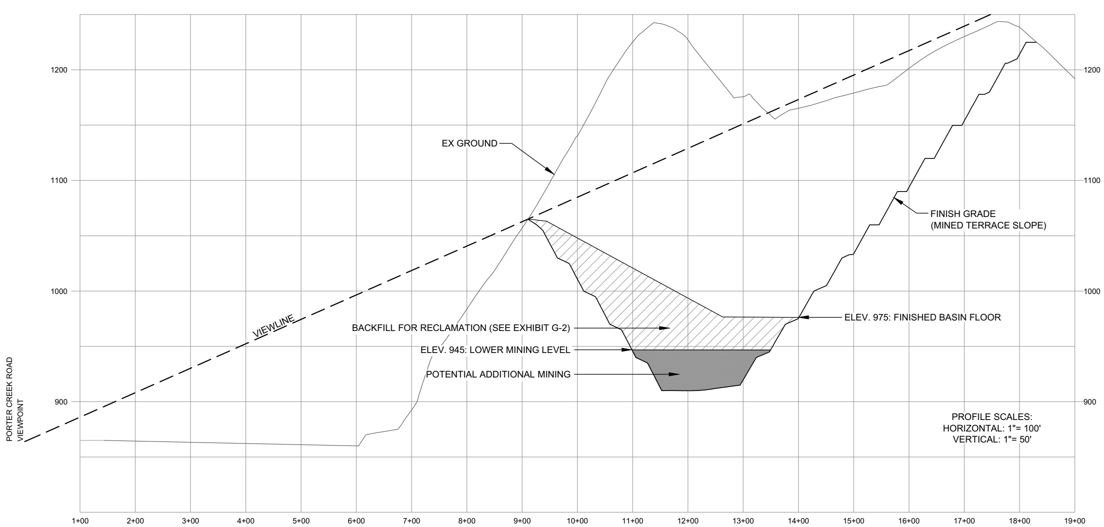
Submittal / Revision:

Job No: 12–1872
Drawn By: SGH
Checked By: DM
Date: 2012–10–04

Sheet Number
G1
1 of 3



VIEWLINE SECTION A-A



VIEWLINE SECTION B-B

Figure 3-13

VIEWLINE SECTIONS
SHOWN IN FIGURE 3-12

EBA ENGINEERING
825 SONOMA AVENUE
SUITE C
SANTA ROSA, CA 95404
TEL: (707) 544-0784

VIEWLINE SECTIONS A-A & B-B

RECLAMATION PLAN - MARK WEST QUARRY
SANTA ROSA, CALIFORNIA

Submittal / Revision:

Job No:	12-1872
Drawn By:	SGH
Checked By:	DM
Date:	2012-10-04

Sheet Number
G3
3 of 3

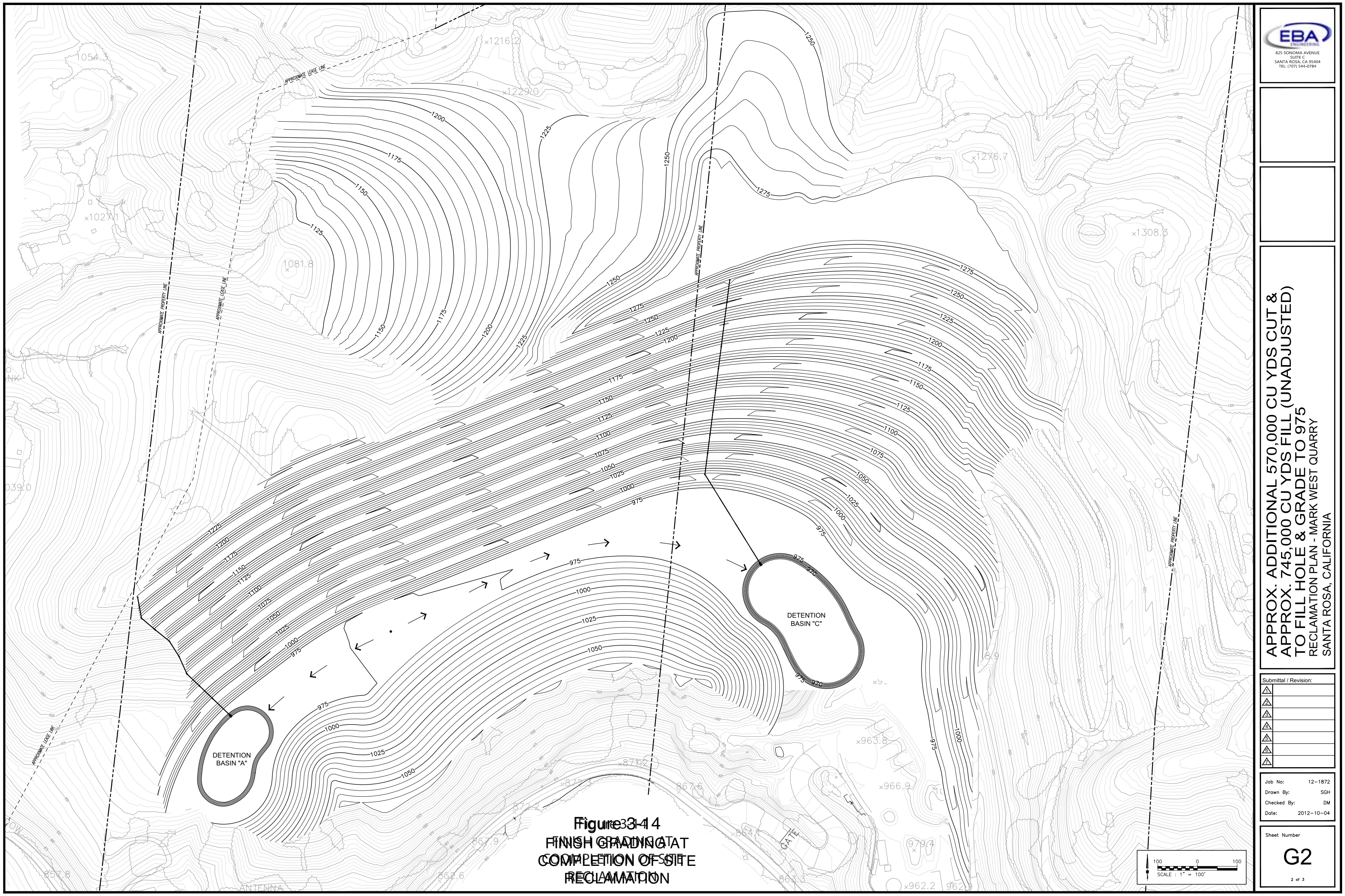


Figure 3-14
FINISH GRADING AT COMPLETION OF SITE RECLAMATION

a. Pre-Extraction Grading

Prior to commencement of quarrying in the expansion area, the quarry floor would be graded toward the face of the mining area in order to expand the quarry floor and provide additional runoff storage during peak storms.

b. Vegetation Removal

The first step in the quarrying of the expansion area would be to remove vegetation. All vegetation would be chipped, mulched, and used as an amendment added to stored topsoil, which would be used for subsequent reclamation activities. The native vegetation in the Overburden Stockpile Area was removed prior to the overburden being placed there in 2005.

The proposed mining area contains some areas of mixed evergreen forest. Removal of trees from this area would result in timberland being temporarily used for other uses than growing timber prior to reclamation. This temporary use will require County approval per County Code Section 26-88-160 and CAL FIRE approval of a Timberland Conversion Permit (TCP).

c. Topsoil Stockpiling

Upon completion of vegetation removal, the topsoil or soil mantle over the rock deposits would be removed and temporarily staged on the Overburden Stockpile Area. This stockpile would be revegetated with grasses and chips or mulch to prevent erosion until the soil is ultimately used in the reclamation process. The soil stockpiles would also be surrounded by sediment fences, straw bales, or equivalent structures to prevent any off-site transport of soil or sediment from the stockpiles.

d. Overburden Stockpiling

In the past, overburden (the material beneath the topsoil and above the greenstone) was stockpiled north of the mining area on the vested rights parcel (APN 120-210-048). During the winter of 2004-2005, this overburden storage was causing landsliding. The applicant received an emergency grading permit from the County to remedy this hazard. Soil removed from the landslide area was then placed on approximately 15.1 acres of the adjacent parcel that includes the quarry expansion area (i.e., the Overburden Stockpile Area). The applicant has placed about 60,000 cubic yards of overburden in this area since 2005. In January of 2011, additional stockpiling in this area was suspended pending completion of this EIR and County approval of the project and rezoning the Overburden Stockpile Area to MR. Currently, the applicant is temporarily storing overburden immediately north of the existing mining area on the existing quarry pit, which is zoned MR. Figure 3-5 shows the existing topsoil and overburden storage area.

As the quarry expands, additional overburden and/or topsoil would be added to the top bench area of the Overburden Stockpile Area. A maximum addition of 24,000 cubic yards would be placed at a depth of 5 feet per year over the first three years after project initiation for a total of 15 vertical feet added to this top bench area. After the first three years, the area would be used to temporarily store and stage overburden and topsoil prior to its being placed for reclamation. There would never be more than 24,000 cubic yards from the expansion area stored here at any one time.

Over the long term, the overburden already stored in the storage area could be sold (the applicant has historically sold about 20% of the greenstone overburden as general fill) and used for quarry reclamation. If sold, the material would be counted as part of the 500,000 cubic yard maximum annual production limit for the project.

Scrapers and excavators would be used to remove the overburden for sale or reclamation. As the overburden is removed and the virgin topography is about to be encountered, removal would be done solely by excavators to avoid damage to the sub-drains that were installed beneath the overburden fill. When the sub-drains are exposed, they would be altered to allow for future use to drain the remaining in-place material. After overburden removal is completed for each year and prior to the rainy season, surface drainages would be rerouted and repositioned as necessary. The exposed virgin topography would then be rehabilitated/reclaimed with plantings and appropriate erosion control. When all the material is removed from the stockpile area, surface drainages have been relocated, and reclamation is complete, the existing detention pond at the west end of the Overburden Stockpile Area would remain.

The applicant estimates that the overburden that would be removed from the expansion area would be approximately 1,453,000 CY. Approximately 291,000 CY would be sold (though it is possible that more could be sold if a large project needing fill were approved in the area). The remainder of the overburden would be used for reclaiming portions of the quarry where mining has been completed.

e. Blasting

Explosives are used in the quarrying process to break up or open areas of rock for extraction. Licensed and trained personnel use explosives an average of twice per week and up to three times a week during peak production periods. To assure safety, blasting takes place under the strict control of these explosives personnel. All blasting is done per the conditions of the blasting permit issued by the Sonoma County Sheriff's Department. The applicant's blasting plan explains how explosives are handled and blasting is done. Explosives are transported to the site by a licensed explosives hauler. All explosives are stored in an approved magazine on the quarry site. Explosives are transported from the magazine to the blasting location and used at the blasting location by licensed blasting personnel. Transport, storage, and use of all explosives are in conformance with the requirements set forth in the California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 17, Mine Safety Orders (specific orders regulating explosives include Article 50, Explosives; Article 51, Storage of Explosives; Article 52, Transportation of Explosives; Article 53, Hauling and Use of Explosives; Article 54, Mixing Blasting Agents; and Article 55, Licensing of Blasters).

f. Sequence of Grading During Quarrying

Once the rock is quarried, it would be moved by equipment to the primary jaw crusher, then by conveyors to various on-site secondary crushers, and then by conveyor to sorting and processing equipment and on to where it is stockpiled for sale. All this activity would be oriented inward toward the quarry rather than outward toward exterior slopes or drainages.

As quarrying proceeds downward, benches would be created as shown on Figure 3-6. Typically, the benches would be 60 feet in height and 45 feet in width. To increase worker safety, earth berms (with appropriate erosion control) would be placed near the bench edges to reduce the hazard of equipment or material falling off of them.

Processing consists of reducing the rock size to the required diameter using primary and secondary crushers, and by screening. Conveyor belt systems transport partially processed materials and stockpile final products. Aggregate used for sale is dry-processed. Water is used for dust suppression and to moisture-condition the aggregate prior to sale. Water is also used to wash sand at the existing wash plant and for irrigating vegetation in reclaimed areas. The wash plant is an existing facility that was constructed in 2006. The sand that is washed at this facility is used for asphalt and concrete manufacture. Currently most of the sand produced is used at BoDean's facility in Santa Rosa, but sand is also sold to other buyers.

As mining moves west on the site, the processing area would expand from about 5 acres to about 10 acres, and about every 5-7 years the primary jaw crusher would be moved to the west to be nearer the working face of the quarry. If necessary, additional conveyors would be used to transport crushed aggregate from the primary crusher to secondary crushers.

g. Equipment

The following motorized mobile equipment is presently used to conduct mining activities:

1. One drill rig (Ingersoll-Rand ECM660)
2. Five Caterpillar front end loaders and one Skid Steer 279C loader
3. One Caterpillar D10T bulldozer
4. One Caterpillar 415C backhoe
5. One Caterpillar 325CL excavator
6. One Caterpillar 740EJ haul truck
7. One Caterpillar 825 compactor
8. One F250 pickup
9. One Ford 550 service truck
10. One Ford 550 flat bed truck
11. One F-130 Ford pickup
12. One Tymko 435 street sweeper

The following stationary equipment is used in processing the rock to prepare suitable aggregate for sale:

1. One primary jaw crusher with vibrating feeder and conveyors
2. One cone crusher
3. Two Remco vertical impact crushers
4. Thirty-six conveyors with seven stacking conveyors and three radial stackers
5. Two surge tunnels with 3 belt feeders and 2 tunnel conveyors
6. Five vibrating screens with multiple decks
7. One portable screening plant
8. One wash plant for PCC aggregates and sand

The applicant is proposing to add a 350 horsepower Caterpillar bulldozer after 2014 and an additional 300-foot conveyor in approximately 15 years. Over time, replacement and/or equivalent equipment would be employed; the type, make and size of which would depend on a variety of future operational factors including rock hardness, transport distances, equipment productivity, and cost. Historically, processing equipment was powered by electricity from the grid. Annual electric consumption is about 1 megawatt. In May 2011. the applicant installed a solar array on the site that can generate 1,026,096 kWh (kilowatt hours) annually. This system meets all the project's existing electric needs. At the increased production rate proposed for the project some additional electricity from the utility grid will be required to power the quarry equipment and other electrical needs. The project applicant has estimated that 650,000 kWh annually will be needed from the PG&E grid. The photovoltaic system would remain on site and in production following site reclamation.

All new rolling stock purchased in the future would be Tier III or higher to meet California Air Resource Board (CARB) requirements in force at that time. Other facilities associated with the quarry include the processing plant support facilities (office, scale, lab, repair shop, fuel storage, wash water facility, etc.) and on-site improvements such as drainage channels and retention ponds to protect downstream water quality. There is a constructed cave on the site that is used mainly for equipment repair and storage; its location is shown on Figure 3-2. Diesel fuel is stored in a 10,000-gallon above-ground storage tank.

h. Aggregate Sales

The quarry operator would continue to supply aggregate to anyone (including private individuals) wishing to purchase it. The vested right limit, determined in 1981, is "subject to fluctuations in local demand." While operating under this vested right, the Mark West Quarry has from time to time produced at the 500,000 CY level which shall serve as the maximum permitted production limit. Both fresh and moderately weathered greenstone is sold. The weathered rock (i.e., overburden) is sold as general fill, aggregate base rock and/or aggregate sub-base. The greenstone is marketed and sold as permeable rock, open graded crushed rock, construction grade rock, asphaltic grade rock and concrete grade (PCC) washed aggregates and other related products.

i. Recycled Materials

The applicant discourages recycling at this facility and directs recycling to its facility in Santa Rosa, but would accept material for recycling from time to time particularly if the person is also buying materials at the quarry. Currently, the quarry recycles less than 10,000 CY per year. Any material recycled would be sold and would be counted as part of the 500,000 cubic yard maximum production limit.

j. Water Use

The rock is dry-processed at the primary and secondary plants. Water is used for dust suppression and to moisture-condition products prior to sale at the primary and secondary plants, and for general dust control throughout the quarry area. Water is also used to water vegetation in reclaimed areas, to periodically rinse solar panels, and to wash aggregates at the wash plant facility. The water is supplied by four on-site wells. The wells all draw groundwater from the fractured greenstone aquifer underlying the site and are utilized on days the quarry processes rock. Water is stored in two 100,000-gallon tanks and one 10,000-gallon tank. The wash plant is a “closed-loop system,” where water is filtered and re-circulated throughout the process. When necessary, make-up water for the wash plant is pumped from the on-site wells (approximately 17,000 gallons of make-up water per day during peak summer season). Existing water use by quarry operations is about 6,800,000 gallons per year (or 20.92 acre-feet of water per year). Of this total, 2,080,288 gallons are used as make-up water for the wash plant (to replace water that leaves the plant in the sand and the remaining filter cake), 3,660,000 gallons are used for dust suppression and moisture conditioning of aggregate, 1,046,780 gallons are used for yard and road dust, and 33,000 gallons are used for washing the solar panels. The proposed project would increase the water use to 9,787,449 gallons per year (or 30.04 acre feet per year. Of this total, an additional 599,161 gallons would be used for the wash plant, an additional 2,340,000 gallons for dust suppression and moisture conditioning of aggregate, and an additional 28,220 gallons for road and yard dust control.

The applicant maintains air quality permits with the Bay Area Air Quality Management District (BAAQMD) to control dust and other air pollutants. The expanded mining area and any associated operations would be incorporated into the necessary permits, as applicable. Application of water to mining sites, haul roads, and the processing operation would be consistent with the BAAQMD’s rules and regulations.

Water is applied to onsite haul roads and working areas by water truck as needed to prevent dust emissions. The number of daily applications of water varies depending on factors such as temperature and wind conditions. The amount of water applied would be sufficient to prevent visible dust emissions. Dust surfactants are also used when needed to help control fugitive dust.

k. Hazardous Materials Management

Explosives are used in the quarrying process to break up or open areas of rock for extraction. Licensed and trained personnel use explosives an average of 2-3 times per week, depending on market conditions and the type of rock encountered. To assure safety, blasting takes place under the strict control of these explosives personnel. Explosives are transported to the site by a licensed explosives hauler. All explosives are stored in an approved magazine on the quarry site. Explosives are transported from the magazine to the blasting location and used at the blasting location by licensed blasting personnel. Transport, storage, and use of all explosives are in conformance with the requirements set forth in the California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 17, Mine Safety Orders (specific orders regulating explosives include Article 50, Explosives; Article 51, Storage of Explosives; Article 52, Transportation of Explosives; Article 53, Hauling and Use of Explosives; Article 54, Mixing Blasting Agents; and Article 55, Licensing of Blasters).

Dust surfactants used to control dust on the site include Dustbuster CDS 8040 (Alpha Olefin Sulfonate) and Dust Off Anticorrosive Dust Suppressant (Aqueous Magnesium Chloride and Magnesium Sulfate with a Proprietary Ingredient). The Materials Data Safety Sheets (MSDS) for these dust surfactants indicate that none of the ingredients found in the dust surfactants is defined as hazardous by the Occupational Safety and Health Administration.

l. Access

The existing access road to the site is located off of Porter Creek Road. Trucks loaded with product enter Porter Creek Road and travel either west toward Highway 101 or east to the Calistoga Road/Petrified Forest Road intersection. The existing access road would continue to be used with no new or additional access roads required for the proposed expansion. Truck travel route percentages are not expected to change as a result of the proposed expansion. Currently, an average of approximately 100 trucks a day are loaded at the quarry. Daily numbers vary depending on market and seasonal demand.

m. Hours of Operation

The County's ARM Plan allows the quarry to operate on weekdays between the hours of 6:00 a.m. to 10:00 p.m. and on Saturdays between the hours of 6:00 a.m. to 4:30 p.m. It is proposed that the hours of future operations would be consistent with these ARM Plan limits.

n. Employees

The quarry currently maintains 12 employee positions. If the project is approved, about 5 employees would be added.

o. Sanitation

Sewage disposal is provided by an existing on-site septic system and portable chemical toilets. These same facilities would continue to be used under proposed quarry expansion.

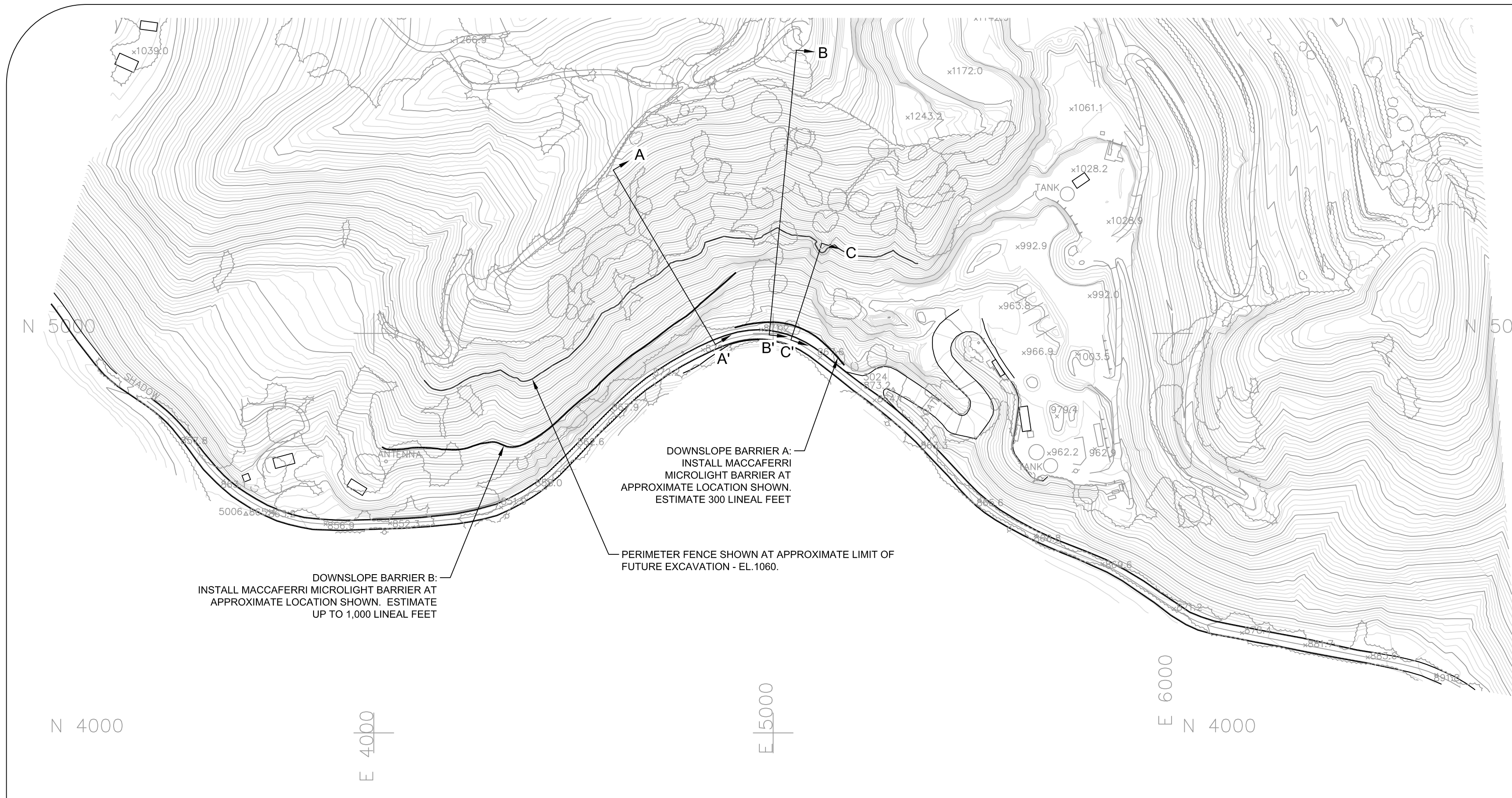
5. Proposed Features to Minimize Environmental Effects

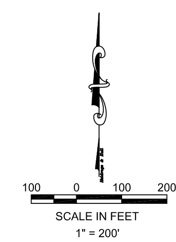
The project application includes several elements intended to minimize what the applicant expects would be health hazards, site security, and environmental effects associated with mining. These are described below. Chapter 4 of this EIR provides additional measures that are needed to mitigate expected impacts.

a. Fencing, Posting, and Security

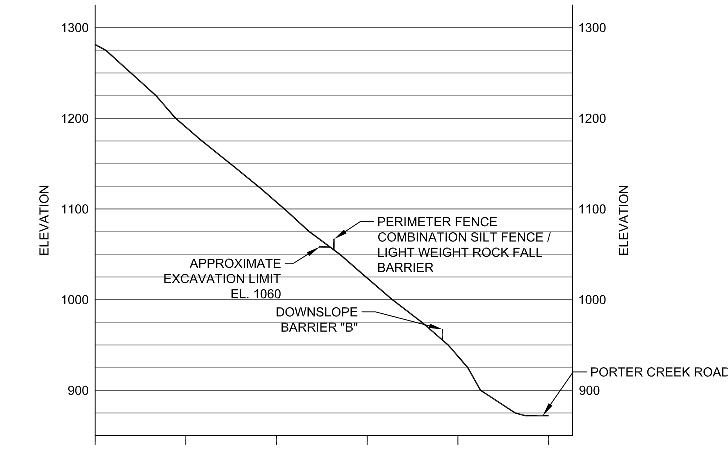
The existing and proposed mining areas would be protected with security fencing, where applicable, and posted with “No Trespassing” signs according to County standards. A rock fall barrier system would be installed between the project site and Porter Creek Road. The intent of this system is to capture individual rocks dislodged by quarrying activities before they enter the road. The full report describing the proposed system is included in Appendix A. The following summarizes that report.

A proprietary, flexible rock fall barrier system be employed at the site (see Figure 3-15). For example, the final system could be a 25 KJ system by Maccaferri. The barrier would be supported on 6-inch diameter posts and includes a cable-supported net structure capable of significant deformation. The rock fall barrier would be constructed to an approximate height of 10 feet. Because of variation in the topography of the slope, a split barrier system would be considered, focusing on the initial construction of an approximate 350 lineal-foot barrier in the lower portion of the slope adjacent to Porter Creek Road (Barrier A) to accommodate the initial

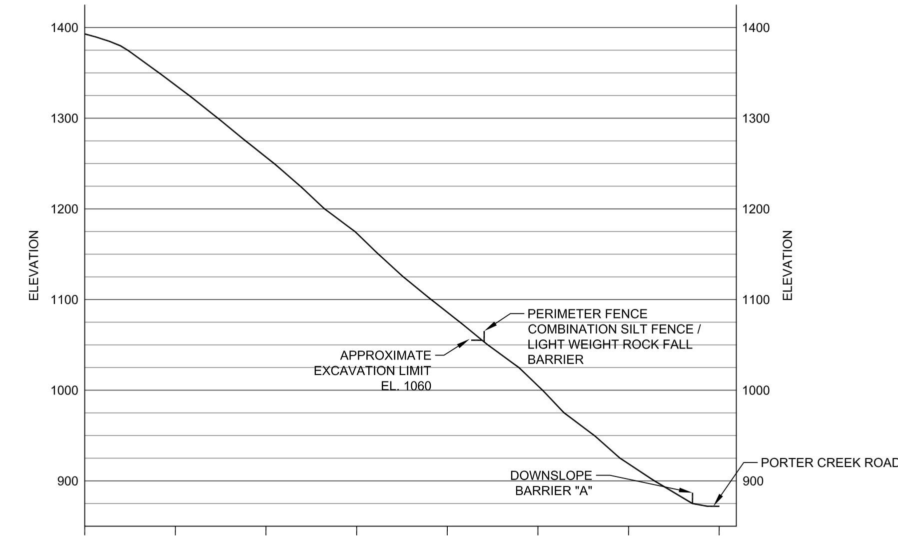




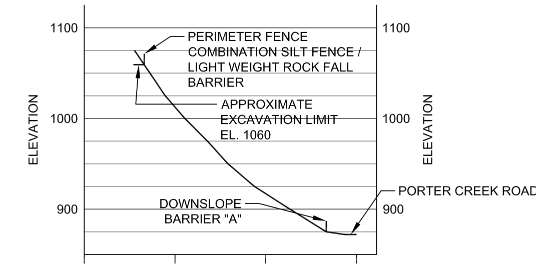
BASE MAP PROVIDED BY:
EBA ENGINEERING
(MAY 2012)



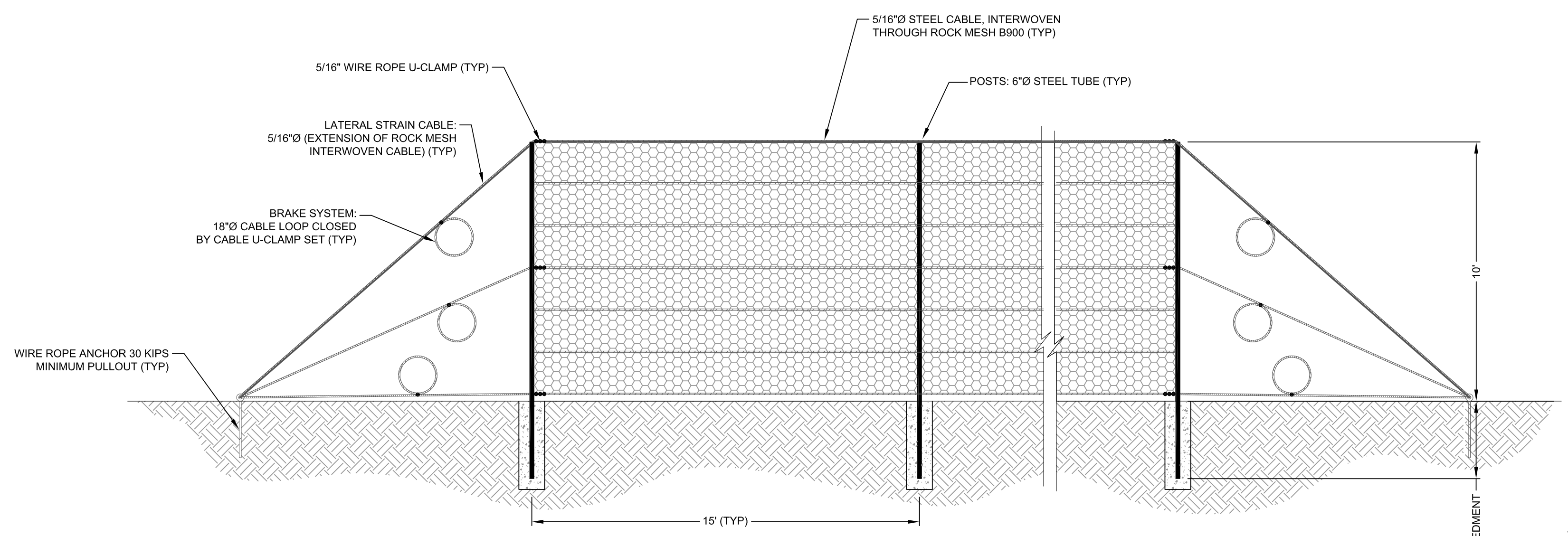
PROFILE A-A'
SCALE: 1 INCH = 100 FEET



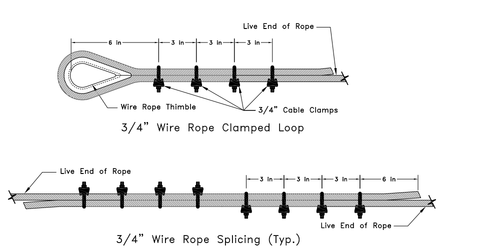
PROFILE B-B'
SCALE: 1 INCH = 100 FEET



PROFILE C-C'
SCALE: 1 INCH = 100 FEET

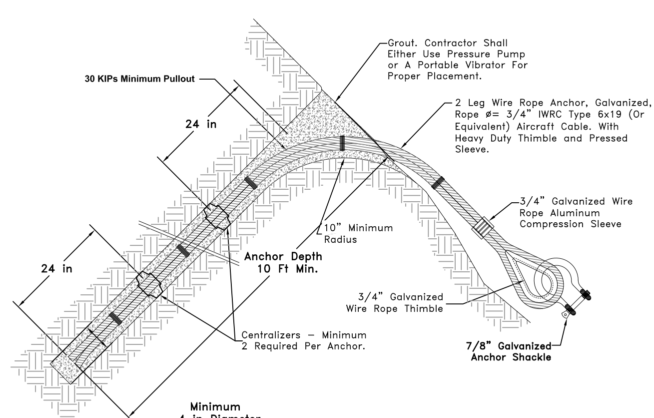


1 PROPOSED 25 KJ ROCK FALL BARRIER - MICROLIGHT BARRIER
NOT TO SCALE

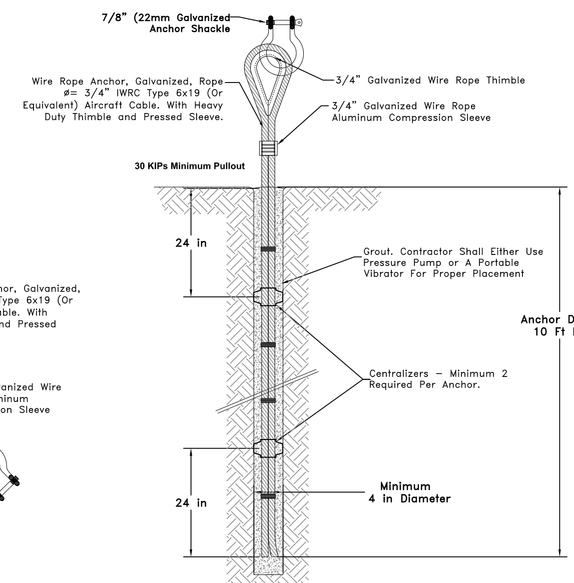


Note: 1.) Always Place Saddle of Clamp on Live Rope End, U-Bolt on Dead End.
2.) First Wire Rope Clip Should Be Placed As Close As Possible To The Thimble.
3.) Torque (Foot-Pounds) : 130

2 WIRE ROPE ENDS AND SPLICED CONNECTIONS
NOT TO SCALE



3 RADIAL WIRE ROPE ANCHOR
- COMPRESSED SLEEVE OPTION -
NOT TO SCALE



4 WIRE ROPE ANCHOR
- COMPRESSED SLEEVE OPTION -
NOT TO SCALE

Figure 3-15
PROPOSED BARRIER PLAN

NO.	REVISIONS	DATE

DESIGNED BY: REF
DRAWN BY: DFD
DATE: JUNE 2012
DRAWING NAME: 4031-01-SHEET1
PROJECT No.: 4031-01

PROPOSED BARRIER PLAN
MARK WEST QUARRY
SONOMA COUNTY, CALIFORNIA

HK HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
792 SEARLS AVENUE
NEVADA CITY, CA 95959
(530) 478-1305 FAX 478-1019

SHEET 1

phases of excavation. As quarry excavation progresses, an upslope barrier (Barrier B) would be constructed in phases to an expected build-out length of approximately 1,000 lineal feet. The location of Barrier B is intended to capture rocks above the existing Porter Creek Road cut slope. If possible, the downslope Barrier A would be constructed adjacent to the Porter Creek Road alignment, within approximately 20 feet of the road shoulder, which would facilitate construction and future maintenance of this rock fall barrier.

It is expected that the construction of Barrier B would be performed several years from now to accommodate future phases of excavation. Depending on the rate of quarry expansion, it may be reasonable to construct Barrier B in relatively short phases or increments (e.g., 250 feet of barrier length) as needed to accommodate the advancing quarry excavation. In general, the barrier would be extended by an additional phase of construction once the advancing edge of the excavation extends within 50 feet of the upslope projection of the edge of the barrier.

b. Buffers

In accordance with the County's ARM Plan, minimum 25-foot buffers would be maintained around the excavation and overburden storage area. As shown on Figure 3-5, buffers would be larger in some areas.

c. Erosion Control

The applicant proposes to control erosion by:

1. Annually hydroseeding/mulching disturbed areas not within active mining areas with an erosion control mix. In areas requiring temporary protection until a permanent vegetative cover can be established, bare soil shall be protected by the application of straw mulch, wood mulch, or mats.

2. To the extent practical, benches should be back-sloped or provided with rock or straw bale checks so that sediment is trapped on the benches rather than washed into the sediment ponds.

3. Reclamation or stabilization of all quarry slopes and the quarry floor (excluding the working/processing/stockpile/loading/access areas and the acreage of the sedimentation ponds) must be completed each year prior to the rainy season.

4. Topsoil suitable for use in revegetation shall be stockpiled in the Overburden Stockpile Area for use in reclamation and replanting of cut slopes. Prior to October 15 of each year, all topsoil stockpiled for future use in revegetation shall be seeded and mulched in order to prevent soil loss through erosion. Topsoil shall be stored in locations that are not immediately adjacent to sediment ponds.

5. Mining activities and the operation of heavy equipment on site shall be done in such a manner as to avoid repeated crossing of open drainageways or ponded areas.

6. Measures shall be included to prevent the inadvertent side-casting of soil from the quarry benches.

7. Straw bales, straw rolls, and erosion control blankets would be installed where necessary.

All roads and work areas in the quarry shall be stabilized surfaces or engineered with aggregate base fill thicknesses adequate to withstand heavy equipment and truck traffic. These roads shall be constructed with culverts and energy dissipation structures to convey runoff under the roads, as necessary. Areas on the quarry floor other than roads and active work areas shall be stabilized with the stabilization techniques described above.

d. Drainage Control

Runoff from the cut slopes would travel to the bench below each cut slope. The benches would be graded to direct flow to the toe of the slope where it would be collected in 12-inch or 18-inch storm drain pipes (depending on the size of the area drained) or an open boulder channel that would then convey the runoff to the bench below. These storm drains would be maintained by the operator during all quarrying activities and for an estimated three years after quarrying of the site has ceased. Figures 3-13 and 3-14 show existing drainage and drainage after 10 years of operation, respectively. Existing retention and siltation basins would be enlarged as needed to store or treat additional runoff from the proposed expansion area. At the end of active quarrying, reclamation plantings and overall slope stability would allow natural drainage to replace maintenance of the drains. The storm drain system would eventually convey the collected runoff to two retention ponds on the quarry floor (see Figure 3-15. Above the main ponds, the applicant would develop smaller detention ponds at the toe of each major swale.

e. Water Quality

The applicant has a Storm Water Pollution Prevention Program and Spill Prevention Program that would be extended to cover the expanded operations. In addition to the Spill Prevention Plan, the mining and reclamation plan includes provisions for siltation ponds and sediment control/storm water discharge separation tank systems to prevent sediments from reaching natural off-site drainages.

f. Traffic Mitigation

The applicant does not own trucks that haul the aggregate. Aggregate is hauled by independent trucking firms or individuals. Consistent with ARM Plan requirements, the applicant conducts a "good neighbor trucking program" that includes: no parking on access roads; no arrival prior to 6:30 a.m.; no convoying; speed limits; avoidance of the use of jake brakes; and reporting of all spills. All drivers must sign an agreement to abide by this program. Infractions can lead to up to 30 day suspensions from accessing the quarry. This program would be continued into the future.

E. Reclamation Plan and Procedures

State law and the County's *Surface Mining and Reclamation Ordinance* (Ordinance 5165) require reclamation of the site following conclusion of quarrying operations. The following information summarizes the proposed reclamation procedures and mitigation measures. The data provided below is the applicant's proposal. The applicant's complete proposed Reclamation Plan is on file with the County Permit and Resource Management Department. The

EIR analysis may determine that changes to this proposed plan are needed to reduce environmental impacts. Some of the information provided below duplicates data described above, but is repeated here to provide a complete description of the proposed Reclamation Plan.

Reclamation would continue to be an ongoing process, with reclamation of previously mined areas occurring as mining expands to the west. Figures 3-10 and 3-11 show the proposed final reclamation by the year 2033. However, the final reclamation as shown on Figure 3-11 would occur only if the applicant did not seek to renew the Use Permit to allow further mining to the north (in the "Future Mining Area Boundary" shown on Figure 3-5). If the applicant seeks Use Permit renewal, then the northern terrace walls would not be reclaimed as shown. Rather, the quarry floor would extend further north and the reclaimed terrace walls would also extend to the north. If and when the applicant seeks a Use Permit renewal, the applicant would file a revised Reclamation Plan. This application would undergo CEQA review. It is speculative to describe or map the final reclamation of the site that might be proposed in the future. Because the County only approves 20-year mining permits, this project application needs to show what mining would be done in that 20-year period and how it would be reclaimed. This EIR needs to assess the impacts of this 20-year mining and reclamation plan.

1. Reclaimed Landscapes

Mining and reclamation activities would result in five general landscapes. These are:

1. *Mined Rock Terraced Slopes*: Exposed terraced slopes with a gradient not steeper than 1:1 (horizontal: vertical) would be created directly through mining activities (see Figure 3-12: Finish Grading Plan). Exposed slopes would be hydroseeded with a native herbaceous plant mixture suitable for erosion control and for colonizing in relatively thin or rocky soils and rock outcrop conditions.

2. *Filled Terraced Slopes*: Exposed terraced slopes with a gradient not steeper than 2:1 (horizontal: vertical) overall would be created directly through placement of overburden materials and topsoil (see Exhibit 3-12: Finished Grading Plan). A minimum one foot of topsoil would be placed on all fill slopes that would then be hydroseeded with a native erosion control mixture of grasses and other herbaceous species.

3. *Filled Basin Floor*: An area where mined lands would be backfilled to create slopes on the south side of the basin that can be planted and a gently sloping center area culminating in two water storage/sediment separation ponds with an approximate maximum storage capacity of 25 and 49-acre-feet of water, respectively. Planned slopes would vary from approximately a 3:1 (horizontal:vertical) gradient on the south slopes of the basin to a relatively flat approximately 10:1 (horizontal:vertical) gradient that would support establishment of a willow thicket along the basin's drainage courses. Average depths of fill over the center of the mined basin floor are expected to be up to approximately 75 feet. The majority of runoff from the rock terraced slopes would be directed into the two ponds. A sub-surface drainage system, if necessary, would be installed to manage groundwater accumulation. The revegetation would consist of a native erosion control mix that would be suitable for future conversion to agricultural uses and willows along the drainage courses and around the ponds. Along the southern perimeter of the mined lands, woody vegetation would either be transplanted or planted

as container stock to screen and soften the appearance of the new ridgeline created by mining as seen from Porter Creek Road.

To maintain the quality of water flowing into water storage ponds and out of the site, a series of sediment filter systems would be installed. These consist of sediment basins: (1) at the top of a drainage channel to intercept water draining from the mined rock terraced slopes prior to it flowing off-site or entering the ponds; (2) new sediment control/storm water discharge separation tank systems below each pond; and (3) the existing on-site sediment separation control features that ultimately drain into Porter Creek. Limited use of willow thickets along the drainages would also assist in controlling erosion. New on-site sediment control features would be installed for that portion of the reclaimed lands draining to the southwest of the project site.

4. *Re-contoured Overburden Placement Area*: As materials are relocated for reclamation elsewhere on site, the existing overburden placement area would be recontoured to slopes that would generally be less than a 4:1 (horizontal: vertical). The revegetation would be to grasslands suitable for future conversion to agricultural uses.

5. *Plant Site*: The existing plant site would be expanded to approximately 10 acres. After mining is completed, the site would be cleared, ripped, and hydroseeded with an erosion control mix. A portion of the plant site would be reserved for later conversion to a general use area that would support agricultural operations.

In addition, a forest screening plant program would be initiated upon commencement of the mining permit (see Figure 3-11: Reclamation Plan: Revegetation) in the northeast portion of the project site. Plant types, densities, planting methods, and success criteria for different plant associations are provided in Tables 3-3, 3-4 and 3-5 below.

2. Overburden and Topsoil

Approximately 1,453,000 cubic yards of overburden and topsoil would be displaced by mining activities. Combined with existing stockpiled materials (see Figure 3-5) most of these materials would ultimately be placed in the mined basin floor and used to backfill already mined lands within the project area to the north that would be reclaimed to shallow gradients (see Figures 3-11 and 3-12).

3. Reclamation Sequencing

Reclamation would occur concurrently with mining activities. Figures 3-6 through 3-10 illustrate the general direction of mining and reclamation through the project site. The steps illustrated in the exhibits and the associated reclamation activities are described in Appendix B.

5. Other Plan Components

The Reclamation Plan contains many details related to slope stability, erosion control, site drainage, and other factors required by SMARA. These details are included in Appendix B of this EIR. Some of the more important factors include:

1. The proposed reclaimed end land use is general agriculture. This end use of agriculture could include vineyards, orchards, a Christmas tree farm, or grazing/pasture.

2. At the conclusion of quarry activities, all mining facilities with the exception of property line fencing, entrance gate and road, wells, sediment basins and drainage facilities, and existing caves that are used as the processing plant's shop would be dismantled and removed from the project site. The photovoltaic system will also be left on site to generate power that can used by PG&E

3. A forest planting program would be implemented outside of the area to be mined along the northeast portion of the project site to screen views of mined slopes as seen from the north.

4. The plan includes success criteria for site revegetation. If these criteria are not met, then additional replanting would be done until the success criteria are met.

5. During the monitoring period, noxious weeds within reclaimed areas would be removed using mechanical means or other means as approved by Sonoma County.

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4.0 ENVIRONMENTAL IMPACT ANALYSIS CHAPTER

A. Format of the Analyses

This section of the EIR addresses in detail the interaction of the proposed project with its natural environment. Each area or topic of environmental concern which is addressed in this EIR is discussed using the following format:

Setting

This section includes a description of the existing physical and environmental conditions as regards the particular environmental factor under consideration (per *CEQA Guidelines* Section 15125).

Baseline conditions for this project include extraction, processing, and sale of 305,000 cubic yards of aggregate per (or 457,000 tons per year).[4] Baseline production includes processing and sale of recycled material, though as noted previously, the applicant discourages recycling at this site and encourages that materials for recycling be delivered to its Santa Rosa site. Baseline conditions also includes the sale of overburden materials.

Potential Impacts and Mitigations

This section begins with a list of the criteria that are used to determine impact significance. The criteria are based on the list of impacts typically considered significant as listed in the *CEQA Guidelines*. This section describes the possible significant impacts (per *CEQA Guidelines* Section 15126a and b).

Each impact is identified, described, and assessed. Following the discussion of each potentially significant impact is a listing of possible mitigation measures for that impact. CEQA requires mitigations only for impacts deemed significant. Nevertheless, this EIR occasionally does recommend additional mitigations even if the identified impact is not necessarily significant. Mitigations that include the words "shall," "will," or "must" are necessary to adequately mitigate potentially significant impacts. Mitigations using the words "should," "would," or "may" are recommended to further reduce the level of impact, but are not necessary to reduce the identified impacts to a level below significance. Finally, there is a determination of whether the impact is significant if the mitigations are required.

ARM Plan

Mark West Quarry was one of the quarries addressed in the Sonoma County Aggregate Resource Management (ARM) Plan Program EIR. Assessments, conclusions, and mitigation measures presented in that ARM Plan/Program EIR will be used to address some of the impacts that would result from expansion of the Mark West Quarry. Where appropriate, this EIR tiers upon and references these assessments and mitigation measures (per CEQA Guidelines Section 15168). However, it is noted at the outset that for most impacts, separate, new analyses have been conducted for the proposed project. Such site-specific analyses are called

[4] This baseline was calculated as the annual average production level for the quarry for the five years preceding the project application in 2010. Site surveys and traffic counts used to establish baseline conditions were conducted in 2010.

for in the ARM Plan Program EIR when the impacts from a specific quarry project were not addressed in the Program EIR analyses. Some information in the ARM Plan Program EIR may be dated and conditions may have changed. New areas of impact (such as health effects from diesel emissions and the protected status of salmonids) were unknown at the time the Program EIR was prepared. For these reasons, this current EIR references ("tiers from") the Program EIR only in cases where that Program EIR adequately assesses cumulative impacts or identifies the types of impacts that quarries might cause. The current EIR does not rely on the ARM Plan Program EIR for site-specific analysis of the impacts of this project.

4.1 GEOLOGY, SOILS AND SEISMICITY

The Geology, Seismicity, and Soils section provides details on the regional and local geologic and seismic settings. It then discusses potential geologic hazards and project impacts. This discussion focuses on increased exposure of people, improvements, and the environment to impacts including slope failure, ground shaking, and accelerated erosion and sedimentation. The setting section also includes a discussion of applicable regulations. It is followed by an analysis of project impacts and a description of necessary mitigation measures.

A. Setting

1. Regional Geology and Seismicity

Geologists have subdivided California into 12 provinces based largely on the dominant landforms found within each of them. The project area is located in the Coast Range Geomorphic Province (hereafter called the "Province"), which covers northern and central California between the Pacific Ocean and the Central Valley. The dominant landform pattern within the Province is one of broad, persistent, northwest-trending ranges with generally narrower intervening valleys. The bedrock, which underlies the Province, belongs to the Franciscan Complex, which is mainly composed of an ancient assemblage of marine sedimentary and volcanic rocks with associated, subordinate serpentinite. Through time the global forces of plate tectonics have subjected these rocks to deformation, burial, and metamorphism (change in rock mineralogy and texture due to increased heat and pressure). As a result, the rocks of the Province have been transformed into a highly fractured, mildly to moderately metamorphosed structural complex. Due to its broken condition, high regional seismicity, high seasonal rainfall, and steep terrain, the Province is subject to high rates of weathering, erosion, and landsliding.

Tectonic activity continues within the province, as movement occurs along the extensive, northwest-trending San Andreas system of faults. This fault system is part of the boundary between the Pacific and North American Plates. Within California, the type of movement along this fault system has changed in the last several million years from subduction (where one global plate collides with and moves beneath the opposing plate) to transform movement (where one side of the fault slides past the other horizontally). In the Bay Area, this fault system is comprised of several different active major faults. These faults and their characteristics are summarized below in the Seismicity section.

2. Project Site Geology

Sources of Geologic Information

The geologic work done for this EIR included literature review, aerial photo geology, geologic mapping, and acquisition of quantitative information on bedrock discontinuities (rock fractures of various types) for stability evaluation. The 2011 Miller Pacific investigation (included in Appendix C) was done for this EIR and it included subsurface exploration, laboratory testing, and analyses for rock and fill slope stability. Recently published 7.5 minute scale regional geologic mapping by the U.S. Geological Survey (McLaughlin, et al,

2004) provided revised and more detailed geologic mapping on that portion of northern Sonoma County surrounding the quarry.

Sources used to prepare this section include: 1) the Mining and Reclamation Plan (January 12, 2009) submitted by the applicant; 2) “Geologic and Geotechnical Report, Mining and Reclamation Plan, Mark West Quarry Expansion, 4611 Porter Creek Road, Santa Rosa, California” (Miller Pacific Engineering Group, December 22, 2003); 3) “Slope Stability Investigation, Mark West Quarry Expansion” (Miller Pacific Engineering Group, December 13, 2011); 4) “Proposed Rock Fall Barrier” (Holdrege & Kull, June 21, 2012 and revised July 13, 2011, and the “Response to Review Comments” by this same firm (August 8, 2012); and 5) field mapping done to prepare this EIR.

Geomorphology

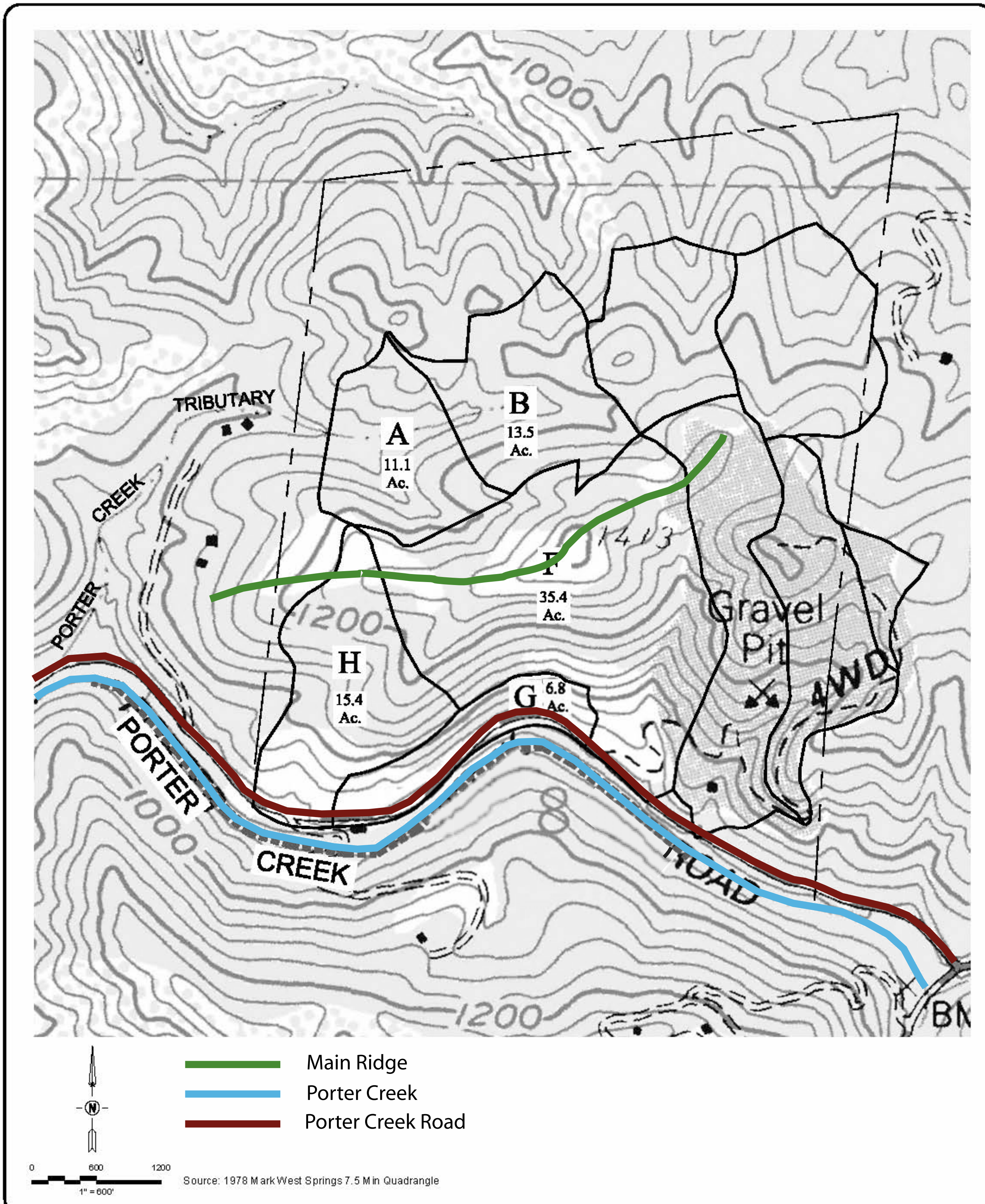
As shown on Figure 4.1-1, the principal landform on the site is a long, prominent, geologically uplifted greenstone ridge (hereafter called the “main ridge”) that trends east-west through the project site and beyond. The greenstone comprising this ridge is the resource rock of past, present and future mining. Porter Creek, located along the south edge of the project site, incised its sinuous, westerly draining canyon into the greenstone in response to tectonic uplift of the main ridge. This created very steep slopes, which extend over 540 feet downward from the top of the ridge (approximately 1,400-foot elevation at its highest point) to the bottom of Porter Creek canyon. At the base of these slopes, Porter Creek Road traverses the slope that runs along the north side of Porter Creek. The elevations of the canyon bottom and road are below the depth of present and proposed mining.

The slopes of the proposed MR-zone northwest of the main ridge are less deeply incised than the slopes above Porter Creek. Most of this northern area was formerly occupied by a short, steep, west-flowing ravine that is now the location of a large benched ravine fill where overburden from past mining and landslide remediation debris is now stored (this is the Overburden Stockpile Area shown on Figure 4.1-2). The maximum depth of this fill is approximately 125 feet.

The existing mining area, which is immediately to the east and south of the main ridge and canyon fill, consists of both temporary, steep actively-mined slopes, and intervening flat benches. Farther to the east-northeast are moderately inclined slopes that have been reclaimed following past mining. Smaller geomorphic features throughout the project site consist of numerous shallow gullies and ravines, colluvial-filled swales[5], and occasional landslides.

A few large, dormant landslides are present in the expansion area. They are shown on Figures 4.1-2 and 4.1-3 and discussed in the subsequent section on natural slope stability. A view of the active quarry face and profile of the proposed resource area immediately to the west are shown in Photo 4.1-1.

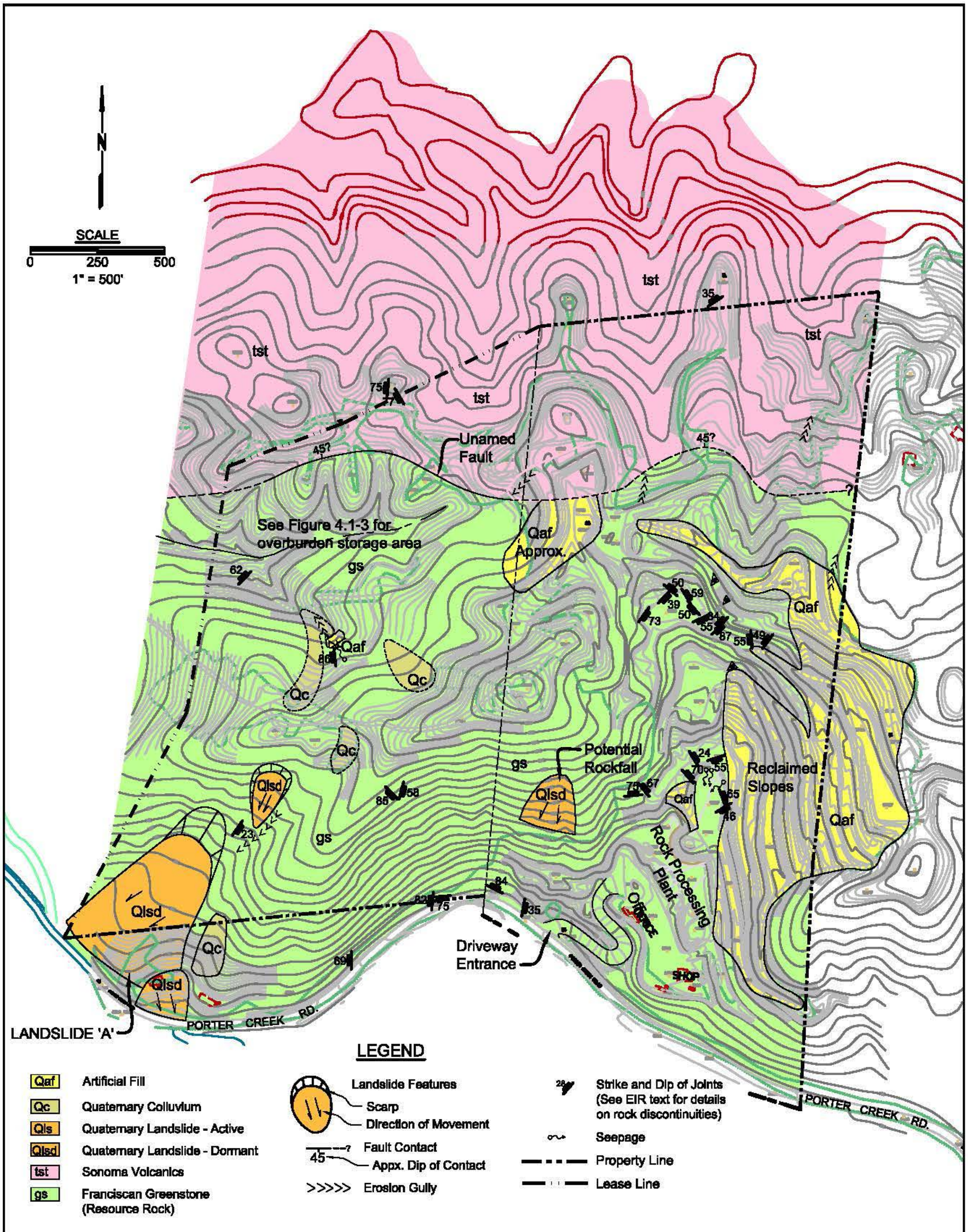
[5] A “colluvial filled swale” is a declivity on a hillside that has progressively been filled, under the influence of gravity, with loose, weathered rock fragments and soil (collectively referred to as colluvium). Such swales are very common in the California Coast Ranges and, over time (decades to thousands of years), often become the source of landsliding.



Geologic Setting Map

Mark West Quarry, Sonoma County, CA

FIGURE 4.1-1



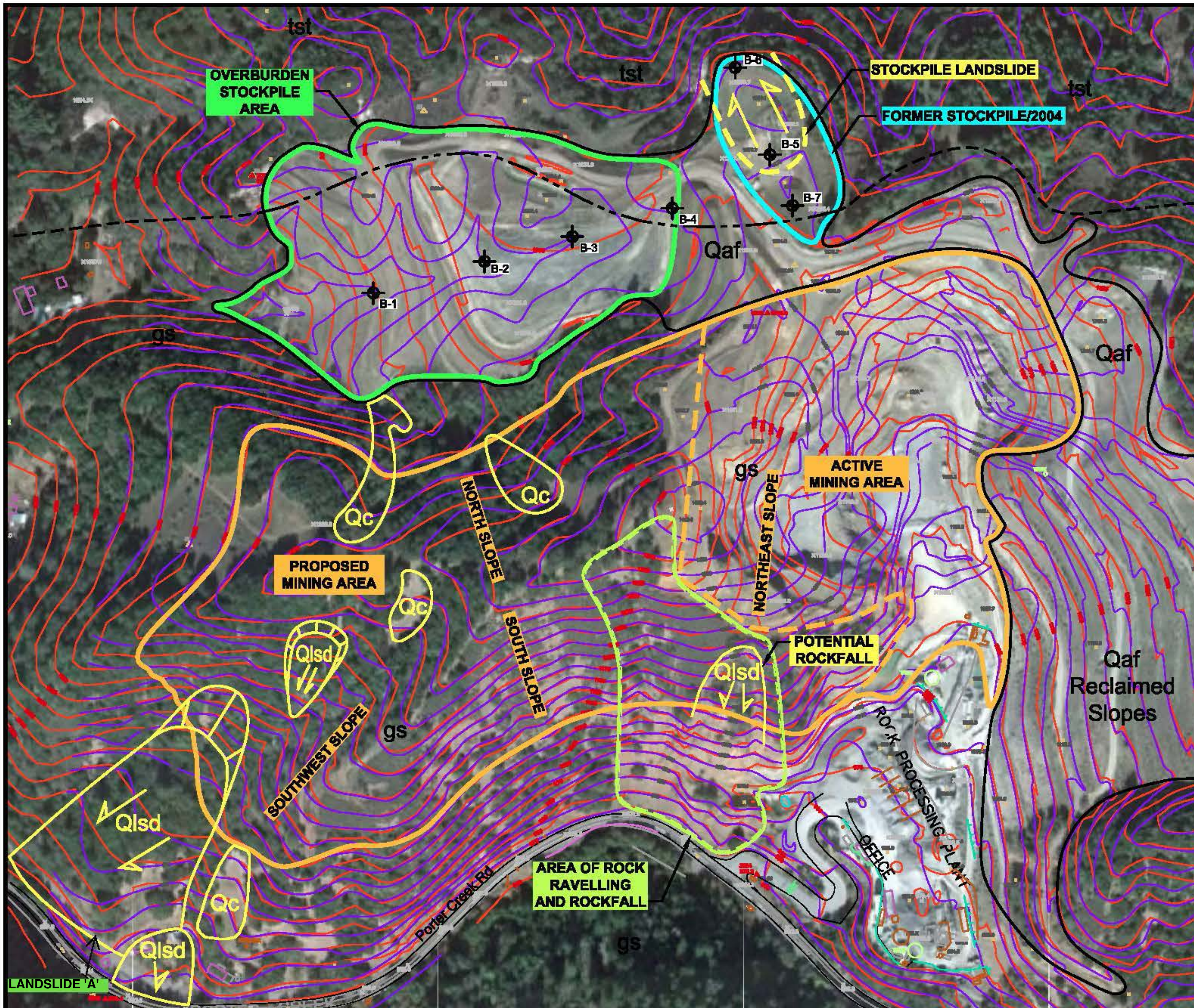
Miller Pacific
ENGINEERING GROUP

Sources:
Miller Pacific Engineering Group 2003
Michael Dwyer Consulting Engineering Geologist 2010

Date October 2012

Figure 4.1-2 Site Geologic Map
Mark West Quarry Expansion

Santa Rosa, CA



Approx. Scale: 1" = 500'±

LEGEND

2003 Topographic Elevations

2010 Topographic Elevations

Boring by MPEG, October 2010

Fault Contact

Buried Fault Contact

Qaf - Artificial Fill

Qlsd - Quaternary Landslide - Dormant

Qls - Recent Landslide

Qc - Colluvial Filled Swale

tst - Sonoma Volcanics - Tuff

gs - Franciscan Greenstone

Figure 4.1-3 Details of Geology and Existing and Proposed Project
Mark West Quarry Expansion
Santa Rosa, CA

Sources:
Miller Pacific Engineering 2011
Michael Dwyer Consulting Engineering Geologist

Photo 4.1-1: West view of active quarry face (2010). Mining of the proposed resource area would extend the face west through the tree covered ridge (main ridge). Photo by M. Dwyer.

Bedrock Units

The principal type of exposed rock at the project site is greenstone volcanic rock, which is one of the subordinate bedrock types of the Franciscan Complex. It is a fine grained to very fine grained, closely fractured to shattered, hard, mildly metamorphosed basalt (meta-basalt) of submarine origin that is typical of the Franciscan Complex.

The greenstone occurs in a large mass and includes the main ridge described above. It is exposed over an area that extends well beyond the project site. The most recent regional geologic mapping (McLaughlin, et al, 2004) found that the exposed greenstone covers an area of about 2.25 miles east-west by 0.54 miles north-south. Water well logs located in the southern part of the quarry show the greenstone mass underlies the current quarry floor to a depth of at least 650 feet (Balance Hydrologics Inc., 2003 and 2011). Beneath the greenstone is chert (fine grained, hard siliceous marine sediment) also of the Franciscan Complex. This was encountered in the deepest water well (Balance Hydrologics, Inc., 2003). Based on the above data, as well as on the greenstones' vertical exposures revealed in nearby deeper canyon bottoms, this thickness or greater very probably persists beneath the entire project property and beyond. The depth of the greenstone extends well below the project's proposed mining depth of 945-ft above sea level.

Included within the greenstone are minor amounts of breccia (different sized angular fragments of greenstone enclosed in an indurated, fine-grained matrix of comminuted greenstone), chert, and an exposure of highly oxidized, red, soft, material charged with angular rock fragments of weathered greenstone and porphyritic-appearing greenstone. All of these minor rock types are non-resource rock.

Ash flows and falls of the geologically much younger Sonoma Volcanics (about 3 million years in age near the project site, McLaughlin, 2004) partially overlay the greenstone. These rocks are pale-colored, fine-grained, light weight, generally soft, and are not designated by the applicant as sources of aggregate: they have been used only for reclamation purposes. They are exposed within the project site along the north edge and beyond the existing quarry and proposed project site on all sides, except to the southeast. The contact (geologic boundary) between the greenstone and the younger volcanics trends east-west along the north edge of the project. Detailed geology and components of the existing and proposed expansion project are shown on Figure 4.1-1 and Figure 4.1-2.

A detailed petrographic description of representative samples of both greenstone and Sonoma Volcanics taken from the project is contained in the petrologic report by Vennum (2003), which is an appendix to the December 2003 Miller Pacific report submitted as part of the project application.

Geologic Structure

Structural geology is the study of deformed rocks as they occur at various scales from the regional to the microscopic. Rock deformation includes such features as fractures, folds, and faults. Study of deformed rocks contributes to the understanding of seismic hazards and slope stability, and can assist in the reserve assessments of a particular natural resource deposit such as an existing or potential rock quarry.

The principal structure mapped at the project is the 2.25-mile-long, fault-bounded, Petrified Forest Antiform ridge (McLaughlin, 2004), whose axis generally conforms to the described east-west main ridge of the project.[6] The antiform-ridge and its core are occupied by greenstone.

The rock of the greenstone antiform is pervasively fractured, both at the scale of mined slopes (dimensions of hundreds of feet) and often down to the size of large hand specimens. This fracturing influences the larger-scale stability of mining slopes. The greenstone antiform-ridge on the site contains fractures, joints and shear fractures, with lesser but still numerous faults, fault zones, and shear zones, which in geotechnical terms are referred to as discontinuities. Bedrock exposures observed at many locations within and

[6] An antiform is a convex upward fold in a rock body. The north-bounding fault of the antiform is a normal fault with the east side down to the north (McLaughlin, 2004). The faults to the south are mapped as better defined and longer than the fault to the north, and are referred to as the Petrified Forest Thrust Zone (McLaughlin, 2004). The bounding fault along the north edge of the project is unnamed. Only a relatively small segment of this north fault is within the project site, and here it has an east-west to northwest-southeast trend. The dip (inclination) of both south and north faults is to the north, with the unnamed fault dipping at approximately 45 degrees. Thus, the greenstone mass plunges north along these faults beneath the overlying Sonoma Volcanics.

somewhat beyond the project site show these discontinuities to have considerable variability in spacing, orientation, persistence, roughness, and filling.[7]

3. Seismicity

Surface Faulting

There are no known active faults[8] that pass through the project site (California Geological Survey, 1993). This includes the unnamed, short fault (about 2.5 miles in mapped length) that bounds the greenstone antiform along the north part of the property. Therefore, the hazard of surface fault rupture on the project site is remote.

Ground Shaking

The principal seismic hazard that could impact the project site is ground shaking. This would be generated by earthquakes occurring along one or more of the region's known active faults. The known, major active fault that is closest to the project site is the southern segment of the Maacama Fault Zone, whose eastern boundary is located about 2.5 miles to the west. The Maacama is characterized as a predominantly right lateral strike slip fault and is considered to be the northernmost segment of the Hayward Fault subsystem of the San Andreas Fault Zone. The northern segment of the Maacama is undergoing measured, average seismic creep rates of about 4.3–6.1 millimeters per year[9], but the southern segment of the Maacama is locked and, as is the case with the Rodgers Creek and San Andreas (northern segment) Faults, has a high potential for a major earthquake (Galehouse and Lienkaemper, 2003). The Maacama is capable of approximately a Magnitude 7.0 Mw earthquake.[10]

Ground motion during an earthquake is commonly expressed with the motion parameters of acceleration, velocity, and duration of shaking. A common measure of ground motion is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. *Magnitude* is a measure of the energy released during an earthquake. *Intensity* is a measure of the ground shaking effects at a particular location. The estimated magnitudes, described as moment magnitudes (Mw), represent characteristic earthquakes on particular faults (Table 4.1-1).[3]

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[7] Most commonly the rock exposures display a dense pattern of short, tight, irregular fractures spaced a few inches or less apart. These are referred to as nonsystematic joints or simply fractures and often give the rock an overall shattered appearance. This pervasive fracturing pattern is punctuated by the more widely spaced (several inches to several feet), well defined, more linear, and much more persistent joints, faults, fault zones and shear zones. Less common are variably-sized masses of mostly intact, only moderately to slightly fractured rock. This project-wide condition of variable and complex fracturing is typical of Franciscan rocks on a regional basis.

[8] An "active fault" is a fault that has had surface displacement within Holocene time (about the last 11,000 years); hence, having a greater probability for future movement and thus constituting a potential hazard to structures that might be located across it. Such faults are regulated according the provisions of the California Alquist-Priolo Earthquake Fault Zoning (AP) Act.

[9] Seismic creep is slow but measurable surface displacement along a fault in the absence of notable earthquakes.

[10] Mw is the acronym for Moment magnitude. Moment magnitude is now generally used in place of Richter magnitude because it is capable of measuring the magnitude of larger (over about 7.0) earthquakes and is more reliable for measuring distant earthquakes (over about 370 miles). However, to about magnitude 7.0 the Moment magnitude and the Richter magnitude are the same.

Ground movement at a given location during an earthquake will vary depending on the magnitude of the earthquake, distance from the site to the earthquake epicenter, focus (depth beneath the earth's surface at which the earthquake originates), and type of geologic material upon which the site rests. The composition of underlying soils, even for sites relatively distant from an earthquake epicenter, can directly affect the ground shaking at a particular location. For instance, soft soil (i.e. bay mud or artificial fill) can intensify ground shaking (result in higher PGAs) while bedrock beneath a site would attenuate seismic waves (i.e., lower PGAs).

Table 4.1-1
Estimated Peak Ground Acceleration for Principal Active Faults

Fault	Moment Magnitude for Characteristic Earthquake	Closest Estimated Distance (kilometers/miles)	Median Peak Ground Acceleration (g)[1]
Maacama-Garberville	7.1	4/2.5	0.40
Rodgers Creek	7.0	9/5.6	0.29
San Andreas	7.8	42/26.1	0.15
Hunting Creek-Berryessa	7.1	30/18.6	0.14
Collayomi	6.5	25/15.5	0.12
West Napa	6.5	30/18.6	0.10

Source: Miller Pacific Engineering Group, 2011

The characteristics of other major, active faults that could cause ground shaking in the project vicinity are shown in Table 4.1-1. The Petrified Forest Thrust Zone bounding the greenstone antiform 0.15 miles south of the project is not recognized as active by the California Geological Survey (1993). Based on lack of associated seismic activity, this fault does not appear to present a significant risk of shaking hazards to the project site.

The Modified Mercalli (MM) intensity scale (Table 4.1-2) is commonly used to measure earthquake effects due to ground shaking. It is a useful scale because it describes ground motion in terms of effects observed by people during past earthquakes. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total). Intensities ranging from IV to X could cause moderate to significant structural damage. The Association of Bay Area Governments (ABAG) maintains an interactive web site tool that predicts earthquake intensities within regions of the Bay Area under certain characteristic earthquake scenarios. The earthquake scenario shown to cause the highest ground shaking intensity at the project site is an earthquake on the southern segment of the nearby Maacama Fault. According to ABAG such an earthquake could cause strong ground shaking intensities at the project site (MM VII to possibly VIII). These MM values are lower than what would often be associated with 7.0 Mw earthquake, but this is very likely due to the fact that the expansion area is predominantly underlain at shallow depths by firm bedrock, which attenuates the shaking.

Table 4.1-2
Magnitude and Modified Mercalli Intensity Scales

Magnitude	MM Intensity	Description of Modified Mercalli Intensity Levels
1.0 – 3.0	I	I. Not felt except by a very few under especially favorable conditions.
3.0 – 3.9	II – III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck.
4.0 – 4.9	IV – V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0 – 5.9	VI – VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0 – 6.9	VIII – IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.0 and higher	VIII or higher	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: California Geological Survey (2002)

Based on the foregoing, there is potential for strong seismic shaking at the project site. Due to their close proximity, the Maacama and the Rodgers Creek Faults present the highest potential for ground shaking damage. The timing of earthquakes on these and other Bay Region faults cannot be predicted with accuracy. However, the current Uniform California

Earthquake Rupture Forecast, 2008, states there is a 63% probability for one or more 6.2 Mw (Moment magnitude) in the San Francisco Bay Region between 2007 and 2036.

4. Soils

Soil Types

Vegetated, thin natural soils and locally thicker deposits of colluvium (i.e., soil and detritus that collects at the base of a slope) occupy about 70 percent of the proposed expansion areas, with deeper soils along the main ridge and on its side slopes to the north. North-facing slopes throughout the project site are expected to have relatively deeper soils due to higher moisture retention. Soils and vegetation are thin and patchy on the steep slopes below the main ridge to the south, especially immediately above Porter Creek Road, where numerous often continuous rock outcrops are exposed. Soils are locally thin and patchy along the ridgeline that parallels the north boundary of the quarry. This is the area predominantly occupied by the ash flows and falls of the Sonoma Volcanics. Within the active quarry, slopes are bare, mined rock, while reclaimed slopes have been covered with soils and overburden previously stockpiled for this purpose.

Potential erosion hazard is high on sloping terrain mantled by natural soils and on overburden slopes if protective vegetation is not present and/or if sloping soils are subject to concentrated runoff. Soil erosion potential is highest on low rock-content soils developed over greenstone and expected to be somewhat lower on their rockier, better drained equivalents. Soil erosion potential of the Sonoma Volcanics is expected to be somewhat lower, due to their higher clay content, which makes them more cohesive and thus relatively more resistant to erosive forces. Observations of permanent or long-term constructed slopes in soil (cut slopes along primary haul roads), or similarly constructed fill slopes (the large ravine fill and reclaimed slopes), indicate generally good erosion control performance at the project site.

In general, the soils observed on the site are similar to those reported in the Soil Survey for Sonoma County of 1972. A map showing the locations of soils identified by the Soil Survey is shown on Figure 3, Soils Map in Appendix A of the *Mining and Reclamation Plan* submitted by the project applicant, which is on file with Sonoma County PRMD. Descriptions of the soils identified by the Survey are included. Note that the soil thicknesses are based on regional information and local conditions in the quarry may not reflect those of the Soil Survey. The following soil types occur on the project site:

The Forward series consists of well-drained gravelly loams that have a gravelly sandy clay loam subsoil and includes the following:.

> *Forward gravelly loam (FoG).* The soil is generally found on 9 to 30 percent slopes with a depth to bedrock from 25 to 30 inches. Rhyolite outcrops are exposed in some areas. Runoff is rapid to very rapid, and the hazard of erosion is high to very high. The available water capacity is 3 to 4 inches.
>
> *Forward-Kidd complex. (FrG)*. Forward and Kidd soils each make up about 45 percent of the complex. The remaining 10 percent is made up of Toomes soils and Rock land. The Forward soils are similar to the FoG soils but have a depth of only 9

to 15 inches. The Kidd soils are found on 9 to 50 percent slopes with a depth to bedrock of 5 to 15 inches.

The Goulding series consists of well-drained clay loams.

Goulding clay loam (GgF). This soil is about 16 to 20 inches thick and found on slopes between 30 and 50 percent. Runoff is rapid and the hazard of erosion is high.

Goulding cobbly clay loam (GlF). This soil is about 16 to 20 inches thick and found on slopes between 30 and 50 percent. The surface layer contains about 25 percent cobblestones and stones by volume. Outcrops of basaltic rock are scattered throughout areas of this soil. Runoff is rapid, and the hazard of erosion is high.

Rock land (RoG). The soil consists of stony steep slopes and ridges that generally are in rough mountainous areas where there is little soil material.

Spreckles loam (SkE). This soil is well drained with a clay subsoil. It is underlain at a depth of 22 to 60 inches by volcanic tuffs mixed with uplifted river sediment and weathered basic igneous rock. It is found on slopes between 18 and 25 percent in most places. The A horizon is from 18 to 26 inches thick and is light brownish gray to gray or grayish brown. Gravel content ranges from 0 to 20 percent by volume. The B horizon is between 18 to 34 inches thick and has a distinct speckled appearance because of decomposed and scattered light-colored andesitic basalt fragments and tuffaceous sediment. Permeability is slow and runoff is medium to rapid. The hazard of erosion is moderate to high.

5. Project Slope Stability

The discussion of project slope stability is divided into three subsections: the stability of natural slopes, slopes in the Overburden Stockpile Area, and slopes in the former stockpile area.

Stability of Project Site Natural Slopes

Reconnaissance-level geologic mapping by Miller Pacific (2003) and for this EIR revealed the presence of natural existing and potential slope instability. The principal types of identified instability are landslides and rockfalls.

Landslides

Landslides are defined as masses of soil and rock that have failed and moved downslope in a relatively coherent form. Natural landslide movement (as opposed to those caused by human intervention, such as mining) can be triggered by a number of mechanisms including over steepening of slopes by erosive processes, buildup of slope moisture, and earthquake shaking.

As shown on Figures 4.1-2 and 4.1-3, there is a small number of landslides within and immediately adjacent to the expansion area. Though all these landslides are considered dormant, one of these landslides could be affected by the project. This landslide (Landslide A) is located in the southwest corner of the project and as shown on Figures 4.1-2 and 4.1-

3. The head of the slide is midslope on the main ridge and extends downslope about 600 feet where its toe is exposed in the cut slope of Porter Creek Road. The maximum width of the slide is about 350 feet. The uppermost part of the slide's left flank extends approximately one hundred feet into the area to be occupied by the west edge of the proposed final highwall. The slide is clearly dormant, as indicated by its dense revegetation and moderately eroded condition. This indicates lack of activity for many decades to perhaps a few hundreds of years.

From the toe of this slide and continuing east along Porter Creek Road for approximately 1,900 feet, there are continuous, steep, high slopes extending from the road up to the top of the main ridge. From road level to the ridge top, these slopes presently range in vertical height from 325 to 625 feet and are often inclined greater than 45 degrees. The lower part of these slopes above Porter Creek Road is shown in Photo 4.1-2. Within this 1,900-foot section, the greatest risk for slope failure impacts to the road is from slopes near the quarry entrance driveway and extending west for approximately 300 feet (see Figures 4.1-2 and 4.1-3).

The Miller Pacific mapping (2003) also shows four colluvial filled swales and one smaller landslide within the expansion area. Due to their location or size, none appear to present a hazard. Three of them would be removed by proposed future mining and the fourth will not be a hazard as long as surface runoff from mined slopes is directed around it.

Rockfalls

Rockfalls are defined as the detachment and rapid descent, usually by a combination of free fall, bounding and, rolling, of a loose, incoherent masses of rock debris of various sizes. Most rockfalls do not include large volumes of rock. Because rockfalls can occur without forewarning, and descend so rapidly, they present a much higher risk of damage or injury than slower moving slope failures, such as Landslide A (if it were reactivated).

Above Porter Creek Road, there is a relatively large, well defined rockslide located west of the quarry driveway. There are also numerous other potential locations of shallower rock failure, but they present a lower hazard and risk than the large rockslide. The slopes are the highest and among the steepest along the entire road section. This is in part due to limited initial mining in the early part of the 20th century, which caused over steepening directly above the road. As a result, the lower half of these slopes consists of open, very steeply inclined talus aprons with bare rock chutes and intervening rock knobs and protrusions immediately above. These conditions expedite the rapid downward movement of failed material toward the road. There are two types of rockfall hazard. The first is the existing rockslide labeled "Potential Rockfall" on Figures 4.1-1 and 4.1-2. It is perched high above the driveway to the existing quarry. Failure of this meta-stable slide above the steep slopes would cause it to break up producing a large, rapid, potentially damaging rockfall that could impact Porter Creek Road. The second rockfall hazard is different in character and presents a lower risk to the road. It is not a single point source (single slide) like the first rockfall hazard, but a series of smaller sources that are located across the bare rock slopes above the Porter Creek Road.

Photo 4-1.2 View to west showing very steep lower slopes along Porter Creek Road. Expansion area mining will take place on the upper part of these slopes which are mostly outside the photo. (Photo by M. Dwyer)

Overburden Stockpile Area Stability

The Overburden Stockpile Area is the large ravine fill located within the northwest quarter of the project site. Construction of this fill was initiated in 2004 on approval of an emergency grading permit that allowed removal and storage of stockpiled overburden that was progressively causing large failure of a nearby hilltop and adjacent slope (i.e., the 2004 Landslide). Fill was placed according to design specifications including construction of keyways, installation of subdrains, grading observation, and compaction testing. From 2004 to 2011, additional overburden from ongoing mining and filter cake from the wash plant was routinely added to the fill, substantially increasing its size. Although the overall fill has performed satisfactorily to date, the additional fill placed from 2004 to 2010 did not have supporting geotechnical work to document its continued stability. In January of 2011, additional stockpiling in the ravine was suspended pending completion of this EIR and County approval of the project.

The existing fill is approximately 1,050 feet long and up to about 600 feet wide (Green Valley, 2010 and 2011). The fill was placed in a narrow, steep-sided, steep gradient ravine that drains west off the property. The fill has a maximum thickness of about 125 feet (Miller

Pacific, 2011). The ratio of the interbench slopes comprising the fill face varies between 1.7:1(horizontal to vertical) and 3:1. Midslope benches (which provide access for maintenance) are about 20 feet wide. The overall slope ratio (including benches) is about 3.2:1.

Subsurface exploration of the fill was performed as part of this EIR to assist in determining its current stability (Miller Pacific, 2011). The exploration consisted of the drilling and sampling of four borings up to 66-feet below ground surface. Select samples of the fill were collected for laboratory testing to determine their pertinent engineering properties. The stability analysis was done under both static and dynamic (earthquake shaking) conditions.

Based on the Miller Pacific analysis, the ravine fill slopes are stable under static conditions (non-seismic shaking conditions). However, under seismic conditions (earthquake shaking), their analysis shows the ravine fill slopes to be below a 1.0 factor of safety (factor of safety is a metric that describes the stability of a slope; factors of safety that exceed 1.0 under earthquake shaking conditions and 1.5 under static, non-earthquake shaking conditions are typically considered stable). While deformation of the fill could occur as a result of earthquake shaking, massive slope failure that would result in highly damaging erosion/siltation impacts to nearby improvements or Porter Creek are not anticipated. The possible consequences of failure and its correction are later described in the project impact section. The complete Miller Pacific report is contained in Appendix C.

Former Overburden Stockpile (2004 Landslide)

This slide occurred beneath the site of a large overburden stockpile constructed from past mining of the existing quarry (see Figures 4.1-2 and 4.1-3). It is roughly estimated a total of 150,000 to possibly 200,000 cubic yards were incrementally stockpiled at this location until 2004 (verbal communication, Miller Pacific Engineering Group, 2010) when the underlying Sonoma Volcanic bedrock slopes failed due to the excessive load imposed by the overburden. Had actions not been immediately taken to bring the sliding to a halt, large volumes of debris would have moved downslope to the north with both onsite and offsite impacts. Emergency actions included the removal of the stockpiled material to unload the slide and its placement as engineered fill in the described Overburden Stockpile Area. Although the slide has not undergone noticeable failure since its emergency unloading in 2004, a post-failure stability analysis was performed by Miller Pacific Engineering Group (2011) to evaluate its long term performance and to determine if additional mitigations might be necessary to avoid slide reactivation. The analysis was based on subsurface exploration, sampling of subsurface materials, and laboratory testing. The Miller Pacific analysis concluded the unloaded landslide (previous overburden stockpile removed) appears to be stable under both static and seismic conditions. Because the project would not result in any additional material being stored at this location, the project would not affect stability of this site.

6. Regulatory Background

The following section provides a summary of the Federal, State, and County regulations, goals and policies for quarry mining, mining safety, and protection of natural resources from open pit mining.

Federal

Mine Safety and Health Administration

The Mine Safety and Health Administration (MSHA), a division of the U.S. Department of Labor, administers the provisions of the Federal Mine Safety and Health Act of 1977. MSHA develops and enforces mandatory safety and health regulations pursuant to the Code of Federal Regulations (CFR) 30 that apply to all surface and underground mines located in the U.S. through inspections, rigorous training, and providing educational programs for employers and employees in the mining industry. The ultimate purpose is to eliminate fatal accidents, reduce the frequency and severity of nonfatal accidents, minimize health hazards, and promote improved safety and health conditions in mines of the United States. Project operations would be regulated by MSHA, and periodic inspections of the quarry would be performed under MSHA regulations to ensure maximum worker safety during project operation.

State

Surface Mining and Reclamation Act (SMARA)

SMARA was signed into law (California) in 1975, went into effect in 1976, and has been amended numerous times over the years. The intent of the Act is to: 1) assure reclamation of mined lands, 2) encourage production and conservation of minerals, and 3) create and maintain surface mining and reclamation policy (regulations).

One of the principal requirements of SMARA is the preparation of a Surface Mining and Reclamation Plan. This plan must be prepared by a mining applicant prior to initiation of mining activities. Once the plan is prepared and reviewed for compliance, an Environmental Impact Report must be prepared on the plan by the lead agency to identify impacts of the project and to develop adequate mitigation measures.

SMARA is administered by lead agencies (most often counties or cities) and, in some cases, by the California State Mining and Geology Board. Technical assistance and oversight is provided by the Office of Mine Reclamation (Department of Conservation). Lead agency administration and enforcement is based on a lead agency-prepared (Sonoma County PRMD) ordinance based on SMARA. With respect to the proposed project, this is County Ordinance No. 5165, Surface Mining and Reclamation Ordinance (SMARO), as discussed in a following subsection.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 directs the Department of Conservation (California Geological Survey) to identify and map areas prone to earthquake hazards of liquefaction, earthquake-induced landslides and amplified ground shaking. The purpose of the Act is to reduce the threat to public safety and to minimize the loss of life and property by identifying and mitigating these seismic hazards. The Act was passed by the legislature following the 1989 Loma Prieta earthquake. While this Act pertains to seismic hazards, they are not the same as the fault surface rupture hazard regulated by the Alquist-Priolo Special Studies Zone Act of 1972.

As of mid 2011, Seismic Hazard Zone Maps had been prepared for portions of Southern California and a small part of the San Francisco Bay Area. The intent is to first prepare the maps for areas that are undergoing the most rapid urbanization and which have recognized hazards. Maps have yet to be prepared for the Mark West Springs Quadrangle, within which Mark West Quarry and expansion area are located.

California Building Code

The California Building Code (CBC) is another name for the body of regulations found in the California Code of Regulations (CCR), Title 24, Part 2, which is part of the California Building Standards Code (CBSC). The purpose of the CBC is to provide minimum standards to safeguard life, limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. Published by the International Conference of Building Officials, the Uniform Building Code (UBC) is a widely adopted model building code in the United States. The CBC incorporates by reference the UBC with necessary California amendments. These amendments include significant building design criteria that have been tailored for California earthquake conditions. The latest publication of the CBC is 2010.

The project area is located within Zone 4 of the CBC which is one of the four seismic zones designated in the United States. Zone 4 is expected to experience the greatest effects from earthquake ground shaking and, therefore, has the most stringent requirements for seismic design. The national model code standards adopted into Title 24 apply to all occupancies in California except for modifications.

County

Sonoma County Surface Mining and Reclamation Ordinance (SMARO)

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. Only those sections from the ordinances, or portions thereof, that are applicable to the geologic/geotechnical aspects of the proposed project are shown below.

Sec. 26-A-09-010 – General standards for mining permit and operations
(g) Erosion and Sedimentation.

(2) Sediment basins, settling ponds, ditches, levees, dikes, culverts and other structures as well as erosion control and streambank protection measures shall be sized and designed by a civil engineer in accordance with standards set forth in the most current "flood control design criteria" manual published by the Sonoma County water agency and otherwise in accordance with acceptable engineering practices and any subsequent local, state, or federal regulations or revisions.

(m) Slopes and Benches.

(1) Finished slopes shall conform to the requirements of Section 26A-11-010 (d)(2). In addition, quarries shall be subject to the applicable slope standards set forth in Section 26A-11-040.

(2) Temporary slopes steeper than the finished slopes, in areas where finished slopes are to occur, shall be constructed and maintained in accordance with the recommendations, as approved by the director, of a geotechnical engineer or a civil engineer registered in the state of California or an engineering geologist registered and certified in the state of California. Temporary slopes shall not be created or maintained in a manner that will interfere with the construction of finished slopes conforming to subsection (m)(1) of this section, and the geotechnical engineer, civil engineer or engineering geologist shall make specific recommendations for the conservation of such temporary slopes to finished slopes.

(3) Benches shall be provided on any working slope with a vertical elevation in excess of forty feet unless otherwise recommended, as approved by the director, by a geotechnical engineer or civil engineer registered in the state of California or an engineering geologist registered and certified in the state of California. No benches are required for terrace pit slopes below the minimum water level. The bench interval shall not exceed thirty feet in vertical distance. Benched slopes shall not be created or maintained in a manner which will interfere with the construction of final reclaimed slopes.

(n) Salvage of Topsoil. Where the Reclamation Plan requires resoiling of finished grade areas or offsite locations, topsoil shall be separately removed and stockpiled during the excavation phases for later use in reclamation. A protective ground cover shall be established on topsoil stockpiles to retard erosion and runoff during the winter rainy season.

Sec. 26A-09-040. Quarry mining standards
In addition to the general mining standards set forth in Section 26A-09-010, the following standards shall be applied to quarry mining operations.

(c) Slope Stability. The maximum allowable working slopes of the mine face shall be approved by a certified engineering geologist or a registered geotechnical engineer and specifically stated in the use permit. Any variation from the slope requirements of section 3502 (b)(3) of the state reclamation guidelines shall be specifically justified in the reclamation plan. Benches in slopes are required every twenty-five to thirty vertical feet for access and drainage control. Working slopes must eventually conform to final reclaimed slopes and topography. Quarries in or near fault zones may be required to incorporate additional geotechnical measures to insure worker and public safety.

(d) Setbacks. Mining operations, stockpiles, and processing operations are to be set back a minimum of twenty-five feet from the MR zone boundary, the property boundary, and road easements and rights-of-way, whichever is the most restrictive. The minimum allowed setback for quarry mining operations from stream banks and critical habitat areas designated in the General Plan is one hundred feet. A minimum two hundred foot setback is also required from the boundary of any General Plan residential land use designations. Additional setbacks may be required as a result of site specific reviews in order to mitigate environmental impacts and land use conflicts.

(g) Erosion and Sediment Control. Drainage plans and facilities must minimize slope erosion and off-site sedimentation.

(h) Use of Explosives. No explosives shall be used except as authorized by the use permit. Blasting activities shall be conducted by a qualified licensed blasting professional in compliance with state blasting regulations. Blasting permits shall be obtained from the Sonoma County sheriff's department. Blasting operations shall be designed to minimize adverse noise and vibration impacts on offsite residential areas. Permits may be conditioned to require notice to immediate neighbors prior to blasting.

<u>Sec. 26A-11-010. Reclamation Plan requirements</u>
Numerous reclamation requirements of both a general and a specific nature are contained in this Section. Only those requirements, or portions thereof, judged to be geologically/geotechnically significant with respect to the Mark West Quarry expansion (20-year plan) are shown below.

(c) A reclamation plan shall contain the following:

(2) The depth, quantity and type of minerals to be mined;

(4) A description of the general setting of the area, including a detailed description of the geology, climate, groundwater, drainage, and soil characteristics of the area in which surface mining and/or reclamation is to be conducted;

(9) Maps and/or graphic exhibits of the final grades, re-vegetation plans, cross sections of the mining site, and/or other reclamation details proposed to be implemented;

(10) An assessment of the effect of implementation of the Reclamation Plan on future mining in the area.

(d) Reclamation Plan Standards. Properties used for surface mining operation shall be reclaimed after the operation or an approved phase of the operation has been completed in accordance with the following standards:

(2) Final Reclaimed Slopes. Final reclaimed slopes, abandoned spoil piles, topsoil or overburden stockpiles, and the entire mining site shall be graded and smoothed as necessary so as to control erosion, prevent the creation of potentially dangerous areas, present a natural appearance, and comply with any minimum or maximum slope standards set forth and required in the Reclamation Plan approval in order to leave the site in an acceptable condition adaptable to the stated post-mining land use;

(3) Resoiling. Mined slopes shall have soil added where needed to support the approved type of revegetation. Topsoil, overburden, aggregate processing sediment,

and other native earth materials from the site and surrounding area shall be used to the maximum extent feasible in this process;

(5) Grading, Backfilling and Cleanup. Reclamation plans shall make provisions to ensure that the mining site is left in a final condition after operations are complete, that is:

(i) Safe with stable waste piles, cut slopes, fill slopes and with the elimination of steep-sided pits and holes,

(iii) Revegetated where necessary for soil stabilization,

(6) Drainage, Erosion and Sediment Control.

(vii) Overburden, waste mud, silt, and other sediments generated by the mining operation shall be stored in such a manner that allows their recovery for use in reclamation.

Sonoma County Zoning Ordinance

The California Geological Survey's (CGS) Special Report 175 (Miller, et. al., 2005) has classified all lands within Sonoma County into various Mineral Resource Zones (MRZs). The classification of MRZs is based on guidelines adopted by the California State Mining and Geology Board, as mandated by the Surface Mining and Reclamation Act (SMARA) of 1975. SMARA requires local lead agencies (County of Sonoma) to incorporate the classification information into their general plans. MRZ categories range from MRZ-1 to -4 and are guidelines indicating the likelihood for a particular quality of aggregate to be present. MRZ-2a and 2b represent the highest occurrence probabilities of resource rock, and AC and base rock represent relatively high quality aggregate classes.

The MRZ designation assigned to resource rock within the presently permitted Mark West Quarry by Special Report 175 is MRZ-2a, for AC grade aggregate (asphaltic concrete grade) and base rock. For the surrounding area in an east-west direction, including the proposed expansion project, the designation MZR-2b has been assigned for AC and base rock. Based on the more detailed field work done as part of this EIR, the expansion project parcel could also be classified as MRZ-2a.

In response to Special Report 175, the County has zoned the currently permitted part of the quarry (87-acre parcel) as MR (Mineral Resource Combining District). This includes the active quarry, presently reclaimed slopes, all processing equipment and other mine facilities (Miller, et. al., 2005). The current zoning of the proposed project (about 81 acres) is presently RRD (Resources and Rural Development). The Applicant is seeking rezoning of the expansion parcel to an MR Zone as part of the project. This parcel includes both the future mining area and the existing ravine fill (overburden stockpile area).

Sonoma County Aggregate Resource Management Plan

By law, the State Geologist classifies or inventories mineral lands throughout California. The State has designated certain mineral bearing areas as being of regional significance. Local agencies must 1) adopt mineral management policies which recognize mineral information provided by the State, 2) assist in the management of land use which affect areas of statewide and regional significance, and 3) emphasize the conservation and development of identified mineral deposits.

Sonoma County has adopted the Aggregate Resources Management Plan (ARM Plan), a plan for obtaining future supplies of aggregate material. This plan serves as the State-mandated mineral management policy for the county and is intended to accomplish the mandated purposes. This plan was first adopted by the County in 1980 and later updated in 1994. A discussion of the objectives contained in the ARM Plan that are relevant to the proposed project are presented in ***Section 4.10 Land Use and Planning Consistency***.

Sonoma County General Plan 2020

The Open Space Resource Conservation, Public Safety, and Land Use Elements of the General Plan contain policies that are relevant to the project. These policies, or portions thereof, that are applicable to the proposed project are listed below.

Open Space and Resource Conservation Element

Policy OSRC-13a: Consider lands designated in the ARM Plan as priority sites for aggregate production and mineral extraction and review requests for additional designations for conformity with the General Plan and the ARM Plan.

Policy OSRC-13b: Review projects for environmental impact and land use conflicts and consider the following minimum factors when approving mining permits: topsoil salvage, vegetation, fisheries and wildlife impacts, noise, erosion control, roadway conditions and capacities, reclamation and bonding, air quality, energy consumption, engineering and geological surveys, aggregate supply and replenishment, drainage, and the need for economical aggregate materials.

Policy OSRC-13c: Review projects that are on or near sites designated "Mineral Resources" in the ARM Plan for compatibility with future mineral extraction.

Public Safety Element

Policy PS-1a: Continue to utilize all available data on geologic hazards and related risks from the appropriate agencies.

Policy PS-1b: Continue to utilize studies of geologic hazards prepared during the development review process.

Policy PS-1f*:* Require and review geologic reports prior to decisions on any project which would subject property or persons to significant risks from the geologic hazards shown on Figures PS-1a through PS-1i and related file maps and source documents. Geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability.

Land Use Element (Policies for Resources and Rural Development Areas)

(3) Protect lands for aggregate resource production as identified in the Aggregate Resources Management Plan.

(5) Protect against intensive development of lands constrained by geologic hazards, steep slopes, poor soils or water, fire and flood prone areas, biotic and scenic areas, and other constraints.

B. Potential Impacts and Mitigation Measures

1. Criteria Used for Determining Impact Significance

Based on the *CEQA Guidelines*, the project would have a significant impact on geology or soils if it:

1. Exposes people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving any of the following:

    a. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.
    b. Strong seismic shaking.
    c. Seismic-related ground failure, including liquefaction.
    d. Landslides.

2. Is located in a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

3. Is located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (UBC) creating substantial risks to life or property.

4. Results in substantial soil erosion or the loss of topsoil.

5. Has soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems, where sewers are not available for the disposal of wastewater.

6. Results in the loss of availability of a known mineral resource that would be of value to the region and residents of the State.

7. Results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

2. Project Impacts

Less Than Significant Impacts Not Requiring Further Analysis

Certain issues identified in the significance criteria are not considered impacts of the proposed project and are discussed briefly below.

Criterion 1a (Fault Rupture Hazards). Seismically-induced ground rupture is defined as the physical displacement of surface deposits along one side of a fault trace with respect to the other. Ground rupture is more likely along active faults (faults which have undergone displacement in the last 11,000 years). The project site is not underlain by known active faults. As discussed in the Setting, the nearest active fault is the Maacama Fault, which passes within about 1.5 miles of the project. Therefore, fault rupture is not considered a potential project impact.

Criteria 1c and 2 (Liquefaction). Liquefaction is a transformation of soil from a solid to a liquefied state during which saturated soil temporarily loses strength resulting from the buildup of excess pore water pressure, especially during earthquake-induced cyclic loading. Soil liquefaction and associated ground failure can damage roads, pipelines, underground utilities, and buildings with shallow foundations. Liquefaction can occur at depths of less than 40 feet in areas characterized by water-saturated, cohesion-less, granular materials. Subsurface exploration Miller Pacific (Appendix C) and geologic mapping performed by the consultant team did not reveal the presence of potentially liquefiable soil within the proposed project area. Therefore liquefaction and its related ground distress is not considered a potential project impact.

Criterion 3 (Expansive Soil Hazards). Expansive soils, or those soils with high expandable clay contents, can over time, misalign some foundation structures or warp pavement and flatwork. All existing and future project facilities would be located on non-expansive soils or bedrock. Given that the site would be an active quarry and the underlying material is rock, expansive soils are not considered a potential project impact.

Criterion 5: Septic System Hazards. The existing quarry has a functioning septic system that includes portable units that would also be utilized by the expansion project. There would be no impact per this criterion.

Criterion (Loss of Availability of A Known Mineral Resource). The proposed project is the expansion of an existing hard rock quarry. The project would make use of this resource. Loss of mineral resource availability is not an impact of the project.

Criterion 7 (Loss of Availability of a Locally-important Mineral Resource Recovery Site). The project would maintain its current practice of recycling aggregate materials. There would be no loss of a resource recovery site.

In addition, *soil* erosion and siltation impacts (*Criterion 4)* are addressed in ***Section 4.2, Hydrology and Water Quality*** (specifically, see Impact 4.2-C).

The EIR geotechnical consultants conducted a review of applicable State and County regulations pertaining to geologic and geotechnical aspects of the expansion project. Based upon this review, it appears that the geologic and geotechnical information contained in the applicant's Mining and Reclamation Plan as amended by mitigation measures included in this EIR would comply with pertinent regulatory requirements.

Seismic Shaking Impacts

Impact 4.1-A In the event of a major earthquake in the region, seismic ground shaking could result in injury to mine personnel, increase the potential for slope instability, and cause damage to equipment and structures. This would be a potentially significant impact.

As discussed in the Setting section, the project is located in a seismically active region and in close proximity to the Maacama and the Rodgers Creek Faults. The project could experience a large (6.0-6.9 Mw) to possibly major (7.0+ Mw) earthquake sometime within its operational life. The intensity of project ground shaking would vary depending on the magnitude of the event, distance from the causative fault to the project, and the project geologic materials. The maximum earthquake (see Table 4.1-1) could generate peak ground accelerations of about 0.40 g (10% probability of exceedance in 50 years or 1 in 475 chance of occurring each year) or Modified Mercalli Intensities ranging from strong (MM I- MM VII) to very strong (MM I-MM VIII). However, even a smaller (but more likely) earthquake of MMI-MMVI strength originating nearby on the Maacama Fault is expected to trigger some rockfalls on steeper natural or mined slopes.

Human Safety

When a strong earthquake occurs, there is a potential for structural or equipment damage that could result in worker injury. However, that possibly is reduced due to the relatively low number of daily on-site workers at the quarry (eight during the peak season and two during off season) and due to required safety training of personnel. The quarry operator has submitted a geotechnical report (Miller Pacific 2003) as part of the project application that states that after an earthquake, mine personnel will inspect all structures, equipment, and slope faces to determine whether mining can safely resume in compliance with applicable MSHA and Cal OSHA regulations. These inspections and existing legal regulations, along with the low number of personnel typically present, would reduce earthquake shaking impacts of human injury to a ***less-than-significant*** level.

Equipment and Structures

All major structures at the existing quarry have been constructed to the California Building Code's stringent seismic design criteria for the Zone 4 regions. On this basis, the impact of structural and equipment damage from seismic shaking should be minor to possibly moderate and constitute a temporary delay in normal operations. The extent of any damage would be limited to onsite structures, wells, and earthworks. The purpose of the CBC/UBC is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures within its jurisdiction.

Included in the purpose of the CBC/UBC is the reduction of risk to human life and property due to seismic ground shaking. These existing regulations would reduce potential impacts to equipment and structures to a ***less-than-significant*** level.

Overburden Stockpile Area Slopes

Maximum anticipated earthquake shaking could cause deformation in the fill slopes of the Overburden Stockpile Area. Miller Pacific (2011) calculated an existing and future seismic factor of safety (FS) of less than 1.0 for this fill. A FS of less than 1.0 indicates possible deformation or failure. Their calculations included the additional 24,000 cubic yards of overburden fill the applicant proposes to add to this storage area during the first three years following permitting of the expansion project. Their analysis indicates that the maximum amount of shaking-induced deformation of the fill that could occur is between 1.2-4.5 feet. Should deformation in this range occur, it would likely cause some visible ground fissuring, fill toe bulging, and some degree of slide failure within the outer parts of the fill (west edge). Although massive failure of the fill is not anticipated, these deformations, particularly if not immediately corrected are a ***potentially significant impact****.*

It should be noted that the amount of deformation and risk of its occurrence is expected to somewhat diminish over time. This would be due to the partial removal of overburden from the storage area; the removed overburden would be sold or used for project reclamation.

Other Project Site Slopes

Earthquake shaking will likely cause landsliding, rockfalls, and talus slope failures on mining and natural slopes above Porter Creek Road. Failures could impact Porter Creek Road and be a hazard to the road and road traffic. The number and size of the failures would vary with the degree of the shaking. However, even a moderate earthquake of about 5.0 Mw occurring on the nearby Maacama Fault would likely trigger some slope failures. Larger earthquakes would trigger larger and more numerous failures. These are ***potentially significant impacts****.* However, it is noted that as mining creates the final highwall, the impact of mining-induced failures will eventually diminish due to the flatter, lower slopes that will be created.

Summary of Seismic Shaking Impacts

In summary, the proposed expansion project could experience a potentially damaging earthquake during its permitted lifetime (20 years). Although the event could put mine personnel at some risk and cause some structural damage, it is unlikely that death or structural collapse would occur. Mining faces and natural slopes could experience localized failures that could pose a risk to workers and Porter Creek Road traffic. Overburden fill slopes in the Overburden Stockpile Area could sustain deformation and require repair. As described above, some of these impacts are ***potentially significant***.

Mitigation Measures

The applicant is legally required to comply with applicable MSHA and Cal-OSHA regulations and comply with any safety directives following inspections. In addition, the following mitigation is recommended.

4.1-A.1 Following discernible seismic shaking at the quarry project, a visual inspection shall be made by experienced, onsite mining personnel of all quarry slopes and slopes above Porter Creek Road. The intent shall be to identify any failure or incipient failures that require correction for safety or ongoing mining. In the event of failures causing substantial damage, or an identified incipient failure that could cause such damage, a Certified Engineering Geologist and/or licensed Geotechnical Engineer shall be immediately retained to characterize the failure(s) and recommend repair procedures. All slope repairs within the active mining area posing a risk to workers shall be completed prior to resuming routine mining activities in the affected area. All slopes above Porter Creek Road posing a risk to road traffic shall be immediately protected or stabilized prior to reopening the road to traffic.

Impact Significance After Mitigation

The recommended inspections and existing regulations will provide protection for quarry personnel following an earthquake. The recommended mitigation measures would repair or prevent damage caused by potential failures above Porter Creek Road, in the Overburden Stockpile Area, or at sites of other significant cuts or fills. Any failures of the fill within the Overburden Stockpile Area would be quickly repaired to ensure that there would be continued satisfactory performance of the fill and to minimize or eliminate any off-site impacts resulting from further fill failure. Failed rock from active quarry slopes that is perched or otherwise unsafe would be removed prior to resuming mining operations in the affected area(s). Mitigation measures for slopes above Porter Creek Road will minimize risk to the road and its users. While some damage from earthquake shaking is always possible in a seismically active area, existing slope protection measures and safety regulations adopted to address these impacts, plus the mitigations recommended above would reduce impacts potentially resulting from earthquakes to a ***less-than-significant*** level.

Slope Stability Impacts Caused by Mining

Impact 4.1-B Mining practices could cause slope failure, landsliding, or rockfalls that could injure on-site workers and travelers on Porter Creek Road. This would be a potentially significant impact.

Future mining can cause unstable slopes and rockfalls. Active mining slopes (production slopes) are often over-steepened and therefore subject to instability. Blasting and heavy equipment vibrations resulting from mining can further destabilize slopes and may trigger instability on the nearby slopes directly above Porter Creek Road. Instability on over-steepened mining slopes can range from raveling to wedge failures, or possibly rockfalls; while failures on natural slopes can include rockfalls, rock raveling, talus slides, and reactivation of dormant slides. The final highwall could undergo some localized, minor, post-construction rock failures and fill failures, and where highwall construction partially removes old dormant landsliding, it could cause slide reactivation. Removal of overburden stockpiled in the Overburden Stockpile Area could cause over-steepened slopes that could result in slope failure.

In preparing this EIR, three stability analyses were performed (Miller Pacific, 2011) at key locations within the existing quarry and proposed expansion area where mining activities have or could affect slope stability. The analyses were performed at the Overburden Stockpile Area, the site of the Former Overburden Stockpile (the 2004 Landslide site), and on the configuration of the Final Highwall Slopes at the completion of proposed mining. The purpose of the analyses was to evaluate the possibility of existing or future slope instability at these locations and, if necessary, to develop mitigation measures to correct the instability. The highwall analysis also provided insight into the continued slope performance of existing and future active mining slopes (production slopes). The summary of the analyses are presented below. Additional detail is presented in the full Miller Pacific report contained in Appendix C.

1. Active Mining (Production)

Active mining slopes of the project site will typically be high and steep. As these fractured rock slopes are mined, they are routinely subjected to the forces of blasting and to vibration caused by operation of heavy equipment. Such slopes would not have a high factor of safety, and localized failures are an expected and inherent part of hard rock quarrying. This conclusion is supported by the geologic and geotechnical investigations done for the quarry (Miller Pacific, 2003 and 2011). According to verbal information provided by mine personnel and filed observations, the quarry has experienced several localized mining-related failures. These have been primarily minor to occasionally moderate-sized (a few to several hundred cubic yards), incipient (not rapid) wedge failures. The Miller Pacific report of 2003 also supports these observations. They noted three such failures on the northeast quarry walls. The failures were all about of equal size of 20 to 25 feet across, up to about 5 feet in thickness and having volumes of approximately 25 to 75 cubic yards. Failures such as these are expected to intermittently occur as mining continues into the proposed expansion area. They can be a hazard to mining personnel and equipment. This is a ***potentially significant impact.***

2. Slopes Above Porter Creek Road

Because the slopes above Porter Creek Road are high and steep, there is an existing hazard of rocks occasionally falling onto the road. As mining advances west and south into the quarry expansion area, the high slopes above Porter Creek Road will become increasingly subject to blasting vibrations. In addition, mining activity would occur near the top of the main ridge above the road. These activities near the top of the slope could trigger landslides and rockfalls.

As discussed in the Setting section, two areas and types of hazard have been identified above Porter Creek Road. The first hazard is the rockslide perched above the quarry driveway ("Potential Rockfall", on Figures 4.1-2 and 4.1-3). Based on aerial photo analysis the slide is about 250 feet long and 100 feet wide. The analysis shows it initially failed sometime prior to 1980. During initial failure, it slid a few tens of feet, before coming to rest in its present position. Although this slide does not display discernible aerial photo evidence of significant activity since 1980 and it will eventually be removed by future mining, its steep slope and well-defined failure boundaries indicate it is meta-stable (i.e., partially stable). Therefore, it could be activated by vibration from blasting or nearby heavy equipment operation, before it is removed by future mining expansion. Due to near vertical slopes directly below the slide toe, its reactivation could quickly result in a disaggregated, rapid rock fall. If the entire slide mobilized from a single failure and moved down this slope, it could generate several thousand cubic yards of rapidly descending, blocky debris. A large percentage of this falling and bounding debris could very quickly impact Porter Creek Road and present high risk of property damage and injury to travelers. It would also likely block the road for an extended period of time.

The risk of the second hazard is different in character and has a lower probability of impacting the road. It is not a single point like the first hazard, but a series of smaller sources spread across the bare rock slopes above the road, especially for about 300 feet west of the entrance to the quarry. Failures in this area would consist primarily of rockfalls and talus slides, or a combination of the two(the first triggering the second).

These rock failures are more frequent and smaller in volume and rock fragment size (estimated to be less than six inches) than failures from the area above the driveway. They typically do not always travel all the way down to the road. Based on observed rock slope morphology, it appears the failures that do reach Porter Creek Road occur less frequently than those remaining on the slopes, but they have larger individual volumes.

This conclusion regarding the volume and frequency of this second failure type is supported by Sonoma County Road Maintenance (Rob Houlwing, verbal communication, 2010), that states in at least the past 40 years there has only been one landslide or rockfall off these unmined, natural slopes that has significantly impacted Porter Creek Road (large is defined as a complete blockage of both lanes of travel). Previous failures have not caused injury and/or damage, but at times have required heavy equipment for cleanup. More commonly, there are one or two small falls or talus slides (few cubic yards) per year that move down slope to partially impinge on the roadway. Based on the above history and geologic observation, it is estimated that the failures that have reached the road commonly had volumes of a few cubic yards to infrequently as much as about 100+ cubic yards. This latter volume would be large enough to block both lanes. Volumes large enough to block part or all of one lane are considered a potentially serious road hazard.

The incidence and volume of these failures could be significantly increased by the proposed project. These rockfall hazards will be partially mitigated by the proposed mining process. The quarry will be expanded to the west with materials being removed by pulling them toward the existing pit floor. Accordingly, there would not be mining equipment located on the slope above the road. Nevertheless, risk will remain from the mining loosening rocks on the slope that may then roll, fall, or slide to the road.

As described in ***Section 3.2, Project Characteristics***, the applicant has proposed a rockfall barrier system to address these hazards. The proposed system would use flexible rockfall barriers, which consist of wire mesh anchored into the ground and supported on 10-foot steel posts. For design purposes, it was assumed that a proprietary system designed by Maccaferri would be used. Initially, a 350-foot barrier (Barrier A) would be constructed immediately north of Porter Creek Road as shown in Figure 3-15. As mining moves west and south, a second barrier (Barrier B) would be constructed midslope up the hill from the road. This barrier would be constructed in phases as mining proceeds west (about 250 feet of barrier installed per phase), and would eventually be about 1,000 feet long. The applicant's geotechnical report (Holdrege & Kull, 2012) recommends an engineering review of Barrier A's performance prior to deciding whether the barrier design is appropriate or whether an alternative system should be used for Barrier B.

In addition to these two barriers, a temporary, removable fence consisting of welded wire mesh supported by T-posts or similar materials would be installed within 50 feet of the active excavation on slopes above Porter Creek Road. This fence would be approximately 4 feet high. The intent of this fence is to capture sliding or rolling rocks disturbed by active mining near the top of the slope before it reaches the lower barriers.

The intent of the proposed rockfall barriers is to capture mining-generated rockfalls before they reach the road. The design approach was based on the calculation of maximum bounce height and energy at the proposed barrier locations by numerical modeling and the selection of barriers which would capture these rocks. The design is intended to provide 100 percent capture of the rockfall incidents (based on calculated bounce heights and energies) revealed by the modeling software. Consequently, no mining-generated rockfall or debris would be expected to reach Porter Creek Road.

The selected barrier system will possess a minimum energy rating of 25 kJ (kilojoules). In Holdrege & Kull's discussions with Maccaferri, the barrier system manufacturer, it is expected that the described barrier would more likely possess an energy rating of 50 kJ. Based on their modeling of rockfall on the slope, a 12-inch diameter, spherical rock traveling from the top of the slope (pre-mining or initial condition) would possess a maximum energy of 9 kJ, with average energies ranging from 2.8 kJ to 4 kJ depending on the fall path. Although the barrier is intended to capture individual rocks rather than debris flows, they estimate that the proposed barrier could accommodate the impact of 0.5 to 1 cubic yard of loose debris containing a mix of loose rock, gravel, and soil. The actual capacity may be much larger, depending on the velocity of the debris flow. Typically, debris resulting from mixed materials is expected to move at a much lower velocity than an individual rock.

Material captured by the barriers and fence would be removed to prevent accumulation behind the barrier. Rocks would be broken up, and finer materials would be scattered upslope from the barrier.

The proposed design was peer reviewed by Miller Pacific (the EIR geotechnical engineering consultant); the review included interviews with Holdrege & Kull staff. This review is included in Appendix A of this EIR. They concluded that the proposed system is feasible from a geotechnical perspective. They identified several conditions that would be required at the time of the final barrier design, and these conditions are incorporated in the mitigation measures for this impact.

If properly engineered and constructed the proposed rockfall barrier system would be adequate to mitigate for most potential rockfalls onto Porter Creek Road. The one exception is the potential rockfall generated by reactivation of the dormant rockslide located above the quarry driveway ("Potential Rockfall" on Figures 4-1.2 and 4-1.3). Due to the volume of this slide, removal or stabilization is necessary because reactivation could cause a large volume rockfall that would overwhelm the proposed rockfall barrier system. This would be a ***potentially significant impact***.

Barrier installation could require the creation of trails/roads to provide access for construction personnel and lightweight drilling equipment. It is anticipated that the construction will be performed using relatively lightweight, hand operated demolition hammers, drills, and limited access drilling equipment. Construction of a trail or road across the slope to provide access for barrier installation would have potentially significant impacts as regards rocks falling during its construction and possible landsliding. This road/trail would also have secondary impacts on vegetation and views. Construction of access roads or trails would have ***potentially significant impacts.*** This impact can be avoided by using workers in harnesses and portable drilling equipment, and this is recommended in the following mitigation measures.

3. Final Highwall Slopes

The final highwall is the completed quarry face at the termination of 20 years of mining (see Figure 3-14). The wall will be curved and approximately about 2,650 feet long at its base and about 300 feet high. Approximately the western two thirds of the wall will remain in rock and the eastern one third will be capped with compacted fill (reclaimed overburden).

The rock wall will have an overall slope angle of 1.5:1 (H:V), no steeper than 1:1 inter-bench slopes, and intervening 15-foot wide benches spaced every 30 vertical feet. The fill-capped wall will have an overall slope ratio of about 2.4:1, with no steeper than 2:1 interbench slopes, and will typically have 10-foot wide benches every 30 vertical feet of fill. The throughcut-backslope (i.e., the north-facing wall) is 85 feet in height and will also be capped with fill and have a have a final slope ratio of about 3:1. At the base of the highwall there will be a bench constructed by placing up to about 65 feet of fill (reclaimed overburden) along the bottom of the cut lying between the base of the highwall and the opposing throughcut-backslope. The fill bench will mostly vary in width between 75 and 150 feet, but will be up to 300 feet wide along the east end of the highwall. These slope configurations would be in compliance with the SMARO (Section 26A-09-010 (m), 26A-11-010 (2), 26A-09-040 (c), and 26A-11-040).

The wall will consist of greenstone that is mostly highly fractured to shattered by short, mostly tight, irregular breaks of various orientations. This pervasive pattern of close fracturing is punctuated by more widely spaced (several inches to several feet), well defined, more linear, and much more persistent discontinuities consisting of joints, faults, fault zones and shear zones. It is these various fractures or discontinuities, especially the more continuous ones, that control stability, not the unfractured rock strength. For this reason, measuring and evaluating bedrock discontinuities was an important step in the overall stability evaluation of the final highwall slopes.

Two hundred and twenty seven individual bedrock discontinuity measurements were made in the field at various locations within the existing quarry and the proposed expansion area. These measurements and related discontinuity properties were used by Miller Pacific (2011) in assessing the stability of the rock slopes at the various highwall orientations that would exist following final reclamation. Miller Pacific calculated the factor of safety (FS) for the various orientations of the final rock highwall and its highwall backslope (see Appendix C). Based on their analysis, highwall orientations have favorable factors of safety against large (global) failures under both static and seismic conditions. The favorable FS values are due in part to the fact the final reclaimed wall will be as much as 400 feet lower than existing natural slopes and will have mostly flatter slope angles. Based on the report included in Appendix C, the potential impact of large global failures of the final highwall would be ***less than significant.***

Constructing the final highwall will likely require utilizing blasting practices that vary somewhat from production blasting. Blasting methods typically used to break and move rock from temporary mining slopes for production purposes may not be best suited for forming the final highwall configuration. The final walls should be constructed to avoid or minimize over or under blasting that, respectively, either excessively fractures and weakens the rock, or leaves an overly uneven slope face with protrusions. Such protrusions would reduce the designed slope performance, and thus require trim blasting and/or additional slope scaling for their removal. Unless these more precise blasting practices are followed, there could be localized failure on the final highwall and higher than expected maintenance. This is a ***potentially significant impact.***

Even with the generally high calculated global stability of the final rock highwall and good construction and blasting practices, minor failures of a few to possibly several cubic yards are anticipated to occasionally occur on interbench slopes. In time, the accumulated debris could result in localized blockage of individual benches and cause interruption or damage to slope drainage facilities. In turn, this could cause locally uncontrolled, concentrated runoff on the slope face. The runoff could induce accelerated erosion which could penetrate into weak areas and zones of more intensely fractured and sheared rock, gradually removing needed lateral support. This could eventually cause increased instability, possibly leading to larger and more damaging failures. This is a ***potentially significant impact.***

The extreme southwest corner of the highwall excavation will encounter the upper left flank and scarp of the large dormant landslide (Landslide A) described in the Project Slope Stability subsection in the Setting section (see Figure 4.1-2). As described, the slide is within the slope above Porter Creek Road near the extreme lower west edge of the expansion area. Slide dimensions are about 500-600 feet long and up to 350 feet wide. The slide is located mostly outside of the highwall area. Only the uppermost part of the slide’s left flank extends approximately one hundred feet into the area to be mined. This relatively minor physical disturbance near the upper end of the slide would be unlikely to cause slide reactivation. Blasting and heavy equipment vibrations are unlikely to reactivate the slide due to its large size and apparent semi-rotational subsurface geometry. However, a major increase in surface runoff onto the slide from constructed highwall slopes could be destabilizing. Potentially more important is debris from the slide would likely be exposed in the excavation for the future highwall corner and possibly in the west part of proposed Detention Pond A. If not mitigated, this could cause wall instability and differential settlement of part of the detention pond. This is a ***potentially significant impact.***

The rock slopes comprising the east part of the final highwall will be capped with reclaimed overburden that could be up to a few tens of feet thick. Actual thickness is yet to be determined. These slopes will be just as high (300 feet) as those of the west part, but are less steeply inclined to enhance stability of the fill. Nonetheless, the fill must be placed according to specifications in order to provide satisfactory long-term performance. If this is not done, substantial slope failures would likely occur in the fill, especially with low compaction and/or seismic shaking. The result is costly long term repair and maintenance. Significant fill failure is a ***potentially significant impact.***

4. Overburden Stockpile Area

For the first three years of project operations, up to 24,000 cubic yards of additional overburden could be added to the existing fill in the Overburden Stockpile Area. Miller Pacific (2011) calculated that under static (non-seismic) conditions the existing fill plus the added 24,000 cubic yards of material would have a factor of safety of 1.68. A static FS of 1.5 or greater is satisfactory to prevent substantial slope failure. The potential impact of large damaging slope failures in this area is ***less than significant***.

5. Former Overburden Stockpile Area (2004 Landslide)

The Miller Pacific stability analysis (Miller Pacific 2011) of the 2004 landslide area (failed overburden stockpile) shows the area is stable in its present, unloaded condition (with all pre-slide overburden removed). The project does not include storing additional overburden at this location so the project would not have an impact on this old landslide.

Mitigation Measures

The applicant is legally required to comply with applicable MSHA and Cal-OSHA regulations as they pertain to slope stability and comply with any safety directives following inspections. Also, the project must comply with SMARO and SMARA requires relative to slope stability. In addition, the following mitigations set forth in the Miller Pacific 2003 report are required.

For Active Production Slopes

4.1-B.1 Mining slopes will be graded to meet the following guidelines:

1. In order to reduce the damage created by rock failures, benching is required on active mining slopes over 60 vertical feet in height.
2. The width of the benches shall be no less than half the height of the slope face that is directly above it.
3. Inter-bench mining cuts shall have an average steepness of no more than 0.25 to 0.5:1 (horizontal to vertical) and generally be kept to 60 feet in height or less, and 90-foot cuts shall only be excavated if the rock appears highly stable and shows no signs of failure, such as incipient wedge failures, substantial raveling or sloughing.
4. Overburden at the top of working slopes consisting of soil and severely weathered rock shall be sloped no steeper than 2:1.
5. Minimum 10-foot wide benches shall be constructed every 30 vertical feet or at the middle of the soil/overburden slopes, whichever is less.

4.1-B.2 From the onset of mining, the applicant shall be responsible for annual monitoring and assessment of the mining production slope stability. After 5 years, the monitoring will be done every 3 years; after 10 years the monitoring interval will be extended to every 5 years. This work will be done by a qualified engineering geologist. The geologist shall prepare a written report describing the results of the monitoring and any related subsurface investigation~~s~~, and will specifically note any observed changes in the properties of newly exposed rock that might indicate that large, or otherwise damaging slope failures could occur. In the event that such changes in rock properties are observed, the geologist will make recommendations for revisions to the Final Grading

Plan that may be required to improve slope stability and protect adjacent properties. The geologist's report will be submitted to the Sonoma County Permit and Resource Management Department by June 30th of each year. If the geologist recommends changes to the Final Grading Plan in any area of the quarry, the quarry operator will revise that plan and submit it to the County. Once the County has approved the changes, the Reclamation Plan will be also be revised accordingly. This must be done prior to making further excavations in the area requiring grading.

For Porter Creek Road Slopes

4.1-B.3 Before production slopes are developed in the quarry expansion area, the large landslide above the quarry driveway (the "Potential Rockfall" on Figure 4.1-2) shall be removed or stabilized. An engineering geologist shall confirm that subsequent mining would not cause additional sliding or rockfall off the site that cannot be contained by the proposed rockfall barrier system.

4.1-B.4 Prior to the initiation of mining on the slopes above Porter Creek Road, the applicant shall develop a blasting program to reduce blasting vibrations on these slopes. This will be done to minimize the potential for blasting-triggered instability above the road. This shall include retaining a blasting engineer to assist in selecting, calibrating, and installing a vibration monitoring system. The purpose of the system would be to determine if recommended vibration limits are being exceeded on the slopes and, if necessary, to reduce them to acceptable levels through modification of blasting practices.

4.1-B.5 The applicant shall prepare a final design for the rockfall barrier system. The final design and supporting geotechnical data shall be submitted to the County for review. The applicant shall pay for any technical review required by the County. The final design shall include the following:

1. The barrier system will be designed to capture rocks that could be dislodged from Landslide A on Figure 4.1-2 as well as from all other sources above Porter Creek Road on the project site.
2. The barrier shall capture rocks of a size that currently exist on the slopes as well as rocks that could be expected (as predicted by an engineering geologist) to be exposed or dislodged given future blasting, seismic ground shaking, and mining activities.
3. The height of the barriers shall be sufficient to accommodate the predicted bounce height of dislodged rocks.
4. Details specifying when and how to shift the upper temporary removable fence downslope, remove debris, and maintain the fence, shall be included.
5. No road or trail shall be constructed on the slopes above Porter Creek Road to install the rockfall barriers.

4.1-B.6 During the duration of mining the slope above Porter Creek Road, visual inspections shall be made at least once a month by mining personnel to confirm the slopes and slope protection facilities are performing satisfactorily. Any necessary slope maintenance or repairs shall be promptly completed.

4.1-B.7 The temporary fence will be removed once mining of the section of slope being protected ends.

After the completion of mining, the natural slopes remaining above the road (about 200 feet in height) would still be a potential source of occasional instability (non-mining-caused instability). But this remaining hazard would be substantially reduced compared to pre-mining (expansion project) conditions because mining will have greatly reduced the height and slope of pre-mining slopes, and increased overall stability.

For the Final Highwall

4.1-B.8 The final highwall slopes shall be developed to include the following measures:

1. Final reclaimed cuts in rock slopes shall average no steeper than 1.5:1 from the toe of the overall highwall cut to the top.
2. Fifteen-foot wide drainage/catchment benches shall be constructed every 30 vertical feet and intervening cut slopes shall have a maximum inclination of 1:1.
3. Benches shall be cut to dip into the slope at an angle of no less than 2%.
4. If a zone of weathered rock (overburden) or soil remains at the top of the highwall cut, it shall be sloped no steeper than 2:1.
5. At least 10-foot-wide benches shall be constructed every 30 vertical feet or at the middle of the weathered rock zone, whichever is less.
6. A permanent earthen berm (compacted to a minimum of 85% relative compaction) or rock containment fence shall be installed along the outside perimeter of the wide bench that will be constructed beyond the base of the completed highwall.
7. The top of the throughcut backslope facing the base of the completed highwall shall be rounded off to prevent a sharp edge that will be susceptible to accelerated erosion or rock fall.
8. Prior to construction of the final highwall, a Certified Engineering Geologist or licensed Geotechnical Engineer and a blasting engineer shall review the geologic conditions exposed at that time and develop a blasting program appropriate for the construction of the finished highwall slopes.
9. Once final highwall construction starts, the project applicant shall annually survey the highwall benches and maintain them free of loose rock and debris and maintain interbench drainage ditches and culverts in good operating order. This shall be done prior to the onset of the rainy season and following intense rainfall events (3 inches or more in 24-hour period). The engineering geologist conducting monitoring of slopes will determine if the frequency of inspections and maintenance by mine personnel is adequate, will identify incipient failures that require repair, and develop recommendations for their repair. Recommended repairs shall be made, documented, and submitted to County PRMD.
10. Any portions of the final highwall or the proposed location of Detention Basin A that are found to include unstable/compressible landslide material shall be corrected by either removing the debris and/or stabilizing the wall and ground beneath the basin. Stabilization can include one of several geotechnically acceptable methods, and depending on conditions encountered, could include placement of rip rap, gabion structures, reinforced fills, or retaining walls. Additionally, surface runoff from the highwall or nearby areas shall be directed away from the surface of the slide. The monitoring engineering geologist and geotechnical engineer will

determine whether additional measures are needed to ensure that the landslide is not reactivated. Alternatively the highwall corner and basin site can be shifted to the east to eliminate intrusion by the landslide.

11. The final highwall shall be inspected on an annual basis for a period of 5 years after final reclamation by an engineering geologist. If more than two damaging failures occur within the five year inspection period, inspections shall be extended in increments of two years until the slopes are free of all but minor failures that constitute routine maintenance. Maintenance and repairs shall be done prior to the following rainy season. Documentation of monitoring and any maintenance/repair shall be submitted to County PRMD.

4.1-B.9 All rock slopes to be capped with fill shall be developed to include the following measures:

1. Fill will be placed on completed rock benches as described in Mitigation Measure 4.1-B.8 (subsections 1-4).
2. The slope ratio of the overall final fill slope shall be no steeper 2.4:1 (H:V).
3. Permanent interbench fill slopes shall be no steeper than 2:1 (H:V), as shown on Figure 8 of Miller Pacific 2003 report (part of the project application).
4. Minimum 10-foot wide benches shall be constructed no more than 30 vertical feet apart.
5. Keyways and subdrains for the fill shall be placed as shown on Figure 8, referenced above.
6. Once it has been determined what the maximum thickness will be of the fill to be placed on constructed rock slopes of the highwall, the project applicant shall retain a geotechnical engineer to provide additional design-level mitigations to insure fill performance. One of the most important of these will be the degree of compaction required for long term stability of the high (300 f00t) filled slopes. Other design guidelines to be developed by the geotechnical engineer include guidelines for the placement of fill keyways and installation of subdrains and their outlets.

Impact Significance After Mitigation

The recommended mitigations would result in all mined slopes meeting required factors of safety during mining and the reclamation stage. The chance of rocks falling onto Porter Creek Road cannot be completely eliminated, as it is possible that such rockfalls would occur during a major earthquake. However, the recommended mitigations would reduce the impact of this risk from mining to a less-than-significant level. In addition, the rockfall barrier system would be expected to capture rocks that fall under natural conditions. In the future, as mining reduces the elevation of the ridge, this hazard would be substantially reduced. In summary, the recommended mitigation would reduce landslide and slope stability impacts to a ***less-than-significant*** level.

Impacts of Quarry Floor Reclamation

Impact 4.1-C If the deep backfill to be placed at the base of the completed highwall is not properly engineered, settlement/differential settlement of the fill beneath the large siltation ponds and any piping connecting them could occur. This could damage the ponds and piping and compromise their intended performance. This is a potentially significant impact.

Reclamation of the quarry floor will include backfilling with overburden from ongoing mining. The reclaimed surface will support planned agricultural use. The thickness of the fill will vary, but will likely average 20 feet, though at the base of the final highwall the fill thickness will be up to about 65 feet deep. Compaction of the fill on relatively flat quarry floors is not considered to be a major concern for either the proposed post-reclamation end use of general agriculture, or areas where settlement will not pose any significant problems or hazards. However, where the fill is to be placed on floors sloping more than 3:1 (H:V), or especially when facilities like ponds are to be sited upon it, undesirable settlement and damage could result. This is a ***potentially significant impact.***

Mitigation Measures

The following mitigation for the quarry floor reclamation was developed by Miller Pacific (2003). Where appropriate, the 2003 recommendations made by Miller Pacific have been revised to reflect current conditions.

4.1-C.1 The applicant shall have a Final Grading Plan for the final reclamation phase prepared by geotechnical and civil engineers. That plan shall include the following requirements regarding fill operations. The final plan shall be submitted to County PRMD for review and comment prior to implementation.

1. Fill with a plasticity index (PI) of less than 30 (non-expansive) may be placed at slopes no steeper than 3:1.
2. Fill with a PI of greater than 30 (moderately to highly expansive) may be placed at slopes no steeper than 4:1.
3. All quarry floor fills shall be moisture conditioned to near optimum and track-walked in lifts to provide initial compaction that will decrease the erosion potential.
4. Any fills that are steeper than described in requirements 1 and 2, above, shall be constructed based on the recommendations for final reclaimed fill slopes presented above.
5. Where catchment dams, ponds, subdrains, or other structures used for drainage or water retention are either buried in or rest on top of reclaimed fill on the quarry floor, the compaction of the fill under and around these structures shall be designed to minimize the settlement of the fill to limit damage or decreased performance over the long term.
6. Gravity flow storm drains, open channels, or other improvements with minimal slopes toward outfalls shall be designed to accommodate settlement of loosely compacted fill.

Impact Significance After Mitigation

The recommended mitigation measure would ensure that the final reclaimed quarry would be designed and constructed to be stable and perform as expected. The impact would be reduced to a ***less-than-significant level.***

Impacts of Removal of Stored Overburden

Impact 4.1-D Removal of overburden from the Overburden Stockpile Area could result in slope failure and exposure of the subdrain system. This is a potentially significant impact.

If there is market demand for the overburden, it would be removed for sale, and some could be used for site reclamation. As material is removed, the underlying compacted fill surface would be disturbed and would be subject to erosion. If the removal is complete, this would expose over 15 acres of bare ravine sidewalls and channel. All the exposed surfaces would contain varying amounts of disturbed, loose, residual fill and soil. At lower elevations in the fill, components of the subdrain system would be exposed and require removal and disposal. Because of steepness of ravine slopes, steep channel gradient, and the loose, unprotected nature of the residual materials, there would be high potential for accelerated erosion and siltation. Any permanently remaining portions of the original fill mass could also be subject to erosion/siltation and possibly slope failure. This is a ***potentially significant impact.***

Mitigation Measures

4.1-D.1 Overburden that was placed in the Overburden Storage Area prior to the initiation of project operations shall not be removed until a geotechnical engineer and a hydrologic engineer prepare a removal plan that identifies what and how materials should be removed to maintain slope stability and control erosion. This plan shall be submitted to the County for review and approval. At final reclamation, any remaining fill will be assessed by a geotechnical engineer to determine what, if any, additional treatment is required to maintain slope stability and erosion control per the requirements of the Reclamation Plan.

Impact Significance After Mitigation

This mitigation measure would ensure slope stability, erosion control, and adequate restoration of the Overburden Storage Area. This measure would reduce the impact to a ***less-than-significant*** level.

4.2 HYDROLOGY AND WATER QUALITY

This section of the DEIR describes the existing hydrologic conditions of the Mark West Quarry area and discusses the potentially adverse physical and chemical hydrologic and drainage impacts from the project. Hydrologic data and information on the project site were obtained from field reconnaissance, surface and groundwater sampling, and various published reports, studies, design reports, investigations, and geographic data. This section incorporates, as appropriate, the results of a hydrologic analysis (surface water and groundwater) of the site and the vicinity, including a spring and well inventory, and groundwater drawdown and water quality testing conducted by Balance Hydrologics (2011) and a Water Supply Assessment (Balance Hydrologics, 2012). Additionally, this section incorporates previous design reports and ongoing surface water quality monitoring conducted by the applicant. All these reports prepared for the applicant were peer reviewed by the EIR preparers.

A. Existing Conditions

Topography

The project straddles a ridge that divides the Franz Creek and Porter Creek watersheds and is located on relatively steep terrain with typical slopes ranging between 25 and 40 percent. Elevations at the site range from 865 feet at the quarry floor to 1,300 feet along the reclaimed slopes on the eastern side of the quarry.

Climate

The project site is located in the Mediterranean climate zone typical of central coastal California. Average rainfall at the project site is 47 inches. Given this amount of rainfall, regional runoff, and evapotranspiration of 39 inches, the average annual groundwater recharge at the proposed project site is approximately 8 inches or 67 acre-feet per year. Annual recharge rates for the existing quarry operations, including the plant site, access roads, and graded slopes were similarly estimated at 7 inches or 60 acre-feet per year (Balance Hydrologics, 2011).

Surface Water

Because the project site straddles the Franz Creek and Porter Creek watersheds, surface water drainage patterns at the project site are quite complex with several receiving water-bodies. The existing active quarry drains southerly to Porter Creek. The northwest portion of the project site encompassing the Overburden Stockpile Area drains both westerly to the Porter Creek Tributary and southerly to Porter Creek (see Figure 4.2-1). The remainder of the north side of the property drains to Franz Creek, and then Maacama Creek, a major tributary to the Russian River.

Porter Creek

Porter Creek has an approximate drainage area of 10 square miles. This second order stream is shown as approximately 8 miles of blue line (i.e., perennial) stream on the USGS Mark West and Calistoga 7.5 minute quadrangles.[11] Elevations along Porter Creek range from about 440 feet at the confluence with Mark West Creek to 1,300 feet at the headwaters. The stream flows through a narrow V-shaped canyon except for the last 1 1/4 mile before its confluence with Mark West Creek, where it widens and flows through a flat alluvial valley of pasture land and vineyards. In general, Porter Creek flows year-round and receives the majority of its base-flow volume from groundwater during the summer months.

Porter Creek Tributary

The Porter Creek Tributary watershed borders the project site to the west and encompasses a total of 0.13 square miles. The unnamed creek is represented as a blue line stream on the Mark West Springs USGS topographic map and drains the southern portion of the overburden and stockpile area and joins Porter Creek roughly half a mile downstream of the quarry entrance. At just over 2,900 feet long, the Porter Creek Tributary includes 830 feet of ephemeral stream channel that has been converted to a rock-lined ditch at the base of the existing overburden stockpile area.

Mark West Creek

The Mark West Creek watershed covers approximately 254 square miles and joins the Russian River just north of Forestville. The principal tributary of Mark West Creek, Laguna de Santa Rosa, joins five miles upstream of the Mark West and Russian River confluence in the Santa Rosa Valley. The Laguna de Santa Rosa drains a large flat marshy area and provides significant floodplain storage. The Upper Mark West watershed is the approximate 40-square-mile portion of the watershed east of the Larkfield-Wikiup area and includes the proposed project site.

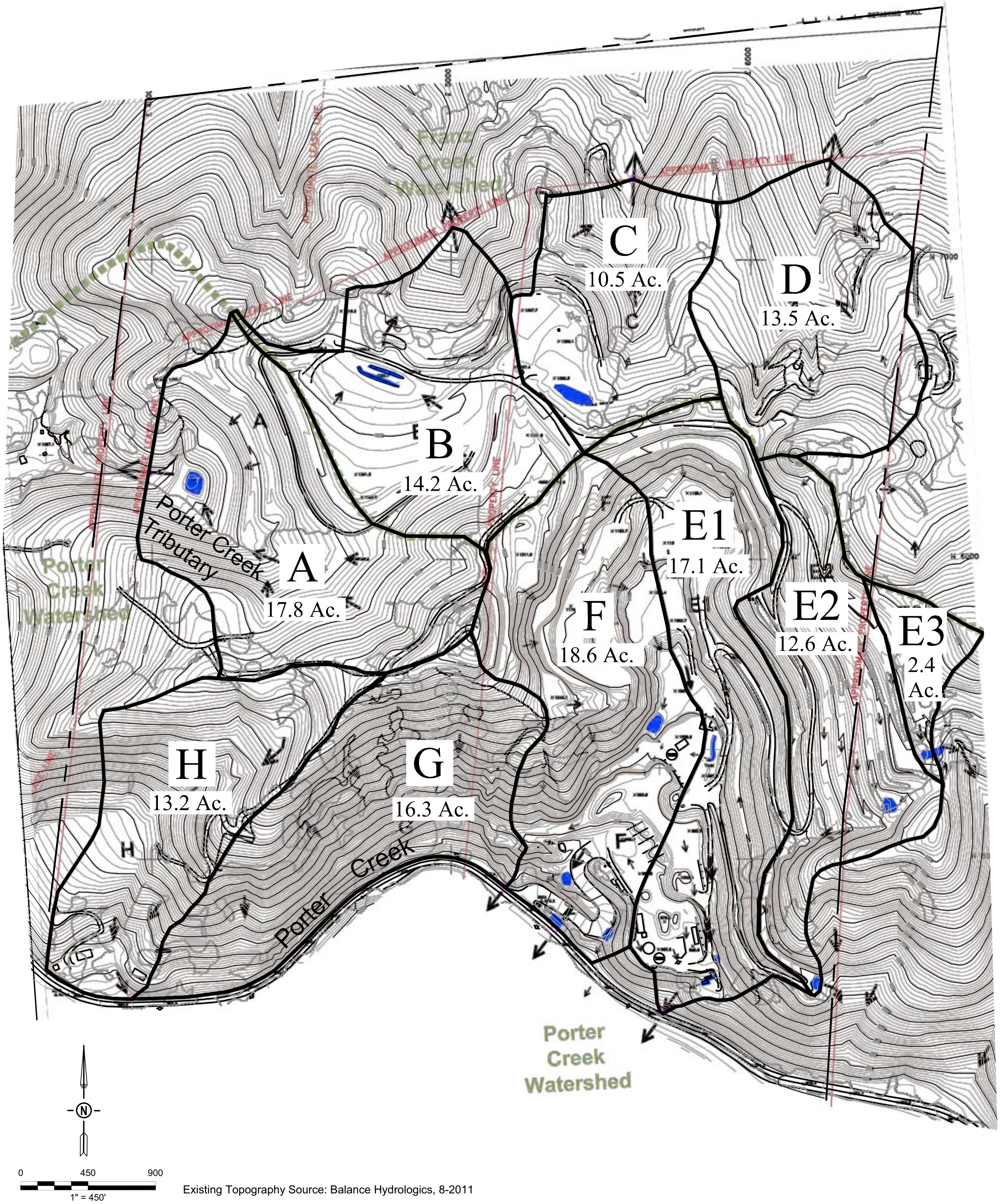
Franz Creek

The Franz Creek watershed covers approximately 24 square miles and meets Maacama Creek less than a mile from its confluence with the Russian River, just east of Healdsburg. Franz Creek is a third order stream with a length of approximately 17.7 miles according to the USGS Healdsburg and Mark West Springs 7.5 minute quadrangles. Elevations range from about 365 feet at the mouth of the creek to 1,180 feet in the headwaters. With the exception of the first mile upstream of Maacama Creek where it flows through a flat valley, the creek flows through a low gradient U-shaped canyon.

Russian River

The Russian River drains an area of 1,485 square miles in the California Coast Range north of San Francisco. From its headwaters north of Ukiah, the Russian River flows southeastward through a series of canyons and valleys for about 104 miles. South of Healdsburg, the river generally flows to the southwest until it joins the Pacific Ocean near the unincorporated community of Jenner. The Russian River system is the primary drinking water source for more than 570,000 people in Mendocino, Sonoma, and Marin counties. Basin elevations range from

[11] Stream orders range from first order to twelfth order. A first order stream is a headwater stream collecting sheet runoff. A second order stream is one that transport water from one or more first order streams. A third order stream is one transporting water from one or more second (and possibly first) order streams, and so forth.



Existing Topography Source: Balance Hydrologics, 8-2011

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Mark West Quarry
Existing Project Site Sub-basins

Mark West Quarry, Sonoma County, CA

FIGURE 4.2-1

sea level to 4,480 feet. The principal tributaries of the Russian River are East Fork, Sulphur Creek, Maacama Creek, Dry Creek, and Mark West Creek.

Project Site Drainage

The majority of the existing quarry drains by overland and shallow concentrated flow directly to Porter Creek with only minor runoff entering the Porter Creek Tributary and Franz Creek Watersheds. Overall, rainfall falling on the project site either infiltrates into the underlying soils and fractured bedrock or is captured in a series of lateral drainage ditches at the base of mined and reclaimed slopes. The shallow drainage ditches direct flows from mining and reclaimed areas to sediment retention ponds and siltation boxes before exiting the project site. The existing sub-basins of the project site are shown on Figure 4.2-1 and discussed below.

The existing mining and reclamation areas are designated as Sub-basins E1, E2, E3 and F, comprising a total area of approximately 50.7 acres. Sub-basin E1 drains south via overland flow through roadway ditches, into a sediment retention pond and a series of four rectangular metal sediment boxes before exiting the site in a 36-inch culvert under Porter Creek Road to Porter Creek. Before entering the retention pond, water is diverted from Sub-basin E1 and a reclamation sub-drain to fill two water tanks (20,000 and 100,000 gallons) that supply the wash plant and dust control operations. Sub-basins E2 and E3 flow to earthen sediment retention ponds that lead to ephemeral tributaries of Porter Creek. Sub-basin F drains overland ultimately down the quarry entrance driveway to a 30-inch culvert below Porter Creek Road to Porter Creek. Lateral sub-drains are located at the base of the reclaimed slope near the rock crusher. Shallow sub-surface flows emanating from the reclaimed slopes of Sub-basins E1, E2, and E3 are captured and diverted to on-site water tanks and sediment retention basins located within Sub-basin E1.

The Overburden Stockpile Area drains west to the Porter Creek Tributary (which drains to Porter Creek). Sub-basin A consists of 17.8 acres of vegetated overburden, natural grasslands, and graded vegetated hill slopes that drain to the Porter Creek Tributary. Before exiting Sub-basin A, shallow concentrated flow is directed a sediment retention pond near the western edge of the leased property and then discharged through a 36-inch culvert into the existing drainage. The 830-foot long rock-lined drainage feature above the retention pond is labeled as a blue line stream on USGS topographic maps as described above (Porter Creek Tributary). Sub-basin B includes 14.2 vegetated acres where the former stockpile area was located that drains to a linear earthen sediment retention basin before exiting the project site in natural drainage channel. Overall, Sub-basins B, C, and D, drain northerly to Franz Creek through steep ephemeral drainage features.

Sub-basins G and H drain primarily by overland and shallow concentrated flow directly into Porter Creek. No drainage improvements are located within Sub-basin G, however some flow from this Sub-basin is routed through a 12-inch culvert at the base of Sub-basin F and underneath Porter Creek Road.

Surface Water Recharge Characteristics of Site Soils

Surficial soils at the quarry site reflect the geologic parent material from which they have evolved. Soils along the northern edge of the site are derived from deposits of Sonoma Volcanic tuffs and are mapped as Forward (FoG) and Forward-Kidd (FrG) series. Forward soil series average 21 inches deep and are typically well-drained gravelly loams with a gravelly, sandy clay loam subsoil. Available water capacity (ability of a soil to hold water) is commonly about 2.3 inches. The moderately high permeability and moderately low water-holding capacity generally promote recharge to the fractured groundwater aquifer below. Runoff and erosion hazard may be high to very high, particularly on steeper slopes with shallower soils, as commonly associated with the Forward-Kidd soil complex (Balance Hydrologics, 2011).

Older soils located near the center portion of the quarry are mapped as Spreckles loam (SkE) and range from 22 to 60 inches in depth. The Spreckles series are considerably deeper than Forward series and have developed a clay subsoil with moderately low permeability, approaching that of the fractured bedrock underlying the entire site. The available water capacity is moderate, typically about 6.3 inches, with a moderate to high runoff potential.

Goulding soils (GgF, GiF) are mapped on the greenstone slopes, and are mainly found on the southern half of the site. These loam soils are similar in depth and permeability to Forward soils, but are characterized by having less gravel and thicker, low permeability clay layers at depth. Therefore, water holding capacity is higher and potential recharge to the underlying bedrock aquifer is considerably less. As with Forward soils, infiltrating water may temporarily perch during rainfall events and contribute to increased runoff and erosion hazard.

Existing artificial fill on the reclaimed fill slopes is estimated to have a low range of permeability based on compaction and placement. In addition, about twenty-five percent of the site, including the expansion area, is mapped as either steep-sloped rock land or actively mined area, which is estimated to have very low permeability and high runoff potential. Overall, recharge on the site is moderately low, and runoff and erosion potential moderately high.

Flooding

The project site is not located within a 100-year or 500-year flood hazard zone, as mapped by the Federal Emergency Management Agency (FEMA) (FEMA, Flood Insurance Rate Map, Sonoma County, California (Unincorporated Areas), Panel 060375 0660 B, 1991). Flooding within Sub-basins E and F is possible if the sediment forebays, siltation ponds, or culverts are undersized or they are not maintained.

Surface Water Quality

The Mark West and Geyserville HSAs (Hydrologic Subareas) were listed in 2006 as impaired water bodies under Section 303(d) of the Clean Water Act due to sedimentation/siltation and water temperature stressors. The potential sources of sediment within the watershed include agricultural and land development activities such as vineyard management, livestock grazing, home building, mining, road building, logging and other activities that disturb natural land surfaces and expose fine sediment to transport mechanisms. Potential sources of elevated water temperatures include hydromodification (dams and water diversions), riparian vegetation removal, and modification of natural habitat.

Surface water pollutants at the project site include storm water runoff consisting of loose decomposed rock (rock flour), soil from disturbed slopes roadways and reclaimed lands, and chemicals associated with vehicles, equipment storage, and maintenance areas. Rock flour and soil can contribute silt and suspended solids to storm water runoff and impact receiving water bodies. Siltation of stream channels reduces benthic organism productivity and reduces the reproductive success of salmonid species. Vehicles and equipment can contribute diesel fuel, gasoline, motor oil, lubricants, hydraulic fluid, anti-freeze, and other similar pollutants to storm water runoff and receiving water bodies.

To prevent the transport of storm water pollutants from existing quarry operations to downstream waterways, the applicant has developed a Storm Water Pollution Prevention Plan (SWPPP), a Storm Water Monitoring Program, and a Spill Prevention Control and Countermeasure Plan (SPCCP). Each plan was developed by EnviroNet Consulting (2001) in accordance with the General Industrial Activities Storm Water Permit conditions (General Permit), Water Quality Control Order No. 9703-DWQ, adopted by the State Water Resources Control Board (State Board) on April 17, 1997 which conforms with the National Pollution Discharge Elimination System (NPDES) for discharges of storm water associated with industrial activities.

As described in more detail in the following subsections, the storm water monitoring program has been in effect since 2002. Since that date. the quarry has been submitting annual reports on its storm water discharges to the RWQCB as required by the quarry's approved permit. To date, there have been no actions by the RWQCB against the quarry in regards to water quality violations. Accordingly, the present storm water management plan appears to be complying with permit conditions.

Existing Mark West Quarry Best Management Practices

The Mark West Quarry Storm SWPPP discusses the sources of sediment on the site and how the quarry currently utilizes Best Management Practices (BMPs) to mitigate some of the potential impacts of on- and off-site pollutant transport. The plan focuses on filtering and detention of eroded sediments in runoff water, and places less emphasis on soil erosion control through establishment of adequate protective cover. The BMPs are both structural and non-structural in nature as discussed below. In general, prevention of soil erosion (dislodgement and transport of soil particles) is considered more effective than sediment management, which typically removes only the larger sized materials in transport, and a very small percentage of the fine soil particles.

Structural BMPs

Storage containers are used to house potential pollutants such as fuel, paints, hydraulic fluids, grease, and explosives. Fine sediments from general mining activities (explosion, excavation, and crushing) are controlled via direct surface runoff control through grading and drainage to a sediment ponds that are managed annually. Bare surfaces are stabilized per the SWPPP. Dust is controlled by water trucks during dry or summer months.

Non-structural BMPs

Non-structural BMPs include good housekeeping practices (e.g., using a vacuum truck to remove soil from the paved parking area), preventative maintenance of all structural control measures, a spill response plan, employee training in material handling and storage, as well as training in conducting storm water visual observations and monitoring, collecting storm water samples, and completing data forms. Monthly storm water observations, quarterly non-storm water observations, and annual comprehensive site compliance evaluations are all documented. Preventative maintenance includes a weekly inspection of berms, straw bales, straw wattles, and detention ponds to ensure they are functioning effectively. Additionally, signs of erosion or potential problems with benching, berming, or drain pipes are looked for weekly within the mining area and access roads.

Baseline Surface Water Monitoring at Mark West Quarry

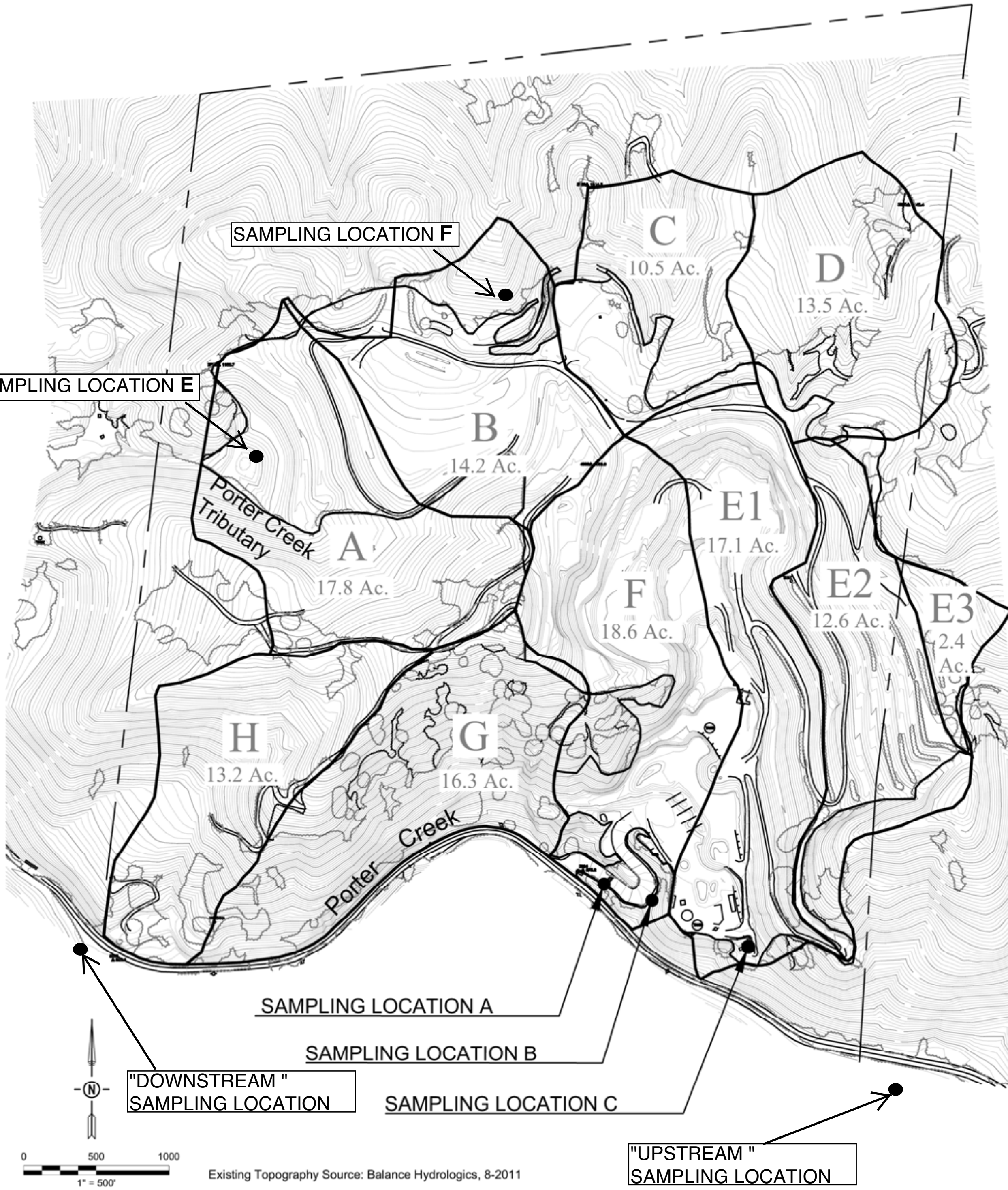
Beginning in 2002, Mark West Quarry instituted a water sampling protocol to meet its General Permit requirements. The sampling protocol is intended to document impacts and assess storm water quality improvement measures and overall facility impact to receiving waterways. In accordance with general permit requirements the applicant conducted testing at all major outfalls leaving the project site during significant rainfall-runoff events at least twice per year. In anticipation of needing baseline water quality monitoring data for the proposed project, the applicant voluntarily conducted additional surface water sampling upstream and downstream of the quarry along Porter Creek.

As shown on Figure 4.2-2, there are six baseline surface water sampling points, named A, B, C, E, F, Upstream (of the quarry on Porter Creek), and Downstream (of the quarry on Porter Creek) were selected on the project site and on Porter Creek at locations representing surface water conditions up-gradient (above the quarry on Porter Creek), cross-gradient (within the quarry), and down-gradient (below the quarry on Porter Creek). Sampling was conducted during runoff events initiated by storms of various intensities ranging from 1 to 3.5 inches. Overall, approximately 130 water samples were collected from various sampling points and sampled for a suite of water quality variables including total suspended solids, specific conductance, hydrogen ion concentration, oil and grease, total organic carbon, turbidity, dissolved iron, and total petroleum hydrocarbon diesel. The sampling data is on file with the Sonoma County PRMD.

The data obtained from this surface water monitoring represents a “snapshot” of rainy season conditions at the quarry and in Porter Creek. Overall, surface water quality appears to be influenced by the surrounding soils, topography, geology, and land uses throughout the Porter Creek watershed including the Mark West Quarry. The water quality in the stream is primarily impacted by non-point-source pollutants such as suspended sediment. The sampling data shows that turbid water is being released from the site into Porter Creek after it has been through the quarry’s onsite storm water collection system. This water is typically higher in total suspended solids and turbidity than the Porter Creek samples from upstream of the quarry. The increases in total suspended solids and turbidity are highly variable, but remain within the natural range of water quality conditions for this stream. Though the data consistently show increases in turbidity and suspended solids downstream of the quarry, existing turbidity increases are less than 20% of background levels, which is consistent with the Basin Plan’s requirements regulating turbidity.

Groundwater Conditions

According to the Sonoma County General Plan 2020, the project site is located in groundwater availability classification Zone IV. Wells in Zone IV areas are described as having “Marginal Groundwater Availability.” In general groundwater is limited and variable depending on local rock fracturing and recharge to underlying bedrock aquifers. Discretionary projects in these



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Design:
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Appr'd:

Mark West Quarry
Stormwater Sampling Points

Mark West Quarry, Sonoma County, CA

FIGURE
4.2-2

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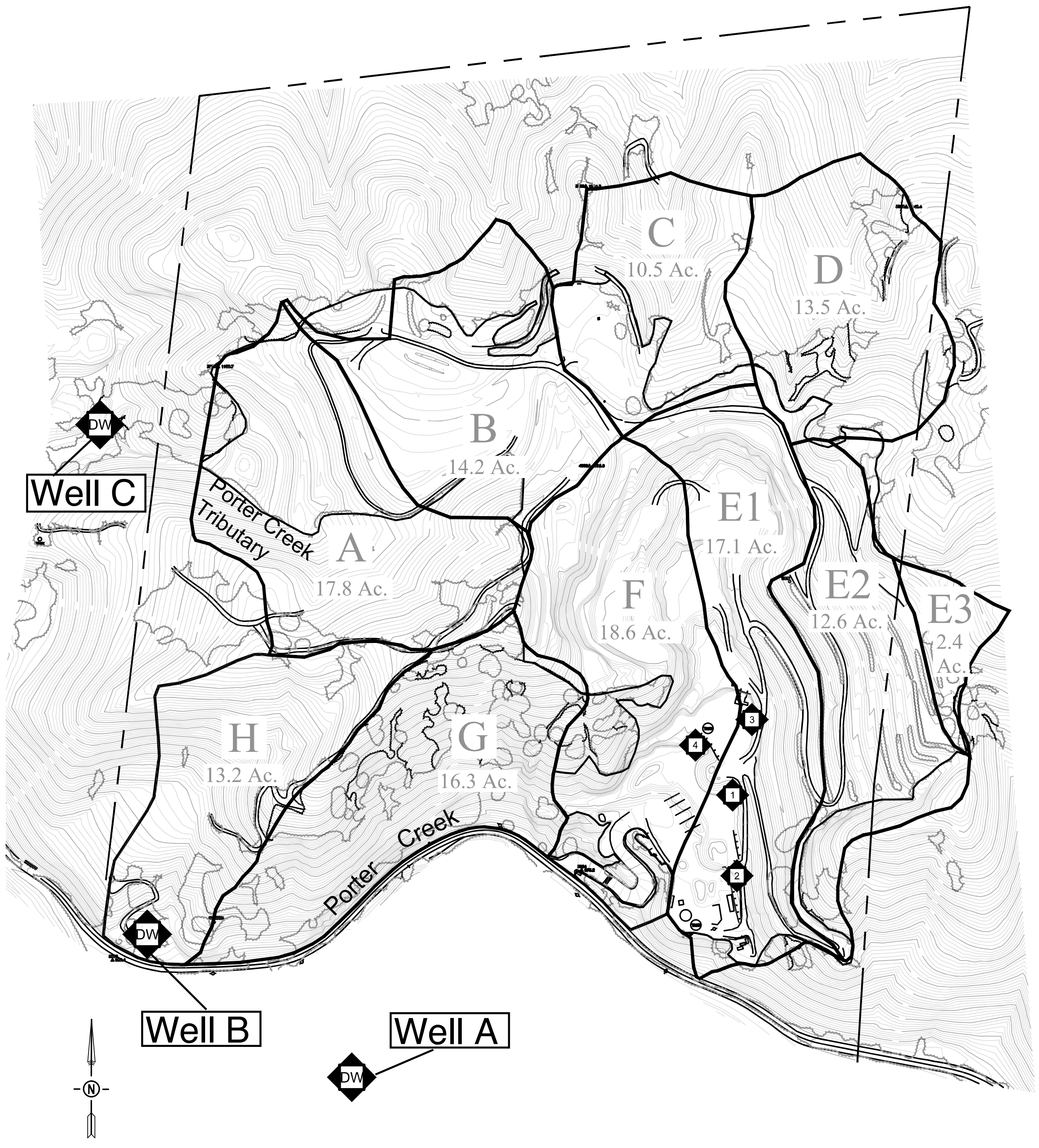

Existing Topography Source: Balance Hydrologics, 8-2011

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Mark West Quarry
Project Area Wells

Mark West Quarry, Sonoma County, CA

FIGURE
4.2-3

areas require proof of an adequate water supply under General Plan Objective WR-2e (see the section on Regulatory Framework below).

Groundwater Wells on the Project Site

As described in ***Section 3.2 Project Characteristics***, water is used for increasing aggregate moisture content, washing, dust control, equipment cleaning, irrigation, and office uses. The onsite aggregate washer is a closed loop system that captures the majority of wash water and clarifies it before recycling it into the aggregate washer. Water is stored in two 100,000- and one 10,000-gallon tanks and filled with on-site groundwater pumped from four wells located on the project site (Figure 4.2-3), as described below:

1. Well #1 is located near the shaker, drilled and completed in 1982 to a depth of 190 feet and screened from 140 to 190 feet.

2. Well #2 is located near the truck-wash area, drilled and completed in 1991 to a depth of 400 feet and screened from 25 feet to 400 feet.

3. Well #3 is located near the crusher, drilled to a depth of 720 feet, completed to 420 feet in 1984, and screened from 80 to 420 feet.

4. Well #4 is located near the crusher, completed in 2005 to a depth of 640 feet, and screened from 80 to 100 feet and from 160 to 640 feet. BoDean staff report that this well also exhibits artesian conditions during the wet season.

The wells draw groundwater from the fractured greenstone bedrock aquifer that flows in a southerly direction from the Franz/Porter Creek divide towards the quarry floor. Well pumping and water-quality test results (Balance Hydrologics, 2011) indicate that the on-site wells draw on a deeper groundwater source uniquely different from Porter Creek and the groundwater supplying the off-site domestic wells in the vicinity, perhaps partially drawing on groundwater beneath the bottom of the wells. Groundwater levels vary between 22 and 77 feet below the surface during dry periods. Balance Hydrologics estimated water usage and pumping rates for pre- and post-project conditions based on historic water use at the Mark West Quarry. The combined average annual pre-project pumping rate for all wells was estimated at 13 gallons per minute. However, pumping rates vary with the season and production of rock and average 26 gallons per minute between the months of June and October (construction season). The total annual consumption rate for pre-project mining operations and rock production was estimated by Balance Hydrologics at 21.6 acre-feet per year. The 2011 Balance Hydrologics report is contained in Appendix B.

Adjacent Groundwater Wells

Rural residential homes near the project site rely on domestic groundwater wells drilled into similar bedrock aquifers. There are three offsite wells near the quarry; Figure 4.2-3 shows the location of the two wells located on the north side of Porter Creek. The three wells are described below.

1. The first domestic well (Well A) is located on 4500 Porter Creek Road. This well is across Porter Creek from the quarry entrance and is screened from 50-90 feet and 230-320 feet.

2. The second well (Well B) is located on 4512 Porter Creek Road approximately 1,500 feet west of the quarry entrance. The well is screened from 80 feet to 600 feet.

3. The third well (Well C) is located on Assessor's Parcel 120-021-032. It is west of Sub-basin A on the quarry property. Information on the depth of screening for this well is not available.

Existing Site Groundwater Recharge

Groundwater at the project site is recharged during rainfall events when water percolates through the upper soil profile and moves through rock fractures to the bedrock source aquifers below. As stated above, Balance Hydrologics (2003, 2011) estimated the rate of groundwater recharge at Mark West Quarry for unimpaired (non-mined) land, the existing quarry, the proposed quarry expansion, and the reclaimed expanded quarry assuming a future agricultural land use for the entire project area. Balance Hydrologics (2011) utilized a water balance method that subtracted runoff and evapotranspiration depths, in inches, from the annual rainfall depths reported by the Sonoma County Water Agency.

Average annual groundwater recharge for the approximately 100-acre portion of the site draining to Porter Creek (drainages A, E1, E2, E3, F, G, and H) was estimated at 7 inches, or about 60 acre-feet per year. For the expanded quarry, groundwater recharge for the same area was estimated at 6 inches, or 53 acre-feet per year (Balance Hydrologics 2011). Overall, the existing groundwater recharge rate exceeds the existing annual estimated use rate of about 29-acre feet.

Groundwater Quality

Balance Hydrologics (2003) conducted an investigation into the quality of groundwater at the Mark West Quarry and three off-site domestic wells located near the project site. Wells #1, #2, and #3 were sampled in October 2003. Wells #1 and #3 were re-sampled in November 2003 during aquifer testing procedures. While wells, #1, #3, and #4 consistently draw water from deeper locations, well #2 seems to be a mix of surface water originating in Porter Creek and water contained within the primary bedrock aquifer underlying the project site. Groundwater can be described as soft sodium bicarbonate with trace element concentrations below detection levels for most constituents. Groundwater quality is suitable for mine operations, potable uses, and potential agricultural uses as part of the reclamation plan.

Regulatory Framework

Water resources are regulated by a variety of local, State, and Federal statutes. Agencies with regulatory and enforcement jurisdiction in Sonoma County include the North Coast Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board (SWRCB), the California Department of Fish and Game, the Federal Emergency Management Agency (FEMA), the U.S. Army Corps of Engineers (Corps), and the U.S. Environmental Protection

Agency (EPA). Plans, policies, and regulations pertaining to hydrology and water quality in the project area are outlined below.

Federal

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the U.S. Environmental Protection Agency (EPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The CWA authorizes the EPA to implement water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under section 402(p) of the CWA controls water pollution by regulating storm water discharges into the waters of the U.S.

Section 401 of the CWA requires a permit for every applicant of a federal permit or license for an activity that may result in a discharge of pollutants to the waters of the U.S. (including permits under section 404 of the CWA). The purpose of the permit application is to obtain certification that the proposed activity will comply with the State water quality standards.

State

State and Regional Water Quality Control Board

The CWA authorizes the EPA to implement water quality regulations. The EPA has delegated authority for water permitting to the California State Water Resources Control Board (SWRCB). The SWRCB administers water rights, water pollution control, and water quality functions throughout the State, and has nine regional boards. The Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities; The North Coast Regional Water Quality Control Board (RWQCB, Region 1) regulates water quality in Sonoma County.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act allows the SWRCB to adopt statewide water quality control plans or basin plans. The purpose of the plans is to establish water quality objectives for specific water bodies. The RWQCB has prepared the North Coast Water Quality Control Plan (Basin Plan) (2011) that establishes water quality objectives and implementation programs to meet the stated objectives and to protect the beneficial uses of the Bay waters (see regional regulatory discussion below). The act also authorizes the NPDES program under the CWA, which establishes effluent limitations and water quality requirements for discharges to waters of the State. Most of the implementation of SWRCB's responsibilities is delegated to the nine regional boards. Under the NPDES program, the RWQCB has established permit requirements for storm water runoff for the project area.

National Pollutant Discharge Elimination System (NPDES)

The National Pollutant Discharge Elimination System (NPDES) program under Section 402(p) of the CWA controls water pollution by regulating storm water discharges into the waters of the

U.S. California has an approved State NPDES program. The NPDES permit system was established in the CWA to regulate point source discharges. Point sources include a municipal or industrial discharge at a specific location or pipe. For individual point source discharges, each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. The proposed project would be subject to the NPDES permit system through the following NPDES permits:

- ***NPDES General Construction Activity Stormwater Permit (Construction General Permit).*** Pursuant to the CWA Section 402(p) and as related to the goals of the Porter-Cologne Water Quality Control Act, described above, the SWRCB has issued a statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Construction General Permit) (Order No. 2009 0009-DWQ, NPDES No. CAR000002), adopted September 2, 2009, in effect since July 1, 2010. Every construction project that disturbs one or more acres of land surface or that is part of a common plan of development or sale that disturbs more than one acre of land surface requires coverage under the Construction General Permit. To obtain coverage under the Construction General Permit, the landowner or other applicable entity must file Permit Registration Documents (PRDs) prior to the commencement of construction activity, which include a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other documents required by the Construction General Permit. Every regulated construction project, including those covered under the previous Construction General Permit (Water Quality Order No. 98-08-DWQ), are required to seek coverage under the newly adopted Construction General Permit.

- ***NPDES General Industrial Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit).*** Pursuant to the CWA Section 402(p), the SWRCB has issued a statewide permit for certain types of industrial activities (Industrial General Permit) (Order No. 97-03-DWQ). A wide range of industries is covered under the Industrial General Permit, as determined by the facility Standard Industrial Classification (SIC) code, a four-digit code that refers to the type of business conducted. The Industrial General Permit regulates discharges from the quarry's mining operations.

  The Industrial General Permit requires control of pollutant discharges using Best Available Technology/Best Conventional Technology (BAT/BCT) to meet water quality standards. The requirements of the General Permit typically include, but are not limited to, the following:

  1. Prepare and maintain a Storm Water Pollution Prevention Plan;
  2. Develop and implement storm water best management practices to minimize discharge of pollutants in runoff;
  3. Conduct wet and dry weather inspections of the quarry on a regular basis;
  4. Collect and analyze storm water runoff at least twice per year from each discharge location; and
  5. Prepare and submit annual reports on storm water management activities.

California Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (SMARA) addresses the State's need for mineral resources while preventing or minimizing negative public health, property, and environmental impacts of surface mining. As related to hydrologic and water quality issues, the process of reclamation includes maintaining water quality, and minimizing flooding and erosion damage to wildlife and aquatic habitats caused by surface mining. The requirements of the SMARA apply to any surface mining operations that disturb more than one acre or remove more than 1,000 cubic yards of material. The proposed project is obviously above the requirements for SMARA inclusion and would need to comply with regulations outlined therein.

Regional

The North Coast RWQCB is responsible for the protection of beneficial uses and the water quality of water resources within the North Coast region of California. The North Coast RWQCB has set water quality objectives for all surface waters in the region. Of particular importance to the proposed project is the Basin Plan (discussed below) turbidity standard (since quarries are known sediment producers), which states "turbidity shall not be increased more than 20 percent above naturally occurring background levels" (RWQCB, 2001). Water quality objectives are also set for groundwater with respect to bacteria, organic and inorganic chemical constituents, radioactivity, and taste and odor. The RWQCB administers the NPDES storm water permitting program and regulates storm water discharges. The RWQCB also issues 401 certifications for projects that require Section 404 permit from the U.S. Army Corps of Engineers (USACE). The regulatory requirements under the RWQCB are discussed below.

The first comprehensive Water Quality Plan for the North Coast Region (Basin Plan) was adopted by the RWQCB in 1975. Since that time, the RWQCB has updated and amended the Basin Plan several times. The RWQCB adopted the most current version of the Basin Plan in 2011.

Sonoma County General Plan 2020

The Sonoma County General Plan 2020 contains the following policies that pertain to hydrology and water quality issues at the project site.

Water Resources Element

Policy WR-1g**:** Minimize deposition and discharge of sediment, debris, waste and other pollutants into surface runoff, drainage systems, surface water bodies, and groundwater.

Policy WR-1h**:** Require grading plans to include measures to avoid soil erosion and consider upgrading requirements as needed to avoid sedimentation in storm water to the maximum extent practicable.

Policy WR-2e (formerly RC-3h)**:** Require proof of groundwater with a sufficient yield and quality to support proposed uses in Class 3 and 4 water areas. Require test wells or the establishment of community water systems in Class 4 water areas. Test wells may be required in Class 3 areas. Deny discretionary applications in Class 3 and 4 areas unless a hydrogeologic report establishes that groundwater quality and quantity are adequate and will not be adversely impacted by the cumulative amount of development and uses allowed in the area, so that the proposed use will not cause or exacerbate an overdraft condition in a groundwater basin or subbasin. Procedures for proving adequate groundwater should consider groundwater overdraft, land subsidence, saltwater intrusion, and the expense of such study in relation to the water needs of the project.

Policy WR-2g: In cooperation with Sonoma County Water Agency (SCWA), DWR, and other public agencies and well owners, support the establishment and maintenance of a system of voluntary monitoring of wells throughout the county, utilizing public water system wells and private wells where available. Encourage participation in voluntary monitoring programs, and, if funds are available, consider funding of well monitoring where determined necessary in order to stimulate participation.

Policy WR-4a: Encourage disposal methods that minimize reliance on discharges into natural waterways. If discharge is proposed, review and comment on projects and environmental documents and request that projects maximize reclamation, conservation and reuse programs to minimize discharges and protect water quality and aquifer recharge areas.

Policy WR-4g: Require that development and redevelopment projects, where feasible, retain stormwater for on-site use that offsets the use of other water.

Open Space and Resource Conservation Element

Policy OSRC-8g: Support non-regulatory programs for protection of streams and riparian functions, including education, technical assistance, tax incentives, and voluntary efforts to protect riparian resources.

Policy OSRC-8i: As part of the environmental review process, refer discretionary permit applications near streams to CDFG and other agencies responsible for natural resource protection.

Policy OSRC-8j: Notify permit applicants of possible Federal and State permit requirements in areas near streams and notify landowners whose property overlaps or touches a designated Riparian Corridor regarding the public hearings on the proposed regulations affecting them.

Policy OSRC-11b: Include erosion control measures for any discretionary project involving construction or grading near waterways or on lands with slopes over 10 percent.

Policy OSRC-11d: Require a soil conservation program to reduce soil erosion impacts for discretionary projects that could increase waterway or hillside erosion. Design improvements such as roads and driveways to retain natural vegetation and topography to the extent feasible.

Public Safety Element

Policy PS-2l: On-site and off-site flood related hazards shall be reviewed for all projects located within areas subject to known flood hazards.

Policy PS-2m: Regulate development, water diversion, vegetation removal, grading and fills to minimize any increase in flooding and related damage to people and property.

Policy PS-2p: Require that design and construction of drainage facilities be subject to the review and approval of the Permit and Resource Management Department.

Sonoma County Aggregate Resources Management (ARM) Plan

The main objective of the Aggregate Resource Management Plan (1994) was “to increase quarry production to provide a full range of uses and replace terrace sources as the primary supply for future construction aggregate and to facilitate the expansion of existing quarry operations in a manner that can meet the needs for aggregate in an environmentally sound manner.” The ARM Plan states the following with regard to upland quarries:

> “Drainage plans and facilities must minimize slope erosion and off-site sedimentation” (page 7-10).
>
> “The minimum allowed setback for quarry mining operations from streambanks and critical habitat areas designated in the General Plan is 100 feet” (page 7-10).

The ARM Plan states that “quarries are not expected to result in significant hydrologic impacts, primarily because of their occurrence in upland areas, away from river courses and heavy water flows” (page 8.3-1).

Sonoma County Surface Mining and Reclamation Ordinance

The ARM Plan contains several Operating Standards (ARM Plan, pages 7-5 to 7-6) and Reclamation Standards (ARM Plan, page 7-6) regarding hydrologic and water quality issues. These Standards are all included in the requirements set forth in the Sonoma County Surface Mining and Reclamation Ordinance (Chapter 26A).

Chapter 26A: Surface Mining

Unless otherwise noted, all standards set forth in Chapter 26A-Surface Mining of the Sonoma County Municipal Code apply to hydrology and water quality at the Mark West Quarry study area. Specific provisions are reviewed below.

Sec. 26A-09-010 General Standards for Mining Permit and Operations
In addition to meeting the requirements of the Surface Mining and Reclamation Act (SMARA) and related public resource codes and policy guidelines adopted by the State, each surface mining operation requiring a permit shall be conducted and designed to meet the applicable operational standards set forth in this article and in the Sonoma County aggregate resources management plan (ARM Plan). Conditions may be imposed on mining permits to ensure compliance with State and local codes, standards and guidelines. The standards applying to all types of surface mining are set forth in this article, followed by the standards specific to quarry, instream and terrace mining operations

(d) Stormwater Runoff, Flood Control and Water Quality. All operations shall manage earthwork and processing activities in such a manner as to minimize: ponding or accumulation of storm water not necessary for silt control, alterations to the natural drainage system, and siltation of adjacent or downstream watercourses.

(1) All operations shall incorporate the "best management practices" into the storm water pollution prevention plan required by the RWQCB.

(2) Operations along stream channels shall obtain the appropriate permits and comply with the requirements of this code, including Ordinance 3836R, the Sonoma County water agency, the Regional Water Quality Control Board, the California Department of Fish and Game (now the Department of Fish and Wildlife)), the State Lands Commission, and/or the Army Corps of Engineers as applicable. Any of the drainage alterations, ponding or filling activities listed below shall be expressly prohibited unless approved by the applicable agencies before commencing operations.

(i) Impair or impede or obstruct the natural flow of storm waters, or other water running in a defined channel, natural or man-made, or cause or permit the obstruction of any such channel or easement dedicated for drainage purposes.

(ii) Deposit any material in such channel.

(iii) Alter the surface of land so as to reduce the capacity of such channel.

(iv) Construct, alter, or repair any storm water drainage structure, facility or channel without first obtaining a permit therefore, as herein provided.

(v) Place any material along the sides of any defined channel or so close to the side of said channel as to cause such material to be carried away by flood waters passing through such channel.

(vi) Construct any structure within one hundred feet (100′) of the top of any embankment, natural or man-made which defines a channel, except where the flood hazard has been found to be remote in the view of the Sonoma County water agency.

(vii) Deposit any material, which contains paper, bottles, cans, lumber, garbage, organic matter, or other material which will not readily become an integral part of said channel side.

(viii) Deposit car bodies, concrete or asphalt construction rubble or any unsightly material on the top or sides of any embankment, natural or manmade which defines a channel.

(e) Water Quality. In order to avoid and prevent contamination or degradation of surface or ground waters, all operations shall comply with the following standards:

(1)Any waters discharged from the site to adjacent lands, streams, or bodies of water or to any groundwater body shall meet all applicable water quality standards of the Regional Water Quality Control Board and any other agency with authority over such discharges. Records of any water quality monitoring conducted in conjunction with the requirements of such agency or agencies shall be made available to the director on request. Discharges of sediment laden water to designated on-site settling ponds, desilting basins in or reclamation areas shall not be deemed to be in violation of this part solely on the basis of sediment content.

(2) Excavations which may penetrate near or into usable water bearing strata shall not subject such groundwater basin or subbasin to pollution or contamination.

(g) Erosion and Sedimentation.

(1) During the period mining operations are being conducted, and prior to final reclamation of mined lands, measures shall be taken to prevent erosion of adjacent lands from waters discharged from the site of mining operations or the offsite discharge of sediment. In addition, the mining operator shall be responsible for, and take whatever steps are necessary to prevent the erosion of lands adjacent to the district boundary into the excavated area. Such measures may include the construction of properly designed retarding basins, settling ponds and other water treatment facilities, ditches, diking and revegetation of slopes. Settling ponds and other water treatment facilities shall be located and managed so that accumulated sediment will not enter any stream or groundwater body unless such discharge is in accordance with the storm water pollution prevention plan (SWPPP) and best management practices (MBP's) approved by the RWQCB pursuant to subsection (d) of this section.

(2) Sediment basins, settling ponds, ditches, levees, dikes, culverts and other structures as well as erosion control and streambank protection measures shall be sized and designed by a civil engineer in accordance with standards set forth in the most current "flood control design criteria" manual published by the Sonoma County water agency and otherwise in accordance with acceptable engineering practices and any subsequent local, state, or federal regulations or revisions. An erosion and sediment control plan, including supporting calculations and diagrams, shall be prepared by a civil engineer or certified erosion and sediment control specialist and submitted for review with new mining or reclamation applications. Erosion and sediment control plans shall be designed in accordance with the most current "Erosion and Sediment Field Manual" published by the Regional Water Quality Control Board.

(3) Grades in areas being mined shall be maintained so as to avoid accumulations of water that could serve as breeding areas for mosquitoes or as sites of fish entrapment.

Sec. 26A-09-040 Quarry Mining Standards
In addition to the general mining standards set forth in Section 26A-09-010, the following standards shall be applied to quarry mining operations.

(f) Water Supply. All quarry sites must have adequate water supplies to support the operation. Sites located in Sonoma County Water Availability Zones III and IV will require analysis of the proposed water use, evaluation of the adequacy of the water supply, and mitigation of effects on water resources and nearby water users. Quarry operators may be required to monitor, survey, or report on depth and grades of excavation, groundwater levels, water use, revegetation and other subjects.

(g) Erosion and Sediment Control. Drainage plans and facilities must minimize slope erosion and off-site sedimentation.

Sec. 26A-11-010 Reclamation Plan Requirements

(d) Reclamation Plan Standards. Properties used for surface mining operation shall be reclaimed after the operation or an approved phase of the operation has been completed in accordance with the following standards:

(i) Grading plans shall be designed and carried out to minimize erosion, provide for drainage to natural outlets or interior basins designed for water storage, and to eliminate potholes and similar catchments that could serve as breeding areas for mosquitoes, sites of fish entrapment, or threats to public safety.

(ii) Silt basins which will store water during periods of surface runoff shall be equipped with sediment control and removal facilities and protected spillways designed to minimize erosion when such basins have outlet to lower ground.

(iii) Sediments accumulated in any detention basin, pond, or other facility shall be periodically removed. Such removal shall take place at least once within fourteen (14) days of and no later than November 1st of each year.

(iv) Final grading and drainage shall be designed in a manner to prevent discharge of sediment above natural levels existent prior to mining operations.

(v) Upon reclamation, no condition shall remain which will or could lead to the degradation of water quality below applicable standards of the regional water quality control board or any other agency with authority over water quality.

(vi) Measures undertaken for slope protection, erosion and sediment control, shall conform to the requirements of Sections, 26A-09-010 (d), (e) and (g).

(vii) Overburden, waste mud, silt, and other sediments generated by the mining operation shall be stored in such a manner that allows their recovery for use in reclamation.

(viii) Levees and other bank protection measures shall conform to the standards of the Sonoma County water agency consistent with the requirements of Section 26A-090-010(g). Plans for the maintenance of such measures or structures shall be included in the reclamation plan.

B. Potential Impacts and Mitigation Measures

The following section focuses on potential project impacts related to surface water, groundwater, and water quality. The evaluation considered current conditions at the project site, proposed project plans, and applicable regulations and guidelines.

1. Criteria Used for Determining Impact Significance

Based on CEQA Guidelines, the proposed project would have a significant if it meets any of the following criteria.

1. Violates any water quality standards or waste discharge requirements.

2. Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the groundwater table level (e.g., the production rate of pre-existing nearby wells or springs would drop to a level which would not support existing land uses or planned uses for which permits have been granted)

3. Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increases the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

4. Substantially alters the existing drainage pattern of the site or area, including through the alternation of the course of a stream or river in a manner which would result in substantial erosion or siltation on- or off-site.

5. Creates or contributes runoff water which would exceed the capacity of existing or planned storm water drainage systems or provides substantial additional sources of polluted runoff.

6. Substantially degrades water quality or results in additional siltation of either surface or groundwater.

7. Places housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood delineation map.

8. Places within a 100-year flood hazard area structures which would impede or redirect flood flows.

9. Exposes people or structures to significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

10. Is subject to inundation by seiche, tsunami, or mudflow.

2. Project Impacts

Less Than Significant Impacts Not Requiring Further Analysis

Due to the location and characteristics of the proposed quarry site, certain hydrologic conditions are not associated with the project and therefore, are not considered potential impacts. These hydrologic conditions are addressed briefly below but are not discussed further in this document.

Criteria 7 and 8 (100-Year Flood Zone). The project site is located between 865 and 1,200 feet above mean sea level (msl) and 75 feet above the largest adjacent tributary (Porter Creek) Given the elevation of the proposed project and its disconnect with potential flooding sources (Porter Creek), the site is not located within a 100-year flood zone. The proposed expansion and any appurtenant structures and ancillary equipment for the quarry operation would not be sited within the 100-year flood zone.

Criterion 9 (Flooding). The project would not include placement of structures or workers downstream of a levee or dam.

Criterion 10 (Seiche, Tsunami, or Mudflow). The project site is not located within the influence of any large open bodies of water (lakes, oceans, ponds), and therefore, the site is not susceptible to damage from seiche activity. The project site is more than twenty-five miles from the Pacific Ocean, and therefore is not susceptible to coastal hazards (tsunami, extreme high tides, or sea level rise). The potential for slope instability, including mudflows, is addressed in the previous section on Geology and Soils.

Impact of Increased Flows on Porter Creek

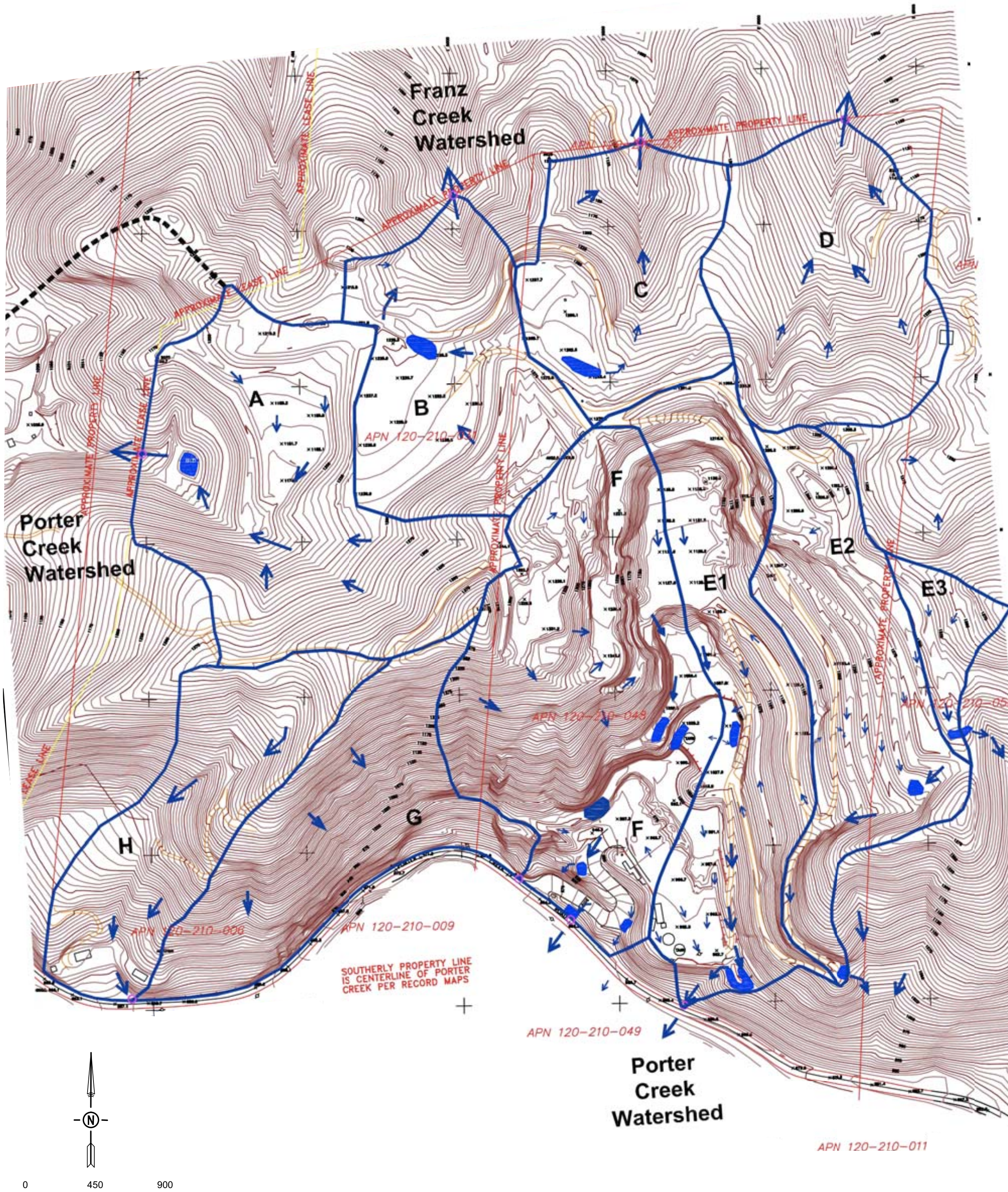
Impact 4.2-A **Quarry expansion, removal of overburden material, and subsequent exposure of bedrock would increase the amount of storm water runoff leaving the site and increase peak flows in Porter Creek. The additional flows caused by the project could lead to downstream flooding, bank erosion, and channel instability in Porter Creek. This would be a potentially significant impact.**

The project would increase the drainage area of Sub-basins F and H and, therefore, the overall watershed area draining to Porter Creek between the outfall of Sub-basin F and the confluence with the Porter Creek Tributary (herein referred to “Porter Creek Impact Reach” (PCIR).[12] Additionally, as mining expansion progresses, the removal of overburden material would reduce surface water infiltration and soil water storage as well as expose semi-impervious to impervious fractured bedrock. Although hillslopes and benches would be revegetated as part of the reclamation plan, the plant cover and soil conditions would be significantly different from native undisturbed conditions, and post-reclamation infiltration would likely be decreased compared to that of the pre-project conditions. Overall, the expansion of drainage areas, reduction of infiltration and soil water storage, and exposure of fractured bedrock would result in increased peak storm flows and overall runoff in the PCIR. Without storm water retention facilities sized to accommodate this increase in peak storm water flows during infrequent events (those with recurrence intervals of 10-, 25-, or 100-year), there is the potential that increased runoff from the quarry expansion would initiate or exacerbate any existing downstream flooding and erosion issues along Porter Creek.

Based on the applicant’s proposed grading and expansion plan, the proposed mine expansion would increase the total mining, reclamation, and disturbance area to approximately 97.3 acres, with Sub-basin F expanding by 16.8 acres to the north and west into Sub-basins A, B, G, and H. Sub-basin H would expand by 2.2 acres to the north and south by encroaching into Sub-basins A, G, and an adjacent ephemeral ravine draining to Porter Creek (Figure 4.2-4).

In order to independently gauge potential impacts to peak storm flows and assess erosion and bank stability conditions in Porter Creek, the Sonoma County Water Agency () Rational Method was employed to estimate the worst storm flow runoff scenario for pre- and post-project storm water flows (assuming no on-site storm flow detention). Pre- and post-Sub-basin area and

[12] The analysis focuses initially on the PCIR as this would be the section of Porter Creek most impacted by the project because it is the area between the tributaries whose watersheds would be altered.



Proposed Topography Source: Balance Hydrologics, 8-2011

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10-Year Expansion Surface Water Drainage

Mark West Quarry, Sonoma County, CA

FIGURE 4.2-4

runoff coefficients for the Mark West Quarry are summarized in Table 4.2-1 with the respective 10-, 25- and 100-year peak flow estimates in Table 4.2-2.

Table 4.2-1
Pre- and Post-Project Sub-Basin Size and Runoff Coefficients

		Area (acres)			Runoff Coefficient (C)	
Water Body	**Sub basin**	**Pre**	**Post**	**Change**	**Pre**	**Post**
Porter Tributary	A	17.8	11.1	-6.8	0.45	0.45
Franz Creek	B	14.2	13.5	-0.7	0.45	0.45
Porter Creek	F	18.6	35.4	16.8	0.60	0.60
Porter Creek	G	16.3	6.8	-9.4	0.45	0.45
Porter Creek	H	13.2	15.4	2.2	0.45	0.60

Source: Questa Engineering Corp., 2012; Runoff Coefficients derived from SCWA Rational Method

Table 4.2-2
Pre- and Post-Project Flows for Major Storm Events

		10-yr Flow (cfs)		25-yr Flow (cfs)		100-yr Flow (cfs)	
Water Body	**Sub basin**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
Entire Porter Tributary	-	100.6	92.7	115.1	106.1	141.1	130.0
On-site Portion of the Porter Tributary	A	20.7	12.8	23.7	14.7	29.0	18.0
Franz Creek	B	16.5	15.6	18.9	17.9	23.2	21.9
Porter Creek	F	28.7	54.8	32.9	62.7	40.3	76.9
Porter Creek	G	18.9	7.9	21.6	9.1	26.5	11.1
Porter Creek	H	15.4	23.8	17.6	27.3	21.5	33.4
Total to Porter Creek		163.8	179.2	187.2	205.2	229.4	251.4

Source: Questa Engineering Corp., 2012
Note: "On-site Porter Tributary" is that portion of the "Entire Porter Tributary" that is located on the project site.

Peak flows exiting Sub-basins F and H would increase by approximately 91% and 55% due to reduced infiltration and larger drainage areas, respectively. Therefore, the 2,850-foot PCIR reach would experience an overall increase in peak flows as a result of the project. The increased peak flows could initiate or even exacerbate existing bank stability and erosion sites along the PCIR and affect sensitive biological resources located there. However, to put the changes and potential impact to the PCIR in context, it is helpful to look at the overall contribution of runoff from Sub-basin F and H to Porter Creek from a watershed-scale perspective. Under existing conditions the PCIR has an overall watershed area of approximately 3,152 acres. The proposed project would increase the total watershed area draining to the PCIR by approximately 19 acres or 0.6 percent of the total watershed area. Despite significant increases to peak flow at the Sub-basin scale, the overall increase to the PCIR is very small based on the contributing watershed area. This very small increase in watershed area and commensurate increase in peak flows represents a less-than-significant impact to Porter Creek and would not significantly change erosion and bank stability processes in the PCIR between the outfall of Sub-basin F and the confluence of Porter Creek and the Porter Creek Tributary.

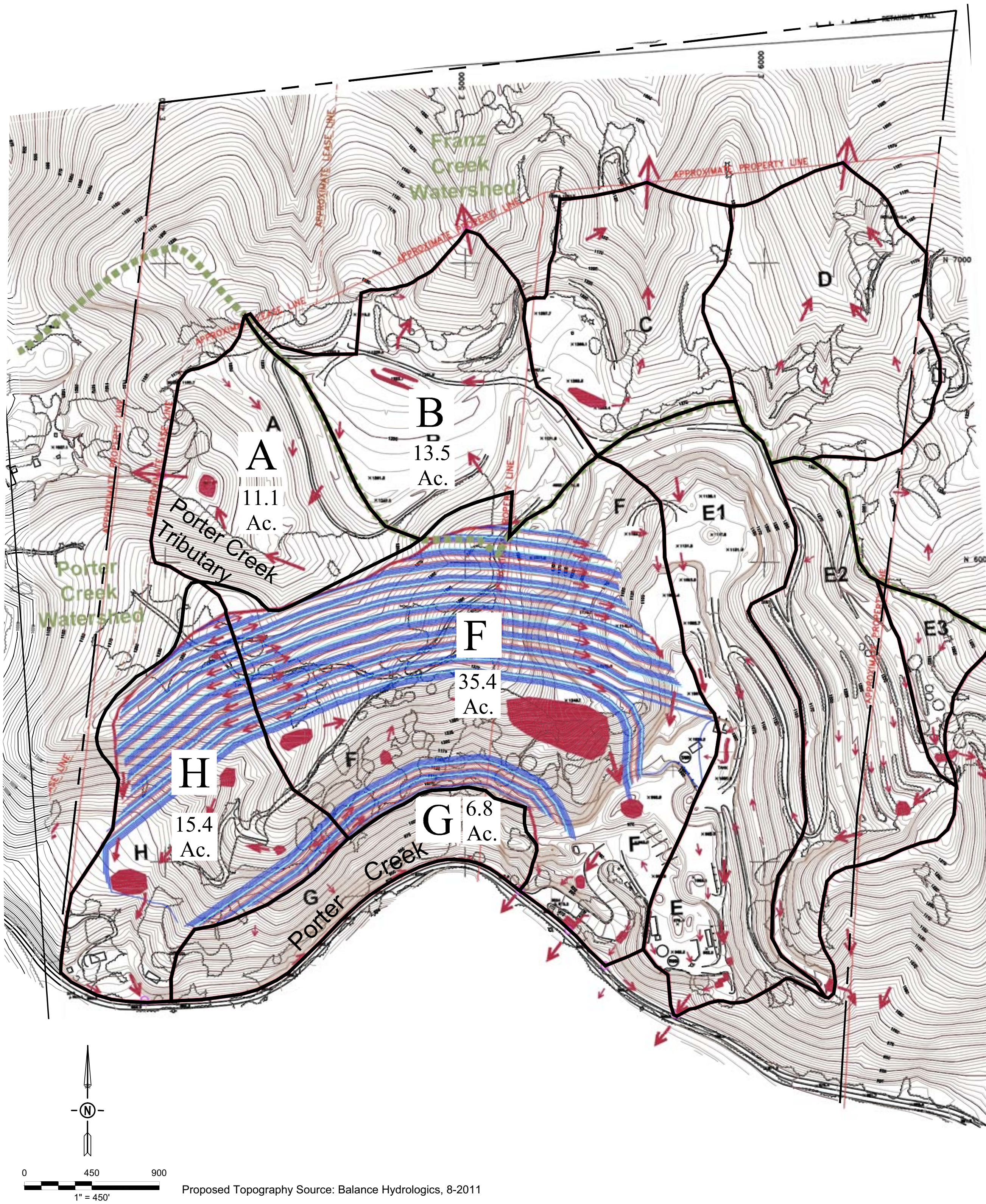
The impact to Porter Creek downstream of the PCIR would be less than the impact on the PCIR. As shown in Table 4.2-2, the project would increase peak flows from the quarry site to Porter Creek by approximately 9.5%. As stated previously, approximately 100 acres of the property drains to Porter Creek, which is approximately 3% of the total Porter Creek watershed upstream of the Porter Creek Tributary's confluence with Porter Creek. Accordingly, the project would increase peak flows on Porter Creek immediately downstream of the site by about 0.4%. Further downstream the percentage increase in peak flows would be further reduced because the amount of watershed draining to the creek increases as one proceeds downstream. While the increase in peak flows is small, it is possible that it could exacerbate downstream flooding. This is a ***potentially significant impact***.

The future mining would result in higher storm water flows leaving the site and larger peak runoff periods in existing drainage facilities (culverts) that drain Sub-basins F and H. Without storm water management (detention) facilities with adequate capacity, there is the potential that storm water runoff exiting the quarry site would exceed the capacity of existing facilities and result in localized erosion and flooding along Porter Creek Road during large to very large storm events (those with recurrence intervals of 10-, 25-, 50-, or 100-years). Increased storm flows capable of causing localized flooding and damaging streambank erosion do not typically occur during normal rainstorms (2-year and 5-year storms).

Various storm water drainage and detention plans and storm water analyses have been conducted by the applicant's design engineer (Green Valley Engineering, Inc., 2008) and hydrologic consultant (Balance Hydrologics, Inc., 2011) as the final extent of mine expansion has changed. In general, as shown on Figure 4.2-4, as mining moves to the west, for the first 10+ years of the expansion storm water that currently flows from Sub-basin G will be redirected into Sub-basin F. Storm water originating on the active and reclaimed quarry slopes would traverse laterally along the back-sloped quarry benches in shallow 12- to 18-inch deep linear drainage features. Flow would be directed along the quarry benches to the east where boulder-lined channels would transmit water and sediment to the four existing and one new sediment retention/storm water detention facilities located on the quarry floor or between the quarry floor and Porter Creek Road (see Figure 4.2-4). As mining proceeds further west, the westernmost area would drain via Sub-basin H to the 12-inch culvert beneath Porter Creek Road.

As shown on Figure 4.2-5, at the reclamation stage, runoff would be captured by two primary sediment retention/storm water detention facilities located on the quarry floor. Additional sediment and flow detention would be incorporated into the final grading by installing shallow detention ponds at the base of each cut with smaller ponds spaced throughout the site. Flows exiting the sediment retention/storm water detention ponds would be routed through additional siltation boxes before exiting the project site in a 30-inch (Sub-basin F) and a 12-inch (Sub-basin H) corrugated metal culvert under Porter Creek Road.

The sizing of storm water detention facilities is extremely important for reducing impacts to existing drainage facilities, open channels downstream, and Porter Creek. Un-detained peak flows are expected to increase by 91% and 55% at the outlet of Sub-basin F and H, respectively. Increases of this magnitude would significantly increase the risk of overtopping the existing culverts exiting Sub-basin F and H and result in erosion and flooding along Porter Creek Road.



Proposed Topography Source: Balance Hydrologics, 8-2011

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Design:
Drawn:
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Appr'd:

Mark West Quarry
Proposed Final Sub-basins

Mark West Quarry, Sonoma County, CA

FIGURE
4.2-5

The 2011 Balance Hydrologics report provided preliminary detention basin sizing for the final reclamation phase grading and reclamation topography. A size of 1.5 and 0.7 acre-feet for the F and H Sub-basins was proposed to ensure pre-project peak flows are maintained for the 100-year storm event.

In order to independently verify detention basin sizing, the "Modified Rational Method for Detention Storage Calculations" was employed to approximate the total volume of storage required for both Sub-basin F and H. After constraining post-project peak outflow to pre-project values, the modified rational methodology confirms that Balance Hydrologics' preliminary estimate would provide the required storage volume to detain and maintain pre-project flows in Sub-basins F and H from a peak flow storm water perspective.

However, the detention basins that would be used during at least the first 10 years of the expansion would be smaller than those that would be installed at the reclamation phase (see Figure 4.2-4). Onsite storm water detention would be done using the detention facilities used for existing operations with the addition of one small basin located northwest of the quarry driveway. It is possible that these detention basins may be too small, and increased runoff from quarry expansion could exceed the capacity of culverts beneath Porter Creek Road and cause flooding of that road, and this is a ***potentially significant impact.***

The applicant has also schematically shown additional detention basins (see Figures 3-8 and 3-9) that could be added as mining extends to the west, but no engineering details of these possible basins was provided. The proposed Reclamation Plan (see Appendix B) includes provisions that the applicant will prepare a final Stormwater/Water Quality Protection Program for the review and approval of the County PRMD. This final plan will include appropriate hydrologic and hydraulic information to design the on-site detention basins so they will function as storm water detention basins that will prevent peak storm water flows from exceeding the calculated baseline levels. It is expected that this final plan will include some portion of the conceptual basins shown on Figures 3-8 and 3-9. The drainage plan will be prepared by a Registered Civil Engineer and in conformance with the Sonoma County Water Agency's Flood Control Design Criteria. All on site drainage facilities will be constructed according to Sonoma County Water Agency's Flood Control Design Criteria and the County of Sonoma Permit and Resource Management Department standards and requirements, and will be operated in accordance with the prepared drainage plan.

Mitigation Measures

The following mitigations provide additional details, including performance standards, to be used in developing the final Stormwater/Water Quality Protection Program proposed in the applicant's Reclamation Plan.

4.2-A.1 The applicant shall prepare, for the review and approval by the Sonoma County Permit and Resource Management Department, a final Stormwater/Water Quality Protection Program (including appropriate hydrologic and hydraulic calculations). The plan and calculations shall include sizing for all sediment retention/storm water detention facilities (see Mitigation Measure 4.2-B.4) and shall verify the available capacity of existing conveyance facilities (culverts) exiting the project site. The storm water plan and calculations shall ensure that peak storm water flows are managed to the extent that flows entering the existing culverts crossing under Porter Creek Road do not exceed pre-project peak flow estimates for the 10-, 25-, 50, and 100-year flows. Alternative detention strategies could include additional detention basins, expanded use of the quarry floor for detention, or expanded use of infiltration areas for percolation and storage. The drainage plan and accompanying design calculations shall be prepared by a Registered Civil Engineer and in conformance with the Sonoma County Water Agency's Flood Control Design Criteria. The plan shall be approved and detention facilities constructed prior to the onset of mining the expansion area.

4.2-A.2 All on-site drainage facilities shall be constructed according to Sonoma County Water Agency's Flood Control Design Criteria and the County of Sonoma Permit and Resource Management Department standards and requirements, and shall be operated in accordance with the prepared drainage plan.

4.2-A.3 All detention basins and other drainage features shall be maintained (e.g., accumulated sediment shall be removed) pursuant to the standards stated in the approved sediment/erosion control and drainage plan. The sediments shall be stockpiled for use as topsoil in the reclamation process. All detention basins and drainage features shall be cleaned out by October 15 each year. If upon inspection by the County or RWQCB, the basins and drainage system have not been adequately maintained by October 15, the owner of the quarry would be notified that the maintenance must be completed within 30 days or all crushing, screen, grading, and sales of material on site shall immediately cease until the basins and drainage system have been sufficiently maintained.

4.2-A.4 All detention basins and other drainage features shall be monitored and maintained for 5 years after completion of site reclamation. At the end of this 5-year period, the applicant shall engage a qualified civil engineer to determine whether the site drainage system can operate without further maintenance. If further maintenance is warranted, it will be done. A new review will be done each year until the engineer determines that the system is self-sustaining for a period of an additional 5 years.

Impact Significance after Mitigation

The mitigation measures listed above are feasible and would ensure that peak runoff from the project site would be detained to maintain pre-project peak flows. Maintenance of pre-project peak flows would ensure the impact to existing drainage faculties and the risk of increased erosion and flooding along Porter Creek Road and Porter Creek would be reduced to a less-than-significant level for the operational life of the project and after project reclamation. After mitigation, the potential increase in flooding along Porter Creek Road conveyance facilities and Porter Creek would be ***less than significant***.

Sedimentation Impacts on Water Quality

Impact 4.2-B During quarry expansion and active mining, disturbed and unprotected soil and overburden could erode from contact with wind and water causing an increased amount of sediment and other pollutants to be carried downstream through the proposed drainage system. This could

degrade water quality in Porter Creek, Mark West Creek, and the Russian River. This would be a potentially significant impact.

The proposed expansion would create newly disturbed areas and expose sediment and rock flour to weathering and transport processes. Once disturbed, soil particles can become entrained in storm water runoff and, if not properly controlled, the sediment-laden runoff can be discharged into Porter Creek and Mark West Creek. Porter and Mark West Creeks are part of the Russian River Mark West HSA and are listed as impaired waterways under Section 303(d) of the Clean Water Act due to sediment and temperature. High sediment loads can be detrimental to aquatic plants and animals by increasing water temperatures and limiting oxygen availability. The proposed project could increase the sediment delivery and exacerbate already impaired water quality conditions downstream in Porter and Mark West Creeks.

Specific mining and reclamation activities most likely to increase the sediment load in Porter Creek include initial grading and stockpiling of overburden, expansion of access roads, grading of sediment retention facilities, and daily quarry operations. Daily operations include transport and storage of blasted and processed rock, aggregate processing and other minor grading that exposes fine sediment to weathering processes. The mishandling, misuse, or accidental spillage of hydrocarbon-based contaminants (grease, hydraulic oil, and diesel) and other hazardous wastes used in mining activities could worsen downstream water quality conditions by direct contamination. Additionally, hydrocarbons and other pollutants bind to sediment particles that are entrained in storm water. If not properly handled, hydrocarbons and other hazardous wastes that are transported with sediments would end up in receiving waterways.

The project's proposed storm drainage plain is discussed and illustrated in ***Section 3.2, Project Description.*** The current system of capturing runoff in shallow ditches along cut slopes and filtering out sediment particles with swales, sediment retention ponds, and siltation boxes would be continued as part of the proposed expansion. Storm water facilities would be expanded and re-sized to accommodate the increased storm flow and sediment generated from the quarry expansion (see Impact 4.2-B, above). The design of sediment retention facilities and capture efficiency is a key element of storm water design. Sediment retention ponds of insufficient size may not provide the residence time necessary to capture sediment before polluted storm water is discharged to Porter Creek.

The size of a sediment basin required to settle sediment of a certain size can be calculated by the following formula (ABAG, 1995):

$$A_s = \frac{.\ Q}{V_s}$$

where: A_s is the pond surface area, square feet (ft2)
Q is peak discharge, cubic feet per second (cfs)
V_s is the settling velocity of a particle, feet per second (ft/s)

Note that the sizing of the pond is based on the Q or rate of inflowing water and the size of the particle, not the incoming sediment load or volume of sediment. That is because detention is based on providing adequate residence time for the sediment to drop out of the water column and fall to the pond bottom, before the pulse of water carrying the suspended sediment moves out of the pond system and into Porter Creek. Since very small particles such as fine silts and clays require a long period before they drop out of suspension, a large pond size is required to provide the required lengthy residence time for the inflowing water if fine particles are to be removed. Pond depth is not a factor, provided adequate minimum depth (3-4 feet) is provided. Table 4.2-3 uses the above equation and flows in Table 4.2-2 to predict the required sediment detention pond volume to trap various sediment classes and storm events for sediment retention facilities located at the base of Sub-basins F and H. SMARA requires that erosion control practices (sediment retention facilities) be designed for no less than the 20-year, 1-hour storm event (this determines the Q in the above equation). If only detention basins are the only sediment control measure used, then a basin approximately 0.8 acres in size would be required for runoff from Basin F and approximately 0.3 acres for runoff from Basin H. Currently, the quarry has approximately 0.1-0.2 acres of detention facilities.

As the quarry operation expands into the proposed project area, new temporary or semi-permanent storm drainage facilities would need to be designed and constructed to handle increased runoff and sediment from the quarry site. The detention facilities shown on Figure 4.2-4 would not be of sufficient size to settle medium silt. The proposed Reclamation Plan states that detention basins will be constructed to the maximum size practical for the available space. Recognizing that the available space would not allow for detention basins of a size to capture medium silt-sized particles, the applicant states that the final design will include the use of chemical treatment to cause the finer particles to settle or the use of filters to remove the particles from the water. Chemical treatments use synthetic polymers, which can significantly increase the effectiveness of sediment detention ponds in trapping and settling out fine particles by causing them to aggregate together, forming larger masses that drop out of suspension. Examples of such polymers include Chitosan and Polyacrylamide. Polyacrylamide is used for erosion control and in settling basins. The material binds sediments and other pollutants into heavy particles that then sink to the bottom of the settling basin. Research indicates that this polymer does not adversely affect fish and other aquatic life when properly applied (Sojka, et al., 2003). It is expected that little of the polymer would leave the site as it would settle out. Even if some of this material escapes the site, it would not be expected to adversely affect water quality of Porter Creek. If there were a concern about use of such a polymer, there are biopolymers available (though not as effective as Polyacrylamide); these include such biopolymers as wheat starch xanthate, corn starch xanthate, and cellulose xanthate. Chitosan is a natural product made from shrimp or crab shells that is commonly used as a flocculent. As a natural and biodegradable product, it has no adverse water quality impacts if properly applied. However, improper application can result in levels that are lethal to fish. These products have been approved by the EPA for use in erosion control and sediment detention pond applications. While these products could cause water quality and aquatic impacts if not properly applied, these impacts can be avoided by using the products in accordance with the manufacturers' recommendations.

The regulatory controls on the proposed project extend from the local (County) to the Federal level (CWA). The Sonoma County Surface Mining and Reclamation Ordinance (SMARO) requires the applicant to control storm water runoff, manage quality of waters discharged to receiving waters and sediment (Section 26A-090-010), slope erosion and offsite sedimentation (Section 26A-09-040), and reclamation erosion and sediment control (Sec 26A-11-010). The applicant must also comply with the State Water Resources Control Board NPDES regulations for industrial activities, which would require preparation of a Storm Water Pollution Prevention

Plan (SWPPP) and set acceptable levels of sediment (TSS, and Turbidity) in water exiting the project site.

Overall, the expansion of the quarry would result in more disturbed areas potentially subject to erosion. Although sediment basins are proposed in the quarry expansion plan, at most they are effective only in controlling coarser materials (sands and larger silt particles) from being transported downstream. Finer sediments would not likely settle out of the proposed detention ponds, and could potentially be transported downstream unless larger ponds are constructed or supplementary chemical treatment or filters are also used.

The applicant's proposed Reclamation Plan (see Appendix B) states that prior to the initiation of mining outside of the vested rights area, the applicant will prepare a final Stormwater/Water Quality Protection Program that will be submitted to the County, the Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW) for review and comment, and shall be subject to approval by the County.

The proposed program will include water quality performance criteria that must be met for the storm water that leaves the quarry. The amount of total suspended sediment (TSS), Total Petroleum Hydrocarbons as Diesel (TPH), iron, specific conductance, or pH in the storm water leaving the site will not be allowed to exceed the levels coming off the site under baseline conditions.

The water quality benchmarks will be based on the State Stormwater Pollutant Benchmark levels. The benchmarks are used by the RWQCB to determine when additional pollution control may be required for a project. For this project, they include:

1. pH benchmark should be between 6.5 to 8.5;
2. Total Suspended Solids (TSS) benchmark should not be greater than 100 mg/L;
3. Specific Conductance benchmark should not be greater than 200 uS/cm;
4. Iron benchmark should not be greater than 300 ug/L; and
5. Total Petroleum Hydrocarbons as Diesel (TPH) benchmark should not be greater than 15 mg/L.

The Reclamation Plan contains specific actions and BMPs under the headings: "Source Control Measures to Prevent Erosion," "Operational Measures to Prevent Erosion," "Measures to Retain Sediment On-site," and "Measures to Prevent Discharge of Other Pollutants." There is a list of on-going maintenance measures including inspection and maintenance requirements. The Reclamation Plan actions and BMPs are modeled on the conditions of approval for the previously approved Blue Rock Quarry Expansion and other recent quarry projects approved in the County.

The "Measures to Prevent Discharge of Other Pollutants" includes a requirement that any slope stabilization chemicals or polymers, and sediment detention basin enhancement chemicals or polymers that may be used will be EPA-approved and will be used strictly according to the manufacturer's specifications. If chitosan is used, a residual chitosan test (available from Natural Site Solutions[13] or the equivalent) would be required to check residual chitosan in water leaving the site. Residual chitosan in discharge water will not exceed 1.1 mg/L, which would reduce water quality effects on fish to a less-than-significant level.

[13] Storm Water Solutions at http://www.estormwater.com/natural-site-solutions-2

Although the regulatory provisions under SMARO and the applicant's proposed Reclamation Plan would be instrumental in reducing sediment inputs to Porter Creek, there remains a potential that uncontrolled sediment discharges could occur from a project of this magnitude. Therefore, considering the large area of disturbance associated with the proposed quarry, the proximity of that disturbance to Porter Creek, and the fact that Porter Creek and Mark West Creek are Section 303(d) impaired water bodies that support threatened salmonids, increases in sediment delivery as a result of uncontrolled erosion or undersized sediment retention facilities would be a ***potentially significant impact***.

Mitigation Measures

Compliance with County (SMARO) and State (SMARA and NPDES) requirements regulating mining and discharge of storm water from mining sites would result in the project meeting State water quality standards. The applicant's proposed Reclamation Plan incorporates site- and project-specific measures to comply with these County and State regulations. The following mitigations supplements the erosion control actions included in the proposed Reclamation Plan, and replace these actions, where warranted.

4.2-B.1 The applicant shall develop and implement a final Stormwater/Water Quality Protection Program (the Program) to control sediment and pollutant runoff from the quarry expansion for both interim mining operations and after final reclamation. All erosion control measures listed in the proposed Reclamation Plan shall become conditions of approval for the project. In addition, the following measures are required:

1. All structural elements and drainage features shall be designed and approved by a professional civil engineer experienced in storm water management and sediment control. The design shall meet the standards of the Sonoma County SMARO. All hydrologic and engineering calculations, including sediment retention pond trap efficiency, shall be submitted to the County for review and approval prior to commencement of quarry expansion activities.

2. The existing 2011 Storm Water Pollution Prevention Plan (SWPPP) shall be updated to include the proposed quarry expansion. The SWPPP shall be regularly updated to reflect current conditions at the quarry. The following recommendations supplement the proposed actions:

3. The applicant shall update the Spill Prevention Control and Countermeasures Plan (SPCCP), which identifies and evaluates sources of pollutants associated with industrial activities at the quarry including the use, storage, and quantity of potential contaminates. The SPCCP shall also include emergency response and notification procedures.

4. As specified by SMARA, sediment retention ponds will be reconstructed or, if needed, new ones constructed so that particles of medium silt (0.32 mm) will be settled out for no less than the 20-year, 1-hour rainfall event before runoff leaves the site. Flocculents and/or filters can be used to enhance the settling process in order to meet this standard. Sediment retention design shall include emergency spillways sized to accommodate larger less frequent storm events (25-, 50-, and 100-year) and concomitant overtopping. Prior to each construction season (May

1), the applicant shall quantify the total proposed drainage area contributing to each sediment retention pond at the beginning of the next winter season (October 15) and verify the ponds provide adequate residence time and design capacity to meet both water quality and flow detention goals. All design and annual pond sizing verification shall be completed by a professional civil engineer experienced in sediment detention basin design and the regulations of SMARA. All hydrologic and engineering calculations, including sediment trap efficiency, shall be submitted to the County for review and approval prior to any additional quarry expansion.

5. If any semi-annual monitoring indicates that the mining of that year exceeded the water quality performance criteria, the applicant shall confer with the Regional Board and propose changes to the sediment control program that will improve its performance sufficiently to meet the performance criteria of the Reclamation Plan and the general permit. The proposed changes shall be submitted to the Regional Board for comment, revised as needed to address their comments, and then implemented by the applicant. If the performance criteria are not met for two consecutive years, the County will confer with the applicant and the Regional Board to determine what additional changes in the sediment control plan are needed to result in compliance, and these changes shall be made until compliance is reached.

6. Chemical dust suppressants and sediment detention basin enhancement chemicals or polymers shall be used strictly according to the manufacturer's specifications as well as any additional restrictions required by the RWQCB. An accurate accounting of all these materials purchased and used on the site shall be maintained, including kinds and quantities of material.

7. The Basin Plan allows storm water from a project site to increase turbidity in a receiving stream by no more than 20%. However in the case of this project, because of the sensitivity of Porter Creek, the storm water from the project would not be allowed to increase turbidity any more than the runoff from the existing quarry does for an overall no net increase as a result of quarry expansion. The RWQCB shall review the water quality monitoring data and determine the turbidity baseline to be used in the final Stormwater/Water Quality Protection Program.

8. The applicant shall monitor all storms that generate discharge from the active mining portion and overburden stockpiling area of the project site to Porter Creek. However, as a practical measure, it shall not be required that monitoring events occur more frequently than once every two weeks or pursuant to the criteria developed by the RWQCB. The discharge end of each outfall shall be made easily accessible for inspection and water sampling during storm events by the applicant.

Impact Significance After Mitigation

The mitigation measures described above require that the runoff from the site meet or exceed the water quality performance criteria set forth by the Basin Plan and General Permit for the life of the project. Overall, storm water runoff from the expanded quarry will not be allowed to increase sedimentation or exceed any other water quality criterion over baseline conditions. The mitigation measures ensure ongoing monitoring of water quality and provide appropriate discretion to the County and the RWQCB to require additional erosion control devices and practices to ensure compliance with State water quality standards. To date, quarry operations have not exceeded applicable water quality standards in their permit. Based on water quality monitoring upstream and downstream of Porter Creek, existing turbidity increases are less than 20% of background levels (20% increase in turbidity is the maximum increase allowed under the Basin Plan). Though the site is constrained, it is expected that with ongoing reclamation of the existing quarry site that there would be sufficient space on the project site (as augmented with flocculation and/or filters) to meet the required water quality standards for water leaving the site. The recommended mitigation measures would reduce the impact to storm water quality to a ***less-than-significant*** level.

Reduction in Streamflows

Impact 4.2-C Quarry expansion may result in reduced summer baseflow to salmonid streams (Franz Creek and Porter Creek Tributary). This is considered a less-than-significant impact.

As shown by comparing Figures 4.2-4 and 4.2-5, quarry expansion would result in approximately 6.8 acres of Sub-basin A that currently drains to the Porter Creek Tributary being drained directly to Porter Creek. In addition, approximately 0.7 acres of Sub-basin B that currently drains to Franz Creek would drain to Porter Creek. This would reduce the summer baseflow to Franz Creek and the Porter Creek Tributary.

The contribution of upland rainfall infiltration to creek summer baseflow is difficult to independently quantify without stream gage information. One method of providing an approximation of watershed area contribution to baseflow is to use data from a nearby gaged watershed that has similar characteristics, and equate the contribution of the watershed on an equal area basis.

Mean daily and mean monthly stream flow data is available for the U.S. Geological Survey Franz Creek watershed gage (11463940) near Kellog for the period August 1963 through September 1968. Streamflow records for the Franz Creek gage are available at the web site: http://wdr.water.usgs.gov/nwisgmap/?state=ca

The Franz Creek watershed has a similar Franciscan rock-based geology, is located just north of the Porter Creek Watershed, and has a similar climate and vegetative cover. The average discharge for the critical low flow period of June-October based on 6 years of record and which represents almost entirely baseflow, is about 0.5 cfs for the 15.7-square-mile Franz Creek near Kellog gage. Each square mile (640 acres) of watershed therefore contributes on average about 0.03 cfs during the June-October low flow period, or about 0.00005 cfs per acre of watershed.

Following this logic, the ultimate expansion of the quarry to redirect flows from 6.8 acres of Sub-basin A and 0.7 acres of Sub-basin B to sub-basins to Porter Creek could result in the loss of about 0.00034 cfs to low flow (which is the equivalent of approximately 4 tablespoons of water per minute or less than one pint per hour.) in the Porter Creek Tributary and 0.000035 cfs to low flow (again, less than one pint per hour) in the Franz Creek Tributary. The total conversion of 7.5 acres of adjacent watershed and the potential loss of base flow to the Porter Creek Tributary and Franz Creek would not substantially affect streamflow in either stream. It represents a ***less-than-significant impact***, and no mitigation is required (also see the discussion of impacts to the fishery of these streams in the subsequent discussion of Impact 4.3-D as well as the discussion of Project Alternative C in ***Section 6.1, Project Alternatives*** for an alternative that deletes mining within the Franz Creek watershed)***.***

Removal of the forest vegetative and soil cover preceding mining operations, and their ultimate replacement with a benched rock faced quarry configuration upon completion of rock mining would result in a post-reclamation land surface that has increased runoff, and therefore reduced infiltration of rainfall. The reduced rainfall infiltration would result in less water moving into and through the underlying rock fractures, and consequently less baseflow contribution from this portion of the watershed to Porter Creek and Porter Creek Tributary. However, the reduction would again be so small on a watershed level as to be immeasurable. In addition, the infiltration from the large detention basins that would be created during the reclamation phase would be expected to substantially offset any loss of infiltration on the remainder of the site. This would also be a ***less-than-significant impact.***

Project Groundwater Use

Impact 4.2-D The proposed mine expansion would require additional groundwater pumping. The increased pumping of onsite wells could reduce recharge to the underlying bedrock aquifers and lead to long-term reduction in groundwater availability. This is considered a less-than-significant impact.

The proposed project would increase the annual production of rock from 457,500 tons/year to 750,000 tons/year. Production increases would require additional groundwater for dust control and aggregate processing. The applicant proposes to utilize existing on-site wells to meet future water supply demands. Water consumption rates that exceed groundwater recharge rates could potentially result in groundwater overdraft. Groundwater overdraft would be a potentially significant impact.

Balance Hydrologics (2012) prepared a Water Supply Assessment (WSA) for the project (consistent with the requirements of the State's Senate Bill 610 – SB 610). This WSA was peer reviewed by the EIR consultants and found to comply with SB 610 requirements. Total water use was estimated for current and proposed project conditions. Total water consumption for aggregate production depends on the type of material being delivered (sand, coarse aggregate, washed aggregate, etc) and other factors such as the moisture content of filter cake (waste product generated from aggregate processing). Overall, based on the maximum average production of 750,000 tons/year, and volumes of each quarry product, total water use is expected to increase from approximately 21.6 acre-feet/year to 30 acre-feet/year. Periodic pumping rates in the four existing onsite wells would be increased to supply the additional 8.4 acre-feet of water for the proposed project.

Recharge to the bedrock aquifers underlying the site depends on surficial soils, degree of bedrock fractures that allow vertical movement of water to the underlying source, and total volume of water available for recharge. Balance conducted an annual water balance for the Mark West Quarry under existing and proposed conditions. The total volume of water available for recharge can be approximated as the annual rainfall near the site minus annual runoff and evapotranspiration. The proposed project would increase the runoff component of the water balance and decrease losses to evapo-transpiration by removing a portion of the Mixed Evergreen Forest vegetation. Overall, the total volume of water available for recharge would decrease from 60 acre-feet/year to 53 acre-feet/year. Despite a net reduction in groundwater recharge, the proposed groundwater consumption rate of 30 acre-feet/year is still less than the proposed recharge rate of 53 acre-feet/year and results in a net positive recharge of 23 acre-feet/year (see water demand calculations in Appendix D). Recharge rates that exceed consumption rates indicate a low potential for groundwater overdraft during most years and subsequent reduction in groundwater availability.

The WSA assessed water availability for a typical year, single extremely dry year, and multiple dry years as required by SB 610. The WSA also assessed potential impacts to six wells within a 0.5-mile radius around on-site wells (502 acres). Table 4.2-3 summarizes estimated water supply, represented by simulated groundwater recharge, and proposed demand for normal (typical), single dry, and multiple dry years. The results indicated that groundwater supply estimates are adequate to meet existing and proposed future demand, except possibly during the "extremely dry year," when demand exceeds supply (the "extremely dry year" is the year with the least rainfall on record – in this case the year of 1976). The small deficit shown in Table 4.2-3 for the (more conservative) property/lease boundary area could be reasonably offset by project detention pond infiltration and the use of additional pond storage as proposed in the proposed expansion plan. Nevertheless, for worst-case planning purposes, it is reasonable to expect that there would be insufficient water to supply quarry operations during the single "extremely dry year." However, about 60% of the project water demand is used for dust control in order for the quarry to comply with its Permit to Operate from the Bay Area AQMD. If there is insufficient water during the single "extremely dry year" to meet all project water demands, then operations would necessarily be scaled back to a level where dust control requirements are met. The impact during this single year would be limited to effects on project operations as there would be adequate water to recharge neighboring residential wells. If there is inadequate water during this severe single year, then the quarry would be required to reduce extraction and/or use of the wash plant until such time as the wells were again producing the needed amount. Because operations would need to be reduced to comply with its air quality permit (i.e., its Permit to Operate), the only impact would be to the quarry financial interests. There would be no impact to the environment. The impact would be ***less than significant*** given existing Permit to Operate requirements.

Table 4.2-3
Water Supply and Demand Comparison

Source	Project Property (154 acres)				½ Mile Radius Around Quarry Wells (502 acres)			
	Existing Usage		Proposed Usage		Existing Usage		Proposed Usage	
	ac-feet	million gals.	ac-feet	million gals	ac-feet	million gals	ac-feet	million gals
Typical year (mean)								
Groundwater recharge	102.0	33.1	102.0	33.1	388.0	126.0	388.0	126.0
Groundwater demand	17.9	5.84	24.9	8.12	27.1	8.84	38.7	12.6
Surplus or Deficit	83.6	27.2	76.5	25.0	361.0	118.0	349.0	114.0
Single extreme dry year (1976)								
Groundwater recharge	14.3	4.67	14.3	4.67	49.7	16.2	49.7	16.2
Groundwater demand	17.9	5.84	24.9	8.12	27.1	8.84	38.7	12.6
Surplus or Deficit	-3.57	-1.16	-10.6	-3.45	22.6	7.36	11.0	3.58
Multiple drought years (1987-91)								
Typical year (mean)								
Groundwater recharge	66.6	21.7	66.6	21.7	254.0	83.0	254.0	83.0
Groundwater demand	17.9	5.84	24.9	8.12	27.1	8.84	38.7	12.6
Surplus or Deficit	48.7	15.9	41.7	13.6	227.0	73.8	215.0	70.0

Source: Balance Hydrologics, 2012

Notes: There are 6 off-site domestic wells within 1/2 mile radius of the Mark West Quarry water supply wells. A typical demand rate for a single family dwelling is 0.5 acre-feet per year. The maximum demand used is 50% more, or 0.75 acre-feet per year per dwelling

Off-site Well Impact

Impact 4.2-E The proposed project would increase pumping rates in the four onsite supply wells. The increased use of onsite wells could periodically lower groundwater levels in adjacent domestic wells and potentially lower productive capacity. This is considered a less-than-significant impact.

The increased use of the four onsite groundwater production wells (#1, #2, #3, and #4) could interfere with neighboring private supply wells located to the south and east of the Mark West Quarry. Under proposed conditions the existing wells would be the primary source for increased processing operations, dust control, irrigation and landscaping, and for the office building (for drinking and septic use). Well water would be periodically pumped to fill on-site tanks and when available, water collected in the proposed sediment retention ponds and reclaimed slope drains would be used instead of groundwater derived from onsite wells. Increased pumping and drawdown could result in a significant reduction or loss of the water supply.

The proposed quarry operation would continue to obtain groundwater from the fractured bedrock aquifers underlying the project site and would not include the drilling of additional wells. Instead, the proposed project peak pumping rates during the driest portion of the year when water use is greatest and recharge smallest, would increase from a combined (all wells) maximum periodic rate of 21.5 gallons per minute to 29.4 gallons per minute. Specific pumping rates for Well #1, #2, #3, and #4 would increase from 2.1, 4.2, 8.0, and 7.2 to 2.9, 5.7, 11.0, and 9.8 gallons per minute, respectively. The total volume of groundwater extracted at the quarry would increase by an estimated 38% from 21.6 to 30 acre-feet per year (Balance Hydrologics, 2012 – see Appendix D).

Well capture and groundwater drawdown from pumping the four on-site water supply wells was assessed for the existing and proposed (maximum) annual water use using the Theis equation, capture zone curves, and the California Department of Health Services Drinking Water Source Assessment and Protection Program (1999) fixed radius method to quantify impacts to adjacent water wells (Balance, 2011). Using the maximum pumping rates for each well under existing and proposed conditions all three methodologies confirm that the adjacent domestic wells are too far from the onsite quarry wells to be influenced by groundwater pumping at the existing and proposed pumping rates. Furthermore, ionic structure analysis of the onsite wells and adjacent domestic wells indicate three distinctly different sources of groundwater near the project site. The quarry wells draw on groundwater uniquely different and deeper than the surrounding domestic water supply wells.

Given the results of drawdown testing and a structure comparison of the groundwater characteristics, increased groundwater pumping in the quarry supply wells would not affect pumping in adjacent domestic wells. Adjacent domestic groundwater wells are located too far from on site wells and obtain water from a significantly shallower bedrock aquifer. Therefore, this impact is ***less than significant***, and no mitigation is required.

Groundwater Aquifer Recharge

Impact 4.2-F The proposed mining expansion would reduce the contributing area and potential groundwater recharge to the domestic supply well located below Sub-basin A. This would be a potentially significant impact.

The proposed expansion and reclamation of the quarry would include altering the topography so that roughly 6 acres that presently drain to the Porter Creek Tributary would drain through the quarry and Sub-basin F. As shown on Figure 4.2-3, a well used as the primary water source for a residence is located on a property west of the quarry (APN 120-021-032); it is owned by the party leasing the expansion site to the quarry operator. The well may be impacted by the loss of recharge area (or through interception of subsurface flow by quarrying activities), potentially resulting in a significant reduction or loss of the water supply. The reduction or depletion of flow to the existing well represents a potentially significant impact.

The degree to which quarry expansion would affect the off-site domestic well located below Sub-basin A is not easily quantified due to the complex hydrogeology and bedrock fractures in the area. However, water quality sampling conducted by Balance Hydrologics suggests the well is connected to the “greenstone spring” (this is Wetland A on the subsequent Figure 4.3-2)located in Sub-basin A. This suggests that subsurface fractures in the greenstone rock provide the pathways for water percolating through the overlying soil to reach the underlying bedrock aquifer tapped by the well. Grading and removing 38% of the potential recharge area contributing to the well would likely result in lower recharge rates. This is a ***potentially significant impact.***

Mitigation Measures

4.2-F.1 With the permission of the property owner, the applicant shall monitor the domestic water supply well located on Assessor’s Parcel 120-021-032 for significant changes due to quarry expansion and regrading of recharge areas. Monitoring shall include monthly observations of groundwater levels in the well and shall commence before quarry expansion. Well monitoring shall continue through the length of the project. If it is determined that well levels have deviated statistically from the baseline condition at any time during the expansion and reclamation of the quarry (accounting for rainfall totals), or within five-years following the completion of the expansion and reclamation, and the owner of the property requests, the applicant shall be financially responsible for providing a reliable supply of water to the impacted property, which may include deepening of the existing well and/or drilling a new well.

Impact Significance After Mitigation

The mitigation measure listed above will reduce potential groundwater recharge and well levels on Assessor’s Parcel 120-021-032 to a ***less-than-significant*** level.

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4.3 BIOLOGICAL RESOURCES

A. Existing Conditions

1. Introduction

This section describes the existing botanical, wildlife, and wetland resources at the project site; identifies the potential impacts of the proposed project on these resources; and discusses mitigation measures to minimize or eliminate potentially significant impacts imposed by the project. The EIR biologists (Garcia & Associates, or GANDA) conducted background research, reconnaissance field surveys, and tributary and wetland surveys, and reviewed hydrology and biological reports in order to identify the potential for impacts to sensitive biological resources.

Vegetation, wildlife, and wetland documentation presented in this section are based on field reconnaissance surveys conducted in 2006 and 2010,[14] as well as focused biological surveys conducted on the property or vicinity on April 24, May 22, and July 24, 2006; February 2007; July 2010; and January 15, April 1, May 3, and July 18, 2011. In addition, surveys for California red-legged frogs were conducted by a firm under contract to the applicant in 2012. The habitat requirements for special-status plant and animal species with potential to occur in the project area were assessed and compared to the habitats present at the project site. Factors such as habitat quality and species distribution were also considered in evaluating the likelihood of special-status species occurring in the project area. Vegetation and general hydrologic conditions were examined to estimate the extent of wetlands potentially subject to the U.S. Army Corps of Engineers (Army Corps) and the California Department of Fish and Wildlife (CDFW) jurisdiction.

Other information sources included applicable biological literature, the Sonoma County General Plan 2020, the U.S. Fish and Wildlife Service (USFWS) on-line list of special-status species (USFWS, 2010), the California Native Plant Society (CNPS) on-line Electronic Inventory (CNPS, 2011), and the California Department of Fish and Game's California Natural Diversity Data Base (CNDDB, 2011) for the Mark West Springs USGS 7.5-minute quadrangle and surrounding quads.

2. Regional Setting

The project site is located in the Mayacamas Mountains in Sonoma County, approximately eight miles northeast of Santa Rosa. The project site is located on the north side of Porter Creek Road, about 0.4 miles west of its intersection with Calistoga Road and Petrified Forest Road. Porter Creek flows to the west on the south side of Porter Creek Road. Elevations within the project site range from 900 to 1,400 feet. Elevations within the nearby area range from about 1,200 to 1,400 feet. The project site is mainly forested, with small patches of grassland and chaparral.

[14] The 2006 surveys were done to prepare the biological resources section of the EIR that was being prepared on the original project proposal. Subsequent studies were done on the current proposal, which included additional areas not surveyed in 2006.

3. Plant Communities and Wildlife Habitat

As shown on Figure 4.3-1, six natural vegetation types are represented on the project site, including five upland types and one wetland type. These natural vegetation types are classified here using the Holland system (1986) as a principal reference. Equivalent alliances from *A Manual of California Vegetation*, second edition (Sawyer et al. 2009), are given when possible. Descriptions of the vegetation of the study area are based on field observations from special-status plant surveys conducted by GANDA, and information from the biological constraints analysis (Macmillan and Buck 2003) prepared for the applicant. In addition to natural vegetation, plants of disturbed areas are briefly described.

The project site vegetation is composed mainly of Mixed Evergreen Forest, chaparral, and grassland. The five upland vegetation types found on the project site are described below. Wetland habitat and vegetation is described in the following subsection (Section 4 below).

California Annual Grassland

California Annual Grassland found on the project site is an upland vegetation type characterized by a dense to sparse cover of introduced annual grasses, mainly less than three feet in height. This type sometimes includes native perennial grasses and a diverse assemblage of native annual forbs (wildflowers). California Annual Grassland is widespread in the valleys and foothills of California west of the Sierra Nevada. Holland (1986) notes that the species composition of grasses and forbs varies considerably among stands. The comparable type recognized in *A Manual of California Vegetation* (Sawyer 2009) is the California Annual Grassland series.

On the project site, California Annual Grassland occurs in patches surrounded by Mixed Evergreen Forest and in places is bordered by stands of common manzanita (*Arctostaphylos manzanita* ssp*. manzanita*). The total acreage of grassland within the current project area boundary is approximately 2.42 acres. Based on the diversity of native species and the sharp boundary between grassland and forest, these grassland patches appear to be naturally occurring and possibly related to soil type, rather than the result of previous clearing, although this cannot be determined with certainty. These grassland patches are species-rich, especially in native forbs. They lack highly invasive weedy grasses found in some annual grasslands in the vicinity.

The dominant grasses on the project site include: slender wild oat (*Avena barbata*), rattlesnake grass (*Briza maxima*), soft chess (*Bromus hordeaceus*), hedgehog dogtail (*Cynosurus echinatus*), and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*). Native perennial grasses such as blue wildrye (*Elymus glaucus*) and purple needlegrass (*Nassella pulchra*) are scattered and in low abundance. Native annual and perennial forbs are a significant component of this vegetation. Common species include: annual agoseris (*Agoseris heterophylla*), tower mustard (*Arabis glabra*), blue dicks (*Dichelostemma capitatum*), shooting star (*Dodecatheon hendersonii*), miniature lupine (*Lupinus bicolor*), California fluff-weed (*Micropus californicus*), Kellogg's yampah (*Perideridia kelloggii*), popcorn-flower (*Plagiobothrys nothofulvus*), western buttercup (*Ranunculus occidentalis*), lacepod (*Thysanocarpus

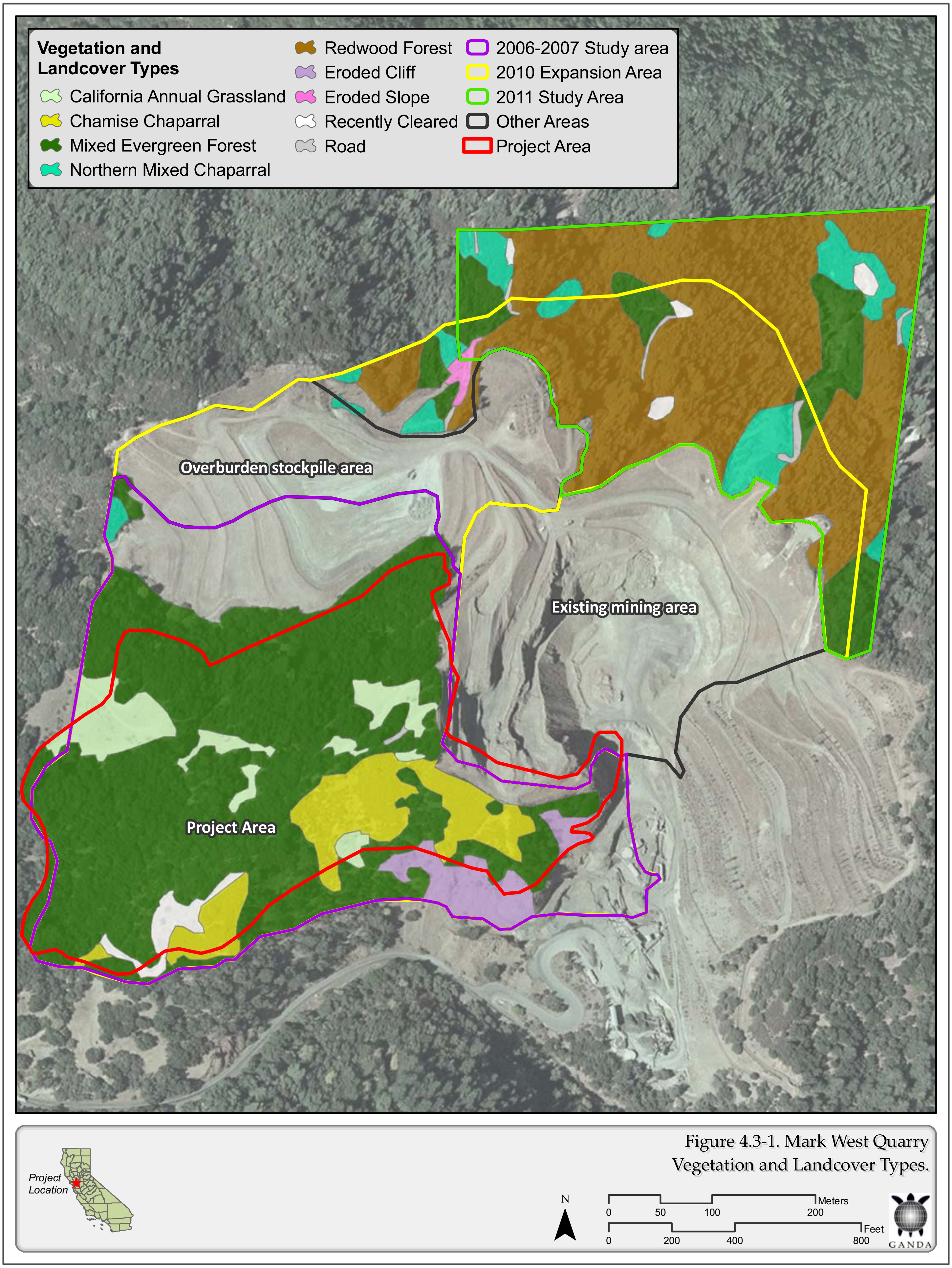

Figure 4.3-1. Mark West Quarry Vegetation and Landcover Types.

curvipes), and several native clovers (*Trifolium barbigerum, T. ciliolatum, T. microcephalum*, and *T. oliganthum*).

One special-status plant, Jepson's linanthus (*Leptosiphon jepsonii*), was found in one location in the California Annual Grassland on the project site. This species is discussed further in Section 5 below.

Grasslands support a variety of small mammals and provide important foraging habitat for raptors and other bird species. Birds commonly found in grasslands include red-tailed hawk (*Buteo jamaicensis)*, American kestrel (*Falco sparverius*) and western meadowlark (*Sturnella neglecta*). Common mammals include black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*). Rodent burrows in grassland habitats also provide essential upland refuge sites for some amphibians and reptiles.

Chamise Chaparral

Chamise Chaparral is a dense scrub vegetation of moderate height with an overstory made up almost entirely of chamise (*Adenostoma fasciculatum*). It grows on very dry, rocky, steep slopes that are often south-facing. The vegetation is highly fire-prone and burns frequently. Chamise is a fire-dependent shrub that rapidly sprouts back from a basal root crown after fire. The understory tends to be sparse, with some forbs and sub-shrubs occupying spaces between the dominant shrubs. This type is widespread in the Coast Ranges and Sierra Nevada foothills. Chamise Chaparral corresponds to the *Adenostoma fasciculatum* Shrubland Alliance of Sawyer and others (2009).

On the project site, Chamise Chaparral is the dominant vegetation on the steep south-facing slope directly above Porter Creek Road that forms the southern boundary of the project site. Patches of Mixed Evergreen Forest and California Annual Grassland also are found on this slope, but it is mainly vegetated with Chamise Chaparral. This slope would not be affected by mine expansion, and most of it is too steep to access safely. Details on its composition were derived from observations of the upper slope from the trail that runs along the ridge at the top of the slope, and from examining the slope with binoculars. Chamise is the dominant shrub in this vegetation type, with associates that include: toyon (*Heteromeles arbutifolia*), deerweed (*Lotus scoparius*), and sticky monkeyflower (*Mimulus aurantiacus*). No special-status plants were found within the small area of Chamise Chaparral that could be observed directly from the ridge trail. The total acreage of Chamise Chaparral within the current project area boundary is approximately 3.87 acres.

Chaparral habitat can provide protection and habitat for a number of bird species, including California quail (*Callipepla californica),* California thrasher (*Toxostoma redivivum),* California towhee (*Pipilo crissalis)*, spotted towhee (*Pipilo maculatus*), Western scrub jay (*Aphelocoma californica*), Anna's hummingbird (*Calypte anna*) and bushtit (*Psaltriparus minimus*). Along with bird species, black-tailed deer (*Odocoileus hemionus)*, cougar (*Puma concolor*), bobcat (*Lynx rufus*), coyote (*Canis latrans)* and several small rodent species can inhabit these areas.

Scrub Oak Chaparral

Scrub Oak Chaparral is a very dense and tall form of chaparral that is dominated by scrub oak (*Quercus berberidifolia)* with mountain mahogany (*Cercocarpus betuloides*) as a sub-dominant. Scrub Oak Chaparral occupies sites that are, in general, higher in elevation, moister and somewhat more favorable for plant growth than the very steep, dry, rocky slopes typical of many chaparral types. Therefore, it can recover from fire more quickly than other types. This type corresponds to the *Quercus berberidifolia* Shrubland Alliance in Sawyer and others (2009). This vegetation type formerly occupied portions of the Overburden Stockpile Area.[15]

Northern Mixed Chaparral

Northern Mixed Chaparral consists of a dense growth of medium-to-tall shrubs that grow on dry, rocky slopes. The dominant plants include one or more species of manzanita (*Arctostaphylos* spp.) and/or ceanothus (*Ceanothus* spp.), the presence of which distinguish this type from the other forms of chaparral found within the project site that contain chamise and scrub oak. This type is widespread in the Klamath Mountains, the Coast Ranges and the Sierra Nevada foothills. Because this type has a mixture of dominant species, there is no single equivalent alliance in Sawyer and others (2009).

Northern Mixed Chaparral is present in the northwestern part of the property (not part of the current project site but within the area assessed for cumulative impacts), on a south-facing slope next to the project site boundary. This form of chaparral contains the highest diversity of shrub species of the three types of chaparral found within the project site. No single species dominates this vegetation. The co-dominants include: Cushing's manzanita (*Arctostaphylos glandulosa* ssp. *cushingiana*), Stanford manzanita (*Arctostaphylos stanfordiana* ssp. *stanfordiana*), wavy-leaved ceanothus (*Ceanothus foliosus* ssp. *foliosus*), Parry ceanothus (*Ceanothus parryi*), toyon, coyote brush (*Baccharis pilularis)*, chamise, chaparral pea and poison oak. No special-status plants were found in the Northern Mixed Chaparral habitat on the project site.

Wildlife using this vegetation community would be similar to those described above under chamise chaparral.

Mixed Evergreen Forest

Mixed Evergreen Forest is typically found in the transition areas between Redwood Forest and Oak Woodland. This forest is dominated by broad-leaved evergreen and deciduous trees that form a closed canopy. Madrone (*Arbutus menziesii*) is an indicator

[15] Scrub Oak Chaparral formerly was found in the northwestern part of the project site, on the north-facing slopes of a shallow, west-draining canyon (in the Overburden Stockpile Area). All of the site's Scrub Oak Chaparral was cleared by 2006-2007 (prior to the issuance of the NOP for this EIR) when the area it occupied was used for overburden storage from emergency landslide repair operations. Formerly, scrub oak in this area was very dense, reaching 15 feet or more in height. Associated species included: chaparral pea (*Pickeringia montana*), golden-fleece (*Ericameria arborescens*), sticky monkeyflower, Cushing's manzanita and poison oak (*Toxicodendron diversilobum*). No special-status plants were found in a 2005 preliminary survey of the site before the Scrub Oak Chaparral was cleared.

for this type. California black oak (*Quercus kelloggii*), Oregon oak (*Quercus garryana*), coast live oak (*Quercus agrifolia*) and Douglas fir (*Pseudotsuga menziesii*) are all prominent in the Northern California form of this type. Mixed Evergreen Forest occurs on slopes with moist, well-drained, coarse soils, usually within the summer fog zone. It is a transition type, both geographically and biologically, between dense coastal conifer forests (especially Redwood Forest) and open interior oak woodlands. It extends more or less continuously from Santa Cruz County to the Oregon border in the outer Coast Ranges, and occurs sporadically south of Santa Cruz County to Santa Barbara County. There is no equivalent alliance in Sawyer and others (2009).

Mixed Evergreen Forest is the dominant vegetation of the project site except on the steep slope at the southern boundary. The total acreage of Mixed Evergreen Forest within the current project area boundary is approximately 21.15 acres. The tree canopy is very dense (mostly 100% cover), and is composed of California black oak, coast live oak, madrone, California bay (*Umbellularia californica*), redwood (*Sequoia sempervirens*), and Douglas fir. The understory varies from sparse to dense, and is composed of many species of ferns, annual and perennial forbs, and small to large shrubs. Common manzanita (*Arctostaphylos manzanita* ssp. *manzanita*), poison oak and toyon are common understory shrubs. One species of special-status plants, Napa false indigo, was found in the understory of the Mixed Evergreen Forest (but not within the proposed mine expansion area).

Mixed evergreen forest provides habitat for a variety of migratory and nesting birds, and several mammal species. Redwood, oak, bay and manzanita (*Arctostaphylos* sp.) trees, along with a variety of scrub plants including coyote bush and *Ceanothus* sp., can provide habitat and refuge for red-tailed hawk, turkey vulture (*Cathartes aura*), western scrub jay, dark-eyed junco (*Junco hyemalis*), California towhee, and nuthatch (*Sitta* sp.). In addition to birds, this area provides habitat for several mammal species, including black-tailed deer, cougar, bobcat, coyote, raccoon (*Procyon lotor*) and woodrat (*Neotoma* sp.).

Plants of Disturbed Areas

Disturbed sites within the project site include: unpaved roads, a bladed trail and an adjacent recently cleared area along the southernmost ridge, and eroded cliffs above Porter Creek Road and adjacent to the active mining area. The new trail and some other disturbed sites were vegetated with a mixture of native and non-native plants derived either from naturally dispersed propagules or from seeds included in the hydroseed mix used for erosion control. At a few sites, the hydroseeded roads supported two native plants: common meadowfoam (*Limnanthes douglasii* ssp. *douglasii*) and California semaphore grass (*Pleuropogon californicus*). These are obligate wetland species typically found in vernal pools under natural conditions, which would not be expected in dry, hilly terrain like that of the project site. These plants likely were present as seeds in the straw or hydroseed mix used for erosion control. These revegetated areas and other disturbed sites do not constitute natural vegetation and cannot be classified using the system of Holland (1986) or of Sawyer and others (2009).

4. *Tributaries and Wetlands*

Project site tributaries to Franz Creek and Porter Creek and on-site wetland areas were surveyed for potential special-status species habitat and to determine impacts to wetlands and streams. Five tributaries (A-E) were surveyed along with two ponds: Wetland A and a pond at the base of Tributary A on the Less Property west of the project site. In addition, two tributary confluences along Porter Creek and several settling ponds on the project site were surveyed (Figure 4.3-2). The five tributaries were identified during previous wetland delineation surveys as potentially subject to U.S. Army Corps of Engineers (Army Corps) jurisdiction pursuant to Section 404 of the Clean Water Act (Macmillan 2004).

Wetlands and surrounding tributaries found on the project site can support aquatic invertebrates and provide habitat for amphibians such as Pacific chorus frog (*Pseudacris regilla*), western toad (*Anaxyrus boreas*), California newt (*Taricha torosa*) and rough-skinned newt (*T. granulosa*). Ponds can provide habitat for the western pond turtle and foraging habitat for garter snakes (*Thamnophis elegans*) and other reptile species. In winter and spring, wetlands also provide foraging habitat for resident and migratory birds such as killdeer (*Charadrius vociferus*), snowy egret (*Egretta thula*), and several duck species. Tributaries found within the project site could potentially provide habitat for juvenile coho salmon (*Oncorhynchus kisutch*), steelhead (*Oncorhynchus mykiss*), and Chinook salmon (Oncorhynchus tshawytscha), although habitat conditions on the project site present a low probability for presence of these fish species. Specific results for wetland and tributary surveys are provided in the following discussions. Descriptions of each tributary or wetland are outlined below:

Wetland A

Wetland A is located in the western section of the project site (Figure 4.3-2) and appears to have been created by the damming of a small spring. This 0.02-acre wetland is located just outside the northern edge of the proposed Mine Expansion Area (Figure 4.3-2) and would not be directly impacted by the expansion project. The shallow pond margins are dominated by native plants typical of freshwater marshes such as cattails (*Typha* sp.), umbrella sedge (*Cyperus eragrostis*), and common spikerush (*Eleocharis macrostachya*). The pond is small and circular, with a diameter of approximately 14 meters during the wetter seasons and has a narrow (0.5 meters in width) outflow drainage that connects to Tributary A4. This outflow was dry during all survey rounds.

In 2006, a dip-net survey of Wetland A found tadpoles of Pacific chorus frog, and several newts were observed roaming the shoreline and upland areas. During the July 2010 site visit EIR biologists observed an abundance of Pacific chorus frog metamorphs in and around Wetland A. Tadpoles were in various stages of development including fully metamorphosed and two- and four-legged tadpoles. In January 2011, other than higher water levels attributed to winter rain run-off, Wetland A remained in similar condition to what was previously observed. No amphibians were observed at Wetland A during this survey. Surveys conducted by NCRM for the applicant in 2012 found chorus frogs at this wetland, but no other frogs were found.[16]

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[16] NCRM, "California Red-legged Frog Habitat Protection Proposal," 2012, on file with PRMD.

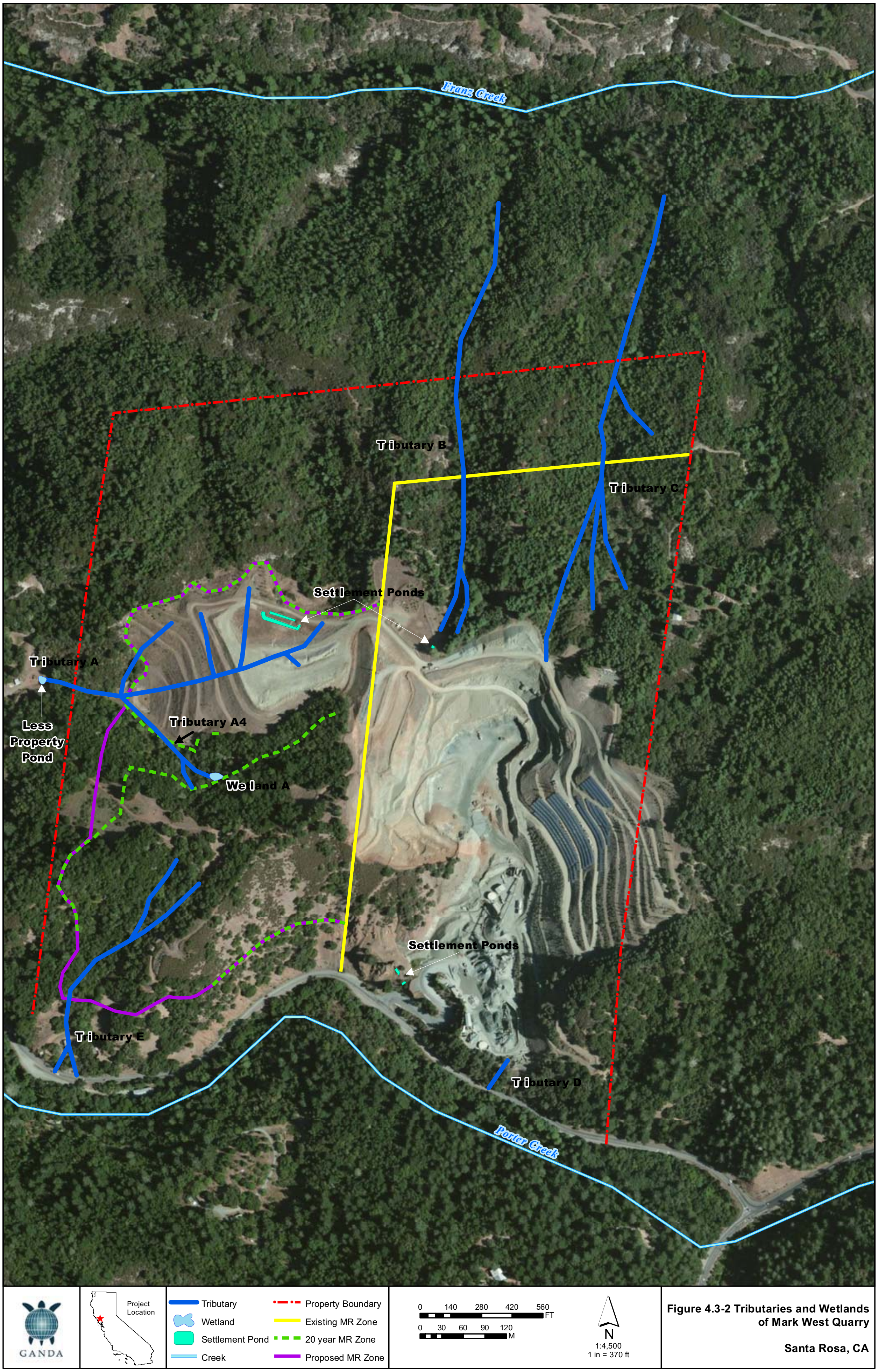


Figure 4.3-2 Tributaries and Wetlands of Mark West Quarry

Santa Rosa, CA

Figure 4.3-3 Tributary A Location of Mark West Quarry

Santa Rosa, CA

Less Property Pond

This pond is located at the base of Tributary A on the Less Property that is adjacent to the expansion parcel. It is near the end of a gravel driveway with several buildings, where a trailer, farming equipment, and construction materials are stored. The pond was approximately 3 meters in width and approximately 30-40 centimeter deep at the time of the survey. Water from the remaining western portion of Tributary A was flowing into the pond, but the outflow culvert across the driveway was dry. The pond is known to hold water year round (R. Less, personal communication, 7-29-10) and the outflow from the pond eventually drains to Porter Creek. Vegetation at the pond is typical of a freshwater marsh and includes cattails, bulrushes (*Scirpus* sp.), and curly dock (*Rumex crispus)* around the margins. There are no California red-legged frog (*Rana draytonii*) records of occurrence within a five-mile radius of the project site. However, this small ponded area could provide some habitat for this species. No protocol-level surveys were conducted for the California red-legged frog at this location.

The Less Property Pond is on private property and would not be directly impacted by the expansion project. However, there is potential for sedimentation and erosion runoff to impact this pond unless mitigation measures are implemented in the area around the remaining portions of Tributary A and A4.

Tributary A

Tributary A flows into the Less Property Pond, which ultimately drains to Porter Creek. The eastern portions of Tributary A and its smaller tributaries were removed during the emergency landslide repair operations of 2006–2007 (Figures 4.3-2 and 4.3-3). The western portion of Tributary A remains intact.

Prior to the emergency operations, Tributary A covered approximately 0.21 acres and consisted of one primary drainage and 4 minor tributaries (A1–A4) (Macmillan 2003, Figure 4.3-2). It flowed toward the west from the hills in the western central portion of the project, into the Less Property, and eventually into Porter Creek (Macmillan 2003). The remaining western portion of Tributary A, approximately 1 meter in width and 85 meters in length at the time of the survey, had a low velocity flow into the Less Property pond. During the landslide repair operations, Tributaries A1 to A3 and A5 removed. The lower portion of Tributary A4 was reconfigured to the southeastern edge of the Overburden Stockpile Area to reconnect to the western section of the original Tributary A (Figure 4.3-3). This reconfigured channel measures approximately 192 meters in length and approximately 3 to 5 meters in width. It is highly incised, consisting of large rip-rap boulders with no measureable bank, pool, or edgewater habitats. It flows to a large siltation retention pond at the southern edge of the Overburden Stockpile Area. Runoff exits this basin via a 36-inch culvert, which then flows to the Less Pond as described above. There is no wetland vegetation present and no riparian canopy cover in the pond or upstream channel. This channel directs seasonal runoff for erosion control and was dry at the time of surveys in July 2010 and January 2011. Due to the highly disturbed conditions of the reconfigured portion of Tributary A4, it is unlikely to provide suitable habitat for steelhead, California red-legged frog, western pond turtle, or other amphibian species.

The remaining upper portion of the A4 channel draining Wetland A (approximately 46 meters in length) are outside the proposed mine expansion area (Figure 4.3-2) and would not be directly impacted by the expansion project.

Tributary B

Tributary B is a tributary to Franz Creek to the north and is located on the northwestern portion of the project site (Figure 4.3-2). It is situated north of the existing quarry operation and originates as two small “erosional gullies” located in a grassland area just north from one of the main quarry access roads (Macmillan 2003). The gullies converge approximately 100 meters downstream as the terrain begins to steepen into redwood habitat (Macmillan 2003). The streambed is narrow (average 1 meter in width), consists of steep banks, and is comprised of volcanic ash deposits, and bedrock. Several steep bedrock “falls” were observed, but all potential pool habitats were dry during the surveys. Generally, the stream was filled with leaf litter and clogged in some places with large piles of woody debris.

Tributary B is seasonal and was dry at the time of the survey in July 2010, but showed some shallow (<2 inches) pockets of standing water during the January 2011 survey. The steep banks and high canopy cover of this stream limit the suitability for California red-legged frog, western pond turtle or other amphibians such as foothill yellow-legged frog. Although Franz Creek is less than a mile to the north, the lack of pool habitat and the steep slope of this north-draining tributary would be significant barriers to migrating fish species. Foothill yellow-legged frogs could potentially find suitable refuge habitat in the lower portions of Tributary B, nearer the confluence, although these areas were not surveyed because this area would not be directly impacted by the project.

Tributary C

Tributary C is located to the east of Tributary B and also flows north to Franz Creek (Figure 4.3-2). It is a seasonal stream situated near the eastern property line on the northeast section of the project site. The upper reaches of Tributary C have little canopy cover due to previous clearing of vegetation. However, dense shrub cover consisting of coyote bush and chamise make this area near the tributary virtually inaccessible to surveys. Approximately 275 meters downstream, the slope steepens into redwood and oak habitat that is virtually undisturbed (Macmillan 2003). This stream is also narrow (average 1.2 meter in width) and comprised of bedrock, boulder, and some historic volcanic ash deposit substrates. The streambed is filled with leaf litter and large pockets of woody debris. Canopy cover is high providing a constant source of shade or filtered light. There are at least three small seasonal streams that enter the mainstem of Tributary C, which were all dry at the time of surveys in July 2010 and in January 2011. The steep banks and high canopy cover of this stream limits the suitability for California red-legged frog, western pond turtle, or other amphibians such as foothill yellow-legged frog. Similar to Tributary B, the lack of pool habitat and the steep slope of this north-draining tributary would be significant barriers to migrating fish species.

Tributary D

Tributary D is located just southeast of the quarry offices and originates at the base of a series of settling tanks that are part of a man-made sediment basin (Figure 4.3-2). It is approximately 80 meters in length and highly disturbed. The streambed has been lined with plastic and filled with large boulders and rip-rap and feeds into several large steel containers acting as settling tanks for runoff into Porter Creek. Just downstream of the last settling tank, there is some wetland vegetation such as willow (*Salix* sp.). A few oak trees provide some canopy cover at the base of the tributary near Porter Creek Road. Tributary D runs through a culvert at Porter Creek Road where it enters Porter Creek. Other than the standing water in the settling tanks, the tributary was dry at the time of all surveys. An incidental observation of this area after a series of winter rains in March 2011 found Tributary D dry above the road; however, a small amount of water was draining out of the culvert into Porter Creek. Due to these highly disturbed conditions of Tributary D. It is unlikely to provide suitable habitat for California red-legged frog, western pond turtle, or other amphibian or fish species.

Tributary E

Tributary E is located on the southwestern portion of the project site and is a seasonal tributary to Porter Creek (Figure 4.3-2). It is situated southwest of Wetland A. The drainage originates as two smaller drainages (E-1 and E-2) at elevations of approximately 1,300 feet. The upper reaches of Tributary E are in mixed evergreen forest habitat that is mostly undisturbed with a high canopy cover. It is a narrow creek that is an average 1 meter in width and 370 meters in length. It crosses through a culvert under the southern ridgeline access road on the quarry property. The substrate consists mostly of small boulders and no potential pool habitats were observed. The surrounding understory is fairly open in most sections of the upper reach. In the lower reaches, it continues across a property where former residents deposited large quantities of household, construction, and landscaping debris into the streambed (this property was recently purchased by the project applicant and is now used for employee housing). Much of this debris is old, consisting of large appliances, various metal objects, and discarded plastic materials. This section of tributary was dry at the time of surveys in 2006, 2010 and 2011. Due to the high canopy cover in the upper reach and lack of potential pool habitat in this creek, along with the highly disturbed conditions at the lower reach, it is unlikely to provide suitable habitat for California red-legged frog or other amphibian or fish species.

The upper reaches of Tributary E are included in the proposed Mine Expansion Area (Figure 4.3-2) and approximately 0.1 acres would be directly impacted by the expansion project. Tributary E was identified during previous wetland delineation surveys as potentially subject to Army Corps jurisdiction pursuant to Section 404 of the Clean Water Act (MacMillan 2004).

Porter Creek

Porter Creek is located along Porter Creek Road and directly south of the quarry property (Figure 4.3-2). Tributaries D and E flow into Porter Creek through culverts under Porter Creek Road. A survey was conducted along the section of Porter Creek between these two confluence areas in July 2010 to assess habitat conditions and determine potential for project impacts. Porter Creek at this location is a low-gradient stream, approximately 10 meters in width, consisting of boulder and sedge (*Carex* sp.) habitat. At the time of the survey, flow levels were at a low velocity. The wetted channel ranged between approximately 1 and 5 meters wide. It has a high canopy cover with some pockets of filtered light. In addition, it appears to be used for recreational activity and is littered with food trash and other waste. Low lying woody debris provides some basking habitat for western pond turtle, and several areas of cobble/boulder bar could provide habitat for foothill yellow-legged frog, though none were observed. Several non-native crayfish, a known predator of tadpoles and egg masses, were seen. While this section of creek could provide foraging habitat for foothill yellow-legged frog or western pond turtle, it has a lower suitability for breeding habitat for either species due to the high canopy cover, invasive species, and the amount of human disturbance.

Franz Creek

Franz Creek is a tributary to Maacama Creek which flows to the Russian River. The creek and its tributaries drain a basin of approximately 18.9 square miles. Tributaries B and C flow to Franz Creek, which is less than a mile to the north of the project site. The stretch of creek nearest the project site has similar characteristics as those described above for Porter Creek.

Other Wetlands

The following manmade wetlands were observed and evaluated during surveys.

Two ponded areas were present just west of the driveway into the Mark West Quarry property. These two man-made ponds are connected by a small drainage and are used as settling pools for quarry runoff. These ponds support freshwater marsh plants such as cattails and, although closely abutting the driveway and a gravel overflow parking lot, provide habitat for breeding amphibians such as newts, Pacific chorus frogs, and western toads. During the survey, Pacific tree frog and Western toad metamorphs were observed at both of these ponds.

Two man-made settling ponds near the Overburden Stockpile Area are situated at the north end of this area and held water during surveys in July 2010 and January 2011. These ponds were built during emergency operations in 2006-2007 to hold ground water from this section of the project site (R. Folmar, personal communication, 7-29-10). One pond is approximately 40 meters in length and the other approximately 57 meters in length. Both are approximately 3 meters in width. The water had an alkaline appearance and the ponds appear to have no inflow or outflow. No wildlife was observed in or near the vicinity of these settling ponds during surveys and there is no vegetation at the margins.

Directly north of the overburden stockpile area, another man-made settling pond is situated just south of the headwaters of Tributary B. It is approximately 3 meters in width and the banks consist of silt and grasses. During the January 2011 survey it was holding water but it was dry during all previous surveys. Water depth was approximately 50 centimeters at the time of the 2011 survey. There are no freshwater marsh plant types at the margins. No wildlife was observed in or near the vicinity of the settling pond during surveys.

In January 2011, a shallow depression holding pooled water was observed in the parking area just west of the headwaters of Tributary B. It appears that this depression was created inadvertently as a result of emergency operations in 2006-2007. Vegetation surrounding the pool consisted of sprouted grasses, probably a result of seeding for erosion control. It was approximately 30 centimeters in depth at the time of the survey and was not observed during any previous surveys. It is seasonal and present only during winter rainy seasons. MWQ staff report having seen it deep enough in past years to observe ducks floating on it (R. Folmar, personal communication, 1-11-11). No aquatic wildlife was observed in the vicinity of this pool during the survey.

5. Special-status Species

Several species known to occur in the project vicinity are accorded "special status" because of their recognized rarity or vulnerability to various causes of habitat loss or population decline. Some of these receive specific protection defined in Federal or State endangered species legislation (see Regulatory Framework below). Others have been designated as "sensitive" based on adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. The latter category is recognized by Section 15380(b) of the California Environmental Quality Act (CEQA) Guidelines. This CEQA Guidelines section provides a definition of rare, endangered or threatened species that is broader than that included in Federal and State endangered species regulations[17]. These species are referred to collectively as "special-status species" in this document, following a convention that has developed in practice but has no official sanction. The various categories encompassed by the term, and the legal status of each, are discussed in the Regulatory Framework component of this section below. For purposes of this EIR, special-status species include:

1. Plant and animal species designated as rare, threatened or endangered under the Federal or State endangered species acts;
2. Species that are candidates for listing under either Federal or State law;
3. Species designated by the USFWS as species of concern or species of local concern, or by CDFW as species of special concern;
4. Species protected by the Federal Migratory Bird Treaty Act (16 U.S.C. 703-711);
5. Bald and golden eagles protected by the Federal Bald and Golden Eagle Protection Act (16 U.S.C. 668)[18]; and
6. Species such as candidate species and CNPS List 1 and 2 species that may be considered rare or endangered pursuant to Section 15380(b) of the CEQA Guidelines.

Table E-1 in Appendix E lists 27 special-status plant species and 18 special-status wildlife species known or reported to occur in the vicinity of the project site based on data in the CNDDB (2011), CNPS Electronic Inventory (2011), special-status species information from the USFWS (2010), field surveys of the project site discussed above, and biological literature of the region. Special-status plants and wildlife are evaluated in

[17] For example, there is a general agreement among biologists, ecologists and other resource specialists, that vascular plants listed as List 1 or 2 by the CNPS meet the broader definition in CEQA Guidelines Section 15380(b).

[18] Bald eagles are no longer a listed species under the Endangered Species Act; however, they are still provided protection under the Bald and Golden Eagle Protection Act.

this document based on a plausible likelihood of habitat loss or project-related disturbance occurring during the implementation of the proposed project.

Special-Status Plant Species

Two species of special-status plants were found on the project site during surveys conducted in 2006 and 2007 for this project. Additional special-status plant localities were found during 2011 surveys conducted in the area zoned MR in the existing mining area in the northeast part of the Mark West Quarry property (i.e., part of the area assessed for cumulative impacts in this EIR), which is not included in this project. All special-status plant localities detected in 2006, 2007, and 2011 are shown in Figure 4.3-4. The following species accounts provide a summary of the characteristics and geographic distribution for each species, and their locations within the study area.

Napa false indigo (Amorpha californica var. napensis)

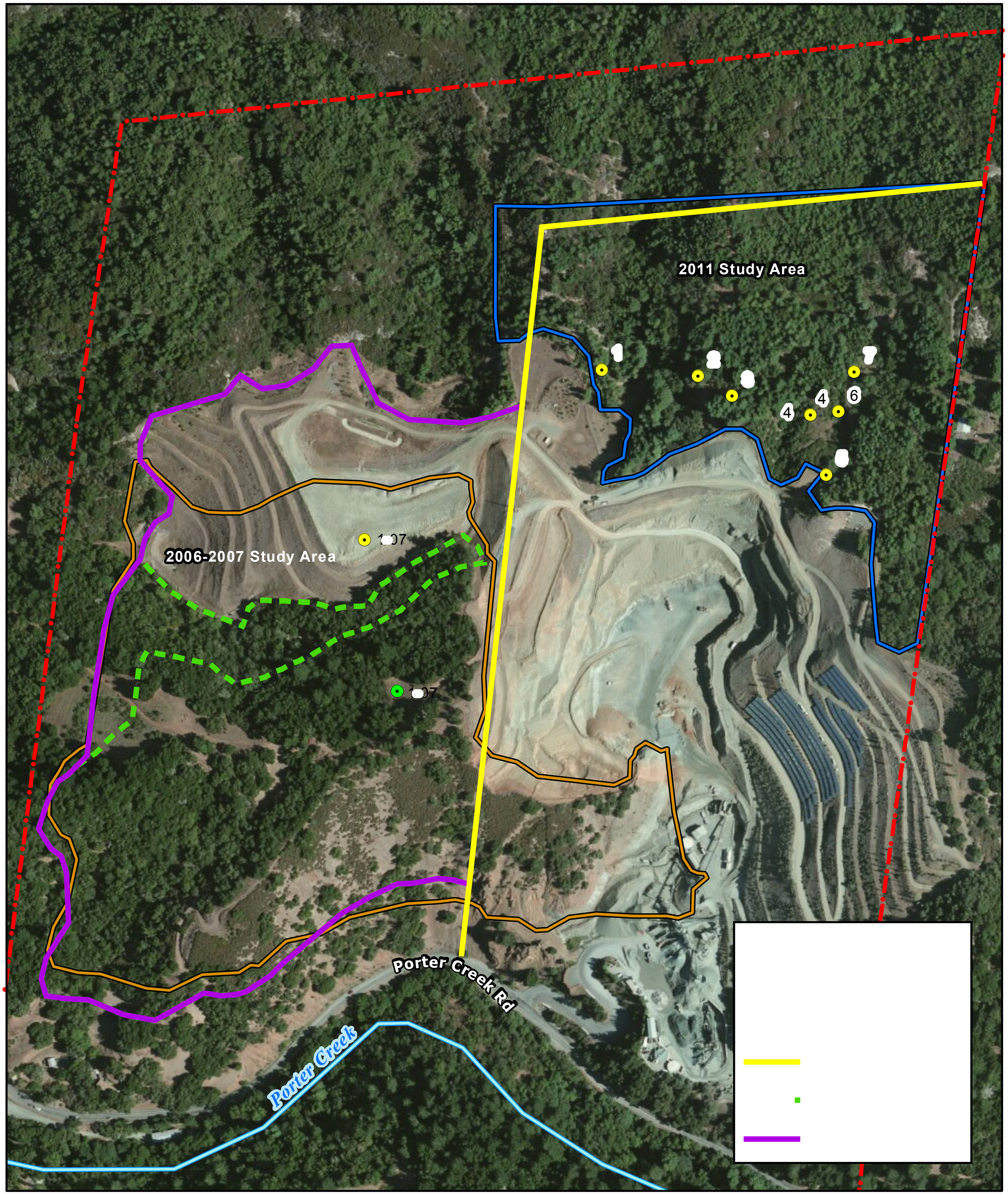
Napa false indigo is a deciduous, many-branched large shrub or small tree in the Pea Family (*Fabaceae*). The large, pinnately compound, light-green leaves are distinctive. The flowers are very small, purplish-red, and are borne in elongated inflorescences at the ends of the branches. Its typical habitat is shaded north-facing slopes, in the understory of oak forests and Mixed Evergreen Forest. This subspecies is most abundant in Sonoma, Marin and Napa counties, with scattered other locations. The California Natural Diversity Database (2011) lists 45 existing locations for Napa false indigo, including 18 that have been verified recently, and 27 that are historic. Historic locations are those that have not been verified in 20 years or more (CNDDB 2011). Napa false indigo is designated California Rare Plant Rank (CRPR) 1B.2 (CNPS 2011), meaning that it is rare and endangered in California and elsewhere. Plants with this designation typically qualify for protection under the California Environmental Quality Act (CEQA) (CEQA Guidelines, Section 15380).

In 2011, seven localities (Figure 4.3-4, #s 1-7) of Napa false indigo containing 93 plants were found in the area zoned MR on the existing mining parcel, which is part of the area assessed for cumulative impacts in this EIR.[19]

Jepson's linanthus (Leptosiphon jepsonii)

Jepson's linanthus is an annual herb with pale pink flowers in the Phlox Family (*Polemoniaceae*). Jepson's linanthus was first named and described in 1996 as *Linanthus jepsonii*, a member of the *Linanthus androsaceus* complex. The second edition (2012) of *The Jepson Manual* (Baldwin et. al., 2012) includes this species in the new genus *Leptosiphon*). Jepson's linanthus is found mainly in the inner North Coast Ranges in Lake, Napa and eastern Sonoma counties, with outlying locations in Yolo County (Jepson Online Interchange 2012). Its habitat is open or partially-shaded grassy slopes, principally on volcanic soils. Known locations include several that are less than

[19] Napa false indigo was located and mapped in one locality on the project site during a reconnaissance survey on December 13, 2005, prior to the issuance of the NOP for this EIR (Figure 4.3-4, locality #1-07); however, those plants were removed the following year in the course of conducting the emergency landslide repair. No other individuals of Napa false indigo were found within the proposed mine expansion area.



Special-status Plants

- Napa false indigo (*Amorpha californica* var. *napensis*)
- Jepson's linanthus (*Leptosiphon jepsonii*)

Figure 4.3-4
Mark West Quarry
Special-status plant localities

N
1:5,000

0 150 300 450 600 Feet

0 50 100 150 200 Meters

GANDA

two miles from the study area, at Pepperwood Ranch. Jepson's linanthus is designated CRPR 1B.2 (CNPS 2011), meaning that it is considered rare and endangered in California and elsewhere. The California Natural Diversity Database (CNDDB 2011) lists 39 existing locations for Jepson's linanthus, of which 26 are recent and 13 are historic (unverified for 20 years or more).

Within the project site, one locality of Jepson's linanthus was found in California Annual Grassland, in a partially shaded site at the boundary of grassland and Mixed Evergreen Forest (see Figure 4.3-4, locality #1-07). This locality contained about 400 individuals in 2006. Annual plants like Jepson's linanthus can vary greatly in abundance and distribution from year to year.

6. Special-status Wildlife Species

Seven Federally listed species that may be affected by the proposed project have been identified in the nine USGS 7.5 minute quads associated with the project site. This includes one invertebrate, three fish, two amphibians, and one bird species (see Table 4.3-1, which also shows special-status species listed by the State). None of these species has designated critical habitat within the project site. A search for USFWS critical habitat areas reported one result for California Central Coastal steelhead critical habitat within less than one mile of the project site in Franz Creek, and several results within a five-mile radius of the project site in streams within the Maacama, Napa River, Mark West Springs and Russian River watersheds. Additional State listed special-status species that may be affected by the project include one invertebrate, two fish, three amphibians, one bird, and one mammal species.

Those species or their habitats were identified as having moderate potential to be impacted by project construction activities and are described below in Table 4.3-1, and in the following text. The complete USFWS species list is included in Appendix E.

Table 4.3-1
Assessment of Potential for Listed Wildlife Species
Impacted by Project Activities

Species Name	Common Name	Species Status*		Habitat Requirements	Potential to be Impacted by Project Activities
		Federal	State		
Invertebrates					
Syncaris pacifica	California freshwater shrimp	E	E	Instream pools with undercut banks.	**Low.** Two CNDDB occurrence records in Franz Creek and Napa River within 5-mile radius, but no suitable habitat within project site.
Fish					
Hypomesus transpacificus	Delta smelt	T	T	Brackish water habitat in Delta sloughs.	**None.** Outside of known range. Populations too far from project site to occur.
Lavinia symmetricus navarroensis	Navarro roach	–	SSC	Found in warm, intermittent streams as well as cold, aerated streams.	**Low.** One record within 5-mile radius on Mark West Creek, but no suitable habitat in project site.
Oncorhynchus kisutch	Coho salmon – Central California Coast ESU	E	E	Anadromous; migrates through and spawns in coastal rivers and streams.	**Low.** Outside of known range. No records in or near project site and outside of designated Critical Habitat. Occurs in Mark West Creek.
Oncorhynchus mykiss	Steelhead – Central California Coast	T	SSC	Anadromous; coastal rivers, streams and creeks from Santa Cruz County north to Russian River basin. The Central California coastal DPS includes all	**Low.** No records in or near the project site. However, critical habitat is designated in several creeks and rivers within a 5-mile radius of the Project. Known records also occur in Porter, Franz, Bidwell, Maacama, and Mark West creeks.

Table 4.3-1
Assessment of Potential for Listed Wildlife Species
Impacted by Project Activities (continued)

Species Name	Common Name	Species Status*		Habitat Requirements	Potential to be Impacted by Project Activities
		Federal	State		
				naturally spawned anadromous *O. mykiss* populations in California streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers.	
Oncorhynchus mykiss	Steelhead – Central Valley	T	SSC	Anadromous; Sacramento and San Joaquin Rivers and their tributaries.	**None.** Central Valley populations too far from project site to occur.
Oncorhynchus tshawytscha	Salmon – California Coastal Chinook	T	–	Anadromous. Remain at sea for one to six years and begin their freshwater migration at an immature stage and travel to the upper portions of the watershed to spawn in the spring.	**Low.** Known to occur in the Russian River, but stream inventory surveys conducted by CDFW in 1996 to 1997 found no observations of Chinook salmon in Franz Creek, Bidwell Creek, Maacama Creek, Mark West Creek or Porter Creek. Project site outside of designated

Table 4.3-1
Assessment of Potential for Listed Wildlife Species
Impacted by Project Activities (continued)

Species Name	Common Name	Species Status*		Habitat Requirements	Potential to be Impacted by Project Activities
		Federal	State		
					critical habitat.
Oncorhynchus tshawytscha	Salmon – Central Valley Spring-run Chinook	T	T	Anadromous; migrates through San Francisco Bay and Delta, spawns in upper Sacramento River and tributaries.	**None.** Central Valley populations too far from project site to occur.
Oncorhynchus tshawytscha	Salmon – Sacramento River winter-run Chinook	E	E	Anadromous; migrates through SF Bay and Delta, spawns in upper Sacramento River and its tributaries.	**None.** Central Valley populations too far from project site to occur.
Amphibians					
Ambystoma californiense	California tiger salamander	Sonoma Co. E, FT	T	Breeds in seasonal ponds and pools. Spends most of the year in rodent burrows or other subterranean refuges in grassland and oak savannas within 1 km of breeding pools.	**None.** No suitable habitat in project site and no records within a 5-mile radius.
Rana aurora draytonii	California red-legged frog	T	SSC	Ponds, pools of streams, freshwater marshes with submerged and	**Moderate.** Some suitable habitat in perched wetland and on private property west of project site. No

Table 4.3-1
Assessment of Potential for Listed Wildlife Species
Impacted by Project Activities (continued)

Species Name	Common Name	Species Status*		Habitat Requirements	Potential to be Impacted by Project Activities
		Federal	State		
				emergent vegetation. May move through and take temporary refuge in upland habitats near aquatic sites.	CNDDB occurrence records and outside of designated Critical Habitat.
Rana boylii	Foothill yellow-legged frog	–	SSC	Inhabits cobble bars along streams and rivers to breed. Retreats into tributaries mid-summer to spring.	**Low.** Suitable habitat in Porter and Franz creeks. Six CNDDB occurrence records in Franz, Porter and other creeks within 5-mile radius of project.
Reptiles					
Actinemys marmorata marmorata	Northwestern pond turtle	–	SSC	Freshwater ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation.	**Moderate.** Some suitable habitat at small wetland area and on private property adjacent to project site. Several CNDDB occurrence records within a 5-mile radius.
Birds					
Strix occidentalis caurina	Northern spotted owl	T	SSC	Old growth or mature forest with high canopy closure.	**Moderate.** Suitable habitat present in the north and northeastern portions of the existing quarry property. Seven CNDDB occurrence records within 5-mile radius.

Table 4.3-1
Assessment of Potential for Listed Wildlife Species
Impacted by Project Activities (continued)

Mammals					
Antrozous pallidus	Pallid bat	–	SSC	Grasslands, shrublands, woodlands, open/ dry habitats, rocky outcrops, cliffs, crevices.	**Moderate.** Some suitable habitat on project site. Two CNDDB occurrences within 5-mile radius of project site.

Source: Garcia & Associates
***Status Codes:**
Federal Status – E (Endangered); T (Threatened); C (Candidate); D (Delisted)
State Status – E (Endangered); T (Threatened); SSC (California Department of Fish and Wildlife State Species of Concern

Species Accounts

Federally Listed Species

The following describes eight Federally-listed species identified by the USFWS as having potential to be affected by projects in the county and which have records of occurrence within a five-mile radius of the project site. All but three of these species are also listed by the State of California as endangered or threatened. These three are Central California Coastal and Central Valley Steelhead, California red-legged frog, and Northern spotted owl, which are listed as State species of concern. The project site is well outside the range for Delta Smelt; thus this species will not be addressed further in this report.

California Freshwater Shrimp

The California freshwater shrimp (*Syncaris pacifica*) is listed as endangered by both the State and Federal governments. This shrimp is found in low-elevation, low-gradient, perennial freshwater streams with structurally diverse banks, undercut banks, exposed roots, overhanging woody debris, or overhanging vegetation. However, they have been documented in perennial pools and in intermittent streams with perennial pools. Existing populations are threatened by introduced predators such as non-native fish and bullfrogs, viticultural operations, bank disruption, and urban and commercial development. These shrimp are known to occur only in Marin, Napa, and Sonoma counties. The closest known occurrences to the project site are in Franz Creek and in Garnett Creek, a tributary to the Napa River. A review of stream inventory reports for Bidwell, Maacama, Mark West and Porter Creeks reported no observations of California freshwater shrimp. Suitable habitat for the freshwater shrimp does not occur within the project site. Due to a deficiency of perennial pools, high gradient, and lack of bank complexity in the tributaries adjacent to the project, it is unlikely that this species would occur in these drainages and would, therefore, not be directly affected by project activities.

Coho Salmon

The Central California Coast coho salmon is Federally listed as endangered. Historically distributed throughout the North Pacific Ocean from central California to Point Hope, Alaska, through the Aleutian Islands, and from the Anadyr River, Russia, south to Hokkaido, Japan, salmonid species on the west coast of the U.S. have experienced dramatic declines during the past several decades as a result of human-induced and natural factors. Coho salmon have a relatively fixed three-year life cycle. Adults typically return to their natal stream in the fall to spawn. In California, adult Coho typically return to spawning areas between November and January, often moving upstream with the high water of winter storms. Most spawning occurs in December and January. Adults spawn in clean gravels and cobbles, typically at tail crests or riffles where surface waters are forced into the gravel, thereby keeping the gravels clean and the eggs well oxygenated. Adult Coho spawn in smaller waters and tributaries than Chinook, although there is some overlap with habitats chosen by steelhead. Juvenile Coho are found in all habitat types, and habitat preferences change with seasonal changes to stream conditions. Coho usually segregate themselves from steelhead and other salmonids, often choosing deeper waters with more woody debris and cover. Juvenile Coho remain in their natal streams for their full first year, and begin emigrating to the ocean during the spring of their second year. Coho require cool water temperatures, and are excluded from streams where summer water temperatures exceed 22-25°C for extended periods of time; however, some data suggests that the upper thermal limit may be closer to 18°C. In California, most Coho remain in the ocean for the end of their second and third years, before returning as adults at the end of their third year. Some precocious males return as two year old ‘Jacks.’ All Coho adults die after spawning. The project site is outside of Critical Habitat, and there are no CNDDB occurrence records within a five-mile radius of the project site for this species. However, Coho salmon were observed in Mark West Creek during surveys conducted in 2011 (Sotoyome Resource Conservation District email, September 20, 2011).

Central California Coastal Steelhead

Central California Coast Steelhead are listed as Federally threatened species. Steelhead is the anadromous form of rainbow trout, a salmonid native to western North America and the Pacific Coast of Asia. Steelhead have a complex and variable life history. Although they are generally anadromous, juveniles spend a wide range of time rearing in fresh water (1-3 years), and some individuals may remain in fresh water throughout their life cycle. Steelhead spend between one to four growing seasons in the ocean before returning to their native freshwater streams to spawn. Adults generally begin returning to streams with the first heavy rains of fall, with peak migration occurring in winter to early spring. In California, most steelhead spawn from December through April in small streams and tributaries where cool, well-oxygenated water is available year round. Steelhead usually spawn in high-gradient, upper reaches of tributaries. Juvenile steelhead can occupy a variety of in-stream habitats that provide adequate cover, food supply, and cold water temperatures. Outmigration usually occurs between February and June and requires sufficiently high flows and cool water temperatures.

Critical habitat was previously designated for this population in all accessible stream reaches in its geographic range. This designation was rescinded by Federal court decision in 2002. However, critical habitat was re-issued for the Central California Coast Steelhead population in 2005 to include all known populations. The Central California coastal population includes all naturally spawned anadromous steelhead populations in California streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers. Although potential habitat for this fish is not found within the vicinity of the project site, critical habitat is present within a five-mile radius in Mark West Creek, Humbug Creek, Franz Creek, Napa River, Jericho Canyon Creek, and Garnett Creek. Central California coastal steelhead is known to occur in several Sonoma and Napa creeks and streams, including Franz Creek, Bidwell Creek, Maacama Creek and Mark West Creek (CDFG 2006a-d).

Chinook Salmon

California Coastal Chinook salmon are listed as Federally Threatened. Chinook salmon are anadromous fish that spawn only once, and then die. Juvenile Chinook spend their first three months to two years in freshwater before emigrating to the ocean. Most Chinook salmon remain at sea for one to six years and have different seasonal (i.e., spring, summer, fall, or winter) “runs”. Multiple runs can co-exist within a single river system. Adult California Coastal Chinook salmon have a typical “fall-run” pattern and are “ocean-type” Chinook, with a short juvenile residence time in fresh water. Fry typically emigrate during the winter and spring. Chinook spawning sites have larger gravel and more water flow forced through the gravel than the sites used by other Pacific salmon. After laying eggs, adult Chinook guard them for a period ranging from a few days to one month before dying. Chinook salmon eggs will hatch, depending upon water temperatures, in three to five months following deposition. Chinook salmon are large channel spawners, and only occur in the mainstem Russian River and in some main tributaries.

Although Chinook Salmon are known to occur in the Russian River, stream inventory surveys conducted by CDF in 1996 to 1997 found no observations of Chinook salmon in Franz Creek, Bidwell Creek, Maacama Creek, Mark West Creek or Porter Creek (CDF 2006a-e).

California Tiger Salamander

The California tiger salamander (*Ambystoma californiense*) is a Federally Endangered species in Sonoma County. It is Federally Threatened throughout its entire range, and is listed as a California Threatened species. The California tiger salamander of Sonoma County is an isolated population that occurs only in the Santa Rosa Plain (USFWS 2003, CDFG 2010).

The California tiger salamander is a large, terrestrial salamander that breeds in vernal pools and other seasonal or permanent ponds. They spend up to 90 percent of their lives in upland habitats. They typically occur in grassland and oak savanna habitats and use rodent burrows or deep soil crevices as long-term refuge sites (USFWS 2009a). Individuals may move as far as 1.2 miles between breeding ponds and upland refuge sites (USFWS 2003). Adult salamanders migrate from upland habitats to breeding ponds during late fall and early winter. The aquatic larvae hatch and develop in pools during winter and spring and require about ten weeks to complete their aquatic development. The juvenile metamorphs leave the pools to disperse into upland habitats during mid- to late spring. Adults and juveniles may also undergo dispersal movements within and between upland habitats at any time during the wet season, typically on rainy nights. There are no records of occurrence of this species within a five-mile radius of the project site and no suitable habitat exists within or near the project site. Project activities are not likely to impact this species.

California Red-legged Frog

The California red-legged frog (*Rana draytonii) i*s a Federally Threatened species that currently occurs along the Coast Ranges and within the Sierra Nevada foothills of California from Butte to El Dorado County up to 1,500 meters (4,921 feet) elevation. Critical habitat has also been designated for this species.

Adult California red-legged frogs occur primarily in perennial ponds or pools and perennial or ephemeral streams where water remains long enough (14-28 weeks) for breeding and metamorphosis of young. Habitats with the highest densities of frogs often contain dense emergent or shoreline riparian vegetation closely associated with still or slow-moving water fairly shallow to deep (> 0.5 meters). The project site lies approximately 16 miles northeast from the nearest California red-legged frog management and protection area, Recovery Unit #3. There are no records of California red-legged frog occurrence within a five-mile radius of the project site. However, one wetland (Wetland A) on the project site, and the Less pond west of the project site, could provide some suitable habitat for this species. No red-legged frogs were found on the site by biologists who prepared the original biological assessment report submitted by the project in the project application materials, or by the EIR biologists. A 2012 survey conducted by NCRM for the applicant found no red-legged frogs at Wetland A during 5 surveys conducted during the breeding season and 2 surveys conducted after the breeding season (NCRM 2012; this report is available for review at the offices of the Sonoma County PRMD).

Northern Spotted Owl

The northern spotted owl (*Strix occidentalis caurina*) is a Federally threatened species. They are found from southern Alaska to Marin County. The California spotted owl occurs in the Sierra and southern California coast ranges and is a California species of special concern. Spotted owls generally prefer mature forests and mature forest conditions. Optimum habitat for the owls is moderate to high canopy closure (60%-80%); a multilayered, multispecies canopy dominated by large ($\geq$30 inches diameter at breast height) overstory trees and an understory of shade-tolerant conifers or hardwoods; a high incidence of standing dead trees; and an abundance of downed woody debris to support prey populations. Spotted owls nest in cavities or on platforms created by deformed branches, mistletoe, or in abandoned nests of other birds or mammals. There are seven CNDDB records of occurrence for his species within a five-mile radius of the project area. The nearest record is approximately 2.75 miles to the northwest, and suitable mature mixed evergreen forest habitat occurs on the portion of the existing quarry parcel north of the existing quarry.

State Listed Species

The following describes the four additional State-listed and species of concern identified as having records of occurrence within a five-mile radius of the project site (CDFG 2010). All but one of these species are listed by the State of California as Species of Concern. The American peregrine falcon has been delisted by the USFWS, but remains listed as a threatened species by the State of California.

Navarro Roach

The Navarro roach (*Lavinia symmetricus navarroensis)* is a California Species of Concern. The Navarro roach is a sub-species of the California roach and inhabits rocky headwaters, creeks and small to medium rivers in the Russian and Navarro rivers (Froese, et al. 2006). This species is reported to live up to approximately 5 years of age. Navarro roach are omnivorous, feeding mainly on filamentous algae, but also upon aquatic insects and crustaceans. Navarro roach are relatively abundant in the Russian and Navarro Rivers in Sonoma County. The CNDDB reports one record of occurrence for the Navarro Roach in Mark West Creek within a five-mile radius of the project site. No suitable habitat occurs in the project site.

Foothill Yellow-legged Frog

The Foothill yellow-legged frog (*Rana boylii)* is listed as a California Species of Concern. The foothill yellow-legged frog inhabits streams and rivers from coastal Oregon south into coastal California, west of the Sierran crest from sea level to approximately 2,040 meters (6,700 feet). In California, it has undergone a drastic range reduction, and is extinct in numerous historic localities in the southern Sierra Nevada Mountains. Typical foothill yellow-legged frog habitat consists of cobble bars along stream or river margins with various amounts of boulder, cobble, gravel, and vegetation. Adults can be found on mainstem river margins during the breeding season from March to June, and usually retreat into tributaries during mid-summer where they remain until the following spring. The CNDDB reports six records of occurrence within a five-mile radius of the project site in Franz Creek, Porter Creek, Mark West Creek, and Humbug Creek. Potential breeding habitat does not occur within the project site.

Northwestern Pond Turtle

The Northwestern pond turtle (*Actinemys marmorata marmorata)* is listed as a California species of concern (CDFG 2010) by the California Department of Fish and Wildlife. Pond turtles require still or slow-moving temporary and permanent waters such as ponds, freshwater marshes and pools in perennial streams. Pond turtles may live for 30 to 40 years, grow slowly, and may take up to 8 years to reach sexual maturity. Mating occurs in April and May, after which females build nests along wetland margins or in adjacent uplands. Oviposition requires soil which is at least 10 cm deep, and usually takes place in a southern exposure at a site which will not flood. Females leave the watercourse in late afternoon and evening, and travel into adjacent wetland margins or uplands to build nests. Oviposition occurs in July and August, with hatchlings emerging in approximately 12 weeks. Pond turtles may remain active all year and sometimes move overland for distances of more than 300 feet (90 meters) to find a suitable nest site. They generally lay their eggs in open areas that are on dry slopes with soils rich in silt and clay. There are seven pond turtle records of occurrence within a five-mile radius of the project site. Wetland A on the project site and the Less pond at the base of Tributary A could provide some habitat for this species, although high canopy cover and lack of basking habitat at these two sites lessen the potential for this species to occur there. Some suitable basking habitat occurs in Porter Creek downstream of Tributaries D and E.

Pallid Bat

The pallid bat (*Antrozous pallidus*) is a State Species of Concern. Pallid bats occur throughout California, except in the higher elevations of the Sierra Nevada Mountains (CDFG 1998). Pallid bats inhabit a variety of habitats, including grasslands, shrublands, woodlands, and forests from sea level up through mixed coniferous forests. The pallid bat generally inhabits arid areas with rocky outcrops and vegetation dominated by dry shrubland or dry forested habitat near water. (CDFG 1998). Mating starts in late October. Following delayed fertilization, gestation lasts about 60 days, and litters are born in late spring to early summer. Litter size is typically one or two young per female. The young begin to fly at about one to one-and-a-half months. Young females attain sexual maturity during the first year, and males a year later. The CNDDB reports two records of occurrence for the pallid bat within five miles of the project site. The forested areas, remaining shrublands, and rocky outcrop area of the project site provide potentially suitable foraging and roosting habitat for this species.

7. Regulatory Framework

a. Federal Regulations

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973, as amended, provides the regulatory framework for the protection of plant and animal species (and their associated critical habitats), which are formally listed, proposed for listing, or candidates for listing as endangered or threatened under the FESA. The act has four major components: provisions for listing species; requirements for consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries); prohibitions against “taking” of listed species; and provisions for permits that allow incidental “take.” The law also discusses recovery plans and the designation of critical habitat for listed species. Both the USFWS and the NOAA Fisheries share the responsibility for administration of the law. During the CEQA review process, each agency is given the opportunity to comment on the potential of the proposed project to affect listed plants and animals.

Clean Water Act Section 404 & 401

The Army Corps of Engineers and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Section 404 of the Clean Water Act (33 U.S.C. 1344). Waters of the United States include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds as defined in Title 33 CFR Part 328. 3(a). Activities in waters of the United States regulated under Section 404 include fill for development, water resource projects (such as dams and levees), infrastructure developments (such as highways and airports) and mining projects. Section 404 of the Clean Water Act requires a Federal license or permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

Section 401 of the Clean Water Act (33 U.S.C. 1341) requires any applicant for a Federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification that the discharge would comply with the applicable effluent limitations and water quality standards. This is obtained from the State in which the discharge originates or would originate, or, if appropriate, from the interstate water pollution control agency that has jurisdiction over the affected waters at the point where the discharge originates or would originate. A certification obtained for the construction of any facility must also pertain to the subsequent operation of the facility. The responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs).

U.S. Army Corps of Engineers

The Army Corps has direct jurisdiction over activities which would alter fresh water wetlands pursuant to Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by "ordinary high water marks" on opposing channel banks. Wetlands are habitats with soils which are intermittently or permanently saturated or inundated. The resulting anaerobic conditions support plant species known as hydrophytes which show a high degree of fidelity to such soils. Wetlands are identified by the presence of hydrophilic vegetation, hydric soils (soils intermittently or permanently saturated by water), and wetland hydrology according to methodologies outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region*. In locations where wetlands are present, a jurisdictional study is required. In cases where the wetland acreage to be filled is small and no sensitive rare or endangered species occur in the area, it is possible that filling would be authorized under certain Nationwide Permits. These Nationwide Permits apply in limited circumstances where the Corps has determined that the fill would not constitute a significant impact on the environment if carried out according to the limitations and conditions of the pertinent Nationwide Permit.

If the proposed fill is not authorized under a Nationwide Permit, the applicant would be required to obtain approval under the individual permit program administered by the Corps under Section 404. When an individual permit is required, the Corps analysis would include a determination of whether the project is "water dependent." The analysis per Section 404(b)(1) must include an analysis of practical alternatives to filling of wetlands. If the Corps authorizes a permit, it can require mitigations for the loss of jurisdictional wetlands. The Corps is required to consult with the U.S. Fish and Wildlife Service, NMFS, the EPA, and California Department of Fish and Wildlife in carrying out its discretionary authority under Section 404. No permit can be issued until the RWQCB issues a certification (or waiver of such certification) that the proposed activity would meet State water quality standards. If an applicant is able to demonstrate that proposed filling of wetlands is necessary and that there is no practicable alternative to this filling, then the project mitigation plan would be reviewed by the U.S. Fish and Wildlife Service in relation to their mitigation policies.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) administers the Federal Endangered Species Act (ESA) and the Marine Mammal Protection Act. The FWS operates under a number of statutory and administrative authorities. Its basic responsibilities concern migratory birds, anadromous fish, and endangered species. If a project involves a "take" of a Federally listed species, then the FWS must approve the permit for this "taking." "Take" is defined by the ESA as harassing, harming, pursuing, shooting, wounding, trapping, capturing, or collecting any listed wildlife species. Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter.

Take incidental to an otherwise lawful activity may be authorized by one of two procedures. If a Federal agency is involved with the permitting, funding or implementing of the project, then initiation of formal consultation between that agency and USFWS, pursuant to Section 7 of the ESA, is required if it is determined that the proposed project may affect a Federally listed species. Such consultation would result in a biological opinion that addresses anticipated effects of the project on listed and proposed species and may authorize a limited level of incidental take. If a Federal agency is not involved with the project, then an "incidental take" permit pursuant to Section 10(a) of the ESA should be obtained.

The USFWS is an advisory agency to the Army Corps on Section 404 and Section 10 projects. The USFWS will review mitigation plans for these projects. The USFWS identifies four different resource categories with criteria and mitigation goals for each. The Fish and Wildlife Service will review the resources on a site and assign a category to each. Each category has a specific set of mitigation requirements.

National Oceanic and Atmospheric Administration–Fisheries

NOAA Fisheries administers the Federal Endangered Species Act and the Marine Mammal Protection Act as they pertain to marine and anadromous species. NOAA Fisheries also advises the Army Corps of Engineers on Section 7 and Section 404 permits for projects that could affect fish habitat.

The Migratory Bird Treaty Act & Bald and Golden Eagle Protection Act

The Federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.), Title 50 Code of Federal Regulations (CFR) Part 10, prohibits taking, killing, possessing, transporting, and importing of migratory birds, parts of migratory birds, their eggs, and their nests, except when specifically authorized by the Department of the Interior. As used in the act, the term “take” is defined as meaning, “to pursue, hunt, capture, collect, kill or attempt to pursue, hunt, shoot, capture, collect or kill, unless the context otherwise requires.” With a few exceptions, most birds are considered migratory under the MBTA. Disturbance that causes nest abandonment and/or loss of reproductive effort or loss of habitat upon which these birds depend would be in violation of the MBTA.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668) was passed in 1940 to protect bald eagles and was later amended to include golden eagles. Under the act it is unlawful to import, export, take, sell, purchase, or barter any bald eagle or golden eagle, their parts, products, nests, or eggs. Take includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing eagles.

b. State of California Regulations

California Endangered Species Act

The State of California enacted two laws similar to the Federal Endangered Species Act: the California Native Plant Protection Act (NPPA) of 1977 and the California Endangered Species Act (CESA) of 1984. The second expanded upon the first, and enhanced legal protection for plants, but the NPPA remains part of the California Fish and Game Code. To align with the Federal Endangered Species Act, CESA created the categories of “threatened” and “endangered” species. It converted all “rare” animals into the CESA as threatened species, but did not do so for rare plants. Thus, these laws provide the legal framework for protection of California-listed rare, threatened, and endangered plant and animal species. The California Department of Fish and Wildlife implements both the NPPA and CESA, and its Wildlife and Habitat Data Analysis Branch maintains the California Natural Diversity Database (CNDDB), a computerized inventory of information on the general location and status of California’s rarest plants, animals, and natural communities. During the CEQA review process, the CDFW is given the opportunity to comment on the potential of the proposed project to affect listed plants and animals.

Fully Protected Species

The classification of “fully protected” was the CDFW’s initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibians and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under CESA and/or FESA. The Fish and Game Code sections (fish at §5515, amphibians and reptiles at §5050, birds at §3511, and mammals at §4700) dealing with “fully protected” species state that these species “…may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species, ” although take may be authorized for necessary scientific research. This language makes the “fully protected” designation the strongest and most restrictive regarding the “take” of special status species. In 2003, the code sections dealing with fully protected species were amended to allow the CDFW to authorize take resulting from recovery activities for State-listed species. Species on the “Watch List” consist of taxa that were previously California species of special concern (SSCs) but no longer merit SSC status or which do not meet SSC criteria but for which there is concern and a need for additional information to clarify their status.

Species of Special Concern

Species of special concern (SSCs) are broadly defined as animals not listed under the FESA or CESA, which are nonetheless of concern to the CDFW because they are declining at a rate that could result in listing or because they historically occurred in low numbers and known threats to their persistence currently exist. This designation is intended to result in special consideration for these animals by the CDFW, land managers, consulting biologists, and others, and is intended to focus attention on the species to help avert the need for costly listing under FESA and CESA and cumbersome recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them. Although these species generally have no special legal status, they are given consideration under CEQA during project review.

Porter-Cologne Water Quality Control Act

Waters of the State are defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the State.” The RWQCB protects all waters in its regulatory scope, but has special responsibility for isolated wetlands and headwaters. These waterbodies have high resource value, are vulnerable to filling, and may not be regulated by other programs, such as Section 404 of the Clean Water Act. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program, which regulates discharges of dredged and fill material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require an ACE permit, or fall under other Federal jurisdiction, and have the potential to impact Waters of the State are required to comply with the terms of the Water Quality Certification Program. If a proposed project does not require a Federal license or permit, but does involve activities that may result in a discharge of harmful substances to waters of the State, the RWQCB has the option to regulate such activities under its State authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

California Fish and Game Code Sections 1600-1616

Streams, lakes, and riparian vegetation essential as habitat for fish and other wildlife species are subject to jurisdiction by the CDFW under Sections 1600-1616 of the California Fish and Game Code. A 1602 Lake and Streambed Alteration Agreement is generally required for any activity that will substantially divert the natural flow of a stream, substantially alter its bed or bank, use any material from the streambed, or deposit material into a stream or lake. Such an agreement would usually include a requirement that there be no net loss of wildlife habitat values or that lost acreage would be replaced. Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFW.

Sensitive Vegetation Communities

Sensitive vegetation communities are natural communities and habitats that are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. These resources have been defined by Federal, State, and local conservation plans, policies or regulations. The CDFW ranks sensitive communities as “threatened” or “very threatened” and keeps records of their occurrences in its CNDDB. Sensitive vegetation communities are also identified by CDFW on its List of California Natural Communities recognized by the CNDDB.

Impacts to sensitive natural communities and habitats identified in local or regional plans, policies, regulations or by Federal or State agencies must be considered and evaluated under CEQA (CCR: Title 14, Div. 6, Chap. 3, Appendix G).

Regulations for Oak Woodlands Protection

The State Public Resources Code (Section 21083.4) states that if a County determines that a project in its jurisdiction may result in a conversion of oak woodland that would be considered significant under CEQA, then mitigation for this impact is required. The mitigation can include 1) conservation of oaks on the site; 2) replanting oaks (can be used for a maximum of 50 percent of the required mitigation); 3) contribution to the Oak Woodlands Conservation Fund; and/or 4) other mitigations developed by the County.

Regulations for Timberland Conversion

Removal of trees and converting forestland to alternate uses requires CAL FIRE approval of a Timberland Conversion Permit. An approved Timber Harvest Plan is required to conduct the conversion activities (in accordance with Subchapter 7, Article 2 of the *Forest Practice Rules.*[20] The Harvest Plan remains in force for 3 years, with up to two 2-year extensions currently allowed.

c. California Rare Plant Ranks

Regional committees made up of professional botanists review current status information and recommendations for changes made by the California Natural Diversity Database of CDFW and the CNPS, and comment on whether changes are warranted. Changes are made if there is a consensus that this is warranted. In April 2011 the California Native Plant Society (CNPS) officially changed the name “CNPS List” to “California Rare Plant Rank.” The definitions of the ranks and the ranking system have not changed.

California Rare Plant Ranks include the following categories:

- 1A. Presumed extinct in California
- 1B. Rare, threatened, or endangered in California and elsewhere
- 2. Rare, threatened, or endangered in California, but more common elsewhere
- 3. Plants for which more information is needed
- 4. Plants of limited distribution – a “watch” list

Additionally, endangerment codes are assigned to each taxon as follows:

1. Seriously endangered in California (over 80 percent of occurrences threatened/high degree of immediacy of threat).
2. Fairly endangered in California (20-80 percent occurrences threatened).
3. Not very endangered in California (<20 percent of occurrences threatened or no current threats known).

[20] Jeanette Pedersen, CAL FIRE, personal communication 8/31/10, and Alan Robertson, CAL FIRE, personal communication, 9/3/10.

Plants designated CRPR 1A, 1B, and 2 may qualify for State listing, and are given consideration under CEQA during project review.

d. Sonoma County Regulations

Sonoma County General Plan 2020

The Sonoma County General Plan 2020 is the current governing general plan. Relevant goals and policies from the plan are presented below for informational purposes.

Goal OSRC-7: Protect and enhance the County's natural habitats and diverse plant and animal communities.

Policy OSRC-7o: Encourage the use of native plant species in landscaping. For discretionary projects, require the use of native or compatible non-native species for landscaping where consistent with fire safety. Prohibit the use of invasive exotic species.

Goal OSRC-8: Protect and enhance Riparian Corridors and functions along streams, balancing the need for agricultural production, urban development, timber and mining operations, and other land uses with the preservation of riparian vegetation, protection of water resources, flood control, bank stabilization, and habitat other riparian functions and values.

Policy OSRC-8b: Establish streamside conservation areas along both sides of designated Riparian Corridors as follows, measured from the top of the higher bank on each side of the stream as determined by PRMD: Other Riparian Corridors: 50'.

Policy OSRC-8d: Allow or consider allowing the following uses within any streamside conservation area:

4. Mining operations conducted in accordance with the County Surface Mining and Reclamation Ordinance.

Policy OSRC-8m: Apply the SCWA Flood Control Design Criteria creek setback to development along streams where necessary to protect against streambank erosion.

Sonoma County Tree Ordinance

The Tree Protection and Replacement Ordinance (No. 4014) of the Sonoma County Code sets preservation and protection standards for protected trees with a 9-inch or greater diameter at breast height. However, this ordinance does not apply to projects where trees are removed under an approved Timber Harvest Plan. Because a THP would be required for the proposed project, the ordinance does not apply.

Sonoma County Timberland Conversion

The County Code (Section 26-88-160) requires County approval of a use permit to allow conversion of timberland on properties zoned RRD. To approve such a permit, the County requires that two acres of forestland on slopes no steeper than 50% be protected in perpetuity for each acre of timberland that is converted. The cited Code Section includes several conditions that must be met for the forestland that is to be preserved.

B. Potential Impacts and Mitigation Measures

1. Criteria Used for Determining Impact Significance

The CEQA Guidelines provide that a project would have a significant impact on biological resources if it would:

1. Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service.

2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service.

3. Have a substantial adverse effect on Federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means.

4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

For the purposes of this EIR, the determination of significance is based on the above-mentioned guidelines and policies set forth by the County's General Plan and other documents as referenced in the impact discussion. Environmental impacts associated with the proposed project are discussed below.

2. Project Impacts

Less Than Significant Impacts Not Requiring Further Analysis

Criterion 6 – Plan Conflict. There is no adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan that includes the project site.

Special-status Species of Plants

Impact 4.3-A Future mining of the project site would displace a population of Jepson's linanthus. This is a potentially significant impact.

Future mining of the expansion area would result in the loss of at least one locality of Jepson's linanthus. The one locality of this species found on the site consisted of about 400 plants in 2011. However, the distribution and abundance of annual plants like Jepson's linanthus can vary greatly from year to year due to the presence of dormant seeds in the soil seedbank, and changes in environmental conditions. Jepson's linanthus is placed on CNPS List 1B.2, so impacts to this species are ***potentially significant.***

Mitigation Measures

The proposed project does not provide an opportunity to avoid or minimize direct impacts to the population of Jepson's linanthus because all of the area's vegetation would be cleared during mining activities. The EIR biologists considered the possible mitigation of attempting to replant Jepson's linanthus on the quarry property. However, this mitigation approach was rejected for the following reasons.

1. Attempts to transplant rare plants in California, especially those conducted for impact mitigation, have typically resulted in failure (Falk et al. 1996, Fiedler 1991, Fahselt 1988, Hall 1987).

2. Suitable habitat is unlikely to be found at the MWQ site. Jepson's linanthus was found only in one locality on the project site, a small patch of grassland that was especially moist because it was shaded by immediately adjacent trees. This grassland patch was also unusual because it was fairly open, and was not invaded by weedy grasses, or covered with dense thatch. That type of habitat is unlikely to be found elsewhere on the site.

3. If linanthus seeds are planted elsewhere, some may germinate and grow for a year or two, but they are unlikely to survive over the long term (see the references cited above). There are very few examples of annual plants that have been successfully translocated. Many attempts have been made in many different types of habitat, and most fail immediately, or after a few years. The few efforts that have been successful for more than a year or two, notably Tahoe yellow cress, a plant known only from the shoreline of Lake Tahoe, have been extremely expensive. More than $100,000 has been spent on research on all aspects of its life cycle, categorizing the habitat, evaluating potential outplanting sites, and conducting precision outplanting where the location of each planted seed is marked, and its fate is monitored for months.

4. There are significant technical difficulties in collecting and planting linanthus seeds (or any species), and attempting to keep alive any that germinate. First, plants have to grow from whatever seed is in the seedbank at the original location. So conditions have to be right for that in the year of the attempt to collect seed. Then, if collected seeds are outplanted, they would need to be planted at the right time, in a suitable place (see above), monitored for germination, and the area watered or weeded, if needed, to give any chance of success. And that is just the first year. Again even well-designed research-based attempts have been lengthy, costly, and often ultimately unsuccessful (Falk et al. 1996). Most special-status plant species grow only in sites with specialized conditions, and for most rare plants, these conditions are not well understood. Even when they are understood, a suitable transplantation site often cannot be acquired. Therefore, transplantation is very unlikely to be successful in mitigating project impacts,

and is not proposed. Donating voucher specimens and cleaned seed to research institutions is the recommended mitigation, as described below

4.3-A-1 Prior to ground-disturbing activities in any part of the expansion area, and for several years in succession, conduct annual focused surveys until ground clearing removes all potential habitat to identify all localities of Jepson's linanthus within the project area. Each year that plants are found, collect voucher specimens, mark the locations in the field, and collect seed when mature. Donate voucher specimens to university herbaria and donate cleaned seed to research institutions with facilities for long-term storage. Details are provided below:

1. A qualified botanist familiar with Jepson's linanthus and its habitat in Sonoma County shall conduct the focused surveys.
2. Each annual survey shall cover 100% of the California annual grassland found within the project area.
3. For each locality of Jepson's linanthus that is found, the surveyor shall record the location with a Global Positioning System (GPS) unit; record habitat information (soil type, slope position, elevation, vegetation type, associated species, etc.), and phenology (vegetative, early flowering, etc.); collect herbarium-quality voucher specimens of Jepson's linanthus and its associated species; mark the location in the field using a durable and visible marking system; and photograph Jepson's linanthus and its habitat.
4. Voucher specimens shall be collected, dried, stored and distributed according to the requirements of the receiving institution.
5. The surveyor shall make a return visit to each Jepson's linanthus locality during the time period when seeds are mature, and shall collect as much mature, dry seed as possible. Several visits each year may be needed. Seed shall be stored in paper envelopes labeled with the date, location and species name.
6. Cleaned seed shall be donated to a university or other research institution located in California that has modern cold-storage or other state-of-the-art facilities for keeping plant seed in good condition over the long term. Any required storage fees shall be paid by the project applicant.
7. Location and habitat information for all localities of Jepson's linanthus found during pre-ground-clearing surveys shall be provided to CNDDB during the calendar year that the locality is found.
8. Results of each annual survey shall be provided in memo format, and shall include a figure showing the location of all Jepson's linanthus localities found to date within the project site.

Impact Significance After Mitigation

Implementation of this measure would provide information about the species' historic presence and the conditions in which it grew. Because the plant is an annual, it can vary greatly in abundance and distribution from year to year. Documentation of its distribution will be conducted prior to actual ground clearing. Seed could be used in the future to reestablish a new population(s) when similar conditions were found and there is better understanding of how to successfully reestablish populations of this species. This may include replanting the plant as part of site reclamation. The mitigation would reduce potential impacts to Jepson's linanthus to a ***less-than-significant*** level.

Special-status Species of Birds and Bats

Impact 4.3-B Project construction and grading activities within the proposed aggregate mining area could disturb active nests of special-status birds, as well as roosts of special-status bats. This is a potentially significant impact.

No special-status bird species were observed on the project site during reconnaissance surveys. Although none of these species were observed within the proposed expansion site, potential habitat exists for the northern spotted owl in the mixed evergreen forest located in the north and northeastern portions of the existing quarry parcel (i.e., north of the existing quarry but not in the proposed mine expansion area). From a habitat perspective, there is not suitable habitat for NSO to breed on the proposed project site.

Though none were observed on the site, potential foraging and roosting habitat for pallid bat (a State Species of Concern) is present on the project site. There are two occurrence records of pallid bat within a five-mile radius of the project vicinity and potentially suitable foraging and roosting habitat occurs within the forested, remaining shrublands, and rocky outcrops of the project site. There is a moderate probability for this bat to occur on the site. There is also the potential habitat for sharp-shinned hawk (*Accipiter striatus*) on the site. This species was formerly a State Species of Concern, but is now on the State's Watch List.

Proposed grading, stockpiling, and other site disturbance would result in the removal of approximately 2.4 acres of grassland, 3.9 acres of chaparral, and 21 acres of woodland, including Redwood Forest and Mixed Evergreen Forest. If removal of the vegetation is conducted during the breeding season (February 1 through August 31), these project activities have the potential to result in direct mortality of raptors, roosting bats, and passerines nesting within woodlands, grasslands, or riparian vegetation.

If ground-disturbing activities (i.e., ground clearing or grading, including removal of shrubs), are scheduled to occur during the non-breeding season (September 1 through January 31), no mitigation is required. However, if ground-clearing activities would occur from February 1 to August 31, there would be a ***potentially significant impact*** to special-status species of birds and bats.

Mitigation Measures

4.3-B.1 Avoid disturbing active nests of raptors and other special-status birds through preconstruction surveys and creation of no-disturbance buffers during ground-clearing and grading activities associated with initiation of each mining phase. If site preparation activities are scheduled to occur during the general breeding season (February 1 through August 31), the following measures shall be implemented to avoid potential adverse effects to nesting raptors, other special-status birds, and bats:

1. A qualified wildlife biologist shall conduct preconstruction surveys of all potential nesting habitat for raptors and other special-status birds within 300 feet of construction activities where access is available.

2. If active nests of raptors or other special-status birds are found during preconstruction surveys, a no-disturbance buffer acceptable in size to CDFW shall

be created around active raptor nests and nests of other special-status birds during the breeding season or until it is determined that all young have fledged. Buffers include 300 feet for raptors and 75 feet for other nesting special-status birds. The size of these buffer zones and types of construction activities restricted in these areas may be further modified through coordination with CDFW and will be based on existing noise and human disturbance levels at each project site. Nests initiated during construction are presumed to be unaffected and no buffer is necessary. However, the "take" of any individual is prohibited.

4.3-B.2 If evidence of special-status bats in trees on the property is observed by the wildlife biologist, the following measure is required. Removal of trees or other suitable habitat showing evidence of special-status bat activity will occur during the period least likely to impact the bats as determined by a qualified bat biologist (generally between February 15 and October 15 if winter hibernacula are observed or between August 15 and April 15 if maternity roosts are present). If known bat roosting habitat is destroyed during tree or other suitable habitat removal activities, artificial bat roosts shall be constructed in an undisturbed area of the property, at least 200 feet from any project activities. The design and location of the artificial bat roost(s) shall be determined by a qualified bat biologist.

Impact Significance After Mitigation

Implementation of this measure would reduce potential impacts to nesting raptors, other special-status birds, and special-status bats to ***a less-than-significant*** level.

Special-Status Species Habitat for Amphibians and Turtles

Impact 4.3-C Project construction and grading activities within the proposed aggregate mining area could injure or kill special-status species of frogs and turtles. This is a potentially significant impact.

While no special-status species of amphibians or turtles were found during site surveys, it is possible that these species might be present now or in the future prior to expansion of mining. Mining would remove all native habitat in the mine expansion area – habitat that is needed by certain species that may occur on the site. Aquatic species that could be affected by expansion of mining include: 1) California red-legged frog, 2) foothill yellow-legged frog, and 3) northwestern pond turtle. Their status and probability of being on the project site are described below:

The California red-legged frog is a Federally-listed species that inhabits perennial ponds or pools and perennial or ephemeral streams. There are no records of this frog within a five-mile radius of the project vicinity. However, two ponds near the project site (Wetland A and the off-site Less pond) could provide potential habitat for this species. Red-legged frogs could use moist and upland habitat near the ponds, including areas on the project site used by red-legged frogs dispersing from Wetland A and the Less pond. There is a moderate probability for California red-legged frog to occur in the area. As reported earlier, no red-legged frogs were found during site surveys by the three biological consulting firms. However, because none of the surveys completed the USFWS protocol for California red-legged frog surveys, it is assumed for EIR purposes that the frog exists on the site.

The foothill yellow-legged frog is a State Species of Concern that inhabits small streams and rivers. There are six records of this frog within a five-mile radius of the project vicinity. Some habitat exists near the confluences of Tributaries D and E on Porter Creek (this area includes low-gradient cobble bars on the creek) and near the confluence of Tributaries B and C with Franz Creek. Breeding habitat for this species does not occur on the site. The frog could use the lower reaches of the tributaries as dispersal habitat (i.e., they could disperse into tributaries on the site and use these tributaries at certain periods, but not as breeding habitat). There is a moderate probability for foothill yellow-legged frog to occur in Tributaries A and E. The project would not be expected to displace breeding habitat. However, project impacts on water quality could adversely affect potential downstream populations.

The northwestern pond turtle is a Federal and State Species of Concern that inhabits permanent and seasonal ponds, lakes and slow-moving parts of streams. There are seven records of this turtle within a five-mile radius of the project vicinity. This species could have a moderate probability of occurring in the open water habitat within or near the project site. Wetland A on the project property and the Less pond could provide some habitat for this species, although high canopy cover and lack of basking habitat at these two sites lessen the potential for this species to occur there. Some suitable basking habitat occurs in Porter Creek downstream of Tributaries D and E.

Proposed land clearing and mining could have a ***potentially significant impact*** on these species.

Mitigation Measures

4.3-C.1 Prior to vegetation removal or grading on the expansion site, a survey of the site for California red-legged frog shall be conducted per the protocol established by the USFWS. If red-legged frogs are found, a work plan shall be developed addressing how to avoid impacts to this species. This plan shall be submitted to the USFWS and CDFW for review and comment.

Until such time that protocol surveys can be completed in their entirety, it is assumed the California red-legged frog inhabits the Wetland A area. Therefore, to protect the potential habitat until such time as the protocol study has been done and, if frogs are present, a work plan has been submitted, a protective buffer and continuing seasonal restrictions will be implemented. A buffer area as shown on Figure 4.3-5 will be maintained and no vegetation or grading will occur there.

Seasonal restrictions will be imposed during the winter period (November 15 – April 1). During this time period mining and excavation operations will not be conducted during extended rain events that produce overland flow. California red-legged frog dispersal typically occurs during these rainy periods and therefore, these seasonal restrictions of operations will provide another source of protection to any potentially occurring California red-legged frogs.

As shown on Figure 4.3-5, the proposed protection area or buffer has been designed to include the best habitat on site including the pond, forested upland habitat, and a migration corridor connecting the pond to a tributary of Porter Creek. The proposed pond buffer extent ranges in size from 75-300 feet (approximately 23-91 meters) wide to 1,400 feet long (approximately 427-meters); the total protected area is 5.5-acres. The potential buffer does infringe on roughly 0.7-

acres of the approximately 24-acre proposed mining area. The buffer provides protection of the pond and extends southwest to the property boundary. The buffer covers potential breeding, non-breeding, and migration habitats.

4.3-C.2 The project shall not injure or destroy habitat used by foothill yellow-legged frogs (on Porter Creek near the confluences with Tributaries D and E), and/or northwestern pond turtle (at Wetland A on the project property and on the Less pond west of the project site). To accomplish this, a qualified biologist, capable of monitoring projects with potential habitat for these three species, shall conduct a pre-construction survey for these species no more than 14 days prior to grading or construction in suitable aquatic habitats within the project site, including stream crossings, drainage ditches, settling ponds, and culverts. The confluence of project site tributaries with Porter Creek shall also be surveyed for foothill yellow-legged frog and northwestern pond turtle to determine if the species is present near tributaries draining the site. If these species are found near any proposed construction areas, impacts on individuals and their habitat shall be avoided. In addition, if any species are found during pre-construction surveys, a work plan addressing how to avoid impacts to these species shall be submitted to USFWS and CDFW for approval prior to construction. If occupied habitat can be avoided, an exclusion zone shall be established around the habitat and temporary plastic exclusion fencing shall be installed around the buffer area with “Sensitive Habitat Area” signs posted and clearly visible on the outside of the fence. If avoidance is not possible and the species is determined to be present in work areas, a qualified biologist with appropriate permits from USFWS and CDFW may capture frogs and turtles prior to construction activities and relocate them to nearby, suitable habitat out of harm’s way (e.g., downstream from the work area or as designated by the agency). Exclusion fencing shall then be installed to prevent these animals from re-entering the work area. For the duration of work in these areas the biologist shall conduct monthly follow-up visits to monitor effectiveness of the mitigations.

Impact Significance After Mitigation

The mitigation measures would reduce the chance of injury or take of the three species to a ***less-than-significant*** level.

Indirect Impacts to Special-Status Species

Impact 4.3-D Project construction and grading activities could pollute downstream waterways and adversely affect special-status species of fish, amphibians, and turtles. This is a potentially significant impact.

Site grading and mining would result in soil erosion. If not controlled on the site, eroded soil could be transported off the site, thereby adversely affecting water quality of Porter Creek, and possibly receiving waterways including Mark West Creek and the Russian River. In addition, the project does include some mining activities at the southern end of Watershed B that would result in about 0.7 acres that currently drain to Franz Creek being graded so runoff from that area would flow instead to Porter Creek. Work in this area could release sediment to Franz Creek thereby affecting water quality in that creek. Residues from dust surfactants used during mining as well as petrochemical residues from heavy equipment use could enter on-site tributaries and ponds (see ***Section 4.9, Hazards and Hazardous Materials*** for a list of all fuels

Figure 4.3-5
Proposed CRF Habitat Protection Buffer

Mark West Quarry
4611 Porter Creek Rd.,
Santa Rosa, Sonoma County, CA

N
W E
S

Scale 1:4,500
1" = 375'

0 100 200 400 600 800 1,000 Feet

Legend

Pond (Approximate)
Proposed Pond Buffer (5.5-ac.)
Proposed Mining Area

Streams
1
2
3

Roads
SR
ES
ET

Habitat Assessment (1-mi.)

Pond/ Lake
Forested
Chaparral
Grassland/ Grassy Area
Agriculture
Rural Residential/ Light Commercial
Quarry Area (Active)
Stockpile Area (Inactive)

and chemicals that would be used on the site). Unless controlled at the site, these contaminants could be transported to receiving creeks and adversely affect the water quality of those streams. These changes to water quality could adversely affect California red-legged frog, foothill yellow-legged frog, northwestern pond turtle, central California coastal steelhead, California freshwater shrimp, coho salmon, and Navarro roach. The first three species were discussed in the previous impact; the other four species are discussed below.

1. Central California coastal steelhead are Federally listed and inhabit streams and rivers. There are no records of these salmonids within a five-mile radius of the project site. However, critical habitat for this species is designated in several nearby creeks and rivers, including Franz, Bidwell, Porter, and Mark West Creeks. While the potential for steelhead to occur in the vicinity of the project site is low, sedimentation and erosion run-off could impact species located downstream in Mark West Creek and Franz Creek.

2. Central California Coast coho salmon is Federally listed as endangered and inhabits streams and rivers downstream of the project site. In 2011 juveniles were found in Mark West Creek. While potential for coho salmon to occur in the vicinity of the project site is low, sedimentation and erosion run-off could impact species located downstream in Mark West Creek and Franz Creek.

3. The California freshwater shrimp is Federally listed and inhabits low-gradient, perennial freshwater streams. There are two records of this species on Franz Creek within a five-mile radius of the project site. While potential for this shrimp to occur within the project site is low, sedimentation and erosion run-off could impact species located downstream in Franz Creek. The shrimp is not reported for Bidwell, Mark West, Maacama, or Porter Creeks.

4. The Navarro roach is a State Species of Concern that inhabits rocky creeks and small to medium rivers. There is one record of occurrence in Mark West Creek within a five-mile radius of the project site. While potential for this fish to occur within the project site is low, sedimentation and erosion run-off could impact species located in Mark West Creek and the Russian River.

These indirect impacts on the seven species listed above constitute a ***potentially significant impact.***

See Impact 4.2-B in the previous Hydrology section for additional discussion of water quality impacts resulting from the project. Mitigation measures recommended for those impacts would reduce water quality impacts to a less-than-significant level. As discussed in Impact 4.2-C, the project would result in a small reduction in base flow to Franz Creek and the Porter Creek Tributary that drain the project site. The reduction in flow is so small (less than one pint per hour) that the impact on flows and the fishery would be considered less than significant.

Mitigation Measures

Mitigation measures for Impact 4.2-B in the Hydrology and Water Quality section of this EIR that address water quality impacts also apply to this impact.

Impact Significance After Mitigation

Implementing the erosion control and water quality mitigation measures would reduce impacts to downstream water quality and to fish and aquatic species dependent on adequate water quality to a ***less-than-significant*** level.

Wetlands and Stream Tributaries

Impact 4.3-E Future mining of the project site would remove waters of the U. S. This is a potentially significant impact.

Future mining of the project site would result in the removal of a portion of Tributary E (0.1 acre). Other tributaries or wetlands on the project site would not be removed nor filled.

At the completion of reclamation, two ponds would be constructed in the relatively flat quarry floor (see Figure 3-16). These ponds (with storage capacity of 25 and 49 acre-feet, respectively) would more than compensate for the wetland loss caused by the project. In addition, the Reclamation Plan states that drainage courses on the reclaimed site would be planted with willows. However, these new wetland features would not be in place for over 20 years from the time the project begins. The loss of on-site streams for over 20 years is considered a ***potentially significant impact.***

Removal of a portion of the channel of Tributary E would be detrimental to existing downstream habitat for Federally-listed invertebrate, salmonid, reptile and amphibian species. Any expansion activities near the vicinity of wetlands or tributaries could potentially have direct impacts to these species. Ground disturbance, including operation of vehicles and equipment and other activities adjacent to stream zones, could result in increased erosion, water turbidity and sediment transport into waterways, which would reduce water quality relied on by Federally-listed species.

The Open Space Plan Map in the County's General Plan shows that Tributary A on the site is a "designated stream" where a 50-foot streamside conservation area is required. However, all but 0.03 acres of this tributary was filled as part of the emergency grading project that occurred in 2006, and the remaining portion of the tributary is outside the proposed expansion area. The proposed project would not substantially affect any designated stream. In addition, County General Plan Policy OSRC-8d allows permitted mining activities within streamside conservation areas.

Mitigation Measures

Because the project would affect waters of the U.S., the applicant would need to comply with Federal and State laws and regulations governing these resources. The applicant would need to conduct a formal wetland delineation in accordance with the 1987 Army Corps of Engineers Wetlands Delineation Manual and have it verified by the Corps. If the Corps and/or CDFW determine that the potentially affected water-associated features are jurisdictional, then the project applicant would need to obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly a Nationwide permit) from the Corps, the Section 1603 Streambed Alteration Agreement from CDFW, and/or the Section 401 water quality certification from the Regional Water Quality Control Board. Because the on-site wetland feature cannot be avoided if the mining is to be approved on this site, mitigation would be required by these agencies. The following recommended mitigations may be modified by these Responsible Agencies when they issue permits, agreements, and/or certifications.

Typically, the agencies prefer that if wetlands or waters of the U. S. are lost that replacement wetlands be created on site. However, given the hilly nature of the site and the ongoing land clearing and mining, such on-site replacement would be difficult until final reclamation occurs. Final reclamation would contain two large ponds and other ephemeral drainage channels. However, additional mitigation would be required to offset the loss of the wetland for more than 20 years before reclamation occurs.

Mine expansion activities resulting in the loss of jurisdictional wetland areas would require Clean Water Act Section 404 authorization from the Corps and Clean Water Act Section 401 authorization from the North Coast Regional Water Quality Control Board (RWQCB). Compensation for potential wetland loss would be developed in consultation with the Army Corps and RWQCB in accordance with these agencies' mitigation policies. The Corps typically requires wetland that is filled or lost to be replaced at a minimum 1:1 replacement ratio. Options may include creation of wetlands on the project site (this is unlikely) or at an off-site location, or restoration or enhancement of an existing wetland. There are four other tributaries on the project site as well as several ponds, and it is feasible that the agencies would accept a restoration or enhancement project on one or more of these tributaries to offset the 0.1 acre of lost wetland. Purchase of wetland creation credits at an approved wetland mitigation bank equal to the size and kind of wetland habitat lost may also be an alternative. The RWQCB typically requires wetland impacts to be mitigated at a 2:1 replacement ratio if replaced on-site and 3:1 if replaced off-site; means of compensation for wetlands-related impacts (i.e., on- or off-site creation or the purchase of creation credits) are similar to those required by the Corps.

4.3-E.1 The project applicant shall prepare a formal wetland delineation in accordance with 1987 *Corps of Engineers Wetlands Delineation Manual* and have it verified by the U.S. Army Corps of Engineers (Corps). If the Corps and/or CDFW determine that the potentially affected water-associated feature is jurisdictional, then the applicant shall obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly a Nationwide permit) from the Corps, Section 1603 Streambed Alteration Agreement from CDFW, and/or Section 401 water quality certification from the Regional Water Quality Control Board.

4.3-E.2 The applicant shall compensate for the loss of jurisdictional wetlands at a 2:1 ratio (or as agreed to by the permitting agencies) within the project site boundary, or at a 3:1 ratio (or as agreed to by the permitting agencies) off-site within the local watershed, by creating, restoring or enhancing waters of the U.S., contributing in-lieu funds to an existing or new restoration project preserved in perpetuity, or purchasing wetland creation credits at an approved wetland mitigation bank. The restoration effort shall require implementation of a five-year monitoring program with applicable performance standards (as agreed to by the permitting agencies), including but not limited to: 80 percent survival rate of restoration plantings; restoration species that are native to the local watershed; absence of invasive plant species; erosion features will be remediated; and a functioning, and self-sustainable wetland system will be maintained.

4.3-E.3 Obtain a Streambed Alteration Agreement from CDFW pursuant to Section 1603 of the California Fish and Game Code for removing on-site ephemeral drainages. Mitigation measures designed to offset streambed-related impacts may include on-site creation of drainage habitats (unlikely) and/or enhancement of existing drainage habitats. Off-site mitigation may also be an option. Mitigations could include conducting stream and riparian enhancement projects identified by CDFW, Sotoyome Resource Conservation District, or Friends of the Mark West, as approved by CDFW. Mitigation measures will be finalized in coordination with the CDFW through the Streambed Alteration Agreement process.

Impact Significance After Mitigation

By conducing the replacement or enhancement mitigations listed above or otherwise complying with the pertinent Federal and State mitigation requirements for the loss of streambeds, impacts to these resources would be reduced to a ***less-than-significant*** level.

Blasting and Disturbance

Impact 4.3-F Blasting activities associated with the proposed project could result in noise disturbance to special-status wildlife species. This is a less-than-significant impact.

As discussed in the ***Project Description (Section 3.2***), blasting may be conducted on an average of twice per week and up to three times a week during peak production periods. As described in ***Section 4.6 (Noise***), the detonation of explosive charges results in temporary ground vibration, air-overpressure, and audible blast noise. The blast noise is instantaneous and does not persist. The EIR noise consultants estimate the linear peak overpressure to be 114-120 decibels at 100 feet from the blast location. This maximum pressure is reduced by at least 6 decibels for each doubling of the distance, though the reduction is strongly influenced by atmospheric conditions. Blasting activities may therefore disturb special-status wildlife species (e.g., nesting birds and roosting bats) present on or adjacent to the project site.

Although no specific criteria or guidelines have been developed to reduce the potential impacts of blasting on wildlife, a review of available scientific literature and other published materials indicate that the effects of proposed blasting at the project site would be considered minor and therefore less-than-significant. One study evaluated the impacts of blasting on a variety of animal species at the Washington Park Zoo in Portland, Oregon. In this study, researchers evaluated the physiological and observed physical effects on a number of mammal and bird species that were as close as 500 feet to blasting noise and vibration. Blasting and ground motion conducted during the study were at levels higher than expected for the blasting at the proposed quarry. Researchers concluded that the tested animals experienced no long-term negative effects from the levels of noise and vibration produced by the blasting (ESA 2008).

Another study evaluated the likely effects of low-level jets and sonic booms on nesting peregrine falcons and other raptors. Responses to extremely frequent and nearby jet aircraft were often minimal and never associated with reproductive failure. Nesting success and site re-occupancy rates were high for all aeries and no significant changes in heart rate response were noted. The birds observed were noticeably alarmed by the noise stimuli in the range of 82-114 dBA, but the negative responses were brief and never limited productivity (ESA 2008).

A third study conducted disturbance tests such as shotgun blasts and explosives detonations at seabird colonies. Startled birds flew from their nests but did not knock their eggs from the nests and returned within 30 seconds. Birds were more susceptible to disturbance while they were roosting or courting than during nest-building, incubation, or rearing young, when their tendency to remain at their nest site was strong. In laboratory studies on avian production of white leghorn hens, simulated sonic booms (156.3 dB peak flat) had no effect on oviposition, hatchability, viability, and hatching time, compared to controls. However, chicks subjected to sound stress weighed less than the control chicks at 19 days (ESA 2008).

Although no references regarding the potential effects of blasting on bats are available, the peak auditory sensitivity of bats is typically at a higher frequency than that of humans, while blast-induced noise occurs at frequencies below the threshold-of-hearing for humans. As such, blast-induced noise at the proposed quarry site is not expected to affect special-status bat species.

The available literature on the effects of noise disturbance on wildlife indicates that blasting at the project site would have brief startling effects on wildlife, but would not result in long-term impacts such as nest abandonment or decline in reproductive success. In addition, as wildlife residing in the area has experienced blasting for many years, it would not be a new intrusion to the project area. At most, blasting-induced noise levels would amount to a short-term (several seconds) nuisance, but the overall impact is considered ***less than significant***, and no mitigation is required.

Wildlife Corridors

Impact 4.3-G Proposed expansion activities would cause the loss of wildlife corridors through fragmentation of open space, loss of habitat such as mixed evergreen forest, and new fencing. This is a less-than-significant impact.

The project mining operations would remove wildlife habitat and block wildlife movement through the active mining portion of the site. Rock fall barriers above Porter Creek Road would also block wildlife movement, though the area where the barriers are located is a very steep slope that is likely not to be heavily used by larger wildlife. Security fencing would be installed to prevent public access except in areas where the terrain would prevent access. However, given the lack of wildlife habitat in the active quarry, restricting wildlife movement into the quarry area would not be a substantial impact on wildlife. While the fenced quarry does limit wildlife travel in the area, there are large areas of undeveloped land on all sides of the quarry that would continue to provide wildlife travel corridors.

The headwaters of Tributary E would be excavated and removed, which would remove frog and turtle travel corridors. However, frogs and turtles would still have access to portions of the tributary downstream of the area of disturbance. The two large ponds that would be created when the site is reclaimed would provide potential habitat for frogs, turtles, and other aquatic species. There would continue to be wildlife corridors on all sides of the project site, and after reclamation, all impediments to wildlife travel would be removed. This impact is considered ***less than significant***, and no mitigation is required.

Timberland Conversion

Impact 4.3-H Proposed expansion activities would result in the loss of trees and conversion of timberland. This is a potentially significant impact.

The quarry expansion area contains trees that constitute timberland as defined by the State. There are 21.15 acres of Mixed Evergreen Forest within the mining expansion area. The project includes a Reclamation Plan that includes planting new trees at the termination of mining in 20 years. Thus, the site is not being permanently "converted." Nevertheless, CAL FIRE (the California Department of Forestry and Fire Protection) staff states that the project does constitute conversion, and the necessary permit and plan approvals from that agency may be required.[21] Additionally, the County has determined that the project meets the County's definition of conversion and requires County approval of a use permit to allow the conversion (County Code Section 26-88-160).

Before this timberland can be logged and converted to another use (i.e., a quarry), the applicant would be required to prepare and submit an application for Timberland Conversion to CAL FIRE. The applicant would also need to prepare and submit a THP in accordance with Subchapter 7, Article 2 of the *Forest Practice Rules.* Each Harvest Plan remains in force for 3 years, and currently up to two 2-year extensions are allowed. This means all trees would need to be removed within 7 years, even though it may take up to 20 years before the entire area is actually converted. The alternative is to submit a THP for only the area to be quarried in the first 7 years, and then subsequently seek additional Harvest Plan approvals.

Mitigation Measures

This conversion of timberland is considered a potentially significant impact. However, the impact is mitigated by the requirement that the applicant would need to abide by existing State law regarding timberland conversion and timber harvesting. CAL FIRE would be responsible for approving the TCP and THP(s). Prior to considering the merits of those plans, CAL FIRE would conduct a CEQA review. Typically, CAL FIRE would use the data included in this EIR for its CEQA analysis. However, CAL FIRE may require supplementary analyses to ensure compliance with the State Forest Practice Act and Forest Practice Rules. It is possible that other State agencies (e.g., CDFW and the Regional Water Quality Control Board) that would review the THP would require that the initial THP cover only the area needed for quarry expansion in the first seven years, and that additional THPs would be needed for future tree removal. Until CAL FIRE approves these plans, the applicant cannot remove trees on the proposed quarry expansion area or the asphalt processing facility site.

The applicant would also need to comply with the County's requirements for the use permit to allow timberland conversion. This includes the requirement that the applicant secure perpetual protection for 2 acres of forestland (as defined by the County Code) for each acre that would be converted. The applicant would need to provide protection for approximately 42 acres of forestland. The acreage of timberland that would be converted would be confirmed by CAL FIRE.

Impact Significance After Mitigation

Compliance with existing State law and County Code requirements would reduce the timberland conversion impact to a ***less-than-significant*** level, and no further mitigation is required.

[21] Kimberly Sone, CAL FIRE, NOP Response Letter.

4.4 TRAFFIC AND CIRCULATION

A. Existing Conditions

1. Introduction

This section describes the existing and future setting for traffic and circulation both with and without the proposed project. The analysis provides information on the local roadway network, operating levels of service (LOS), potential impact of traffic associated with the project, traffic and bicycle/pedestrian safety, road wear, and identification of mitigation measures necessary to mitigate potential significant impacts.

The transportation analysis is prepared for six (6) scenarios, including:

1. Existing (2010);
2. Existing + Project;
3. Near-term Background (Year 2015);
4. Near-term Background + Project;
5. Long-term Background (Year 2035); and
6. Long-term Background + Project

This section was prepared with the technical input of TJKM Transportation Consultants. It was prepared consistent with the *Sonoma County Traffic Impact Study Guidelines* (2009).

2. Existing Roadway System and Setting

Sonoma County is considered a rural, low-density region. Major trip attractors are dispersed throughout the county and therefore, the dominant mode of transportation is the private automobile. The roadway network that would be affected by the project is located in the east central part of unincorporated Sonoma County, as well as within the Cities of Calistoga and Santa Rosa. The transportation system in the project region is composed of an interconnected network of Federal, State, and County roadways and bicycle facilities.

As shown on Figure 4.4-1, the project site is located off of Porter Creek Road. Several County roads or State highways provide access to quarry customers. The major roads serving the project are described below.

U.S. 101 is a major north-south freeway serving Sonoma County and providing regional connections to Mendocino County and Eureka to the north and San Francisco and Los Angeles to the south. In the project vicinity and in much of Sonoma County, the freeway is currently a four-lane mixed-flow facility. Locally, the freeway will eventually become a six-lane facility that includes one high-occupancy vehicle (HOV) lane in both directions. Proposed project traffic is expected to access U.S. 101 using the River Road interchange, as existing quarry traffic does today. This interchange is located north of the City of Santa Rosa and approximately 10 miles southwest of the project site.

State Route 128 (SR 128) is an east-west, two-lane primary arterial roadway providing regional access for Napa County and the City of Calistoga in the vicinity of the project site. Proposed project traffic is expected to access SR 128 at its intersection with Petrified Forest

Road, located northwest of downtown Calistoga and approximately five (5) miles northeast of the project site.

Mark West Springs Road is a two-lane County secondary arterial roadway that originates at the River Road / U.S. 101 interchange and proceeds in a northeasterly direction to its terminus at the Mark West Springs Road / Porter Creek Road intersection (adjacent to the Mark West Lodge) located approximately 4.3 miles west of the project site. The segment between the U.S. 101 freeway and Ursuline Road serves a mix of commercial, office, schools, and residential areas in Sonoma County just north of the City of Santa Rosa.

Porter Creek Road is a two-lane County secondary arterial roadway that runs generally in an east-west direction and provides direct access to the project site via a single driveway. The roadway is approximately 4.7 miles long, beginning at the Mark West Springs Road / Porter Creek Road intersection and terminating at its intersection with Calistoga Road and Petrified Forest Road. The project site driveway is located approximately 4.3 miles from the west terminus of the road and 0.4 miles from the east terminus.

Petrified Forest Road is a two-lane County secondary arterial roadway that begins at its intersection with Calistoga Road and Porter Creek Road, extending east approximately 4.4 miles to its terminus at SR 128 in the City of Calistoga.

Calistoga Road is a two-lane County secondary arterial that begins at its intersection with Petrified Forest Road and Porter Creek Road, extending south approximately 7.2 miles to its terminus at State Route 12.

3. Existing Traffic Operating Conditions

Vehicle volume and classification data was collected in May 2010 during the period that the County determined the project-generated traffic would have the most effect on other roadway users, namely during weekday a.m. and p.m. peak periods (7:00-9:00 a.m. and 4:00-6:00 p.m., respectively) at 10 study intersections. These intersections were identified during preparation of the Initial Study and review of the Notice of Preparation as locations that could be most affected by project traffic. The traffic count data and level of service calculations for this analysis are on file at the Sonoma County Permit and Resource Management Department. The 10 study intersections are shown on Figure 4.4-2. The study intersections and their associated traffic controls are:

1. River Road-Mark West Springs Road / U.S. 101 Southbound Ramps (One-Way STOP)
2. River Road-Mark West Springs Road / U.S. 101 Northbound Ramps (Signal)
3. Mark West Springs Road / Old Redwood Highway (Signal)
4. Mark West Springs Road / Ursuline Road (Signal)
5. Mark West Springs Road / Riebli Road (One-Way STOP)
6. Mark West Springs Road / Franz Valley Road (One-Way STOP)
7. Porter Creek Road / Quarry Driveway (One-Way STOP)
8. Porter Creek Road / Calistoga Road – Petrified Forest Road (All-Way STOP)
9. Petrified Forest Road / State Route (SR) 128 (All-Way STOP)
10. Calistoga Road / SR 12 (Sonoma Highway) (Signal)

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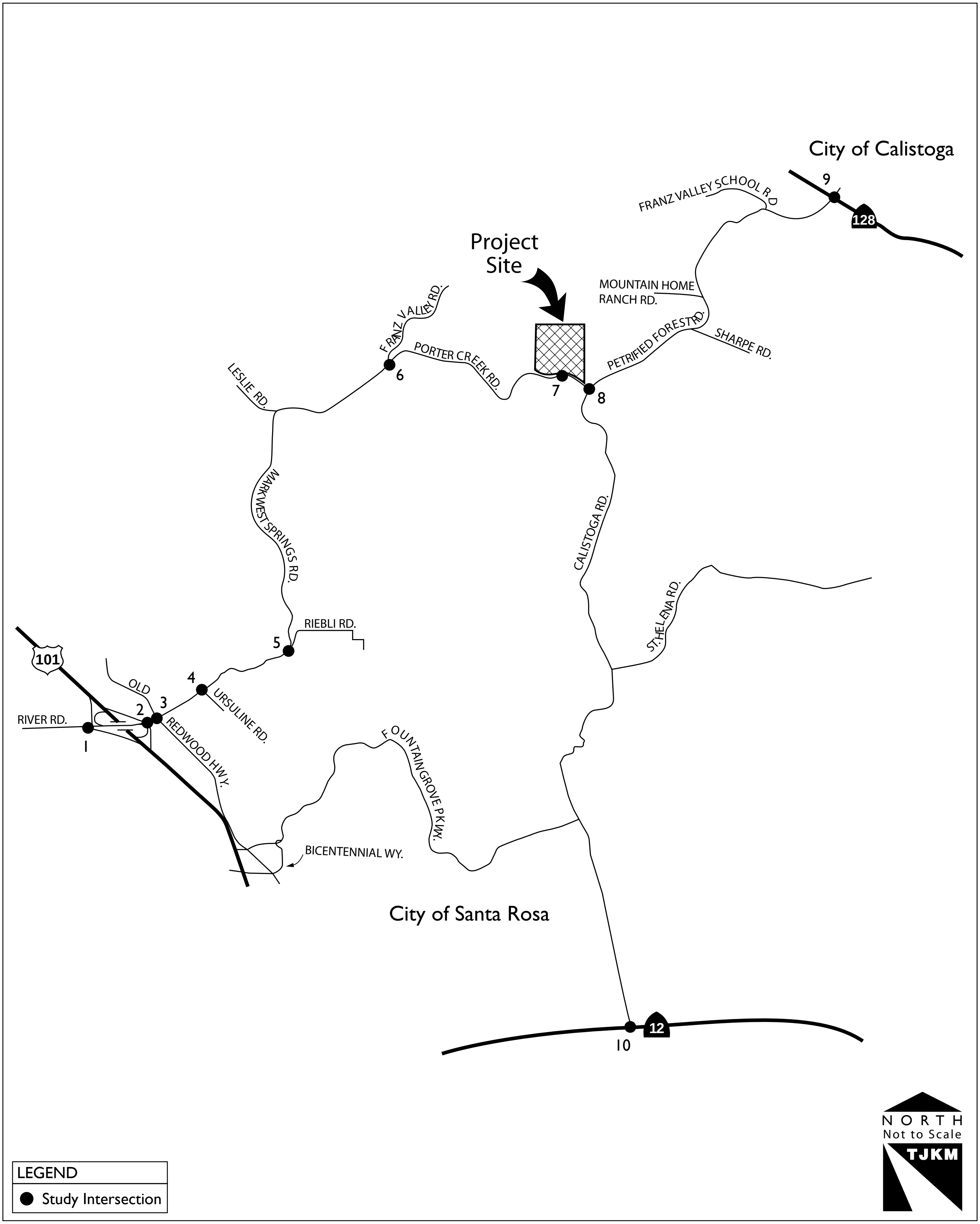
Vicinity Map

Figure

4.4-1



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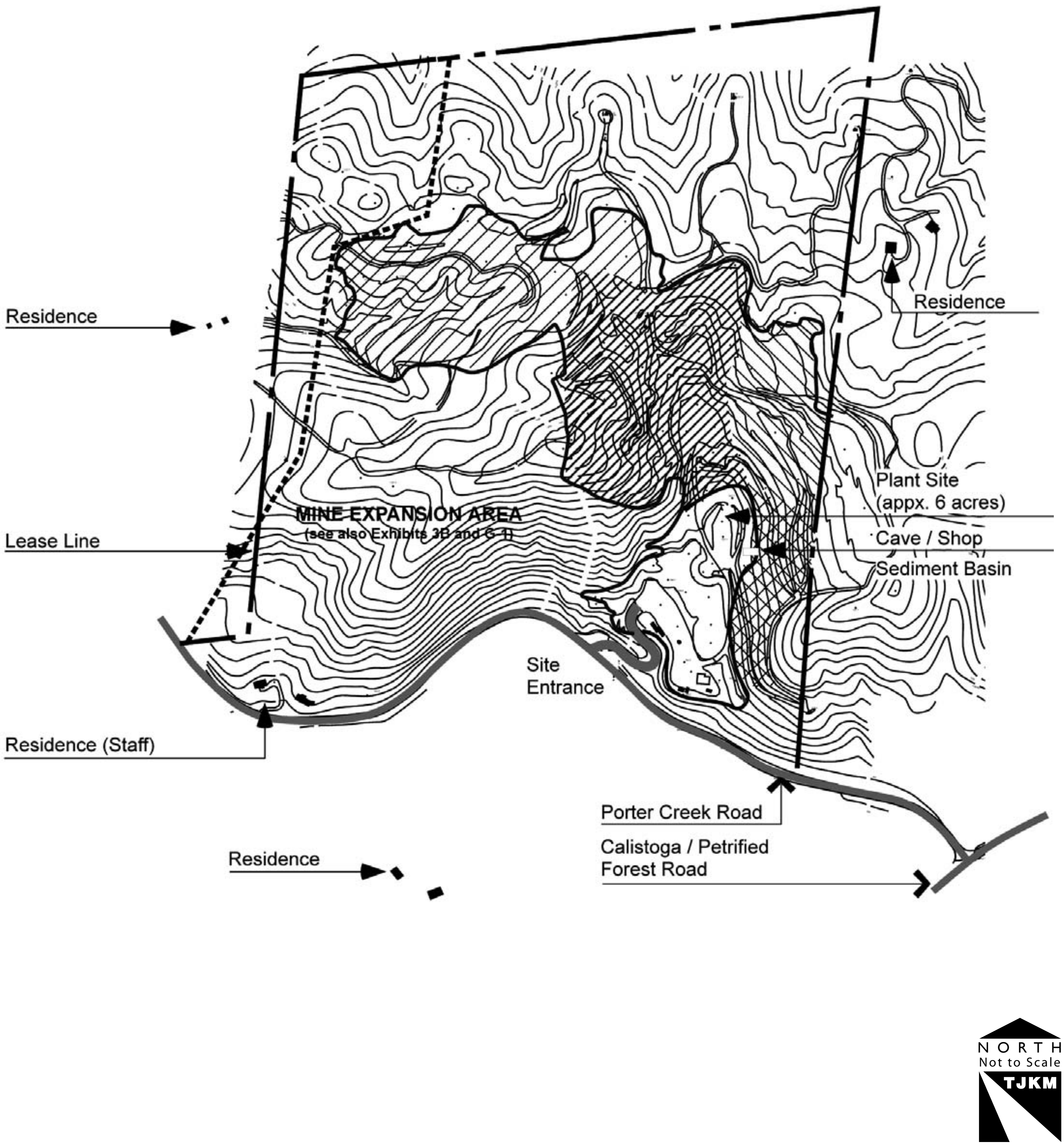
Residence
Residence
Plant Site
(appx. 6 acres)
Cave / Shop
Sediment Basin
MINE EXPANSION AREA
(see also Exhibits 3B and C-1)
Lease Line
Site
Entrance
Residence (Staff)
Porter Creek Road
Calistoga / Petrified
Forest Road
Residence
NORTH
Not to Scale
TJKM

4. *Intersection Level of Service Analysis Methodologies*

The operating conditions experienced by motorists are described as the Levels of Service. The Level of Service (LOS) quantifies the subjective measure of traffic tolerance by ranking traffic operation based on traffic volumes and roadway capacity (i.e., the ratio of the traffic volume on a street as compared to the maximum capacity of that street). Ranked from A to F, Level of Service A generally represents free flow conditions and Level of Service E represents full capacity. Level of Service F operating conditions are generally perceived as intolerable. Both road segment and intersection Levels of Service are important in determining whether a road network under study is capable of handling the additional traffic generated by a proposed project.

LOS is based on the number of lanes, average daily traffic, terrain, average speed, road surface, and geometrics, among other factors. However, this categorization should be used as a guideline only because road safety, maintenance, and other local conditions may also be important.

Unsignalized Intersections

The operating conditions at the study intersections with minor stop-controlled approaches (one-way or two-way) were evaluated using the HCM 2010 Unsignalized Methodology, also contained in Synchro. For two-way stop controlled intersections, LOS is based on and reported for the worse of the two minor approaches. For all-way stop controlled intersections, LOS is based on the average control delay experienced on all approaches. The methods rank level of service on an “A” through “F” scale (similar to that used for signalized intersections) to describe travel delay and congestion. The methodologies for unsignalized intersections are also presented in Appendix F. Table 4.4-1 provides definitions of LOS for unsignalized intersections.

Table 4.4-1
Unsignalized Intersection – LOS Thresholds

Level of Service	Average Control Delay (seconds/vehicle)	Description
A	≤ 10	Little or no delay
B	> 10 and ≤ 15	Short traffic delay
C	> 15 and ≤ 25	Average traffic delays
D	> 25 and ≤ 35	Long traffic delays
E	> 35 and ≤ 50	Very long traffic delays
F	> 50	Extreme delays potentially affecting other traffic movements in the intersection

Source: Transportation Research Board, Special Report 209, Highway Capacity Manual, Chapter 17-Unsignalized Intersections, 2000.
Notes: Worst Approach Delay (in seconds per vehicle)

Signalized Intersections

The study intersections under traffic signal control were analyzed using the Highway Capacity Manual 2000 (HCM 2000) Operations Method contained in the standard traffic software Synchro. This methodology determines LOS based on average control delay per vehicle for the overall intersection during peak hour intersection operating conditions. LOS “A” indicates free flow conditions with little or no delay, while LOS “F” indicates jammed conditions with excessive delay and long back-ups. The methodology is described in detail in Appendix F. Table 4.4-2 defines the levels of service for signalized intersections.

Table 4.4-2
Signalized Intersection – LOS Thresholds

Level of Service	Average Stopped Delay (seconds/vehicle)	Description
A	Delay ≤ 10.0	Free flow; minimal to no delay
B	10.0 < Delay ≤ 20.0	Stable flow, but speeds are beginning to be restricted by traffic Condition; slight delays.
C	20.0 < Delay ≤ 35.0	Stable flow, but most drivers cannot select their own speeds and feel somewhat restricted; acceptable delays.
D	35.0 < Delay ≤ 55.0	Approaching unstable flow, and drivers have difficulty maneuvering; tolerable delays.
E	55.0 < Delay ≤ 80.0	Unstable flow with stop and go; delays
F	Delay > 80.0	Total breakdown; congested conditions with excessive delays.

Source: Transportation Research Board, Special Report 209, Highway Capacity Manual, Chapter 16-Signalized Intersections, 2000.
Notes: [1] Control Delay per vehicle (in seconds per vehicle)

5. Existing Traffic Operating Conditions

Figure 4.4-3 shows the existing peak hour intersection vehicle turning movement counts at the study intersections, as well as current lane configurations and traffic controls. Table 4.4-3 summarizes the results of the intersection analysis under Existing Conditions. Currently, all study intersections operate at acceptable LOS during both weekday a.m. and p.m. peak hours, with the following exceptions:

1. River Road-Mark West Springs Road / U.S. 101 Southbound Ramps (LOS F during the a.m. peak hour for the minor southbound stop-controlled approach); and
2. Porter Creek Road / Calistoga Road / Petrified Forest Road (LOS E during the p.m. peak hour for the minor Porter Creek Road eastbound stop-controlled approach).

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Figure 4.4-3

Existing Turning Movement Volumes, Lane Geometry, and Traffic Controls

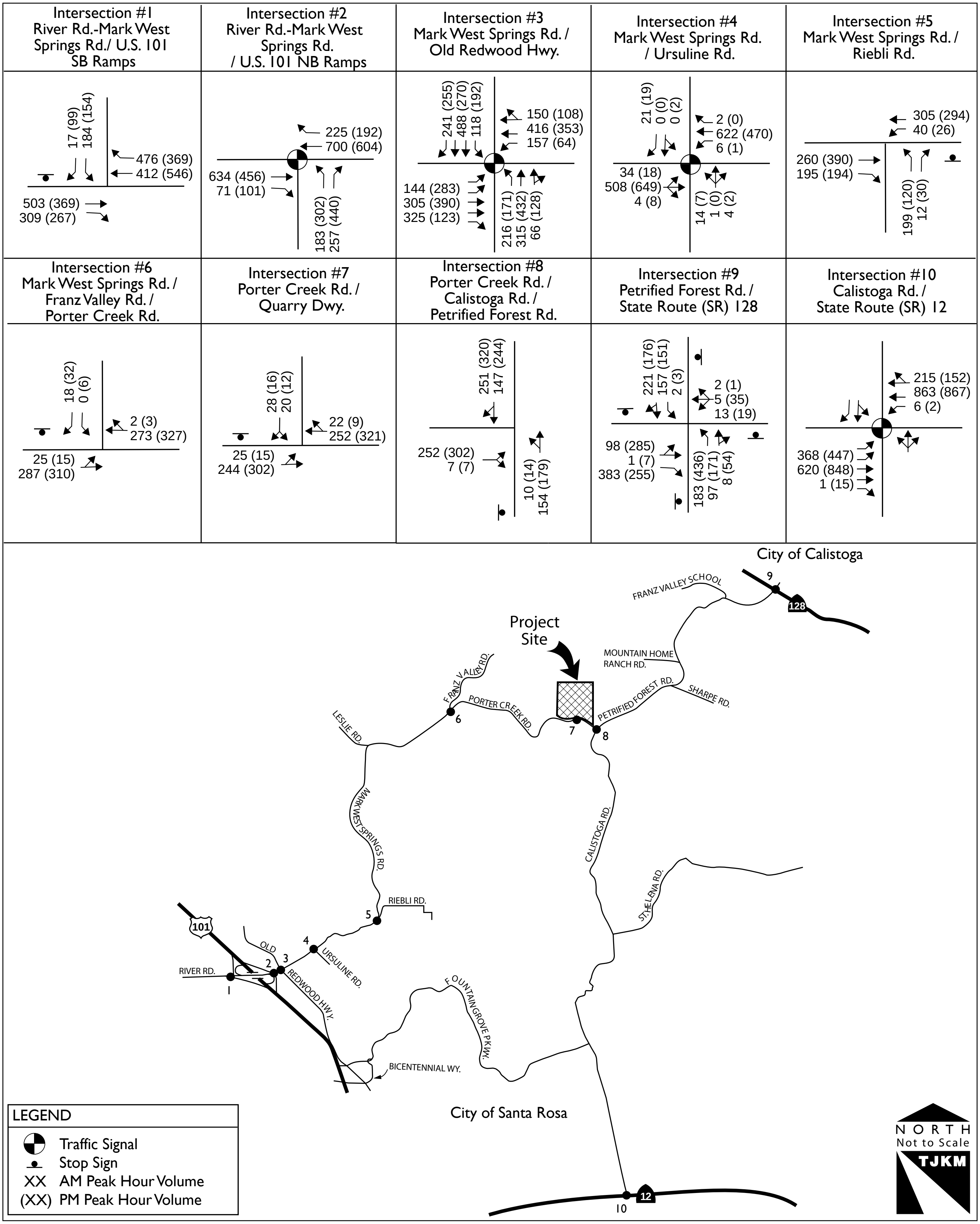

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Table 4.4-3
Intersection Levels of Service: Existing Conditions To Be Revised

ID	Intersection	Control	Existing Conditions			
			A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS
1	River Road-Mark West Springs Road / U.S. 101 Southbound Ramps	One-way stop	61.8	**F**	32.5	D
2	River Road-Mark West Springs Road / U.S. 101 Northbound Ramps	Signal	19.3	B	21.0	C
3	Mark West Springs Road / Old Redwood Highway	Signal	36.6	D	33.9	C
4	Mark West Springs Road / Ursuline Road	Signal	17.9	B	19.7	B
5	Mark West Springs Road / Riebli Road	One-way stop	29.4	D	22.0	C
6	Mark West Springs Road / Franz Valley Road / Porter Creek Road	One-way stop	11.8	B	9.6	A
7	Porter Creek Road / Quarry Driveway	One-way stop	13.4	B	14.2	B
8	Porter Creek Road / Calistoga Road / Petrified Forest Road	All -way stop	13.4	B	27.4	D
9	Petrified Forest Road / State Route (SR) 128	All-way stop	21.4	C	34.3	D
10	Calistoga Road / State Route (SR) 12	Signal	41.1	D	36.8	D

Source: TJKM Transportation Consultants
Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.

6. Existing Traffic Safety Concerns

Mark West Springs Road / Porter Creek Road Haul Route Study

In 1997, the Sonoma County Department of Transportation and Public Works (DTPW) and the Permit and Resource Management Department (PRMD) conducted a joint study titled "A Discussion of Truck Traffic Impacts Along Mark West Quarry Haul Route." The purpose of the study was to improve understanding of activities and impacts of heavy trucks on the corridor and to identify potential measures to minimize impacts of aggregate haul trucks. The County study discussed potential safety impacts of aggregate haul trucks using the primary Mark West Quarry haul route, defined as Mark West Springs Road and Porter Creek Road, with a western terminus at Old Redwood Highway and an eastern terminus at the Porter Creek Road / Calistoga Road / Petrified Forest Road intersection.

According to the study, truck traffic raises safety concerns for the following reasons:

1. Trucks sweep a wider path around curves, leaving less room for driver error.
2. Trucks require longer distances to decelerate, accelerate, and stop due to their additional weight.
3. Some segments of haul route roads are not built to modern recommended arterial design criteria, including travel lane width, shoulder width, curve radii, and sight distance.

4. There is unsafe driving by truck drivers.
5. Collisions between trucks and autos, pedestrians, or bicycles are likely to be severe since trucks are typically 10-30 times heavier than a passenger vehicle.

The 1997 study evaluated a 10.5-year collision history along the haul route, using available California Statewide Integrated Traffic Records System (SWITRS) collision data, to determine whether the route had experienced a higher-than-normal collision rate when compared to similar corridors. The study referred to truck with trailer-involved collisions, which for study purposes was considered to be all aggregate trucks. However, it should be noted that all trucks with trailers reported in the collision data are not necessarily only those that carry aggregate, but also those carrying agricultural, timber, or other products.

The 1997 study concluded that despite a general increase in traffic on the haul route, most traffic growth was attributable to area growth and not quarry activity. Furthermore, the annual collision rate stayed essentially the same over the 10 1/2-year period despite traffic increases. Truck with trailer collisions ranged from zero to two per year in the first five years of the period, while ranging from one to five per year during the remaining 5 1/2 years. The County study concluded that the annual collision rate was not considered excessive or exceptional given the annual traffic volumes along this arterial haul route. Nonetheless, the study acknowledged the ongoing concern about truck safety along the corridor and that the County should make reasonable preemptive efforts to minimize collision potential, and it recommended measures to reduce the potential safety impacts of trucks along the haul route. Recommendations included lowering the speed along certain segments of the road; improving speed limit enforcement; improving traffic safety signing, striping, and roadway design; identifying problem trucks; and improving truck operators' driving habits.

Mark West Springs Road Citizen Safety Committee Concerns

The EIR traffic engineers reviewed and identified concerns raised by constituents along the quarry haul truck corridors. The Mark West Springs Road Citizens Safety Committee was formed in 2004 to investigate ways to improve road conditions and provide informed input into use of funds that could be applied to roadway safety improvements along the Mark West Springs corridor. The Committee identified a number of concerns related to haul truck traffic along this corridor.

Many of these concerns have been addressed by the roadway improvements that the County has completed since 2004 on Mark West Springs Road, and others will be addressed by the additional planned improvements listed subsequently in this chapter.

Quarry Truck Program and Rules

Responding to local resident concerns, the quarry operator, BoDean Company, recently instituted a good neighbor trucking program (GNTP) that must be followed by trucks accessing the quarry. Following is an excerpt of the Mark West Quarry GNTP detailing the primary regulations and guidelines for quarry customers with respect to operating trucks on the primary haul routes leading to the quarry:

Rules of the Road Compliance: Agreement for Owners, Managers, Brokers & Drivers

The purpose of this agreement is to assure our commitment to the overall safety of daily operation on the roads surrounding our two quarry sites and asphalt plant as demonstrated by the implementation of the Good Neighbor Trucking Program. We must follow through not only with the drivers but also with the managers, owners, and brokers of trucks using the plants.

It shall be the responsibility of owners, managers and brokers that all drivers be advised of the GNTP while operating to and from our plants. It shall be required that a copy of the GNTP be signed by the driver and owner, manager or broker. The original shall be sent to BoDean Company, Inc. for filing. A copy can be retained for your records. Failure to comply with this agreement may ultimately result in the loss of operating at all plants sponsoring the GNTP.

Off-Site Regulations:

1. No trucks are permitted to park on access roads leading to the quarries.
2. No truck shall arrive at the Quarry prior to 6:30 a.m.
3. No convoying. Please keep a 500-foot interval between you and all other vehicles.
4. Jake Brakes are to be strictly avoided on roads surrounding the quarry.
5. Please extend any and all courtesy to all pedestrians and vehicles.
6. No Speeding. The speeds along routes vary. Please be aware of the posted speed at all times (The limits on Porter Creek and Mark West Springs is generally 45 mph. However, coming upon MW Lodge the limit is 25 mph – Do not exceed these limits).
7. Report any materials spills to BoDean Company immediately. Phone 576-8205 or Channel 19.
8. All trucks must travel on approved County Truck Routes.

7. Existing Public Transit and Bicycle Facilities

Transit

There is currently no transit service along the Mark West Springs/Porter Creek/Petrified Forest Road corridor in the study area.

Bicycle Facilities

There are currently no designated bicycle facilities along the Mark West Springs/Porter Creek/Petrified Forest Road corridor in the study area. This corridor consists of variable lane width, as well as shoulder widths varying from zero (no shoulder) to six feet. There is also currently no designated bicycle route signage along this corridor.

The SCTA 2010 Countywide Bicycle and Pedestrian Master Plan identifies the Mark West Springs/Porter Creek/Petrified Forest Road corridor within the County as a future Class II facility (on-street, striped bicycle lanes) between the U.S. 101 freeway to the west and the Napa County border to the east. The County currently has preliminary engineering underway for shoulder and other safety improvements along the Mark West Springs corridor, pending SCTA Measure M funding, which can accommodate the Class II designation.

Riebli Road and Calistoga Road within the study area are identified as future Class III routes (bicycle routes with signage only). The future Calistoga Road designation would extend southerly to its existing Class II bicycle lanes that extend to State Route (SR) 12.

In order to evaluate existing bicycle activity within the study area, bicycle volume data was collected on Mark West Springs Road, Porter Creek Road, and Calistoga Road for seven consecutive days in January 2012 at the following locations:

1. Mark West Springs Road east of Old Redwood Highway
2. Mark West Springs Road east of Riebli Road
3. Porter Creek Road between Franz Valley Road and Mark West Quarry Driveway
4. Calistoga Road south of Porter Creek Road
5. Calistoga Road north of State Route 12 (Existing Class II lanes within City of Santa Rosa)

TJKM reviewed the above collected bicycle data to determine whether the counts required seasonal adjustments. The National Bicycle and Pedestrian Documentation Project (NBPDP) has indentified seasonal adjustment factors according to different climates throughout the U.S. that are attributable to overall bicycle activity. According to the NBPDP, bicycle counts during the month of January typically represent seven percent of overall annual bicycle counts for a corridor, whereas bicycle counts taken in the peak month of August typically represent 16 percent of annual counts. The NBPDP estimated these percentages for a year-round moderate climate such as that found in the San Francisco Bay Area. Based on these factors, TJKM increased the collected January 2012 bicycle counts on all corridors by a factor of 2.29 (16 percent / 7 percent) in order to estimate peak August seasonal bicycle activity along the study area corridors.

As a result of seasonal adjustments, TJKM estimated the following daily two-way bicycle counts on the five segment locations:

1. Mark West Springs Road east of Old Redwood Highway: 56 (average weekday), 53 (average weekend), 101 (one-day maximum weekday), 55 (one-day maximum weekend)
2. Mark West Springs Road east of Riebli Road: 3 (average weekday), 19 (average weekend), 9 (one-day maximum weekday), 32 (one-day maximum weekend)
3. Porter Creek Road between Franz Valley Road and Mark West Quarry Driveway: 2 (average weekday), 2 (average weekend), 2 (one-day maximum weekday), 2 (one-day maximum weekend)
4. Calistoga Road south of Porter Creek Road: 1 (average weekday), 1 (average weekend), 2 (one-day maximum weekday), 2 (one-day maximum weekend)
5. Calistoga Road north of State Route 12 (Santa Rosa) : 82 (average weekday), 126 (average weekend), 110 (one-day maximum weekday), 131 (one-day maximum weekend)

The bicycle count estimation results show that the three roadway segments closest to the quarry have the lowest overall daily bicycle counts, namely Mark West Springs Road east of Riebli Road, the Porter Creek Road segment, and Calistoga Road south of Porter Creek Road.

The low-bicycle-volume Porter Creek and Calistoga segments currently have minimal to no roadway shoulders, which make the corridors less attractive for most bicyclists who otherwise must share the road with all vehicles. Bicycle counts on the Mark West Springs segment east of Riebli Road drop off significantly from the segment east of Old Redwood Highway during the weekdays, as many cyclists avoid the variable shoulder width east of Riebli Road towards the quarry. Planned upgrades to shoulders along these segments that would effectively accommodate Class II bicycle lanes may make them more attractive to bicyclists and as a result increase overall bicycle trips in the future.

The Calistoga Road segment north of State Route (SR) 12 currently experiences the highest bicycle volume of all five surveyed roadway segments. This segment is maintained by the City of Santa Rosa and consists of existing Class II on-street striped bicycle lanes. Compared to the Calistoga Road segment further north on Calistoga Road towards Porter Creek Road, the segment north of SR 12 has much higher daily bicycle volumes due to the provision of the striped bicycle lanes as well as more destinations (home, work, shopping) within the immediate vicinity of those lanes in Santa Rosa.

8. Planned Roadway Projects

The Sonoma County Department of Transportation and Public Works (DTPW) has several planned roadway improvement projects along the Mark West Springs / Porter Creek Road, Calistoga Road and Petrified Forest Road haul corridors in the quarry vicinity. There are segments of these roads that do not meet current County design standards (Caltrans and AASHTO). The planned improvement projects are intended to improve capacity and safety along these corridors and bring certain road sections up to County standards. The projects are at various stages of planning, funding, and implementation, with some projects tied to Sonoma County Transportation Authority (SCTA) Measure M sales tax funding. The following improvement projects are planned:

1. *Porter Creek Bridge replacement and eastbound left turn pocket addition at Porter Creek Road / Franz Valley Road intersection.* This project would include a new eastbound left turn pocket to facilitate traffic flow and also widened shoulders along Porter Creek Road for improved vehicle and bicycle safety. The project limits along Porter Creek Road are approximately 500 feet east and west of Franz Valley Road. Final plans are waiting for completion of an environmental process. For purposes of this traffic section, this project is assumed completed under Near Term (2015) Background Conditions onward.

2. *Construct roadway shoulders, turn pockets, and other safety improvements along the Mark West Springs Road corridor*. The roadway project consists of three phases, with Phase 1 adding a center turn lane at Michelle Way with shoulders widened to six feet to accommodate Class II bicycle lanes; Phase 2 adding a continuous center turn lane from Ursuline Road to west of Quiet Water Road with eight-foot wide shoulders to accommodate Class II bicycle lanes; and Phase 3 constructing widened shoulders on an approximately one mile segment between Riebli Road and approximately one mile west of Mark West Springs Lodge that is expected to require extensive slope cuts. According to the 2011 Measure M Strategic Plan and County DTPW staff, preliminary design is scheduled to start in 2015 but no Measure M funds are programmed at this time for the first two phases. There is no schedule yet for Phase 3. According to County DTPW staff, this project's three phases only cover a portion of the entire Mark West Springs/Porter Creek corridor, are not funded at this time, and are not included

in the current list of capital projects. Funding will likely not occur until the end of the Measure M tax cycle. Accordingly, these improvements are not assumed as completed under Near Term (2015) Background Conditions onward.

3. In terms of other County road projects, DTPW staff have also identified a future improvement of the Calistoga Road / Porter Creek Road / Petrified Forest Road intersection that is unfunded and non-specific. The County's Traffic Mitigation Projects list identifies non-specific widening along Mark West Springs Road between the U.S. 101 freeway and Mark West Lodge and the same for Porter Creek Road between the lodge and Petrified Forest Road. These projects are not in the capital list and are currently not funded. There are several locations with minimal shoulders that could be widened for safety and to accommodate bicycles on shoulders. These segments include an approximately one-mile segment of Mark West Springs Road between Riebli Road and the lodge; a 1.6-mile Porter Creek Road segment between the lodge and Franz Valley Road; and approximately 2.9 of 3.2 miles of Porter Creek Road between Franz Valley Road and Petrified Forest Road. Accordingly, these improvements are not assumed as completed under Near Term (2015) Background Conditions onward.

9. Regulatory Framework

The development and regulation of the project area transportation network primarily involves State and local jurisdictions. All roads within the project area are under the jurisdiction of State and local agencies. State jurisdiction includes permitting and regulation of the use of State roads, while local jurisdiction includes implementation of state permitting, policies, and regulations, as well as management and regulation of local roads. Applicable State and local laws and regulations related to traffic and transportation issues are discussed below.

California Department of Transportation

The California Department of Transportation (Caltrans) manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of State roadways. The project area includes three roadways that fall under Caltrans' jurisdiction (U.S. 101, SR 12, and SR 128). Caltrans requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance.

County of Sonoma

Several of the roads in the project corridor are under the jurisdiction of Sonoma County. County policies and regulations regarding the design, use, or obstruction of roadways are detailed in the Sonoma County General Plan 2020 Circulation and Transit Element (Sonoma County PRMD, 2009). The majority of these goals and policy guidelines pertain to the development and planning of roadways and transit systems. The General Plan does contain Objective CT-4.2 that states the County will attempt to maintain the level of service at intersections at LOS D or better.

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of

Sonoma County. The following sections from the ordinance are applicable to the proposed project:

Sec. 26A-09-010. General standards for Mining Permit and Operations

(b) *Off-Street Parking*. Adequate off-street parking shall be provided to accommodate the expected use from employees, customers, and equipment.

(c) *Roads and Traffic.* All mining operations shall be conducted in such a manner as to minimize the adverse impacts of aggregate truck traffic on roads, traffic circulation, traffic congestion, and traffic safety.

(1) Access Roads. All private roads or driveways providing access to a mining site shall be adequately managed to prevent aggregate or other materials being drawn onto the public roads and rights-of-way. Management techniques may include surfacing approach ways, installing tire grates, avoidance of overfilling and over-watering, covering loads, regular sweeping or washing of roadway and shoulders, and spill clean-up response.

(2) All surface mining operations permitted pursuant to this chapter shall be required to pay an annual traffic mitigation fee to the Sonoma County Department of Transportation and Public Works, pursuant to Chapter 26-98 of this code, to mitigate the traffic and circulation impacts of the operation's truck traffic will have on the County road network by paying a fair share of the costs for safety and circulation improvements.

(3) Encroachment Permit – The construction and/or upgrade of driveways or other alterations within the public right-of-way are required to obtain an encroachment permits from the County or Caltrans or have such requirement waived, prior to commencement of activities in the public right-of-way.

(4) Traffic Signs and Traffic Management Facilities – Traffic warning signs, bicycle lanes, acceleration-deceleration lanes, turning lanes or other traffic management facilities shall be placed by the operator at appropriate locations as determined by either the State Department of Transportation or the Sonoma County Department of Public Works.

(5) Public Roads Maintenance – Where public roads are used to access the mining site, provisions may be required in the mining permit and/or reclamation plan for the upgrading of roads to a standard capable of accommodating the additional weight of trucks and minimizing traffic hazards. Such provisions, if required, shall meet the approval of either the State Department of Transportation or the Sonoma County Department of Public Works.

(6) All surfacing mining operations permitted pursuant to this chapter shall be required to pay an annual road mitigation fee to the Sonoma County Department of Transportation and Public Works to mitigate the wear and tear the operation's truck traffic will have on the County roads used as haul routes by paying a fair share of the maintenance and improvement costs. The amount of the fee shall be determined by the Sonoma County Department of Transportation and Public Works on a case-by-case basis.

(7) All operators shall be required to develop a truck driver education program which includes posting details on preferred haul routes and informing drivers of procedures established to reduce public conflicts. Operators will also be required to monitor driver compliance and respond to complaints about gravel trucks.

(8) All roads to be used for site access should have sufficient width, shoulders, pavement strength, and other features necessary to adequately mitigate the traffic impacts of proposed operations. Public access roads shall meet the design requirements of the General Plan and related standards. Traffic levels on public access roads shall not exceed the acceptable levels identified in the General Plan.

The County mining regulations (Ordinance No. 3437) allow the hours of operation for quarries as follows: Monday through Friday 6:00 a.m. to 10:00 p.m.; Saturday, 6:00 a.m. to 4:30 p.m.; and on Sunday, no mining or processing except as authorized. The anticipated typical hours of operation of the proposed quarry would be 7:00 a.m. to 5:00 p.m., with most plant operations, including loading/weighing of trucks, ceasing by 4:00 p.m., and general maintenance occurring until 5:00 p.m.

Sonoma County Transportation Authority (SCTA)

The Sonoma County Transportation Authority, SCTA, was formed as a result of legislation passed in 1990 to serve as the coordinating and advocacy agency for transportation funding for Sonoma County, and, since 2004, administers Measure M funds generated within Sonoma County through a local sales tax for specific transportation projects in the county. The SCTA partners with other agencies to improve transportation in the county, for programmed projects including Highway 101 widening, local streets, transit, bicycle and pedestrian facilities.

The 2009 Comprehensive Transportation Plan for Sonoma County provides further guidance for transportation planning and associated goals and policies (SCTA, 2009). This plan focuses on the design and implementation of improvements to the county circulation system, including roadways, bikeways, and rail service.

B. Project Impacts and Mitigation Measures

1. Criteria Used for Determining Impact Significance

According to Appendix G of the CEQA Guidelines, a project would have a significant impact if it:

1. Conflicts with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways. For purposes of this EIR, the impact would be significant if it exceeded thresholds listed below under the Sonoma County Significance Criteria.

2. Conflicts with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

3. Substantially increases hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

4. Conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreases the performance or safety of such facilities.

5. Results in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Sonoma County Significance Criteria

All study intersections fall within Sonoma County jurisdiction, with the exception of Petrified Forest Road / SR 128 (City of Calistoga) and Calistoga Road / SR 12 (City of Santa Rosa). According to Sonoma County's traffic impact study guidelines, the County standard is LOS D or better at the buildout of the County General Plan. If the cumulative analysis for a project taking up significant existing reserve capacity at an intersection shows deteriorating service levels below this standard, the project is considered to have a significant impact. According to the Calistoga General Plan, the general goal is LOS C or D for City intersections, though it does not specify whether for signalized or unsignalized intersections. Similarly, the City of Santa Rosa General Plan sets a goal of LOS D or better along all major corridors, without providing specific LOS goals for intersections. Accordingly, for purposes of this traffic analysis, the overall minimum acceptable operation for all study intersections is considered to be LOS D.

Furthermore, the following applicable County significance criteria were used to determine potential significant impacts due to the proposed project:

1. At an unsignalized intersection, there would be a significant cumulative impact if operation is worse than LOS D in the existing base case, or if future cumulative peak-hour traffic volumes would cause the operation of the intersection to become worse than LOS D. If there is a significant cumulative impact, then the project-related traffic would cause a significant impact that is cumulatively considerable if the average vehicle control delay of the unacceptable movement or approach is increased by five (5) seconds or more.
2. At a signalized intersection, there would be a significant cumulative impact if operation is worse than LOS D in the existing base case, or if future cumulative peak-hour traffic volumes would cause the operation of the intersection to become worse than LOS D. If there is a significant cumulative impact, then the project-related traffic would cause a significant impact that is cumulatively considerable if the average vehicle control delay of the unacceptable movement or approach is increased by 7.5 seconds or more when conditions without the project are LOS E, and five (5) seconds or more when conditions without the project are LOS F.
3. At an unsignalized intersection, there would be a significant cumulative impact if the addition of project vehicle or pedestrian traffic causes an intersection to meet or exceed Caltrans signal warrant criteria.
4. Traffic safety in the project area would be substantially worsened if the project were to introduce a design feature or incompatible uses, inadequate emergency access, or would add substantial truck traffic to a primary haul road that does not meet current County roadway design standards and/or contain limited sight distance.
5. The project would have a significant impact to bicyclists / pedestrians if the project would add substantial truck traffic to a primary haul road that is a designated proposed bikeway and/or is regularly used by bicyclists or pedestrians, and the road does not meet current County roadway design standards (including paved shoulders of sufficient width for use by bicycles).
6. The project would have a significant impact to road wear if it would increase heavy truck traffic volumes that would increase the Traffic Index (TI) by more than 1.5 on roadways built to accommodate heavy truck traffic, and by more than 0.5 on other roadways, or

would add vehicles whose weight exceeds weight limit restrictions on the affected roadway.

It should be noted that neither the City of Calistoga nor Santa Rosa General Plan standards identify specific thresholds that can be applied to a project's incremental effect at intersections that may already be operating at LOS E or worse under future base (without project) conditions. For purposes of this traffic study, Sonoma County's threshold for signalized intersections identified above is used to assess project impacts at the study intersections in Calistoga and Santa Rosa.

2. Background for Discussion of Project Impacts

Project Trip Generation

The vehicle trip generation for the proposed project was estimated by determining the production and hauling rate at which the project would operate. Expected trip generation for the proposed project is based on the proposed project as described in Section 3.2 of this EIR and discussion about historic and expected quarry operations with the project applicant. According to the project applicant, over the last five years the peak month of production typically has been in October, when an average 13.2 percent of annual production occurred. Assuming this same peak month percentage of annual production, the peak month production level for the proposed 293,000 ton production increment is therefore expected to be approximately 38,676 tons (293,000 x 0.132 = 38,676).[22]

According to the project applicant, average loads for trucks patronizing the quarry are approximately 21 tons. Assuming an empty truck haul load to the site and full load from the site, it is expected that during the peak month, approximately 3,683 truck trips are expected to be added with the proposed project (38,676 / (21 / 2) = 3,683).

The existing quarry operates between 7:00 a.m. and 4:30 p.m., Monday to Friday. The quarry also operates on Saturdays by appointment when necessary. These same hours of operation are expected to continue with the proposed project. Assuming 22 working weekdays per month, on an average day in the peak month (October), 168 daily truck trips are expected to be generated by the proposed project (3,683 / 22 = 168). Table 4.4-4 shows the results of the hourly truck trip estimation for the proposed project of 293,000 tons increase in annual aggregate production.

For the peak hour of the peak day, the average of 18 new truck trips per hour (as shown in Table 4.4-4) is used. All the subsequent intersection analyses are based on this worst case scenario.

Consistent with County procedures, the EIR traffic engineers assumed a passenger car equivalent (PCE) of 3.0 to account for heavy truck trips using the study intersections. The PCE factor means that one truck trip is counted as three autos in the proposed project truck trip generation shown below in Table 4.4-5.

[22] Bill Williams, personal communication, January 2010.

Table 4.4-4
Current and Expected Quarry Production Levels

	Annual Production (Tons)	*Annual Truck Trips*	*Peak Month Production (Tons)*	*Peak Month Truck Trips*	*Peak Daily Truck Trips*	*Peak Hourly Truck Trips*
Current	457,000	43,524	60,324	5,745	261	27
Proposed	750,000	71,429	99,000	9,429	429	45
Net Increase	+293,000	+27,905	+38,676	+3,683	+168	18

Source: TJKM Transportation Consultants communication with Project Applicant (2010).
Note: Current production is based on the 5-year average production for the 5 years prior to the project application.

In addition to the estimated truck trips based on the PCE factor, there are expected to be five additional full-time employees working at the quarry site as part of the 293,000-ton annual production level increase, for a future total of 16 full-time employees (11 existing full-time). Since the existing a.m. peak hour based on existing study intersection traffic counts occurs from 8:00 to 9:00 a.m. and employees arrive at the quarry site prior to opening at 7:00 a.m., no employee trip generation is assumed for the a.m. peak hour. Similarly, the p.m. peak hour based on existing traffic counts is 4:00 – 5:00 p.m. Since employees typically leave the site at quarry closing at 4:30 p.m., all five future additional employees are assumed to leave the site during the p.m. peak hour (11 existing employees included in existing traffic volumes). Table 4.4-5 shows the resulting expected truck and employee trip generation for the proposed project.

Table 4.4-5
Proposed Project's Increase in Quarry Trip Generation

Trip Type	*A.M. Peak Hour Trips*			*P.M. Peak Hour Trips*		
	In	Out	Total	In	Out	Total
Truck	27	27	54	15	12	27
Employee	0	0	0	0	5	5
Totals	**27**	**27**	**54**	**15**	**17**	**32**

Source: TJKM Transportation Consultants communication with Project Applicant (2010).
Notes: 1) Truck trips assume passenger car equivalent (PCE) of 3.0.
2) 50:50 split assumed for truck trips in and out of quarry site during peak hours.
3) All employees arrive prior to local peak hour of 8:00-9:00 a.m. (quarry opens for business at 7:00 a.m.) and leave during the 4:00-5:00 p.m. peak hour (quarry closes at 4:30 p.m.).

Project Trip Distribution and Assignment

Trip distribution is a process that determines the proportion of vehicles that would travel between a project site and various destinations outside the project study area. The process of trip assignment determines the various routes that vehicles would take from the project site to each destination using the calculated trip distribution.

Trip distribution assumptions for the proposed project production level were based on a typical operating day at the quarry as detailed by the project applicant in discussions with TJKM

Transportation Consultants. The assumed distribution percentages for both project trucks and auto trips are as follows:

1. 33 percent to/from West via U.S. 101 Freeway North
2. 27 percent to/from West via U.S. 101 Freeway South
3. 27 percent to/from East via SR 128 East
4. 8 percent to/from East via SR 128 West
5. 5 percent to/from South via Calistoga Road.

Project trips were assigned to the study intersections according to the trip distribution percentages. Figure 4.4-4 shows the resulting proposed project trip assignments at all study intersections. The assigned project trips were then added to the Existing Conditions volumes (shown in Figure 4.4-3) to generate Existing plus Project traffic volumes. Figure 4.4-5 shows the resulting traffic volumes at the study intersections under the Existing Plus Project Conditions. The intersection traffic controls and lane geometries assumed under this scenario are the same as under the Existing Conditions scenario.

Study Traffic Analysis Scenarios

The study evaluated traffic operational conditions under the following six (6) analysis scenarios:

1. *Existing Conditions,* this scenario is based on existing (2010) roadway conditions and traffic counts that include the current Mark West Quarry baseline production level of 457,000 tons per year (based on the annual average production for the five years prior to the project application).[23] The existing conditions at study intersections were described previously in the Setting portion of this chapter.

2. *Existing Conditions Plus Project*, this scenario is identical to Existing Conditions but includes additional traffic expected to be generated by the proposed project, which consists of an expanded annual quarry production of 750,000 tons, a net increase of 293,000 tons per year over current baseline quarry production. The analysis is a worst case analysis that adds the truck traffic generated during the peak hour of the peak month (October) to the existing conditions at the study intersections.

3. *Near Term (2015) Background Conditions*, this scenario analyzes traffic volumes generated by the latest Sonoma County Transportation Authority (SCTA) model that include County-identified background development growth and roadway improvements expected to be in place by 2015. The quarry's current baseline production level of 457,000 tons per year is assumed. The year 2015 was selected to assess project-specific impacts because it was assumed that this would be the first year the quarry might reach the full, requested production level following the final project approvals.

4. *Near Term (2015) Plus Proposed Project Conditions*, this scenario is identical to Near Term (2015) Background Conditions, but includes additional traffic expected to be generated by the proposed project, which consists of an expanded annual quarry production of 750,000 tons, a net increase of 293,000 tons per year over current baseline quarry production.

[23] Actual counts were adjusted to reflect the number of trucks that would be expected on the road if the quarry were actually operating at the baseline production level during the count days. Because the counts were taken in a year with lower production, additional truck trips were factored to accurately reflect the existing conditions baseline.

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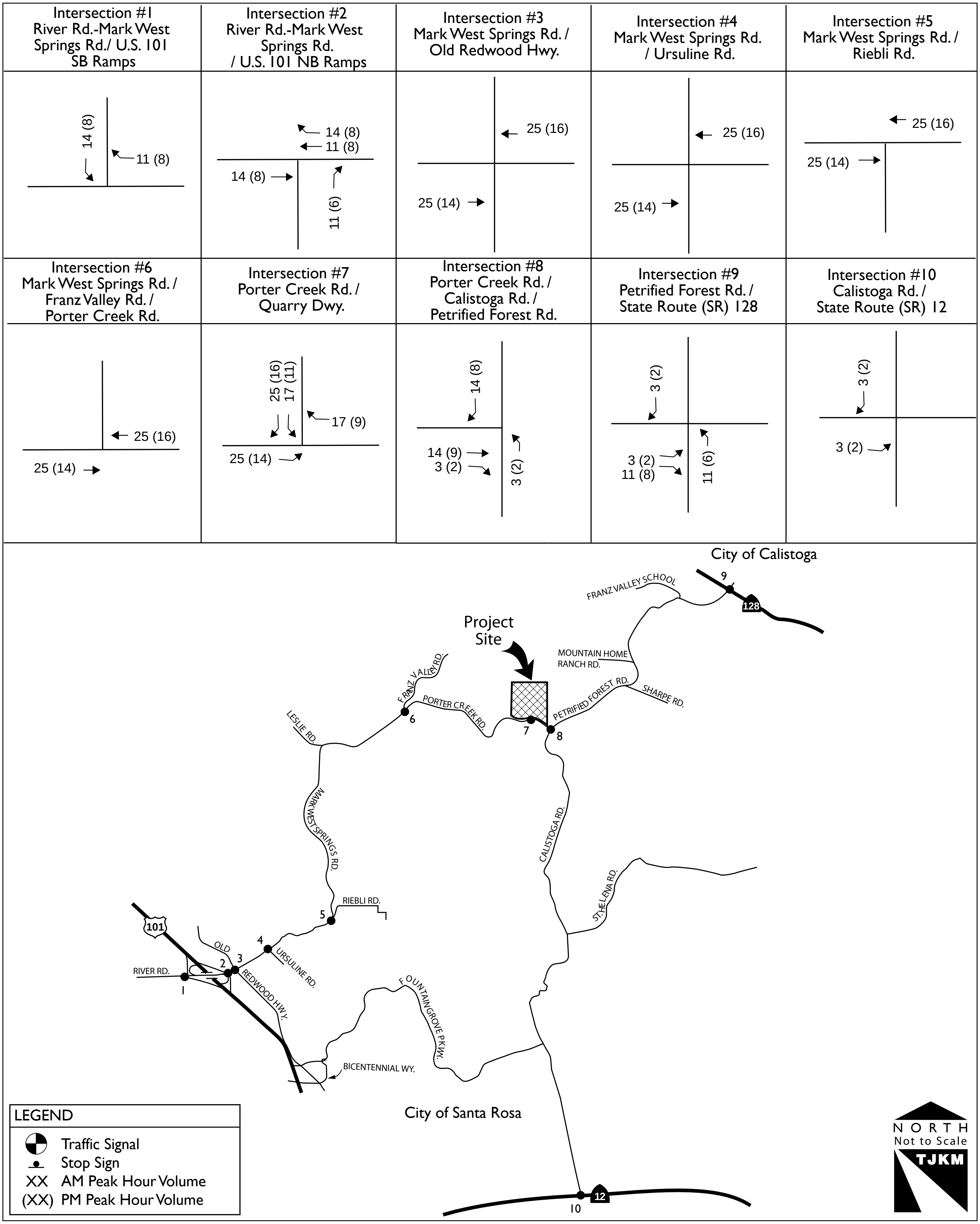
Figure 4.4-4

Proposed Project Trip Distribution and Assignment



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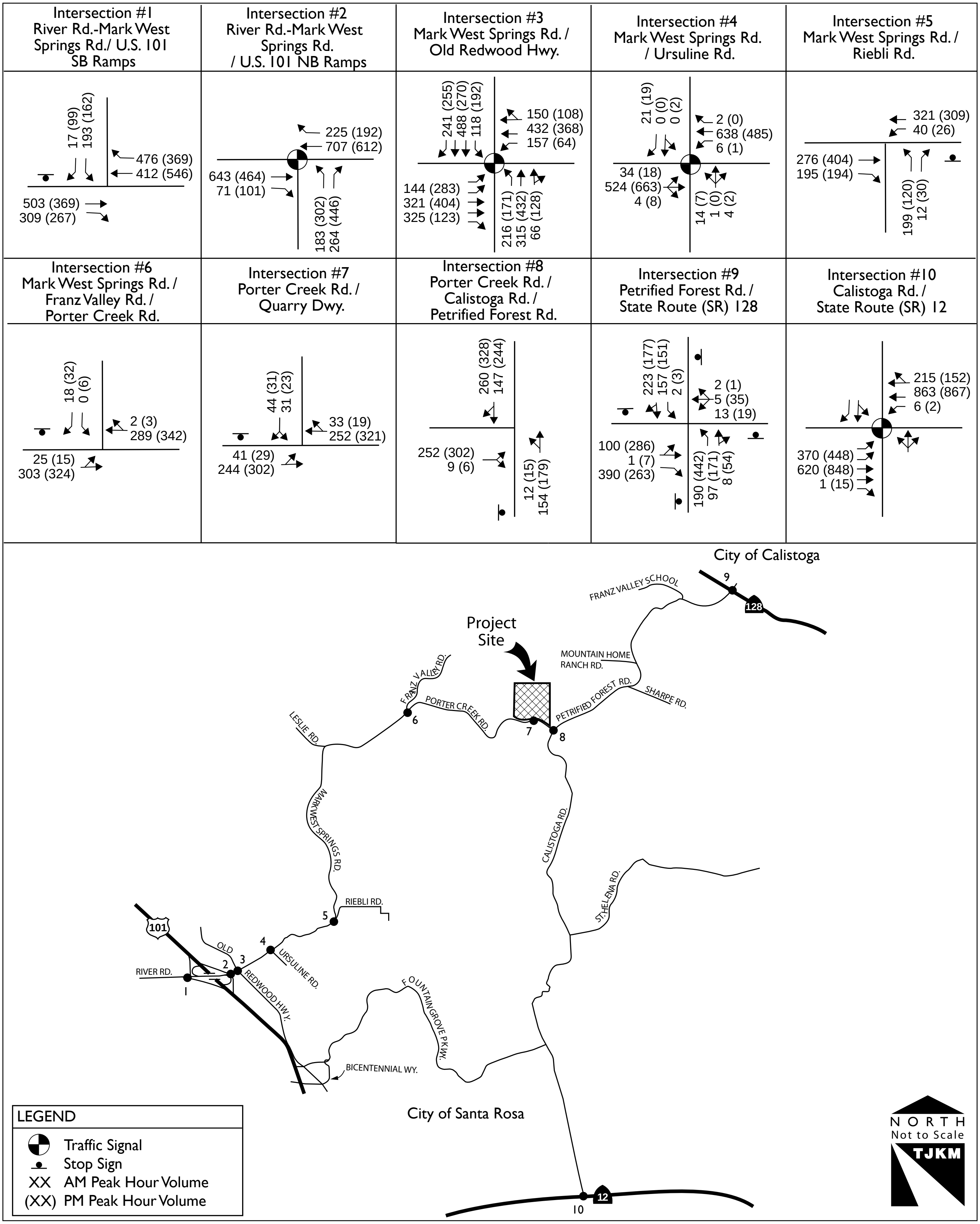
Existing plus Project Turning Movement Volumes, Lane Geometry, and Traffic Controls

Figure 4.4-5



5. *Long-term (2035) Background Conditions*, this scenario analyzes traffic volumes generated by the latest SCTA model that include County-identified background development growth and roadway improvements expected to be in place by 2035, including improvements identified in the 2009 SCTA Comprehensive Transportation Plan Update DEIR. The quarry's current baseline production level of 457,000 tons per year is assumed.

6. *Long-term (2035) Plus Proposed Project Conditions*, this scenario is identical to Long-term (2035) Background Conditions, but includes additional traffic expected to be generated by the proposed project, which consists of an expanded annual quarry production of 750,000 tons, a net increase of 293,000 tons per year over current baseline quarry production.

Existing plus Project Conditions

This section details expected traffic conditions at the study intersections under Existing plus Project Conditions. Traffic volumes under Existing plus Project Conditions are defined as Existing year traffic volumes plus traffic added by the proposed project. Estimated vehicle trip generation for the proposed project is presented under Project Trip Generation. Project impacts are then identified by comparing the LOS results under Existing Conditions to those under Existing plus Project Conditions. Traffic volumes were adjusted to reflect a passenger car equivalent (PCE) of 3.0 for heavy truck traffic.

Turning movement volumes, traffic controls, and lane geometries anticipated for the study intersections under Existing plus Project Conditions are shown in Figure 4.4-5. The intersection traffic controls and lane geometries are based on the anticipated roadway improvements listed above.

The intersection LOS analysis results for both Existing and Existing plus Project Conditions are summarized in Table 4.4-6. Detailed calculation sheets are on file with the Sonoma County Permit and Resource Management Department. All intersections are expected to continue operating acceptably as they do under Existing Conditions, except for the River Road/Mark West Springs Road / U.S. 101 Southbound Ramps that would operate at LOS F during the a.m. peak hour for the southbound stop-controlled approach. However, since average delay for this approach is expected to increase by less than five seconds (i.e., 4.2) with the addition of project traffic to an intersection already operating at LOS F under Existing Conditions, this is not a significant impact per applicable significance criteria, and therefore no mitigations due to project traffic are necessary under Existing plus Project Conditions.

Table 4.4-6
Intersection Levels of Service: Existing plus Project Conditions

ID	Intersection	Control	Existing Conditions				Existing Plus Project Conditions			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	River Rd.-Mark West Springs Rd. / U.S. 101 Southbound Ramps	One-way stop	**61.8**	**F**	32.5	D	**66.0**	**F**	35.0	D
2	River Rd.-Mark West Springs Rd. / U.S. 101 Northbound Ramps	Signal	19.3	B	21.0	C	19.5	B	20.8	C
3	Mark West Springs Rd. / Old Redwood Highway	Signal	36.6	D	33.9	C	36.7	D	34.0	C
4	Mark West Springs Rd. / Ursuline Rd.	Signal	17.9	B	19.7	B	17.5	B	19.7	B
5	Mark West Springs Rd. / Riebli Rd.	One-way stop	29.4	D	22.0	C	32.6	D	23.4	C
6	Mark West Springs Rd. / Franz Valley Rd. / Porter Creek Rd.	One-way stop	11.8	B	9.6	A	12.0	B	9.7	A
7	Porter Creek Rd. / Quarry Driveway	One-way stop	13.4	B	14.2	B	14.8	B	18.3	C
8	Porter Creek Rd. / Calistoga Rd. / Petrified Forest Rd.	All-way stop	13.4	B	27.4	D	13.7	B	27.9	D
9	Petrified Forest Rd. / State Route (SR) 128	All-way stop	21.4	C	34.3	D	22.3	C	34.9	D
10	Calistoga Rd. / State Route (SR) 12	Signal	41.1	D	36.8	D	41.2	D	36.8	D

Source: TJKM Transportation Consultants
Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.

Near Term (2015) Background Conditions

This section details expected traffic conditions at the study intersections under Near Term (2015) Background Conditions. This scenario assumes the latest Sonoma County Transportation Authority (SCTA) travel demand model projections that include County-identified background development growth and roadway improvements expected to be in place by 2015. Under this scenario, the existing Mark West Quarry baseline production level of 457,000 tons per year is assumed, providing a basis of comparison for the proposed quarry expansion and increased annual production. The year 2015 was selected to assess project-specific impacts because it was assumed that this would be the first year the quarry might reach the full, requested production level following the final project approvals.

2015 Background Traffic Estimates

The EIR traffic engineers estimated 2015 traffic volumes for the study intersections within Sonoma County through use of the latest SCTA travel demand model runs. The current model contains a 2005 base year and 2035 cumulative buildout year. The EIR traffic engineers compared the 30-year growth on the model links representing study intersection approaches and then used linear interpolation to estimate a five-year traffic increment. This increment was added to Existing Conditions (2010) traffic volumes at the study intersections to generate Near Term (2015) Background Conditions traffic volumes.

For the one non-Sonoma County intersection, the SR 128 / Petrified Forest Road intersection in the City of Calistoga, the EIR traffic engineers projected Existing Conditions volumes five years into the future based on historical Caltrans volumes taken on SR 128 at the nearest count station to Petrified Forest Road. Based on preceding traffic volume growth over five years (2004-2009), the EIR traffic engineers applied an annual growth factor of 2.48 percent (approximately 13 percent over five years) to existing SR 128 / Petrified Forest Road intersection traffic volumes to generate Near Term (2015) Background Conditions traffic volumes at this study intersection.

Area Development Assumptions

The EIR traffic engineers consulted with County staff regarding anticipated developments expected to be built in Sonoma County near the project site by 2015. The following approved County development projects are assumed to be included in the Near Term (2015) Background Conditions:

1. 11,550 square feet (sq. ft.) retail at 4601 Old Redwood Highway
2. 32,600 sq. ft. commercial / office at 4855 Old Redwood Highway
3. 56 apartments at 525 Fulton Road
4. New church at 3700 Fulton Road
5. 650,000-case winery at 3600 Fulton Road
6. Unity Park Ball field expansions at 4351 Old Redwood Highway
7. Cardinal Newman High School improvements at 50 Ursuline Road
8. 4,000 sq. ft. retail (coffee shop) at 4745 Old Redwood Highway
9. 31,549 sq. ft. retail (Larkfield Shopping Center Expansion) at 4732 Old Redwood Highway
10. Sutter Hospital project at River Road / Mark West Springs Road off US 101 Northbound Off-Ramp

The EIR traffic engineers also consulted with staff from the City of Calistoga and Napa County concerning developments that may add traffic to the study intersections outside of Sonoma County (Lowe and Lundquist, personal communication, 12/2010). The City of Calistoga recently approved two projects, the Highlands Christian Church and Calistoga Village Inn and Spa. Both projects are expected to add background traffic to the SR 128 / Petrified Forest Road study intersection. The respective traffic studies prepared for both developments anticipate no added traffic during a typical weekday a.m. peak hour. Minimal added traffic is expected during a typical weekday p.m. peak hour for the Calistoga Village Inn and Spa, while a maximum of 44 peak hour trips are expected for the Highlands Christian Church. These trip levels are considered included in the 2015 Background traffic volume estimates.

According to Napa County planning staff, there are no major approved developments in the area that would affect study intersections or roadways expected to be in place by 2015.

Roadway Network and Improvement Assumptions

The EIR traffic engineers based the analysis of 2015 traffic conditions on future local roadway network assumptions. According to Sonoma County Department of Transportation and Public Works (DTPW) staff, the Porter Creek Bridge replacement and eastbound left turn pocket addition at Porter Creek Road / Franz Valley Road intersection went out to bid in late 2012. For purposes of this traffic section, this project is assumed completed under Near Term (2015) Background Conditions onward.

The EIR traffic engineers also consulted the SCTA 2009 Measure M Strategic Plan and the 2007 SCTA / Caltrans Environmental Assessment / Final Environmental Impact Report for the U.S. 101 HOV North Segment between the cities of Windsor and Santa Rosa. Based on these documents, signal installation is anticipated at the southbound U.S. 101 off-ramp at River Road along with minor ramp modifications, which are expected to be in place by 2015. These improvements are assumed under Near Term (2015) Background Conditions onward.

Turning movement volumes, traffic controls, and lane geometries anticipated for the study intersections under Near Term (2015) Background Conditions are shown in Figure 4.4-6. The intersection traffic controls and lane geometries are based on the anticipated roadway improvements listed above.

Intersection Level of Service Analysis Results for Near Term (2015) Background Conditions

Table 4.4-7 shows the results of the LOS analysis conducted for the study intersections under Near Term (2015) Background Conditions. Detailed calculation sheets are on file with the Sonoma County Permit and Resource Management Department. All intersections are expected to continue operating acceptably, except for the Petrified Forest Road / SR 128 intersection that would operate at LOS E during the p.m. peak hour.

It should be noted that the previously unacceptable LOS at the River Road-Mark West Springs Road / U.S. 101 Southbound Ramp intersection (LOS F under Existing Conditions), is expected to improve to an acceptable LOS A under both peak hours with the programmed addition of a traffic signal at this ramp as identified by SCTA and Caltrans documentation for the ongoing U.S. 101 HOV project in Sonoma County.

In addition, if a traffic signal were installed at the Petrified Forest Road / SR 128 intersection, service levels would improve to LOS C or better for both peak hours. This potential improvement is identified in the City of Calistoga General Plan. It should be noted that this intersection meets the peak hour volume traffic signal warrant for both peak hours based on California Manual on Uniform Traffic Control Devices (MUTCD) criteria.

3. Project Impacts

Less Than Significant Impacts Not Requiring Further Analysis

Criterion 5 (Air Traffic). As described in the Initial Study, the project site is not near an airport and would not affect air traffic. Consequently, the project would have no impact on this issue; and accordingly, this issue is not discussed further in this EIR.

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2015 Baseline Conditions Volumes, Lane Geometry, and Traffic Controls

Figure 4.4-6

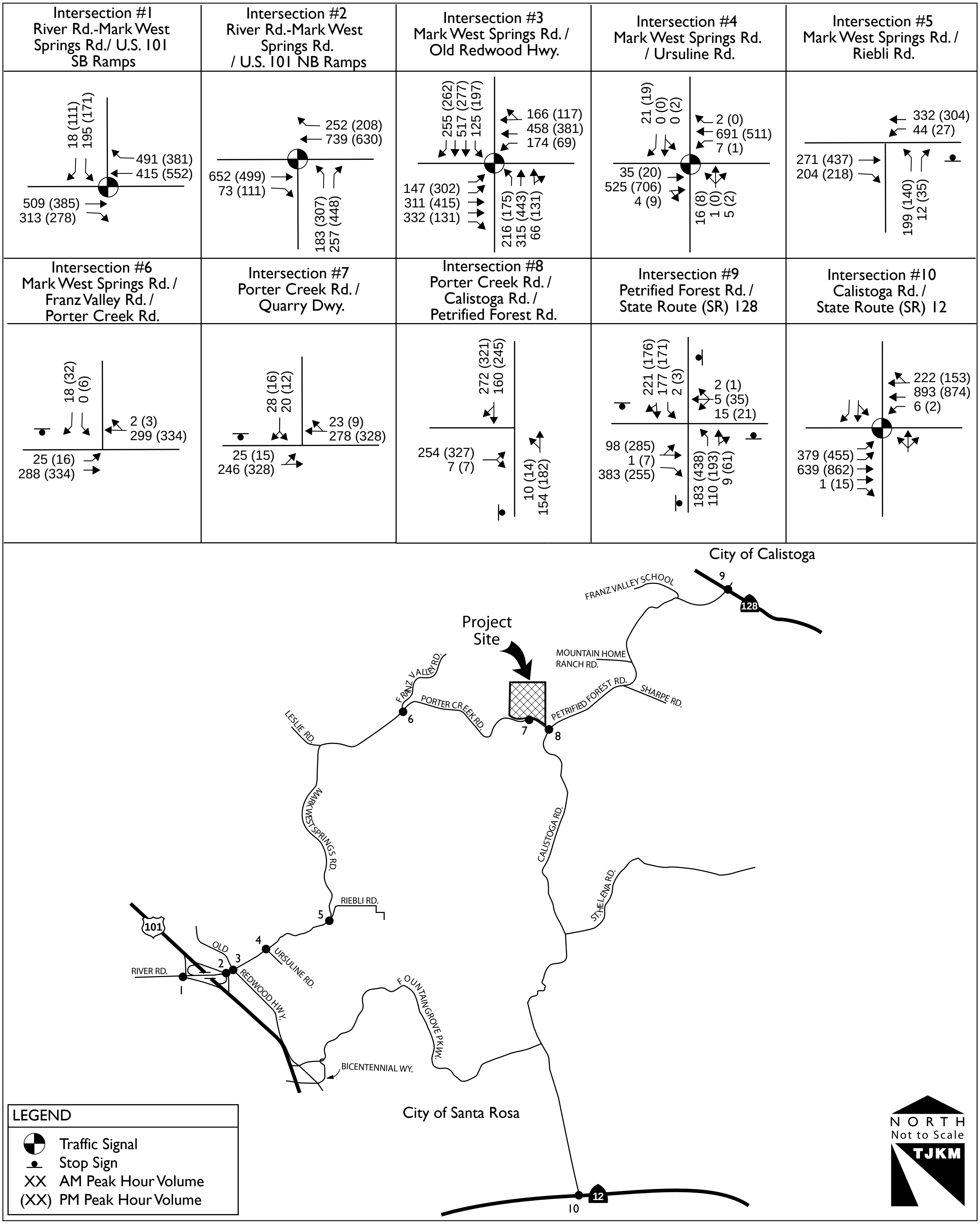

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Table 4.4-7
Intersection Levels of Service – Near Term (2015) Background Conditions

ID	Intersection	Control	Near Term (2015) Background Conditions			
			A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS
1	River Road-Mark West Springs Road / U.S. 101 Southbound Ramps	Signal	8.5	A	8.1	A
2	River Road-Mark West Springs Road / U.S. 101 Northbound Ramps	Signal	19.3	B	21.9	C
3	Mark West Springs Road / Old Redwood Highway	Signal	36.6	D	34.7	C
4	Mark West Springs Road / Ursuline Road	Signal	16.8	B	18.7	B
5	Mark West Springs Road / Riebli Road	One-way stop	29.0	D	28.3	D
6	Mark West Springs Road / Franz Valley Road / Porter Creek Road	One-way stop	12.1	B	9.6	A
7	Porter Creek Road / Quarry Driveway	One-way stop	13.9	B	14.6	B
8	Porter Creek Road / Calistoga Road / Petrified Forest Road	All -way stop	14.5	B	31.5	D
9	Petrified Forest Road / State Route (SR) 128	All-way stop	24.3	C	36.3	**E**
10	Calistoga Road / State Route (SR) 12	Signal	42.1	D	37.1	D

Source: TJKM Transportation Consultants

Existing plus Project Impacts on Study Intersections

Impact 4.4-A Project-generated traffic will impact study intersections. This is a less-than-significant impact.

The intersection LOS analysis results for Existing plus Project Conditions are summarized in the previous Table 4.4-6. Detailed calculation sheets are on file with the Sonoma County Permit and Resource Management Department. All intersections are expected to continue operating acceptably as they do under Existing Conditions, except for the River Road/Mark West Springs Road / U.S. 101 Southbound Ramps, which would operate at LOS F during a.m. peak hour for the southbound stop-controlled approach. However, since average delay for this approach is expected to increase by less than five seconds (i.e., 4.2 seconds) with the addition of project traffic to an intersection already operating at LOS F under Existing Conditions, this is a ***less-than-significant impact*** per applicable significance criteria, and therefore no mitigations due to project traffic are necessary under Existing plus Project Conditions.

Near Term (2015) plus Project Impacts on Study Intersections

Impact 4.4-B Project-generated traffic will increase traffic delay at one study intersection in 2015. This is a less-than-significant impact.

Traffic volumes under Near Term (2015) Plus Project Conditions are defined as traffic generated by the Near Term Background plus traffic added by the proposed project. Estimated vehicle trip generation for the proposed project is presented above under Project Trip Generation. Project impacts are then identified by comparing the LOS results under Near Term Background Conditions to those under Near Term Background Plus Project Conditions. Traffic volumes were adjusted to reflect a passenger car equivalent (PCE) of 3.0 cars for one heavy truck traffic. Intersection traffic volumes for 2015 plus Project Conditions are shown in Figure 4.4-7.

The intersection LOS analysis results for both the Near Term (2015) Background and the Near Term (2015) Plus Project Conditions are summarized in Table 4.4-8. Detailed calculation sheets are on file with the Sonoma County Permit and Resource Management Department. All intersections are expected to continue operating acceptably as they do under Near Term (2015) Background Conditions except for the Petrified Forest Road / SR 128 intersection that would operate at LOS E during the p.m. peak hour. However, since the addition of project traffic adds only 1.1 seconds of delay to an intersection already expected to operate at LOS E under 2015 Background Conditions, the addition of proposed project traffic would cause a ***less-than-significant impact*** based on applicable significance criteria. Therefore, no mitigations due to the addition of project traffic to any study intersection are required under 2015 plus Project Conditions.

Table 4.4-8
Intersection Levels of Service – 2015 Background Plus Project Conditions

ID	***Intersection***	***Control***	***Near Term (2015) Background Conditions***				***2015 Plus Project Conditions***			
			A.M. Peak Hour		***P.M. Peak Hour***		***A.M. Peak Hour***		***P.M. Peak Hour***	
			Delay	***LOS***	***Delay***	***LOS***	***Delay***	***LOS***	***Delay***	***LOS***
1	River Rd.-Mark West Springs Rd. / U.S. 101 Southbound Ramps	Signal	8.5	A	8.1	A	8.7	A	8.3	A
2	River Rd.-Mark West Springs Rd. / U.S. 101 Northbound Ramps	Signal	19.3	B	21.9	C	19.0	B	21.7	C
3	Mark West Springs Rd. / Old Redwood Highway	Signal	36.6	D	34.7	C	37.0	D	36.3	D
4	Mark West Springs Rd. / Ursuline Rd.	Signal	16.8	B	18.7	B	16.4	B	18.9	B
5	Mark West Springs Rd. / Riebli Rd.	One-way stop	29.0	D	28.3	D	33.8	D	30.7	D
6	Mark West Springs Rd. / Franz Valley Rd. / Porter Creek Rd.	One-way stop	12.1	B	9.6	A	12.3	B	9.7	A
7	Porter Creek Rd. / Quarry Driveway	One-way stop	13.9	B	14.6	B	16.4	C	19.2	C
8	Porter Creek Rd. / Calistoga Rd. / Petrified Forest Rd.	All -way stop	14.5	B	31.5	D	15.1	C	33.1	D
9	Petrified Forest Rd. / State Route (SR) 128	All-way stop	24.3	C	**36.3**	**E**	26.1	D	**37.4**	**E**
		Signal	17.0	B	29.4	C	17.4	B	29.8	D
10	Calistoga Rd. / State Route (SR) 12	Signal	42.1	D	37.1	D	42.4	D	37.1	D

Source: TJKM Transportation Consultants
Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.
5) LOS E at Petrified Forest Road / SR 128 exceeds local jurisdictional operational standards, but is a less-than-significant impact based on applicable significance criteria.

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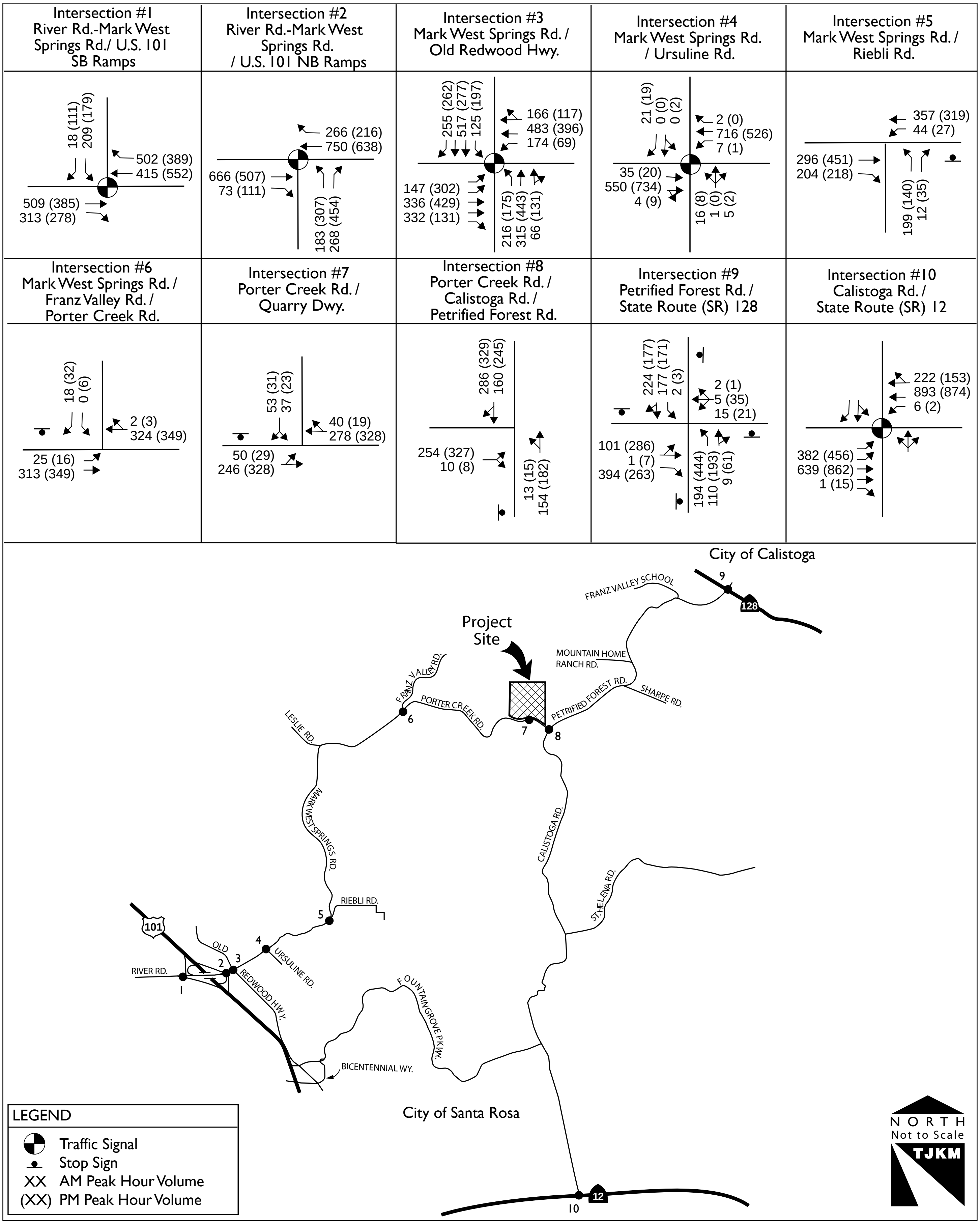
2015 plus Project Conditions Volumes, Lane Geometry, and Traffic Controls

Figure 4.4-7



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Project Access Driveway and Porter Creek Road Intersection Impact

Impact 4.4-C Project-generated traffic will affect intersection operations at the Porter Creek Road / Project Access Driveway intersection both for Existing Conditions and in 2015. This is a less-than-significant impact.

The EIR traffic engineers evaluated the need for an eastbound left turn pocket at the existing quarry entrance on Porter Creek Road given the expected eastbound left turn volumes into the site with quarry expansion under both Existing plus Project and Near Term Background (2015) plus Project Conditions.

The Transportation Research Board (TRB) has published research on left turn pocket warrants and recommended pocket lengths based on the approach speed of opposing vehicle flow, number of opposing travel lanes, composition of vehicle types, and critical gap size. For the Existing plus Project Conditions there would be 16 a.m. and 10 p.m. eastbound left turns into the quarry. These drivers would need to wait for traffic gaps to turn into the driveway while being opposed by westbound through and right turn traffic, which consists of 268 vehicles in the a.m. peak hour and 327 vehicles in the p.m. peak hour. During the 2015 Background plus Project a.m. peak hour, 16 eastbound left turns would need to wait for gaps to turn into the driveway while being opposed by 295 westbound through and right turn vehicles. Similarly during the p.m. peak hour, 10 eastbound left turns would oppose 334 through and right turn vehicles. Given this small number of left turns, as well as recent collision history showing no collisions at this driveway location within the last five years (discussed below in Impacts 4.4-C and 4.4-D) and expected acceptable LOS B operations at this intersection under this scenario, the impact is ***less than significant***, and an eastbound left turn pocket is therefore not required.

Traffic Safety Impacts

Impact 4.4-D The project would add substantial truck traffic to certain primary haul roads that do not meet current County roadway design standards and/or contain limited sight distance. This is a potentially significant impact.

According to County DTPW staff, Mark West Springs Road and Porter Creek Road include road segments that currently do not meet County design standards (AASHTO and Caltrans) in terms of pavement width, sight distance, and other safety standards. As described previously, the County DTPW has plans to improve various segments of Mark West Springs Road/Porter Creek Road; these plans are subject to funding under the Sonoma County Transportation Authority's Measure M program. For the three-phase Mark West Springs Road improvement project, turn lanes and shoulders will be added to facilitate traffic flow and improve safety for all vehicles and bicycles. However, preliminary design will not start until 2015 and this improvement project is not currently fully funded. On Porter Creek Road, a bridge will be replaced and turn lanes and shoulders will be added at the Franz Valley Road intersection by 2015.

These collective programmed improvements would not address all current roadway and safety deficiencies on the Mark West Springs Road and Porter Creek Road haul routes. Specifically, the following roadway segments have minimal shoulders that currently do not meet County roadway standards and would require shoulder and/or lane widening to meet County standards for safety and capacity:

- An approximately one-mile segment of Mark West Springs Road between Riebli Road and Mark West Lodge;
- A 1.6-mile Porter Creek Road segment between the lodge and Franz Valley Road; and
- Approximately 2.9 of 3.2 miles of Porter Creek Road between Franz Valley Road and Petrified Forest Road.

Many of the roads, especially Mark West Springs Road and Porter Creek Road carry relatively high traffic volumes for two-lane County roads. As described in the Existing Conditions section of this chapter, there are longstanding safety concerns with large aggregate haul trucks along this haul corridor. To assess the effects of increasing haul truck traffic on roadway safety, the EIR traffic engineers conducted a review of collision history for the three haul road corridors.

Mark West Springs Road / Porter Creek Road Haul Route

The EIR traffic engineers reviewed the most recent collision history for the same Mark West Springs Road / Porter Creek Road haul route corridor evaluated in the 1997 County haul route study. Reported collision data from 2001 through 2009 were obtained from the California Statewide Integrated Traffic Records System (SWITRS). The purpose of the evaluation was to determine whether any significant collision pattern currently exists along the corridor and to what extent trucks are involved in those collisions.

Table 4.4-9 shows a summary of the recent collision history along the corridor, with classification for trucks (non-aggregate type) and trucks with trailers (assumed to all be aggregate trucks as was done in the 1997 County haul route study). Summaries of collision data by year and type for the entire Mark West Springs Road / Porter Creek Road haul corridor is on file with the Sonoma County Permit and Resource Management Department.

Table 4.4-9
Recent SWITRS Corridor Collision History
(Mark West Springs Road / Porter Creek Road)

Year	***2001***	***2002***	***2003***	***2004***	***2005***	***2006***	***2007***	***2008***	***2009***
Total Collisions	32	28	28	29	36	27	24	23	28
Collisions with Trucks	1	1	2	0	1	2	0	0	2
Collisions with Truck & Trailer	0	1	0	1	2	4	1	2	0

Source: California Statewide Integrated Traffic Records System

The collision data in Table 4.4-9 show that despite general traffic increases over the last decade, the annual collision total for the overall corridor has stayed relatively constant, ranging from 23 collisions in 2008 to 32 collisions in 2001. By comparison, the 1997 County study reported a high of 45 collisions in 1986, suggesting a general downward trend in collisions since then despite an expected increase in traffic along this route.

The 2001-2009 collision data also reveal that annual collisions involving trucks with trailers (aggregate trucks) have ranged from zero to four over the last nine years. This range is virtually identical to the 1986-1996 truck with trailer collision data reported in the 1997 County study. In the 1997 County study, the report concluded that the annual collision rate was not considered excessive or exceptional given the annual traffic volumes along this arterial. Nonetheless, the study acknowledged the ongoing concern about truck safety along the corridor and that the County should make reasonable preemptive efforts to minimize collision potential. It is notable that the high of 45 total collisions in 1986 suggests a reduction in total annual collisions on the corridor since that study was completed.

The more recent collision data results again show that the very low annual collision rate has stayed constant. The results can also be attributed to past and ongoing County safety improvements along the roadway (such as the Ursuline Road / Mark West Springs Road traffic signal, Riebli Road intersection reconstruction, and truck turnout installation), as well as the quarry's existing driver education and enforcement program. It is therefore concluded, just as with the 1997 study, that the annual collision rate involving trucks with trailers is still not considered to be excessive or exceptional given the corridor's traffic volumes and current levels of quarry-related haul truck traffic.

The project is expected to increase the number of truck trips through this corridor by approximately 64 trips per day (annual average) or approximately 101 truck trips per day during the peak production month (October). This increase in truck traffic may increase the risk of collisions with other vehicles. This is considered a potentially significant safety impact.

Petrified Forest Road Haul Route

Similar to the Mark West Springs Road / Porter Creek Road corridor evaluation, the EIR traffic engineers reviewed the most recent collision history for the Petrified Forest Road haul route corridor between the intersection with Petrified Forest Road / Calistoga Road and State Route 128 in the City of Calistoga to determine whether any significant collision pattern currently exists along this corridor and to what extent trucks are involved in those collisions. Table 4.4-10 shows the summary of the recent collision history along this corridor. Summaries of collision data by year and type for Petrified Forest Road are on file with the Sonoma County Permit and Resource Management Department.

Table 4.4-10
Recent SWITRS Corridor Collision History (Petrified Forest Road)

Year	***2001***	***2002***	***2003***	***2004***	***2005***	***2006***	***2007***	***2008***	***2009***
Total Collisions	12	12	12	7	11	9	8	11	7
Collisions with Trucks	0	0	0	0	1	0	0	0	0
Collisions with Truck & Trailer	0	0	0	0	0	0	0	0	0

Source: California Statewide Integrated Traffic Records System

The collision data in Table 4.4-10 show that annual reported collisions on Petrified Forest Road generally have been trending down since a high of 12 in 2001. In the ten-year analysis period, only one non-aggregate truck-related collision was reported (occurring in 2005), while no truck-with-trailer-related collisions were reported. Given these annual collision rates as well as general increases in corridor traffic over the last ten years, there appears to be no current safety concern related to aggregate trucks on the Petrified Forest Road haul route. The project would increase quarry-related truck traffic by approximately 37 truck trips per day on an annual average basis, or 59 per day during the peak month of October, or an average of 3-6 new trips per hour depending on the month. It is not expected that the project would exacerbate current safety conditions along the Petrified Forest Road corridor.

Calistoga Road Haul Route

Similar to the Mark West Springs Road / Porter Creek Road corridor evaluation, the EIR traffic engineers reviewed the most recent collision history for the Calistoga Road haul route corridor between the intersection with Petrified Forest Road / Porter Creek Road and State Route 12 in the City of Santa Rosa to determine whether any significant collision pattern currently exists along this corridor and to what extent trucks are involved in those collisions. Table 4.4-11 shows the summary of the recent collision history along this corridor. Summaries of collision data by year and type for Petrified Forest Road are on file with the Sonoma County Permit and Resource Management Department.

Table 4.4-11
Recent SWITRS Corridor Collision History (Calistoga Road)

Year	*2001*	*202*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*
Total Collisions	51	29	38	30	27	27	33	26	19
Collisions with Trucks	1	0	0	0	1	0	0	1	0
Collisions with Truck & Trailer	0	0	0	3	0	0	1	0	0

Source: California Statewide Integrated Traffic Records System

The collision data in Table 4.4-11 show that annual reported collisions on Calistoga Road have decreased by approximately two-thirds since 2001. Annual reported truck-related collisions have stayed generally low over this time period, with the exception of three truck-with-trailer collisions in 2004. However, since 2004 only one truck-with-trailer collision (aggregate truck-related) has been reported on this corridor. Given these annual collision rates as well as general increases in traffic over the last ten years, there appears to be no current safety concern related to aggregate haul trucks on the Calistoga Road haul route. The annual average of five (5) truck trips per day (8 per day during peak October month) generated by the project and added to these existing conditions would be very small (less than one trip per hour on average). Given the small increase in traffic and the low collision levels, the proposed project is not expected to significantly exacerbate current safety conditions along the Calistoga Road corridor.

It should also be noted that the 2009 Sonoma County Comprehensive Transportation Plan identifies a future roadway project on Calistoga Road, consisting of traffic calming between SR 12 and Montecito Boulevard within the City of Santa Rosa. This project has the potential to improve current safety conditions along Calistoga Road.

Summary

The project would cause an increase in truck traffic on certain public roadways in Sonoma County, and most notably the primary truck haul roads, including Mark West Springs Road and Porter Creek Road. Sections of these haul corridors do not meet current County roadway standards for travel lane width, shoulder width, sight distance, and other safety elements. In particular, the Mark West Springs Road / Porter Creek Road corridor consists of variable lane width and shoulder widths varying from zero (no shoulder) to six feet, as well as limited sight distance on some curves along the route.

The new truck trips generated by the project may increase the risk of collisions involving other vehicles. Given the small increase in traffic and the recorded accident history, the impact would be less than significant for the Petrified Forest Road and Calistoga Road corridors. Given the traffic volumes and speeds of drivers using the Mark West Springs Road / Porter Creek Road corridor, adding more trucks with trailers to this haul route is considered a ***significant safety impact***; however, this significant impact is for the Mark West Springs Road / Porter Creek Road haul corridor only.

Mitigation Measures

In addition to the County continuing to construct planned roadway improvements along Mark West Springs Road and Porter Creek Road, the following mitigation measures shall be required:

4.4-D.1: The applicant shall pay its fair share to improve haul route roads to meet County road standards where such improvements are determined by the County to be feasible. The following roadway segments have minimal shoulders that currently do not meet County roadway standards and would require shoulder and/or lane widening to meet County standards on the Mark West Springs / Porter Creek Road haul corridor:

1. An approximately one-mile segment of Mark West Springs Road between Riebli Road and Mark West Lodge;
2. A 1.6-mile Porter Creek Road segment between Mark West Lodge and Franz Valley Road; and
3. Approximately 2.9 of 3.2 miles of Porter Creek Road between Franz Valley Road and Petrified Forest Road.

The County is planning for future improvements along the above roadway segments; however, they are not currently programmed or funded. The applicant shall be responsible for a fair share for these future improvements when planning and funding are identified in the future, based on an appropriate formula developed by the County.

Fair shares were calculated according to the Caltrans Guide to Traffic Impact Studies. Fair shares are based on the proportion of expected added project traffic to overall future traffic increases. The estimated fair shares that the applicant would be required to pay for the above improvements under 2015 plus Project Conditions are the following:

1. Segment 1: 54 percent
2. Segment 2: 65 percent
3. Segment 3: 64 percent

The project's fair share percentages are high because the project would be the main contributor to new traffic on these roads by 2015. It is very unlikely that these roadway improvements would be constructed by 2015. Every year that passes before the improvements are planned and funded, the applicant's fair share would decrease (due to project-generated traffic remaining constant while the other new traffic from other development on the roads would increase, so the project's percentage of the total new traffic would decrease).

Impact Significance After Mitigation

The recommended mitigation measure is an extension of recommendations made in the County's 1997 Mark West Springs Road / Porter Creek Road Haul Route Study. Implementation of this mitigation measure, along with continuing County improvement of roads in the Mark West

Springs Road / Porter Creek Road Corridor, will reduce the safety impacts. It should be noted that the County's planned safety improvements along certain sections of Mark West Springs Road, pending SCTA Measure M funding, would create wider shoulders and travel lanes that would further improve safety for all vehicles, bicycles, and pedestrians. However, no funding currently exists to install these types of improvements along all currently deficient sections of the Mark West Springs Road / Porter Creek Road haul corridor as specified in Mitigation Measure 4.4-D.1. Given this, the impacts of project traffic on the Mark West Springs Road / Porter Creek Road haul corridor would remain a ***significant and unavoidable impact*** until such time as the roadway improvements are constructed.

Bicycle and Pedestrian Safety Impacts

Impact 4.4-E The project would add substantial truck traffic to the Mark West Springs Road / Porter Creek Road primary haul road that is designated a proposed bikeway and is regularly used by bicyclists or pedestrians, and which do not meet current County roadway design standards. This is a potentially significant impact.

The project would cause a substantial increase in truck traffic on the Mark West Springs Road / Porter Creek Road haul corridor and could increase the risk of collisions due to potential conflicts between project traffic and bicyclists and/or pedestrians. The potential for conflicts would be considered greatest in circumstances where the primary proposed truck haul road would be regularly used by bicyclists or pedestrians and/or is a designated or proposed bikeway, and the road does not meet current County roadway design standards (including paved shoulders of sufficient width for use by bicycles). The impact discussion focuses on lower volume rural roadways and/or collector roadways (i.e., Mark West Springs Road and Porter Creek Road), as added project truck traffic would be most noticeable by bicyclists or pedestrians on these roadways.

As discussed in the Existing Conditions, the SCTA 2010 Sonoma County Bicycle and Pedestrian Plan indicates that there are no existing designated bicycle facilities along the Mark West Springs / Porter Creek Road haul corridor in the study area. These roads have variable lane width and shoulder widths varying from zero (no shoulder) to six feet. There is no designated bicycle route signage along this corridor.

The 2010 Sonoma County Bicycle and Pedestrian Plan identifies the Mark West Springs/Porter Creek/Petrified Forest Road corridor within the County as a future Class II facility (on-street, striped bicycle lanes) between the U.S. 101 freeway to the west and the Napa County border to the east. The County's planned safety improvements along Mark West Springs Road, pending SCTA Measure M funding, would accommodate the Class II designation but would not do so for the entire length of this corridor. Specifically, the following roadway segments have minimal shoulders that currently do not meet County roadway standards and would require shoulder widening to safely accommodate Class II bicycle lanes:

1. An approximately one-mile segment of Mark West Springs Road between Riebli Road and Mark West Lodge;
2. A 1.6-mile Porter Creek Road segment between the lodge and Franz Valley Road; and
3. Approximately 2.9 of 3.2 miles of Porter Creek Road between Franz Valley Road and Petrified Forest Road.

The new truck trips generated by the project may increase the risk of collisions involving other vehicles, including bicycles. As was discussed in Impact 4.4-D, the project would add relatively few trips to the Petrified Forest Road and Calistoga Road corridors, plus these roads are not proposed as bikeways nor regularly used by bicyclists. Given the traffic volumes and speeds of drivers using the Mark West Springs Road / Porter Creek Road corridor, adding more trucks with trailers is considered a ***potentially significant safety impact*** for the Mark West Springs – Porter Creek Road haul corridor.

Mitigation Measures

Mitigation Measure 4.4-D.1 also applies to this impact.

Impact Significance After Mitigation

As discussed under Impact 4.4-D, no funding currently exists to install these types of improvements along all currently deficient sections of the Mark West Springs Road / Porter Creek Road haul corridor as specified in Mitigation Measure 4.4-D.1. Given this, the impacts of project traffic on the Mark West Springs Road / Porter Creek Road haul corridor would remain a ***significant and unavoidable impact*** until such time as the roadway improvements are constructed.

Roadway Wear

Impact 4.4-F The proposed project could contribute to the degradation of pavement on public roads. This is a less-than-significant impact.

The truck trips generated by the project would cause incremental damage and wear to roadway pavement surfaces along the proposed project haul routes of Mark West Springs Road / Porter Creek Road, Petrified Forest Road, and Calistoga Road. The degree to which this impact would occur depends on the roadway's design (pavement type and thickness) and its current condition. Freeways and state routes, such as U.S. 101 and State Route (SR) 128, are designed to handle a mix of vehicle types, including heavy trucks, and thus, the project's impact on those facilities would be negligible. However, local roadways, such as Mark West Springs Road / Porter Creek Road, Petrified Forest Road, and Calistoga Road, are generally not designed to accommodate heavy vehicles, and truck travel on these roads would have the potential to adversely affect the pavement condition. Roadway damage can include conditions such as loose asphalt and potholes that have the potential to make driving conditions less safe. Roadways that may be significantly impacted from project truck traffic would have to be upgraded to support vehicle weights up to 25 tons.

The capability of a roadway to handle a traffic load is measured by deflection testing, coring, and visual condition surveys of the road. These methods allow the roadway's traffic index (TI) to be assessed. The TI is a logarithm-based scale that indicates the ability of the pavement structure to support the repetitive wheel and axle loads of large trucks, given a sound structural roadway subbase. Typically, TI ratings of 7.0 to 9.0 are calculated for roadways that are not expected to carry appreciable amounts of truck traffic. Higher TI values of 9.0 to 10.0 are typical of major arterial roadways with heavy truck traffic, and values of 10.0 or more are common for freeways and freeway ramp systems. The effects on pavement life from passenger cars, pickups, and two-axle, four-wheel trucks are considered to be negligible.

To evaluate the potential project impact on roadway condition and maintenance, an estimated TI for background and project conditions (Existing, 2015, and 2035) was calculated for roadway segments on the proposed project haul routes. The TI was calculated in accordance with the procedures specified in the latest edition of the Caltrans Highway Design Manual on the basis of a 20-year roadway design period (the standard period used by Caltrans) and average daily truck traffic volume estimates. A summary of the TI calculations for roadway segments along the project haul routes are presented in Table 4.4-12.

Current truck traffic volumes on the proposed primary project haul routes reveal that existing TI values range between 5.5 and 7.5 under Existing Conditions and 2015 Background Conditions, and between 5.5 and 8.0 under 2035 Background Conditions. Of the study haul roads, background trips (Existing, 2015, and 2035) are highest on Mark West Springs Road, Porter Creek Road, and Petrified Forest Road, because these roadways currently carry substantial amounts of traffic, including trucks (e.g., from the quarry).

As Table 4.4-12 shows, the project would increase the estimated TI for all the proposed project haul routes. However, based on the significance criteria, the project would have a ***less-than-significant impact*** on these roadways because the increased TI due to proposed project traffic would not increase more than 0.5. As a result, no mitigations due to the effects of project truck traffic on the TI are necessary.

Table 4.4-12
Calculated Traffic Index (TI) for Project Haul Routes

Location	***Existing***	***Existing + Project***	***2015 Background***	***2015 + Project***	***2035 Background***	***2035 + Project***
Mark West Springs Road between Old Redwood Hwy and Ursuline Rd	7.5	8.0	7.5	8.0	8.0	8.0
Mark West Springs Road north of Riebli Road	7.0	7.5	7.0	7.5	7.5	8.0
Porter Creek Rd west of Quarry/Project Driveway	7.5	8.0	7.5	8.0	7.5	8.0
Calistoga Rd south of Porter Creek Rd	5.5	6.0	5.5	6.0	5.5	6.0
Calistoga Rd north of Route 12 (Santa Rosa)	6.0	6.5	6.0	6.5	6.0	6.5
Petrified Forest Rd north of Porter Creek Rd	7.5	8.0	7.5	8.0	8.0	8.5

Note: Traffic Indices in this table represent values calculated on the basis of background and project truck traffic volumes (Existing, 2015, and 2035), and Equivalent Single-Axle Load (ESAL) factors in the latest edition of the Caltrans Highway Design Manual.

Sources: TJKM (2012) and the Caltrans Highway Design Manual Traffic Index methodology.

4. Long-term (2035) Impacts

Long-term (2035) Background Conditions

This section details expected traffic conditions at the study intersections under Long-term (2035) Background Conditions. This scenario assumes the latest SCTA travel demand model projections that include County-identified background development growth and roadway improvements expected to be in place by 2035. Under this scenario, the existing Mark West Quarry baseline production level of 457,000 tons per year is assumed, providing a basis of comparison for the proposed quarry expansion and increased annual production.

Long-term (2035) Background Traffic Estimates

The EIR traffic engineers estimated 2035 traffic volumes for the study intersections within Sonoma County through use of the latest SCTA travel demand model runs. The current model contains a 2005 base year and 2035 cumulative buildout year. The EIR traffic engineers compared the 30-year growth on the model links representing study intersection approaches and then used linear interpolation to estimate a 25-year traffic increment. This increment was added to Existing Conditions (2010) traffic volumes at the study intersections to generate Long-term (2035) Background Conditions traffic volumes.

For the one non-Sonoma County intersection, the SR 128 / Petrified Forest Road intersection in the City of Calistoga, the EIR traffic engineers projected Existing Conditions volumes five years into the future based on historical Caltrans volumes taken on SR 128 at the nearest count station to Petrified Forest Road. Based on preceding traffic volume growth over five years (2004-2009), the EIR traffic engineers applied an annual growth factor of 2.48 percent (approximately 84 percent over 25 years) to existing SR 128 / Petrified Forest Road intersection traffic volumes to generate Long-term (2035) Background Conditions traffic volumes at this study intersection.

Area Development and Roadway Network Assumptions

The Long-term (2035) Background traffic analysis assumes the same approved Sonoma County, Napa County, and City of Calistoga development projects identified under Near Term (2015) Background Conditions, plus additional background development to be built by 2035 as assumed in the latest SCTA travel demand model.

In terms of roadway network assumptions, the Long-term (2035) Background traffic analysis assumes the same SCTA and DTPW-identified roadway improvements expected to be in place under Near Term (2015) Background Conditions, plus the full completion of all U.S. 101 freeway HOV projects as included in the latest SCTA travel demand model. A review of the 2009 Comprehensive Transportation Plan for Sonoma County revealed that there are no other additional roadway improvements anticipated along the Mark West Springs Road / Porter Creek Road corridor beyond the SCTA Measure M and DTPW local projects to be completed by 2015.

Turning movement volumes, traffic controls, and lane geometries anticipated for the study intersections under 2035 Background Conditions are shown in Figure 4.4-8. The intersection traffic controls and lane geometries are based on the anticipated roadway improvements listed previously.

Intersection Level of Service Analysis Results (Long-term 2035 Background Conditions)

Table 4.4-13 summarizes the results of the intersection LOS analysis for Long-term (2035) Background Conditions. Detailed calculation sheets are on file with the Sonoma County Permit and Resource Management Department. All intersections are expected to continue operating acceptably, with the following exceptions:

1. Mark West Springs Road / Riebli Road (LOS F for minor stop-controlled approach during both peak hours); and
2. Petrified Forest Road / SR 128 intersection (LOS F during both peak hours).

It should be noted that the previously described unacceptable LOS at the River Road-Mark West Springs Road / U.S. 101 Southbound Ramp intersection (LOS F under Existing Conditions), is expected to improve to an acceptable LOS A under both peak hours with the programmed addition of a traffic signal as identified by SCTA and Caltrans documentation for the ongoing U.S. 101 HOV project in Sonoma County.

Also, if a traffic signal were installed at the Petrified Forest Road / SR 128 intersection, service levels would improve to LOS C or better for both peak hours. This potential improvement is identified in the City of Calistoga General Plan. The intersection meets California Manual on Uniform Traffic Control Devices (MUTCD) peak hour volume signal warrants for both peak hours.

Table 4.4-13
Intersection Levels of Service – Long-term (2035) Background Conditions

ID	*Intersection*	*Control*	*Long-term (2035) Background Conditions*			
			A.M. Peak Hour		*P.M. Peak Hour*	
			Delay	*LOS*	*Delay*	*LOS*
1	River Road-Mark West Springs Road / U.S. 101 Southbound Ramps	Signal	9.4	A	9.6	A
2	River Road-Mark West Springs Road / U.S. 101 Northbound Ramps	Signal	18.8	B	26.2	C
3	Mark West Springs Road / Old Redwood Highway	Signal	42.4	D	37.7	D
4	Mark West Springs Road / Ursuline Road	Signal	46.8	D	15.4	B
5	Mark West Springs Road / Riebli Road	One-way stop	**77.7**	**F**	**177.3**	**F**
6	Mark West Springs Road / Franz Valley Road / Porter Creek Road	One-way stop	13.5	B	9.8	A
7	Porter Creek Road / Quarry Driveway	One-way stop	15.8	C	16.6	C
8	Porter Creek Road / Calistoga Road / Petrified Forest Road	All -way stop	24.2	C	**56.3**	**F**
9	Petrified Forest Road / State Route (SR) 128	All-way stop	**59.1**	**F**	**59.1**	**F**
10	Calistoga Road / State Route (SR) 12	Signal	51.7	D	38.6	D

Source: TJKM Transportation Consultants
Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions.

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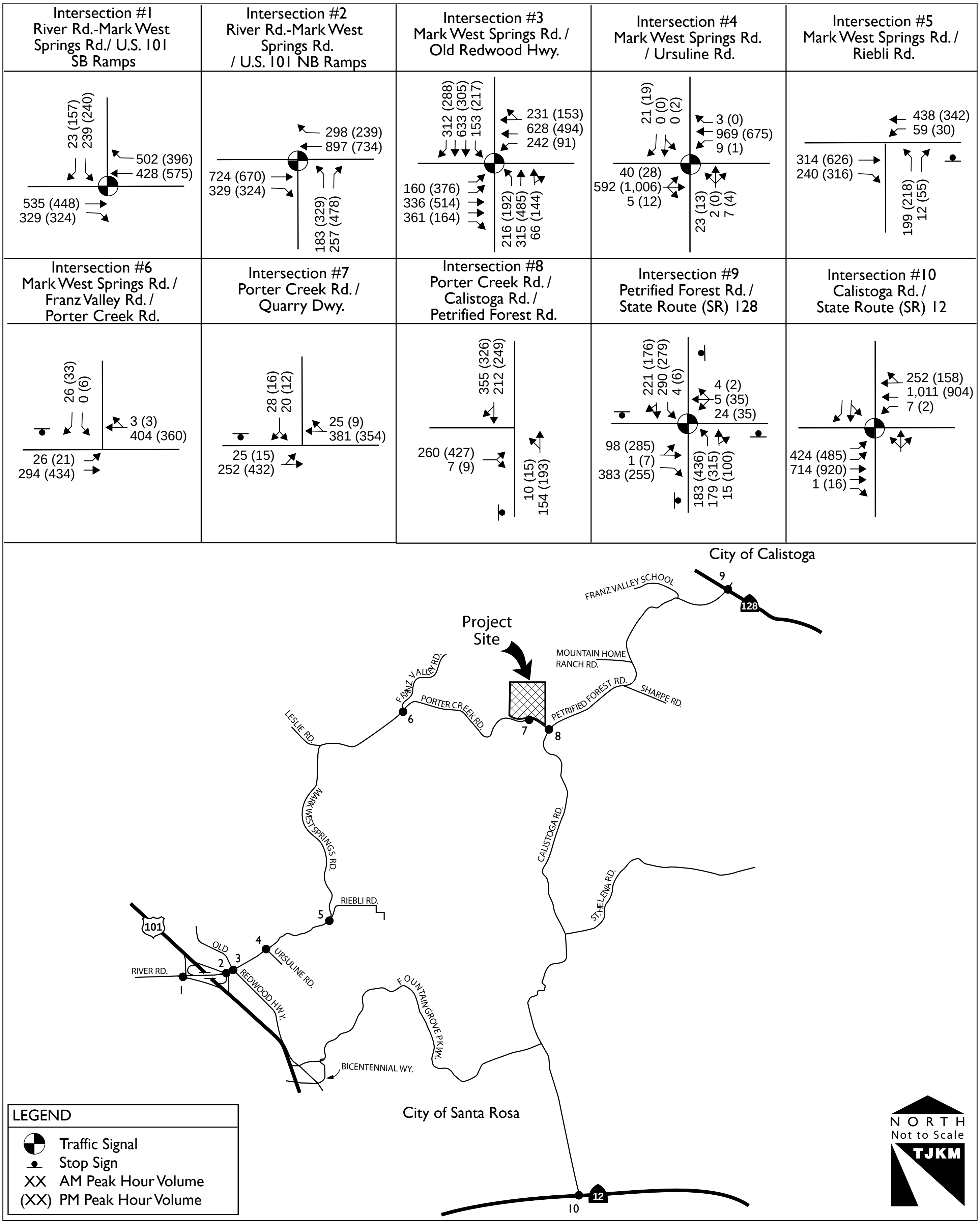
2035 Baseline Conditions Volumes, Lane Geometry, and Traffic Controls

Figure 4.4-8



Impacts to Study Intersections in the Long-term (2035) Background Plus Project Conditions

Impact 4.4-G Project-generated traffic will cause unacceptable intersection operations at two study intersections in 2035. This is a potentially significant impact.

This scenario is similar to Long-term (2035) Background Conditions, but with the addition of traffic generated by the proposed project, which consists of expanding current annual aggregate production at the existing Mark West Quarry from 457,000 tons to 750,000 tons, or a net increase of 293,000 tons per year over current baseline quarry production. The assumed roadway network and nearby area development is assumed to be the same under this traffic scenario as for Long-term (2035) Background Conditions (see the subsequent Table 4.4-14).

The expected proposed project trip generation, distribution, and assignment assumed under Long-term (2035) Background Plus Project Conditions is identical to that assumed under 2015 Plus Project Conditions.

The LOS analysis results for both 2035 Background and 2035 Plus Project Conditions are summarized in Table 4.4-14. Figure 4.4-9 shows the turning movements for the study intersections under 2035 Plus Project Conditions. Detailed calculations are on file with the Sonoma County Permit and Resource Management Department. All intersections are expected to continue operating acceptably, with the following exceptions:

1. Mark West Springs Road / Riebli Road would operate at LOS F for minor stop-controlled approach during both peak hours, with added average delay for the minor approach of approximately 10.1 seconds (a.m. peak hour) and 13 seconds (p.m. peak hour). This is considered a potentially significant impact based on applicable significance criteria that states that a project would make a considerable contribution to an intersection that would operate at worse than LOS D if project-generated traffic would increase vehicle delays by more than 5 seconds.

2. Porter Creek Road / Calistoga Road / Petrified Forest Road intersection would operate at LOS F during the p.m. peak hour for the minor Porter Creek Road eastbound stop-controlled approach. However, since average delay for this approach is expected to increase by less than five seconds (i.e., 2.4) with the addition of project traffic to an intersection already operating at LOS F under 2015 Background Conditions, this is a less-than-significant impact per applicable significance criteria, and therefore no mitigations due to project traffic are necessary at this intersection under 2035 plus Project Conditions.

3. Petrified Forest Road / SR 128 intersection would operate at LOS F during both peak hours, with added average delay for the overall intersection of approximately 3.3 seconds (a.m. peak hour) and 1.7 seconds (p.m. peak hour). However, since the project would add fewer than five seconds of average delay to the intersection, this is considered a less-than-significant impact, and therefore no mitigations due to project traffic are necessary at this intersection under 2035 plus Project Conditions.

Table 4.4-14
Intersection Levels of Service – 2035 Background Plus Project Conditions

ID	Intersection	Control	2035 Background Conditions				2035 Plus Project Conditions			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	River Road-Mark West Springs Road / U.S. 101 Southbound Ramps	Signal	9.4	A	9.6	A	9.7	A	9.7	A
2	River Road-Mark West Springs Road / U.S. 101 Northbound Ramps	Signal	18.8	B	26.2	C	19.3	C	26.5	C
3	Mark West Springs Road / Old Redwood Highway	Signal	42.4	D	37.7	D	43.5	D	38.1	D
4	Mark West Springs Road / Ursuline Road	Signal	46.8	D	15.4	B	53.1	D	15.5	B
5	Mark West Springs Road / Riebli Road	One-way stop	**77.7**	**F**	**177.3**	**F**	**99.7**	**F**	**198.8**	**F**
	Mitigation: Install Signal		-	-	-	-	7.6	*A*	8.9	*A*
6	Mark West Springs Road / Franz Valley Road / Porter Creek Road	One-way stop	13.5	B	9.8	A	13.9	B	9.9	A
7	Porter Creek Road / Quarry Driveway	One-way stop	15.8	C	16.6	C	19.5	B	23.9	C
8	Porter Creek Road / Calistoga Road / Petrified Forest Road	All -way stop	24.2	C	**56.3**	**F**	26.4	C	**58.7**	**F**
9	Petrified Forest Road / State Route (SR) 128	All-way stop	**59.1**	**F**	**59.1**	**F**	**62.4**	**F**	**60.8**	**F**
		Signal	19.7	B	35.6	C	20.4	D	36.3	D
10	Calistoga Road / State Route (SR) 12	Signal	51.7	D	38.6	D	52.0	D	38.6	D

Source: TJKM Transportation Consultants
Notes: 1) LOS=Level of Service, Delay = Average control delay per vehicle
2) Signalized and four-way stop controlled intersections – Delay / LOS is for overall intersection
3) Unsignalized one- and two-way stop controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
4) **Bold** indicates LOS exceeds applicable jurisdictional standards for operating conditions

Based on applicable jurisdictional standards of significance, traffic from the proposed project is expected to cause a potentially significant impact on one intersection: Mark West Springs Road / Riebli Road.

Mitigation Measures

4.4-G.1 The applicant will pay its fair share to fund installation of a traffic signal at the Mark West Springs Road / Riebli Road intersection.

Impact Significance After Mitigation

The recommended mitigation of installing a traffic signal at the Mark West Springs Road / Riebli Road intersection with no other geometric changes would improve traffic operations at this intersection to an acceptable LOS A during both a.m. and p.m. peak hours. As a result, this impact would be mitigated to a less-than-significant level. It should be noted that this mitigation

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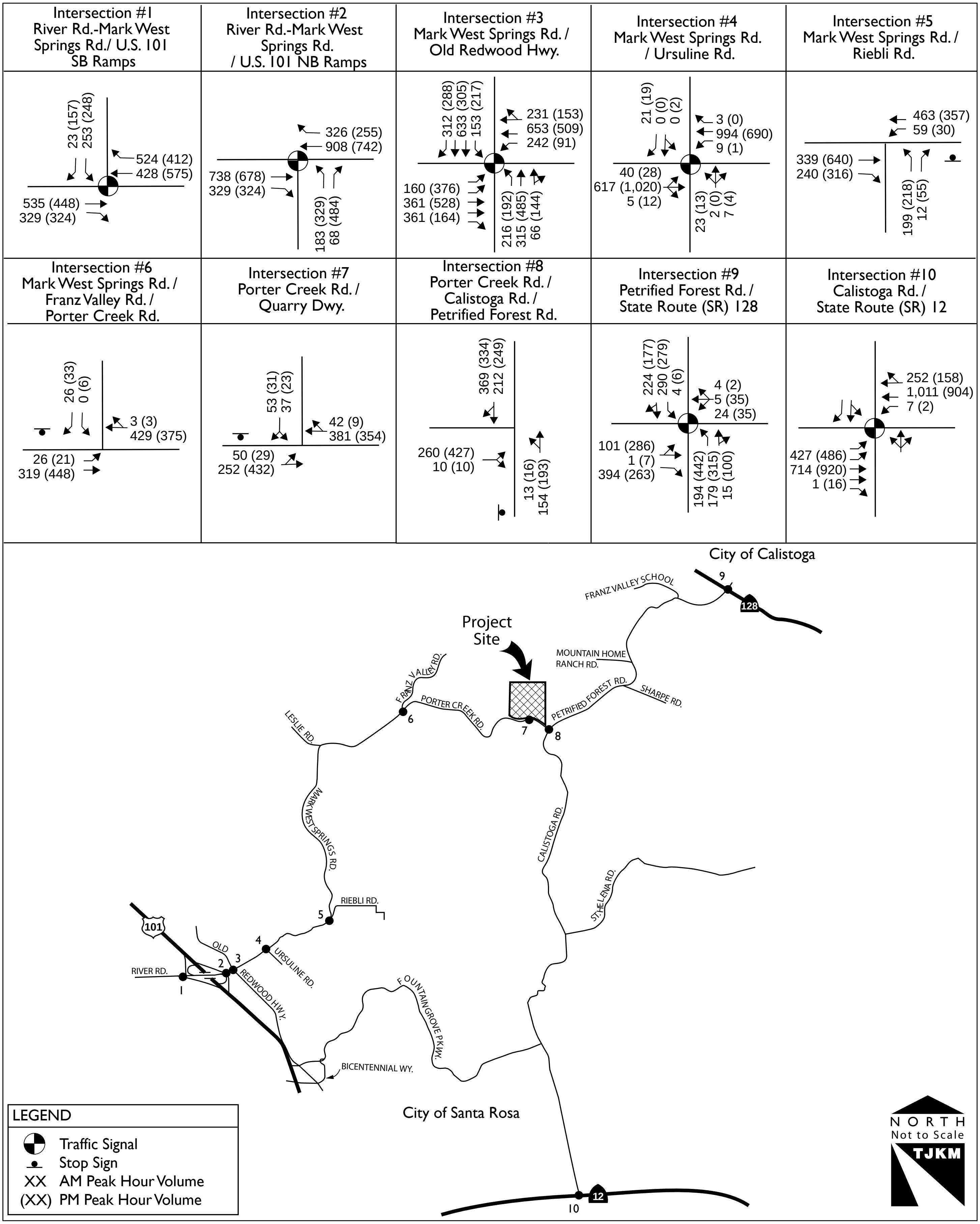
Figure 4.4-9

2035 plus Project Conditions Volumes, Lane Geometry, and Traffic Controls



is not yet programmed or funded by Sonoma County. The signal would be warranted under the Long-term (2035) Background Conditions (i.e., regardless of whether additional traffic is added by the project). Because this improvement has neither been planned nor funded by the County, it would remain a significant and unavoidable cumulative impact. The project would make a considerable contribution to this ***significant impact*** until such time as the signal is installed. Installation of a signal at this intersection would involve construction within the roadway or road shoulder and would not be expected to have any significant secondary environmental impacts.

Project Access Driveway and Porter Creek Road Intersection Impact Under the Long-term (2035) Background Plus Project Condition

Impact 4.4-H Project-generated traffic will impact intersection operations at the Porter Creek Road / Project Access Driveway intersection in the Long-term Base (2035) Plus Project conditions. This is a less-than-significant impact.

The EIR traffic engineers evaluated the need for an eastbound left turn pocket at the existing quarry entrance on Porter Creek Road given the expected eastbound left turn volumes into the site with quarry expansion under Long-term (2035) Background Plus Project Conditions.

During the 2035 Background Plus Project a.m. peak hour, 16 eastbound left turns would need to wait for gaps to turn into the driveway while being opposed by 400 westbound through and right turn vehicles. Similarly during the p.m. peak hour, 10 eastbound left turns would oppose 360 through and right turn vehicles. Based on TRB guidance, the low number of left turns under both peak hours would not warrant the need for an eastbound left turn pocket. Given this result, as well as recent collision history showing no collisions at this driveway location within the last five years and expected acceptable operations of LOS C or better at this intersection under this scenario, the impact is ***less than significant***, and an eastbound left turn pocket is not necessary.

Traffic Safety Impacts Under the Long-term (2035) Background Plus Project Condition

Impact 4.4-I Project-generated traffic will increase the risk of collisions between haul trucks and other vehicles, pedestrians, and bicyclists, along the Mark West Springs / Porter Creek Road haul corridor under the Long-term (2035) plus Project Condition. This is a potentially significant impact.

As described in Impacts 4.4-C and 4.4-D, the project traffic would cause significant safety impacts on the Mark West Springs / Porter Creek Road haul corridor that is currently deficient with respect to County road standards for vehicles, bicycles, and pedestrians. This impact would be expected to continue under long-term conditions, especially because the overall volume of traffic on the roadway system will increase. The project would make a considerable contribution to a ***significant cumulative impact*** on the Mark West Springs / Porter Creek Road haul corridor.

The County's planned safety improvements along Mark West Springs Road, pending SCTA Measure M funding, would widen the roadway, including wider shoulders to accommodate Class II bicycle lanes, but would not do so for the entire length of this corridor. It is possible that future County road improvement plans would include improving the entire corridor to meet County standards, but it remain unknown if and when that planning, funding, and construction would occur.

Mitigation Measures

Mitigation Measure 4.4-D.1 (Road widening to County standards) applies to this cumulative impact.

Impact Significance After Mitigation

Because planning for all the needed improvements and funding of the improvements to the Mark West Springs / Porter Creek Road haul corridor to County standards for vehicles and bicycles have not been identified, this impact would remain significant and unavoidable. The project would make a ***cumulatively-considerable contribution*** to this significant cumulative impact. Until such time as the improvements are constructed.

Secondary Impacts Resulting from Implementing Off-Site Transportation Mitigation Measures

Impact 4.4-J **Implementation of Mitigation Measure 4.4-D.1 on Mark West Springs Road and Porter Creek Road could result in short-term and/or long-term environmental impacts on geology and soils, hydrology and water quality, hazardous materials, biological resources, transportation and circulation, air quality, noise, aesthetics and cultural resources. These could be potentially significant impacts.**

Mitigation Measure 4.4-D.1 (road widening to meet County standards) would consist of roadway shoulder widening for safety purposes and to accommodate full-width Class II bicycle lanes along the following segments on the Mark West Springs / Porter Creek Road haul corridor:

1. an approximately one-mile segment of Mark West Springs Road between Riebli Road and Mark West Lodge,
2. 1.6-mile Porter Creek Road segment between the lodge and Franz Valley Road, and
3. approximately 2.9 of 3.2 miles of Porter Creek Road between Franz Valley Road and Petrified Forest Road.

These improvements are not currently programmed or funded by the County. When the County programs these widening projects and develops specific roadway improvement projects, the County will conduct CEQA reviews of the projects. The County currently conducts such CEQA review for these types of public works projects and has developed a list of appropriate mitigation measures to be used (and amended as warranted) to address standard impacts from such projects.

These potential future widening projects would consist primarily of widening shoulders along existing roadways by potentially up to six feet along both directions of the roadways, or a total of up to 12 feet, plus clearing (or constructing in fill sections) additional unpaved shoulder area to accommodate roadside clear zones, guardrails, and other roadside safety devices as necessary. Roadway shoulder construction would involve preparing a pavement structure, including subgrade, aggregate subbase, and pavement layers. As a result, the widening may require substantial slope cuts or fills along some roadway sections to accommodate larger cross-sections and roadside safety clear zones. Expanding the slope cut/fill areas would also ensure roadbed integrity and stability. The widening projects may also require relocating existing or installing new roadway drainage infrastructure (such as catch basins and subdrain pipes underneath the roadway) to ensure proper drainage of the larger impervious pavement areas that would result from the shoulder widening projects.

Over the long term, the identified off-site improvements would serve to mitigate project impacts, and provide a beneficial effect on the movement of large vehicles, cars and bicyclists on haul routes, and decrease the potential for conflicts between these modes of transportation. However, construction and implementation of these off-site transportation improvements would also result in their own potentially significant temporary and long-term environmental impacts. A detailed analysis of the specific off-site impacts cannot be completed until, and if, design work is undertaken that would provide information on the specific alignment and structural improvements that may be required along Mark West Springs and Porter Creek Roads to accommodate the proposed widening. If the proposed roadway improvements were pursued, as noted previously, subsequent detailed environmental analysis and County approval would be required. Therefore, the following discussion identifies the likely range of potential environmental impacts that could be anticipated with the identified roadway widening improvements.

Geology and Soils

During construction, the identified widening improvements on Mark West Springs and Porter Creek Roads would require vegetation removal, shallow excavation, and grading along the alignment. Construction operations would expose the soil surface and create temporary soil stockpiles, which would be susceptible to erosion by wind or water.

Steep slopes are located adjacent to sections of both roads, particularly Porter Creek Road. Possible roadway widening could require substantial upslope cuts into the underlying bedrock or looser soil materials to achieve required slope stability, and possible downslope fills to support the increased road width. Depending on the geologic material, some areas would require the cut slope angle to reach 1:1 to 3:1; the need for greater slope angle would require considerably more grading and possible encroachment into private property. Additionally, excavation in certain bedrock types could require blasting to remove the rock for grading. Road cut slopes and fill slopes must achieve a required “factor of safety” (the point at which a slope is considered stable) for seismic conditions (earthquake) and non-seismic conditions. Although achieving required factors of safety for conditions in this area is possible using standard engineering design and construction practices, a detailed geotechnical feasibility and design study must be conducted to develop site-specific engineering design criteria and approaches. Mitigation Measure 4.4-J.1, below, reflects current engineering practice and the accepted standard of care to mitigate potential impacts from unique geological conditions along the roadway alignments.

Mitigation Measure 4.4-J.1: A design level geotechnical investigation shall be required to identify site specific geologic conditions and geotechnical constraints and develop adequate engineering design criteria and remedies to reduce the potential for slope instability from cutting and filling of adjacent slopes along the roadway alignments. Methods for reducing potential slope instability effects could include, but are not limited to, slope reconstruction, earth buttress construction, or retaining structures/walls. All recommendations identified by the licensed geotechnical engineer shall be included in the final design and be incorporated into the roadway widening project.

Mitigation Measure 4.4-J.2: As part of the grading and construction specifications for the roadway widening, implement best management practices (BMPs) to reduce or eliminate soil erosion during construction. The contractor shall implement these BMPs and be responsible for the inspection and maintenance of the BMPs during construction. These measures shall be incorporated into the Storm Water Pollution Prevention Plan (SWPPP) for the proposed roadway widening.

Hydrology and Water Quality / Hazardous Materials

During construction, the stripping of vegetation and disturbance of soils along the roadway alignments could result in increases in sedimentation that would affect surface water quality in local watercourses. In addition, the accidental release of hazardous materials (e.g., fuels, lubricants) associated with construction could contaminate soil and/or stormwater along the roadway alignments.

A number of surface watercourses are located along or across the roadway alignments, including Mark West Springs, Porter Creek, and unnamed tributaries to those streams. In addition, open drainages exist along one or both sides of sections of Mark West Springs and Porter Creek Roads along their alignment. Consequently, the proposed roadway widening of these two roads may directly impact portions of these streams and/or could impact Porter Creek at the three roadway crossings of this stream or Mark West Creek at the roadway crossing of that creek.

The proposed widening of Mark West Springs and Porter Creek Roads would incrementally increase the amount of impervious surface along the roadway alignments, and therefore, increase the amount of stormwater runoff from the roadways, and increasing peak flows to local watercourses and hence, potential flooding and bank erosion. However, when considering this increase in impervious area would be distributed throughout a large area, and increases in runoff would be distributed to several watercourses, this net increase would not in itself be significant. However, Mitigations Measures 4.4-J.3 and 4.4-J.4 are provided to ensure that potential impacts associated with temporary construction water quality and drainage would remain less than significant.

Mitigation Measure 4.4-J.3: Prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) before commencing with roadway widening construction. As part of this process, a Notice of Intent shall be filed with the State Water Resources Regional Control Board, in compliance with the statewide NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). The SWPPP shall specify Best Management Practices (BMPs) to control contamination of surface flows through measures to prevent the potential discharge of pollutants from the construction area. The BMPs shall be designed to minimize erosion of disturbed soil areas. BMPs could include, without limitation, silt fences, gravel or sand bags, stormdrain inlet protection, soil stockpile protection, preservation of existing vegetation where feasible, use of straw mulch, dust control, and other measures. The SWPPP will also include protection and spill prevention measures for any temporary onsite storage of hazardous materials used during construction.

Mitigation Measure 4.4-J.4: The proposed storm drain system for the roadway widening improvements shall be designed in accordance with all applicable County and Sonoma County Water Agency (SCWA) drainage and flood control design standards. The drainage plan for the roadway widening improvements shall ensure the proposed drainage facilities are properly sized to accommodate projected storm flows and prevent any potential project flooding on-site and in downstream areas.

Biological Resources

The vegetative communities along Mark West Springs Road and Porter Creek Road alignments consist of coast live oak and other oak woodlands, mixed evergreen forest, grasslands, and several chaparral habitat types. Much of Porter Creek Road extends in close proximity to Porter Creek (crossing it three times), while the northern portion of Mark West Springs Road is quite near (and crosses once) Mark West Creek. These creeks support riparian woodlands habitat.

Depending on the roadway design and extent of disturbance, the identified roadway widening improvements would have the potential to result in temporary and/or permanent impacts to jurisdictional waters of Porter Creek.

There are records of Navarro roach, coho salmon, and steelhead in Mark West Creek. Suitable habitat for foothill yellow-legged frog (FYLF) occurs in both Mark West and Porter Creeks, and there is potential habitat for California red-legged frog (CRLF) and western pond turtle in both streams, their tributaries, and nearby upland habitat. These special status species could be directly or indirectly affect by roadway widening.

Roadway widening improvements would also have the potential to result in direct or indirect impacts to mature trees along the two roads. In addition, construction activities and the loss of these trees along the roadway alignments could result in the disturbance of active nests of raptors and other special-status birds, particularly during the breeding season.

Many of the mitigation measures identified to mitigate potential impacts to biological resources from the proposed quarry project (including jurisdictional waters and wetlands, effects to special status wildlife species and habitat, tree loss) would also be relevant and applicable for mitigating impacts associated with the roadway widening improvements on Mark West Springs and Porter Creek Roads. Accordingly, the following mitigation measures identified in Section 4.3 in this EIR (as amended, below) are identified to mitigate impacts from the roadway widening improvements to biological resources.

Mitigation Measure 4.4-J.5: To mitigate the filling or excavating of potentially jurisdictional wetlands along the roadway widening alignments, the County shall:

1. Conduct a formal wetland delineation in accordance with 1987 Corps of Engineers Wetlands Delineation Manual and have it verified by the U.S. Army Corps of Engineers (Corps). If the Corps and/or CDFW determine that the potentially affected water-associated features are jurisdictional, then the County shall obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly an Nationwide permit) from the Corps, Section 1603 Streambed Alteration Agreement from CDFW, and/or Section 401 water quality certification from the Regional Water Quality Control Board.

2. Compensate for the loss of jurisdictional wetlands at a 2:1 ratio (or as agreed to by the permitting agencies) within the project site boundary, or at a 3:1 ratio (or as agreed to by the permitting agencies) off-site within the local watershed, by creating, restoring or enhancing waters of the U.S., or contributing in-lieu funds to an existing or new restoration project preserved in perpetuity. The restoration effort shall require implementation of a five-year monitoring program with applicable performance standards, including but not limited to establishing: 80 percent survival rate of restoration plantings native to local watershed; absence of invasive plant species; absence of erosion features; and a functioning, and self-sustainable wetland system.

Mitigation Measure 4.4-J.6: Avoid all potential jurisdictional wetlands and riparian habitat located along the roadway alignments, as feasible. Prior to construction activities, the County shall take appropriate measures to protect the wetlands and riparian habitat located in these areas.

Mitigation Measure 4.4-J.7: The County shall implement measures to minimize and avoid take of CRLF that would additionally benefit pond turtles and FYLF, if present. The following measures are derived from the Programmatic Biological Opinion (PBO) for impacts to California red-legged frog. Projects that impact CRLF require formal consultation with the USFWS and issuance of a Biological Opinion. The following actions will minimize impacts to these species.

1. A USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and their habitat, and the general measures that are being implemented to protect the CRLF as they relate to the roadway widening improvements.

2. A USFWS-approved biologist shall be present during initial grading activities to monitor roadway construction activities within 100 feet of creek corridors and aquatic habitat that could support CRLF. Thereafter, an onsite person shall be designated to monitor onsite compliance with all minimization measures. The USFWS-approved biologist shall ensure that this individual receives training consistent with that outlined in the Biological Opinion.

Transportation and Circulation

The proposed future widening improvements on Mark West Springs Road and Porter Creek Road would be expected to cause temporary congestion during construction. It is likely that temporary closures of these roads may be needed. It is also likely that only one lane of traffic would remain open on these roads during the majority of construction duration. During peak commute hours, this could cause substantial traffic backups. This could also result in traffic taking alternate routes to avoid construction delays. Construction of the roadway widening improvements would also result in short-term increases in vehicle trips by construction vehicular activities and construction workers. Most project-related traffic would be dispersed throughout the work day, thus lessening the effect on peak-hour traffic. These would be short-term construction-related impacts and would cease upon construction completion. The following mitigation measures would reduce this potential impact to a less-than-significant level.

Mitigation Measure 4.4-J.8: The following traffic control measures shall be included in the project:

1. To the extent possible, the contractor shall schedule truck trips outside of peak commute hours.

2. Lane closures on Mark West Springs and Porter Creek Roads shall occur only during the hours of 8:30 a.m. and 4:30 p.m. Outside of these hours on Monday through Friday, or on weekends, two lanes of traffic on both roads must be open.

3. If lengthy delays are anticipated, signs shall be posted to notify motorists that traffic will be subject to delay.

4. Traffic safety guidelines compatible with Section 12 of the Caltrans Standard Specifications, "Construction Area Traffic Control Devices" shall be followed during construction. Project plans and specifications shall also require that adequate signing and other precautions for public safety be provided during project construction.

5. For highly sensitive land uses, such as schools, fire and police, the County shall require the construction contractor to develop access plans in consultation with facility owner or administrator. The contractor shall notify the facility owner in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures.

6. The County shall require the contractor to provide for passage of emergency vehicles through the project site at all times.

7. The County shall require the contractor to maintain access to all parcels adjacent to the construction zone during construction.

Air Quality / Noise

Earthmoving and construction activities associated with the roadway widening improvements would result in temporary construction-related impact on air quality and noise (including potential blasting noise if blasting is required to excavate certain bedrock types).

Mitigation Measure 4.4-J.9: The following dust control measures will be included in the project:

1. Water or dust palliative shall be sprayed on unpaved construction and staging areas during construction as directed by the County.

2. Trucks hauling soil, sand and other loose materials over public roads shall cover the loads, or keep the loads at least two feet below the level of the sides of the container, or shall wet the load sufficiently to prevent dust emissions.

3. Paved roads shall be swept as needed to remove soil that has been carried onto them from the project site.

4. Water or other dust palliative shall be applied to stockpiles of soil as needed to control dust.

Mitigation Measure 4.4-J.10: Roadway widening construction activities for this project shall be restricted as follows:

1. All internal combustion engines used during construction of this project shall be operated with mufflers that meet the requirements of the State Resources Code, and, where applicable, the Vehicle Code.

2. Except for actions taken to prevent an emergency, or to deal with an existing emergency, all construction activities shall be restricted to the hours of 7:00 a.m. and 7:00 p.m. on weekdays and 9:00 a.m. and 7:00 p.m. on weekends and holidays. Only work that does not require motorized vehicles or power equipment shall be allowed on holidays. If work outside the times specified above becomes necessary, the resident engineer shall notify the PRMD Environmental Review Division as soon as practical.

Aesthetics

Implementing roadway widening improvements on Mark West Springs and Porter Creek Roads would result in the removal of a number of trees and other vegetation, recontouring of some adjacent slopes, and the potential installation of roadway support features (e.g., retaining walls or embankments) in some locations, resulting in a potential visual impact. The visual impact could be reduced by revegetating slopes. This would include erosion control measures, along with the addition of planting native shrubs and trees to soften the appearance of any cut slopes.

Mitigation Measure 4.4-J.11: Following roadway widening and creation of any cut slopes, the County shall require the contractor to provide landscape improvements. Native shrubs and trees shall be planted to create a landscape that recalls the native landscape of the region. Plants shall be selected that require the least maintenance, and create a sustainable landscape. If retaining walls are required as part of the roadway widening, the use of natural finishes shall be considered, if feasible. A maintenance program, including weeding and summer watering shall be followed until plants have become established (minimum of three years).

Cultural Resources

It is possible that presently unknown archaeological or paleontological sites could be unearthed during construction.

Mitigation Measure 4.4-J.12: If archaeological materials are discovered during project construction, construction shall cease in the immediate vicinity of the find until a qualified archaeologist is consulted to determine the significance of the find, and has recommended appropriate measures to protect the resource. Further disturbance of the resource will not be allowed until those recommendations deemed appropriate by the County have been implemented.

Mitigation Measure 4.4-J.13: If paleontological resources or unique geologic features are discovered during project construction, construction shall cease in the immediate vicinity of the find until a qualified paleontologist or geologist is consulted to determine the significance of the find and has recommended appropriate measures to protect the resource.

Impact Significance After Mitigation

The above-identified mitigation measures would be expected to mitigate all potential significant impacts to a less-than-significant level. The County may well develop alternate or additional mitigations depending on final project design and conditions existing at that time. In addition, subsequent detailed environmental analysis and County approval would be required for the roadway widening improvements. That analysis may disclose additional impacts and/or identify additional mitigation measures to reduce impacts. While it is expected that standard mitigations such as those listed above would reduce impacts to a less-than-significant level, it is possible that there could be impacts that remains significant and unavoidable. To be conservative, unless and until that detailed analysis is completed, the impacts are considered ***significant and unavoidable***.

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4.5 NOISE

This section presents the results of the environmental noise assessment performed for the project. The existing conditions section presents the fundamentals of environmental noise, provides a discussion of policies and standards applicable to the project, and presents a discussion of the existing noise environment at sensitive receptors in the site vicinity. The impacts and mitigation measures section provides a discussion of potential noise impacts including exposure of sensitive receptors to noise levels in excess of standards established in the local general plan, generation of excessive groundborne vibration, and potential increases in noise at sensitive receptors resulting from the project.

A. Existing Conditions

1. Fundamentals of Environmental Noise

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. Decibels and other technical terms are defined in Table 4.5-1.

Most of the sounds which we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflects the facts that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency mid-range. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Typical A-weighted levels measured in the environment and in industry are shown in Table 4.5-2 for different types of noise.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which create a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{01}, L_{10}, L_{50}, and L_{90}, are commonly used. They are the A-weighted noise levels equaled or exceeded during 1%, 10%, 50%, and 90% of a stated time period. A single number descriptor called the L_{eq} is also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, L_{dn} (day/night average sound level), was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted 10 dB higher than the daytime noise level.

Table 4.5-1 Definitions of Acoustical Terms Used in This Report

Term	Definitions
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{02}, L_{8}, L_{25}, L_{50}	The A-weighted noise levels that are exceeded 2%, 8%, 25%, and 50% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Table 4.5-2 Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	120 dBA	
Jet fly-over at 300 meters		Rock concert
	110 dBA	
Pile driver at 20 meters	100 dBA	
		Night club with live music
	90 dBA	
Large truck pass by at 15 meters		
	80 dBA	Noisy restaurant
Freeway at 30 meters		Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70 dBA	Vacuum cleaner at 3 meters
Commercial/Urban area daytime		Normal speech at 1 meter
Suburban expressway at 90 meters	60 dBA	
Suburban daytime		Active office environment
	50 dBA	
Urban area nighttime		Quiet office environment
	40 dBA	
Suburban nighttime		
Quiet rural areas	30 dBA	Library
		Quiet bedroom at night
Wilderness area	20 dBA	
Most quiet remote areas	10 dBA	Quiet recording studio
Threshold of human hearing	0 dBA	Threshold of human hearing

The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

2. Background Information on Blasting

When explosive charges detonate in rock, they are designed so that most of the energy is used in breaking and displacing the rock mass. However, some of the energy can also be released in the form of transient stress waves, which in turn cause temporary ground vibration. Detonating charges also create rock movement and release of high-pressure gas, which in turn induce air-overpressure (blast noise), airborne dust and audible blast noise.

Vibration Perception and Damage Criteria

The average person is quite sensitive to ground motion, and levels as low as 0.50 millimeters per second (mm/s) (equivalent to 0.02 inches per second [in/s]) can be detected by the human body when background noise and vibration levels are low. Vibration intensity is expressed as Peak Particle Velocity (PPV), which is simply the maximum speed that the ground moves while it temporarily shakes. Since ground-shaking speeds are very small, it is measured in inches per second (in/s). Frequency of motion or cycles per second is a measure of how many times a particle of ground moves back and forth (or up and down) in one second of time. Frequency is expressed in units of Hertz (Hz).

Blast Noise (Air-Overpressure)

The term “blast noise” is a misleading because the largest component of blast-induced noise occurs at frequencies below the threshold-of-hearing for humans (16 to 20 Hz). Hence, the common industry term for blast-induced noise is “air-overpressure.” As its name implies, air-overpressure is a measure of the transient pressure changes. These low-intensity pulsating pressure changes, above and below ambient atmospheric pressure, are manifested in the form of acoustical waves traveling through the air.

When calculating maximum overpressure values, the absolute value of the greatest pressure change is used, regardless of whether it is a positive or negative change. The frequency of the overpressure (noise) is determined by measuring how many up-and-down pressure changes occur in one second of time. Blast noise occurs at a broad range of frequencies and the highest-energy blast noise usually occurs at frequencies below that of human hearing (<20 Hz).

When measurements include low frequency noise (2 Hz and higher) with a flat response, they are called “linear scale” measurements. Air-overpressure measurements are typically expressed in dB units and when the scale is linear, the unit designation is “dBL.” Regular acoustical noise measurements taken for the purpose of monitoring compliance with local noise ordinances almost always use weighted scales that discriminate against low frequency noise. Thus for a similar noise source, A-weighted and C-weighted scales will usually record significantly lower levels of noise. Differences between decibel scale measurements for individual blasts will vary depending on their unique frequency-intensity spectrums. Since full-range recording of blast-induced noise can only be done with linear (2-Hz response) instruments, it is imperative that all compliance specifications for blast-induced noise be expressed in dBL.

The regulatory limit defined by USBM, in State of California regulations, for air-overpressure measured with 2-Hz response seismographs is 133-dBL (0.014 psi). Damage to old or poorly glazed windows does not occur until air-overpressure reaches about 150 dBL. More importantly, since the decibel scale is a logarithmic ratio, the actual overpressure at 150 dBL is 0.092 psi, versus 0.013 psi at 133 dBL. Therefore, the actual pressure at the 133 dBL limit, is over seven times (0.0917/0.0129) lower than the threshold damage level at 150 dBL.

3. Regulatory Background

The State of California and Sonoma County establish guidelines, regulations, and policies designed to limit noise exposure at noise sensitive land uses. Appendix G of the State CEQA Guidelines, the Sonoma County Noise Element of the General Plan 2020, and the Sonoma County Zoning Code present the following:

State CEQA Guidelines

The State CEQA guidelines address how to evaluate the significance of effects of environmental noise attributable to a proposed project. Applicable[24] CEQA questions ask whether a proposed project would result in:

1. Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies.
2. Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels.
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

The California Environmental Quality Act does not define what ambient noise level increase would be considered substantial. This determination is made by the lead agency. Typically, in higher noise environments (e.g., where the day-night average noise level would exceed the normally acceptable level), the impact would be considered significant if the L_{dn} due to the project would increase existing noise levels by 3 dBA L_{dn} or more at noise-sensitive receptors. It is generally accepted that in quiet to moderate noise environments, such as the noise environment in areas in the vicinity of the quarry away from Porter Creek Road and Calistoga Road, a 5 decibel increase in the day/night average noise level is considered a substantial increase.

Noise Element of the Sonoma County General Plan 2020

The Noise Element of the County's General Plan 2020 contains objectives and policies intended to protect residents and other sensitive receptors from excessive noise. Noise level performance standards in Noise Element Table NE-2 are to be applied as performance standards for noise producing land uses which may affect noise sensitive land uses and new noise sensitive land uses proposed near noise generating land uses. Infrequent single events

24 The checklist question regarding temporary or periodic noise increases usually applies to construction activities. For this project, all noise level changes would be considered permanent. Checklist questions addressing aircraft noise are not applicable to the project because the site is not located within an airport land use plan or near a public or private airport. Therefore, temporary construction noise impacts and airport noise impacts are not discussed further in this report.

such as passage of a train, truck, or airplane may interfere with adjacent uses even though the cumulative noise exposure is within acceptable limits. These events call for a single event noise standard. The potential for sleep disturbance is often the main concern in these cases. The Noise Element contains the following goal: *GOAL NE-1: Protect people from the adverse effects of exposure to excessive noise and to achieve an environment in which people and land uses may function without impairment from noise.*

The following objectives and policies are applicable for noise assessment:

Objective NE-1.1: Provide noise exposure information so that noise impacts may be effectively evaluated in land use planning and project review.

Objective NE-1.2: Develop and implement measures to avoid exposure of people to excessive noise levels.

Objective NE-1.3: Protect the present noise environment and prevent intrusion of new noise sources which would substantially alter the noise environment.

The following policies are to be used to achieve the above objectives:

Policy NE-1a*:* Designate areas within Sonoma County as Noise Impacted if they are exposed to existing or projected exterior noise levels exceeding 60 dBA L_{dn}, 60 dBA CNEL, or the performance standards of Table NE-2.

Policy NE-1b**:** Avoid noise sensitive land use development in noise impacted areas unless effective measures are included to reduce noise levels. For noise due to traffic on public roadways, railroads and airports, reduce exterior noise to 60 dB Ldn or less in outdoor activity areas and interior noise levels to 45 dB Ldn or less with windows and doors closed. Where it is not possible to meet this 60 dB Ldn standard using a practical application of the best available noise reduction technology, a maximum level of up to 65 dB Ldn may be allowed but interior noise level shall be maintained so as not to exceed 45 dB Ldn. For uses such as Single Room Occupancy, Work-Live, Mixed Use Projects, and Caretaker Units, exterior noise levels above 65 dB Ldn or the Table NE-2 standards may be considered if the interior standards of 45 dB Ldn can be met. For schools, libraries, offices, and other similar uses, the interior noise standard shall be 45 dB Leq in the worst case hour when the building is in use.*

Policy NE-1c*:* Control non-transportation related noise from new projects. The total noise level resulting from new sources shall not exceed the standards in Table NE-2 of the recommended revised policies as measured at the exterior property line of any adjacent noise sensitive land use. Limit exceptions to the following:

(1) If the ambient noise level exceeds the standard in Table NE-2, adjust the standard to equal the ambient level, up to a maximum of 5 dBA above the standard, provided that no measurable increase (i.e. +/- 1.5 dBA) shall be allowed.

(2) Reduce the applicable standards in Table NE-2 by five dBA for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises, such as pile drivers and dog barking at kennels.

(3) Reduce the applicable standards in Table NE-2 by 5 decibels if the proposed use exceeds the ambient level by 10 or more decibels.

(4) For short term noise sources which are permitted to operate no more than six days per year, such as concerts or race events, the allowable noise exposures shown in Table NE- 2 may be increased by 5 dB. These events shall be subject to a noise management plan including provisions for maximum noise level limits, noise monitoring, complaint response and allowable hours of operation. The plan shall address potential cumulative noise impacts from all events in the area.

(5) Noise levels may be measured at the location of the outdoor activity area of the noise sensitive land use, instead of at the exterior property line of the adjacent noise sensitive use where:

(a) the property on which the noise sensitive use is located has already been substantially developed pursuant to its existing zoning; and

(b) there is available open land on these noise sensitive lands for noise attenuation.

This exception may not be used on vacant properties, which are zoned to allow noise sensitive uses.

Table 4.5-3 – Sonoma County General Plan 2020 Noise Table
Table NE-2: Maximum Allowable Exterior Noise Exposures for Non-transportation Sources

Hourly Noise Metric[1]	Maximum Exterior Noise Level Standards, dBA	
	Daytime 7 AM to 10 PM	Nighttime 10 PM to 7 AM
L_{50} (30 minutes in any hour)	50	45
L_{25} (15 minutes in any hour)	55	50
L_{08} (5 minutes in any hour)	60	55
L_{02} (1 minute in any hour)	65	60

[1] The sound level exceeded n% of the time in any hour. For example, the L_{50} is the value exceeded 50% of the time or 30 minutes in any hour; this is the median noise level. The L_{02} is the sound level exceeded 1 minute in any hour.

Policy NE-1m: Consider requiring the monitoring of noise levels for discretionary projects to determine if noise levels are in compliance with required standards. The cost of monitoring shall be the responsibility of the applicant.

Transportation Related Noise

The General Plan includes objectives and policies to protect sensitive receptors from excessive transportation-related noise. The following objectives and policies are applicable:

Objective NE-2.1: Design and manage transportation systems to produce the lowest feasible noise levels and impacts on noise sensitive land uses.

Objective NE-2.2: Provide highway, railroad, and air transportation systems and services so that the extension of the boundaries of projected 60 dBA noise contours for 2020 is discouraged.

The following policies are to be used to achieve the above objectives:

***Policy NE-2c*:** Consider using truck routing, speed limits, signal timing and other traffic control measures to reduce impacts on noise sensitive uses.

***Policy NE-2f*:** Where practical, include noise control measures (based on vehicular volume and speed) in County funded construction of new roadways and additional through travel lanes to maintain noise compatibility with noise sensitive land uses. The goal of these measures shall be to prevent the road project from causing the total exterior noise level to increase above 60 dBA Ldn, as estimated adjacent to dwellings and other noise sensitive primary uses. Where full implementation of such measures is not possible, desirable or appropriate, the reasons for that determination shall be stated clearly by County decision makers.

Sonoma County Aggregate Resources Management (ARM) Plan

The development of mineral resources is subject to the policies of the Aggregate Resources Management Plan. The Plan indicates areas where mineral resources may be mined. These areas should be considered as potential noise sources during review of proposed noise sensitive uses at nearby sites. Noise sources are either mobile or stationary and could have long-term effects on neighboring properties. Blasting may occur during the normal operation of hillside quarries. The ARM Plan addresses noise in Section 7.3.1 (Operating Standards) as described below. The ARM Plan states:

> *The hours of operation for all aggregate operations shall be limited to 6:00 a.m. until 10:00 p.m. Monday through Friday and 6:00 a.m. to 4:30 p.m. on Saturdays, except as specified below for in-stream operations. Mining at other times or on federal holidays will be prohibited unless specially set forth as a use permit condition. Conditions of approval may further limit the hours of operation to reduce noise levels or mitigate other site-specific project impacts.*

Sonoma County Ordinance No. 3437

Noise from mining operations in the County is also addressed in the Sonoma County Mining and Reclamation Ordinance (SMARO, No. 5165). Consistent with the ARM Plan operational noise standard, Article 26A-09, Section 26A-09-010(i) states that “the maximum acceptable noise levels for these operations are those set forth in the Noise Element of the *Sonoma County General Plan*, and that more stringent noise standards may be required as permit conditions when particular local circumstances warrant additional protection of potentially affected areas.” The ordinance allows more stringent requirements when local circumstances warrant additional protection. The performance standards of the General Plan Noise Element are complementary to and consistent with Ordinance No. 3437.

4. Existing Noise Environment

Mark West Quarry is located north of Porter Creek Road, west of the intersection with Calistoga Road/Petrified Forest Road. The proposed expansion area is located immediately west of the existing quarry. The nearest residence to the processing facility site is about one thousand feet to the south. Immediately to the north is undeveloped open space. Further to the north on Mountain Home Ranch Road are rural residential properties, the nearest property boundary being about a half-mile from the northernmost quarry activities. Two recreation and special event areas (Mountain Home Ranch Resort and Mayacamas Ranch) are also located to the north, ranging from 0.75 mile to one mile from quarry activities.

A noise monitoring survey was done by Illingworth & Rodkin, Inc. (I&R) to quantify ambient noise levels at receptors near the quarry (off-site), to document noise levels generated by activities and equipment at the existing quarry (on-site), and to establish traffic noise levels along the main access road for the quarry (Porter Creek Road). Noise measurements were made in September 2010. A combination of unattended long-term noise measurements and attended short-term noise measurements were made to document existing noise levels representative of the nearest residential receptors (Figure 4.5-1). Additionally, two measurements (A and B) that were conducted in a 2003 study to quantify noise levels along Mark West Springs Road were repeated (A2 and B2) to update existing traffic noise levels, as shown in Figure 4.5-2. Data collected at sites A2 and B2 are depicted in Figures 1 to 4 of Appendix H.

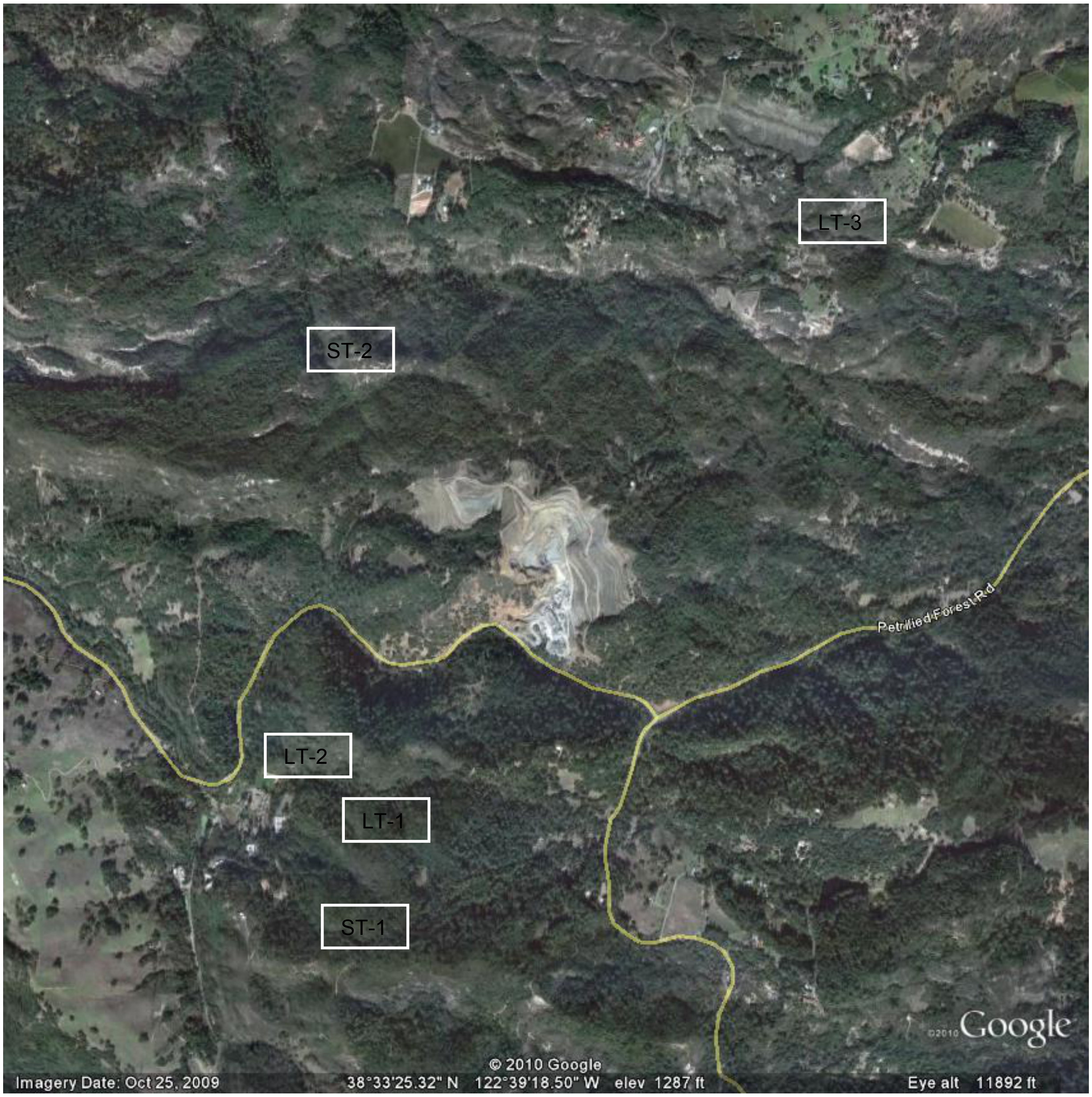
Long-term noise measurement LT-1 was recorded at the nearest residential property south of the quarry, across Porter Creek Road. The location was selected to represent worst-case noise conditions for residents south of the quarry. Noise levels were measured from the afternoon of Thursday, September 9, 2010 to the afternoon of Monday, September 13, 2010. The day-night average noise level at this location ranged from 50 to 53 dBA L_{dn}. The median noise level (L_{50}) generally ranged from 40 to 50 dBA during the day, while nighttime levels were contaminated at all measurement locations with noise from crickets in the surrounding environment[25]. If the influence of the crickets is removed from the data, the day-night average noise level is calculated to be about 50 dBA L_{dn}. Data collected at Site LT-1 are depicted in Figures 5 to 8 of Appendix H.

Long-term noise measurement LT-2 was recorded 78 feet south of Porter Creek Road, approximately 1/3 of a mile west of the Quarry access road. The location was selected as a reference measurement for traffic noise along Porter Creek Road/Mark West Springs Road, to which truck traffic from the quarry was a contributor. The day-night average noise level at this location ranged from 60 to 63 dBA L_{dn}. The median noise level (L_{50}) generally ranged from 40 to 50 dBA during the day. Data collected at site LT-2 are depicted in Figures 9 to 12 of Appendix H.

Noise measurement LT-3 was recorded 190 feet from Mountain Home Ranch Road, about 1 mile north of the nearest activities at Mark West Quarry. The measurement location was selected to represent noise sensitive receptors to the north including residential, vacation, and special event areas. The day-night average noise level at LT-3 ranged from 46 to 56 dBA L_{dn}. Again, noise from crickets significantly contributed to nighttime noise levels during the measurement. The median noise level (L_{50}) generally ranged from 30 to 40 dBA during the day. If the influence of the crickets is removed from the data, the day-night average noise level is calculated to be about 35 dBA L_{dn}. Data collected at Site LT-3 are depicted in Figures 13 to 15 of Appendix H.

25 Measurements were taken during crickets' mating season as shown in noise measurement charts. The sharp increase in ambient noise followed by slow decay can be attributed to the fact that crickets are nocturnal and cold blooded, so as temperature decreases throughout the night, mating calls slow down or decrease as a whole.

Figure 4.5-1: Off-Site Noise Measurement Locations



Source: Illingworth & Rodkin, Inc.

Two short-term noise measurements were made near residential receptors to represent typical daytime background noise levels (L_{90}) in the vicinity of the existing quarry. The first short-term site (ST-1) was located in the front yard of a residence off of Calistoga Road, south of Mark West Quarry near Witt Road. Measured background noise levels were relatively low and ranged from about 31 to 33 dBA between 11:50 a.m. and 12:00 p.m. The second short-term measurement site (ST-2) was near 3303 and 3309 Mountain Home Ranch Road, at the westernmost portion of the road, about a half-mile north of the nearest quarry activities. Measured background noise levels were also low and ranged from about 23 to 25 dBA between 12:20 p.m. and 12:30 p.m. The noise environment at the selected measurement positions was predominantly the result of distant traffic noise and nature sounds such as wind blowing foliage and birdcalls. Quarry noises were difficult to distinguish from ambient noise.

A series of noise measurements were also made to document noise levels generated by activities and equipment at the existing quarry (M-1 to M-6), as shown in Figure 4.5-3. The data are summarized in Table 4.5-4. Major sources of noise at the quarry include the processing equipment and mobile equipment. Motorized mobile equipment includes two drill rigs, six front-end loaders, one skid steer loader, two bulldozers, a backhoe, an excavator and one compactor. Stationary processing equipment includes one primary jaw crusher with vibrating feeder and conveyors, one cone crusher, two vertical impact crushers, two surge tunnels, five vibrating screens with multiple decks, a portable screening plant, a wash plant, and a total of thirty-six conveyors. Trucks move the aggregate. Noise measurements were made at various locations to characterize the noise of the different sources.

Table 4.5-4
Noise Levels at the Existing Quarry Measured
September 9 and 13, 2010

	Noise Level (dBA)	
Source and Distance	**Average**	**L_{max}**
M-1: Secondary crushers at 100 feet	73	77
M-2: Secondary crushers at 150 feet	72	80
M-3: Portable Plant and loader at 300 feet	71	75
M-4: Portable Plant and loader at 350 feet	69	79
M-5: Primary Plant at 220 feet and loader as close as 100 feet	77	86
M-6: Southernmost portion of quarry, 300 to 450 feet east of loader activities	59	65

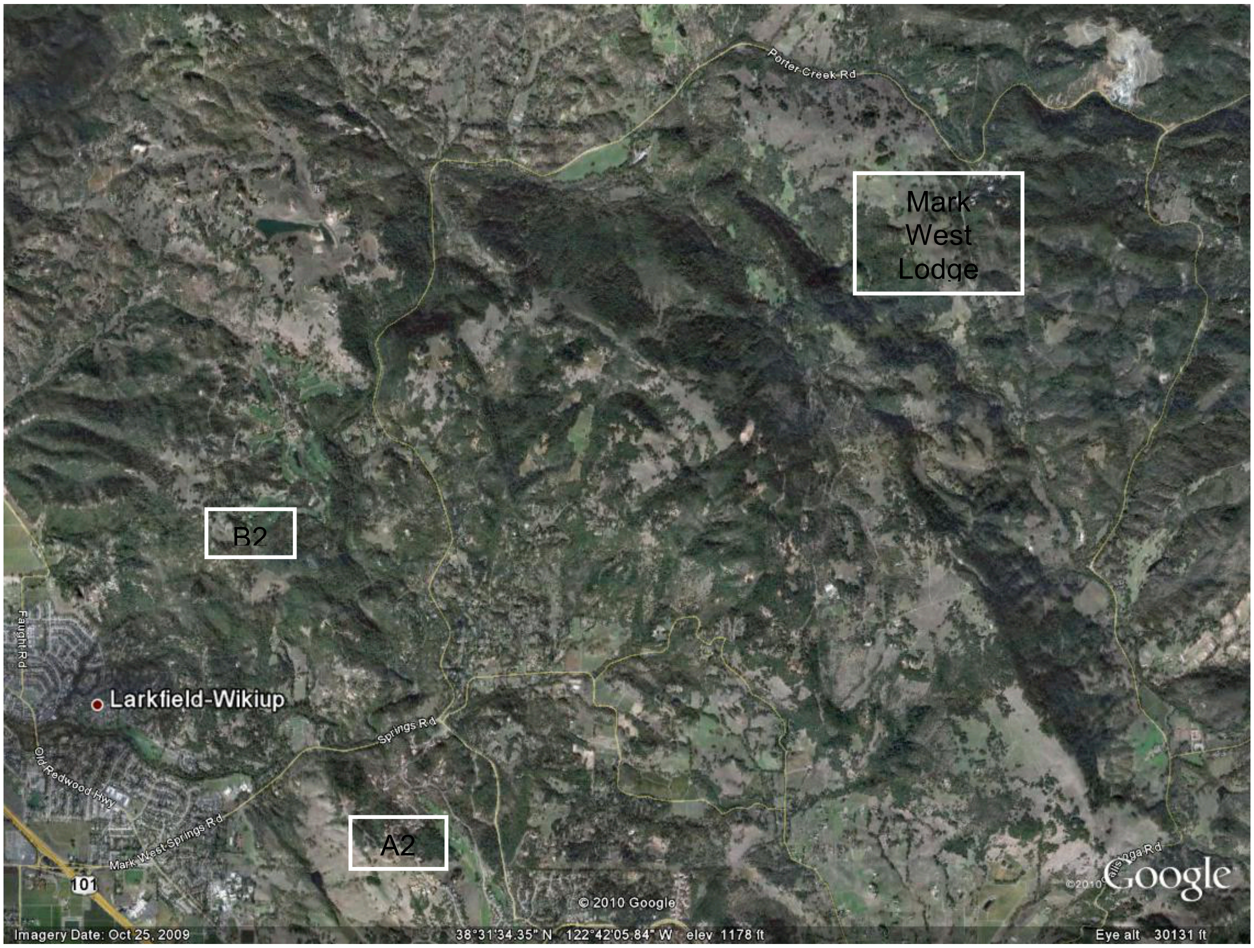
5. Blasting

Blasting occurs intermittently based on the demand for material, generating both airborne noise and groundborne vibration. Blasting records for the last three years were provided by the applicant. Blasting occurs during daytime hours, typically between the late morning and mid-afternoon. From July through October there are up to three blasts per week. In the later fall and spring there is typically one blast per week. In the winter months there is typically one blast every two to three weeks. No complaints were received in the last three years.[26]

When blasting occurs at large distances from sensitive structures, as is the case with Mark West Quarry, the primary concerns are cosmetic damage to structures and the human perception of vibration. Cosmetic damage (e.g., minor cracking in plastered walls) can occur as a result of ground-borne vibration or acoustic overpressures. The Federal Transit Administration establishes 0.20 in/sec PPV as a safe limit to avoid cosmetic damage to non-engineered timber and masonry buildings. The former US Bureau of Mines established 0.50 in/sec PPV and acoustic overpressures exceeding 133 dB(L) as safe limits to avoid damage.

[26] The areas where blasting occurred over the past three years represents the baseline for blasting. Previous blasting further east would not represent where blasting would occur on the project site. As such, the past three years were searched for complaints as regards current blasting conditions.

Figure 4.5-2: Roadway Measurement Locations



Source: Illingworth & Rodkin, Inc.

Standard quarry blasting techniques are followed at Mark West Quarry. An array of holes is drilled and explosives are placed in the holes. The holes are detonated sequentially, with a 25 millisecond delay between the holes in each row, and a 42 millisecond delay between each row of holes. Depending upon the conditions at the blast site, the holes are drilled 12 feet, 24 feet, or 36 feet deep. There is always 10 feet of "stemming" (rock packed in the top of the hole) regardless of the depth of the hole. The weight of the explosive charge in each hole is a function of the depth. The maximum charge weight per delay at Mark West Quarry is 100 pounds. This method reduces peak ground vibration levels and peak air overpressures.

Ground vibration levels are routinely monitored at the quarry. One blast was monitored in 2007 because it was an unusually large blast (more charge holes than normal, but same charge size per delay). The measured peak particle velocity was 0.19 inch/sec at a distance of 200 feet. Ground vibration levels resulting from blasting have been estimated using methods developed by the U.S. Bureau of Mines. The method is based on an extensive database of measured ground vibration levels of differing charge sizes in various soil conditions. The near upper limit of the database is used to predict credible worst-case vibration levels. The nearest sensitive receiving points are residences located west and south of the quarry. The distances from the current mining area to the two nearest residences are about 1,900 feet and 2,250 feet. The predicted peak particle velocities for the maximum charge size of 100 pounds are 0.07 and 0.05 inches per second, respectively, substantially below damage thresholds. The distances from

Figure 4.5-3: On-Site Noise Measurement Locations

Source: Illingworth & Rodkin, Inc.

the current mining area to the two nearest residences to the west are about 1,620 feet and 1,690 feet. The predicted peak particle velocities for the maximum charge size of 100 pounds are 0.09 and 0.08 inches per second, respectively, substantially below damage thresholds.

Peak air overpressure levels are normally substantially below the recommended limit when holes are properly stemmed and buffer distances are sufficient to reduce ground vibration to within acceptable limits. A blast was observed from the nearest residence during the noise survey. It was inaudible.

B. Potential Impacts and Mitigation Measures

1. Criteria for Determining Impact Significance

Appendix G of the CEQA Guidelines states that a project would normally be considered to have a significant impact on the environment if the project would result in:

1. Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies.
2. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels existing without the project.
5. Exposure of people residing or working in the project area to excessive noise levels, for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.
6. Expose people residing or working in the project area to excessive noise levels if the project is located in the vicinity of a private airstrip.
7. Noise generated from the project's on-site sources would exceed the County's General Plan noise level performance standards.
8. Noise generated from a project's off-site generated traffic would increase noise levels by 3 dBA or more at noise-sensitive receptors.

Unlike noise, there are no standards set for ground vibration in the Sonoma County General Plan. The following standards shall be used to identify potentially significant vibration and blast overpressure impacts of the blasting activities associated with the project.

9. Blast overpressure, measured with 2-Hz response seismographs, greater than 133-dBL (0.014 psi) at offsite residences.
10. Ground motion greater than to 0.5 in/s (in accordance with the low-frequency PPV limits suggested by the US Bureau of Mines RI8507) at off-site wood-frame structures.

The MSHA 1999 noise standards would apply to the proposed project and are assumed to provide hearing protection for the quarry workers. Occupational noise levels will not be further discussed in the impacts section of this chapter.

2. Project Impacts

Less than Significant impacts Requiring No Further Analysis

Criteria 5 and 6 (Airport-Related Noise): As described in the Initial Study, the project site is not located within an airport land use plan, is not located within two miles of a public airport or within the vicinity of a private airstrip. Consequently, no impacts associated with public or private air facilities (Criteria 5 and 6) would occur, and this issue is not discussed further in this section.

Noise Effects on Residential Receptors

Impact 4.5-A Noise from on-site operations of the proposed project would affect three noise sensitive receiving locations (residences) in the vicinity of the project. This is a potentially significant impact.

The project would allow extraction of rock from expansion of the existing hillside quarry. Quarry expansion would occur as a continuous operation expanding to the west, increasing the area to be mined by approximately 32.4 acres. Mining phases would overlap to keep operations continuous and the sequence would be: the removal of vegetation and overburden, preliminary grading for control, blasting, rock removal, rock crushing, processing, and implementation of reclamation procedures. At the conclusion of each phase, all exposed areas would be reclaimed. As mining moves west on the site, the processing area will expand from about 5 acres to about 10 acres, and about every 5-7 years the primary jaw crusher will be moved to the west to be nearer the working face of the quarry. Equipment used for quarrying would not increase. However, as existing equipment wears out, it would be replaced by newer equipment.

The quarry is currently allowed to operate on weekdays from 6:00 a.m. to 10:00 p.m., and on Saturdays between the hours of 6:00 a.m. and 4:30 p.m.

A computer model was used to calculate noise levels for the proposed project. The model, SoundPlan Version V7.0, is a three-dimensional ray-tracing program, which takes into account locations and sound levels of the sources of noise, the frequency content of each noise source, and the topography of the area, and the locations of the sensitive receptors. For the quarry area, existing noise measurement data presented above in the Setting Section was inputted into the model. The noise level data was then modeled and propagated out to reference positions, and then it was compared to actual measured levels to calibrate the model. Noise measurements established a source noise level of 73 dBA L_{eq} for quarry activities at the M-1 position, which was 100 feet from the nearest noise source and considered a worst-case position in regards to noise exposure. Noise contours were developed for daytime operating conditions for existing, the near term, and the long term.

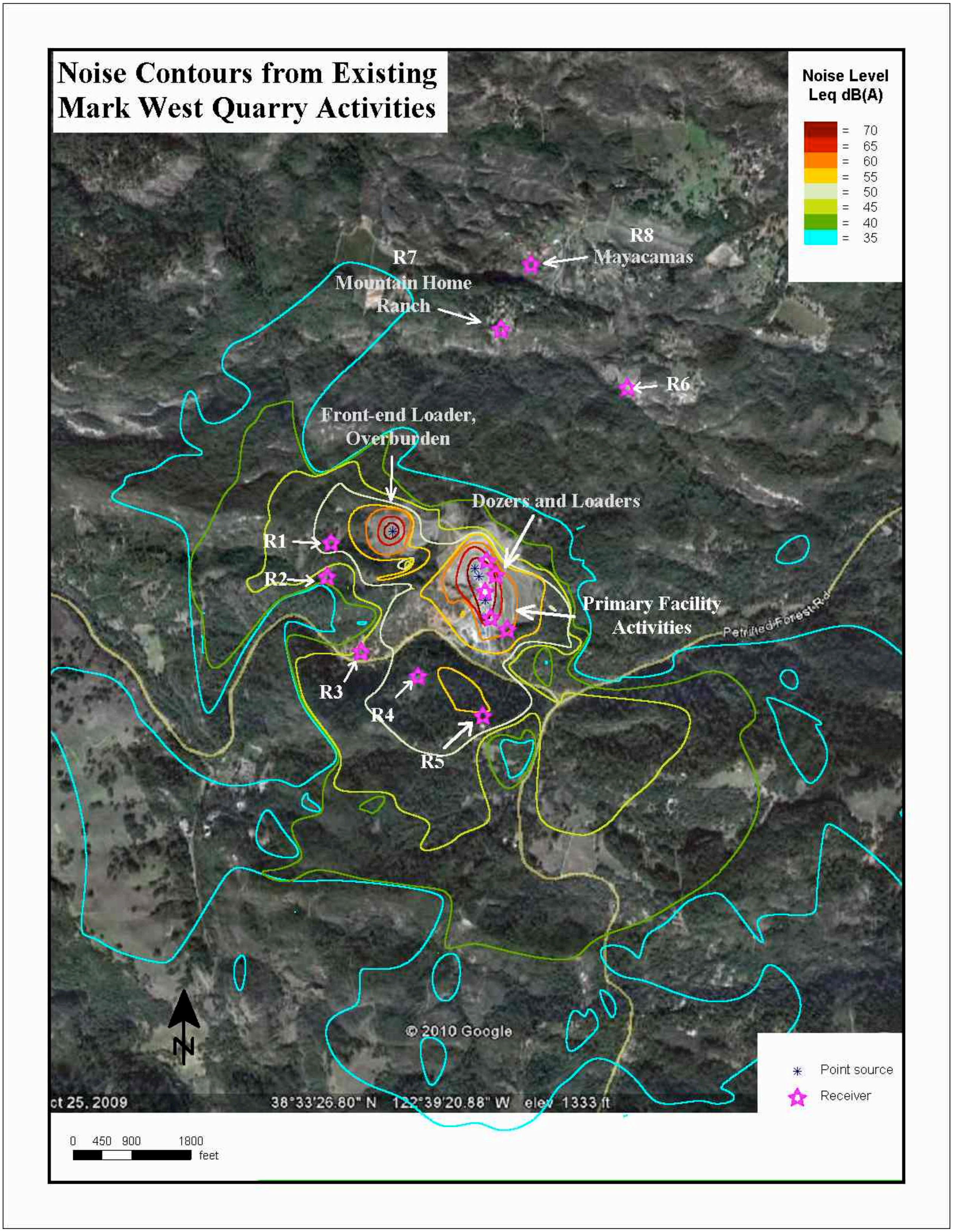
Figure 4.5-4 shows the output from the SoundPlan noise model for existing conditions during daytime operations with all significant equipment operating at the facility. The most affected receptor is a residence (R4) near the LT-1 measurement location, about 1,000 feet southwest of the quarry. The daytime noise level is calculated to be up to 53-54 dBA L_{dn}, of which quarry noise is a significant contributor. As previously noted, the L_{eq} average noise level is used in the analysis for comparison to the L_{50} County noise limit of 50 dBA during the daytime. The hourly L_{eq} is always equal to or greater than the hourly L_{50} so it provides a conservative estimate of the noise. The existing calculated worst case daytime noise level is 3-4 dBA above the 50 dBA daytime limit. Another receptor (R5) approximately 1,500 feet south of the primary mining activities has potential to be affected by noise. Daytime noise levels under existing conditions were calculated to be 54 dBA L_{eq} at the south residence, 4 dBA above the daytime limit.

The results of the modeling are compared to the allowable noise limits and summarized in Table 4.5-5. The County noise limits also regulate the noise level that is exceeded 25 percent of the time (L_{25}) and the L_{max} level during any hour. The allowable level for the (L_{25}) period is 5 dBA higher than the allowable level for the 50 percent exposure time (L_{50}), and the allowable level for the L_{max} is 20 dBA higher. Noise measurement data for the quarry and data from other quarries and plants demonstrate that the L_{25} noise level is typically 1 to 3 dBA higher than the L_{50} noise level, and the max noise level is typically up to 10 dBA greater than the L_{50} level. For these reasons, the L_{50} noise descriptor is the most restrictive and conservative assessor of noise impacts.

Noise contours resulting from project operations when mining occurs on the southeast, southwest, and west slopes are shown in Figure 4.5-5. The noise from processing equipment is modeled at the existing locations, and mobile equipment was placed at positions where drilling and excavating are expected to initially take place in the proposed mining area to the west. This condition results in the highest noise levels that would occur at residences to the south. At the southwest residence (R4), projected noise levels during the daytime would range from the existing level of 53 dBA L_{eq}/L_{50} up to 61 dBA L_{eq}/L_{50} when mobile equipment is operating in the Overburden Storage Area nearest to the residence. The projected noise level is 8 dBA above the noise limit established by the existing daytime noise level. This residence is owned by the applicant and may, therefore, be considered a part of the project buffer area (i.e., noise effects on the applicant's own residence are not considered significant). At the next nearest residence located to the south of the quarry (R5, the projected level is 54 dBA L_{eq}/L_{50}. This is the same as the existing noise level at this receptor. So the project would not result in any noise increase here.

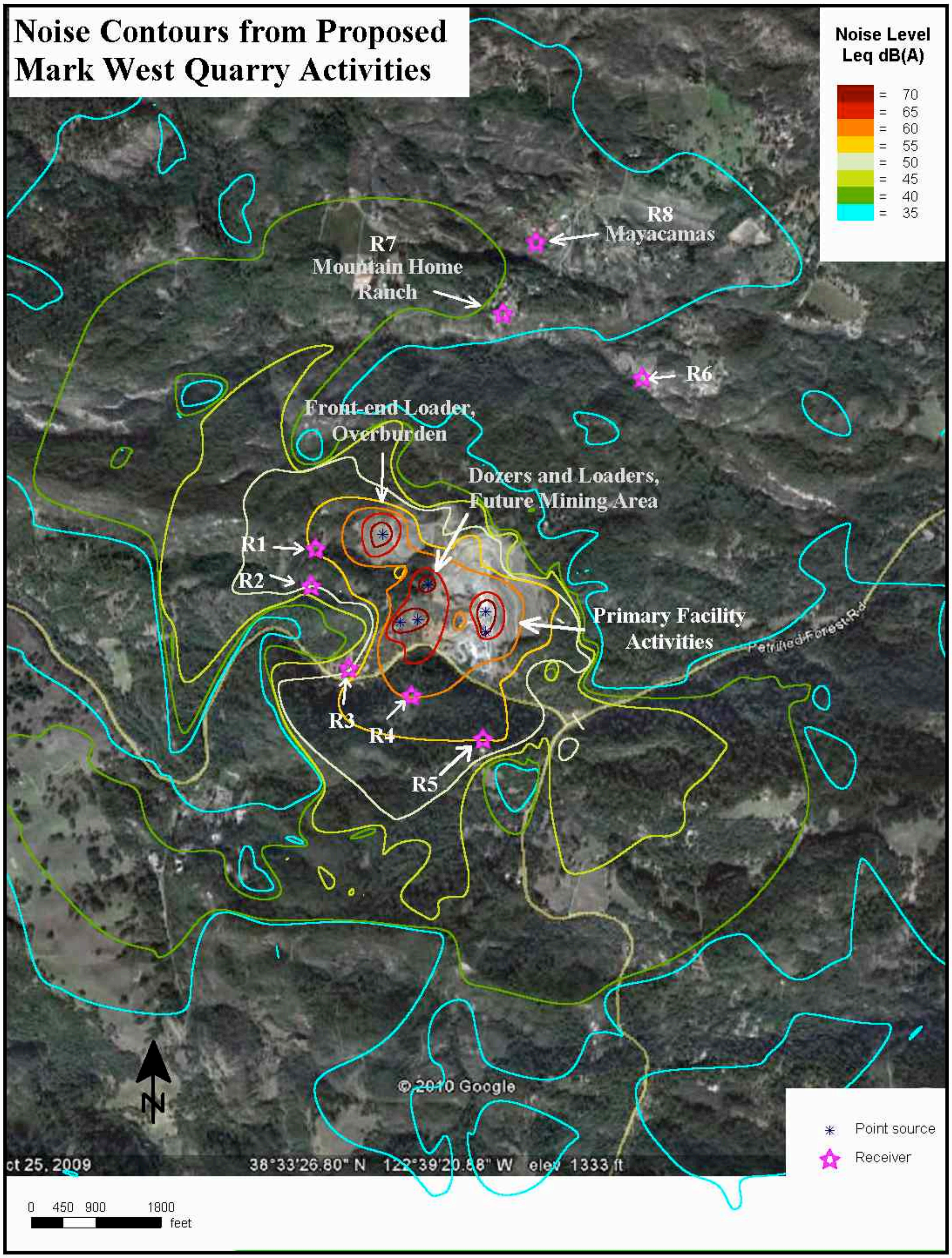
The next most affected residences are located to the west of the quarry (at 4512 Porter Creek Road). The northwesterly residence (R1) would experience an increase in noise level of about 3 dBA L_{eq}/L_{50} with a resulting level of 56 dBA. The west residence (R2) would experience an increase in noise of 8 dBA, to a projected level of 50 dBA L_{eq}/L_{50}. The increased noise at this residence would result from work in the proposed overburden area. These two residences are on the property owned by the same owner who owns the proposed quarry expansion parcel. It is unknown how much, if any, of the existing overburden would be removed during the life of the proposed use permit. However, use of mobile equipment to remove overburden near the west side of the storage area would create noise at these two residences. If the distance between the equipment and the two residences is topographically blocked, the projected noise increase would be less-than-significant. If the overburden removal in an area with an unobstructed path to the two western residences is limited to one 8-month construction season, the impact would be temporary construction noise and considered less than significant. However, if the mobile equipment were used for more than one construction season in an area with a clear path to the two residences, this would be a ***potentially significant impact***. Noise levels would be lower at all other residential receptors that have been identified in the study area.

Figure 4.5-4: Noise Contours From Existing Mark West Quarry Activities



Source: Illingworth & Rodkin, Inc.

Figure 4.5-5: Noise Contours From Proposed Mark West Quarry Activities



Source: Illingworth & Rodkin, Inc

Table 4.5-5
Future "With Project" Quarry Noise (Worst Case): Comparison to County Standards[27]

Receptor	Existing L_{50}	Project L_{50}	Significance Threshold (Adjusted County Limit Daytime)	Project Impact Yes/No
R1 Northwest Residence	53	56	53	Yes
R2 West Residence	42	50	50	Yes
R4 (LT-1) Southwest Residence	53	61	53	Yes
R5 South Residence	54	54	54	No
R6 (LT-3) Mountain Home Ranch Resort/ Mayacamas Ranch	30-40	37/40/39	45	No

Mitigation Measures:

4.5-A.1 If overburden is removed in areas that have a clear path to the two residences to the west of the quarry (Residences R1 and R2 on Figure 4.5-5) for longer than a single construction period (an 8-month period), the applicant shall shield the mobile equipment from the two residences. This can be accomplished by removing overburden starting in the east and retaining a slope between the mobile equipment and the residences to the west. The detailed mining plan required by Mitigation Measure 4.1-D.1 shall delineate the methodology that will be used to maintain a topographical barrier between operating mobile equipment in the overburden area and the receptors to the west.

By implementing a mining approach that limits use of mobile equipment in the overburden area, the impact to the residences to the west would be reduced to acceptable levels (as shown in Table 4.5-5) to a ***less-than-significant*** level.

Noise from Haul Trucks

Impact 4.5-B Project traffic would increase noise levels at noise sensitive receptors along roadways that carry quarry traffic. This is a less-than-significant impact.

The traffic noise impact evaluation is based on information presented in ***Section 4.4, Traffic and Circulation***. Quarry truck traffic would primarily use Porter Creek Road, Mark Springs Road, Calistoga Road, Petrified Forest Road, and the quarry driveway. Truck traffic noise levels generated by trips along Porter Creek Road were calculated at

[27] Noise levels were calculated based on measurements and projections made for measurement locations ST-1, ST-2, and M-1. The existing L50 level at ST-1 was 45 dB with a projected level of 42 dB (less noise at this location because the mining activity would more away from this location). The existing L50 level at ST-2 was 46 dB with a projected level of 46 dB. B The existing L50 level at M-1 was 73 dB with a projected level of 73 dB (less noise at this location because the mining activity would move away from this location

a reference distance of 100 feet from the center of the near lane of the roadway, using the Caltrans LEQV2 traffic noise model. Per the significance criteria, transportation-related noise would be significant if it increases noise levels by 3 dB or more.

Near the quarry there is one residential receptor located along Porter Creek Road between the quarry and Petrified Forest Road, and one residential receptor west of the quarry driveway along Porter Creek Road. Other more distant residences adjoin the roadway and Mark West Springs Road along their rights-of-way. Vehicular traffic makes a significant contribution to the existing noise environment at the identified sensitive receptors south of the quarry and along the roadway. Increases in noise resulting from increased quarry truck traffic resulting from the project were calculated by comparing existing traffic volumes with future traffic volumes under future operating scenarios. The output from the noise model is included in Appendix H. The project would cause noise levels to increase by less than 1 dBA L_{dn} along Porter Creek Road, which is the road that would be most affected by quarry-generated traffic noise. An increase of less than 1 dBA is not substantial, and the impact is ***less-than-significant.*** No mitigation is required.

Combined Operational Plus Truck Noise Impact

Impact 4.5-C The combined noise from operations on the project site plus aggregate haul traffic would affect noise sensitive receptors in the vicinity of the project. This is a potentially significant impact.

The following discusses whether the combined noise from quarry operations plus haul truck traffic would affect sensitive receptors near the quarry site The most affected receptors for this evaluation are the same as those discussed in Impacts 4.5-A and 4.5-B. Based on noise measurement data and modeling results, the existing day-night average noise level at residences R4 and R5 to the south ranges from 50-53 dBA L_{dn}. At the southwest residence (R4), during mining on the nearest slope, the L_{dn} from mining operations and increased truck traffic is calculated to be up to 59 dBA, 6 – 9 dBA above existing levels. This is a potentially significant impact. This residence is owned by the project applicant and may, therefore, be considered a part of the buffer area (i.e., there would be no impact to this residence). At the next nearest residence (R5) to the south, noise levels are calculated to increase by less than 1 dBA L_{dn}. At Mountain Home Ranch Resort (R7) and Mayacamas Ranch (R8) to the north the future noise level during quarry operations is calculated to be up to 37 dBA L_{dn} when mining is occurring at the highest elevations on the site, a 2 dBA increase above the existing noise level. Mining of most of the expansion area would generate significantly less noise than this at these locations, since the mining would be below the top of the ridge. An increase of 2 dBA L_{dn} is not significant. At the residence to the west (R2), operation of mobile equipment in the overburden storage area is calculated to increase average noise levels by up to 8 dBA, which is a substantial increase. This is a ***potentially significant impact.*** Quarry operations do not currently occur during the nighttime hours nor are they proposed to; quarry operations would not cause a substantial increase in L_{dn} levels at any other locations.

Mitigation Measures

Mitigation Measure 4.5-A.1 applies to this impact.

Impact Significance After Mitigation

The mitigation would reduce the impact to the residence to the west to a ***less than-significant level.***

Blasting Impacts

Impact 4.5-D Blasting would result in noise and vibration at sensitive receptors. This is a potentially significant impact.

Blasting would continue to be used to loosen rock from the quarry face and floor. Blasting would continue to occur intermittently on approximately the same schedule as occurs now, and this blasting would generate both airborne noise and groundborne vibration. Blasting occurs during daytime hours, typically between the late morning and mid-afternoon. From July through October there are up to three blasts per week. In the later fall months through spring there is typically one blast per week. In the winter months there is typically one blast every two to three weeks.

The former U.S. Bureau of Mines (closed by the Federal government in 1995) established 0.5 in/sec PPV and acoustic overpressures exceeding 134 dB(L) as safe blasting limits to avoid damage. The County of Sonoma has used limits of 0.5 inch/second PPV and 133 dB(L) and has directed their use as significance thresholds for this project.

The project proposes to continue the same blasting protocols. An array of holes is drilled and explosives are placed in the holes. The holes are detonated sequentially, with a 25 millisecond delay between the holes in each row, and a 42 millisecond delay between each row of holes. Depending upon the conditions at the blast site, the holes are drilled 12 feet, 24 feet, or 36 feet deep. There is always 10 feet of “stemming” (rock packed in the top of the hole) regardless of the depth of the hole. The weight of the explosive charge in each hole is a function of the depth. The maximum charge weight per delay currently employed at Mark West Quarry is 100 pounds. This method reduces peak ground vibration levels and peak air overpressures.

Future ground vibration levels resulting from blasting were estimated using the methods developed by the U.S. Bureau of Mines. The upper limit of the data base is used to predict credible worst-case vibration levels. The equation and assumptions used to calculate ground vibration levels are included in Appendix H. The nearest sensitive receiving points are the existing residences located west of the quarry and south of the quarry. The project proposes mining the slope south of the existing mining area. This area is closer to residences than the existing mining area. The distances from the nearest points of the proposed mining area to the two nearest residences to the west are approximately 500 feet and 600 feet. The distances from the nearest points of the proposed mining area to the two nearest residences to the south are about 1,100 feet and 1,650 feet. The predicted maximum peak particle velocities at the residences to the west for the maximum charge size of 100 pounds per delay are 0.55 and 0.43 inches per second, respectively. The predicted maximum peak particle velocities at the residences to the south for the maximum charge size of 100 pounds per delay are 0.16 and 0.09 inches per second, respectively. Predicted vibration levels for the maximum charge size would exceed the significance threshold of 0.5 inches per second at the nearest residence to the west. This is a ***potentially significant impact***.

Regarding air overpressure impacts, the U.S. Bureau of Mines has determined that peak air overpressure levels are substantially below the recommended vibration threshold of 133 dB(L) when holes are properly “stemmed.” The lack of complaints over the last three years of records during which time blasting was occurring near where the expansion area is located indicates good practices are being followed to minimize noise and vibration. All of these criteria would continue to be met with the project, so air overpressure impacts from the future quarry blasts would be ***less-than-significant***.

Mitigation Measures

4.5-D.1 When blasting within 600 feet of a residence limit the charge weight per delay to a maximum of 60 pounds. Monitor vibration levels at the residence to confirm that the vibration level is less than 0.5 inch/sec PPV. If not, further limit the charge weight per delay until that target vibration level is achieved.

Impact Significance After Mitigation

By limiting blasting within 600 feet of residences, the impact to these residences will be reduced to a ***less-than-significant level***.

4.6 AIR QUALITY AND CLIMATE CHANGE

A. Setting

The Mark West Quarry is located in eastern Sonoma County about 9 miles north-northeast of the City of Santa Rosa. Elevations at the project site range from about 900 feet to 1,300 feet. This area lies within the San Francisco Bay Area Air Basin, which consists of Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara, Marin, and Napa Counties, and the southern portions of Solano and Sonoma Counties. An air basin generally has similar meteorological and geographic conditions throughout. Areas within each air basin are considered to share the same air masses and are therefore expected to have similar ambient air quality. The local air quality regulatory agency responsible for managing air quality in the area where the Mark West Quarry is located is the Bay Area Air Quality Management District (BAAQMD).

1. Climate and Meteorology

Elevations in Sonoma County range from sea level along the western edge and in the southeast to 3,000 to 4,000 feet along much of the eastern boundary. The Russian River flows south and west into the sea. The northwest corner of the County, between the coast and the river is mountainous, with elevations ranging upward to approximately 2,000 feet. East of the river elevations increase again; Mt. St. Helena, on the eastern border reaches a crest of 4,344 feet. Sonoma Creek drains into San Pablo Bay through the Sonoma Valley in the southeastern corner of the County. Much of the southeastern part of the County is relatively flat farmland near sea level.

The climate of Sonoma County is characterized by moderate temperature and precipitation. The coast range of mountains, east of the Russian River, provides a barrier that protects Sonoma County from the very hot weather of the central valley of California during the summer months. At the same time low elevations within the County receive enough sunshine during the summer without any import of hot air from the interior. However, the nearby Pacific Ocean provides a source of cool, moist air during the summer, and the steady inflow of marine air holds temperatures at low levels over that part of the County that it moves through. As a result, the warmest area tends to be the Russian River valley near the north end of the county where mountains deflect the marine air and diminish the cooling effect it provides elsewhere.

Along the coast, temperatures remain cool throughout the summer and seldom drop below freezing during the winter. Inland areas have a wider temperature range, with high readings occasionally exceeding 100ºF and lows sometimes falling several degrees below freezing. However, even during the warm period of the year, the night temperatures usually drop into the lower 50s. Precipitation is concentrated during the six months of winter with only light amounts reported during the rest of the year. Along the coast, low clouds and drizzle frequently occur at night during the summer, while inland it is much drier. The average seasonal precipitation ranges from less than 20 inches in the extreme southeast corner of the County, with 30 and 40 inches over much of the central part of the County. In the mountains, annual precipitation increases to more than 80 inches.

Dominant winds also exhibit a seasonal pattern, particularly in coastal areas. During the summer north to northwesterly winds, frequently strong, are common, while in the winter, storms bring strong southerly winds over most of the area. However, wind direction is profoundly influenced by local topography. In general it may be assumed that winds tend to blow inland from the ocean during the summer afternoons in areas that are not protected from incursions of marine air. Onshore flows frequently bring foggy cool weather to the coast, while offshore flows often bring sunny, warm days.

Predominant winds measured at the meteorological station nearest the project site (Santa Rosa) are typically out of the south during spring, summer and fall and out of the northwest during the winter. Winds are most variable during winter and most persistent during summer. In summer, winds shift to a more southerly orientation. Wind speeds are highest during spring and lowest in fall. In more coastal areas, northwest (off-shore) winds are common in spring and summer. Calm conditions occur frequently during nighttime hours during all seasons, and during winter into the late morning.

2. Regulatory Framework

Air quality and air pollution sources are regulated by Federal, State, regional, and local regulatory agencies. Air quality regulations provide the standards by which air quality is determined and institute controls on air pollution sources to improve air quality. The Federal Clean Air Act established the national ambient air quality standards and delegated the enforcement of air pollution control regulations to the states. In California, the California Air Resources Board (CARB) develops and enforces air regulations, but delegates the responsibility of stationary emission source regulation to local air pollution control agencies. In the project area, the BAAQMD is responsible for air pollution source regulation. Mobile sources of air pollutant emissions are regulated on a statewide basis by the CARB. The air pollutants of concern and the roles of the agencies primarily responsible for managing the air quality within the project area and relevant air quality regulations are further discussed below.

a. Federal Air Quality Regulations

Federal Clean Air Act

The Federal Clean Air Act was established in an effort to assure that acceptable levels of air quality are maintained in all areas of the United States. Air quality is characterized by the presence of pollutants that fall into two basic categories; criteria air pollutants and toxic or hazardous air contaminants. Criteria air pollutants refer to a group of pollutants for which the regulatory agencies have adopted ambient air quality standards and pollution management and control strategies. Toxic or hazardous air contaminants refer to a category of air pollutants that have potential adverse health effects but do not have an associated ambient air quality standard. These pollutants are called hazardous air pollutants (HAPs) in Federal law and toxic air pollutants (TACs) in California law.

Criteria Air Pollutants

The Federal Clean Air Act requires the EPA to establish ambient air quality standards for air pollutants that cause or contribute to air pollution and that may reasonably be anticipated to endanger public health. Pollutants with air quality standards are called criteria pollutants. National Ambient Air Quality Standards (NAAQS or national standards) have been established for seven pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), particulate matter, which includes both respirable particulate matter, PM10 (particulate matter 10 microns or less in diameter) and fine particulate matter, PM2.5 (particulate matter 2.5 microns or less in diameter), sulfur dioxide (SO_2), and lead (Pb). The NAAQS establish the acceptable ambient concentration of each criteria pollutant, the attainment and maintenance of which protect the public health with an adequate margin of safety.

Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing it to an appropriate ambient air quality standard. Depending on the pollutant and its associated effects, the standards may be short term, from one to twenty-four hours, or an annual average. In general, short-term standards represent the maximum acceptable concentrations that may be reached but not exceeded more than once per year. Annual standards are maximum acceptable concentrations that may be reached but not exceeded. Table 4.6-1 lists the primary and secondary NAAQS, along with the California Ambient Air Quality Standards (CAAQS or State standards). Potential health effects and primary sources of criteria pollutants are described below.

Nitrogen Dioxide. Nitrogen dioxide is a reddish-brown gas that is a by-product of combustion processes. During combustion processes at high temperatures, nitrogen from the atmosphere and the fuels being burned combines with oxygen to form various oxides of nitrogen. Nitric oxide (NO) and nitrogen dioxide (NO_2) are the most significant air pollutants generally referred to as NOx. Nitric oxide is a colorless and odorless gas that quickly converts to NO_2 and is easily measured in the atmosphere. Nitrogen dioxide also contributes to ground-level ozone formation. Adverse health effects associated with exposure to high levels of nitrogen dioxide include the risk of acute and chronic respiratory illness.

Ozone. Ground-level ozone (ozone) is the principal component of smog. Ozone is not directly emitted into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. VOCs and NOx are known as precursor compounds for ozone. Ozone levels are highest during late spring through early summer when precursor emissions are high and meteorological conditions are favorable for the complex photochemical reactions to occur. Ozone is a regional air pollutant since it is not emitted directly by sources, but is formed downwind of sources of VOCs and NOx emissions. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infection and impairs lung defense mechanisms and lead to emphysema and chronic bronchitis. Ozone can cause damage to vegetation and other materials.

Carbon Monoxide*.* Carbon monoxide (CO) is a non-reactive pollutant that is colorless and odorless, and is toxic in high concentrations. It is formed by the incomplete combustion of fuels. The largest source of CO emissions is motor vehicles. Wood stoves and fireplaces also contribute to high levels of CO, particularly in the wintertime. Unlike ozone and NO_2, CO is directly emitted to the atmosphere without additional chemical conversion. The highest CO concentrations generally occur during the nighttime and early mornings in late fall and winter. CO levels are strongly influenced by meteorological factors such as wind speed and atmospheric stability. High CO concentrations can develop during periods of light winds combined with ground-level temperature inversions, typical of wintertime conditions during the evening through early morning hours. Adverse health effects of carbon monoxide include the impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin, aggravation of cardiovascular disease, impairment of central nervous system function, and fatigue, headache, confusion, and dizziness. Exposure to carbon monoxide can be fatal in the case of very high concentrations.

Particulate Matter*.* Respirable particulate matter, PM10, and fine particulate matter, PM2.5, consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM10 and PM2.5 represent fractions of particulate matter that can be inhaled and cause adverse health effects. PM10 and PM2.5 are a health concern, particularly at levels above the Federal and State ambient air quality standards. PM2.5 (including diesel exhaust particles) can have greater effects on health than PM10. Because these particles are so small they are able to penetrate to the deepest parts of the lungs. Scientific studies have identified links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Children are more susceptible to the health risks of PM2.5 because their immune and respiratory systems are still developing. Very small particles of certain substances (e.g., sulfates and nitrates) can also cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health.

Several forms of particulate matter, in particular diesel particulate matter, have adverse health effects at concentrations well below the standards established for PM10 or PM2.5. The CARB identified diesel exhaust particulate matter as a toxic air contaminant based on its potential to cause cancer, premature death, and other health problems. Diesel exhaust also contributes to fine particulate matter (PM2.5) air quality problems. Thus, diesel particulate matter presents both an air quality concern, as well as a health risk concern. As such, diesel particulate matter emissions require separate evaluation as a toxic air contaminant in order to assess potential health risks.

Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as mining and demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. In addition to health effects, particulates also can damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is more easily filtered by human breathing passages. This dust is of concern more as a soiling nuisance rather than a health hazard.

CARB has estimated that for 2010 in Sonoma County, about 84 percent of all PM10 emissions were from area-wide sources, including farming operations (22 percent), residential fuel combustion (16 percent), paved and unpaved road dust (27 percent), and construction and demolition activities (14 percent). For PM2.5, about 77 percent of all emissions in the county were from area-wide sources, including farming operations (28 percent), residential fuel combustion (33 percent), paved and unpaved road dust (8 percent), and construction and demolition activities (3 percent).[28]

Sulfur Dioxide. Sulfur dioxide is a colorless gas with a strong odor and potential to damage materials. It is produced by the combustion of sulfur containing fuels such as oil and coal. Refineries, chemical plants, and pulp mills are the primary industrial sources of sulfur dioxide emissions. Adverse health effects associated with exposure to high levels of sulfur dioxide include aggravation of chronic obstruction lung disease and increased risk of acute and chronic respiratory illness. Sulfur dioxide concentrations in Sonoma County are well below the ambient standards.

Lead. Lead occurs in the atmosphere as particulate matter. It was primarily emitted by gasoline-powered motor vehicles; however, the use of lead in fuel has been virtually eliminated. As a result of lead being eliminated from fuels, levels throughout the U.S. have dropped dramatically in the past 20 years. Dust from old lead paints represent very localized lead problems. Lead concentrations measured at ambient monitoring stations in California are well below the ambient standards.

Federal Requirements

Each state is divided into air basins based on topographic, geographic, and meteorological conditions. Each air basin is then assessed to determine if the area meets the NAAQS. Air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant based on whether or not compliance with the standards have been achieved.

If an area does not meet the NAAQS over a set period of time, the EPA designates the area as a "nonattainment" area for that particular pollutant and sets deadlines for bringing the area into compliance with the standards. These deadlines vary by pollutant, the current level of air pollution in the air basin, and the ability of each region to meet the deadline. The EPA requires states that have areas that are not in compliance with the national standards to prepare and submit air quality plans showing how and when the standards will be met. These plans are referred to as State Implementation Plans (SIPs). If the states cannot show how the standards will be met, then they must show progress toward meeting the standards. Under severe cases, the EPA may impose a Federal plan to show progress in meeting the Federal standards.

[28] California ARB website accessed in August 2012 at http://www.arb.ca.gov/app/emsinv/emssumcat.php,

Table 4.6-1
California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards [(a)]
Ozone	8-hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)
	1-hour	0.09 ppm (180 μg/m^3)	NA
Carbon monoxide	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen dioxide	Annual	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)
	1-hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)[f]
Sulfur dioxide	Annual	NA	0.030 ppm (80 μg/m^3)
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)
	3-hour	NA	0.5 ppm (1300 μg/m^3)
	1-hour	0.25 ppm (655 μg/m^3)	75 ppb (196 μg/m^3)
PM_{10}	Annual	20 μg/m^3	NA
	24-hour	50 μg/m^3	150 μg/m^3
$PM_{2.5}$	Annual	12 μg/m^3	15 μg/m^3
	24-hour	NA	35 μg/m^3
Lead	Calendar quarter	NA	1.5 μg/m^3
	30-day average	1.5 μg/m^3	NA

Notes: ppm = parts per million
μg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
(a) Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
- Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

SIPs typically contain measures to reduce air pollution and specific strategies for achieving attainment. SIPs for nonattainment areas must require new sources to achieve the "lowest achievable emission rate." The Federal Clean Air Act also contains specific measures relating to air pollution from cars, trucks, and other "mobile sources." States have the authority to implement transportation control measures to reduce mobile source pollution. Except for California, states do not have the authority to prescribe the level of pollutants emitted directly from the tailpipe of mobile sources. The Federal Clean Air Act also contains specific measures to be included in the SIP for areas that have not attained the ozone and particulate matter NAAQS.

Areas with monitored air pollutant concentrations lower than ambient air quality standards are designated as attainment areas on a pollutant-by-pollutant basis. Areas are designated as unclassified when data are insufficient to have a basis for determining the area's attainment status. From a regulatory standpoint, unclassified areas are treated the same as an attainment area. Table 4.6-2 shows the attainment status of the project area with respect to the National and State air quality standards. The Bay Area as a whole, including the region of Sonoma County within the BAAQMD does not meet the National or State ambient air quality standards for ozone and PM2.5. For PM10, it is unclassified with respect to the Federal standards and nonattainment for the State standards. For all other pollutants it is classified as in attainment or unclassified with respect to the Federal and State air quality standards.

Table 4.6-2
Attainment Status of BAAQMD Portion of Sonoma County

Pollutant	**Federal**	**State**
Ozone (O3) 1 hour	-	Nonattainment
Ozone (O3) 8 hour	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Unclassified/Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Respirable Particulates (PM10)	Unclassified	Nonattainment
Fine Particulate Matter (PM2.5)	Nonattainment	Nonattainment

Source: CARB: http://www.arb.ca.gov/desig/adm/adm.htm (11/2012)

Stationary Source Control Measures

The Federal Clean Air Act authorizes the EPA to adopt regulations specifying pollutant levels that may be emitted from newly constructed stationary sources. These regulations, called New Source Performance Standards (NSPS), are implemented for different categories of stationary emission sources.

One such NSPS regulation has been promulgated for non-metallic mineral processing operations (40 CFR 60 Subpart OOO), which includes rock and sand and gravel quarry operations. This performance standard includes particulate matter emission limitations and visible emissions (opacity) limits for point and fugitive sources at quarries and other facilities. The regulation applies to various equipment components at quarries including crushers, grinders, screening operations, belt conveyors, and storage bins, that were constructed, reconstructed, or modified after August 31, 1983. Existing equipment at the Mark West Quarry is subject to these requirements and any new equipment that is acquired to replace old equipment will also be subject to these requirements.

Mobile Source Control Measures for Diesel Engines

In addition to setting emission standards for stationary sources, the EPA also sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, industrial, and mining (such as bulldozers and loaders). The EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, as long as they are the same or more stringent than the Federal standards.

In the past decade the EPA has established a number of emission standards for on-road and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of particulate matter (PM10 and PM2.5) and because the EPA has identified diesel particulate matter as a probable carcinogen. Emissions from on-road heavy-duty truck and bus engines were estimated to account for about 30 percent of the NOx emissions and 25 percent of the PM emissions from mobile sources. Non-road diesel engine emissions were estimated to be about 40 percent of the total mobile source PM2.5 inventory and 25 percent of the NOx inventory in 1996. Implementation of the heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce PM and NOx emissions by from diesel engines by 90 to 95 percent.

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The new standards reduced the amount of sulfur allowed by 97 percent for highway diesel fuel (from 500 ppmw to 15 ppmw), and by 99 percent for off-highway diesel fuel (from about 3,000 ppmw to 15 ppmw). The low sulfur highway fuel (15 ppmw sulfur), also called ultra low sulfur diesel (ULSD), is currently required for use by all vehicles.

All of the above Federal diesel engine and diesel fuel requirements have been adopted by California, in some cases with modifications making the requirements more stringent or the implementation dates sooner.

Hazardous Air Pollutants

The Federal Clean Air Act also regulates the emission of hazardous air pollutants. HAPs are air pollutants known to be, or reasonably anticipated to be, carcinogenic, mutagenic, teratogenic, neurotoxic, or cause reproductive dysfunction, or are acutely or chronically toxic. Section 112 of the Federal Act (42 U.S.C. § 7412) contains a list of specific substances that are HAPs. These requirements for HAPs generally apply to major sources of HAPs and/or to specific source categories. The Mark West Quarry is not a major source of HAPs and will not become a major source with the proposed quarry expansion[29].

[29] In order for a source to be a major source of HAPs the total facility HAP emissions need to be greater than 10 tons per year of any single HAP or greater than 25 tons per year of all combined HAP emissions. The quarry will not become a major source of HAPs because the primary emission sources that contribute to the quarry's HAP emission inventory are the processing plant equipment which under the proposed project would have emissions of particulate matter of less than 5 tons per year, as shown in Table 4.6-9, of which only a very small fraction could be HAPs. Therefore, the quarry's HAP emissions will be below the major source HAP threshold.

b. State Air Quality Regulations

California Clean Air Act

Air pollution in California is regulated under the provisions of the California Clean Air Act. These statutes provide the basis for implementing the Federal Act. The CARB is responsible for establishing and reviewing the State standards, compiling the California SIP, securing approval of that plan from the EPA, and identifying toxic air contaminants. CARB also regulates mobile emission sources in California, such as construction equipment, trucks, and automobiles. The State Act divides implementation responsibility between the CARB and local or regional agencies called air quality management districts or air pollution control districts. The BAAQMD is the local air quality district for the project. The BAAQMD is responsible for bringing and/or maintaining air quality within Federal and State air quality standards. This includes the responsibility to monitor ambient air pollutant levels and to develop and implement attainment strategies to ensure that future emissions will be within standards.

The air districts are primarily responsible for implementing and enforcing Federal and State regulations for stationary sources at industrial and commercial facilities within their jurisdictions and for preparing the regional air quality plans that are required under the Federal Clean Air Act and California Clean Air Act. These regional air quality plans prepared by districts throughout the State are compiled by the CARB to form the California SIP. The local air districts also have the responsibility and authority to adopt transportation control measures and emission reduction programs for indirect and area-wide emission sources.

The CARB oversees air district regulation of stationary sources and is the agency primarily responsible for controlling air pollution from mobile sources in California. Regulations have been adopted at both EPA and CARB levels that set specific emission standards for vehicles. As older vehicles are retired and replaced with newer, cleaner vehicles (called "fleet turnover"), air quality will improve. Accordingly, most air quality planning documents project reduced vehicle emissions in the future.

Criteria Air Pollutants

The California Clean Air Act outlines a program for areas in the State to attain the California Air Quality Standards (CAAQS) by the earliest practical date. The California Clean Air Act set more stringent air quality standards, as shown in Table 4.6-1, for most of the pollutants covered under the Federal standards. Additionally, California has adopted ambient air quality standards for vinyl chloride, hydrogen sulfide, sulfates, and visibility-reducing particulates.

In a manner similar to the Federal requirements, the California Clean Air Act requires designation of attainment and nonattainment areas with respect to CAAQS. The California Clean Air Act also requires that local and regional air districts prepare a Clean Air Plan (CAP) if the State air quality standards for CO, SO_2, NO_2, or ozone are violated in their district. These CAPs include information on existing air quality in the region, an inventory of current and forecasted future emissions, emission reductions required to meet the standards, and the control measures required to achieve the emission reduction. The CAP must show satisfactory progress in attaining the State air quality standards. The California Clean Air Act requires that the State air quality standards be met as expeditiously as practicable but unlike the Federal Clean Air Act, does not set precise attainment date deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

Unlike for other pollutants an attainment plan is not required for areas that violate the State PM10 or PM2.5 standards. However, in 2003 the California Legislature enacted Senate Bill 656 which seeks to reduce public exposure to PM10 and PM2.5 and to make progress toward attainment of State and National PM10 and PM2.5 standards. SB 656 requires CARB, in consultation with local air quality districts, to develop and adopt a list of the most readily available, feasible, and cost-effective control measures that could be used to reduce particulate matter.

Toxic Air Contaminants

Toxic Air Contaminants (TAC) are a comprised of large group of compounds known to cause short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects. TACs are considered separately from criteria pollutants in the regulatory process. Unlike criteria pollutants, there are no ambient air quality standards for evaluation of TACs. Instead, TAC emissions are generally evaluated based on the degree of health risk that could result from exposure to these pollutants.

TAC sources include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), some agricultural activities, and mobile sources. In general, mobile sources, particularly those with diesel engines, contribute more significantly to health risks than stationary sources. In comparison to other air toxics the CARB has identified and controlled, diesel particulate matter emissions are responsible for about 70 percent of the total ambient air toxics risk. In addition to these general risks, diesel particulate matter can also present elevated localized or near-source exposures.

The State requires the local air districts to quantify and prioritize emissions from individual facilities. High priority facilities must then perform a health risk assessment, and if specific thresholds are exceeded, they are required to communicate the results to the public in the form of notices and public meetings. Depending on the level of risk, facilities can be required to implement varying levels of risk reduction measures. Regulation of TACs from mobile sources has traditionally been implemented through use of engine emission standards for on-road motor vehicles and through specifications for gasoline and diesel fuel sold in California. However, as discussed below, due to the significant contribution to health risks in the State from diesel exhaust, the CARB has implemented a diesel exhaust control program.

CARB Diesel Exhaust Control Program

In August of 1998, CARB identified particulate matter emitted from diesel-fueled engines (diesel particulate matter [DPM]) as a TAC that is carcinogenic (causes cancer) in addition to other adverse health effects. Diesel engines emit TACs in both gaseous and particulate forms. Diesel particulate matter is of particular concern since it can be distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by EPA as HAPs, and by CARB as TACs. Diesel engines emit particulate matter at a rate about 20 times greater than comparable gasoline engines. Because the vast majority of diesel exhaust particles are very small (92% to 94% of their combined mass consists of particles less than 2.5 micrometers in diameter), the particles are inhaled into the lung. Like other particles of this size, a portion will eventually become trapped within the lung. While the gaseous portion of diesel exhaust also contains TACs, CARB uses diesel particulate matter as a surrogate for all the compounds in diesel exhaust that are carcinogenic.

To address the issue of diesel emissions in the State, CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB, 2000a) and the *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* (CARB, 2000b). The Diesel Risk Reduction Plan was adopted by the CARB in September 2000. In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. The projected emission benefits associated with full implementation of this plan, including existing and new Federal measures, are reductions in diesel particulate matter associated cancer risks by 75 percent in 2010 and 85 percent by 2020. The measures in the plan will substantially reduce localized risks associated with activities that expose nearby individuals to diesel particulate matter emissions.

Many of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the Federal on-road and non-road diesel engine emission standards for new engines in 2004 and 2007 previously discussed, as well as adoption of regulations for low sulfur fuel in California. The California diesel fuel regulations are similar to the Federal regulations in that they require the maximum sulfur content to be 15 ppmw, but they also require reductions in the aromatic content. Reductions in aromatic content reduce emissions of several other toxic substances other than diesel particulate matter, including benzene and polynuclear aromatic hydrocarbons (PAHs). Additionally, the low sulfur diesel fuel requirements are be accelerated compared to the Federal requirements. The California low sulfur diesel fuel is currently required for use in both on-road and non-road engines in California.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations.

In December 2008 CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles (such as aggregate haul trucks). The regulation requires fleets that operate in California to reduce diesel truck and bus emissions by retrofitting or replacing existing engines. Starting January 1, 2012, the regulation phases in requirements for heavier trucks to reduce particulate matter emissions with exhaust retrofit filters or by replacing vehicles with newer vehicles that are equipped with PM filters. Starting January 1, 2015, the regulation requires accelerated replacements of both lighter and heavier trucks that do not have PM filters installed. From 2020 to 2023 nearly all older vehicles would need to be upgraded to have exhaust emissions meeting 2010 model year engine emissions levels.

In July 2007, the CARB adopted regulations to reduce DPM and NOx emissions from in-use (existing) off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower (hp) or greater. The regulations are intended to reduce particulate matter and NOx exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve specified fleet-averaged emission rates. The regulations call for different requirements and an implementation schedule that depends on the size of the fleet. Large fleets, those with a total combined equipment horsepower of more than 5,000 hp, are required to comply with the regulations by January 1, 2014. Medium fleets, those with a total combined horsepower between 2,500 and 5,000 hp, are required to comply by January 1, 2017, while small fleets, those with a total combined horsepower of 2,500 hp or less, are to comply with the requirements by January 1, 2019. Implementation of this regulation, in conjunction with stringent Federal off-road equipment engine emission limits for new vehicles, will significantly reduce emissions of DPM and NOx.

Asbestos and Crystalline Silica

Naturally occurring asbestos is found in ultramafic rocks, including serpentine. When this material is disturbed in connection with quarrying or surface mining operations, asbestos-containing dust can be generated. Exposure to asbestos can result in health impacts such as lung cancer, mesothelioma (cancer of the linings of the lungs and abdomen), and asbestosis (scarring of lung tissue that results in constricted breathing). Activities associated with quarrying and surface mining in areas known to contain NOA can result in elevated levels of airborne asbestos.

Crystalline silica is a component of soil, sand, granite, and many other minerals and has been associated with potential respiratory health effects. Respirable-sized particles of crystalline silica may be formed when workers chip, cut, drill, or grind the base materials that contain it. If the base rock material at a quarry contains crystalline silica, the fugitive dust generated during quarrying activities may contain crystalline silica. If respirable crystalline silica dust enters the lungs it can cause the formation of scar tissues (silicosis) which can be disabling or even fatal, reducing the lungs' ability to take in oxygen and increasing the susceptibility to lung infections. The non crystalline form of silica (amorphous silica) is not nearly as toxic, since it usually does not cause silicosis. Crystalline silica has been identified as a TAC with chronic non-cancer health effects by the California Office of Health Hazard Assessment (OEHHA). OEHHA has established an acceptable exposure level for crystalline silica's potential health effect. Screening-level sampling for asbestiform and free-silica minerals at the project site was done for this EIR.

A total of 19 individual samples were collected from the active quarry highwall (highwall refers to the active mining face of the quarry where there is a relatively steep wall where material from which rock is being extracted), the project expansion area, and other adjacent, accessible areas within the site. One aggregate sample was also collected of the filter cake material[30]. The method of sampling used was “targeted sampling.” Targeted sampling is the preferred method when geologic exposures allow this approach. This sampling method was used to collect a wide a variety of rock materials present in case any asbestiform mineral present favored a particular material over another. The same approach was used for free silica sampling. All samples were carefully bagged, labeled, and sealed. They were later combined into nine primary composite samples based on type and field proximity; again carefully bagged, labeled, sealed and transported to Asbestos TEM Laboratories for testing.

The presence/absence of asbestiform minerals and free-silica were tested on the greenstone and on ash falls/ash flows (Sonoma Volcanics) of the project. The geologic origin (petrology) of the quarry greenstone does not strongly suggest the presence of asbestiform minerals, but it does not rule it out, as some rock units of the Franciscan Complex are known to contain them. The Sonoma Volcanics at the quarry have not been tested specifically by the project applicant, but their petrology (Vennum, 2003) indicates the presence of some silica mineral in the samples. The petrology of the Sonoma Volcanic ash falls/flows strongly suggests the absence of asbestiform minerals, but testing was done to confirm absence.

Testing was conducted by Asbestos TEM Laboratories, Berkeley, California. Asbestos TEM is a Certified (CDPH ELAP: Lab ID# 1866) and Accredited (NVLAP: Lab Code 101891-0) laboratory. The analytical procedures were performed according to:

1. NIOSH 7500 X-Ray Diffraction (XRD) Method for Crystalline Silica
2. CARB 435 Polarized Light Microscopy (PLM) Method for Asbestos in Rock/Soil
3. EPA Test Method For the Determination of Asbestos in Bulk Building Materials by Transmission Electron Microscopy (TEM) modified for Soil/Rock Analysis (EPA/600/R-93/116).

The CARB 435 testing found no asbestiform minerals in any of the nine composite samples. This is the most commonly used and required test to detect the presence/absence of such minerals (California Environmental Protection Agency, 2002). While the CARB 435 method has much to commend it, there are a number of situations where it fails to provide sufficient accuracy to make a definitive determination of the presence/absence of asbestos and/or an accurate count of the asbestos concentration present in a given sample. Therefore, the more sensitive TEM analysis was then run on three secondary greenstone composites. One of these samples was found to contain 0.0035 weight percent asbestiform mineral (actinolite amphibole) fibers, with the remaining two samples having no detected asbestiform fibers.

Four of the nine samples analyzed for silica by the XRD procedure were found to contain crystalline silica present as quartz. Quartz was found in both the greenstone and volcanic ash/flows, but not in all of the greenstone samples. Levels identified ranged from 1.3 to 12 weight percent. These percentage levels would exceed the Occupational Safety & Health Administration (OSHA) Permissible Exposure Level (PEL) should the material become pulverized to a respirable size fraction and become airborne.

[30] Filter cake or filter press material is a putty-like material left over from washed aggregate production (wash plant) and consists of silt to clay-sized rock residue from which the excess water has been mechanically pressed for recycling before the material is stockpiled for later mine reclamation.

Asbestos Toxic Air Control Measure

In 2002, the CARB adopted an Asbestos Airborne Toxic Control Measure (ATCM) for construction, grading, quarrying and surface mining operations. The ATCM applies to quarrying and surface mining operations that meet any one of the following criteria:

1. Any portion of the area to be disturbed is located in a geographic area designated as an ultramafic rock unit or ultrabasic rock unit on maps published by the Department of Conservation.

2. Any portion of the area to be disturbed has ultramafic rock, serpentine, or naturally occurring asbestos on the site as determined by the District or the owner/operator.

3. After the start of operation, the local Air Pollution Control District or Air Quality Control District, a registered geologist, or the owner/operator discovers ultramafic rock, serpentine, or naturally occurring asbestos in the area to be disturbed.

The ATCM requires regulated operations in areas where naturally-occurring asbestos/serpentine rock is likely to be found, to employ the best available dust mitigation measures in order to reduce and control dust emissions. The BAAQMD enforces the requirements of the asbestos ATCM. The BAAQMD may grant an exemption from the ATCM requirements if a geological evaluation demonstrates that ultramafic rock or serpentine is not likely to be found. Before an exemption can be granted, the owner/operator must provide a copy of a report detailing the geologic evaluation to the BAAQMD for consideration.

The regional geological map for the Santa Rosa area generated by the Department of Conservation, California Geological Survey[31], does not indicate that the Mark West Quarry site is located in a geographic area designated as ultramafic or ultrabasic rock unit. Naturally occurring asbestos has not been identified to date by the BAAQMD or the Mark West Quarry and the ATCM for naturally occurring asbestos does not currently apply to the Mark West Quarry. As indicated above, testing of quarry materials for asbestos was conducted. The results of this testing and how it relates to the ATCM is discussed further under Impact 4.6-D in Section B.2.

c. Local/Regional Air Quality Plans, Policies and Regulations

BAAQMD Plans and Regulations

The Bay Area Air Quality Management District (BAAQMD) is the agency responsible for regulating air pollutant emissions in the San Francisco Bay Area Air Basin. BAAQMD is responsible for implementing emissions standards and other requirements of Federal and State laws. Emissions of criteria air pollutants are regulated through both emissions limitations and the State standards. The BAAQMD operates a regional network of

[31] Geologic Map of the Santa Rosa Quadrangle (set of five sheets) (reprinted 1999), Wagner, D.L., et. al. Available from:
http://redirect.conservation.ca.gov/CGS/information/publications/database/Publications_type.asp

monitoring stations that provides information on meteorology and ambient concentrations of air pollutants.

The BAAQMD is responsible for regulating those portions of the quarry that have air emissions and the potential to affect air quality. Operations at the quarry are regulated under a single Permit to Operate (PTO) issued by the BAAQMD, and is required to be renewed annually. The permit covers emissions from on site stationary source operations related to quarrying, such as loading, crushing, and screening equipment, conveyance and storage piles. The PTO includes specification of emission controls, emission limitations, monitoring and reporting requirements, and limits on the amount of material processed by individual pieces of equipment and an overall facility production limit. The current PTO for the Mark West Quarry (referred to in the permit as Plant # 1292) allows for the total input of material processed at the plant not to exceed 800,000 tons in any consecutive 12 month period. Therefore, the proposed quarry production rate of 750,000 tons per year is within the limits of the existing PTO. Unless the quarry adds to, or modifies, the existing processing equipment, the existing PTO will not have to be modified or reissued.

2001 Ozone Attainment Plan Addressing the National Standards

The BAAQMD, the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG) prepared the Bay Area 2001 Ozone Attainment Plan as part of the State Implementation Plan (SIP) to achieve the NAAQS for the 1-hour ozone standard. Although U.S. EPA revoked the National 1-hour ozone standard, commitments made in that plan along with emissions budgets remain valid until the region develops an attainment demonstration/maintenance plan for the 8-hour National standard for ozone. The U.S. EPA has already determined that the region met the 1997 8-hour ozone standard. However, the region will be required to submit a maintenance plan and demonstration of attainment with a request for redesignation to U.S. EPA prior to being formally redesignated. BAAQMD will likely not act on this submittal for a few years. In addition, the U.S. EPA's new, slightly more stringent, 8-hour ozone standard was recently established. The U.S. EPA will be making new attainment designations based on that standard in about 3 years and eventually revoking the older standard.

Bay Area 2010 Clean Air Plan Addressing the State Standards

Air quality plans addressing the California Clean Air Act with respect to ozone have been prepared to demonstrate progress toward meeting the more stringent 1-hour and 8-hour State ozone standards, for which the Bay Area is designated nonattainment. In addition, emissions of ozone precursors (NOx and ROG) contribute to higher ozone levels in neighboring air basins. State law requires ozone nonattainment areas to include all feasible measures to reduce ozone precursors and reduce transport of ozone and its precursors to neighboring air basins.

In September 2010, the BAAQMD adopted the Bay Area 2010 Clean Air Plan (CAP). This CAP updates the most recent ozone plan, the 2005 Ozone Strategy. Unlike previous Bay Area CAPs, the 2010 CAP is a multi-pollutant air quality plan addressing four categories of air pollutants:

1) Ground-level ozone and the key ozone precursor pollutants (reactive organic gases and NOx), as required by State law;
2) Particulate matter, primarily PM2.5, as well as the precursors to secondary PM2.5;
3) Toxic air contaminants; and
4) Greenhouse gases.

While the CAP addresses State requirements, it will also provide the basis for developing future control plans to meet Federal requirements (NAAQS) for ozone and PM2.5. The region is required to prepare (by December 2012) a Federally-enforceable plan to meet the NAAQS for PM2.5. In addition, U.S. EPA is likely to adopt a more stringent NAAQS for ozone. These new standards will likely trigger new planning requirements for the Bay Area and more stringent Federally enforceable control measures.

While previous CAPs have relied upon a combination of stationary and transportation control measures, the 2010 CAP adds two new types of control measures: (1) Land Use and Local Impact Measures and (2) Energy and Climate measures. These types of measures would indirectly reduce air pollutant and greenhouse gas emissions through reductions in vehicle use and energy usage. In addition, the plan includes Further Study Measures, which will be evaluated as potential control measures.

PM10 and PM2.5 Plans

The BAAQMD adopted a Particulate Matter implementation Schedule, per the requirements of SB 656. The BAAQMD has found that the primary constituents of elevated PM2.5 and PM10 are secondary ammonium nitrate and wood smoke. Secondary ammonium nitrate forms in the atmosphere as a result primarily of fossil fuel combustion (e.g., motor vehicles). The clean air planning efforts for ozone will also reduce PM10 and PM2.5, since a substantial amount of this air pollutant comes from combustion emissions such as vehicle exhaust. BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM10 and PM2.5 emissions (e.g., Spare the Air Program). SB 656 requires further action by CARB and air districts to reduce public exposure to PM10 and PM2.5. Efforts identified by BAAQMD in response to SB 656 are primarily targeting reductions in wood smoke emissions and adoption of new rules to further reduce NOx and particulate matter from internal combustion engines and reduce particulate matter from commercial charbroiling activities.

Sonoma County General Plan

The Sonoma County General Plan 2020 is the County's long range guide for use of land and protection of natural resources. The Open Space and Resource Conservation Element of the Sonoma County General Plan 2020 (Sonoma County, 2008) contains the following air quality policies that would apply to the proposed project.

Policy OSRC-16a: Require that development projects be designed to minimize air emissions. Reduce direct emissions by utilizing construction techniques that decrease the need for space heating and cooling.

***Policy OSRC-16b*:** Encourage public transit, ridesharing and vanpooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.
***Policy OSRC-16c*:** Refer projects to the local air quality districts for their review.
***Policy OSRC-16d*:** Review proposed changes in land use designations for potential deterioration of air quality and deny them unless they are consistent with the air quality levels projected in the General Plan EIR.
***Policy OSRC-16e*:** Cooperate with the local air quality district to monitor air pollution and enforce mitigations in areas affected by emissions from fireplaces and woodburning stoves.
***Policy OSRC-16h*:** Require that development within the Bay Area Air Quality Management District that generates high numbers of vehicle trips, such as shopping centers and business parks, incorporate air quality mitigation measures in their design.
***Policy OSRC-16i*:** Ensure that any proposed new sources of toxic air contaminants or odors provide adequate buffers to protect sensitive receptors and comply with applicable health standards. Promote land use compatibility for new development by using buffering techniques such as landscaping, setbacks, and screening in areas where such land uses abut one another.

Sonoma County Surface Mining and Reclamation Ordinance

The Sonoma County Surface Mining and Reclamation Ordinance (Sonoma Municipal Code, Chapter 26A) was adopted in order to comply with and implement the provisions of the Surface Mining and Reclamation Act and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must be complied with, where applicable, by aggregate mining and production operations in the County. Sec. 26A-09-010 includes the following air quality requirements:

- Mining facilities having stationary sources of aggregate materials extraction, and/or processing shall comply with all applicable Federal, State, and local requirements governing the review, permitting and emission of air quality contaminants. Where applicable such compliance shall include, but not be limited to, Federal New Source Review (NSR), New Source Performance Standards (NSPS), State Air Toxics Control Measures (ACTMs) and any other such local reviews and permit requirements as determined necessary by either Northern Sonoma County Air Pollution Control District (NSCAPCD) or the Bay Area Air Quality Management District (BAAQMD).

- Dust Suppression. All haul roads, driveways, and activity areas, including equipment, shall be maintained as necessary to minimize the emission of dust. Maintenance shall be conducted as necessary to prevent fugitive dust from becoming a nuisance to adjacent properties. Maintenance procedures may include but are not limited to watering, oiling, paving and/or application of other appropriate dust suppressants.

3. Greenhouse Gas Emissions and Climate Change

Climate change is caused by greenhouse gases (GHGs) emitted into the atmosphere around the world from a variety of sources, including the combustion of fuel for energy and transportation, cement manufacturing, and refrigerant emissions. GHGs are those gases that have the ability to trap heat in the atmosphere, a process that is analogous to the way a greenhouse traps heat. GHGs may be emitted a result of human activities, as well as through natural processes. GHGs have been accumulating in the earth's atmosphere at a faster rate than has occurred historically. Increasing GHG concentrations in the atmosphere are leading to global climate change.

Carbon dioxide (CO2) is the most important anthropogenic GHG because it comprises the majority of total GHG emissions emitted per year and it is very long-lived in the atmosphere. Common GHGs include carbon dioxide, methane, nitrous oxides, and halocarbons (a group of gases containing fluorine, chlorine, or bromine). Typically, when evaluating GHG emissions they are expressed as carbon dioxide equivalents, or CO2e, which is a means of weighting the global warming potential (GWP) of the different gases relative to the global warming effect of CO2, which has a GWP value of one. Other GHGs, such as methane and nitrous oxide which are commonly found in the atmosphere, but at much lower concentrations, have a GWP of 23 and 296, respectively. In the United States, CO_2 emissions account for about 85 percent of the CO2e emissions, followed by methane at about eight percent and nitrous oxide at about five percent.

Federal

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC). While the United States signed the Kyoto Protocol, which would have required reductions in GHGs, Congress never ratified the protocol. The Federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science.

In 2007, the EPA identified CO2 as an air pollutant under the Clean Air Act, and determined that therefore the EPA has the authority to regulate emissions of GHGs. The EPA has promulgated several GHG regulations, which for the most part, apply to larger facilities that emit large amounts of CO2 or its equivalent in other regulated GHGs. These regulations include the Federal Mandatory Reporting of Greenhouse Gases (Mandatory Reporting Rule) and the Tailoring Rule. The Mandatory Reporting Rule, which requires reporting of CO2 and other GHG emissions, applies to particular facility types. Quarries are not identified as facilities that are subject to this rule.

The EPA also issued a rule addressing greenhouse gas emissions from stationary sources and requirements under Title V and PSD permitting programs. This rule is known as the PSD and Title V Greenhouse Gas Tailoring Rule, or Tailoring Rule. New and existing sources with GHG emissions of at least 100,000 tons per year are subject to Title V permitting requirements. The Mark West Quarry is not a major GHG source under the PSD or Title V permit regulations, and it will not become a major source with the proposed increase in quarry production levels.

State

In response to the increasing body of evidence that GHGs will continue to affect the global climate, the State has enacted key legislation and implemented regulations in an effort to reduce the State's contribution to climate change.

California Assembly Bill 1493 (Pavley) enacted in July 2002, required CARB to develop and adopt regulations that reduce GHG emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB will apply to 2009 and later model year vehicles. CARB estimates that the regulation will reduce climate change emissions from light duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels. The California Climate Action Team's (CAT) Report to the Governor contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG in California. GHG as defined under AB 32 include: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 requires CARB to adopt rules and regulations that would achieve greenhouse gas emissions equivalent to statewide levels in 1990 by 2020. CARB approved the Climate Change Scoping Plan (Scoping Plan) in December 2008. The Scoping Plan outlines actions to obtain the goal set out in AB 32 of reducing emissions to 1990 levels by 2020. The Scoping Plan "proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health". The Scoping Plan's recommendations for reducing greenhouse gas emissions to 1990 levels by 2020 providing for emission reduction measures, including a cap-and-trade program linked to Western Climate Initiative partner jurisdictions, green building strategies, recycling and waste-related measures, and Voluntary Early Actions and Reductions. CARB has also developed and approved a 1990 State GHG emissions inventory of 427 million metric tons of carbon dioxide equivalent (MMTCO2e) in December 2007. Therefore, in 2020, GHG emissions in California are required to be at or below 427 MMTCO2e.[32]

AB 32 also required development of a mandatory reporting rule for major sources of GHGs. The CARB reporting rule (sections 95100 to 95313 of Title 17, California Code of Regulations) became effective in January 2009. The rule requires reporting GHG emissions for certain specific industrial sectors and for other facilities that emit greater than 25,000 metric tons per year of CO2e (MT CO2e/year) from stationary combustion sources.

Executive Order S-01-07 was enacted by the Governor on January 18, 2007. The order mandates a two pronged approach to achieving lower fuel emissions. First, it states that

[32] CO2e describes s means of weighting the global warming potential (GWP) of the different gases that cause warming relative to the global warming effect of CO2, which has a GWP value of one.

a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020, then from that baseline a Low Carbon Fuel Standard for transportation fuels shall be established for California.

California Senate Bill 97 (SB-97), signed by the governor in August 2007, acknowledges climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Governor's Office of Planning and Research to prepare, develop, and transmit to the California Resources Agency by July 1, 2009 guidelines for mitigating GHG emissions or the effects of GHG emissions, as required by CEQA. The California Resources Agency was required to certify and adopt these guidelines by January 1, 2010. Amendments to the CEQA Guidelines pursuant to SB-97 were adopted in March 2010.

California Senate Bill 375 passed on August 30, 2008 and was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of greenhouse gas emissions, which emits over 40 percent of the total greenhouse gas emissions in California. SB 375 states that "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing greenhouse gas emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

In January 2010, the State Building Standards Commission adopted the State Green Building Standards Code (CALGreen). CALGreen supplements the California Building Standards Code (Title 24) which became effective on January 1, 2011 requires all new buildings in the State to incorporate energy saving features. New standards include:

1. Water efficiency: New buildings must demonstrate at least a 20 percent reduction in water use over typical baseline conditions.
2. Construction waste: At least 50 percent of construction waste must be recycled, reused, or otherwise diverted from landfilling.
3. Interior finishes: Interior finishes such as paints, carpet, vinyl flooring, particle board, and other similar materials must be low-pollutant emitting.
4. Landscape irrigation: In nonresidential buildings, separate water meters must be provided for a building's indoor and outdoor water use. Large landscape projects must use moisture-sensing irrigation systems to limit unnecessary watering.

In late 2012, the State's cap-and-trade program was initiated and held its first auction for permits under the program. The program is a central element of California's Global Warming Solutions Act (AB 32) and covers major sources of GHG emissions in the State such as refineries, power plants, industrial facilities, and transportation fuels. The regulation includes an enforceable GHG cap that will decline over time. ARB will distribute allowances, which are tradable permits, equal to the emission allowed under the cap.

BAAQMD

BAAQMD established the Climate Protection Program to reduce pollutants that contribute to global climate change and affect air quality in the Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy, all of which assist in reducing emissions of GHG and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders. BAAQMD adopted updated CEQA Air Quality Guidelines, including new thresholds of significance, in June 2010 (updated in May 2012), which advise lead agencies on how to evaluate potential air quality impacts with the new thresholds of significance.[33]

Sonoma County

On September 27, 2005, the Sonoma County Board of Supervisors established a Countywide greenhouse gas reduction target. The target is to reduce emissions 25 percent below 1990 levels by 2015, which exceeds the State target. The same goal has been adopted by all nine cities in Sonoma County. A strategy for achieving this ambitious target has been developed in the Sonoma County Community Climate Action Plan (Climate Protection Campaign, 2008), which was prepared by the Climate Protection Campaign, a consortium of local governments, private sector and public interest organizations, and residents. The Plan calls for reductions in GHG emissions through increased energy efficiency, development of renewable energy sources, and reduction in emissions related to transportation, agriculture and forestry, water and wastewater, and solid waste disposal.

The Sonoma County General Plan 2020 includes several policies directly related to climate change, and many more that are intended, at least in part, to reduce GHG emissions. The County's GHG reduction target is included as an objective in the Open Space and Resource Conservation Element, along with several implementing policies (Sonoma County, 2008). Additional policies that will implement this objective are contained in the Land Use, Agriculture, Water Resources, and Circulation and Transit Elements. The Open Space and Resource Conservation Element goals, objectives, and policies that directly address GHG emissions are provided below.

[33] BAAQMD's adoption of the thresholds was called into question by an order issued March 5, 2012, in California Building Industry Association v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted further environmental review under CEQA. The claims made in the case concerned the environmental impacts of adopting the thresholds, that is, how the thresholds would indirectly affect land use development patterns. Those issues are not relevant to the scientific soundness of the BAAQMD's analysis of what levels of pollutants should be deemed significant, or the threshold to use in assessing any health risk impact a project will have on the existing environment. The County agrees that those thresholds are supported by substantial evidence. Moreover, the thresholds will not cause any indirect impact in terms of land use development patterns insofar as this project is concerned, because the proposal to expand the Mark West Quarry was not influenced by the BAAQMD guidelines. Accordingly, the analysis herein uses the updated thresholds and methodologies from BAAQMD's CEQA Air Quality Guidelines to determine the potential impacts of the project on the existing environment

Policy OSRC-14c: Continue to purchase and utilize hybrid, electric, or other alternative fuel vehicles for the County vehicle fleet; and encourage County residents and businesses to do the same.
Policy OSRC-14d: Support project applicants in incorporating cost effective energy efficiency that may exceed State standards.
Policy OSRC-14e: Develop energy conservation and efficiency design standards for new development.
Policy OSRC-14f: Use the latest green building certification standards, such as the Leadership in Energy and Environmental Design (LEED) standards, for new development.
Policy OSRC-14i: Manage timberlands for their value both in timber production and offsetting greenhouse gas emissions.

4. Existing Air Quality Conditions

The ambient air quality in a given area depends on the quantities and types of pollutants emitted within the area, the location and distribution of emission sources, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Meteorological conditions such as wind speed and direction, atmospheric stability, and for photochemical pollutants, sunlight, all combine to affect the atmosphere's ability to mix, transform, and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while short-term variations result from changes in atmospheric conditions.

Air quality in Sonoma County and the project area is generally very good. There are infrequent exceedances of the air quality standards for particulate matter. The existing air quality conditions in the project region can be characterized using long-term monitoring data collected in the area over a period of years. Ambient ozone, NO_2, CO, and particulate matter (PM10 and PM2.5) concentrations are measured at several monitoring stations in the project region. The pollutants of greatest concentration in the region are ozone and particulate matter (both respirable and fine). Ambient ozone, NO_2, CO, PM10, and PM2.5 are measured in Santa Rosa at 5th Street (about 8.5 miles south-southwest of the project site). The Santa Rosa monitoring station is the closest BAAQMD monitoring station to the project site. Measured pollutant concentrations for the most recent five years (2007 through 2011) of data available are summarized in Table 4.6-3. As seen from Table 4.6-3, there have been no exceedances of the National or State air quality standards over the last five years.

Table 4.6-3
Maximum Measured Air Pollutant Concentrations for the Project Area[a]

Pollutant	Averaging Period	Air Quality Standard		*Monitoring Data by Year*				
		National	State	2007	2008	2009	2010	2011
Particulate Matter (PM10)	24-Hour ($\mu g/m^3$) Annual ($\mu g/m^3$)	150 -	50 20	37.2 17.0	49.9[c] -[c]	-[c] -[c]	-[c] -[c]	-[c] -[c]
Particulate Matter (PM2.5)	24-Hour ($\mu g/m^3$) Annual ($\mu g/m^3$)	35 15	- 12	32.0 7.6	30.8 8.6	29.0 8.4	26.6 7.2	33.2 8.6
Ozone (O_3)	1-Hour (ppm) 8-Hour (ppm)	- 0.08	0.09 0.070	0.071 0.059	0.076 0.065	0.086 0.066	0.084 0.068	0.073 0.053
Carbon Monoxide (CO)	1-Hour (ppm) 8-Hour (ppm)	35 9	20 9.0	2.6 1.7	3.5 1.5	3.5 1.3	2.5 1.1	1.8 1.2
Nitrogen Dioxide (NO_2)	1-Hour (ppm) Annual (ppm)	0.100 0.053	0.18 0.030	0.046 0.011	0.049 0.011	0.045 0.009	0.042 0.008	0.041 0.009

a BAAQMD air monitoring station on 5th St in Santa Rosa.
b The State 24-hour PM10 standard was exceeded the for 2 days in 2006, and the national and State 24-hour PM2.5 standards were exceeded for 1 day.
c PM10 monitoring was discontinued at this station on June 30, 2008.
Notes: ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter
Values reported in bold exceed ambient air quality standard
NA = data not available.

Source: California Air Resources Board: http://www.arb.ca.gov/adam/index.html, August 2012 and BAAQMD.

Baseline Quarry Operation Emission of Criteria Pollutants

The Mark West Quarry is a currently operating quarry that extracts, processes (crushes, screens, and segregates), and sells aggregate to retail customers. Quarry operation typically occurs weekdays during the daytime (7 a.m. to 4:30 p.m.). Aggregate crushing and processing operations occur for about 5 hours per day at an average processing rate of about 416 tons per hour for about 245 days per year.

The quarry production rate varies from month to month and year to year, depending on demand. The production rate of 305,000 cubic yards per year (457,500 tons per year) was used to represent existing (baseline) conditions.[34] Future project conditions assume the maximum quarry production level of 500,000 cubic yards per year (750,000 tons per year).

On-site emission sources at the quarry include stationary, mobile, and fugitive sources. The stationary sources at the quarry include sources associated with the processing of quarry material. The processing equipment includes a feeder, primary jaw crusher, two vertical impact crushers, a cone crusher, five vibrating screens, conveyors, stacking conveyors, a wash plant, and a portable screening plant. Emissions from these sources

[34] As described previously, this baseline production rate was calculated as the annual average production level for the quarry for the five years preceding the project application. Air quality impacts for criteria pollutants and DPM are assessed for the year 2013 (the year of DEIR publication). The year 2013 was selected as a baseline in order to accurately calculate current diesel engine emissions given emission reductions over the past few years due to the new State pollution control requirements for diesel trucks and heavy equipment. Using an older baseline, such as 2010, would not accurately describe current conditions nor accurately predict future impacts.

are minimized by use of water/foam spray systems on the crushers, screens, and at stacker conveyor discharge points to reduce any dust generated.

Other emission sources at the quarry include fugitive dust from quarry maintenance and excavation activities, blasting, and aggregate loading into haul trucks via loaders. On-site mobile equipment includes one bulldozer, five loaders, one excavator, one backhoe, one man lift, one skidsteer loader, one rock drill rig, one off-road haul truck, and one water truck used for dust suppression by watering the roads and work areas. The on-road haul trucks traveling on the paved access road to the quarry and in the quarry area where the trucks are loaded and weighed also generate fugitive dust. Dust control from these sources is achieved by watering work areas and roadways, and wetting surge and storage piles to maintain adequate moisture to minimize airborne particulates. The haul roads are also treated with a magnesium chloride based surfactant at least once per year. Additionally, a vacuum street sweeper is periodically used on the paved road areas. Exhaust emissions are also generated by the mobile sources.

Maximum annual average and average daily emissions associated with the above source categories were calculated for 2013 baseline quarry operation. Daily emissions were based on the estimated daily production levels of the processing facility and hours of operation of the off-road equipment and vehicles provided by the applicant. Maximum annual average emissions were based on a baseline annual average production of 305,000 cubic yards (or about 457,500 ton per year).[35] In estimating the baseline annual number of haul trucks used, an average truckload capacity of 21 tons of quarry product was assumed. Details of the emission calculations are provided in Appendix G.

Particulate matter emissions from the quarry processing equipment were calculated using quarry and equipment processing rates and the U.S. EPA's AP-42 emission factors for Crushed Stone Processing (AP-42 Section 11.19-2). Fugitive dust emissions from on-site equipment and vehicle traveling over unpaved area were calculated using U.S. EPA emission factors for unpaved roads (AP-42 Section 13.2.2) and emissions from soil, rock, and aggregate handling (e.g., truck loading) were calculated using U.S. EPA emission factors for aggregate handling and storage piles (AP-42 Section 13.2.4).

Blasting produces fugitive particulate matter, as well and gaseous emissions of NOx, CO, and SO_2. Blasting at the quarry takes place on average 2 times per week and up to 3 times per week during peak production periods. Emissions from blasting were calculated based on the size and depth of the blast area, the amount of explosives used per blast and U.S. EPA emission factors (AP-42 Section 11.9 Western Surface Coal Mining and Section 13.3 Explosives Detonation). An average blasting rate of 2 times per week was used to calculate the average daily and annual average emissions.

Exhaust emissions from the on-site quarry mobile equipment were computed using emission factors from the CARB OFFROAD model for off-road diesel engines. The CARB developed these emission factors, which vary by engine horsepower rating and year of engine, for preparing State and local emission inventories of diesel equipment and off-road mobile sources. Emissions of NOx, CO, VOCs, PM10, PM2.5, and carbon dioxide (CO2) were computed using these emission factors, along with the year of equipment, engine horsepower ratings, operating schedule, and equipment load factors.

[35] This includes the production of aggregate from materials that are recycled at the project site.

Diesel particulate matter emissions were assumed to be the same as that of the exhaust PM2.5 emissions. Typically, off-road equipment can last many years. Older equipment can produce emissions much higher than newer equipment that must meet current or near-future mandated emission standards. Thus, the age of the equipment was taken into account when estimating emissions.

Exhaust emissions from the haul trucks, facility utility trucks, and employee vehicles were computed using the CARB EMFAC2011 on-road mobile source emissions model. CARB default model inputs for Sonoma County and vehicle fleet mixes were used. The aggregate haul trucks were conservatively assumed to be all diesel-fueled heavy, heavy-duty trucks (HHD). For the baseline analysis, emissions for calendar year 2013 were calculated. Aggregates from the quarry are transported by trucks to various regional locations. Most of the haul trucks travel west to Santa Rosa or Windsor (12 to 15 miles) or to a lesser extent east to Calistoga (6 miles) and St. Helena (14 miles) or south to the Rohnert Park area (20 miles). In calculating emissions from haul trucks an average one-way travel distance of 15 miles was assumed. Employee vehicle trips were assumed to be 20 miles.[36] Haul truck emission estimates included running exhaust emissions, idling emissions, and fugitive particulate matter from roadway travel.

A summary of the estimated daily and annual quarry baseline emissions of CO, NOx, VOC, PM10, PM2.5, and CO_2 are provided in Tables 4.6-4 and 4.6-5, respectively. Details of the emissions calculations are provided in Appendix G.

Table 4.6-4
Summary of Mark West Quarry Baseline Daily Emissions[a]

Emission Source	Daily Emissions (lb/day)				
	NOx	**CO**	**ROG**	**PM10**	**PM2.5**
Off-Road Equipment Exhaust[a]	32.8	9.3	2.6	1.1	1.0
On-Site Truck Use	1.7	0. 5	0.2	0.04	0.04
Processing Equipment	-	-	-	22.4	5.2
Quarrying/Fugitives	-	-	-	30.5	6.8
Blasting	17.0	67.0	-	1.3	0.1
Truck and Employee Vehicles	56.6	15.2	2.4	2.3	1.4
Total	**108.1**	**92.0**	**5.2**	**57.6**	**14.5**

[a] Emissions for 2013 at baseline production rate of 305,000 cubic yards per year.

[36] Aggregate haul truck and employee travel distances were based in information provided by the project sponsor and peer reviewed by the EIR consultants.

Table 4.6-5
Summary of Mark West Quarry Baseline Annual Emissions[a]

Emission Source	Annual Emissions (ton/year)				
	NOx	**CO**	**ROG**	**PM10**	**PM2.5**
Off-Road Equipment Exhaust	4.1	1.2	0.3	0.1	0.1
On-Site Truck Use	0.2	0.1	0.0	0.0	0.0
Processing Equipment	-	-	-	2.7	0.4
Quarrying/Fugitives	-	-	-	2.4	0.6
Blasting	2.2	8.7	-	0.2	0.0
Truck and Employee Vehicles	7.5	2.0	0.3	0.3	0.2
Total	**14.0**	**12.0**	**0.6**	**5.7**	**1.3**

[a] Emissions for 2013 at baseline production rate of 305,000 cubic yards per year.

5. Baseline Quarry Operation GHG Emissions

GHG emissions in 2011 were from combustion of fossil fuel (primarily diesel) in the stationary on-site equipment, off-road mobile equipment, other on-site vehicles, and vehicles accessing the quarry (haul trucks and employee vehicles).

Electricity used at the quarry onto; May 2011 was provided by PG&E. In May of 2011 an 809.34 kW photovoltaic system became operational. The system consists of 3,444 solar panels (235 W per panel) which are interconnected to the utility grid at the site. The system is designed to produce 1,026,096 kWh annually. Electricity from the photovoltaic system provides all the electrical energy requirements for the current quarry (in 2013). The Mark West Quarry is the first quarry in the U.S. to be entirely reliant on solar power.[37]

GHG emissions from current quarry operation were estimated for the onsite equipment, off-road mobile equipment, on-site quarry vehicles, and off-site haul truck and employee vehicle travel using the same methods described earlier for estimating baseline criteria pollutant emissions from the quarry. Since the solar power system was installed after the publication of the Notice of Preparation for the project, to be conservative the GHG emissions from use of utility-based power (PG&E) are included as part of the quarry's baseline GHG emissions. The current GHG emissions are summarized in Table 4.6-6.

Table 4.6-6
Summary of Mark West Quarry Baseline Greenhouse Gas Emissions[a]

Emission Source	Greenhouse Gas Emissions (MT CO2e/year)			
	CO_2	**N_2O**	**CH_4**	**Total**
Off-Road Equipment Exhaust	502.6	4.1	0.7	507.4
On-Site Truck Use	25.9	0.0	0.0	25.9
On-Road Truck Exhaust	1,127.2	0.9	0.1	1,128.2
Employee Vehicles	36.6	0.7	0.1	37.4
Electricity Use	0	0	0	0
Total	**1,692.3**	**6**	**1**	**1,699.3**

[a] Emissions are for baseline production rate of 305,000 cubic yards per year.

[37] PG&E Currents, May 11, 2011. http://www.pgecurrents.com/tag/solar-power/page/7/

6. Sensitive Receptors

Sensitive receptors are locations where an identifiable subset of the general population (children, asthmatics, the elderly, and the acutely or chronically ill) that is at greater risk than the general population to the effects of air pollutants are likely to be exposed. These locations include residential areas, schools, retirement homes, convalescent homes, hospitals, and medical clinics.

Most of the area around the quarry is undeveloped, though there is scattered rural residential development south of Porter Creek Road, east and west of Calistoga Road, and along Calistoga/Petrified Forest Road. North of the site there are residences and lodging businesses on Mountain Home Road. There is one residence owned by the quarry that is in the southwest corner of the property along Porter Creek Road. In addition, there are two off-site residences that are about 300 feet from the western property line of the quarry. One residence is about 850 feet north of Porter Creek Road and the other about 1,400 feet north of the road.

7. Asbestos and Crystalline Silica

A total of 19 individual samples were collected from the active quarry highwall (highwall refers to the active mining face of the quarry where there is a relatively steep wall where material from which rock is being extracted), the project expansion area, and other adjacent, accessible areas within the site. One aggregate sample was also collected of the filter cake material[38]. The method of sampling used was "targeted sampling." Targeted sampling is the preferred method when geologic exposures allow this approach. This sampling method was used to collect a wide a variety of rock materials present in case any asbestiform mineral present favored a particular material over another. The same approach was used for free silica sampling. All samples were carefully bagged, labeled, and sealed. They were later combined into nine primary composite samples based on type and field proximity; again carefully bagged, labeled, sealed and transported to Asbestos TEM Laboratories for testing.

The presence/absence of asbestiform minerals and free-silica were tested on the greenstone and on ash falls/ash flows (Sonoma Volcanics) of the project. The geologic origin (petrology) of the quarry greenstone does not strongly suggest the presence of asbestiform minerals, but it does not rule it out, as some rock units of the Franciscan Complex are known to contain them. The Sonoma Volcanics at the quarry have not been tested specifically by the project applicant, but their petrology (Vennum, 2003) indicates the presence of some silica mineral in the samples. The petrology of the Sonoma Volcanic ash falls/flows strongly suggests the absence of asbestiform minerals, but testing was done to confirm absence.

Testing was conducted by Asbestos TEM Laboratories, Berkeley, California. Asbestos TEM is a Certified (CDPH ELAP: Lab ID# 1866) and Accredited (NVLAP: Lab Code 101891-0) laboratory. The analytical procedures were performed according to:

[38] Filter cake or filter press material is a putty-like material left over from washed aggregate production (wash plant) and consists of silt to clay-sized rock residue from which the excess water has been mechanically pressed for recycling before the material is stockpiled for later mine reclamation.

1. NIOSH 7500 X-Ray Diffraction (XRD) Method for Crystalline Silica
2. CARB 435 Polarized Light Microscopy (PLM) Method for Asbestos in Rock/Soil
3. EPA Test Method For the Determination of Asbestos in Bulk Building Materials by Transmission Electron Microscopy (TEM) modified for Soil/Rock Analysis (EPA/600/R-93/116).

The CARB 435 testing found no asbestiform minerals in any of the nine composite samples. This is the most commonly used and required test to detect the presence/absence of such minerals (California Environmental Protection Agency, 2002). While the CARB 435 method has much to commend it, there are a number of situations where it fails to provide sufficient accuracy to make a definitive determination of the presence/absence of asbestos and/or an accurate count of the asbestos concentration present in a given sample. Therefore, the more sensitive TEM analysis was then run on three secondary greenstone composites. One of these samples was found to contain 0.0035 weight percent asbestiform mineral (actinolite amphibole) fibers, with the remaining two samples having no detected asbestiform fibers.

Four of the nine samples analyzed for silica by the XRD procedure were found to contain crystalline silica present as quartz. Quartz was found in both the greenstone and volcanic ash/flows, but not in all of the greenstone samples. Levels identified ranged from 1.3 to 12 weight percent. These percentage levels would exceed the Occupational Safety & Health Administration (OSHA) Permissible Exposure Level (PEL) should the material become pulverized to a respirable size fraction and become airborne.

B. Potential Impacts and Mitigation Measures

1. Criteria for Determining Impact Significance

According to Appendix G of the CEQA Guidelines, a project would have a significant effect on air quality if it:

1. Conflicts with or obstructs implementation of the applicable air quality plan.

2. Violates any ambient air quality standard or contributes substantially to an existing or projected air quality violation.

3. Results in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

4. Exposes sensitive receptors to substantial pollutant concentrations.

5. Creates objectionable odors affecting a substantial number of people.

For Greenhouse Gas Emissions, a project would have a significant effect if it would:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases

The project would also have a significant effect on air quality if a project's direct and indirect criteria pollutant emissions exceed the significance criteria established by the BAAQMD, as shown on Table 4.6-7.

Table 4.6-7
BAAQMD Significant Impact Thresholds for Criteria Pollutants

Criteria Pollutant and Precursors	Average Daily Emissions (lb/day)	Maximum Annual Emissions (tons/year)
ROG	54	10
NOx	54	10
PM10[a]	82	15
PM2.5[a]	54	10
Construction Related Fugitive Dust (PM10/PM2.5)	Best Management Practices	
Local CO[b]	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)	

Notes: ppm = parts per million

[a] Only the exhaust portion of PM10 and PM2.5 are compared against the threshold.

[b] If a project would cause local emissions of CO to exceed the ambient concentrations thresholds, the proposed project would result in a significant impact to air quality.

In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable with respect to regional air quality. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary (BAAQMD, 2012a).

Proposed projects that have the potential to expose sensitive receptors to TACs that would result in health effects in excess of the following BAAQMD-recommended CEQA thresholds would have a significant impact.

1. An increase in cancer risk of greater than 10.0 cases in a million people

2. An increase in the exposure to TACs that would result in a non-cancer Hazard Index (Chronic or Acute) of greater than 1.0

3. An increase in ambient PM2.5 annual average concentration of greater than 0.3 μg/m3.

These health effects thresholds are typically evaluated based on the results of a health risk assessment utilizing dispersion modeling to assess TAC concentration increases from a project.

There is currently no County Greenhouse Reduction Plan for reduction of emissions that can be used in assessing project GHG impacts. However, the BAAQMD has recommended GHG significance thresholds. For projects other than stationary sources (such as this quarry) the GHG significance threshold is 1,100 metric tons per year of CO2e or 4.6 metric tons of CO2e per service population (residents and employees) per year. The threshold of 1,100 metric tons per year is used for this EIR.

2. Project Impacts

The focus of the air quality impact analysis is to evaluate whether there would be a substantial increase in criteria pollutant emissions from the proposed project, and if so, whether the increased emissions are likely to result in a significant air quality impact, and whether the proposed project would result in significant increases in adverse health effects at sensitive receptor locations in the project area. The pollutants of most concern for the proposed project are particulate matter (PM10 and PM2.5) in addition to carbon monoxide and ozone (including ozone precursor pollutants, ROG and NOx). For the purpose of this assessment, emissions of CO, NOx, ROG, PM10 and PM2.5 were assessed. The impacts from SO_2 emissions are anticipated to be minor because: (1) background concentrations are well below ambient air quality standards, and (2) due to the use of ultra low sulfur fuel for the project, SO_2 emissions are expected to be negligible.

Methodology

For this analysis, emissions from quarry operation were quantified for 1) the no project case using the baseline production rate of 305,000 cubic yards per year (457,500 tons per year) during 2013 (see Tables 4.6-4 and 4.6-5); and 2) for the proposed project case of operation of the quarry at a maximum production rate of 500,000 cubic yards per year (750,000 tons per year) during 2013. The increase in emissions from the proposed project over the no project case were calculated and then compared to the BAAQMD thresholds of significance. In addition to the above, potential increases in cancer risk and other non-cancer health effects associated with project TAC emissions were assessed. The following summarizes the methodologies used for estimating existing and projecting future emissions of air pollutants and evaluating their impacts.

Criteria Air Pollutants

The BAAQMD significance thresholds are used to judge the impacts of the proposed project. Total direct and indirect emissions for both the existing quarry and the proposed project are quantified and the net increases in emissions due to the proposed project are compared to these thresholds.

On-site emission sources at the quarry include stationary, mobile, and fugitive sources. The stationary sources at the quarry are associated with the processing of quarry material. Processing equipment includes a feeder, primary jaw crusher, vertical impact and cone crushers, vibrating screens, conveyors and stackers, a wash plant, and a portable screening plant. Emissions from these sources are minimized by use of water/foam spray systems on the crushers, screens, and at stacker conveyor discharge points to reduce any dust generated.

Other emission sources at the quarry include fugitive dust from quarry maintenance and excavation activities, blasting, and aggregate loading into haul trucks via loaders. On-site mobile equipment includes one bulldozer, five loaders, one excavator, one backhoe, one compactor, one man lift, one skidsteer loader, one rock drill rig, one portable screening plant, one off-road haul truck, and one water truck. For the project, an additional bulldozer may be added in 2014 or later. Dust control from these sources is achieved by watering work areas and roadways, and wetting surge and storage piles to maintain adequate moisture to minimize airborne particulates. The haul roads are also treated with a magnesium chloride based surfactant at least once per year. Additionally, a vacuum street sweeper is periodically used on the paved road areas. Indirect emission sources include employee vehicles and the haul trucks traveling to and from the quarry in the project region.

Emissions from the proposed project were calculated in the same manner as described earlier for the baseline quarry operation emissions (Section 4 in the Setting). Hours of equipment use and processing equipment feed rates for project operation at increased production rates were provided by the applicant (and peer reviewed by the EIR consultant) and used in the emission calculations. Exhaust emission rates for the on-site quarry mobile equipment were calculated with emission factors from the CARB OFFROAD model and exhaust emissions from the haul trucks, facility utility trucks, and employee vehicles were computed using the CARB EMFAC2011 model. Fugitive PM emissions were calculated using the same methods as described for the baseline emissions, but adjusted for increased quarry operation. Details of the emission calculations are provided in Appendix G.

Greenhouse Gas

For this EIR, GHG emissions are quantified for both the existing quarry and the proposed project, and the net increase in GHG emissions due to the proposed project are compared to the GHG significance threshold for projects other than stationary sources (i.e., 1,100 MT CO2e/year).

The primary sources of GHG emissions from existing and proposed quarry operations are due to combustion of fossil fuel (primarily diesel) in the onsite stationary equipment, off-road mobile equipment, other on-site vehicles, and vehicles accessing the quarry (haul trucks and employee vehicles). The primary GHG produced from the combustion of fuel is CO2, while other GHGs, methane and nitrous oxide, are produced, they typically contribute a negligible amount of GHG when compared to the CO2 emissions.

GHG emissions from operation of the existing quarry at the baseline production rate and for the project at the proposed production rate were calculated for conditions in 2013. Direct emission sources at the existing quarry include exhaust from stationary equipment, mobile off-road equipment and on-site vehicles. Indirect emission sources include vehicle exhaust emissions from trucks and employee vehicles while traveling on and off site. GHG emissions from these sources were calculated in a similar manner as for criteria pollutant emissions using emission factors from CARB's OFFROAD and EMFAC2011 emissions models. For the proposed project, emission sources at the quarry are the same as the existing quarry with the addition of a new bulldozer, but at increased annual production rates and equipment use, plus the use of some additional utility-generated (PG&E) electricity. GHG emissions from electricity use were calculated using the PG&E GHG emission factor[39] that takes into account the mix of energy sources used by PG&E to generate electricity. Details of the emission calculations are provided in Appendix G.

Toxic Air Contaminants

In assessing Toxic Air Contaminants (TACs), cancer risk from exposure to TACs is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are not assumed to have a threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk. Under various State and local regulations (including the BAAQMD), an incremental cancer risk greater than 10 in one million due to a project is considered to be a significant impact on public health.

Non-cancer health effects can be either acute (short term) or chronic (long term). In determining potential non-cancer health risks (chronic and acute) from air toxics, it is assumed there is a dose of the chemical of concern below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). Non-cancer health risks are measured in terms of a hazard index, which is the calculated exposure of each contaminant divided by its REL. For DPM and crystalline silica, OEHHA has only identified RELs for chronic non-cancer health effects. The REL for DPM is an annual average concentration of 5 $\mu g/m^3$ and for crystalline silica the REL is an annual average concentration of 3 $\mu g/m^3$. Hazard indices for pollutants affecting the same target organ are typically summed with the resulting totals expressed as a total hazard index for each organ system. A hazard index of less than 1.0 is considered to be a less than significant health risk. In evaluating non-cancer health effects, the BAAQMD uses a significance threshold 1.0 for the hazard index, with a hazard index of greater than 1.0 being considered as having a significant impact.

The project would increase emissions of DPM from on-site mobile equipment (e.g., loaders, bulldozer, and trucks) and from aggregate haul trucks traveling off site. DPM emissions represent the exhaust emissions of PM2.5 from on-road and off-road diesel fueled equipment and vehicles. Emissions of crystalline silica, associated with quarry fugitive particulate matter, would also increase due to increased mining and processing activities. Both DPM and crystalline silica have been identified by the State of California as being TACs. DPM is a carcinogenic TAC and both DPM and crystalline silica cause chronic non-cancer health effects. As such, potential health risks from DPM and crystalline silica emissions were evaluated.

Potential health risks to residents near the quarry from operation of the quarry and to residents living along the quarry haul truck routes were evaluated by conducting a human health risk assessment. The risk assessment involves identifying the TACs of concern and quantifying their emissions, estimating the exposure to TACs at sensitive receptors, and determining the health risks associated with exposure.

Air quality dispersion modeling was used to calculate TAC concentrations at sensitive receptor locations. The TAC concentrations are then used to calculate the expected

[39] *Greenhouse Gas Emission Factors Info Sheet*. PG&E, 4/8/2011.

TAC exposure to the sensitive receptors. For this evaluation, screening level dispersion modeling was used to calculate worst-case TAC concentrations. The SCREEN3 model was used to model DPM and crystalline silica emissions from area sources at the quarry and the CAL3QHC model was used to model DPM emissions from off-site quarry haul trucks. The procedures used in the modeling followed BAAQMD recommended risk modeling methods.[40] Typically, a screening modeling procedure can be used to evaluate worst-case potential impacts. If the screening procedure indicates the possibility of significant impacts, more refined modeling using representative hourly meteorological data, if available, can be conducted to obtain concentrations more representative of actual conditions. In this case, representative hourly meteorological data are not available for the project site, so screening modeling is the only method available for modeling TAC concentrations.

Both the SCREEN3 and CAL3QHC models use worst-case meteorological conditions to calculate maximum 1-hour average concentrations. However, to calculate DPM cancer risks and chronic hazard indices for DPM and crystalline silica longer term annual average concentrations are needed. In order to estimate the annual average DPM concentrations from the maximum 1-hour concentrations produced by the screening models, a multiplying factor representing the ratio between annual average and one-hour maximum concentrations of 0.1 was used (BAAQMD, 2012). The multiplying factor compensates for the effects of varying conditions of wind speed, wind direction, ambient temperature, atmospheric stability, and mixing height over longer averaging periods.

As previously discussed, there is one on-site residence in the southwest corner of the quarry property along Porter Creek Road and two off-site residences that are about 300 feet from the western property line of the quarry. Potential health risks from on-site quarry DPM and crystalline silica emissions were evaluated for these sensitive receptors. The SCREEN3 model was used to model these emissions. DPM emissions from off-road equipment (bulldozer, loader, and an excavator) were assumed to occur in this area for the entire life of the quarry. For crystalline silica, an area source encompassing the area where processing (crushing, screening, and load-out to storage piles) and handling (truck loading and other activities) of quarry material occurs was used.

The US EPA CAL3QHC roadway dispersion screening model was used to calculate DPM concentrations adjacent to the roadways used by the haul trucks traveling to and from the quarry. A 1,000 meter (3,280 feet) section of a two lane roadway, with truck travel in both directions, was used to represent the truck routes in the screening modeling to model truck impacts. Concentrations were calculated every 250 meters along the road segment at receptors placed 50 feet from the road. This distance, 50 feet, is typical of the distance of residences closest to the road along Mark West Springs Road. Worst-case meteorological conditions (D, E, and F stability with a wind speed of 1 meter per second) were used with the model to estimate maximum 1-hour DPM concentrations. Annual concentrations were calculated from the maximum 1-hour DPM concentrations using a conversion factor of 0.1. This screening modeling methodology is consistent with the roadway modeling screening procedures recommended by the BAAQMD for evaluating DPM impacts from diesel vehicles (BAAQMD 2012).

[40] BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012.

Potential increased cancer risks associated with exposure to DPM and chronic non-cancer health effects from exposure to DPM and crystalline silica were evaluated based on maximum annual average TAC concentrations at nearby sensitive receptors. The risk assessment was conducted in accordance with guidance established by BAAQMD (BAAQMD 2010 and 2012). Although the proposed project expects quarry operations to occur for 20 years, the cancer risks from the project were calculated assuming a 70-year exposure period, as recommended by the BAAQMD. This results in a conservative overestimate of potential cancer risks from the proposed project.

Less than Significant impacts Requiring No Further Analysis

All Significance Criteria. The project would not include the construction of new facilities beyond those types of mining activities that are currently occurring at the quarry or would be associated with normal operation of the quarry. The use of operational emissions to evaluate potential impacts represents a worst-case estimate. There would be no impact from construction of new facilities.

Criterion 5 (Odors). Quarries do not include processing of materials that cause odors. The BAAQMD has received no odor complaints about Mark West Quarry in the past five years. The project would, therefore have no impact as regards odors.

Criteria Pollutant Emissions

Impact 4.6-A The quarry project would generate emissions of criteria pollutant emissions (NOx, CO, ROG, PM10, and PM2.5) from on-site and off-site activities during operation of the quarry which could exceed applicable significance levels. This is a potentially significant impact.

The proposed project would result in increased emissions from operation of the expanded quarry. Emissions from the project would be comprised of direct and indirect emissions. Direct emissions from project related on-site activities would result from operation of the quarry processing equipment, off-road mobile equipment (exhaust and fugitive dust) at the quarry, and from blasting. Offsite emissions would also be produced by haul trucks and other vehicles while traveling to and from the project site.

The project would increase annual production from a baseline production level of 457,500 tons per year up to a maximum of 750,000 tons per year. As with current operations, the quarry production rates will vary from month to month and year to year, depending on demand. Aggregate crushing and processing operations would occur for about 6 hours per day at an average processing rate of about 523 tons per hour for about 250 days per year. However, the project includes the ability to conduct higher hourly production of material through the processing equipment during periods of peak demand. The project proposes to add an additional bulldozer and additional conveyors to be used to transport crushed aggregate from the primary crusher to secondary crushers as part of the project. Over time existing equipment will be replaced with newer equipment as needed and in order to comply with CARB off-road regulations. The project will add five additional employees. Quarry operations will generally remain the same except they will occur for more days per year.

Project-related criteria pollutant emissions were calculated for the proposed quarry expansion and for operation at the baseline production rate. Average daily emissions, in pounds per day, and maximum annual emissions, in tons per year, were used for this analysis, consistent with BAAQMD significance thresholds.

Tables 4.6-8 on the following page presents the daily and annual emissions rates for operating the project at the proposed increased production rate and for operating the quarry at the baseline production rate. The project's net increases in daily and annual emissions compared to operating at the baseline production level are also shown in the table and compared to the BAAQMD thresholds of significance. As shown in the table, the increased emissions from the proposed project are below the BAAQMD thresholds of significance. Thus, the emissions of criteria pollutants from proposed project would have a ***less-than-significant*** impact.

Carbon Monoxide

Impact 4.6-B The project could violate the ambient air quality standard for carbon monoxide. This is a less-than-significant impact.

The project would generate traffic that could affect local carbon monoxide levels. However, BAAQMD screening guidance indicates that projects would have a less than significant impact to carbon monoxide levels if project traffic projections indicate traffic levels would not increase at any affected intersection to more than 44,000 vehicles per hour. The busiest intersections affected by these trips would be the River Road-Mark West Springs Road intersection with the northbound and southbound ramps of U.S. 101. According to Caltrans, the peak-hour traffic volume for U.S. 101 at River Road is 6,900 vehicles per hour. The addition of project traffic peak-hour to any affected intersections would be considerably less than 44,000 vehicles per hour. Therefore, it can be concluded that the proposed project would not cause or contribute to a violation of an ambient air quality standard and the impact is considered ***less-than-significant.***

Table 4.6-8
Daily and Annual Emissions From Proposed Project and No Project in 2013

Proposed Quarry – 2013 Proposed Production Rate	Daily Emissions (lb/day)					Annual Emissions (tons/year)				
Emission Source	**NOx**	**CO**	**ROG**	**PM10**	**PM2.5**	**NOx**	**CO**	**ROG**	**PM10**	**PM2.5**
Off-Road Equipment Exhaust	47.5	14.6	3.6	1.6	1.5	6.2	1.9	0.5	0.2	0.2
On-Site Truck Use	2.5	0.8	0.3	0.1	0.1	0.3	0.1	0.0	0.0	0.0
Processing Equipment	-	-	-	37.2	8.7	-	-	-	4.6	0.8
Quarrying/Fugitive Dust	-	-	-	53.2	11.2	-	-	-	5.2	1.1
Blasting	17.0	67.0	-	1.3	0.1	2.2	8.7	-	0.2	0.0
On-Road Trucks	91.4	18.5	3.6	3.4	2.3	12.1	2.4	0.5	0.5	0.3
Employee Vehicles	0.6	5.6	0.2	0.2	0.1	0.1	0.7	0.0	0.0	0.0
Total	159.0	106.5	7.7	97.0	24.0	20.9	13.8	1.0	10.7	2.4
No Project – 2013 Baseline Production Rate	**Daily Emissions (lb/day)**					**Annual Emissions (tons/year)**				
Emission Source	**NOx**	**CO**	**ROG**	**PM10**	**PM2.5**	**NOx**	**CO**	**ROG**	**PM10**	**PM2.5**
Off-Road Equipment Exhaust	32.8	9.3	2.6	1.1	1.0	4.1	1.2	0.3	0.1	0.1
On-Site Truck Use	1.7	0. 5	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.0
Processing Equipment	-	-	-	22.4	5.2	-	-	-	2.7	0.4
Quarrying/Fugitive Dust	-	-	-	30.5	6.8	-	-	-	2.4	0.6
Blasting	17.0	67.0	-	1.3	0.1	2.2	8.7	-	0.2	0.0
On-Road Trucks	56.2	11.4	2.2	2.1	1.4	7.4	1.5	0.3	0.3	0.2
Employee Vehicles	0.4	3.8	0.2	0.2	0.0	0.1	0.5	0.0	0.0	0.0
Total	108.1	92.0	5.2	57.6	14.5	14.0	12.0	0.6	5.7	1.3
Change in Emissions	***50.9***	***14.5***	***2.5***	***39.4***	***9.5***	***6.9***	***1.8***	***0.4***	***5.0***	***1.1***
BAAQMD Threshold	**54**	**-**[a]	**54**	**82**	**54**	**10**	**-**[a]	**10**	**15**	**10**
Significant (Yes or No)?	***No***	***-***	***No***	***No***	***No***	***No***	***-***	***No***	***No***	***No***

[a] There are no emission based significance thresholds for CO, only concentration based thresholds for local CO emissions (impacts discussed below)

Health Impacts

Impact 4.6-C Emissions of diesel particulate matter and crystalline silica from the project could injure the health of workers and residents living in the area. This is a less-than-significant significant impact.

The project would emit toxic air contaminants (TACs) that can cause health impacts if generated in sufficient quantities over an extended period of time. A human health risk assessment was performed to assess potential impacts and public exposure associated with airborne emissions from the project. The risk assessment was conducted in accordance with guidance established by the BAAQMD (BAAQMD 2010 and 2012).

The proposed project would result in changes in the annual DPM concentrations in the project vicinity over time. This assessment was intended to provide a worst-case estimate of those changes through use of screening analyses that employ standard emission estimation methods and dispersion modeling methods. Screening level dispersion modeling was used to calculate DPM concentrations from on-site and off-site activities associated with the project. The screening analyses calculate corresponding DPM concentrations and associated cancer and non-cancer health risks.

DPM Modeling and Health Risks from On-site Quarry Operations

For evaluating DPM concentrations from on-site quarrying activities the U.S. EPA SCREEN3 dispersion model was used. This model, developed by the U.S. EPA to calculate worst-case 1-hour concentrations from a variety of emission source types, was used to calculate downwind concentrations from a 5.5 acre area of the quarry near the boundary of the mine expansion area closest to the nearby residences (the on-site residence and the two residences that are about 300 feet from the quarry's western property line) where off-road equipment (bulldozer, loader, and an excavator) were assumed to be operating for the life of the quarry. DPM emissions for 2013 from the facility's off-road equipment were used for this analysis. Use of 2013 emissions results in a conservative estimate of potential health risks since DPM emissions from the off-road equipment used at the quarry will decrease over time as older equipment are replaced with new or rebuilt equipment. Based on the SCREEN3 modeling the maximum annual DPM concentrations at the nearby residences ranged from 0.017 to 0.018 $\mu g/m^3$.

Potential increases in cancer risk from the project were calculated based on the maximum annual DPM concentration and a 70-year exposure period. Since the actual period of exposure to quarry emissions would be less than 70 years, more on the order of 20 years, the cancer risks would be lower than those presented here. The maximum increased cancer risk for the nearby residents was estimated as 3.5 in a million. Thus, potential cancer risks to nearby residents from on-site operation would be less than the 10 in a million significance threshold.

For non-cancer health risks the chronic REL for DPM is 5 $\mu g/m^3$. Based on this REL and a maximum DPM concentration of 0.018 $\mu g/m^3$, the hazard index would be 0.04, which is well below 1, the significance threshold for non-cancer health effects. Details concerning the health risk assessment are contained in Appendix G.

DPM Modeling and Health Risks from Haul Trucks

In evaluating potential health risks to residents living along the truck routes used by project- related haul trucks, the US EPA CAL3QHC roadway screening dispersion model was used. Maximum annual DPM concentrations from the increased truck traffic associated with the project were used to evaluate potential health impacts.

For this analysis it was assumed that there would be an average of 104 additional truck trips per day for the project. In assessing impacts from these trucks on residents adjacent to the truck routes, all the quarry trucks were assumed to travel on a single route, thereby maximizing the potential number of trucks passing by affected residences. DPM emissions from these trucks for 2013 were used in the modeling. These two assumptions, that all trucks travel on a single route and use of 2013 DPM emission rates, result in a very conservative estimate of cancer risk (i.e., will overestimate risks) because not all trucks will travel the same route and since DPM emissions from trucks will decrease over time from the 2013 level.

Potential increases in cancer risk from project-related haul truck traffic were calculated based on the maximum annual DPM concentration and assuming exposure to the maximum concentration over a 70-year period as recommended by the BAAQMD. As discussed above, use of a 70-year exposure period overestimates actual cancer risks since quarry operations are expected to be only 20 years. The maximum increased cancer risk for residents along the truck routes was estimated as 2.3 in a million. Thus, potential health risks to residents from off-site truck travel would be less than the 10 in a million significance threshold. Additionally, the non-cancer chronic DPM hazard index would be 0.02, well below the significance threshold for non-cancer health effects of 1.0. Details concerning the health risk assessment are contained in Appendix G.

As a worst-case condition, the residence that is located on the quarry site was evaluated for health risks from exposure to both on-site and off-site DPM emissions since this residence is about 70 feet from Mark West Springs Road. The combined cancer risk from on-site and off-site emissions would be less than 5.5 per million, with the chronic hazard index below 1.0. To conclude, additional haul truck traffic would not cause a significant impact from DPM emissions.

Crystalline Silica Non-Cancer Health Effects

Fugitive dust emissions from quarry operations may contain crystalline silica due to quartz present in the base rock materials at the quarry. Based on sampling and analysis of quarry rock material, the amount of crystalline silica present as quartz ranged from 1.3 to 12 percent by weight (refer to Section 4.1 in the Setting for additional details on the sampling and analysis). Crystalline silica has been identified by the OEHHA as a TAC with chronic non-cancer health effects that affect the respiratory system. The chronic inhalation REL for crystalline silica is 3.0 $\mu g/m^3$. Potential off-site concentrations of crystalline silica at the residences near the quarry were estimated using screening modeling with the SCREEN3 model to model PM10 emissions from quarry operations and conservatively assuming that 12 percent of the PM10 was crystalline silica. The maximum annual average concentration of crystalline silica concentrations at the nearby residences was estimated to be 0.6 $\mu g/m^3$. This concentration is less than the REL and would result in a chronic non-cancer hazard index of 0.20, which is less than the significance threshold for non-cancer health effects. When this hazard index is added to the other hazard indices, the total hazard index is 0.024, which is still well below the significance threshold of 1.0.

Based on the above evaluations of cancer and non-cancer health risks from exposure to on-site and off-site project related DPM emissions and crystalline silica, potential health risk impacts from project operation would be ***less-than-significant***.

Asbestos

Impact 4.6-D Naturally Occurring Asbestos could be present at the project site, and mining activities would expose persons to levels of asbestos which would have adverse health effects. This a less-than-significant impact.

As described in Section 4.1 in the Setting, samples of quarry rock and other materials from the active mining face at the Mark West Quarry were collected and analyzed for the presence of asbestiform materials. Testing was conducted using a bulk sampling method (CARB Method 435) and by Transmission Electron Microscopy (TEM). Results of the bulk sampling method found no asbestos (less than 0.25% by weight, non-detect). A more detailed TEM analysis identified one sample out of 19 tested to contain 0.0035% by weight actinolite amphibol asbestos, which is far below the significance threshold. Thus, asbestos may be present at the quarry site, though concentrations of asbestos at this level would not be of concern. In the Asbestos ATCM, CARB defines asbestos-containing material as any material that has an asbestos content of 0.25% or greater. Additionally, the ATCM identifies that material that contains less than 0.25% asbestos as determined using an approved asbestos bulk sampling test method is an appropriate material to be used as a material that can be used to cover naturally occurring asbestos stabilized areas.

Since the level of asbestos in site material is well below an asbestos content of 0.25% by weight, this would be a ***less-than-significant impact***.

Greenhouse Gases and Global Climate Change

Impact 4.6-E The proposed project could result in greenhouse emissions, either directly or indirectly, that may have a significant impact on the environment. This is a potentially significant impact.

The proposed project would result in direct and indirect emissions of GHGs. Direct emissions of GHGs refer to GHGs that are emitted directly as a result of project operation and are primarily due to fuel combustion emissions at the site. Indirect emissions are those emissions that the project will enable, but that are not controlled by the project applicant. Examples of indirect emission sources include vehicles traveling to and from the project site, and from offsite generation of electricity used by the project.

Until May 2011, electricity used to power stationary equipment at the quarry was provided by PG&E. Currently, electricity is produced by an 809.34 kW (kilowatt) photovoltaic system. The system is designed to produce 1,026,096 kWh (kilowatt hours) annually. Electricity from the photovoltaic system currently provides all the electrical energy requirements for the current quarry. At the increased production rate proposed for the project some additional electricity from the utility grid will be required to power the quarry equipment and other electrical needs. The project applicant has estimated that 650,000 kWh from the electrical grid (PG&E) will be needed annually at the proposed production rate increase.

The largest source of GHG emissions from quarry operation is from fuel combustion by heavy equipment and vehicles (both on-site and off-site). The primary GHG produced from the combustion of fuel is $CO2$, while other GHGs, such as methane and nitrous oxide, are produced, they typically contribute a negligible amount of GHG when compared to the $CO2$ emissions.

GHG emissions from operation of the existing quarry at the baseline production rate and for the project at the proposed production rate were calculated for conditions in 2013. Direct emission sources at the existing quarry include exhaust from mobile off-road equipment and on-site vehicles. Indirect emission sources include vehicle exhaust emissions from trucks and employee vehicles while traveling on and off site. For the proposed project, emission sources at the quarry are the same as the existing quarry with the addition of a new bulldozer, but at increased annual production rates and equipment use, plus the use of some additional utility-generated (PG&E) electricity. GHG emissions from electricity use were calculated using the PG&E GHG emission factor[41] that takes into account the mix of energy sources used by PG&E to generate electricity.

Table 4.6-9 provides the GHG emissions from the proposed project and from continued operation of the quarry in 2013 without the proposed production rate increase and also shows the net GHG emission increase in emissions, along with the BAAQMD GHG significance threshold. The project at maximum production would increase GHG emissions by as much as 1,243 metric tons of CO2e per year based on 2013 GHG emission rates.

The net increase in GHG emissions from the project would exceed the BAAQMD significance threshold of 1,100 MT CO2e/year by 143 MT CO2e/year, and therefore the project's increase in GHG emissions would be a ***potentially significant impact.***

Mitigation Measures

CARB's Low Carbon Fuel Standards (LCFS) are designed to reduce CO2 emissions by 10% by 2020, with the reductions increasing incrementally from 0% in 2010 to 10% in 2020. By 2015, CO2 emissions from haul vehicles and off-road quarry equipment would decrease by 43 MT CO2e/year, and by 2020 the CO2 emissions would be 255 MT CO2e/year less than in 2013. Accordingly, project-generated emissions would be below the GHG significance threshold by 2020. However, this future prediction may not be accurate plus conditions may change so that additional GHG emission reductions would be needed by 2020. Accordingly, the following mitigation is recommended to address the impact.

[41] *Greenhouse Gas Emission Factors Info Sheet*. PG&E, 4/8/2011.

Table 4.6-9
Summary of Proposed Project and Existing Quarry Greenhouse Gas Emissions

Emission Source	Greenhouse Gas Emissions (MT CO2e/year)			
	CO_2	N_2O	CH_4	Total
Proposed Quarry 2013 Proposed Production Rate				
Off-Road Equipment Exhaust	862.6	7.9	1.4	871.9
On-Site Truck Use	39.4	0	0	39.4
On-Road Truck Exhaust	1,847.9	1.5	0.1	1,849.5
Employee Vehicles	53.2	1.0	0.1	54.3
Electricity Use[b]	127.4	-	-	127.4
Total				**2,942**
No Project 2013 Baseline Production Rate				
Off-Road Equipment Exhaust	502.6	4.1	0.7	507.4
On-Site Truck Use	25.9	0	0	25.9
On-Road Truck Exhaust	1127.2	0.9	0.1	1,128.2
Employee Vehicles	36.6	0.7	0.1	37.4
Electricity Use	0	-	-	0
Total				**1,699**
Proposed Project Net Increase				**1,243**
BAAQMD Threshold		**-**		**1,100**
Significant (Yes or No)?				**Yes**

1 There would be no need for PG&E electricity in 2013 under continuation of baseline production because the existing photovoltaic system can provide all the electricity needed for this existing production rate.
2 GHGs from electricity calculated using PG&E emission factor of 0.17740.196 MT CO2e/MWh for 2013

4.6-E.1 The applicant shall offset all remaining GHG emissions above the threshold of 1,100 MT CO2e/year. Any offset of project emissions shall be demonstrated to be real, permanent, verifiable, enforceable, and additional as determined by PRMD at its sole discretion. To the maximum extent feasible, as determined by PRMD, offsets shall be implemented locally. Offsets may include but are not limited to the following (in order of preference):

1. Applicant funding of local projects, subject to review and approval by PRMD, that will result in real, permanent, verifiable, and enforceable, and additional reduction in GHG emissions. If the BAAQMD or Sonoma County develops a GHG mitigation fund, the applicant may instead pay into this fund to offset GHG emissions in excess of the significance threshold.

2. Purchase of carbon credits to offset emissions below the significance threshold. Only State Air Resource Board carbon offset credits, credits verified and registered with the Climate Action reserve, or available through a County-approved local GHG mitigation bank or fund may be used to offset project emissions.,

Impact Significance After Mitigation

The recommended mitigation measure would reduce project emissions below the significance threshold, and the impart would be reduced to a ***less-than-significant*** level.

It is also noted that the conclusion of this impact analysis is very conservative in that it did not include electricity generated by the photovoltaic system as part of the baseline emissions inventory for the quarry. If it had been included, the increase in GHG emissions would not have exceeded the significance threshold (i.e., the emissions increase would have been 1,047 MT CO2e/year).

Currently neither Sonoma County nor the BAAQMD have adopted a Greenhouse Gas Reduction Plan or Strategy that would apply to the project. On the State level the applicable plan, policy, or regulation would be the California Global Warming Solutions Act of 2006 (AB 32). As discussed earlier, AB 32 requires that greenhouse gases in California be reduced to 1990 levels by the year 2020. Also as discussed earlier, the County's Community Climate Action Plan's target is to reduce 2015 emissions 25 percent below 1990 emission levels. The mitigated project will increase GHG emissions by at the most 1,099 metric tons per year. By providing a local source for high quality aggregate (suitable for asphalt and concrete production), the project would be expected to reduce the emissions from transporting aggregate from more distant, including other in-county and out-of-country sources.

This reduction in mileage traveled by haul trucks and other vehicles could result in an overall net reduction in GHG emissions in the county from transportation sources. Reduction of GHGs from the transportation sector is one of the goals of AB 32 and other GHG plans and policies. With mitigation, it is concluded that the project would be consistent with the goals and objectives of AB 32 and the County's Community Climate Action Plan.

4.7 VISUAL RESOURCES

This section discusses the existing visual character of the project site and analyzes the potential for the proposed project to affect existing site character and views. Information for the discussion and subsequent analysis is drawn from site visits and project plans. This section also describes the visual context of the project site and identifies policies from the Sonoma County General Plan that are relevant to protection of aesthetic landscape resources and to visual impact assessment pursuant to CEQA.

A. Setting

1. Site Location

Mark West Quarry is located at 4611 Porter Creek Road in Sonoma County near its boundary with Napa County (see Figures 3-1 and 3-2). The portion of Porter Creek Road in the project vicinity is a County-designated Scenic Corridor. The landscape immediately surrounding the project site contains steep slopes with a mix of chaparral, grassland, and mixed evergreen forest. Most of the land in the area is undeveloped, though there is scattered rural residential development south of Porter Creek Road, east and west of Calistoga Road, and along Calistoga/Petrified Forest Road. North of the site are residences and lodging businesses on Mountain Home Ranch Road.

2. Landform

The principal site landform is a long, prominent, geologically uplifted ridge that trends east-west through the project site and beyond. At the bottom of the south side of the ridge is Porter Creek Road with Porter Creek just south of the road. North of the ridge is Franz Creek and further north Mountain Home Ranch Road. Elevations within the project site range from 900 to 1,400 feet.

3. Vegetation

The quarry expansion site is largely undeveloped and is characterized by vegetated steep hillsides. The vegetation of the project site consists mainly of mixed evergreen forest, with small patches of California annual grassland and three types of chaparral. In visual terms, the existing vegetation constitutes a pattern of broad expanses of woodlands with intermixed stands of shrubs and grasses. The stands of evergreen trees and shrubs remain a relatively constant green in color throughout the year, while the grass turns brown during the dry season.

4. On-Site Land Uses

Existing development on the project site is concentrated on the quarry floor, which is located on an excavated bench approximately 60 feet in elevation above Porter Creek Road. To the east and north of the quarry floor are previously mined areas that are being reclaimed. Solar panels have been installed on some of the reclaimed slopes. West of the quarry floor is the active quarry mining face. The only portion of the quarry visible from Porter Creek Road is the driveway that leads to the quarry and some of the solar array installed in 2011. The active quarry is not visible from Mountain Home

Ranch Road, though some of the area where overburden was previously stored can be seen from some vantage points along that road.

5. Project Vicinity

The area around the quarry is relatively undeveloped and is characterized by woodlands and chaparral with dispersed residential uses. Nearby properties are generally comparable in size to the project site, and typically consist of single-family residences with three lodging enterprises and some vineyards along Mountain Home Ranch to the north. The nearest residence that is not part of the project site is about 500 feet distant.

6. Viewpoints of Project Site

The project site is visible from two public vantage points (roadways) and from private property. Depending on the vantage point and distance from project site, the views from public roadways and private property are primarily of the upper portions of the site, though at least four residences have distant views of the active mining face. Roadways providing visibility of the site include Porter Creek Road and Mountain Home Ranch Road. Porter Creek Road is identified in the General Plan as a Scenic Corridor; this designation is discussed further under the subsequent Regulatory Setting. Figure 4.7-1 shows the locations where photographs of the site were taken. The existing views of the project are described below (see Figures 4.7-2, 4.7-5, and 4.7-7).

Short-Range Views

The project site is visible from certain short-range vantage points on private property, but not from any residences or from Porter Creek Road. From, The expansion parcel and the existing quarry site start at the north edge of the Porter Creek Road right-of-way and extend up steeply to the north. The steep slope immediately adjacent to the road generally limits views of upper portion of the site (see Figures 4.7-2 and 4.7-5). These short-range views are dominated by on-site vegetation, primarily chaparral, trees, and grassland. There is one 200-foot section of the eastbound roadway where one can look up and to the northeast and see some of the solar panels on the existing quarry site.

Long-Range Views

Long-range views from which include the project site as a distinct feature are visible from locations along Mountain Home Ranch Road. The existing quarry operations are not visible from this road as they are south of the ridgeline. A small portion of the area where overburden was formerly stored is visible as a relatively unforested portion of the ridgeline. Views to the south from this road are of a forested ridge with no development visible (see Figure 4.7-7).

Long-range views of the project site are also possible from parts of at least 4 distant private residences. Two are on the top of the ridge to the south of the site and Porter Creek Road (approximately 1,000 and 1,750 feet from the nearest part of the proposed expansion area) and two are on the ridge to the east of Calistoga Road (approximately 4,000 and 5,000 feet from the site).

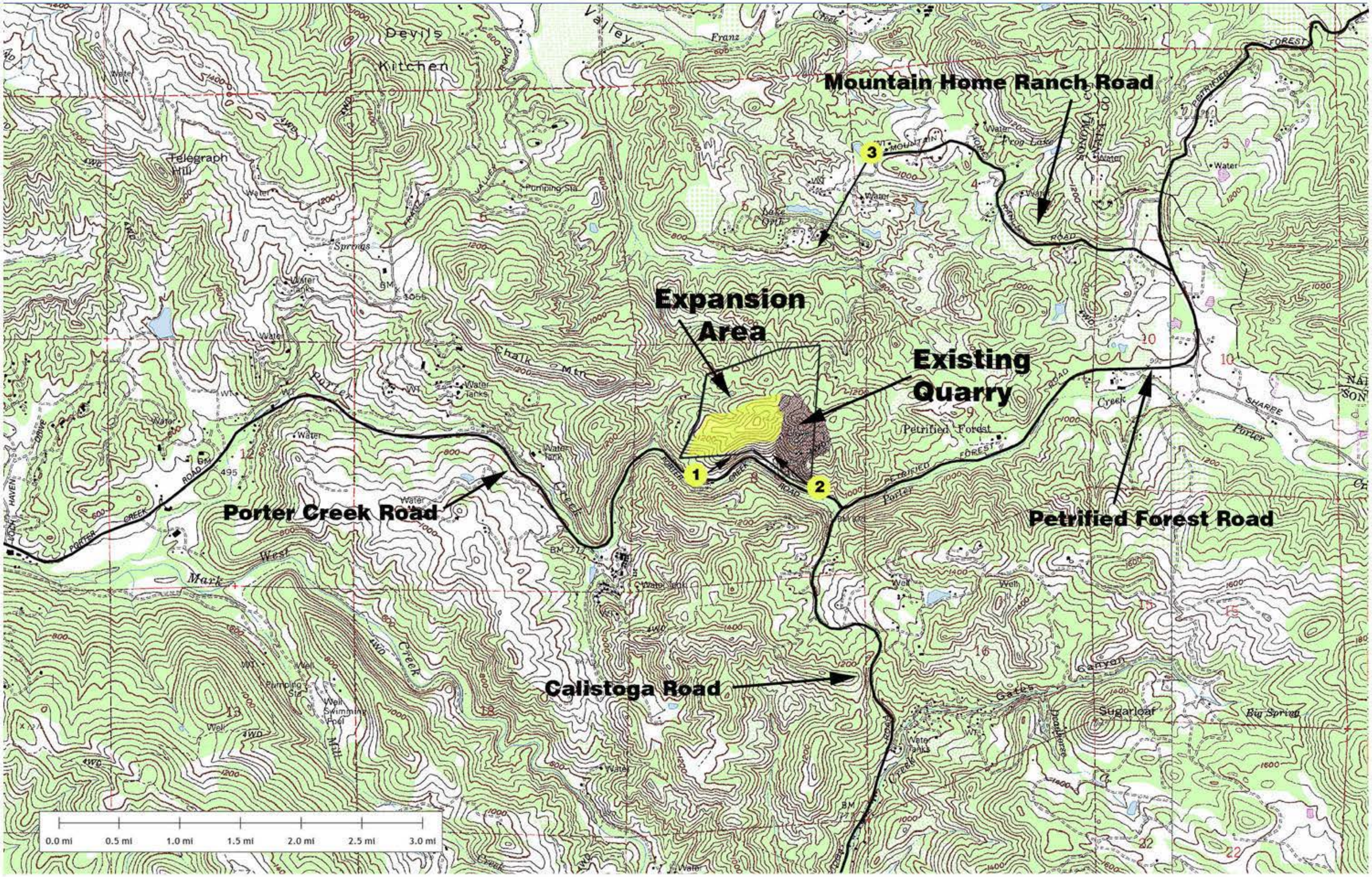


Figure 4.7-1 Viewshed Map - ○ Numbered Locations Identify Photo Locations

Source: ***Visual Impact Analysis LLC***

7. *Existing Visual Sensitivity Determination*

For purposes of this study, the visual sensitivity of the project site is based on the following definitions provided as part of the County Permit and Resource Management Department's Visual Assessment Guidelines:

Table 4.7-1
Definitions of Visual Sensitivity

Low	The site is within an urban land use designation and has no land use or zoning designations protecting scenic resources. The project vicinity is characterized by urban development or the site is surrounded by urban zoning designations and has no historic character and is not a gateway to a community. The project site terrain has slopes less than 20 percent and is not on a prominent ridgeline and has no significant natural vegetation of aesthetic value to the surrounding community.
Moderate	The site or portion thereof is within a rural land use designation or an urban designation that does not meet the criteria above for low sensitivity, but the site has no land use or zoning designations protecting scenic resources. The project vicinity is characterized by rural or urban development but may include historic resources or be considered a gateway to a community. This category includes building or construction sites with visible slopes less than 30 percent or where there is significant natural features of aesthetic value that is visible from public roads or public use areas (i.e. parks, trails etc.).
High	The site or any portion thereof is within a land use or zoning designation protecting scenic or natural resources, such as General Plan designated scenic landscape units, community separators, or scenic corridors. The site vicinity is generally characterized by the natural setting and forms a scenic backdrop for the community or scenic corridor. This category includes building and construction areas within the SR designation located on prominent hilltops, visible slopes less than 40 percent or where there are significant natural features of aesthetic value that are visible from public roads or public use areas (i.e. parks, trails etc.). This category also includes building or construction sites on prominent ridgelines that may not be designated as scenic resources but are visible from a designated scenic corridor.
Maximum	The site or any portion thereof is within a land use or zoning designation protecting scenic resources, such as General Plan designated scenic landscape units, community separators, or scenic corridors. The site vicinity is generally characterized by the natural setting and forms a scenic backdrop for a designated scenic corridor. This category includes building or construction sites within the scenic resource designation on or near prominent ridgelines, visible slopes greater than 40 percent or where there are significant natural features of aesthetic value that are visible from a designated scenic corridor.

The expansion site would be considered to have high visual sensitivity overall mainly due to the Scenic Corridor designation along Porter Creek Road. The project vicinity is rural and characterized by rolling hills covered predominantly by mixed evergreen forest, chaparral, and grasslands. Single-family residences are dispersed among the hills. However the four residences that have a view of the expansion site already have distant views of the existing mining on the site, the bare mining face, and other quarry-related changes to topography and vegetation.

The expansion site is primarily undeveloped, which is consistent with nearby properties in terms of visual characteristics, but the existing quarry would not be considered consistent with views of and from nearby properties. The project site is visible from two public roadways, including one County-designated scenic corridor. However the expansion project would not intrude into the scenic corridor setback (defined as 30 percent of the depth of the lot to a maximum of 200 feet from the centerline of the roadway; see the discussion of the Zoning Code Regulations below). The site itself does not constitute a significant scenic or natural resource nor does it contain individual landscape or architectural features with significant aesthetic value.

8. Regulatory Environment

Sonoma County General Plan

The project site is located in unincorporated Sonoma County and is subject to the policies set forth in the Sonoma County General Plan 2020 (GP 2020) and regulations in the Sonoma County Zoning Regulations (the Zoning Regulations), which are included in Chapter 26 of the Sonoma County Code. The Zoning Regulations complement the General Plan.

The Open Space and Resource Conservation Element (OSRC) of GP 2020 designates certain lands within the county as Scenic Landscape Units, Community Separators, and Scenic Corridors. This information can be found in the Open Space and Resource Conservation Element and shown on Figure OSRC-5e: Open Space Map, Santa Rosa, and Environs of the General Plan. Policies regulating development along Scenic Corridors are located in Section 2.3 of GP 2020. This section focuses on Goal OSRC-3 of the OSRC, which is to “identify and preserve roadside landscapes that have a high visual quality as they contribute to the living environment of local residents and to the County’s tourism economy.” Sonoma County has adopted the following two objectives, located in the OSRC, to meet this goal:

- ***Objective OSRC-3.1***: Designate the Scenic Corridors on Figures OSRC-5a through OSRC-5i along roadways that cross highly scenic areas, provide visual links to major recreation areas, give access to historic areas, or serve as scenic entranceways to cities.
- ***Objective OSRC-3.2***: Provide guidelines so future land uses, development, and roadway construction are compatible with the preservation of scenic values along designated Scenic Corridors.

To achieve these objectives, Sonoma County has adopted a number of policies regulating development along Scenic Corridors. The following policies would apply to the project area:

- ***Policy OSRC-3b*****:** Apply the Scenic Resources Combining District to those portions of the properties within Scenic Corridor setbacks.
- ***Policy OSRC-3c*****:** Establish a rural Scenic Corridor setback of 30 percent of the depth of the lot to a maximum of 200 feet from the centerline of the road unless a different setback is provided in the Land Use Policies for the Planning Areas.

The OSRC also sets forth policies intended to preserve the natural and scenic resources which contribute to the general welfare and quality of life for the residents of the county and to the maintenance of its tourism industry. The OSRC includes policies and objectives addressing outdoor lighting. Goal OSRC-4 of the OSRC was adopted to preserve and maintain views of the night skies and the visual character of urban, rural, and natural areas, while allowing for nighttime lighting levels appropriate to a given use and location. Sonoma County has adopted the following objectives to meet this goal:

- ***Objective OSRC-4.1*:** Maintain night time lighting level at the minimum necessary to provide for security and safety of the use and users to preserve night time skies and the night time character of urban, rural, and natural areas.
- ***Objective OSRC-4.2*:** Ensure that night time lighting levels for new development are designed to minimize light spillage offsite or upward into the sky.

To achieve these objectives, Sonoma County has adopted the following policies:

- ***Policy OSRC-4a*:** Require that all new development projects, County projects, and signage utilize light fixtures that shield the light source so that light is cast downward and that are no more than the minimum height and power necessary to adequately light the proposed use.
- ***Policy OSRC-4b*:** Prohibit continuous all night exterior lighting in rural areas, unless it is demonstrated to the decision making body that such lighting is necessary for security or operational purposes or that it is necessary for agricultural production or processing on a seasonal basis. Where lighting is necessary for the above purposes, minimize glare onto adjacent properties and into the night sky.
- ***Policy OSRC-4c:*** Discourage light levels that are in excess of industry and State standards (Sonoma County 2008).

Sonoma County Zoning Regulations

The County's Zoning Regulations contain regulations on development adjacent to Scenic Corridors, which includes Porter Creek Road as it passes the project site. Section 26-64-030, Scenic Corridors, establishes the following provisions to development of properties adjacent to designated Scenic Corridors:

(a) All structures located within scenic corridors established outside of the urban service area boundaries shown on Figures LU-5a through LU-5i, inclusive, of the general plan land use element shall be subject to the setbacks of thirty percent (30%) of the depth of the lot to a maximum of two hundred feet (200′) from the centerline of the road. Development within the setback shall be prohibited with the following exceptions, where such uses are allowed by the base district with which this district is combined:

(1) New barns and similar agricultural support structures which are added to existing farm complexes provided that such structures proposed within a State scenic highway or where local design review exists by community choice in an adopted specific or area plan are subject to design review.;

(2) New barns and similar agricultural support structures which do not require a use permit in this chapter; provided, however, that such structures proposed within a State Scenic Highway or where local design review exists by community choice in an adopted specific or area plan are subject to design review.;

3) Maintenance, restoration, reconstruction or minor expansion of existing structures.;

(4) Certain telecommunication facilities as provided in Section 26-64-040.

(5) Other new structures provided they are subject to design review, and:

(i) They are associated with existing structures,
(ii) There is no other reasonable location for the structure,
(iii) The location within the setback is necessary for the use, or
(iv) Existing vegetation and topography screen the use.;

(6) Compliance with the setback would render the parcel unbuildable.

Sonoma County Surface Mining and Reclamation Ordinance

The Sonoma County Surface Mining and Reclamation Ordinance (SMARO, Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to visual effects of the proposed project:

Sec. 26A-09-010. General Standards for Mining Permit and Operations

l) *Sight Regulations.* Provisions shall be made where practical for buffering, berming, and visual screening between the operation and an adjacent public street right-of-way, public uses such as schools, parks, golf courses, and other such public uses determined to be visually sensitive by the County. Special provisions for screening may be required for operations in designated scenic areas or within three hundred (300) feet of a designated scenic corridor. The height and type of such screening shall be set by the permit.

q) Night lighting shall be located and designed to minimize off-site glare.

Sec. 26A-09-040. Quarry Mining Standards

b) *Visibility*. To the extent feasible, quarry sites shall be screened visually from public roads and uses with topographic features, berms, shrubs and trees native to the area.

Sec. 26A-11-040. Reclamation of Quarries

c) *Revegetation*. Quarry sites shall be reclaimed and revegetated with planting grass mixtures approved by the Soil Conservation Service and with shrubs and trees native to the area. Mining activities shall be planned so that reclamation is an ongoing activity, thus shortening the duration of habitat loss. Slopes and benches shall be regraded and have soil added as necessary to the surface to restore pre-existing conditions as much as possible.

California Scenic Highway Program and Scenic Corridor Protection Program

In 1963, the California Legislature established the State's Scenic Highway Program, intended to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. There are no officially designated or eligible State scenic highways in the project vicinity, or which have views of the project site.

B. Potential Impacts and Mitigations

1. Criteria Used For Determining Impact Significance

According to the CEQA Guidelines, the project would have a significant visual and aesthetic impact if it:

1. Has a substantial adverse effect on a scenic vista.

2. Substantially damages scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway.

3. Substantially degrades the existing visual character or quality of the site and its surroundings.

4. Creates a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Sonoma County has developed Visual Assessment Guidelines to be used to assess impacts per Criteria 1 and 3. These Guidelines are described under the Approach and Methodology section below.

Approach and Methodology

The methodology used to assess the visual and aesthetic impacts of the proposed project is based on the Visual Assessment Guidelines issued by the Sonoma County Permit and Resource Management Department (PRMD). This methodology addresses the types and scales of proposed projects normally evaluated in environmental documents prepared for the County pursuant to CEQA. The methodology provides an objective basis for determining the significance of visual and aesthetic impacts under CEQA.

The primary tasks in assessing the project's visual and aesthetic impacts consist of viewing the site from relevant locations in the vicinity of the project site, selecting representative viewpoints for consideration in the EIR, describing the site from those locations, determining the sensitivity level of the site, studying photo-simulations that illustrate the post-project appearance of the proposed site to help assess the project's visual dominance within its setting, and determining the significance of impact. These tasks are summarized below.

Determine Viewpoints for Study

Field visits were made to develop an inventory of existing visual conditions, determine the visual exposure of the project site from surrounding public areas, and make direct observations from viewpoints selected for use in illustrating the proposed project in photographic simulations. Field inventories of public roads and private roads that were not signed No Trespassing showed that the site was visible from sections of only two public roads. Candidate viewpoints were reviewed with County staff to select the set of viewpoints to be used for the impact analysis and photo-simulations. Three viewpoints were selected including two on Porter Creek Road and one on Mountain Home Ranch Road (see Figure 4.7-1 for the location of the selected vantage points).

Prepare Photosimulations

Photosimulations were prepared to illustrate development of the proposed project. The photo-simulations depict the changes resulting from proposed mining expansion. The simulations also show proposed project features at the completion of mining and after seven years of reclamation following the termination of mining. The process used to develop the photo-simulations was reviewed by PRMD staff, which also reviewed the photo-simulations and approved them for use in this impact analysis.

Determine Sensitivity Level of the Site

Based on field data and characterizations of view toward the project site, the sensitivity level of the project site (low, moderate, high, or maximum) was determined using the criteria in the County's Visual Assessment Guidelines. Visual sensitivity depends on such things as land use and zoning designation, character of development in the project vicinity, terrain characteristics, and aesthetic value of existing vegetation. As described above in the Setting, the project site is characterized as having a high sensitivity.

Determine Visual Dominance

Using the County's Visual Assessment Guidelines, the visual dominance of the proposed project was determined, first by evaluating the form, line, color, and texture of project features within the visual context of its surroundings. Using this evaluation and the photo-simulations, the project's visual dominance was defined according to the criteria contained in the PRMD Visual Assessment Guidelines. As shown in Table 4.7-2, potential classifications include Dominant, Co-Dominant, Subordinate, or Not Evident depending on a variety of factors including how visible the project will be, how strongly project elements stand out, how different they appear to be from surrounding development in terms of character, mass, and scale, and how much public attention they are likely to attract.

Table 4.7-2
Definitions of Visual Dominance

Dominance	Characteristics
Dominant	Project elements are strong; they stand out against the setting and attract attention away from the surrounding landscape. Form, line, color, texture, and night lighting contrast with existing elements in the surrounding landscape.
Co-Dominant	Project elements are moderate, they can be prominent within the setting, but attract attention equally with other landscape features. Form, line, color, texture, and night lighting are compatible with their surroundings.
Subordinate	Project is minimally visible from public view. Element contrasts are weak; they can be seen but do not attract attention. Project generally repeats the form, line, color, texture, and night lighting of its surroundings.
Inevident	Project is generally not visible from public view because of intervening natural land forms or vegetation

Determine Significance of Visual Impacts

In accordance with the Visual Assessment Guidelines, the determination of visual impacts was made by correlating visual sensitivity with visual dominance. The project would have a significant visual impact if the visual dominance of the proposed project exceeds that which is considered acceptable for the sensitivity level of the project site as shown in Table 4.7-3 below. When the visual sensitivity of a site is classified as Maximum, any level of visual dominance greater than Not Evident yields significant visual impacts. Conversely, when the visual sensitivity of a site is determined to be Low, visual impacts of even visually Dominant projects are considered less than significant.

Table 4.7-3
Visual Impact Significance Matrix

	Visual Dominance			
Sensitivity	Dominant	Co-Dominant	Subordinate	Inevident
Maximum	Significant	Significant	Significant	Less than Significant
High	Significant	Significant	Less than Significant	Less than Significant
Moderate	Significant	Less than Significant	Less than Significant	Less than Significant
Low	Less than Significant	Less than Significant	Less than Significant	Less than Significant

2. Project Impacts

Less Than Significant Impacts Not Requiring Further Analysis

Certain issues identified in the significance criteria are not considered impacts of the proposed project and are discussed briefly below.

Criterion 2 (State Scenic Highway). The project site is not near a State scenic highway. Accordingly, it would not damage scenic resources near such highways.

Changes to Views

Impact 4.7-A The proposed quarry expansion would alter the visual character of the project site and adversely affect views of the site from both public and private vantage points. This would be a potentially significant impact.

Existing Views

As shown in Figure 4.7-2, a portion of the existing quarry is visible to eastbound drivers on Porter Creek Road. The vantage point used for this photograph is the first location where the quarry is visible to an eastbound driver. The quarry remains visible until the driver reaches the yellow right-turn sign, which is about 200 feet east of where the photograph was taken. Past this sign, the road turns to the right and the quarry is obscured by the slope adjacent to the north side of the road. Currently, from this vantage point one can see a portion of the reclaimed west-facing quarry slope including the solar panels that were installed in 2011. At the posed speed of 45 miles per hour, this view of the quarry (and the solar panels) is visible for about 3 seconds. The quarry expansion site is above the roadside bank to the left (north) of the vantage point and is not visible from this road.

Figure 4.7-5 is a view from Porter Creek Road looking west. This vantage point is the first spot where the expansion area is visible to a westbound driver. The quarry driveway intersects Porter Creek Road just where the road bends left in the photograph. The hillside above the road to the north (right) is part of the quarry expansion area. This expansion area is visible for about 200 feet (or about 3 seconds when traveling at 45 miles per hour) until the road bends left after passing the quarry driveway. Further west the view is blocked by the hillslope adjacent to the road.

The site is visible from some locations at two residences on top of the ridge to the south of Porter Creek Road that face the project site and two more distant residences to the southwest. All four of these residences have driveways off Calistoga Road. Views from these residences would include the existing active quarry faces as well as reclaimed areas. It is also possible that the site is visible from some other more distant residences, but due to the distance the site would not be visually distinctive.

Simulations were not prepared for views from these four residences. The County's Visual Assessment Guidelines address changes to views from public vantage points. That said, it is expected that the quarry expansion would be visible from some vantage points at these residences. However, residents of these homes already have views of the existing bared quarry slopes and mining activities. The expansion of these activities would occur at the same time that currently mined areas are reclaimed. Also, the views from these residences are from a considerable distance and comprise a small part of the panoramic views of wooded hillsides from these homes. The project would not introduce any new visual incongruities into the viewshed of these residences.

Project Visual Features

The previous ***Section 3.2, Project Description*** provides a detailed plan, profile, and cross sections of the project site and proposed quarry to illustrate the alterations in the site topography that would occur under the project. The project would result in both temporary and permanent visual changes at the site through the alteration of the landscape and progressive relocation of active mining operations. The project would strip existing vegetation and remove overburden in the footprint of the quarry expansion area to be mined each year, and leave large areas of exposed rock on the quarry face and floor while quarry mining is underway. In addition, for the first three years of operation, the project would add additional overburden to the Overburden Stockpile Area.

The project would include the installation of rock fall barriers along slopes above Porter Creek Road west of the existing quarry driveway. As shown in Figure 3-15, Barrier A would be installed immediately north of the road and west of the quarry driveway. It would extend about 300 feet along the roadway. The barrier would be a cable-supported metal net structure about 10-feet high and supported on 6-inch diameter posts. The rock fall barrier designers (Holdrege & Kull, August 8, 2012) have stated that trails and possibly wider access benches or equipment pads may be constructed to provide access along the barrier construction route. No specifications as to the size or location of these access routes has been provided. Subsequent peer review of the proposed rock fall barrier system by the EIR team determined that it is feasible to install the barriers using hand-held equipment and that the system could be installed without constructing trails or roads along the route of the barriers. Accordingly, Mitigation Measure 4.1-B.5 was recommended previously to address slope stability concerns associated with installing the rock barriers. That mitigation includes a provision that the final rock fall barrier design shall not include new roads or trails to install the barriers. Given the lack of specifications about access roads/trail construction, the conclusion that it is feasible to install the barriers without constructing roads or trails, and that the requirements set forth in Mitigation Measure 4.1-B.5 that would eliminate these possible future roads or trails, it is concluded that the visual simulations of future views that include this required mitigation are accurate.

Ongoing reclamation would include the new planting for erosion control and the incremental planting and maintenance of mined slopes. As quarrying in an area is completed, reclamation would be conducted using fill, overburden and topsoil. Revegetation would primarily consist of hydroseeding, trees and other vegetation. Buildings and other structures not associated with reclamation would be dismantled or demolished and removed from the site once quarrying is complete. The one exception is the photovoltaic system that is on a section of the site which has already been reclaimed; it would remain intact on the site.

Visual Simulations

The adverse changes in the existing visual character of the site would affect existing short- and long-range views from off-site public vantage points as well as private vantage points. Computer-generated visual simulations illustrating “before” and “after” visual conditions at the project site as seen from representative public viewpoints are presented as part of this analysis. Digitized photographs and computer modeling techniques were used to prepare the simulation images, based on the project plans provided by the project applicant. The intent of the simulations is to reflect the worst-case visual impacts on views; therefore the simulations illustrate those stages of the project where the impacts to that particular view would be the greatest.

Comparison of Existing and Proposed Views

Figure 4.7-2 shows the existing view from the selected eastbound Porter Creek Road vantage point. Figure 4.7-3 shows the future view at the termination of mining from this same vantage point. This simulation shows that the top of the hillslope on the north side of Porter Creek Road would be lowered as the result of the quarry expansion, revealing more sky and expanded views of the part of the existing quarry that has already been mined. The change in the topography of the site would make additional ridgeline and more of the trees on the already-reclaimed hillslope on the existing quarry site visible. More of the existing solar panel array would be seen. A rock fall barrier would also be visible though not particularly noticeable. The bare working quarry face of the expansion area would not be visible as it is behind (north of) the top of the remaining hillslope on the north side of the road, so active mining in the expansion area would not be visible from Porter Creek Road. Figure 4.7-4 shows the eastbound view after seven years of reclamation. The simulation assumes that Douglas fir would be planted and grow to 20 feet tall in seven years. Approximately 30 percent more of the solar panels would remain visible after seven years of reclamation.[42] As stated earlier, the view of these panels would be visible for about 3 seconds before a driver travels east to where the view is blocked by roadside topography. It also shows that the rock fall barriers have been removed at the reclamation stage.

Figure 4.7-5 shows the existing view from the selected vantage point on westbound Porter Creek Road. Figure 4.7-6 shows the future view from this same vantage point at the end of the proposed mining. Comparing the simulation to Figure 4.7-5 shows that the hillslope would be reduced, with more sky visible. Again, the active portion of the quarry is behind the slope and not visible from the westbound vantage point. The proposed rock fall barrier is visible on the slope. At the reclamation stage, the barrier would be removed.

Figure 4.7-8 shows the future view from Mountain Home Ranch Road; it demonstrates that the distant quarry expansion would not be visible to the naked eye. There would be a small reduction in the top of one of the skyline knolls, but it would not be noticeable given intervening trees and the distance between the vantage point and the quarry.

Visual Impact

As discussed in the Setting, the project site is identified as possessing high visual quality according to the County PRMD Visual Assessment Guidelines. As determined in the viewshed analysis, three off-site public vantage points and four private residences would have views of some project features, including views from and adjacent to Porter Creek Road and Mountain Home Ranch Road, as well as from a number of private vantage points on surrounding hillsides to the south and southeast.

As illustrated in the visual simulations, active mining operations and mined areas on the expansion parcel would not be visible from public vantage points. The project would be "Inevident" from Mountain Home Ranch Road vantage points.

[42] A simulation from seven years after project initiation is typically used to illustrate medium-term landscaping effects. Douglas fir was selected for planting as it is a native evergreen, grows tall relatively quickly, and is more suited to site conditions than redwood.

Figure 4.7-2 Existing View of Quarry Looking East from Porter Creek Road

Source: *Visual Impact Analysis LLC*

Figure 4.7-3 Photosimulation of Future View of the Quarry Looking East from Porter Creek Road (Pre-Mitigation)

Figure 4.7-4 Photosimulation of View of Reclaimed Quarry Looking East from Porter Creek Road (Post-Mitigation)

Figure 4.7-5 Existing View of Quarry Looking West from Porter Creek Road

Source: ***Visual Impact Analysis LLC***

Figure 4.7-6 Photosimulation of Future View of the Quarry Looking West from Porter Creek Road

Source: *Visual Impact Analysis LLC*

Figure 4.7-7 Existing View of Quarry from Mountain Home Ranch Road

Source: *Visual Impact Analysis LLC*

Figure 4.7-8 Photo-simulation of Future View of the Quarry from Mountain Home Ranch Road

Source: *Visual Impact Analysis LLC*

Eastbound Porter Creek Road Views

In comparing Figure 4.7-3 to Figure 4.7-2, the ridge above Porter Creek Road would be lowered after mining, providing more "blue sky" views and a new view of a wooded ridgeline northeast of the solar array. More of the solar panels would become visible from this eastbound vantage point. The form, color, and texture of these solar panels create marked contrasts with the hillside and surrounding vegetation, though the panels do not contrast with the existing view of solar panels that are currently visible as shown in Figure 4.7-2. However, the project would increase the number of panels visible by approximately 66 percent.

Given traffic volumes and speeds along this road and the roadway alignment, the attention of most drivers would be to the road and other vehicles. The steep ridge on the north side of the road limits views to the north so that most views are of the slope immediately above the road. The posted speed limit here is 45 miles per hour, but field observations showed many drivers exceed that posted speed limit. In addition, most vehicles have a single occupant who is focused on navigating the road and not looking uphill at the hillside to the north. Though more panels would be visible, it is expected that eastbound drivers would be unaware of the additional solar panels or the rock fall barriers. The one exception would be the 300-foot-long Rock Fall Barrier A that would be installed immediately adjacent to the road, which would be visible as the driver passes along side it.

As shown In Figure 4.7-3, Rock Fall Barrier A is not visible from the selected eastbound vantage point, but it would become visible as the driver travels further east. By the time an eastbound driver reaches Barrier A, the solar panels would not be visible. Drivers passing the barrier would see a 10-foot-high steel mesh fence (similar to a cyclone fence) adjacent to the road. As illustrated in Figure 4.7-6, the mesh itself is not noticeable from a distance; mainly one sees the support posts, which would be the most visible component of the barriers. However, as one passes the barrier, it is expected that the mesh will become more noticeable, though one still will be able to see through it. This barrier would be most noticeable to travelers as they pass beside it (visible for 4 to 5 seconds at 45 miles per hour).

As shown in Figure 4.7-3, the upper rock fall barriers are either screened or not noticeable from the selected vantage point. While portions of these barriers could be visible from certain vantage points further west along Porter Creek Road, the upper barriers would not substantially block views of the hillside or vegetation, and, when visible, they would be visible for only a few seconds when travelling in either direction. The upper barriers would not create marked contrasts with the hillside and surrounding vegetation.

Because the view of additional panels would attract attention equally when compared to other landscape features, the additional solar panels would have a dominance rating of "Co-Dominant" per the definition contained in Table 4.7-2. The "Co-Dominant" rating and the "high" visual sensitivity of the site from this vantage point would result in a ***potentially significant*** impact on eastbound views. The changes in view would not rise to the level of "Dominant" because the panels do not contrast with the existing dominant view of the solar array. However, even if the additional panels were considered

“Dominant,” it would not change the conclusion that the project would have a potentially significant impact on this eastbound view.

Construction of access roads and trails to install the rock fall barriers would be visible to drivers passing the site. Such roads and trails would have a “Co-Dominant” rating resulting in a ***potentially significant impact.***

Westbound Porter Creek Road Views

Comparing Figure 4.7-6 to Figure 4.7-5 shows that from the selected westbound Porter Creek Road vantage point, active mining operations would not be visible as they would be north of (behind) of the ridge bordering the road. The project would lower this ridge resulting in more “blue sky” views and less views of the vegetated ridge. The rock fall barriers would be visible from some locations along the road. In most locations the upper barriers would not be visible as the roadside topography and vegetation would screen views. However, views of these barriers would be possible from certain vantage points, though from most vantage points, the traveler would need to be looking north and up to be able to see the barriers. Even where visible, the upper barriers would only be seen for a few seconds as the vehicle passed the site. As described for the eastbound views, these upper barriers would not create marked contrasts with the hillside and surrounding vegetation.

The lower barrier (Barrier A) would be most visible to travelers as they pass by it (see Figure 4.7-6). This barrier would be visible for 4 to 5 seconds at 45 miles per hour. While portions of these barriers would be visible from vantage points along Porter Creek Road, they would not substantially block views of the hillside or vegetation, and they would be visible for only a few seconds when travelling in either direction. The barriers would not create marked contrasts with the hillside and surrounding vegetation. According to County definitions, the project as a whole would have a “Subordinate” dominance rating, and the impact for eastbound travelers on Porter Creek Road would therefore be ***less than significant***.

Mountain Home Ranch Road Views

Figure 4.7-7 shows the existing view of the site from Mountain Home Ranch Road. The active quarry is over the top of the ridge and not visible from this road. The view is of a forested, undeveloped ridge. Expansion of the quarry will reduce the elevation of one portion of the ridge. However, as shown in Figure 4.7-8, this change is virtually unnoticeable from the selected vantage point. There would be a very small increase in blue sky views. There would be no views of equipment or bared slopes in the expansion area as the quarry would remain south of the ridgeline. The new view would have a rating of “Inevident,” and the impacts to views from this road would be ***less than significant***.

Scenic Corridor Consistency

The project site is adjacent to Porter Creek Road, which is a County-designated Scenic Corridor. The zoning regulations pertaining to Scenic Corridors regulate development of structures on properties adjacent to Scenic Corridors. The only "structures" that the applicant proposes within 200 feet of the road are the rock fall barriers, which would be removed within 20 years. As described in the Setting section, such improvements are permissible if the project would undergo design review, and there is no other reasonable location for the structure, the location is necessary for the proposed project use. The proposed rock fall barriers are consistent with these zoning regulations since 1) the Planning Commission will review the visual impacts of the proposed project (including the rock fall barriers); 2) the barriers would not have a significant visual impact; 3) they are needed in the locations proposed; 4) they would be screened from views from many locations; and 5) they would be removed after 20 years or sooner.

Mitigation Measures

The previously described Mitigation Measure 4.1-B.5 also applies to this impact. That mitigation measure includes a prohibition on constructing roads and trails to install rock fall barriers on the slopes above Porter Creek Road. The following mitigation measure also applies.

4.7-A.1 Within the first year after project approval, Douglas fir trees or alternative evergreen species acceptable to the County shall be planted in the area where the trees are shown screening some of the solar panels in Figure 4.7-4. A certified arborist or landscape architect shall develop a final tree plan for this area. The plan shall meet at least the following requirements unless the arborist can demonstrate that substitute measures would meet the targets listed at the end of this mitigation. At least 30 trees shall be planted. The trees shall be fertilized, irrigated, protected, and maintained until they are five years old. Any trees dying within that period shall be replanted until there are 30 new live trees that have been alive for at least seven years. Compacted ground shall be broken to an area three times the diameter of the root ball prior to planting to allow root growth. Trees shall be watered weekly by the property owner in weeks with no natural precipitation (usually April 15 through October 15 of each year), and for the first three years after planting they shall be watered three times per week when temperatures exceed 100 F°. The plan will be based on the targets of: 1) the trees being at least 20 feet high after seven years; and 2) sufficient trees shall be planted to provide the screening shown on Figure 4.7-4. The plan will be reviewed and approved by the County prior to expansion of mining.

Impact Significance After Mitigation

Mitigation Measure 4.1-B.5 would eliminate the potential visual impact resulting from the construction of access roads and trails used to install the rock fall barriers. Mitigation Measure 4.7-A.1 would reduce the number of solar panels visible to the eastbound driver. Nevertheless, after seven years approximately 30 percent more of the photovoltaic system would remain visible (as compared to the existing view). The trees that would be planted to screen views of the solar panels would continue to grow to approximately 40 to 80 feet tall in 20 years, and correspondingly screen more of the solar array. It is possible that after 20 years that there would not be substantially more panels visible than is currently the case. The change in views would remain significant per the County's Visual Assessment Guidelines although the project does not introduce views of solar panels into the eastbound Porter Creek Road viewshed; the westbound view of the increased number of solar panels is possible for three seconds at the most; and over the long term screening may block views of the additional panels. Because the view of additional panels for many years would attract attention equally as compared to other landscape features, the additional solar panels would have a dominance rating of "Co-Dominant" per the definition contained in Table 4.7-2, which would result in a ***significant*** impact on eastbound views.

Lighting Impacts

Impact 4.7-B The project could result in the production of new sources of light and/or glare. This would be a less-than-significant impact.

Typical hours of operation for the quarry are and would continue to be between 7:00 a.m. and 4:30 p.m., Monday through Friday with occasional operations on Saturday, with most plant operations, including loading/weighing of trucks, ceasing by 4:30 p.m., and general maintenance occurring until 5:00 p.m. However, the quarry may periodically be open until 10:00 p.m. Monday through Friday.

The quarry could operate infrequently during the permitted evening hours, such as when a quarry client requires materials for a nighttime construction project. Under such circumstances, mining or crushing would not occur between 10:00 p.m. and 6:00 a.m., and nighttime operations would be limited to the loading and weighing of material. As allowed under Country Ordinance Section 26A-09-010, the County could grant approval for operations after 10:00 p.m. for emergencies or special circumstances (this has occurred once in the past 10 years at this quarry). The quarry has existing lighting for these operations. No new lighting would be added. Because no additional lighting would be added, the impact would be ***less than significant***, and no mitigation is required.

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4.8 PUBLIC SERVICES AND UTILITIES

This section discusses public service and utility issues, including the proposed project's relationship to existing police, fire, park, solid waste and other applicable public service/utilities provided in unincorporated areas of Sonoma County.

A. Setting

1. Fire and Emergency Medical Service

The project site is located in unincorporated Sonoma County northeast of the City of Santa Rosa. This area is under the jurisdiction of the Sonoma County Fire and Emergency Services Department. Fire protection for wildland fires in State Responsibility Areas in the unincorporated areas of the county is provided by the California Department of Forestry and Fire Protection (CAL FIRE). The Rincon Valley Fire Protection District would also respond to a fire at the project site.

All explosives and other hazardous, flammable materials used and stored on the site are subject to an approved Hazardous Materials Business Plan (see ***Section 4.9, Hazards and Hazardous Materials*** for additional information). All mining operations are required by the Sonoma County Surface Mining and Reclamation Ordinance to manage hazardous materials and hazardous wastes in compliance with the requirements of the Uniform Fire Code, the Uniform Building Code, the County Public Health Department, local fire protection agencies, the Regional Water Quality Control Board, the California EPA, and either the Northern Sonoma County Air Pollution Control District or the Bay Area Air Quality Management District, as applicable.

Sonoma County Fire and Emergency Services Department

The Sonoma County Fire and Emergency Services Department provides fire suppression, emergency rescue, emergency medical services and hazardous materials incident response to the unincorporated County, including the project area, through government authority and service agreements with local volunteer fire companies and the California Department of Forestry and Fire Protection (CAL FIRE), and through mutual-aid agreements with fire protection districts and municipalities.

The Sonoma County Fire and Emergency Services Department is an "all risk" fire department providing emergency services to all unincorporated areas of Sonoma County not within a fire protection district, through a network of fire stations, personnel and equipment. This network is comprised of 15 volunteer fire companies with a fleet of approximately 50 engines and support vehicles, and staffing that includes approximately 250 volunteer firefighters. Fire prevention, hazardous materials program management and response, emergency management, and administrative support personnel consist of County employees.

The volunteer fire department that would provide first response to the project site is the Mountain Volunteer Fire Department (Mountain VFD). In 2010 the Mountain VFD located on Sharp Road off Petrified Forest Road responded to 35 calls for service within its response area. Of those calls 29 were for medical aid calls, and 7 were for fire related incidents. Over the past 10 years there have been no calls for service from Mark West Quarry. The time needed for the first emergency unit to arrive at the project site after receiving the alarm from the dispatch center is estimated to be 29 minutes. This is broken down as follows: volunteer firefighters respond to the fire station, (10 minutes); firefighters don protective equipment (2 minutes); and travel time from the fire station to the project location (17 minutes).[43]

Rincon Valley FPD

Rincon Valley Fire Protection District (Rincon Valley FPD) also provides fire protection to the existing quarry and would provide protection to the expansion site under agreement with the County of Sonoma Fire and Emergency Services Department. The Rincon Valley FPD is an independent special district governed by an elected board of directors.[44] The District provides fire and emergency services within the District boundaries and to surrounding areas as contracted. The District lies approximately 60 miles to the north of the city of San Francisco and adjacent to the city of Santa Rosa with a service area of approximately 120 square miles. The population serviced is approximately 30,000. The district maintains 4 fire stations, 2 of which are staffed 24 hours a day, and the remaining 2 stations are staffed by volunteers. Service is also provided by a 24-hour facility within the City of Santa Rosa, which responds to District and City emergencies. The District operates 19 pieces of equipment including staff and utility vehicles.

The District experiences an annual estimated call volume of 3,200 calls for service. Approximately two-thirds of the call volume is medically related. Department medical aid is limited to first responder, AED (automated external defilibrator), and EMT level. ALS (Advanced Life Support) and transport is conducted by private providers.

The nearest station is located 10 miles away in Larkfield, located at 45 Lark Center Dr. Santa Rosa, CA. The station is staffed by a Captain, two firefighter/engineers, and approximately 50 volunteer firefighters. Equipment includes a Type 1 Engine, a Type 3 Engine, a water tender/engine combination, and a Rescue unit (air and rescue support unit). Response time to the project site varies but is approximately 20 minutes from the Larkfield Station.

Initial response to a fire at the project site would be as follows:

1. **Structure Fire response would include at minimum:** two Type 1 Engines, one Type 3 Engine, three Water Tenders, one Air Support unit, one Battalion Chief, and mutual aid from Mountain VFD (either a Type 1 or Type 3 engine).

2. **Wildland Fire response would include at minimum**: two Type 1 Engines, two Type 3 Engines, three Water Tenders, one Battalion Chief, and mutual aid from Mountain VFD (for one Type 3 Engine) plus CAL FIRE's Response (see below).

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[43] Sonoma County Fire and Emergency Services Department Assistant Chief/Fire Marshal Robert MacIntyre, email communications, 12/01/11 and 12/06/11

[44] Central Fire Authority of Sonoma County is a Joint Powers Agreement between Rincon Valley Fire Protection District and Windsor Fire Protection District for management and oversight services for both Districts.

3. Any fire reported in this area igniting during declared fire season would be responded to by CAL FIRE, Mountain VFD and RVFPD.[45]

CAL FIRE

The project site is located within a designated State Responsibility Area (SRA), for which the California Department of Forestry and Fire Protection (CAL FIRE) is primarily responsible for addressing wildfires.

The CAL FIRE station nearest the project site is located at 1199 Big Tree Road, St. Helena. This station maintains a minimum of 6 firefighters during the fire season (typically the end of May through the end of October), 2 firefighters during the non-fire season, and a minimum of one Type 3 fire engine throughout the year. Average response time to the site would be 15 minutes.

The CAL FIRE station of second response is located at 2210 West College Avenue, Santa Rosa. CAL FIRE is also capable of providing other resources for fighting wildfires, including additional fire response personnel and additional engines, as well as air tankers, helicopters, bulldozers, and other equipment, when needed.

CAL FIRE response level is determined by the calculated Spread Component (i.e., rating of the forward spread of a fire front expressed in feet per minute) and Burning Index (i.e., a numerical measurement of the difficulty of fire containment based on spread component and fire intensity; the number that describes anticipated fire behavior and how difficult it will be to control the fire). The Spread Component and Burning index change throughout the day and over the summer/fall. For the majority of the summer this area would receive a High Dispatch during the afternoon. Initial Attack Response Levels for this site would be:

<u>Low Dispatch</u>
1 Battalion Chief (BC)
2 Engines from St. Helena Station

<u>Medium</u>
1 BC
1 Air Attack- from Sonoma Air Attack Base
2 Air Tankers from Sonoma Air Attack Base
1 Helicopter from Boggs Mountain
3 Engines, 2 from St. Helena 1 from Santa Rosa
1 Bulldozer from St. Helena
1 Crew from Konocti Camp

<u>High</u>
1 BC
1 Air Attack from Sonoma Air Attack Base
2 Air Tankers from Sonoma Air Attack Base
1 Helicopter from Boggs Mountain

[45] Data on Rincon Valley FPD provided by John Lantz, Assistant Fire Chief, Rincon Valley FPD, email of 12/12/11/

5 Engines from same as above plus 2 engines from Glen Ellen
2 Bulldozers, 1 from St. Helena, 1 from Healdsburg
2 Crews from Konocti Camp

The project will be required to comply with the California Public Resource Code (PRC) 4290 and California Code Regulations (CCR) 1270-1276 which address fire and life safety regulations. These regulations include, but are not limited to the following issues: roadway design and length, driveway grades, dead-end road lengths, turnarounds, turnouts, signage, and emergency water standards.[46]

Emergency Medical Services

Emergency Medical Service (EMS) systems in Sonoma County are a blend of First Responder agencies, ground and air ambulance providers, EMS from the Fire Dispatch Center, and acute care receiving facilities. The County's EMS system contains an Exclusive Operating Area ambulance franchise, assessment district ambulance providers, privately owned air ambulance (helicopter) service, and a law enforcement based Advanced Life Support resource helicopter.[47]

2. Police Service

The Sonoma County Sheriff's Office provides law enforcement services to unincorporated areas of the county, including the project site. Currently the Office is comprised of over 660 employees and over 100 volunteers. The Department's law enforcement services are provided by over 135 Deputy Sheriffs in the Patrol Bureau, 48 Deputies in its Investigations Bureau, and 35 Deputies assigned to the Court Security and Transportation Bureaus. The Sonoma County Sheriff's Department Headquarters are located at 2796 Ventura Avenue, in Santa Rosa.

The project site is located in an emergency service zone of the Department (Zone 3) covering an 143-square mile unincorporated area of Sonoma County that surrounds the City of Santa Rosa.

The California Highway Patrol (CHP) provides law enforcement along all State routes within California and along all the haul routes that provide access to the quarry. The CHP also assists local governments during emergencies when requested.

3. Solid Waste Generation and Disposal

The Sonoma County Department of Transportation and Public Works (DTPW) owns and operates four transfer stations throughout Sonoma County. Landfill operations at the County's Central Landfill on Mecham Road were reopened in 2010. About 60% of the county's garbage is disposed of at the Central Landfill with the remaining solid waste being shipped to Hay Road Landfill (Solano County).[48]

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[46] Data on CAL FIRE from Todd Derum, Division Chief, CAL FIRE, email dated 1/11/12.
[47] Assistant Chief/Fire Marshal Robert MacIntyre, email communications, 12/01/11 and 12/06/11.
[48] Susan Klassen, Deputy Director of the Sonoma County Department of Transportation and Public Works personal communication 5/29/12.

The Aggregate Resources Management (ARM) Plan calls for the Sonoma County Permit and Resource Management Department, in consultation with the Sonoma County Department of Transportation and Public Works (DTPW), to explore ways in which recycled materials could be used to substitute for newly mined aggregate and how the County could encourage this activity. The recycled materials that would most likely be used to substitute for newly mined aggregate include recycled concrete, asphalt, and road base. As noted in ***Section 3.2, Project Description***, the Mark West Quarry currently accepts asphalt and concrete that is then recycled for reuse, though the Quarry discourages recycling at this site and directs customers seeking to dispose of materials that could be recycled to their Santa Road facility. Currently, they recycle less than 10,000 cubic yards per year at the project site.

4. Water and Wastewater

Water for the quarry operations is provided by on-site wells and bottled water for drinking. Wastewater is disposed of by a private on-site treatment and disposal system. The project is not served by a municipal water or wastewater utility.

B. Potential Impacts and Mitigation Measures

1. Criteria Used For Determining Impact Significance

Based on the *CEQA Guidelines*, the project would have a significant impact on public and utilities services if it would:

1. Physically alter governmental facilities or generate a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: fire, police, schools, parks, or other public facilities.
2. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.
3. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments
4. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
5. Have insufficient water supplies available to serve the project from existing entitlement and resources, or require new or expanded entitlements to serve the project.
6. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
7. Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or

8. Not comply with Federal, State, and local statutes and regulations related to solid waste.

2. Project Impacts

Less Than Significant Impacts Not Requiring Further Analysis

Criterion 1 (New or Altered Facilities). Since there are no public parks or recreation areas located in the vicinity of the project site; the project would have no effect on public park and recreation facilities. The project would generate five new jobs. These additional positions would not result in a significant increase in the number of children that would be educated at local schools (approximately 2-3 new students) nor require expansion of any other public facility.

Criteria 3 to 5 (Water and Wastewater). The project is served by an on-site wastewater system and would have no effect on a municipal wastewater treatment system. The project is served by on-site wells, so there would be no impact to a public water system. The availability of on-site wells to serve the project are discussed in ***Section 4.2, Hydrology and Water Quality***.

Criterion 6 (Drainage Facilities). The site is not drained by a public stormwater system, nor would off-site runoff affect a manmade drainage conveyance. Potential effects on local on-site stormwater collection facilities are addressed in ***Section 4.2, Hydrology and Water Quality***.

Need to Alter or Construct New Fire or Emergency Response Facilities

Impact 4.8-A The project would generate increased calls for fire response and emergency medical aid. This would be a less-than-significant impact.

The mining of aggregate and subsequent processing takes place on the quarry floor where there is no vegetation. Most of the processing is done by equipment not enclosed in buildings. The quarry operations pose no unusual risk of structure fire; see the subsequent impact for a discussion of the potential for wildfires. There is some risk of workers being injured during aggregate removal and processing, but that risk is not substantially greater than currently occurs at the site. In addition, the applicant is required to comply with all safety regulations required by the Mine Safety and Health Administration (MSHA).

Water is stored on the site in two 100,000-gallon tanks and one 10,000-gallon tank. This water is available for fire suppression activities at the site. Whether water stored on the site would be sufficient to suppress a wildfire on the quarry property depends on the size of the fire and the fire conditions when suppression activities begin.

Based on past calls for service from the quarry (no calls in the past 10 years), it is not expected that the expansion project would result in a substantial increase for calls for service. Accordingly, the project would not increase the demand for fire or emergency responses to a level where new equipment, vehicles, or structures would be needed to serve the project. The impact would be ***less than significant*** per Significance Criterion No. 1, and no mitigation would be required.

Increased Risk of Wildfire Ignition

Impact 4.8-B The project would increase the risk of igniting wildland fires or being affected by a wildland fire. This would be a potentially significant impact.

As noted in the Setting Section, any fire ignition during the fire season would be responded to by numerous engines, firefighters, and other equipment. Trees within the proposed expansion area would be removed under an approved Timber Harvest Plan, which would include all CAL FIRE requirements to reduce the risk of fire ignition during the logging operations. This project is within a State Responsibility Area and is subject to Public Resources Code requirements (including Sections 4290, 4291, 4427, 4443) regarding access roads, clearance around structures and other improvements, spark arrestors and other equipment use requirements and restrictions.[49]

Subsequent to tree removal, overburden is removed as needed to expose the underlying rock. This is accomplished using bulldozers and loaders. It is possible that use of this heavy equipment in areas containing understory vegetation and grass could ignite a wildfire. The Sonoma County Fire and Emergency Services Department believes that mining expansion would increase the risk of wildland ignition since the project area contains hazardous woodland vegetation with steep topography. This would be a ***potentially significant impact.***

In addition, the Fire Marshal for the Sonoma County Fire and Emergency Services Department has stated that the Mountain VFD has insufficient resources and staffing to adequately respond to existing let alone additional calls for service and that the project could impede the ability of the Fire Department and the County Fire and Emergency Services Department to control wildfires igniting on the site.[50] Given the lack of calls for fire or emergency response to the quarry, the project would not exacerbate this existing lack of resources. However, given this existing problem, the County may wish to add a condition on the project to require the project applicant to pay its fair share of any future fire fee the County approves to augment funding of the Mountain VFD.

Mitigation Measures

4.8-B.1 Prior to vegetation removal or mining of the expansion area, the project applicant shall provide to the Sonoma County Fire and Emergency Services Department an affirmative covenant, that includes a vegetation management maintenance agreement approved by the County Fire Marshal, which shall run with the land in perpetuity.

[49] Todd Derum, CAL FIRE Division Chief, personal communication, 12/2/11.
[50] Assistant Chief/Fire Marshal Robert MacIntyre, email communications, 12/01/11 and 12/06/11

Impact Significance After Mitigation

Compliance with Public Resource Code requirements and implementation of the recommended mitigation measure would reduce the impact to a ***less-than-significant*** level.

Increased Demand for Police Response

Impact 4.8-C The proposed project would require police protection and traffic enforcement services of the Sonoma County Sheriff's Department. This would be a less-than-significant impact.

Like any business, the project could result in additional crime, requiring police response. However, this is not a retail business, and crimes typically correlated with retail commercial development would not be expected. The project would not be expected to generate a substantial increase in calls to the Sheriff's Department for typical police protection services (e.g., for traffic enforcement, traffic control in the event of vehicular accident, trespassing/vandalism, etc.). The proposed project would not prevent the Department from providing adequate law enforcement services to the general area, or require any new or physically altered facilities because of the proposed development. Similarly, potential effects to the California Highway Patrol along Highway 1, 101, and 128 are not expected to be adverse. Thus, project impacts on police protection services, including potential contribution to cumulative demand for police protection services, would be less than significant.[51] The impact on the Sheriff's Department is considered to be ***less than significant,*** and no mitigation is required.

Solid Waste Generation

Impact 4.8-D The proposed project would generate solid waste as well as allow use of recycled materials at the quarry. This would be a less-than-significant impact.

Under the project, employees and general administrative functions associated with the quarry would generate a minor amount of trash that would require disposal. This waste would be regularly collected and transported to the Central Landfill or a landfill in Solano County. Given the amount of solid waste generated onsite from these sources would be relatively small, it would be considered a ***less-than-significant impact***.

As part of quarry operations, the quarry would allow import of concrete and asphalt to the site for recycling. This operation would be consistent with the goals of the ARM Plan and aid in achieving the County's goals of reducing the amount of solid waste that is disposed of in landfills, and therefore would be beneficial.

[51] Steve Brown. Lieutenant, Sonoma County Sheriff's Office, personal communication, 1/20/11.

4.9 HAZARDS AND HAZARDOUS MATERIALS

This section discusses existing conditions at the project site, the potential public health and environmental issues related to storage, use or accidental release of potentially hazardous materials from the project and project site, and worker safety.

A. Setting

1. Hazardous Materials

Hazardous materials are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into the following four categories, based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases). Hazardous materials have been and are commonly used in industrial applications.

Explosives are currently used on the quarry, and future mining will use, transport, and store explosives as described below. Typically, blasting is done 2-3 times per week by licensed and trained personnel. All blasting is done per the conditions of a blasting permit issued by the Sonoma County Sheriff's Department. Explosives are transported to the site by a licensed explosives hauler. All explosives are stored in an approved (and locked) magazine on the quarry site. Explosives are transported from the magazine to the blasting location and used at the blasting location by licensed blasting personnel. Transport, storage, and use of all explosives are in conformance with the requirements set forth in the California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 17, Mine Safety Orders (specific orders regulating explosives include Article 50, Explosives; Article 51, Storage of Explosives; Article 52, Transportation of Explosives; Article 53, Hauling and Use of Explosives; Article 54, Mixing Blasting Agents; and Article 55, Licensing of Blasters).

A number of other potentially hazardous substances used for quarry operating equipment are stored on the existing quarry site; these same substances will be used for future mining on the site. These include:

1. Diesel fuel is currently stored on site in a 10,000-gallon above-ground double-containment storage tank with an overfill prevention valve and 110% secondary containment. It is re-supplied approximately every 2 months.

2. Hydraulic fluid is stored in a 240-gallon double-walled above-ground tank. It has 110% secondary containment, is located inside a storage container, and is re-supplied as needed.

3. Motor oil is stored in a 240-gallon double-walled above-ground tank. It has 110% secondary containment, is located inside the storage container, and is re-supplied as needed.

4. Waste oil is stored in a 240-gallon double-walled above-ground tank. It has 110% secondary containment; is located next to the storage container in a concrete secondary containment structure, has overhead coverage, and is emptied as needed by a licensed waste recycler.

5. Grease is stored in a 55-gallon drum, located inside the storage container. It is re-supplied as needed.

6. Several 5-gallon containers containing motor oil, gear compound, transmission fluid, and drive train fluid are stored on shelves inside the storage container. They are re-supplied as needed.

7. Several 1-gallon containers containing anti-freeze are stored on shelves inside the storage container. They are re-supplied as needed.

8. Miscellaneous cans and/or containers of starting fluid, gasoline, paint, and solvents are stored on shelves inside the storage container or in cabinets in the shop building. They are re-supplied as needed.

2. Regulatory Framework

Hazardous Materials Management

Numerous local, State, and Federal laws and regulations regulate the use, storage, and disposal of hazardous materials, including management of contaminated soils and groundwater. In addition to the State regulations governing the transport, storage, and use of explosives listed previously, the following agencies have some responsibility regarding hazardous materials. The United States Environmental Protection Agency (U.S. EPA) is the Federal agency that administers hazardous materials and waste regulations. State agencies include the California EPA (Cal/EPA), which includes the Department of Toxic Substances Control (DTSC), the North Coast Regional Water Quality Control Board (RWQCB), the California Air Resources Board (CARB), and other offices. The Bay Area Air Quality Management District (BAAQMD) has jurisdiction over the air basin, which includes this part of Sonoma County. A description of agency jurisdiction and involvement in management of hazardous materials is provided below.

U.S. Environmental Protection Agency

The U.S. EPA is the Federal agency responsible for enforcement and implementation of Federal laws and regulations pertaining to hazardous materials. The legislation includes the Resource Conservation and Recovery Act of 1986 (RCRA), the Superfund Amendments and Reauthorization Acts of 1986 (SARA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The Federal regulations are primarily codified in Title 40 of the Code of Federal Regulations (40 CFR). The U.S. EPA provides oversight and supervision for site investigations and remediation projects, and has developed land disposal restrictions and treatment standards for the disposal of certain hazardous wastes.

Department of Toxic Substances Control

The California Department of Toxic Substances Control works in conjunction with the U.S. EPA to enforce and implement specific laws and regulations pertaining to hazardous wastes. The California legislation, for which DTSC has primary enforcement authority, includes the Hazardous Waste Control Act and the Hazardous Substance Account Act. Most State hazardous waste regulations are contained in Title 22 of the California Code of Regulations (CCR). The California DTSC generally acts as the lead agency for soil and groundwater clean up projects, and establishes clean up and action levels for subsurface contamination that are equal to, or more restrictive than, Federal levels. In unincorporated Sonoma County, investigation or remediation of releases from underground or aboveground petroleum storage tanks are performed under the direction of the local oversight agency (LOP). The Sonoma County Department Health Services, Environmental Health Division is the LOP for the area of the project site. Other types of hazardous substance release sites may be overseen by the LOP with proper notification and authorization from the RWQCB, North Coast Region, and the DTSC.

North Coast Regional Water Quality Control Board

The project site is located in the jurisdiction of the North Coast RWQCB. The RWQCB is authorized by the California Porter-Cologne Water Quality Act of 1969 to implement water quality protection laws. The RWQCB provides oversight for sites where the quality of groundwater or surface waters is threatened, and has the authority to require investigations and remedial actions.

California Air Resources Board and the Bay Area Air Quality Management District

The project site is in the Bay Area Air Basin. The California Air Resources Board (CARB) and the Bay Area Air Quality Management District (BAAQMD) have joint responsibility for developing and enforcing regulations to achieve and maintain State and Federal ambient air quality standards in the district. CARB is responsible for enforcing the Clean Air Act and California's State Ambient Air Quality Standards. BAAQMD is responsible for regulating air emissions from stationary sources, monitoring air quality, and reviewing air quality issues in environmental documents. The Air Quality section of this EIR further describes the responsibilities of CARB and BAAQMD, air quality conditions in the Bay Area Air Basin, and potential air quality impacts associated with the proposed project.

Local Hazardous Materials Management

The primary agencies responsible for local enforcement of State and Federal laws controlling hazardous materials management include the Hazardous Materials Division (HMD) of the Sonoma County Department of Emergency Services (SCDES) and the Environmental Health Division (EHD) of the Sonoma County Department of Health Services (SCDHS). SCDES is a Certified Unified Program Agency (CUPA), the local agency responsible for coordination of hazardous waste generator programs, underground fuel tank management, tiered permitting process for waste treatment, and administering the Hazardous Materials Business Plan program. SCDHS is responsible for management of leaking underground storage tank site investigation and cleanup.

Businesses that store, handle, or dispose of hazardous materials must submit a Hazardous Materials Business Plan (business plan) in accordance with the California Health and Safety Code Section 25504. The business plans must be updated every two years or within 30 days after a substantial change in site operations. The business plan must:

1. List all the hazardous materials stored at a site
2. Identify emergency response procedures for spills and personnel (Emergency Response Plan)
3. Identify evacuation plans and procedures
4. Identify training records for personnel to substantiate annual refresher training

If hazardous materials are used or stored at a site, all employees are also required to receive hazard communication training. The purpose of the training is to ensure that employees understand the nature of the hazardous materials that they handle and can safely use, store, and dispose of the materials in accordance with Title 8, CCR. The hazard communication standard requires that employers must:

1. Prepare an inventory of hazardous materials
2. Make Material Safety Data Sheets available to employees
3. Conduct employee training on chemical hazards and safe handling of materials
4. Ensure that hazardous material containers are properly stored and labeled

Inspections of businesses that store hazardous materials are performed by SCDES. The hazard communication requirements are enforced by the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA).

Worker Health and Safety

Worker health and safety is regulated at the Federal level by the Federal Department of Industrial Relations. Worker health and safety in California is regulated by the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA). California standards for workers dealing with hazardous materials are contained in Title 8, CCR, and include practices for all industries (General Industry Safety Orders), and specific practices for construction, and hazardous waste operations and emergency response. Cal/OSHA conducts on-site evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.

Sonoma County Surface Mining and Reclamation Ordinance

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to the proposed project:

Sec. 26A-09-010. General Standards for Mining Permit and Operations

f) Hazardous Materials. All operations shall manage hazardous materials and hazardous wastes in compliance with the requirements of the Uniform Fire Code, the Uniform Building Code, the County Public Health Department, local fire protection agencies, the Regional Water Quality Control Board, the California EPA, and either the Northern Sonoma County Air Pollution Control District or the Bay Area Air Quality Management District as applicable. Hazardous materials and wastes are to be removed from all mining areas within the 100-year flood plain by November 1 of each year. Each mining site where hazardous materials are used or hazardous wastes are stored is required to have a Spill Prevention and Countermeasure Plan.

Sec. 26A-09-040. Quarry Mining Standards

(h) Use of Explosives. No blasting shall be used except as authorized by the use permit. Blasting activities shall be conducted by a qualified licensed blasting professional in compliance with State blasting regulations. Blasting permits shall be obtained from the Sonoma County Sheriff's Department. Blasting operations shall be designed to minimize adverse noise and vibration impacts on offsite residential areas. Permits may be conditioned to require notice to immediate neighbors prior to blasting.

B. Potential Impacts and Mitigation Measures

1. Criteria Used For Determining Impact Significance

A project will have a significant impact if it meets any of the following criteria.

1. Creates a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

2. Creates a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

3. Emits hazardous emissions or handles hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

4. Is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport, would the project result in a safety hazard for people residing or working in the project area.

6. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.

2. Project Impacts

Less Than Significant Impacts Not Requiring Further Analysis

Criterion 3 (Emissions Near Schools). As described in the Initial Study, the project would not emit any hazardous emissions within one-quarter mile of a school as the nearest school is over four miles away.

Criterion 4 (Hazardous Materials Site). The site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

Criteria 5 and 6 (Airports). The site is not within an area under an airport land use plan, within 2 miles of a public airport, or in the vicinity of a private airstrip.

The following impact analysis focuses on potential effects of hazardous materials associated with mining and reclamation activities.

Risk from Spillage or Release of Hazardous Materials

Impact 4.9-A Hazardous materials transported or used on the project site during proposed mining and reclamation activities (i.e., petroleum products, blasting materials) could be spilled or otherwise released through improper handling or storage. This would be a potentially significant impact.

Proposed mining and reclamation activities may involve the use of certain hazardous substances and/or petroleum products. Inadvertent release of these materials could result in adverse impacts to soil, surface water, and/or groundwater. The implementation of appropriate best management practices is required pursuant to existing permits (e.g., National Pollutant Discharge Elimination System and Hazardous Materials Business Plan permits for mining and reclamation activities). The applicant has an approved Storm Water Pollution Prevention Plan, Hazardous Materials Business Plan, and Spill Prevention Control and Countermeasure (SPCC) Plan for Above Ground Storage for existing quarry activities.

As required by law, a revised Storm Water Pollution Prevention Plan for the expansion area will need to be approved by the North Coast RWQCB. The applicant will be required to comply with all provisions of that approved plan. As required by County regulations, a revised Hazardous Materials Business Plan will need to be reviewed and approved by the County. The applicant will be required to abide by all conditions set forth in that plan. Compliance with existing State and county regulations regulating hazardous materials would reduce impacts associated with such materials to a less-than-significant level.

The potential impact of releases of hazardous materials at mining sites was evaluated in the Program EIR for the Sonoma County Aggregate Resources Management Plan (Impact 8.16-1). That impact analysis determined that adherence to existing Federal, State, and local laws and regulations would reduce the potential impact of releases of hazardous materials to a less-than-significant level. The mitigation measure (ARM Plan

Mitigation Measure 8.16-1) specifically referenced adherence to the requirement that a Spill Prevention, Control and Counter Measure Plan (SPCCMP) be prepared for mining operations, and this has been done for the existing quarry.

Explosives would continue to be used during quarry expansion. The transport of blasting materials to the site is restricted by the California Highway Patrol to pre-approved routes, and all explosive transport vehicles must satisfy all the stringent vehicle standards as required by the Federal Department of Transportation. Once explosives enter the site, their transportation and use is regulated by the Federal Occupational Safety Administration and by Cal OSHA. All blasting would be conducted in compliance with applicable Federal and State blasting regulations. Blasting would be conducted by the applicant's blasting expert pursuant to an approved blasting plan. The existing and approved blasting plan contains a complete description of clearing and guarding procedures; descriptions of how explosives will be safely transported and used at the site; evacuation, security and fire prevention procedures; blasting equipment list, and procedures for notification of nearby receptors. With continued compliance with existing regulations, the potential project hazards related to the transport, storage, and use of blasting materials on site is considered mitigated to a less-than-significant level.

Compliance with regulations governing hazardous materials would adequately address impacts related to hazardous materials. The mitigation measures listed below ensure that the applicant will comply with these legal requirements.

Mitigation Measures

4.9-A.1 Prior to initiation of the project, the applicant shall prepare a revised Spill Prevention, Control and Counter Measure Plan (SPCCMP) in conformance with the requirements of the Code of Federal Regulations 40CFR112. A copy of the SPCCMP shall be submitted to the Sonoma County Department of Emergency Services to demonstrate completion of the mitigation.

4.9-A.2 If hazardous waste is generated or stored, then the operator shall comply with hazardous waste generator laws and AB2185 requirements and obtain a permit or approval from the C.U.P.A. or the participating agency. The applicant shall submit a copy of a current permit to the Permit and Resource Management Department Health Specialist to verify compliance.

4.9-A.3 All hazardous waste materials shall be stored, handled and managed in accordance with the approved site plan and hazardous materials plan so as to reduce the potential for any spillage. No soil or other material containing hazardous or toxic waste shall be imported to the quarry.

Impact Significance After Mitigation

Revising existing plans relative to hazardous wastes to incorporate the expanded project will ensure compliance with State and County regulations, which will reduce potential impacts resulting from spillage or unsafe use of explosives to a l***ess-than-significant*** level.

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4.10 CULTURAL AND PALEONTOLOGICAL RESOURCES

A. Existing Conditions

Introduction

This section is based on a cultural resources study of the project site and vicinity prepared by Garcia & Associates for this EIR. Because the study includes a map of the location of a cultural resource, it is confidential and not available for public review; however, the pertinent findings of the study are presented below. This study included archival and background research at the Northwest Information Center (NWIC), Sonoma State University (NWIC File No. 05-444), examination of the library and files of Tom Origer & Associates, consultation with the Native American Heritage Commission and local Native American representatives, and field inspection of the project site in order to identify cultural resources within the Area of Direct Impacts (ADI), which is the area on the existing quarry parcel that is currently zoned MR and on the expansion parcel that is proposed to be zoned MR.

Study Area Location and Description

The Mark West Quarry is situated in the Mayacamas Mountains, approximately 9 miles northeast of the City of Santa Rosa. It is located at 4611 Porter Creek Road, about 0.5 miles northwest of the intersection of Porter Creek Road and Calistoga Road. The existing quarry extends north from Porter Creek, a tributary of Mark West Creek, into the ridge forming the divide with the headwaters of Franz Creek. Most of the land is undeveloped in a rural/residential setting. The proposed lands for the quarry expansion currently have no dwellings or agricultural usage. The ADI currently consists of seasonal drainages, oak woodlands, chaparral, and grassy, open and forested ridge tops.

Cultural Context

The project area is located within a region ethnographically recorded as the territory of the Southern Pomo Indians. This territory spanned an area from the coastal town of Gualala, east to Cloverdale, and south towards Healdsburg, Santa Rosa, and Sebastopol. The Kashaya Pomo, Coast Miwok, and the Wappo groups occupied the lands to the west, south, and east of the Southern Pomo territory. Native American groups or individuals consulted for this project include the Pomo, Miwok, and Wappo.

Three tribal units of the Southern Pomo occupied the region: the Kataictemi, the Konhomtara, and the Bitakomtara. The Bitakomtara controlled an area of approximately 200 square miles to the east of the Laguna de Santa Rosa, roughly from Cotati to Mark West Creek, Porter Creek, and east to the Mayacamas Mountains. No known village sites have been located within the ADI. However, consultation with Reno Franklin, Cultural Resources Coordinator for the Stewarts Point Rancheria (Kashaya Band of Pomo Indians), yielded information regarding bedrock mortars (BRMs) along Porter Creek, approximately 0.38-miles west of and outside of the project area.

The Pomo settlement pattern was typified by large, permanent villages surrounded by seasonal camps and task-specific sites. Main village sites were occupied throughout the year, while campsites were visited seasonally in order to procure resources that were especially abundant or available during particular seasons. Inland sites were located adjacent to sources of fresh water at “ecotonal junctions,” where plant and animal life was diverse and abundant.

The earliest documented human occupation in California, the Paleo-Indian period (ca. 10,000-6000 B.C.), was a time of variable climate, rising sea levels, and other broad-scale environmental change. People lived in small, highly mobile groups, moving through broad geographic areas and leaving relatively meager archaeological remains. With the more stable climate of the long Archaic period (6000 B.C. to A.D. 1000), people gradually became more sedentary, new groups entered the area, and regional distinctions developed. During the Emergent, or Late period (ca. A.D. 500 to the historic period), social complexity developed toward the contact-period settlement pattern of large, central villages where political leaders resided, with associated hamlets and specialized activity sites. Innovations associated with this period include the bow-and-arrow, small corner-notched points, and a diversity of beads and ornaments. Archaeological sites dating to this period are common throughout the North Coast Ranges, and include sites of ritual significance, such as rock art; small resource-processing areas marked by stone-tool-manufacturing debris (debitage) and flaked stone tools or milling equipment (such as mortars and pestles); and moderate-to-large-sized occupation sites marked by midden soils, dietary bone and shell, and a diversity of artifacts.

In 1840, William Marcus West came to this area after he was granted 6,663-acres of the San Miguel Rancho between Mark West and Santa Rosa Creeks by the cousin of his wife, General Mariano G. Vallejo. There he established a hacienda, post office, trading post, and developed Mark West Springs as a resort destination. In the mid-1800s, the economy of Calistoga (five miles east of the project area), was based on the mining of silver and mercury, agriculture, and the hot springs. On August 6, 1904, the Healdsburg Enterprise newspaper reported "Claim Rich Discovery of Quicksilver [.].” The article states that cinnabar, the common ore of mercury also called quicksilver, was found near Mark West Springs and Franz Valley, and specifically at the junction of Calistoga and Rincon Valley roads.

Mining in Sonoma County dates to the 1850s. In 1852, reports of gold in the Russian River brought prospectors to the area, but gold fever faded quickly. An 1877 history states that the county contained “promising veins of copper ore” but that the value remained unknown due to the lack of exploration. It also stated that its coal was not of high quality, because it did not coke but burned to ash like wood. Therefore, both copper and coal were mined in limited quantities. In comparison, early residents found rich deposits of cinnabar containing mercury, or quicksilver, and the county became well-known for its production of the mineral.

Although never approaching the prolific supply of mercury at the New Almaden Mine, smaller mines in Sonoma County were noted for their production, which followed booms and busts in the industry. In the 1850s, an extensive concentration of cinnabar was found in the Mayacamas District spanning portions of Sonoma, Napa, and Lake counties.

Cultural Resource Study Procedures

Archival Study Procedures

Two records searches were performed at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) at Sonoma State University in Rohnert Park, in order to compile data regarding previously conducted surveys and recorded cultural resources within the ADI. The results of records searches indicated that five cultural resource studies were conducted within a 0.5 mile radius of the ADI. No previous cultural resources investigations have been conducted within the ADI. No previously recorded cultural resources were identified within the ADI. In addition, historical records and maps were reviewed to determine the potential presence of historical resources in the area (e.g., *Illustrated Atlas of Sonoma County, California* (Reynolds and Proctor 1897, California Register of Historical Resources; 4) *California Place Names* (Gudde 1998).

Regulatory Setting

State

The following California statutes apply:

1. CEQA: California Public Resources Code Sections 5020.1, 5024.1, 21083.2, 21084.1, et seq. require analysis of potential environmental impacts of proposed projects and application of feasible mitigation measures.

2. California Public Resources Code Section 5020.1 defines several terms, including the following: (f) “DPR Form 523” means the Department of Parks and Recreation Historic Resources Inventory Form; (i) “historical resource” includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California; (j)”local register of historical resources” means a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution; (l) “National Register of Historic Places” (NRHP) means the official Federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture as authorized by the National Historic Preservation Act of 1966 (Title 16 United States Code Section 470 et seq.); (q) “substantial adverse change” means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

3. California Public Resources Code Section 5024.1 establishes a California Register of Historical Resources (CRHR); sets forth criteria to determine significance; defines eligible properties; lists nomination procedures.

4. California Public Resources Code Section 5097.98 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn; sets penalties.

5. California Public Resources Code Section 21083.2 states the lead agency determines whether a project may have a significant effect on unique archaeological resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they can't be avoided, mitigation measures shall be required; discusses excavation as mitigation; discusses cost of mitigation for several types of projects; sets time frame for excavation; defines "unique and non-unique archaeological resources"; provides for mitigation of unexpected resources; sets limitation for this section.

6. California Public Resources Code Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial change in the significance of a historic resource; the section further describes what constitutes an historic resource and a significant historic resource.

7. CEQA Guidelines Section 15064.5 specifically addresses effects on historic and prehistoric archaeological resources, in response to problems that have arisen in the application of CEQA to these resources.

8. CEQA Guidelines Sections 15000, et seq., Appendix G (j), specifically defines a potentially significant environmental effect as occurring when the Proposed Project will "…disrupt or adversely affect…an archeological site, except as part of a scientific study."

CEQA requires that public or private projects financed or approved by public agencies must assess the effects of the project on unique or significant historical resources. Historical resources are defined as buildings, sites, structures, objects or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance (California Public Resources Code 21083.2; *CEQA Guidelines* Section 15064.5).

Archaeological resources that are not "historical resources" according to the above definitions may be "unique archaeological resources" as defined in Public Resources Code section 21083.2, which also generally provides that "nonunique archaeological resources" do not receive any protection under CEQA. If an archaeological resource is neither a "unique archaeological" nor an "historical resource," the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the EIR, but they need not be considered further in the CEQA process.

CEQA requires that if a project results in an effect that may cause a substantial adverse change in the significance of an historical resource, then alternative plans or mitigation measures must be considered; however, only significant historical resources need to be addressed.

Therefore, prior to the assessment of effects or the development of mitigation measures, the significance of cultural resources must first be determined. The steps that are normally taken in a cultural resources investigation for CEQA compliance are as follows:

1. Identify potential historical resources
2. Evaluate the eligibility of potential historical resources
3. Evaluate the effects of a project on all historical resources

CRHR Criteria of Evaluation

The CRHR is a listing of State of California resources that are significant within the context of California's history. The CRHR is a State-wide program of similar scope to the NRHP (National Register of Historical Places). All resources listed in or formally determined eligible for the NRHP are eligible for listing in the CRHR. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR. A historic resource must be significant at the local, State, or national level under one or more of the following criteria that are defined in the California Code of Regulations Title 14, Chapter 11.5, Section 4850:

1. It is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

The CRHR criteria are similar to NRHP criteria, and are tied to CEQA, as any resource that meets the above criteria is considered an historical resource under CEQA.

A historical resource must not only be shown to be significant under one of the CRHR criteria but must also retain its integrity, or the physical characteristics that existed during the time when it achieved its significance. The seven aspects of integrity include location, design, setting, materials, workmanship, feeling, and association. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if it maintains the potential to yield significant scientific or historical information or specific data.

County

The Sonoma County General Plan Open Space Element contains the following goal and objectives regarding cultural resources:

Goal OS-9: Preserve significant archaeological and historical sites which represent the ethnic, cultural, and economic groups that have lived and worked in Sonoma County.

Objective OS-9.1: Encourage the preservation and conservation of historic structures by promoting their rehabilitation or adaptation to new uses.

Objective OS-9.2: Encourage preservation of historic building or cemeteries by maintaining a Landmarks Commission to review projects which may affect historic structures or other cultural resources.

Objective OS-9.3: Encourage preservation of archaeological resources by reviewing all development projects in archaeologically sensitive areas.

Native American Consultation

The State of California Native American Heritage Commission (NAHC) was contacted for information regarding the presence of sacred sites or other cultural use sites within or near the study area. A letter from the Native American Heritage Commission, dated November 11, 2005, indicated that they have no information regarding the presence of sacred sites within or near the project area. The NAHC forwarded a Native American Contact List of local Native American groups and individuals to contact for further information regarding local knowledge of sacred lands. GANDA sent letters to each of the groups and individuals on the list on November 10, 2005 and July 26, 2010. Follow-up calls were conducted on January 5, 2006 and August 23, 2010.

Results of 2005-2006 Native American Consultation

June Dollar, from the Lytton Band of Pomo Indians, contacted GANDA by phone on November 29, 2005 to ask more about the project and to inform GANDA that there were known sites in the area but not within the ADI. Gene Buvelot, Tribal Council Liaison for the Federated Indians of Graton Rancheria (FIGR) contacted GANDA and indicated that the Tribe does not have knowledge of sacred sites within a 0.50-mile radius of the project location. He did, however, point out the project's proximity to Porter Creek indicated that there is the potential for discovery of archaeological sites. Mr. Buvelot reported that in the case of any such discovery, the Tribe would be available to provide monitoring services. Reno Franklin, from Stewarts Point Rancheria, Kashaya Band of Pomo Indians, also contacted GANDA. Mr. Franklin informed GANDA of the presence of a bedrock mortar site located west of the project boundary on Porter Creek Road, along Porter Creek. In a phone conversation, Mr. Franklin expressed no other concerns about the overall project area.

Results of 2010 Native American Consultation

On August 12, 2010, GANDA received a letter from Nick Tipon, of the Sacred Sites Protection Committee of the FIGR. Mr. Tipon stated that the project is located outside of their ancestral territory, and that he has no further comments. Brenda Tavares, legal representative for the Lytton Band of Pomo Indians, contacted GANDA's archaeologist and indicated that the Tribe does not have knowledge of sacred sites within a 0.25-mile radius of the project location. Subsequently, Ms. Tavares sent a letter on August 23, 2010, stating compliance regulations for the inadvertent discovery of cultural resources and human remains, and requesting that the tribe be informed of any such discoveries.

Field Methods and Results

Three reconnaissance surveys were conducted within the ADI. These surveys include lands in the proposed and existing MR Zones. Archaeologists inspected the entire area for cultural resources using transects spaced no more than 25 feet apart (about 8 meters). Approximately 55 percent of the ADI could not be systematically surveyed using transects due to the dense growth of chaparral and steep slopes. Surface visibility in these locations was extremely poor. The remaining 45 percent of the ADI consisted of open grassy areas, access roads and accessible slopes up to a 30% grade. Surface visibility in these areas was moderate depending on the terrain. In addition, bare patches of ground, rodent burrows, erosive areas, access roads, and other locations of ground disturbances were examined for any evidence of culturally modified soils and the presence of artifacts.

As a result of the field surveys, two cultural resources were identified and recorded. One isolated obsidian flake (GANDA-571-ISO) was identified on a dirt access road covered with vegetation, within the western portion of the ADI. Two features associated with a historic period mining site (GANDA-571-01) were identified within the western boundary of the ADI.

GANDA-571-ISO

This isolated artifact is an obsidian flake that measures approximately two centimeters. The isolate was found in a dry mud vehicle rut, on a dirt access road within the proposed MR-Zone of the ADI. The isolate is glossy gray in color, and was situated in a densely vegetated location that included oak woodland with grasses, wildflowers, patches of chaparral shrubs, mountain mahogany, fir, and madrone trees. There is no indication that the obsidian flake is associated with a larger archaeological deposit, and, therefore is not considered significant nor does it warrant further identification.

GANDA-571-01H

This resource is a historic mining site that consists of five features: one five-course stacked rock wall and four prospect pits. The site was observed in an oak woodland area and is situated on a 30% slope straddling the western boundary of the proposed MR-Zone of the ADI. While the five-course stacked rock wall (called Feature 1) and two prospect pits (Features 2 and 5) were outside of the ADI by approximately 88 feet, two other features associated with the mining site, Features 3 and Features 4 prospect pits, were recorded within the ADI. This site may be associated with and is consistent with historic quicksilver claims of the early 1900s found near Mark West Springs and Franz Valley.

Prospect pits are associated with mine exploration, or the search for ore bodies, and are found in abundance in mining areas. Miners dug these speculative test pits (ranging in type from hand-dug pits, power-shovel trenches, bulldozer cuts, and drill holes) to prove that a site contained ore. Additionally, they may have dug the pits in order to establish and to retain holding of an unpatented claim. The 1872 Mining Law required miners to conduct an annual assessment that could include digging another prospect pit to demonstrate the claim was still active. Even if the pits did not contain any ore, they sometimes sparked mining booms based solely on speculation and resulted in the establishment of mining camps.

Paleontological Resources

The site mainly contains Franciscan greenstone, which is an oceanic basalt, and typically does not include fossils. A portion of the site contains Sonoma Volcanics, which again is a rock type that does not include fossils. In addition, it is unlikely this volcanic material would be mined. There is no evidence that the site contains significant paleontological resources. The Initial Study that accompanied the Notice of Preparation (NOP) and that was circulated for public agency and public review stated this contention and that additional paleontological research would not be conducted when preparing this EIR. No responses to the NOP were received that requested additional paleontological studies.

B. Potential Impacts and Mitigation Measures

1. Criteria Used for Determining Impact Significance

In accordance with Appendix G of the CEQA Guidelines, a significant effect will normally occur if a project would:

1. Cause a substantial adverse change in the significance of a historical resource, or a unique archaeological resource, as defined in §15064.5;

2. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or

3. Disturb any human remains, including those interred outside of formal cemeteries

2. Project Impacts

Cultural Resources

Impact 4.10-A Land alteration proposed by the project could affect existing as well as undiscovered cultural resources. This would be a potentially significant impact.

Future mining could damage two of the five features comprising the GANDA-571-01H resource. The two mining pits were evaluated for their potential eligibility for listing in the CRHR (California Register of Historical Resources). Feature 4 consists of a rectangular shaped, prospect pit that measures 21 feet long by 8 feet wide by 2 feet deep. One complete jar with an intact metal screw top lid (A-1) was also identified approximately 10 feet from this feature (ca. 1957-1971). Feature 5 consists of a circular shaped, prospect pit. The prospect pit measures approximately 10 feet long by 6 feet wide by 2 feet deep. Only Features 3 and 4 are on the project site; the remaining features (Features 1, 2, 5) are located approximately 88 feet outside of the ADI. The EIR cultural resource specialists conducted the required fieldwork and archival research to evaluate eligibility for the CRHR.

The following evaluation of this resource is based on the results of the archaeological field work and the archival research.

Criterion 1

The mining site (GANDA-571-01H) does not appear to be eligible for the CRHR under Criterion 1, or an association with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States. They did not result in significant mining activities in the area, nor did they spark a speculative or "boom and bust" period of mining in Sonoma County. For example, they are not associated with adjacent mining camp or the construction of a large-scale mining operation. Therefore, it was not found to meet the significance threshold for listing under Criterion 1.

Criterion 2

The mining site also does not appear to be associated with persons important to local, California, or national history. Archival research did not reveal significant persons associated with owners of the parcels that contain the pits, including the Sherwoods, Engels, Gieselia Hindringer, the Huntingtons, the Reeses, and the Lesses. Therefore, the mining site was found not eligible for listing in the CRHR under Criterion 2.

Criterion 3

Additionally, the prospect pits and the rock wall do not appear to be eligible for listing in the CRHR under Criterion 3, for possessing the distinctive characteristics of a type, period, region, or method of construction; for representing the work of a master; or possessing high artistic values. They are simple hand-dug pits with no design features. Therefore, they do not possess significant value for their engineering design nor did they advance the design or construction of mining operations.

Criterion 4

Lastly, the mining site does not appear to be eligible for listing in the CRHR under Criterion 4, for yielding, or having the potential to yield, information important to the prehistory or history of the local area, California, or the nation. As a result of the fieldwork, no subsurface deposit was identified that would indicate that there is the potential to yield further information from the recorded features. The mining site has been documented, and does not appear to be the source of additional important information regarding the history of the ADI, Sonoma County, or California.

Integrity

The five features of the mining site, which include the mining prospect pits and the rock stacked wall, retain their integrity. They do not appear to have been significantly altered since their construction and retain their overall depth and dimension. Therefore, they retain their integrity of design, workmanship, and materials. They retain their integrity of location, having never been moved, and their integrity of setting, which continues to be a largely undeveloped parcel of land adjacent to Mark West Quarry. As such, they retain their integrity of feeling and association as mining prospect pits and a rock stacked wall in rural Sonoma County.

In conclusion, though the five features of the mining site retain their integrity, the mining site does not appear to be eligible for the CRHR, and has been assigned California Historical Resource (CHR) Status Code 6Z (Found ineligible for NR, CR or Local designation through survey evaluation). Removal of these two features as part of quarry expansion would be a ***less-than-significant impact***, and no mitigation is required.

It is possible that future mining could damage currently undiscovered resources, including human remains. These are ***potentially significant impacts*.**

Mitigation Measures

4.10-A.1 If concentrations of prehistoric or historic-period materials (other than the GANDA-571-01H resource) are encountered during ground-disturbing work at the project location, all work in the immediate vicinity will be halted until a qualified archaeologist can evaluate the finds and make recommendations. Historic-period features that may be present include backfilled privies, wells, and refuse pits; concrete, stone, or wood structural elements or foundations; and concentrations of metal, glass, and ceramic refuse. Prehistoric cultural remains might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, choppers), midden (culturally darkened soil containing heat-affected rock, artifacts, animal bone, or shellfish remains), and/or stone milling equipment, such as mortars and pestles.

4.10-A.2 If human remains are encountered, work in the immediate vicinity will stop and the Sonoma County Coroner will be notified immediately. At the same time, a qualified archaeologist will be contacted to evaluate the discovery. If the human remains are determined to be of Native American origin, the Coroner must notify the Native American Heritage Commission within 24 hours of this identification.

Impact Significance After Mitigation

The mitigations ensure that cultural resources will be protected to the level required by State regulations, and the impact will be reduced to a ***less-than-significant*** level.

Paleontological Resources

Impact 4.10-B Land alteration proposed by the project could affect undiscovered paleontological resources. This would be a potentially significant impact.

While not expected, it is possible that paleontological resources occur on the project site, which could be damaged by future mining operations. This would be a ***potentially significant impact.***

Mitigation Measures

4.10-B.1 If paleontological resources are found, all work in the vicinity of the find must cease, and a paleontologist and PRMD staff must be notified to develop proper mitigation measures required for the discovery. No earthwork in the vicinity of the find shall commence until a mitigation plan is approved and completed subject to the review and approval of the paleontologist and Project Review staff. This condition shall be noted on all grading and construction plans and provided to all contractors and superintendents on the job site.

Impact Significance After Mitigation

This mitigation measure ensure that paleontological resources will be properly evaluated and, if warranted, preserved. The impact will be reduced to a ***less-than-significant*** level.

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4.11 LAND USE AND PLAN CONSISTENCY

A. Setting

1. Surrounding Land Uses

Mark West Quarry is located at 4611 Porter Creek Road on Sonoma County near its boundary with Napa County (see Figures 3-1 and 3-2). The area immediately surrounding the project site contains steep slopes with a mix of mainly chaparral and evergreen forest. Most of the land is undeveloped, though there is scattered rural residential development south of Porter Creek Road, east and west of Calistoga Road, and along Calistoga/Petrified Forest Road. North of the site, are residences and lodging businesses on Mountain Home Road. The nearest commercial agriculture (vineyards) are north of the quarry property on the north side of Franz Creek. The nearest vineyard is at least 0.75 from the proposed expansion area. The vineyards are at a lower elevation (approximately 300-400 feet below the quarry site).

The quarry has been in operation since 1910. The proposed expansion area is a relatively steep ridge vegetated with chaparral species with some redwood forest, mixed evergreen forest, and grassland. It has no improvements except ranch access roads. The east-west oriented ridge on the northern part of the site is the dividing line between the Porter Creek watershed to the south and the Franz Creek watershed to the north.

B. Existing Land Use Controls

Sonoma County General Plan 2020

The County General Plan contains goals, objectives, and policies aimed at reducing the environmental effects of future uses of the land in the county, including reducing the potential for land use conflicts. Policies pertinent to the proposed project are listed and discussed in the subsequent Project Impacts subsection.

Sonoma County Aggregate Resources Management (ARM) Plan

The Sonoma County Aggregate Resources Management Plan (ARM Plan) was last adopted in 1994. The goal of the ARM Plan is to meet the County's need for aggregate while minimizing environmental impacts and land use conflicts in a manner consistent with the requirements of CEQA, SMARA and State Mineral Resources Management policies. The following objectives contained in the ARM Plan are relevant to the proposed project:

Objective 2: Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.
Objective 7: Change specifications, standards and practices where possible so that quarry rock will be more competitive with instream and terrace sources.
Objective 8: Reduce the need for additional aggregate through utilization of recycled and substitute materials, changes in development standards, and other means possible.

Objective 9: Encourage the retention of locally produced aggregate for use within the Sonoma County.

The ARM Plan also establishes operating and reclamation standards for hard rock quarry mining activities. These include standards for erosion control, slope and bench standards, hazardous materials control, noise standards, days and hours of operation, revegetation standards, successful reclamation standards, and other criteria. These standards have been added to the County's Surface Mining and Reclamation Ordinance, and are referenced as appropriate in other sections of this EIR.

The Sonoma County Aggregate Resource Management Plan (ARM Plan) identifies this quarry as one of the sources of aggregate in the County. The ARM Plan shows a likely expansion area for the quarry onto the parcel that contains the applicant's proposed mining expansion.52 Sonoma County Surface Mining and Reclamation Ordinance (SMARO)

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to the proposed project.

Sec. 26A-09-010. General Standards for Mining Permit and Operations
a) Use permits for surface mining shall not be approved on a parcel if the mining activity is not consistent with the zoning ordinance provisions set forth in Chapter 26 of County Code. To be considered consistent with the Zoning Ordinance, the proposed mining sites must be (1) within a base zoning district where mining is permitted with a use permit, or 2) an area zoned with the "MR" (Mineral Resource) combining district consistent with ARM Plan policies. Rezoning to the "MR" zoning district shall be found consistent with the ARM Plan only in the following cases: rezoning for purposes of quarry operations are limited to the "RRD," "DA," and "LEA" base zoning districts. Rezoning to the "MR" District restricts residential and other incompatible uses normally allowed in the Base Zoning District.

r) Compliance with other Agency and statutory requirements: Operations shall obtain any and all permits and approvals required by other agencies having jurisdiction over the mining operations and provide copies to the County. In addition, all aggregate operations shall be conducted in a manner consistent with the applicable requirements posed by other Federal and State agencies which are charged with enforcing Federal and State laws, including but not limited to, the Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and the Federal Clean Water Act (CWA).

52 Sonoma County Aggregate Resource Management Plan and EIR, County of Sonoma, November 1995,p. 5-35.

s) The owners and operators of aggregate mining operations and reclamation plans shall be responsible for complying with the requirements of the State Surface Mining and Reclamation Act, and the Sonoma County ARM Plan, and all applicable chapters of County Code including, but not limited to, reimbursement of the operator's fair-share of the County's costs for carrying out the administration, mitigation, and monitoring activities set forth in the ARM Plan.

Sec. 26A-09-040. Quarry Mining Standards
d) *Setbacks*. Mining operations, stockpiles, and processing operations are to be set back a minimum of twenty-five feet (25') from the MR zone boundary, the property boundary, and road easements and rights-of-way, whichever is the most restrictive. The minimum allowed setback for quarry mining operations from stream banks and critical habitat areas designated in the general plan is one hundred feet (100'). A minimum two hundred foot (200') setback is also required from the boundary of any general plan residential land use designations. Additional setbacks may be required as a result of site specific reviews in order to mitigate environmental impacts and land use conflicts.

Sec. 26A-11-010. Reclamation Plan Requirements
a) *Requirement for reclamation of mining sites:* All areas disturbed by surface mining operations after January 1, 1976 shall require the approval, implementation, and completion of a reclamation plan. New mining permits shall not be approved until a reclamation plan for the mining site has been approved.
b) *Findings for reclamation plan approval:* All areas disturbed by surface mining operations after January 1, 1976 shall require the approval, implementation, and completion of a reclamation plan. New mining permits shall not be approved until a reclamation plan for the mining site has been approved.

1) The Reclamation Plan complies with SMARA Sections 2772 and 2773, and any other applicable provisions;
2) The Reclamation Plan complies with the applicable requirements of State regulations (CCR Section 3500-3505, and 3700-3713);
3) The Reclamation Plan will restore the mined lands consistent with the Sonoma County General Plan, ARM Plan, and any other applicable specific plan or resource plans;
4) The Reclamation Plan has been reviewed pursuant to CEQA and the County environmental review guidelines, and all significant impacts from the mining operation and the reclamation activities are mitigated to the maximum extent feasible;
5) The land and/or resources such as water bodies to be reclaimed will be restored to a condition that is compatible with, and blends in with, the surrounding natural environment, topography, and other resources, or that suitable off-site development will compensate for related disturbance to resource values;
6) Where the decision of Sonoma County decision-making body is at variance with the recommendations and objections raised by the State Department of Conservation, findings have been adopted to explain the reasons why specific comments and suggestions were not accepted.

B. Potential Impacts and Mitigations

1. Criteria Used to Determine Impact Significance

A project will typically have a significant impact if it meets any of the following criteria:

1. Physically divides an established community.

2. Converts Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.

3. Conflicts with existing zoning for agricultural use or a Williamson Act contract.

4. Involves other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use.

5. Displaces substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

6. Displaces substantial numbers of people, necessitating the construction of replacement housing elsewhere.

7. Conflicts with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;

2. Project Impacts

Less Than Significant Impacts Not Requiring Further Analysis

As reported in the Initial Study, the project would have no impact or a less-than-significant impact per the significance criteria listed below.

Criterion 1 (Division of a Community). The project site is located in a mainly undeveloped area, and the project would not divide any existing community. Accordingly, it would have no impact per Criterion 1.

Criteria 2 and 3 (Farmland and Williamson Act Contract Lands). The project site does not contain Farmland, is not zoned for agricultural use, and is not under a Williamson Act contract, and thus would have no effect per Criteria 2 and 3.

Criterion 4 (Agriculture). The nearest commercial agricultural operations (vineyards) are located to the north of the project site approximately 0.75 miles from the nearest edge of the proposed expansion area. In addition, there is a ridgeline between the expansion area and these vineyards. Therefore, the project would not conflict with other agricultural operations in the area, so there would be no impact per Criterion 4.

Criteria 5 and 6 (Displacement of Housing or People). The site is undeveloped. The project would neither displace housing nor people, so there would be no impact per Criteria 5 and 6.

Land Use Compatibility

Impact 4.11-A The proposed project would expand existing quarry operations onto an undeveloped site, The effect of this expansion on compatibility with surrounding land uses would be less than significant.

The project expansion site is currently undeveloped. As explained in earlier sections of this EIR, the nearest residences to the expansion area are two residences to the west that are located on land owned by the same owner who owns the quarry and expansion site parcels. These two residences would not have views of the expansion. Noise impacts on residents of these two homes can be reduced to a less-than-significant level. Mining expansion could affect groundwater recharge to the aquifer used for wells by one of these residences, but this potential impact can be reduced to a less-than-significant level. The proposed expansion would move active mining closer to these two residences, but as described in previous sections of this EIR, the expansion would not cause a significant impact on residents of these two homes.

There are three residences within 1,500 feet of the expansion area to the south of the project site (south of Porter Creek Road). As described in ***Section 4.7, Aesthetics***, two of the residences are at a higher elevation and have existing views of the quarry operations (there are also distant views of quarry operations from two other residences to the southeast of the site). As described in the section on Aesthetics, the expansion of the quarry would move the view of the active quarry face from these residences to the west. It would not introduce a new view of industrial uses, and the impact of expanding the quarry to the west was found to be less than significant. Likewise noise and other impacts on these residences were found to be less than significant.

To the north of the site (north of the ridgeline that traverses the site), there are commercial recreation facilities, residences, and agricultural operations. People living at or using these facilities or residences would be unable to see the project. Noise and other impacts on these land uses were found to be less than significant.

Given that the project would not introduce a new use to the area, there are few residences or commercial recreational facilities in the general area, and all direct impacts to these surrounding uses can be reduced to a less-than-significant level, it is concluded that the project would not result in a significant land use incompatibility. The impact is less than significant, and no mitigation beyond that recommended previously in this EIR is required.

Consistency with Plans and Policies

CEQA Guidelines Section 15125 (d) requires that an EIR discuss any inconsistencies between the proposed project and applicable general plans and regional plans. For purposes of this EIR, an apparent inconsistency of the project with a policy reflected in the County's general plan documents would not, in and of itself, constitute a significant impact on the environment. Rather, the policies of the Sonoma County General Plan 2020, the Sonoma County Zoning Ordinance, the SMARO, and the Sonoma County ARM Plan are used as sources of criteria for assessing potential environmental effects identified throughout this EIR. Ultimately, the Sonoma County Permit and Resource Management Department will make recommendations to the Sonoma County Planning Commission and Board of Supervisors regarding the consistency of the project with the General Plan and the project site's suitability for the proposed use. In the following consistency review, the finding that the proposed project would be consistent with the policy is the opinion of the EIR preparers; in all cases the conclusion would be that the proposed project "appears to be consistent with" the cited policy. Again, the County is responsible for making final decisions regarding project consistency with County policies.

The Sonoma County General Plan 2020 designates the existing quarry and the proposed expansion area as Resource and Rural Development, 100-acre density (RRD,100), which permits surface mining operations consistent with the ARM Plan, subject to the standards of the SMARO. The project would be required to meet all applicable requirements of the ARM Plan and SMARO, consequently, the proposed project would be consistent with the General Plan RRD land use designation. The project site is currently zoned RRD (Resources and Rural Development), 100-acre density. The existing quarry parcel (APN 120-210-048) is also zoned as Mineral Resource Combining District (MR). Properties to the south, east, and west are designated RRD,100, while the property to the north is designated RRD,20 (20-acre density). A General Plan policy-by-policy consistency analysis is presented later in this section.

The MR combining district overlay that is proposed would allow mining on the project site with the issuance of a surface mining use permit and the approval of a reclamation plan. The SMARO requires mining operations to have a surface mining use permit (or vested right), reclamation plan, and financial assurance approved prior to commencing mining operations. These requirements would be met by imposing conditions of approval for the project that require compliance with the operational and reclamation standards of the SMARO. Thus, the project appears to be consistent with the proposed MR zoning overlay designation for the site.

The project appears to be consistent with the ARM Plan, which identifies the expansion site as a potential quarry expansion area. The project, as designed and mitigated, would be consistent with ARM Plan objectives for developing expanded quarry operations at designated sites to meet the needs for aggregate in an environmentally sound manner, and providing a local source of aggregate for use within the County. The operating and reclamation standards for hard rock mining activities established in the ARM Plan have been added to the SMARO, and the conditions of approval of the project would require compliance with the operational and reclamation standards of the SMARO.

Sonoma County General Plan 2020

The following consistency analysis discusses project consistency with County General Plan 2020 policies that are designated in the plan as policies that are needed to mitigate significant General Plan impacts (these policies are designated with a star * in the General Plan text). Where policies are all related to the same issue, they are grouped together below, and one common response is provided. Many of the General Plan 2020 policies do not apply to the project as they address issues that are not related to specific projects, not related to this type of project or site, or otherwise not pertinent to the project; these policies that do not apply to this project are enumerated at the end of each element discussion.

Land Use Element

Policy LU-4b: *Use the levels of service in Objectives CT-3.1, CT-3.2, and CT-3.3 of the Circulation and Transit Element to determine whether or not congestion is exceeding the desired level of service on County roadway segments. Use area and/or project traffic analyses to determine whether intersection impacts or other localized congestion may also affect these desired levels of service.**

Policy LU-4b: *Use the levels of service in Objectives CT-3.1, CT-3.2, and CT-3.3 of the Circulation and Transit Element to determine whether or not congestion is exceeding the desired level of service on County roadway segments. Use area and/or project traffic analyses to determine whether intersection impacts or other localized congestion may also affect these desired levels of service.**

Policy LU-4f: *Assure that new development contributes its fair share toward provision of the public services and infrastructure needed for projected growth.**

> *Consistent.* The project would not cause an unacceptable level of service at an intersection nor have a significant impact on intersections currently operating at an unacceptable level of service. The project would result in a significant contribution to a cumulative unacceptable level of service at one intersection. The EIR recommends signalizing this intersection, and the applicant would be responsible for paying its fair share of these signalization improvements and all other adopted County-required transportation-based fees.

Policy LU-11a: *Encourage reduction in greenhouse gas emissions, including alternatives to use of gas-powered vehicles. Such alternatives include public transit, alternatively fueled vehicles, bicycle and pedestrian routes, and bicycle and pedestrian friendly development design.**

Policy LU-11b: *Encourage all types of development and land uses to use alternative renewable energy sources and meaningful energy conservation measures.**

> *Consistent.* About 60% of the quarry mechanical equipment would be powered by solar energy.

Policy LU-11c: *Encourage the use of alternatives to harmful chemicals, heavy metals, and synthetic compounds.**

> *Consistent.* The project does not use toxic materials except for petrochemicals and lubricants commonly used by heavy equipment.

Policy LU-11e: *Encourage use of compact and mixed use development that minimizes the need to drive, re-uses existing infill and brownfield sites that have been reclaimed and remediated before using open land, and avoids sprawl.**

Consistent. The project is an extension of an existing quarry, consistent with the County's ARM Plan. The site is not suitable for mixed use development.

Policy LU-11f: *Encourage conservation of undeveloped land, open space, and agricultural lands, protection of water and soil quality, restoration of ecosystems, and minimization or elimination of the disruption of existing natural ecosystems and flood plains.**

Consistent. While the project will extract mineral resources from undeveloped land, this is consistent with the objectives of the County's ARM Plan. The site would be reclaimed to provide replacement open space and natural ecosystems.

Policy LU-11g: *Encourage development and land uses that reduce the use of water. Where appropriate, use recycled water on site, and employ innovative wastewater treatment that minimizes or eliminates the use of harmful chemicals and/or toxics.**

Consistent. The quarry includes a wash plant that recirculates wash water to reduce water use. Water collected in project site retention ponds would be used for dust control and other on-site uses. Reclaimed wastewater is not available at the site.

Policy LU-11h: *Encourage development and land uses that pursue reduction and re-use of by-products and waste, especially approaches that also employ waste as a resource, such as eco-industrial development.**

Consistent. The quarry would allow recycling of asphalt and concrete.

Policy for Resources and Rural Development Areas Purposes and Definition*. This category allows very low density residential development and also is intended to:*

(1) Protect timberlands needed for commercial timber production under the California Timberland Productivity Act,
(2) Protect lands needed for geothermal resource production,
(3) Protect lands for aggregate resource production as identified in the Aggregate Resources Management Plan,
(4) Protect natural resource lands including, but not limited to watershed, fish and wildlife habitat and biotic areas,
(5) Protect against intensive development of lands constrained by geologic hazards, steep slopes, poor soils or water, fire and flood prone areas, biotic and scenic areas, and other constraints,
(6) Accommodate agricultural production activities but limit such activities on timberland, or
(7) Protection of county residents from proliferation of growth in areas where there are inadequate public services and infrastructure, including water supply and safe wastewater disposal.

Consistent. The extraction of aggregates is an allowed use under this land use classification.

The following General Plan mitigating policies do not apply to the project: LU-1b, 1f, 1g, 1i, 2a, 2b, 2d, 3a through 3e, 4a, 4d, 5b, 5e, 6a, 6g, 11d, 11i, and 11j.

Agricultural Resources Element

There are no policies in this element that apply to the project because the project is not an agricultural property and the nearest commercial agricultural uses are at least 0.75 from the proposed expansion area.

Open Space and Resource Conservation Element

Policy OSRC-3b: *For development on parcels located both within Scenic Landscape Units and adjacent to Scenic Corridors, apply the more restrictive siting and setback policies to preserve visual quality.*
Policy OSRC-3c: *Establish a rural Scenic Corridor setback of 30 percent of the depth of the lot to a maximum of 200 feet from the centerline of the road unless a different setback is provided in the Land Use Policies for the Planning Areas. Prohibit development within the setback with the following exceptions:* (none of the exceptions apply to this project).*

> *Consistent.* The project will not involve constructing new buildings within 200 feet of the centerline of Porter Creek Road, and the edge of mining activity will also be over 200 feet from the road centerline. There will be rock safety barriers installed above Porter Creek Road to protect the road and motorists from falling rock. However, these barriers are not so substantive an improvement as to be considered “development.” These barriers would be removed as mining progresses to the west, and all barriers would be removed at the final reclamation stage.

Policy OSRC-4a: *Require that all new development projects, County projects, and signage utilize light fixtures that shield the light source so that light is cast downward and that are no more than the minimum height and power necessary to adequately light the proposed use.**
Policy OSRC-4b: *Prohibit continuous all night exterior lighting in rural areas, unless it is demonstrated to the decision making body that such lighting is necessary for security or operational purposes or that it is necessary for agricultural production or processing on a seasonal basis. Where lighting is necessary for the above purposes, minimize glare onto adjacent properties and into the night sky.**
Policy OSRC-4c: *Discourage light levels that are in excess of industry and State standards.**

> *Consistent.* The project would not operate at night except during emergencies with County approval. No additional lighting is proposed for the quarry expansion.

Policy OSRC-7c: *Notify discretionary and ministerial permit applicants of possible requirements of Federal and State regulatory agencies related to jurisdictional wetlands or special status species.**

> *Consistent.* The Draft EIR will be submitted for review to pertinent Responsible and Trustee Agencies.

Policy OSRC-7d: *In all areas outside Urban Service Areas, encourage property owners to utilize wildlife friendly fencing and to minimize the use of outdoor lighting that could disrupt native wildlife movement activity.**

> *Consistent.* The only new fencing would be the rock fall barriers on the steep slope above Porter Creek Road and security fencing around the active mining area. The barriers and fencing would be temporary, plus they would not block a

significant wildlife travel corridor. At the reclamation stage, wildlife could travel to the reclaimed benches and the quarry floor. Wildlife-friendly fencing is not feasible as the purpose of the security fencing is to prohibit ingress to hazardous areas and steep terrain. The project would not add new lighting.

Policy OSRC-7o: *Encourage the use of native plant species in landscaping. For discretionary projects, require the use of native or compatible non-native species for landscaping where consistent with fire safety. Prohibit the use of invasive exotic species.**
Policy OSRC-7p: *Support voluntary programs for habitat restoration and enhancement, hazardous fuel management, removal and control of invasive exotics, native plant revegetation, treatment of woodlands affected by Sudden Oak Death, use of fencerows and hedgerows, and management of biotic habitat.**

Consistent. Portions of the project site will be reclaimed with native plant species as mining of that area ceases. Eventually, the entire site will be reclaimed.

Policy OSRC-8b: *Establish streamside conservation areas along both sides of designated Riparian Corridors as follows, measured from the top of the higher bank on each side of the stream as determined by PRMD:*
*(1) Russian River Riparian Corridor: 200' (2) Flatland Riparian Corridors: 100' (3) Other Riparian Corridors: 50'**

Consistent. The Open Space Plan Map in the General Plan shows that one tributary on the expansion area is a designated stream. However, most of this tributary was filled as part of the emergency grading project that occurred in 2006; no additional filling of the remaining portion of the tributary would occur under the proposed project. The proposed project would not affect any designated stream. This EIR requires mitigations for filling of non-designated streams and wetlands on the site. In addition, Policy OSRC-8d allows permitted mining activities within streamside conservation areas.

Policy OSRC-8i: *As part of the environmental review process, refer discretionary permit applications near streams to CDFG and other agencies responsible for natural resource protection.**
Policy OSRC-8j: *Notify permit applicants of possible Federal and State permit requirements in areas near streams and notify landowners whose property overlaps or touches a designated Riparian Corridor regarding the public hearings on the proposed regulations affecting them.**

Consistent. The Draft EIR will be submitted for review to pertinent Responsible and Trustee Agencies.

Policy OSRC-11a: *Design discretionary projects so that structures and roads are not located on slopes of 30 percent or greater. This requirement is not intended to make any existing parcel unbuildable if Health and Building requirements can be met.**
Policy OSRC-11b: *Include erosion control measures for any discretionary project involving construction or grading near waterways or on lands with slopes over 10 percent.**
Policy OSRC-11d: *Require a soil conservation program to reduce soil erosion impacts for discretionary projects that could increase waterway or hillside erosion. Design improvements such as roads and driveways to retain natural vegetation and topography to the extent feasible.**

Consistent. The project would not include constructing new roads or structures. This EIR recommends as a mitigation measure that no roads or trails would be constructed to install the proposed rockfall barriers. The project includes erosion control measures, and this EIR includes additional erosion control mitigations.

Policy OSRC-11e: *Retain natural vegetation and topography to the extent economically feasible for any discretionary project improvements near waterways or in areas with a high risk of erosion as noted in the Sonoma County Soil Survey.**

Consistent. Retaining vegetation for a mining project is not "economically feasible." Upon termination of mining, the site will be reclaimed including revegetation with native species.

Policy OSRC-13a: *Consider lands designated in the ARM Plan as priority sites for aggregate production and mineral extraction and review requests for additional designations for conformity with the General Plan and the ARM Plan.**
Policy OSRC-13b: *Review projects for environmental impact and land use conflicts and consider the following minimum factors when approving mining permits: topsoil salvage, vegetation, fisheries and wildlife impacts, noise, erosion control, roadway conditions and capacities, reclamation and bonding, air quality, energy consumption, engineering and geological surveys, aggregate supply and replenishment, drainage, and the need for economical aggregate materials.**

Consistent. Preparation of this EIR provides consistency with the stated review requirements.

Policy OSRC-14d: *Support project applicants in incorporating cost effective energy efficiency that may exceed State standards**
Policy OSRC-15c: *Encourage and promote the use of renewable energy and distributed energy generation systems and facilities that are integral to and contained within existing and new development (e.g., solar thermal installations to provide space and water heating or solar electric installations for small commercial buildings or residences in rural areas, small wind energy systems to provide electricity to agricultural accessory structures, etc.).**

Consistent. The applicant will use solar energy to power about 60% of the onsite equipment used for aggregate processing.

Policy OSRC-16a: *Require that development projects be designed to minimize air emissions. Reduce direct emissions by utilizing construction techniques that decrease the need for space heating and cooling.**
Policy OSRC-16d: *Review proposed changes in land use designations for potential deterioration of air quality and deny them unless they are consistent with the air quality levels projected in the General Plan EIR.**
Policy OSRC-16i: *Ensure that any proposed new sources of toxic air contaminants or odors provide adequate buffers to protect sensitive receptors and comply with applicable health standards. Promote land use compatibility for new development by using buffering techniques such as landscaping, setbacks, and screening in areas where such land uses abut one another.**

Consistent. The air quality analysis included in this EIR concludes that air quality impacts of the project can all be reduced to a less-than-significant level.

Policy OSRC-18f: *Ensure the provision of adequate bikeways while preserving visual quality along Scenic Corridors.**
Policy OSRC-18g: *Make every effort to provide minimum 4 foot wide bicycle lanes on all roads designated as Class II bikeways in the Bikeways Network. When traffic markings on*

*roads are modified, existing minimum 4 foot wide lanes should be maintained wherever feasible. Where it is infeasible for minimum 4 foot wide lanes, use striped edgelines or other techniques to provide the widest possible lane for bicyclists.**
Policy OSRC-18h: *Where feasible, avoid parking on designated Class II bikeways unless the removal of parking adversely affects adjacent property owners.**
Policy OSRC-18q: *Use the following criteria to determine consistency of public and private projects with this element:*
(1) Development of lands traversed or adjoined by a designated Class I bikeway accommodates, and does not conflict, with development of the bikeway.
(2) Construction or widening of roads designated for Class II bikeways meets the criteria for Class II bikeways specified in the Bikeways Plan.
(3) Construction or widening of roads designated for Class III bikeways meets the criteria for Class III bikeways specified in the Bikeways Plan.
*In the event that a project proposed without inclusion of a bikeway has a significant, overriding public benefit, or no funds are available for bikeway construction, the project may be found consistent with this Element and the Bikeways Plan if it does not preclude future construction of a bikeway and if it makes the best feasible provision for interim bicycle travel.**

> *Consistent.* The project would be required to contribute its fair share to planned future bikeway improvements to Mark West Springs Road and Porter Creek Road.

Policy OSRC-19k: *Refer applications for discretionary permits to the Northwest Information Center to determine if the project site might contain archaeological or historical resources. If a site is likely to have these resources, require a field survey and preparation of an archaeological report containing the results of the survey and include mitigation measures if needed.**
Policy OSRC-19l: *If a project site is determined to contain Native American cultural resources, such as sacred sites, places, features, or objects, including historic or prehistoric ruins, burial grounds, cemeteries, and ceremonial sites, notify and offer to consult with the tribe or tribes that have been identified as having cultural ties and affiliation with that geographic area.**
Policy OSRC-19m: *Develop procedures for consulting with appropriate Native American tribes during the General Plan adoption and amendment process.**
Policy OSRC-19n: *Develop procedures for complying with the provisions of State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, if applicable, in the event of the discovery of a burial or suspected human bone. Develop procedures for consultation with the Most Likely Descendant as identified by the California Native American Heritage Commission, in the event that the remains are determined to be Native American.**

> ***Consistent.*** The cultural resources study done for this EIR meets all the requirements set forth in these policies.

The following General Plan mitigating policies do not apply to the project: OSRC-1a through 1k, 2a through 2f, 3a. 3d, 3g through 3i, 5b, 6a, 7a, 7b, 7e through 7i, 7i, 7m, 7n, 7q though 7u, 8q, 8c through 8e, 8h, 8k, 8l, 9a, 11c, 11f, 11g, 12b, through 12e, 13c, 14a through 14c, 14f through 14i, 14j, 15b, 15d, 15f, 16e through 16g, 16k through 16m, 18a though 18e, 18j though 18p, 18r though 18v, 10a through 19j.

Water Resources Element

Policy WR-1g: *Minimize deposition and discharge of sediment, debris, waste and other pollutants into surface runoff, drainage systems, surface water bodies, and groundwater.**
Policy WR-1h: *Require grading plans to include measures to avoid soil erosion and consider upgrading requirements as needed to avoid sedimentation in stormwater to the maximum extent*

*practicable.**
Policy WR-1k: *Seek opportunities to participate in developing programs and implementing projects for water quality restoration and remediation with agencies and organizations such as RWQCBs, the California Department of Fish and Game, and RCDs in areas where water quality impairment is a concern. Consider allowing expanded treatment options for contaminated water from individual wells.**

> ***Consistent.*** The project complete with the erosion control measures and water quality protection measures recommended in this DEIR would be consistent with policies aimed at protecting water quality in streams draining the site. All water quality impacts would be reduced to a less-than-significant level.

Policy WR-2a: *Encourage and support research on and monitoring of local groundwater conditions, aquifer recharge, watersheds and streams where needed to assess groundwater quantity and quality.**
Policy WR-2e (formerly RC-3h): *Require proof of groundwater with a sufficient yield and quality to support proposed uses in Class 3 and 4 water areas. Require test wells or the establishment of community water systems in Class 4 water areas. Test wells may be required in Class 3 areas. Deny discretionary applications in Class 3 and 4 areas unless a hydrogeologic report establishes that groundwater quality and quantity are adequate and will not be adversely impacted by the cumulative amount of development and uses allowed in the area, so that the proposed use will not cause or exacerbate an overdraft condition in a groundwater basin or subbasin. Procedures for proving adequate groundwater should consider groundwater overdraft, land subsidence, saltwater intrusion, and the expense of such study in relation to the water needs of the project.**
Policy WR-2g: *In cooperation with Sonoma County Water Agency (SCWA), DWR, and other public agencies and well owners, support the establishment and maintenance of a system of voluntary monitoring of wells throughout the county, utilizing public water system wells and private wells where available. Encourage participation in voluntary monitoring programs, and, if funds are available, consider funding of well monitoring where determined necessary in order to stimulate participation.**

> ***Consistent.*** Project wells would provide sufficient water to meet project water demand except for the single extremely dry year, and mitigation is recommended for that scenario so that production would be reduced if there is insufficient water to meet the dust control requirements of the quarry's Permit to Operate. The applicant has provided hydrologic data on the site wells consistent with the requirement to show proof of available groundwater.

Policy WR-4a: *Encourage disposal methods that minimize reliance on discharges into natural waterways. If discharge is proposed, review and comment on projects and environmental documents and request that projects maximize reclamation, conservation and reuse programs to minimize discharges and protect water quality and aquifer recharge areas.**
Policy WR-4b: *Use water effectively and reduce water demand by developing programs to: (1) Increase water conserving design and equipment in new construction, including the use of design and technologies based on green building principles, (2) Educate water users on water conserving landscaping and other conservation measures, (3) Encourage retrofitting with water conserving devices, (4) Design wastewater collection systems to minimize inflow and infiltration, and (5) Reduce impervious surfaces to minimize runoff and increase groundwater recharge.**
Policy WR-4e: *Require water conserving plumbing and water conserving landscaping in all new development projects and require water conserving plumbing in all new dwellings. Promote programs to minimize water loss and waste by public water suppliers and their customers. Require County operated water systems to minimize water loss and waste.**
Policy WR-4g: *Require that development and redevelopment projects, where feasible, retain*

*stormwater for on-site use that offsets the use of other water.**

> ***Consistent.*** Project-generated wastewater is treated and disposed of via a County-approved on-site septic system. The project reuses stormwater to the maximum extent possible given the steep topography. The site contains ponds and little impervious surface to encourage aquifer recharge. It uses a wash plant that recycles wash water. New plumbing facilities would not be required for the project. The project complete with recommended mitigations would be consistent with all these policies aimed at maximizing the use of rainfall on the site.

The following General Plan mitigating policies do not apply to the project: WR-1a through 1f, 1i, 1j, 1l through 1v, 2b through 2d, 2f, 2h through 2n, 3a through 3r, 4c, 4d, 4f, and 4h through 4l.

Public Safety Element

Policy PS-1a: *Continue to utilize all available data on geologic hazards and related risks from the appropriate agencies.**
Policy PS-1b: *Continue to utilize studies of geologic hazards prepared during the development review process.**
Policy PS-1f: *Require and review geologic reports prior to decisions on any project which would subject property or persons to significant risks from the geologic hazards shown on Figures PS-1a through PS-1i and related file maps and source documents. Geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability.**

> *Consistent.* This EIR includes a geologic assessment of the proposed project. Geologic impacts can be reduced to a less-than-significant level.

Policy PS-3b: *Consider the severity of natural fire hazards, potential damage from wildland and structural fires, adequacy of fire protection and mitigation measures consistent with this element in the review of projects.**

> *Consistent.* This EIR includes an assessment of fire hazard, and finds that the impact can be reduced to a less-than-significant level.

The following General Plan mitigating policies do not apply to the project: PS-1c, through 1e, 1g through ik, 1m through 1o, 2a through 2w, 3a through 3l, 4a through 4o**.**

Circulation and Transportation Element

Policy CT-1m: *Require development projects contribute a fair share for development of alternative transportation mode facilities, including pedestrian and bicycle facilities along project frontages and links from these to nearby alternative mode facilities. Development near urban boundaries should provide safe access to the urban area.*
Policy CT-2f: *Require discretionary development projects to provide bicycle and pedestrian improvements and gap closures necessary for safe and convenient bicycle and pedestrian travel between the project and the public transit system*.*
Policy CT-3n: *Use the following criteria to determine consistency of public and private projects with the Bikeways Plan:*

(1) Development of lands traversed or adjoined by an existing or future Class I bikeway shall not preclude establishment of the bikeway, nor conflict with use and operation of the bikeway or adversely affect long term maintenance and safety of the facility.
*(2) Construction, widening, or maintenance of roads with designated bikeways meets the design and maintenance standards for the appropriate class of bikeway as specified by the Bikeways Plan.**

> *Consistent.* The project would be required to contribute its fair share to the future bikeway improvements to Mark West Springs Road and Porter Creek Road.

Policy CT-4a: *Use the levels of service established in Objectives CT-4.1 and 4.3 to determine whether or not roadway segment congestion would exceed the desired LOS on the countywide road system. In cases where a roadway segment is designated as LOS F on Figure CT-3, a PM peak volume to capacity ratio of 1.2 is the acceptable LOS, with the exception of road segments shown below, for which the acceptable LOS is determined by the volume to capacity ratio or LOS as indicated.**
Policy CT-4b: *Use area and/or project traffic analyses to determine if intersections meet the LOS standards of Objectives CT-4.2 and CT-4.3. Based on this analysis, identify and implement intersection improvements needed to achieve LOS D.**

> *Consistent.* The project would result in a significant contribution to a cumulative unacceptable level of service at one intersection (in 2035). The EIR recommends signalizing this intersection, and the applicant would be responsible for paying its fair share of these signalization improvements as well as all other pertinent County-required truck transportation-based fees.

Policy CT-4f: *Implement safety improvements when and where problems arise. Where safety problems may result from a proposed project, require the safety improvements as a condition of approval.**
Policy CT-6f: *Review and condition discretionary development projects in the unincorporated area to assure that the LOS and/or public safety objectives established in Policy CT-3a and CT-3b are being met. If the proposed project would result in a LOS worse than these objectives, consider denial of the project unless one or more of the following circumstances exists:*
(1) The improvements needed to meet the LOS and/or public safety objectives will be completed prior to occupancy of the use,
(2) Funding is identified and committed to completion of the needed improvements, or
*(3) A fee or fair share contribution has been established for the needed improvement that will fully fund the project's fair share of the future improvements.**
Policy CT-6g: *Require that new development provide project area improvements necessary to accommodate vehicle and transit movement in the vicinity of the project, including capacity improvements, traffic calming, right-of-way acquisition, access to the applicable roadway, safety improvements, and other mitigation measures necessary to accommodate the development.**

> *Consistent:* The traffic analysis prepared for this EIR assessed impacts to intersection LOS and traffic safety and identified mitigation measures needed to reduce the significant impacts to a less-than-significant level. The applicant would be responsible for paying its fair share of those mitigations. Because the mitigations are unprogrammed and unfunded, the project would not meet the three criteria for approval listed under Policy CT-6f. The County will need to determine whether the project should be approved given that fact.

The following General Plan mitigating policies do not apply to the project: CT-1a through 1l, 1n through 1q, 2a through 2e, 2g through 2z, 3a through 3m, 3u, 3bb, 3cc, 3ff, 3gg, 3ccc through 3ggg, 3jjj through 3nnn, 7f4d, 4e, 4g, 4h, 4i, 4n, 5a, 5c, 6b through 6d.

Public Facilities and Services Element

Policy PF-2l: *Continue to implement State law pertaining to school impact mitigation that allows for the dedication of land, the payment of fees, or both, as a condition of approval for development projects.**
Policy PF-2n: *Require prior to discretionary project approval written certification that fire and related services customarily provided to comparable uses are available or will be available prior to occupancy for projects within the service area of the applicable fire agency.**

> *Consistent.* The project will pay required school mitigation fees. The project will not result in a significant increase in the demand for fire services. Nevertheless, the applicant will need to provide the required written certifications from the Sonoma County Fire and Emergency Services Department and the Sonoma County Sheriff's Office. These agencies have reviewed the project in response to queries from the EIR preparers, and none have indicated significant concerns with the project.

The following General Plan mitigating policies do not apply to the project: PF-1a through 1i, 2a, 2b, 2f, 2k, 2o through 2t, 3e, 3i, 3j,

Noise Element

Policy NE-1c: *Control non-transportation related noise from new projects. The total noise level resulting from new sources shall not exceed the standards in Table NE-2 as measured at the exterior property line of any adjacent noise sensitive land use. Limit exceptions to the following:*
(1) If the ambient noise level exceeds the standard in Table NE-2, adjust the standard to equal the ambient level, up to a maximum of 5 dBA above the standard, provided that no measurable increase (i.e. +/- 1.5 dBA) shall be allowed
Mitigate noise from recreational and visitor serving uses.
(2) Reduce the applicable standards in Table NE-2 by five dBA for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises, such as pile drivers and dog barking at kennels
(3) Reduce the applicable standards in Table NE-2 by 5 decibels if the proposed use exceeds the ambient level by 10 or more decibels
(4) For short term noise sources which are permitted to operate no more than six days per year, such as concerts or race events, the allowable noise exposures shown in Table NE- 2 may be increased by 5 dB. These events shall be subject to a noise management plan including provisions for maximum noise level limits, noise monitoring, complaint response and allowable hours of operation. The plan shall address potential cumulative noise impacts from all events in the area.
(5) Noise levels may be measured at the location of the outdoor activity area of the noise sensitive land use, instead of the exterior property line of the adjacent noise sensitive land use where:
(a) the property on which the noise sensitive use is located has already been substantially developed pursuant to its existing zoning, and
(b) there is available open land on those noise sensitive lands for noise attenuation.
*This exception may not be used on vacant properties which are zoned to allow noise sensitive uses.**
Policy NE-1d: *Consider requiring an acoustical analysis prior to approval of any discretionary project involving a potentially significant new noise source or a noise sensitive land use in a noise impacted area. The analysis shall:*

(1) Be the responsibility of the applicant, (2) Be prepared by a qualified acoustical consultant, (3) Include noise measurements adequate to describe local conditions,
(4) Include estimated noise levels in terms of Ldn and/or the standards of Table NE-2 for existing and projected future (20 years hence) conditions, based on accepted engineering data and practices, with a comparison made to the adopted policies of the Noise Element. Where low frequency noise (ex: blasting) would be generated, include assessment of noise levels and vibration using the most appropriate measuring technique to adequately characterize the impact,
(5) Recommend measures to achieve compliance with this Element. Where the noise source consists of intermittent single events, address the effects of maximum noise levels on sleep disturbance,
(6) Include estimates of noise exposure after these measures have been implemented, and
*(7) Be reviewed by the Permit and Resource Management Department and found to be in compliance with PRMD guidelines for the preparation of acoustical analyses.**

> *Consistent.* A noise analysis of the project was prepared for this EIR. All project-generated noise impacts can be reduced to a less-than-significant level.

The following General Plan mitigation policies do not apply to the project: NE-1a, 1b, 1g, 1h, and 2b.

Other Elements

Policies in the Housing Element and the Air Transportation Element do not apply to this project.

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4.12 ENERGY

Energy conservation implies a wise and efficient use of energy with several methods available to obtain this goal such as: decreasing overall per capita energy consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy resources. In accordance with Appendix F, Energy Conservation, of the CEQA Guidelines, potentially significant energy implications of a project should be considered in an EIR.

A. Setting

This section discusses the current state of energy use in California and Sonoma County.

Energy Use

Until May 2011, PG&E supplied the electricity required to operate the quarry's stationary equipment. In 2011, the applicant installed an 809.34 kW (kilowatt) photovoltaic system, which currently provides all the electricity needed to power existing quarry operations.

California consumed 274,985 gigawatt hours (GWH) of electricity in 2010, while in that same year Sonoma County consumed 297,491 GWH.[53] California's electrical energy sources include 53.4% from natural gas, 15.7% from nuclear, 14.6% from large hydropower, 1.7% from coals, and 14.6% from renewables.[54] In 2010, California had the lowest per capita electrical use in the country (6,721 kilowatt hours per capita).

In 2002, California established its Renewable Portfolio Standard program with the goal of increasing the annual percentage of renewable energy in the State's electricity mix by the equivalent of at least 1% of sales, with an aggregate total of 20% by 2017. The California Public Utilities Commission subsequently accelerated that goal to 2010 for retail sellers of electricity (Public Utilities Code Section 399.15(b)(1)). Then-Governor Schwarzenegger signed Executive Order S-14-08 in 2008, increasing the target to 33% renewable energy by 2020.

In September 2009, then-Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the Air Resources Board under its Assembly Bill (AB) 32 authority to enact regulations to help the State meet its Renewable Portfolio Standard goal of 33% renewable energy by 2020. In September 2010, the California Air Resources Board adopted its Renewable Electricity Standard regulations, which require all of the State's load-serving entities to meet this target. Additional energy efficiency measures are needed to meet these goals as well as the AB 32 greenhouse gas (GHG) reduction goal of reducing statewide GHG emissions to 1990 levels by 2020 (see Section 4.5, Air Quality, for a discussion of AB 32).

California's energy goals include reducing energy use in existing homes and commercial

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[53] California Energy Commission, Electricity Consumption by County at: http://ecdms.energy.ca.gov/elecbycounty.aspx

[54] California Energy Commission at: http://energyalmanac.ca.gov/electricity/total_system_power.html

buildings, generating one-third of the State's electricity using renewable resources, decreasing petroleum dependence through the use of alternative transportation fuels and vehicles, and reducing greenhouse gas emissions to 1990 levels by 2020.[55] Energy efficiency is one of the State's priority goal because it has the biggest potential for long-term and lasting energy savings, and California's energy efficiency policies over the last 30 years have saved California consumers more than $56 billion in energy costs.

Through 2010, California has been awarded approximately $5 billion from the American Recovery and Reinvestment Act of 2009 that will help meet these goals and foster energy efficiency, build the domestic renewable industry, modernize the electric transmission grid, and increase the use of alternative fuels and vehicles. As of December 2010, project developers are proposing 345 new renewable power plants in California, and the California Energy Commission certified nine solar thermal power plants that sought funding under the American Recovery and Reinvestment Act of 2009.

Current Energy Providers

Sonoma County receives most of its electricity from Pacific Gas and Electric Company (PG&E), which also provides natural gas and electricity to most of Northern California. PG&E has an electricity generation portfolio that totals approximately 6,870 megawatts.[56] In total, the 2010 PG&E power mix consisted of natural gas (19.6%), coal (1.0%), large hydroelectric plants (15.6%), nuclear (23.8%), eligible renewable resources (15.9%), other fossil fuel (1.2%), and unspecified sources (22.9%). Renewable Portfolio Standard-eligible renewable resources used include geothermal (30.5%), biomass and waste (26.6%), small hydroelectric (18.3%), wind (24.0%), and solar (0.5%). In 2010, PG&E's retail customers purchased 77,485 GWH of electricity.[57]

Transportation Fuels

California's transportation sector uses roughly half of the energy consumed in the State. In 2007, the California Energy Commission, in partnership with the California Air Resources Board and other State, Federal, and local agencies, prepared the State Alternative Fuels Plan which identifies strategies to increase the use of alternative fuels to meet California's goals for reducing petroleum consumption, improving energy security, and increasing in-State production of biofuels.

Regulatory Framework

Federal Regulations

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards and

[55] California Energy Commission "2010 Integrated Energy Policy Report Update," CEC-100-2010-001-CMF. http://www.energy.ca.gov/2012_energypolicy/
[56] Pacific Gas and Electric Company (PG&E), "2009 Corporate Responsibility and Sustainability Report, PG&E's Sustainable Journey: Recommitting and Refocusing for the Journey Ahead." At http://www.pgecorp.com/corp_responsibility/reports/2010/
[57] Ibid.

seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under the act, consumers and businesses can attain Federal tax credits for purchasing fuel-efficient appliances and products, including hybrid vehicles; constructing energy-efficient buildings; and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment. Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in 2007, strengthens the key energy management goals for the Federal government and sets more challenging goals than the Energy Policy Act of 2005. The energy reduction and environmental performance requirements of Executive Order 13423 were expanded upon in Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance), signed in 2009.

Energy and Independence Security Act of 2007 and Corporate Average Fuel Economy Standards

The Energy and Independence Security Act of 2007 sets federal energy management requirements in several areas, including energy reduction goals for federal buildings, facility management and benchmarking, performance and standards for new buildings and major renovations, high-performance buildings, energy savings performance contracts, metering, energy-efficient product procurement, and reduction in petroleum use and increase in alternative fuel use. This act also amends portions of the National Energy Policy Conservation Act.

State Regulations

2008 California Energy Action Plan Update

The *2008 Energy Action Plan Update* provides a status update to the *2005 Energy Action Plan II,* which is the State of California's principal energy planning and policy document. The plan continues the goals of the original *Energy Action Plan*, describes a coordinated implementation plan for State energy policies, and identifies specific action areas to ensure that California's energy is adequate, affordable, technologically advanced, and environmentally sound. First-priority actions to address California's increasing energy demands are energy efficiency, demand response (i.e., reduction of customer energy usage during peak periods in order to address system reliability and support the best use of energy infrastructure), and the use of renewable sources of power. To the extent that these actions are unable to satisfy the increasing energy and capacity needs, the plan supports clean and efficient fossil-fired generation.

California Green Building Standards Code

The 2010 California Green Building Standards Code, as specified in Title 24, Part 11 of the California Code of Regulations, specifies building standards to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. The provisions of this code apply to the planning, design, operation, construction, replacement, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such building structures throughout California.

Building Energy Efficiency Standards

Senate Bill 1078 and 107 and Executive Order S-14-08 and S-21-09

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the State's Renewable Portfolio Standard to 33% renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the ARB under its AB 32 authority to enact regulations to help the State meet its Renewable Portfolio Standard goal of 33% renewable energy by 2020.

Local Regulation

Sonoma County General Plan 2020

The County General Plan includes several goals, objectives and policies related to energy conservation and efficiency. The following objectives and policies are the most relevant to the project:

***Goal OSRC-14*:** Promote energy conservation and contribute to energy demand reduction in the County.
***Objective OSRC-14.1*:** Increase energy conservation and improve energy efficiency in County government operations.
***Objective OSRC-14.2*:** Encourage County residents and businesses to increase energy conservation and improve energy efficiency.
Objective OSRC-14.4: Reduce greenhouse gas emissions by 25% below 1990 levels by 2015.
***Policy OSRC-14d*:** Support project applicants in incorporating cost effective energy efficiency that may exceed State standards.

B. Potential Impacts and Mitigation Measures

1. Criteria Used for Determining Impact Significance

Based on the *CEQA Guidelines*, the project would have a significant impact on energy if:

1. It would result in wasteful, inefficient and unnecessary usage of energy as identified by CEQA Section 21100(b)(3) and CEQA Guidelines Section 15126(a)(1).

2. It would require a substantial increase in demand or transmission services which would require the construction of new or expanded energy production and supply facilities.

2. Project Impacts and Mitigations

Project Use of Energy

Impact 4.12-A Expanded quarry production would not result in the wasteful or inefficient use of fuel or energy. This would be a less-than-significant impact.

Currently, electricity is produced at the quarry by an 809.34 kW (kilowatt) photovoltaic system. The system is designed to produce 1,026,096 kWh (kilowatt hours) annually. Electricity from the solar array provides all the electrical energy requirements for the current quarry. At the increased production rate proposed for the project some additional electricity from the utility grid would be required to power the quarry equipment and other electrical needs. The project applicant has estimated that 650,000 kWh annually would be needed from PG&E's electrical grid.

This electricity would be used to process aggregate. The future demand on the electricity grid would be less than the quarry's demand up through May of 2011 (i.e., prior to installation of the solar array). By generating over 60% of quarry electrical demand on site, the project is a model for an industrial project in California. Accordingly, it would not wastefully use electricity. The demand on the PG&E transmission system would be less than it was in 2011, and this demand would not require development of additional energy production or supply facilities.

There would be no effect on transmission capability since the transmission lines that formerly served the project remain in place.

The project would result in increased use of diesel fuel, mainly from increased haul truck trips. However, there is no evidence that these trucks would use diesel fuel in a wasteful fashion. Over time, the engines in these trucks, which must meet State guidelines for diesel engines, would become increasingly efficient as new regulations already adopted go into effect[58]. Also, it should be noted that if the aggregate were not hauled from Mark West Quarry, it would be hauled from another in or out of county source. Hauling of aggregate uses fuel, regardless of the source. The impact would be ***less than significant***, and no mitigation would be required.

[58] Regulations adopted by the California Air Resources Board (CARB); see CARB's regulations for Diesel Activities at: http://www.arb.ca.gov/diesel/mobile.htm

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5.0 OTHER CEQA CONCERNS

5.1 GROWTH-INDUCING IMPACTS

CEQA mandates that an EIR assess potential growth-inducing impacts of a project. The *CEQA Guidelines* describe the required assessment in the following way:

> *Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment* (CEQA Guidelines, Section 15126.2(d)).

Growth-inducing impacts usually arise when a project would provide new infrastructure or public services that can be used to serve other future projects. The analysis should be balanced with the general rule that EIRs should evaluate foreseeable, but not speculative, impacts. Note that the assessment of growth-inducing impacts is not the same assessment that is required for cumulative impacts (which are assessed in Section 5.2). Growth-inducing impacts refer to impacts that might arise from the project if it were approved, while cumulative impacts are the impacts resulting from the project plus other projects that have been specifically approved or proposed.

The proposed project would provide various forms of aggregate that would be used In a variety of building projects, including highways, roads, driveways, parking lots, leachfields, stream repair and restoration, and construction of most types of buildings. Without this aggregate being produced by some operator, it would be difficult for the local population to construct new facilities or repair existing facilities.

Aggregate is produced when there is a demand for it. The general plans of the County and the incorporated cities in the County allow a certain amount of growth and describe where that growth can occur. Future aggregate mining and mineral processing are not expected to encourage any development or growth that is in conflict with adopted general plans. Even in those cases where growth in certain parts of the County may exceed general plan-projected growth levels, this growth is a result of market forces for new housing and employment opportunities. This growth is not induced by the availability of aggregate and asphalt. Further, if aggregate was not available from Mark West Quarry, it would continue to be available from other sources inside and outside the County. While the cost of aggregate from more distant sources might increase if the proposed project were not approved, there is no evidence that this price increase would substantially slow or stop new development in the County.

Indirectly, the proposed project would result in the hiring of five additional employees. This small increase in employment, with new employees living in various communities, would not have any measurable effect regarding an increased demand for housing, public services, and/or utilities.

5.2 CUMULATIVE IMPACTS

1. Introduction

According to the CEQA Guidelines, cumulative impacts are changes in the environment that result from adding the effect of the project to those effects of closely related past, present, and probable future projects. The cumulative impact from several projects is the change in the environment that results from the incremental impacts of the proposed project when added to these other closely related past, present, and reasonably foreseeable future projects. As defined in Section 15355 of the CEQA Guidelines, an EIR should not discuss impacts that do not result in part from the project evaluated in the EIR. As such, the discussion in this section focuses specifically on those cumulative impacts of the project that would contribute to cumulative effects, and does not consider cumulative impacts to which the project would not contribute.

The CEQA Guidelines identify two basic methods for establishing the cumulative environment in which the project is to be considered: the use of a list of past, present, and reasonably anticipated future projects; or the use of adopted projections from a general plan or other regional planning document. As explained in the following subsections, this EIR uses a hybrid approach including General Plan projections and a list of projects proposed since the General Plan was adopted that may combine with the proposed project to have cumulative impacts. In addition, the DEIR includes an assessment of cumulative impacts associated with possible future mining of the project site (after the completion of the requested use permit).

2. General Plan Containing Projections Considered in the Cumulative Scenario

This analysis of cumulative effects for this project is based, in part, on a summary of the projections that have been included in the Sonoma County General Plan 2020 (County of Sonoma, 2008, as amended in 2009). Future aggregate mining as allowed by the ARM Plan was included as part of the impact assessment done for the County's General Plan 2020 EIR (GP2020 EIR). As such, the analysis focuses on those long-term impacts that the General Plan EIR identified as significant and unavoidable, since it is not expected that impacts from the proposed project would result in any additional cumulative General Plan impacts (i.e., countywide impacts) becoming significant and unavoidable.

3. List of Projects

Because the General Plan EIR was three years old at the time of the publication of the NOP, it is possible that the analysis of impacts to certain resources could be out of date. Accordingly, the cumulative impact analysis also includes a list of projects (provided below) that were proposed or implemented after publication of the GP2020 EIR and were identified by the County[59] as having the potential to have related or cumulative impacts. This list includes projects that could be operational by 2015 and that could affect the cumulative traffic analysis and, correspondingly, the analysis of cumulative

[59] Stabler, personal communication, 11/10/11

impacts on air quality, noise, and climate change since these resources are affected by traffic increases.

1. 11,550 square feet of retail space at 4601 Old Redwood Highway
2. 32,600 square feet of commercial/office at 4855 Old Redwood Highway
3. 56 apartments at 525 Fulton Road
4. New church at 3700 Fulton Road
5. 650,000-case winery at 3600 Fulton Road
6. Unity Park Ball field expansions at 4351 Old Redwood Highway
7. Cardinal Newman High School improvements at 50 Ursuline Road
8. 4,000 square feet of retail space (a coffee shop) at 4745 Old Redwood Highway
9. 31,549 square feet of retail space (the Larkfield Shopping Center Expansion) at 4732 Old Redwood Highway
10. Sutter Hospital project at River Road/Mark West Springs Road off US 101 Northbound Off-Ramp

The City of Calistoga and Napa County recently approved two projects, the Highlands Christian Church and Calistoga Village Inn and Spa. Both projects are expected to add background traffic to the SR 128/Petrified Forest Road study intersection. According to Napa County planning staff, there are no major approved developments that are expected to be in place by 2015.[60]

There are no proposed or anticipated projects in the vicinity of the proposed project site. Accordingly, the above list of projects was developed to identify projects further to the west that could generate traffic that when added to project-generated traffic could have cumulative off-site impacts on the main haul routes used by trucks hauling project-generated aggregate.

4. Future Mining Considered in the Cumulative Scenario

In addition to using the GP2020 projections and list of projects approaches described above, this EIR also includes an analysis of possible future mining of the Mark West Quarry site, that is, mining that could occur after the end of the requested use permit for the project assessed in this EIR. The existing quarry parcel contains unmined land that is currently zoned MR and could be mined under the quarry's vested rights. There is no proposal to mine this area as part of the proposed project, but a future use permit application could include mining of this area. In the subsequent discussions of cumulative impacts, this area is called the 'vested rights MR area." On the proposed quarry expansion parcel, there are two types of MR areas. First is the area that would be mined over the next 20 years as part of the proposed project (the "active expansion MR area"). Second is the proposed MR area that would not be mined for aggregate during the 20-year use permit period but that could be mined in the future if a new use permit and reclamation plan were applied for and approved by the County; this includes the Overburden Stockpile Area (where overburden may be removed for sale or reclamation but the underlying aggregate would not be mined under the proposed project) and a small area between the proposed mining area and the Overburden

[60] See the discussion of long-term impacts (Subsection B4) of the Traffic and Circulation section (Section 4.4) for additional description of the use of this project list and modeling for future traffic baseline conditions and impacts.

Stockpile Area (see Figure 3-5 in Chapter 3 of this EIR); this area is referred to hereafter as the "proposed MR future mining area."

Given the MR zoning, these lands could be mined at a future date. In addition, the applicant has stated that in the future, after completion of the proposed mining project, they could apply to deepen the quarry floor below the 945-foot elevation to the 905-foot elevation to extract additional aggregate (as shown on Figure 3-12). This possible future mining of the vested rights MR area and the proposed MR future mining area and/or deepening of the quarry would require County approval of a new use permit and reclamation plan and, therefore, require additional CEQA review. Specific impact analyses would be done at that time based on the mining proposal submitted for review. To the extent possible, this EIR assesses whether the project in combination with that possible future mining could result in any cumulatively significant impacts.

In assessing cumulative impacts from possible future mining of the vested rights MR area that is located north of the active quarry, this EIR provides a general discussion of the range of impacts that might be expected from that mining. Because there are no current specific plans of where this possible future mining may occur, the method of how the additional area would be mined, or proposed reclamation, the precise impacts remain speculative, and the discussion in this EIR is general. The existing Reclamation Plan (see Figures 5-1 and 5-2) shows that mining of the vested rights MR area would extend the quarry footprint north from the existing quarry floor and reduce the elevation of the ridge by approximately 250 feet. As the mining expands north, the area currently draining to Franz Creek would drain to Porter Creek. It is unknown whether the same mining approach as shown in this 1988 plan would be proposed in the future.

The following cumulative impact analysis will also assess possible future mining of the proposed MR future mining area since it is possible that this area, as well as the small adjoining area to the south, could be mined once the overburden is removed. Again, the precise impacts of such mining remains speculative, particularly since most of the area that could be mined is currently buried under many feet of overburden. As such, the analysis of possible future impacts is general in nature.

The possible deepening of the quarry floor could involve removal of additional overburden and aggregate from the slopes surrounding the quarry floor in order to avoid over-steepening as the quarry floor is mined (i.e., any appreciable deepening of the floor would require that adjacent slopes be cut back to provide an adequate factor of safety). At this time, it is unknown exactly how this mining would be conducted. Accordingly, the assessment of impacts of this possible future mining is general in nature.

5. Cumulative Impacts Analysis

A two-step approach was used to analyze cumulative impacts. The first step was to determine whether the combined effects from the proposed project and other projects would be cumulatively significant. This was done by adding the project's incremental impact to the anticipated impacts of other projects and the GP2020 projections. Where the combined effect of the projects was determined to result in a cumulatively significant effect, the second step was to evaluate whether the proposed project's incremental contribution to the combined significant cumulative impact would be cumulatively considerable as required in Section 15064(h)(1) of the CEQA Guidelines. It should be noted that Section 15064(h)(4) of the CEQA Guidelines states that "the mere existence of cumulatively significant impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable." Therefore, it is not necessarily true that, even where cumulative impacts are significant, any level of incremental contribution must be deemed cumulatively considerable. Conversely, it is not necessarily true that if the project's individual impact is less than significant; its contribution to a cumulatively significant impact will not be cumulatively considerable. An impact that is less than significant when considered individually may still be cumulatively considerable in light of the impact caused by all projects considered in the analysis.

For each environmental issue, cumulative impacts may occur over different geographic areas. The geographic scope of area and time horizon considered for each cumulative impact evaluated in the EIR is dictated by the specific type and nature of impact being considered. For example, when considering the project's incremental contribution to cumulative air quality criteria pollutants, the geographic scope of area is the Bay Area air basin under the jurisdiction of the BAAQMD. In contrast, geologic impacts are site-specific and limited to the immediate vicinity of the project area, and water quality impacts are considered within the watershed in which the project area is located.

The following sections describe the potential cumulative impacts associated with the project and whether the project would make a cumulatively-considerable contribution to that impact.

Geology, Soils, and Seismicity

Impact CI-1: The proposed project could make a potential cumulatively-considerable contribution to significant cumulative impacts related to slope stability and seismic hazard.

The entire Sonoma County region is susceptible to impacts from geologic activity (seismic hazards, landsliding, and, along the coast, tsunami hazard). The GP2020 EIR determined that growth in the region would increase the exposure of people and structures to geologic hazards. This was considered a cumulatively significant impact. As discussed in Section 4.1 of this EIR the project could result in potentially unstable slopes under normal conditions and especially if an earthquake occurred. If the slopes fail, it could cause damage to project infrastructure as well as Porter Creek Road. Accordingly, the project would make a contribution to the hazards involving slope stability and seismic hazard.

Implementation of mitigation measures recommend for Impacts 4.1-A through 4.1-D would result in the proposed project's geologic impacts being reduced to a less-than-significant level on the project site. The mitigations ensure that working and reclaimed slopes would be stable and capable of withstanding projected seismic events. Implementation of these mitigation measures should ensure that the project's contribution to significant cumulative geologic impacts would be less-than-cumulatively-considerable.

Future mining of much of the vested rights MR area or the proposed MR future mining area would have potentially significant future geologic impacts due to the steep

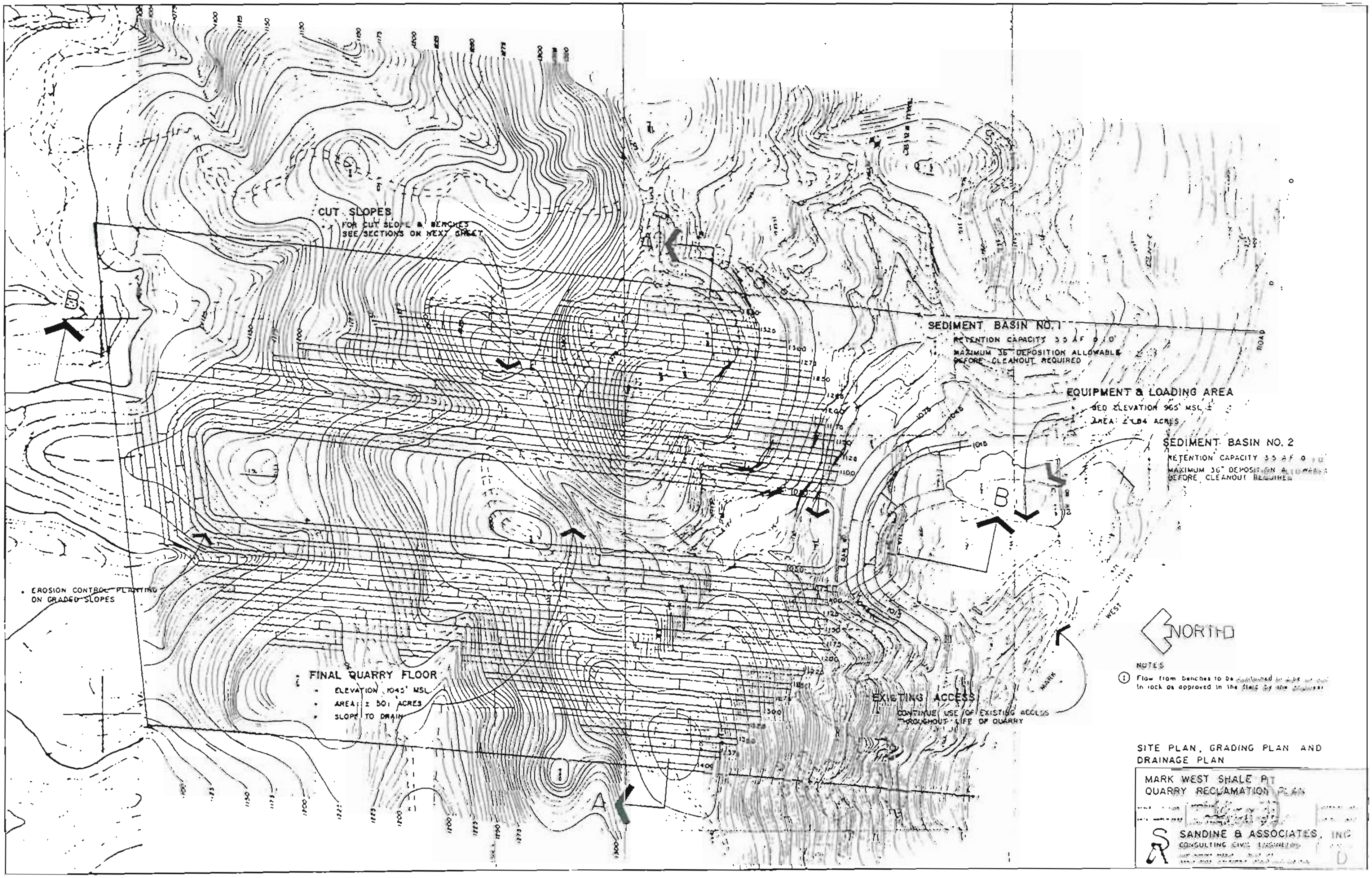

FIGURE 5-1 **1988 RECLAMATION PLAN - GRADING AND DRAINAGE**

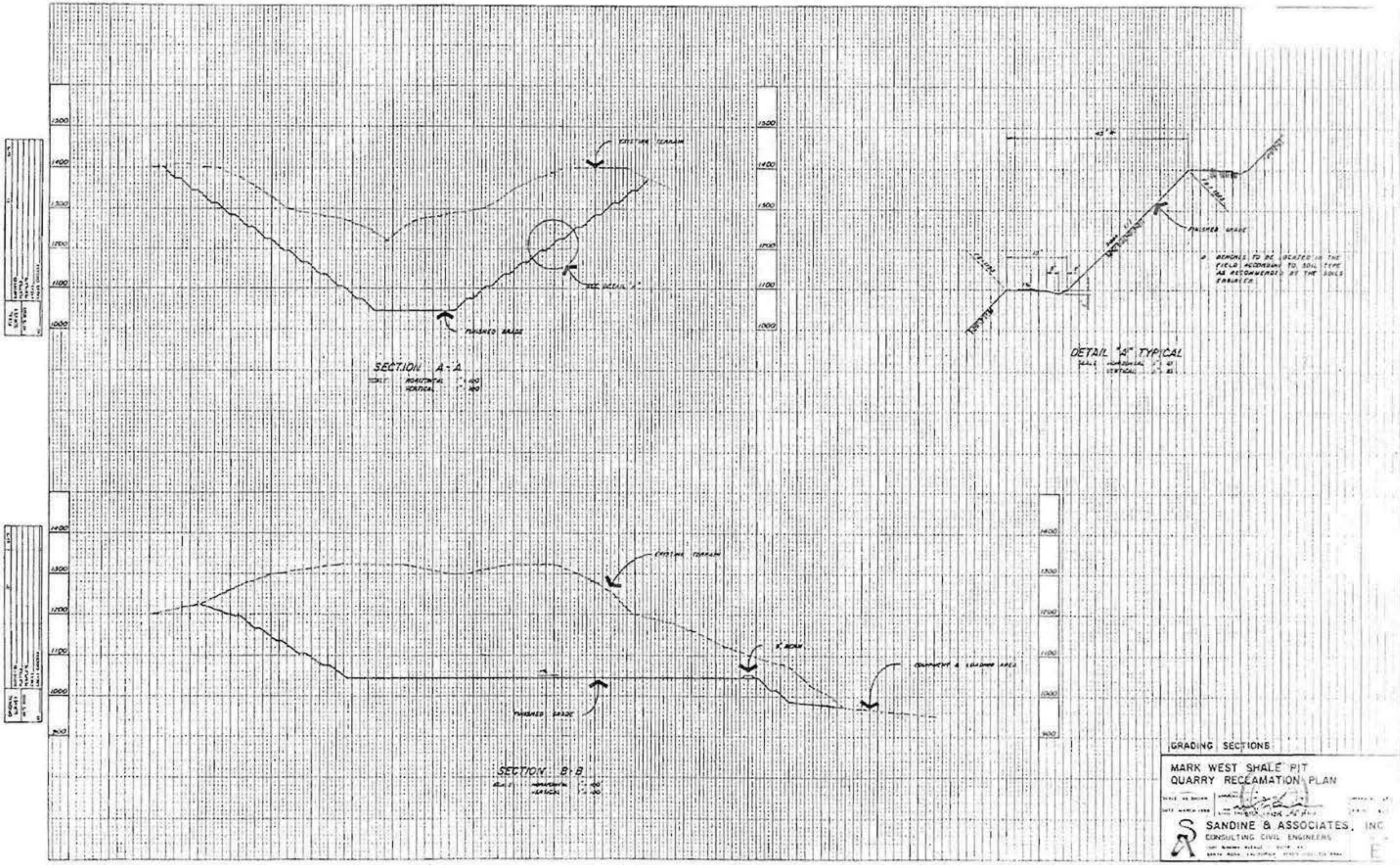

FIGURE 5-2 **1988 RECLAMATION PLAN - GRADING SECTIONS**

topography of the areas and the potential for landsliding. It is possible that such mining could result in slope instabilities (e.g., reactivation of the old landslide area). However, prior to any future expansion of mining, the proposed project would be completed and the proposed expansion area reclaimed. Slopes on the reclaimed project site would be required to be stable and replanted. Because the proposed mining site would be stabilized and reclaimed prior to any future expansion, and because mining of the proposed project site and future mining would not occur at the same time, there would be no cumulative geologic impact involving the proposed project and future mining expansion. In addition, any future mining would also be required to maintain stable slopes during mining and at the final reclamation stage.

Future deepening of the quarry floor could reduce stability of adjacent slopes located above the quarry floor and Porter Creek Road. This deepening would have similar impacts to the proposed project. Because the deepening is reliant on the proposed mining of the expansion area, the project would make a contribution to this potential cumulatively significant impact. However, as stated above, the slopes constructed by the proposed project would be stabilized and reclaimed prior to any deepening of the quarry. Likewise, mining associated with future deepening of the quarry floor would have to comply with all SMARO regulations for slope stability. With implementation of mitigation measures for Impacts 4.1-A through 4.1-D, the project should make a less-than-considerable contribution to a cumulative geologic impact regarding slope instabilities.

To summarize, as mitigated, the project should make a ***less-than-considerable contribution*** to cumulative geologic impacts. Any application for subsequent mining of the property would undergo additional CEQA review to address slope stability, seismic hazard, and other geologic constraints of those areas proposed for future mining. That analysis would be expected to address how the stability of slopes on the proposed expansion area could be affected or compromised by future mining, and measures that would be required to ensure the integrity of the proposed project-created slopes as well as the slopes of future mining.

Hydrology and Water Quality

Impact CI-2: The proposed project could make a potential cumulatively-considerable contribution to significant cumulative impacts related to water quality.

The GP2020 EIR determined that future agricultural and resource development could significantly increase the amount of sediment and nutrients in County waterways, thereby significantly affecting water quality and aquatic wildlife dependent on that water quality. Similarly, anticipated future projects could result in sediments entering Mark West Creek and/or the Russian River when constructed. In addition, possible future mining of MR areas on the quarry site could release sediments to Porter Creek and Franz Creek. Because the proposed project has the potential to release sediments to Porter Creek, it would contribute to this potentially cumulatively significant water quality impact. Consistent with SMARO and the ARM Plan, this EIR recommends Mitigation Measure 4.2-B.1 to control these sediments on site before they enter Porter Creek. After mitigation implementation, water leaving the site would not include more sediments than leave under current (baseline) conditions, and the project would comply with all

RWQCB water quality requirements for discharges to Porter Creek. Accordingly, with implementation of that mitigation measure, the project should not make a cumulatively-considerable contribution to this significant cumulative impact.

The GP2020 EIR also found that new development could result in alterations to drainage patterns resulting in erosion and sedimentation, as would the more recent projects included in the list of projects. Future mining of MZ-zoned lands would eliminate portions of tributaries draining to Franz Creek, as well as the remaining on-site portion of Tributary A of Porter Creek. Flows from these areas would be rerouted directly to Porter Creek. This could increase sediment delivered to Porter Creek and result in potentially significant cumulative water quality impacts on that creek. Additionally, mining the steeper north-facing slopes of the vested rights MR area could result in landsliding that could cause sediment to enter Franz Creek. The project would not result in decreased flows to Franz Creek, though proposed mining would eliminate the uppermost watershed (about 0.7 acres) of Tributary B (see Figure 4.2-5). Because the extension of mining into this uppermost portion of Tributary B's watershed would be advancing from the south (so runoff from the expansion area would be re-routed south towards Porter Creek), it is not expected that it would cause bared slopes draining to Tributary B. Accordingly, the project would not combine with future mining to cause a significant water quality impact on Franz Creek.

Finally, deepening of the quarry floor would require some modification of on-site drainage patterns to allow future drainage to exit the property via the existing quarry outlets on the existing quarry site. This future deepening could result in additional erosion and the potential for transport of sediments to Porter Creek. However, it is expected that any deepening of the quarry would be conditioned to control erosion similar to the mitigations established for the project. The project would alter streamcourses on the site, and this alteration could result in erosion and sedimentation; it is expected that some erosion could continue after the site is reclaimed. Accordingly, the project could make a contribution to this cumulative water quality impact on Porter Creek. As mentioned above, Mitigation Measure 4.2-B.1 recommended for the project would reduce onsite erosion and transport of sediments off the site so that sediment leaving the site does not exceed baseline levels. Accordingly, after mitigation implementation, the project should not make a cumulatively-considerable contribution to this significant cumulative impact.

To summarize, with implementation of Mitigation Measure 4.2-B.1 the project is expected to make a ***less-than-considerable contribution*** to the significant cumulative hydrologic impacts. Any application for subsequent mining of the property would undergo additional CEQA review to address slope stability, erosion potential, stream sedimentation, and other water quality and hydrologic impacts that could result from that future mining. That analysis would address how the drainage and sediment retention facilities serving the proposed project site would be protected and/or incorporated into an expanded drainage system to ensure that future mining activities do not compromise proposed project facilities.

Impact CI-3: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact related to groundwater resources.

The GP2020 EIR concluded that providing water for future development not served by a municipal water supplier could result in groundwater level declines and result in adverse well interference effects. The Water Supply Assessment prepared for the project concluded that project well use would not result in groundwater declines or otherwise interfere with surrounding off-site wells. However, future mining could result in a reduction in groundwater recharge for one private well located west of the project site. Accordingly, the project could make a contribution to a cumulative impact on this well. Mitigation Measure 4.2-F.1 was recommended for the project to ensure that any reduction in groundwater recharge area affecting this well would not result in a loss of water available to that residence. With implementation of this mitigation measure, the project should make a ***less-than-considerable contribution*** to this significant cumulative groundwater impact.

Biological Resources

Impact CI-4: The proposed project could make a potential cumulatively-considerable contribution to significant cumulative impacts on special-status species of plants and wildlife.

The GP2020 EIR determined that future development and land use activities consistent with that plan would result in a significant cumulative impact to special-status plants and wildlife. That EIR found that policies in the General Plan and existing oversight by regulatory agencies entrusted with enforcement of State and Federal regulations addressing the protection and management of special-status species would reduce potential adverse effects to a less-than-significant level for projects that undergo a permit review process. The impact was determined to be cumulatively significant because not all occurrences of special-status species are known and not all projects undergo environmental review. Similarly, potential impacts to unspecified special-status species can be expected from development of the projects on the list of projects. However, an assessment of the proposed project's impact on special-status species is contained in this EIR. The impacts to these species can all be mitigated to a less-than-significant level. Accordingly, the project would not make a cumulatively-considerable contribution to this significant cumulative impact on unknown or unanalyzed special-status species.

The vested rights MR area contains seven localities of Napa false indigo (a CNPS List 1B.2 species); 93 individual plants were found during EIR surveys. These plants would be removed if the area was mined after completion of the proposed project. The proposed project site does not contain populations of this species, so there would be no cumulative impact on this species. In addition, it is expected that any future mining application for this area would be required to mitigate for the loss of these plants. This species has potential for re-establishment by transplanting or reseeding and could be reestablished on the reclaimed portions of the site.[61]

The vested rights MR area also contains tributaries to Franz Creek, and the proposed MR future mining area contains tributaries to Porter Creek, all of which provide potential dispersion habitat for foothill yellow-legged frogs and may contain habitat suitable for western pond turtle and California red-legged frog. There is also potential habitat for northern spotted owl on the vested rights MR area and pallid bats. Mining of these areas

[61] Stabler, personal communication, 4/2/13.

could result in “take” of these special-status species. The proposed project site does not contain northern spotted owl habitat, so there would be no cumulative impact on that species. The impacts from the proposed project and this future potential mining would combine to make a potential cumulatively significant impact on the other special-status species. Mitigation Measures 4.3-B.1 through 4.3-B.3 would protect raptor and special-status bird nests and special-status bat roost sites from disturbance, thereby reducing project impacts to these sites to a less-than-significant level. Mitigation Measures 4.3-C.1 and C.2 protect special-status frogs and turtles on the proposed project site from harm or take, thereby reducing impacts to these species to a less-than-significant level. Accordingly, with implementation of these mitigation measures the project should not make a cumulatively-considerable contribution to this potential significant cumulative impact.

As discussed above under Impact CI-2, the project would make a potentially significant contribution to a cumulative water quality impact. Potential future mining of the vested rights MR area as well as the proposed MR future mining area could cause significant erosion. Eroded soils as well as other pollutants resulting from mining operations, unless adequately controlled on the property, could cause significant water quality impacts on Franz and Porter Creeks, and possibly downstream on Mark West Creek and the Russian River. This could adversely affect aquatic habitat needed to support the special-status species of fish as well as foothill yellow-legged frog, western pond turtle, California freshwater shrimp, and California red-legged frog. The project could make a potentially significant contribution to this cumulative impact on special-status species. As previously described, Mitigation Measure 4.2-B.1 recommended for the project would reduce onsite erosion and transport of sediments as well as other pollutants off the site so that sediment leaving the site does not exceed baseline levels and other pollutants are controlled as required by the RWQCB. Accordingly, after mitigation implementation, the project should not make a cumulatively-considerable contribution to this significant cumulative impact.

To summarize, with implementation of mitigation measures recommended for Impacts 4.2-B, 4.3-B, and 4.3-C the project should make a ***less-than-considerable contribution*** to cumulatively significant impacts on special-status species.

Any application for subsequent mining of the property would undergo additional CEQA review to address impacts to special-status species. Specific mitigations to avoid or reduce impacts to those species would be identified after site-specific surveys are done at the time of project application (as the species composition on the property may well change in the 20 or more years before any additional application is filed).

Impact CI-5: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact on waters of the U. S. and riparian habitat.

The GP2020 EIR identified the cumulative impact to riparian habitat (a sensitive natural community) as a cumulatively significant impact. It is expected that there could be a similar loss of riparian habitat from construction of the projects on the list of additional projects. The areas on the property that could be mined in the future also contain riparian habitat along intermittent streams that would be removed during that possible future mining. As discussed in Impact 4.3-E, the project would result in the loss of 0.1

acre of tributary stream channel and adjacent riparian habitat. At the completion of reclamation, two ponds would be constructed on the relatively flat quarry floor. These ponds (with storage capacities of 25 and 49 acre-feet, respectively) would more than compensate for the wetland loss caused by the project. In addition, the Reclamation Plan requires planting of willows along drainage courses on the reclaimed site. Finally, Mitigation Measures 4.3-E.1 through 4.3-E.3 would address the short-term loss of riparian habitat until such time as the site is reclaimed. These measures require replacement or restoration of wetlands to offset the 0.1 acre of wetland that would be lost. Therefore, with implementation of the mitigation measures recommended for the proposed quarry expansion the project should make a ***less-than-considerable contribution*** to this significant cumulative impact.

Any application for subsequent mining of the property would undergo additional CEQA review to address impacts to wetlands and riparian habitat. Specific mitigations to avoid or reduce impacts to these sensitive resources would be identified after site-specific wetland surveys are done of the area to be mined.

Impact CI-6: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact on wildlife movement and loss of Timberland.

The GP2020 EIR identified a third cumulatively significant impact associated with biological resources, namely the fragmentation of natural habitat and construction of impediments to wildlife movement. As discussed in Impact 4.3-G, the project would remove natural habitat on the expansion area. In addition, temporary rock fall barriers would be constructed on the slope above Porter Creek Road and security fencing would be added in certain locations that could block wildlife movement from the north and south of the site. The possible future mining of other portions of the property would further reduce wildlife habitat and further block wildlife movement. The project would make a contribution to this significant cumulative impact. Over the long term, once reclamation of the project and any future mining is complete, the site would be reclaimed with native vegetation as well as two large ponds and riparian habitat. However, until that reclamation is completed in 20-50 years (depending on whether there is future mining of the property), there could be a cumulative loss of approximately 90 acres of wildlife habitat. This habitat loss would, along with scattered rural residential development in the area and recreational and agricultural uses to the north, combine to fragment the habitat for all wildlife species residing in or using the area. Travel would be adversely affected across the active quarry and the benched portions of the site that are being reclaimed, as well as in the vicinity of the security fencing and rock safety barriers that would block the south side of much of the expansion site. The proposed project would make a ***considerable contribution*** to this significant cumulative impact. There is no mitigation to reduce the cumulative loss of habitat and blockage of wildlife movement until such time as mining is completed and the property is reclaimed.

Future expansion into the vested rights MR area would convert Timberland. The project plus this possible future expansion would result in a cumulative loss of Timberland. The applicant would need to obtain a Timberland Conversion Permit, a Timber Harvest Plan, and a County use permit prior to removing trees in this vested rights MR area. The project, as well as any future conversion of Timberland on the property, would need to comply with all State and County requirements for a Timberland conversion, including the County requirement for perpetual preservation of two acres of Timberland for each acre that is converted. In addition, after site reclamation, benches on the site and the quarry floor would be reforested. With implementation of State and County requirements for Timberland conversion plus long-term site reclamation, the project should make a ***less-than-considerable contribution*** to loss of Timberland in the County.

Traffic

Impact CI-7: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact related to traffic congestion.

Section 4.4 of this EIR contains cumulative traffic impact analyses for the years 2015 and 2035 (the analyses incorporate traffic generated by projects on the list of projects presented earlier). As described in Impact 4.4-G, the project would make a considerable contribution to a cumulatively significant impact at the intersection of Mark West Springs Road/Riebli Road. This impact could be mitigated to a less-than-significant level if the intersection was signalized, and this mitigation is recommended. However, because this intersection improvement has not been planned or funded, the impact is considered significant. The project would make a ***considerable contribution*** to this significant cumulative impact until such time as the intersection is signalized.

Any application for subsequent mining of the property would undergo additional CEQA review to address traffic impacts on intersections, roadways, and safety conditions. While this EIR assesses intersection impacts to 2035, it is possible that conditions at that time will vary from what is currently predicted. The subsequent traffic analyses would identify the impacts of traffic from future mining and determine whether additional intersection or roadway improvements would be needed to serve traffic that would be generated by that future mining.

Impact CI-8: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact related to traffic safety.

As described in Impact 4.4-I, project-generated truck traffic would make a considerable contribution to traffic safety hazards along the Porter Creek Road/Mark West Road corridor. Because roadway safety improvements needed to mitigate safety impacts (i.e., road widening) have not been programmed or funded, project traffic would make a ***considerable contribution*** to this significant cumulative impact until such time as the roadway safety improvements are constructed.

Any application for subsequent mining of the property would undergo additional CEQA review to address traffic impacts on safety conditions. While this EIR assesses safety impacts to 2035, it is possible that conditions at that time will vary from what is currently predicted. The subsequent traffic analyses would identify the impacts of traffic from future mining and determine whether additional roadway improvements would be needed at that time.

Noise

Impact CI-9: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact related to noise.

The noise analysis conducted for this EIR calculated that project-generated traffic would increase cumulative noise levels along Porter Creek Road, which would be the road most affected by quarry traffic, by less than 1 decibel (dBA). Because there is more existing traffic along Mark West Springs Road than there is on Porter Creek Road, the project would increase noise less than 1 dBA along that road. Because this noise increase is less than the significance criterion for traffic noise, the project would make a ***less-than-considerable contribution*** to this cumulative impact.

The noise modeling done to assess the project impacts also included an assessment of noise from possible future mining of the other MR-zones on the property (see Appendix G for additional data regarding noise modeling). Mining the north face of the ridge would generate future noise levels that would exceed the adjusted County noise limit at the Mountain House Ranch Resort and the residence located northwest of the property. Accordingly, there would be a substantial future increase in noise at these receivers located north of the quarry.

However, mining on the vested rights MR area or the proposed MR future mining area would occur after the cessation of project mining. Noise resulting from project operations would not occur at the same time as this future mining nor combine with that mining noise. The area could be mined regardless of whether the proposed expansion area is mined, so the project does not “induce” this possible future mining. Project-generated noise would not be an increment of future mining noise. Accordingly, there would be no cumulative noise impact from this possible expansion.

Any application for subsequent mining of the property would undergo additional CEQA review to address noise impacts, especially noise impacts on sensitive receptors to the north.

Air Quality

Impact CI-10: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact related to air resources and climate change.

The GP2020 EIR concluded that future emissions of ozone precursors would be significant because the rate of vehicle miles travelled (VMT) would exceed the rate of the population increase (which would be significant per the BAAQMD’s CEQA Guidelines). The increased haul truck traffic generated by the project would be an increment of this VMT increase. The increase in the hauling of aggregate, whether from this quarry or another source, is an inevitable component of providing the infrastructure for an expanding population. In addition, by providing a local source of aggregate (particularly a type of aggregate that can be used for asphalt and concrete production), it is possible that the project would reduce import of such aggregate from out-of-County sources. It is expected that delivery of aggregate from the proposed project would result in less VMT than if that material were partially supplied from out-of-County sources. Accordingly, the project could reduce future emissions of ozone precursors. However, absent a detailed study of the location of all future aggregate sources and the VMT to transport that aggregate, it is conservatively concluded that the project's increased haul truck traffic would be an increment of the VMT increase exceeding the population rate increase, and it would constitute a ***considerable contribution*** to this significant cumulative impact. There is no feasible project-related mitigation to reduce the emissions of ozone precursors resulting from the increase in VMT.

Impact 4.6-E discusses project impacts on climate change. Because the global climate does not change due to GHG emissions from a single project, that impact discussion is by definition a cumulative impact assessment of the project's contribution to the potentially significant cumulative impact on the global climate. That impact discussion concludes that the project would emit GHG in exceedance of the significance threshold. A mitigation is recommended to reduce future emissions to below the threshold level. With implementation of Mitigation Measure 4.6-E.1, the project would make a ***less-than-considerable contribution*** to the significant cumulative impact on climate change.

Any application for subsequent mining of the property would undergo additional CEQA review to address air quality and climate change impacts. It is expected that at that time the regional air quality conditions and the global climate situation could be substantially different than current conditions. Those conditions and project impacts would be assessed during that subsequent CEQA review.

Visual Resources

Impact CI-11: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact related to visual resources.

The GP2020 EIR concluded that additional lighting of new development would significantly affect nighttime views in certain areas of the County. The proposed project does not include any additional night lighting and would make no contribution to this cumulative impact.

If mining of the northern slopes (the vested rights MR area) were permitted in the future, views from Mountain Home Road and residences and lodging establishments along that road as well as from more distant residences would be substantially changed. Views of the currently north-sloping forested hillside could be replaced by bare slopes and rock faces. At the least, the elevation of the ridge would be substantially reduced. This could be a significant future visual impact. However, as described in Impact 4.7-A, the proposed project mining would not be visible from the north. Accordingly, the project would not make a contribution to any cumulative visual impact on views from the north. This northern area can be mined whether or not the proposed expansion area is mined first, so the project does not "induce" nor accommodate any future mining of that area.

Deepening of the quarry could result in additional mining of adjacent slopes visible from southern vantage points. However, the future effect on views from these southern vantage points would not be substantially different from the impacts identified for the project. The project impact for eastbound travelers on Porter Creek Road was identified as a significant project impact. It is possible that additional lowering of the ridge on the north side of that road could expose additional solar panels resulting in a potential cumulatively significant impact. Accordingly, the project would make a ***considerable contribution*** to this significant cumulative impact.

Any application for subsequent mining of the property would undergo additional CEQA review to address the proposed project's visual impacts, especially impacts on views from the north.

Public Services and Utilities

Impact CI-12: The proposed project could make a potential cumulatively-considerable contribution to a significant cumulative impact related to public services and utilities.

The GP2020 EIR identifies a number of significant impacts associated with providing adequate public services and utilities to serve potential new development. Many of these impacts are associated with municipal water and wastewater systems that would need to be expanded to serve future growth. The project does not contribute to these impacts as it does not rely on municipal water or wastewater systems.

The GP2020 EIR describes how it may be necessary to construct new facilities to serve the potential growth in the County. Construction of these new facilities could have significant (though currently unknown) environmental impacts. This includes potentially significant impacts from constructing new solid waste, recreational, fire protection, emergency service, library, human services, and criminal justice facilities. As discussed in Section 4.8, the proposed project would not substantially increase the demand for public services, and the impact to service providers would be less than significant. Accordingly, the project would make a less-than-cumulatively-considerable contribution to all impacts associated with constructing new public service facilities and utilities.

Finally, the GP2020 EIR determined that additional development in the County would expose people and improvements to a significant wildfire risk. The proposed quarry project does not include housing. Improvements on the site are in cleared areas not exposed to wildfire. As described in Impact 4.8-B, the project would be required to have an approved vegetation management plan for the property, and this would reduce the project's impact as regards fire hazard to a less-than-significant level. It is expected that vegetation clearance and mining in other portions of the property would be required to be incorporated into this vegetation management plan, which applies to the property for perpetuity. Given that vegetation would be cleared and managed on the project site to minimize wildfire ignitions, the project would make a ***less-than-considerable contribution*** to any cumulative impact regarding vegetation clearance and management.

Because the project would be completed and the site reclaimed prior to any future mining of the site, any demand on public service providers from the proposed project would not occur conterminously with any future demand from mining expansion operations.

With implementation of Mitigation Measure 4.8-B.1, the project should make ***no or a less-than-considerable contribution*** to significant cumulative impacts on public services and utilities.

Any application for subsequent mining of the property would undergo additional CEQA review to address impacts to public service providers and pertinent utilities.

Hazards and Hazardous Materials

Hazardous materials transported, stored, and use during the proposed project would all be removed prior to any mining of other portions of the project. Because the project would be completed and the site reclaimed prior to any additional mining of the site, project use of hazardous materials would not combine with use of such materials by future mining operations. Therefore, there would be no cumulative impact of hazards involving proposed expansion and future post-project mining expansion. Any application for subsequent mining of the property would undergo additional CEQA review to address impacts regarding hazards and hazardous materials.

Cultural Resources

Impact CI-13: The proposed project could make a potential cumulatively considerable contribution to a significant cumulative impact related to cultural resources.

The GP2020 EIR concluded that for projects where the Northwest Information Center (NWIC) did not review and/or respond to a project referral from the County or for ministerial projects not requiring that referral, new development could significantly impact cultural resources. The proposed project was referred to the NWIC, cultural resource surveys were conducted, and identified resources were assessed. The project would not damage any significant cultural resources plus no cultural resources were found on other existing or proposed MR-zoned areas of the property. However, mitigations are provided in the event that currently unknown cultural or paleontological resources are uncovered during the course of mining. The project's impacts on cultural and paleontological resources can all be reduced to a less-than-significant level by implementing these mitigations. With implementation of mitigation measures recommended for Impacts 4.10-A and 4.10-B, the project should make a ***less-than--considerable contribution*** to this cumulative impact. Any application for subsequent mining of the property would undergo additional CEQA review to address impacts regarding cultural resources.

Land Use

Impact CI-14: The proposed project would not make a potential cumulatively considerable contribution to a significant cumulative impact related to land use.

The GP2020 EIR concluded that future growth in the County could result in significant land use incompatibility impacts between agricultural and urban/residential uses or new development in agricultural areas that would be incompatible with agriculture. The project is not an agricultural project, so it would not contribute to any incompatibility of agriculture with surrounding uses. The quarry expansion would not cause any substantial noise, visual, air quality, or other impacts on vineyards located to the north of the property. Accordingly, the project would make no contribution to land use incompatibility impacts associated with agriculture.

Expansion of mining on the project site would not create any additional land use conflicts beyond the previously described visual and noise impacts on neighboring properties to the north. While these land use conflicts could be identified as significant in the subsequent CEQA review that would be required for any future expansion, the project would not make any contribution to those possible future impacts. Therefore, there would be no cumulative land use impacts caused by the project plus any future mining expansion.

Energy

Impact CI-15: The proposed project would make a potential cumulatively-considerable contribution to a significant cumulative impact related to energy.

The GP2020 EIR concluded that energy demand from an expanded population would require development of new energy sources, and that development could have significant impacts. Quarry processing equipment is currently powered by an on-site photovoltaic system. While this system will not be sufficient to meet the full electrical demand of expanded production, it would provide over 63% of that total demand. Aggregate needs to be produced somewhere inside or outside of the County in order to meet the projected aggregate demand. Producing the aggregate at the Mark West Quarry would use much less electrical energy from the grid than other quarries that do not have on-site generation facilities. Accordingly, the project would make a ***less-than-considerable contribution*** to this cumulative impact.

Because the project would be completed and the site reclaimed prior to any future mining of the site, project energy use would not combine with energy used by future mining, so there would be no cumulative impact regarding energy production or use.

5.3 IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126.2(c) of the CEQA Guidelines requires a discussion of the extent to which a proposed project would commit nonrenewable resources to uses that future generations would be unable or unlikely to reverse. An example of such an irreversible commitment is the construction of highway improvements that would provide public access to previously inaccessible areas. A project would generally result in a significant irreversible impact if:

1. Primary and secondary impacts would commit future generations to similar uses.
2. The project would indirectly involve a large commitment of nonrenewable resources.
3. The project would indirectly involve uses in which irreversible damage could result from any potential environmental accidents associated with the project.

1. Changes in Land Use That Commit Future Generations

The rezoning of portions of the expansion parcel to MR commits the parcel to possible future mining of aggregates. Such mining would be consistent with the designation of the site as a potential aggregates site in the ARM Plan.

2. Commitment of Resources

If the project is approved, the public would be committing non-renewable sources of electricity and petrochemicals that would be used to develop aggregate resources. This commitment of resources is needed to provide the basic materials for construction of infrastructure and buildings needed to support future generations. As described in Section ***4.12, Energy***, 63% of on-site electrical demand would be met by the on-site photovoltaic system.

3. Damage from Environmental Accidents

As described in previous sections, the risk of environmental damage from blasting or use of hazardous materials would be less than significant given existing regulations governing the transport, storage, and use of such hazardous materials. The risk of damage to Porter Creek Road (and travelers along that road) would be reduced to a less-than-significant level by the proposed rockfall barrier system (as mitigated by EIR-recommended additions).

6.0 PROJECT ALTERNATIVES CHAPTER

6.1 PROJECT ALTERNATIVES

CEQA requires that an EIR assess alternatives to the project if the project will have significant environmental impacts, even if these impacts can be mitigated to a level that is less than significant. As noted in Chapter 4.0 of this EIR, the project will have several potentially significant impacts.

The *CEQA Guidelines* offer a number of requirements and recommendations regarding the alternatives analysis. The more pertinent issues are summarized as follows:

1. A range of reasonable alternatives must be assessed. The range must be sufficient to permit a reasonable choice of alternatives so far as environmental aspects are concerned. The EIR need not assess multiple variations of alternatives. The range of alternatives to be assessed is governed by the rule of reason (CEQA Guidelines Section 15126.6(a)).

2. Alternatives must be ones that could feasibly attain most of the basic objectives of the proposed project. While alternatives can impede the attainment of the objectives, they should not substantially impede those objectives. Alternatives that fundamentally change the nature of the project do not meet the basic objectives of the project (CEQA Guidelines Section 15126.6(c)).

3. The alternatives must be feasible. Feasibility takes into account factors such as site suitability, economic viability, availability of infrastructure, consistency with the General Plan, other plans and regulatory limitations, jurisdictional boundaries, and ability to acquire, control, or gain access to alternative sites (CEQA Guidelines Section 15126.6(g)).

4. The analysis of the alternative must determine whether the alternative reduces the significant impacts identified for the project. If the alternative would generate additional significant impacts, those must be identified and discussed (CEQA Guidelines Section 15126.6(d)).

5. One of the alternatives to be assessed must be the “no project” alternative (CEQA Guidelines Section 15126.6(e)). (See discussion below under that heading.)

6. The EIR must assess the identified alternatives and determine which among them (including the project as proposed) is the environmentally superior alternative. If the no project alternative is identified as the environmentally superior alternative, then another of the alternatives must be identified as the environmentally superior alternative among the remaining alternatives (CEQA Guidelines Section 15126.6(e)).

Given these guidelines, this EIR assesses the following alternatives:

1A. No Project and No Subsequent Development Alternative
1B. No Project with Reasonably Foreseeable Development Alternative
2. Reduced Production Alternative
3. Reduced Mining Footprint Alternative

The alternatives have been selected to reduce as many impacts as possible, with emphasis on reducing the three project impacts and a secondary impact that would remain significant and unavoidable even following mitigation, and the project's cumulatively-considerable contributions to five significant cumulative impacts. These impacts include: 1) a project traffic safety impact affecting motorists along the Porter Creek Road/ Mark West Springs Road corridor; 2) a traffic safety impact affecting bicyclists and pedestrians along that same corridor; 3) possible secondary environmental impacts from implementing an EIR-recommended mitigation to widen Mark West Springs and Porter Creek Roads; 4) a project visual impact on views from eastbound Porter Creek Road; 5) a cumulatively-considerable contribution to a significant cumulative impact on one intersection; 6) a cumulatively-considerable contribution to a significant cumulative traffic safety impact involving the Porter Creek Road/Mark West Springs Road corridor; 7) a cumulatively-considerable contribution to a significant cumulative air quality impact regarding emission of ozone precursors; 8) a cumulatively-considerable contribution to a significant cumulative visual impact on views from eastbound Porter Creek Road; and 9) a cumulatively-considerable contribution to a significant cumulative biological impact involving blockage of wildlife movement.

The alternatives selected for analysis provide a reasonable range of alternatives, which can be used to test effects against the proposed project as well as one another. Although other combinations of project components and phasing could be developed to create additional alternatives, CEQA does not require that every conceivable mix of uses and mitigations be analyzed, but that a range of alternatives be assessed. The four alternatives should provide decision-makers and the public with sufficient information to understand how alternatives (or portions of alternatives) may reduce or eliminate impacts identified for the project as proposed. If it wishes, the County can select portions of these alternatives and approve a hybrid alternative.

Project Objectives

The CEQA Guidelines state that project alternatives considered in the EIR should feasibly attain most of the project objectives. The seven objectives stated by the applicant are reiterated below:

1. To profitably operate an existing hard rock quarry in reasonable proximity to Highway 101, at a site designated for aggregate production in the Sonoma County ARM Plan.

2. Encourage the use of locally produced aggregates within Sonoma County thereby reducing unsustainable importation, which will aid in the reduction of GHG (Greenhouse Gas) and compliance with AB32.

3. To provide an affordable and reliable source of aggregate suitable for Portland Cement Concrete (“PCC”), Asphalt Concrete (“AC”), Asphalt Concrete Base (ACB) Lean Concrete Base (LCB), and Cement Treated Base (CTB), as well as construction grade aggregates, etc., to customers in Sonoma County and the local area, thus minimizing transport distances and associated costs and impacts and facilitating the State and County policy of meeting local demand for high quality aggregates with local resources.

4. To allow the continuance of an existing quarry to assist the County of Sonoma in meeting its stated goals and policies of shifting aggregate production away from terrace mining to hard rock quarries, thereby avoiding the conversion of prime agricultural land on the terraces of the Russian River.

5. To assist in ameliorating the PCC, AC and ACB aggregate shortage identified in a report of the Department of Conservation titled CGS Special Report 175: Mineral Land Classification of Aggregate Materials in Sonoma County, California, dated 2005.

6. To facilitate a new or expanded quarry with resources which can meet the needs for aggregate in an environmentally sound manner.

7. To encourage the extraction and utilization of natural resources in a more sustainable fashion as in this case with the use of renewable energy via photovoltaic solar power.

In addition, the County’s goals and objectives for aggregate resources that were established in the Sonoma County ARM Plan include:

1. Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.

2. Encourage the retention of locally produced aggregate for use within Sonoma County.

1. Alternative 1A, No Project and No Subsequent Development Alternative

The EIR assesses two variations of the No Project Alternative. The first is the alternative where no additional development of the project site would occur, and the second assesses the impacts of future development of the site given existing land use designations and availability of services. The approach to the no project alternative is not as clear for this project as it typically is for most projects. This is because there is existing mining being conducted on the existing quarry property under vested rights. In addition, there is an area to the north of the existing quarry that can also be mined under these vested rights (the area currently zoned MR on Figure 3-2). If no project was approved, it would eliminate expansion of the quarry onto the expansion parcel, but mining of the existing parcel could continue without any additional County approvals. However, this future mining would need to comply with existing laws and regulations included in adopted County plans (e.g., SMARO, the Arm Plan, and the 2020 General Plan) and all Federal and State regulations governing mining and resource protection.

This existing MR-zoned area on the existing quarry parcel is covered under the quarry's vested rights and the existing 1988 Reclamation Plan (see Figures 6-1 and 6-2). As part of the project application, the applicant has agreed that the proposed Use Permit and Reclamation Plan would cover only future mining of the expansion site, and not future mining of the unmined MR-zoned land (the vested rights MR area) on the existing quarry site. The applicant has agreed that if the County approves the Use Permit and Reclamation Plan for the proposed expansion area, the applicant would not exercise its vested rights on the vested rights MR area on the existing quarry property (the County would condition the Use Permit, if approved, to formalize this agreement). If the project were not approved, then mining of the existing quarry, including the vested rights MR area, could continue. Accordingly, to provide a worst case analysis, the following discussion of the No Project and No Subsequent Development and the subsequent No Project with Reasonably Foreseeable Development includes assessment of the impacts of mining the vested rights MR area on the existing quarry parcel per the existing approved 1988 Reclamation Plan.[62]

a. Description

The project expansion site would be left in its current condition (i.e., primarily undeveloped with the exception of unimproved roads). The project site would continue to be owned by the existing owner, and left vacant or leased for livestock grazing (though it has little grazing value). As a result, none of the approvals that would be required by the County under the project would occur under this alternative, including the proposed Zone Change to add the Mineral Resource (MR) combining zone and the Surface Mining Conditional Use Permit/Reclamation Plan to allow mining operation. Although this alternative would not preclude the potential for future sale or lease of the project site, or the potential for future private or public development, these potential activities would be subject to separate approvals and environmental review, as applicable (see description of Alternative 1B: No Project with Reasonably Foreseeable Development, below).

Under this alternative the parcel containing the existing quarry would continue to be mined under the applicant's legally vested right to mine that portion of the parcel currently zoned MR. The requested Use Permit and Reclamation Plan (including mitigation measures recommended in this EIR) would not apply to future mining of this area. Per the 1988 Reclamation Plan, under this alternative the mining would extend the quarry northward from the existing quarry floor (see Figure 5-1). The final quarry floor would be oriented north-south with benches along the east, west, and north slopes above the floor. Drainage of the quarry would continue to be directed towards Porter Creek. Once that mining was completed, the site would be reclaimed per the existing 1988 Reclamation Plan.

[62] If mining of the vested rights MR area did not occur in the future, then the impacts of that mining described below also would not occur. Accordingly, the impacts of this alternative would be substantially less than what is described below and substantially less than the proposed project.

b. Basis for Selection

The No Project and No Subsequent Development Alternative is included in this EIR because CEQA Guidelines, Section 15126.6(e)(1), requires that an EIR evaluate a “no project” alternative along with its impacts in order to provide a comparison of the impacts of approving the proposed project with the impacts of not approving the proposed project. Pursuant to CEQA Guidelines, Section 15126.6(e)(3)(B), the No Project Alternative and No Subsequent Development Alternative discusses the expansion property remaining in its existing state.

c. Environmental Impacts

Geology, Soils, and Seismicity

The alternative would eliminate all impacts related to geology and soils on the proposed expansion parcel. As there would not be any additional mining above Porter Creek Road, there would be no risk of mining-generated rock falls or slope failure above this road. The rock fall barrier system would not be required. The alternative would include further mining of the vested rights portion of the existing quarry. The area north of the existing quarry that is currently zoned MR and within the vested rights area has steep and potentially unstable slopes. Mining of this area would have impacts similar to those described for the proposed project, including: accelerated erosion and siltation; instability of natural and artificial slopes (both fill and cut); the possibility of seismically induced slope failures; and loss or damage to other improvements. Excavations into the area subject to slope failure (where the old overburden storage caused slippage) could be problematic and trigger additional failures potentially affecting the northern slope of the property. It is possible that expansion on the north side of the ridge could result in a significant slope stability impact. Because mining of the vested rights area would not require additional review or mitigation, some of the mitigations recommended in this EIR regarding slope stability and erosion control would not apply, which could result in more significant geologic and soil impacts than described for the proposed project. The 1988 Reclamation Plan does not provide any standards for final slope stability or control of erosion. However, the provisions of the County’s Surface Mining and Reclamation Ordinance (SMARO) that provide basic standards and guidelines for slope stability and erosion control would still apply. County monitoring of future mining per SMARO standards would provide basic mitigation for potential geologic impacts. However, the SMARO standards are not as site- and project-specific as the measures contained in this EIR. Accordingly, it is expected that mining of this area could have more impacts than would occur under the proposed project.

Hydrology and Water Quality

None of the project-generated hydrologic impacts associated with the expansion parcel would occur. There would be no new impermeable surfaces developed on the proposed expansion parcel, and, thus, no increase in runoff from that site. Accordingly, there would be no need to expand culverts or other-site drainage facilities. As there would be no erosion from the site, there would be no need to build expanded detention facilities. There would be no off-site water quality impact from site-generated sediments or transport of petrochemical or other residues. There would be no impact to groundwater resources, and the alternative would eliminate the impact to the groundwater recharge area of the well to the west of the site.

However, mining of the vested rights area would have similar impacts on Porter Creek as the proposed project, including potential water quality impacts. Expansion of mining to the north would redirect runoff that currently flows to Franz Creek to Porter Creek. This increase in the runoff to Porter Creek could increase peak flood flows on that creek.

Sediment washed off working quarry surfaces would be transported to Porter Creek after flowing through the existing detention basins on the site. The additional sediment control mechanisms recommended in this EIR would not be required for this alternative, so there could be greater escape of sediments off the site than under the proposed project.

Future mining of the vested rights MR area would not be expected to increase pumping of groundwater for aggregate conditioning and dust control beyond the existing level of pumping, and, therefore, would have no net adverse impact on groundwater resources. Reclamation activities would involve removal and transport of overburden and soils to reclaim the mined areas per the existing approved Reclamation Plan. This overburden removal could result in sediments entering the Porter Creek tributary on the site. The existing Reclamation Plan does not include specifications for how this overburden would be removed or how erosion control would be implemented during reclamation. However, future mining would still be subject to the drainage plan in the existing approved Reclamation Plan, the quarry's NPDES permit, its Storm Water Pollution Prevention Plan, and the requirements of SMARO. These existing laws and regulations would provide basic drainage requirements and water quality protections. However, the standards and regulations are not as site- and project-specific as the measures contained in this EIR. Accordingly, it is expected that mining of the vested rights MR area could have more hydrologic impacts than would occur under the proposed project.

Biological Resources

The existing vegetation on the expansion site would remain. The expansion site would continue to provide habitat for those wildlife species that currently use the site. Specifically, this alternative would avoid the potentially significant but mitigable impacts to: jurisdictional waters of the U.S.; riparian habitat; tree loss; special-status plant and wildlife populations; habitat for special-status species; disturbance of active nests of raptors and other special-status birds and active roosts of special-status bat species; blasting impacts; and indirect water quality impacts on special-status fish species downstream of the expansion site. Because no security fencing or rock fall barriers would be constructed, interference with an existing migratory wildlife corridor would also be avoided.

However, there would be substantial loss of additional vegetation on the vested rights portion of the existing quarry site. The MR-zoned area on the existing mining parcel contains similar wildlife habitat as the proposed expansion area. There would be similar potential impacts to raptors and pallid bats. The MR-zoned area contains habitat suitable for northern spotted owl nesting, and this species could be affected by mining this area. The MR-zoned area on the existing parcel contains 7 localities (93 plants) of Napa false indigo (a special-status species). These plants would be removed if the area was mined. Because the proposed expansion site would be left undeveloped, the project's considerable contribution to habitat fragmentation and blockage of wildlife travel would be eliminated. Mining of the northeast, steep north-facing could cause significant erosion. Eroded soils as well as other chemical pollutants resulting from mining operations, unless controlled on the property, could cause significant water quality impacts on Porter Creek, and possibly downstream on Mark West Creek. Future mining would result in possible loss of nests and dens, wetlands, waters of the U. S, and habitat used by California red-legged frog, foothill yellow-legged frog, and northwestern pond turtles. It is possible that some of these significant impacts to biological resources may not be reduced to a less-than-significant level. Mining would reduce site runoff to Franz Creek, which could adversely affect dry season streamflows and the fishery dependent on those flows.

However, any future mining would be subject to the Federal and State Endangered Species Act, the Migratory Bird Treaty Act, the Clean Water Act, State and Federal laws regarding filling of wetlands and work in stream channels, and SMARO requirements relative to wildlife habitat. These existing laws and regulation would provide basic protections for special-status species and sensitive biological habitat. However, the standards and regulations are not as site- and project-specific as the measures contained in this EIR. Thus the alternative eliminates the project's considerable contribution to a significant cumulative impact on wildlife movement, but would otherwise result in more impacts to special-status species and other biological resources. Overall, it would have more impacts on biological resources than would the proposed project.

Traffic

Without the proposed expansion project there would be no increase in truck trips hauling aggregate from the expansion parcel. However, mining of the existing MR area could occur at the 500,000 cubic yards production rate allowed under the 1988 Reclamation Plan. Accordingly, mining of the MR-zoned area could generate approximately the same number of trips as generated by the proposed project. This could result in the same two traffic safety impacts, the cumulative safety impact, and the cumulative intersection impact identified for the proposed project. Because this mining would not require any additional permits, the operator would not be required to contribute its fair share to future roadway and/or intersection improvements. Therefore, this alternative could have greater traffic impacts than the proposed project.

The alternative would eliminate the need to widen Mark West Springs and Porter Creek Roads, thereby eliminating the significant impacts on environmental resources that could accompany this EIR-recommended widening.

Air Quality and Global Climate Change

Without the proposed expansion project, as noted above for traffic, there would not be increased emissions from production or hauling of aggregate from the expansion parcel. However, mining of the existing MR-zoned area would result in similar air quality impacts as described for the proposed project. Local emissions from haul trucks could remain the same. This alternative would have about the same emission of criteria pollutants, including emission (albeit less-than-significant emissions) of NO_x. This alternative would have similar DPM emissions, as well as contribute to regional criteria pollutant and TAC cumulative impacts. Finally, this alternative would result in similar GHG emissions from operation of the quarry. The quarry would remain operating under its Permit to Operate (PTO) issued by the BAAQMD, and this permit must be renewed annually. Emissions from haul truck engines will continue to decline given State regulation of diesel emissions. Overall impacts are expected to be the same as the proposed project.

Noise

Without the proposed expansion project, no noise would be generated on the expansion parcel. However, noise would be generated by subsequent mining of the existing vested rights MR-zoned area. Mining the north face of the ridge would generate future noise levels that would exceed the adjusted County noise limit at the Mountain House Ranch Resort and a residence located northwest of the property. The noise levels during future quarry operations would result in a significant increase in noise at Mountain Home Ranch Resort and Mayacamas Ranch to the north of the quarry (see Appendix G for more information on possible future noise effects of mining this area). Traffic noise along haul routes would remain about the same as described for the project as proposed. Overburden would be removed from the Overburden Stockpile Area to sell or to be used for reclamation. This could have significant off-site impacts as was described for the proposed project. Future mining would need to comply with the noise standards in the County's 2020 General Plan (specifically Table NE-2) and conditions contained in the ARM Plan. These standards would provide basic noise protection for sensitive receptors near the quarry. Overall impacts are expected to be the same as the proposed project.

Visual Resources

Without the proposed expansion project there would be no mining of the expansion parcel. Accordingly, the rock fall barriers would not be required, and the visual impacts associated with the rock fall barrier system would be eliminated. The significant impact on views for eastbound drivers on Porter Creek Road (which is also considered a cumulatively-considerable contribution to the cumulative impact on this view) would be eliminated because the slopes to the north of the road would not be lowered. Expansion of the working face to the west would not occur. However, expansion would occur to the north in the MR-zoned land. Mining of the northern slopes in the vested rights area would substantially affect views from Mountain Home Road and residences and lodging establishments along that road as well as more distant residences to the north. Existing views of the currently north-sloping forested hillside would be altered. The crest of the ridge would be lowered. The quarry would continue to be oriented toward the south, so it is unlikely that there would be views of quarry working slopes from the north, but there would be a significant lowering of a portion of the ridge and loss of views of woodland from vantage points to the north. While the alternative eliminates visual impacts to Porter Creek Road views, including the significant impact on views for eastbound drivers on this road, the increased impact on views from the north would result in more visual impacts than would occur under the proposed project.

Hazards and Hazardous Materials

Transport, storage, and hauling of hazardous materials would remain about the same as described for the proposed project. Given required compliance with existing laws and regulations, impacts associated with hazards would be less than significant for both the project and this alternative.

Public Services and Utilities

Impacts to public service providers would be less than significant both for the project and this alternative except for potential impacts to fire protection agencies. Subsequent mining of the MR-zoned land would result in similar calls for fire and emergency response as the proposed project. The proposed project would be required to provide the County Fire and Emergency Services Department with a covenant that includes a vegetation management agreement and that would run with the land in perpetuity. Such an agreement would not be required for this alternative. Accordingly, this alternative could have a greater impact than the project as proposed.

Cultural and Paleontological Resources

This alternative would eliminate potential impacts to any cultural resources on the expansion parcel. While no cultural resources were discovered during surveys conducted for this EIR, there would remain the potential for damage to currently undiscovered resources on the MR-zoned land. This EIR contains specific mitigations to be followed in the case that cultural resources are discovered during subsequent mining. SMARO contains similar protections for resources uncovered during mining. Accordingly, this alternative would have similar impacts to cultural resources as the proposed project.

Land Use and Plan Consistency

This alternative would be consistent with the General Plan and Zoning Ordinance as it would allow mining of the MR-zoned area and ultimately reclaim the site. The expansion parcel would be left undeveloped and available for grazing use. However, extending mining north of the ridge crest would move mining operations nearer existing vineyards and lodging facilities located along Mountain Home Ranch Road. Noise, visual, and possibly other impacts from this northern extension of mining could cause future land use conflicts with existing lodging operations. Though existing requirements and controls in the County's 2020 General Plan and ARM Plan would apply to this future mining, it is expected that the alternative would have a greater potential to cause land use conflicts.

d. Ability to Accomplish Project Objectives

Under this alternative, the proposed project and mining of the proposed expansion parcel would not occur. No additional development of that property would occur, and the land would be used as wildlife habitat or for grazing. However, mining of the MR-zoned area on the existing quarry property could continue. This mining would appear to partially meet the project objectives of continuing to provide aggregate for use within the County.

e. Conclusions

The No Project and No Subsequent Development Alternative would result in more significant impacts than the project as proposed. This is an uncommon conclusion for an EIR since, typically, the No Project Alternative is identified as the environmentally superior alternative. In the case of this project, it is not the superior alternative due to the fact that the existing quarry operation would be able to continue mining its vested rights area if the proposed quarry expansion is denied, and mining of this vested rights area would have potentially significant impacts that outweigh the alternative's reduction in impacts on the proposed expansion parcel.

The alternative would eliminate one of the three remaining significant project-specific impacts (the impact on eastbound Porter Creek Road views), the significant secondary impact associated with EIR-recommended roadway sidelining, and the cumulatively-considerable contribution to the significant visual cumulative impact and the significant biological impact. However, the alternative would result in a new significant visual impact and have greater impacts as regards biological resources, traffic, and public services and could have greater impacts as regards geology and hydrology. The alternative would have similar impacts as regards noise, air quality, hazards and hazardous materials, public services and utilities, cultural and paleontological resources, and land use. The proposed project is environmentally superior to this alternative.

2. Alternative 1B, No Project with Reasonably Foreseeable Development Alternative

a. Description

Under the No Project with Reasonably Foreseeable Development Alternative, as under Alternative 1A, implementation of the proposed project would not occur, and all aggregate reserves on the expansion parcel would remain in place. As a result, none of the approvals that would be required by the County under the project would occur under this alternative, including the proposed Zone Change to add the Mineral Resource (MR) combining zone and the Surface Mining Conditional Use Permit/Reclamation Plan to allow mining operation on the expansion parcel. Given the potential uses permitted under the RRD zoning, and the existing terrain and resources within the project site, potential permitted uses (without a use permit) for the project site under Alternative 1B could include low-density residential use (one residence would be permitted). The RRD zone allows a range of uses related to farming, timber management, and housing for agricultural workers. Commercial agriculture is not a predicted use of this site given its steep slopes and lack of agricultural soils. The site does not contain extensive stands of commercial tree species. Nevertheless, if logging were to occur, the timber operation would need an approved THP. Logging this parcel would be quite expensive given topographic and access constraints. Accordingly, logging is not a predicted use. The most likely use would be a single-family residential use. The zoning also allows for a second unit, so it is possible that there could be two residential units on the site. As was the case for Alternative 1A, mining of the MR-zoned land on the existing quarry parcel would be allowed per existing vested rights under this alternative.

b. Basis for Selection

The No Project with Reasonably Foreseeable Development Alternative is included in this EIR to discuss “what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services” (CEQA Guidelines Section 15126.6(e)(2)).

c. Environmental Impacts

Without knowing where a residence, a second unit, and access roads would be developed, the following describes possible impacts that could arise from such development. In addition, the discussion summarizes the impacts that would occur if subsequent mining of the existing vested rights MR area were to occur, as described in more detail in the foregoing discussion of Alternative 1A.

Geology, Soils, and Seismicity

Development of two homesites would require grading to develop building pads and driveways. This grading would cause soil erosion. Grading would be done under a grading permit that would require implementation of BMPs. Given the topography of the site, it is expected that the residences would be constructed on a slope and that they would be designed and engineered to be able to withstand slope instabilities and expected seismic activity. As was described under Alternative 1A, the alternative would eliminate mining-induced rock falls and slope instability impacts above Porter Creek Road. Future mining of the MR-zoned land would have potentially significant impacts as regards slope stability and soil erosion. The provisions of the County’s Surface Mining and Reclamation Ordinance (SMARO) that provide basic standards for maintaining adequate slope stability and erosion control would apply to mining the vested rights MR area. County monitoring of future mining per SMARO standards would provide basic mitigation for potential geologic impacts. However, the SMARO standards are not as site- and project-specific as the measures contained in this EIR. Accordingly, the impacts of such mining could exceed the impacts of the proposed project.

Hydrology and Water Quality

Runoff from the new homesites would not be expected to substantially increase runoff in Porter Creek or Franz Creek. While residential construction and use would result in some soil erosion and potential stream sedimentation, the impact of such a small project would be expected to be less than significant. The residences would be served by an on-site well. Use of that well would not be expected to significantly affect groundwater resources nor existing wells in the area (second units in this groundwater area would need to have a geohydrologic study done to show there is sufficient groundwater to serve the second unit).

As described under Alternative 1A, eliminating mining of the expansion site would eliminate project impacts on increased runoff, inadequately sized drainage improvements, inadequate sediment detention facilities, groundwater resources, and groundwater recharge area. However, subsequent mining of the vested rights area, which could occur if the expansion project is not approved, would be expected to have more substantial water quality impacts on Porter Creek than the project as proposed.

Future mining would be subject to the drainage plan in the Reclamation Plan, the quarry's NPDES permit, its Storm Water Pollution Prevention Plan, and the requirements of SMARO. These existing laws and regulations would provide basic drainage requirements and water quality protections. However, the standards and regulations are not as site- and project-specific as the measures contained in this EIR. Accordingly, it is expected that mining of this area could have more impacts than would occur under the proposed project.

Biological Resources

Development of homesites plus driveway access would result in some loss of vegetation. Substantially less vegetation would be removed than would occur for the project. As much as 2+ acres could be cleared for two residences and driveway development. Additional trees could be removed to meet defensible space requirements. Since biological surveys would not be required, it is possible that construction of the residences could inadvertently destroy or adversely affect special-status plants and wildlife and disturb nesting birds. Wildlife habitat would be displaced, with possible disruption of travel or migration routes. Domestic dogs and cats residing at the residences could adversely affect bird and wildlife populations near the homesites. Runoff from the homesites could adversely affect water quality, thereby adversely affecting salmonids. These impacts to biological resources would be substantially less than the impacts of mining the proposed expansion site. While there would be some impacts to habitat and sensitive species, most of the site would remain undeveloped whereas for the proposed project, the biological resources would be removed in stages within the proposed 32-acre expansion area.

As described under Alternative 1A, future mining of the vested rights MR area would result in a substantial loss of additional vegetation in that area with consequent blockage of wildlife travel. The cumulative impact on wildlife movement would remain significant for this alternative since there would continue to be development on both the proposed expansion parcel and the MR-zoned area. The MR-zoned area on the existing mining parcel contains populations of Napa false indigo (a special-status species) that would be eliminated. This area also contains similar wildlife habitat as the proposed expansion area. In addition, it contains suitable habitat for northern spotted owl, and future mining could significantly affect that special-status species. There would be similar potential impacts to raptors and pallid bats. Eroded soils as well as other chemical pollutants resulting from mining operations, unless controlled on the property, could cause significant water quality impacts on Porter Creek, and possibly downstream on Mark West. Future mining would result in possible loss of nests and dens, wetlands, waters of the U. S, and habitat used by California red-legged frog, foothill yellow-legged frog, and northwestern pond turtles. It is possible that some of these significant impacts to biological resources may not be reduced to a less-than-significant level. Future mining of the MR-zoned area would reduce site runoff to Franz Creek, which could adversely affect dry season streamflows and the fishery dependent on those flows. Future mining would be subject to the Federal and State Endangered Species Act, the Migratory Bird Treaty Act. the Clean Water Act, and State and Federal laws regarding filling of wetlands and work in stream channels, and SMARO requirements relative to wildlife habitat. These existing laws and regulations would provide basic protections for special-status species and sensitive biological habitat. However, the standards and regulations are not as site- and project-specific as the measures contained in this EIR. In addition, this alternative would result in more impacts to special-status species. The alternative would have greater impacts on biological resources.

Traffic

Two new residences could generate up to twenty new trips per day, which would have a less-than-significant impact on roadways and intersections. However, as described under Alternative 1A, mining of the MR-zoned area could generate approximately the same number of trips as generated by the proposed project and result in similar significant traffic safety and intersection congestion impacts as would occur under the project. The alternative could have greater traffic impacts than the proposed project given that this future mining would not contribute to long-term roadway and intersection improvements.

The alternative would eliminate the need to widen Mark West Springs and Porter Creek Roads, thereby eliminating the significant impacts on environmental resources that could accompany this EIR-recommended widening.

Air Quality and Climate Change

The residential use of the expansion parcel would not generate significant air pollutants or greenhouse gas. However, as described under Alternative 1A, mining of the MR-zoned area could result in similar air quality impacts as described for the proposed project. This alternative could have the same DPM and GHG emissions, as well as contribute to regional criteria pollutant and TAC cumulative conditions. The alternative could result in similar air quality and climate change impacts as the proposed project.

Noise

Residential use on the expansion parcel would generate noise, but there are no adjacent residences, plus that type of noise would be typical for the rural area and not considered significant. As described under Alternative 1A, mining of the vested rights area would have significant adverse noise impacts on sensitive receptors along Mountain Home Road. Traffic noise along haul routes would remain the same as described for the project as proposed. Overburden would be removed from the Overburden Stockpile Area to sell or use for reclamation. This could have significant off-site impacts as was described for the proposed project. As described for Alternative 1A, future mining would be subject to ARM Plan noise controls and the requirements set forth in Table NE-2 of the 2020 General Plan that sets limits for acceptable noise levels at sensitive receptors. The alternative could result in similar air quality and climate change impacts as the proposed project.

Visual Quality

The two new residences on the expansion parcel would likely not be visible from public vantage points, though even if they were, this would not have a significant impact on views. The alternative would not result in additional views of solar panels, so it would eliminate the r significant impacts on visual resources. Mining of the northern slopes in the vested rights area would substantially affect views from Mountain Home Road and residences and lodging establishments along that road as well as from more distant residences to the north. This would be a significant impact of this alternative. Views of the currently north-sloping forested hillside would be replaced by bare slopes and rock faces and the elevation of the ridge would be substantially reduced. Because the alternative would substantially impact views from the north, it would result in more visual impacts than would occur under the proposed project.

Public Services and Utilities

Two new residences on the expansion parcel would not significantly affect public service providers. The homes would need to be built consistent with CAL FIRE requirements for new home construction in State Responsibility Areas. This would include access, defensible space, and fireflow storage requirement. While these requirements would reduce the risk of wildfire burning these new homes, it does not eliminate the increased risk of ignition. Two new homesites would increase the number of locations where fires could ignite and spread to neighboring properties. Mining the vested rights area would have similar impacts as the proposed project. However, the covenant that includes a vegetation management agreement required for the project would not be required under this alternative. Accordingly, this alternative could have more impact than the project as proposed.

Hazards and Hazardous Materials

The new residences on the expansion parcel would not require the transport, storage, or use of hazardous materials not typically associated with rural residential use. As described under Alternative 1A, mining of the vested rights area would have similar potentially significant but mitigatable impacts as the proposed project.

Cultural and Paleontological Resources

There are no known cultural resources on the property. However, unknown resources could be uncovered during future grading and mining. While no significant cultural resources were discovered by surveys done for this EIR on the MR-zoned land, there would remain the potential for damage to currently undiscovered resources. This EIR contains specific mitigations to be followed in the case that cultural resources are discovered during subsequent mining. SMARO contains similar protections for resources uncovered during mining. These EIR-recommended mitigations would not be required for the residential development allowed under this alternative. Accordingly, this alternative could result in more substantial impacts than the project as proposed on cultural resources.

Land Use and Plan Consistency

Development of a single-family residence and a second unit on the expansion parcel would be consistent with property zoning and General Plan designation. These residences would not result in any land use impacts on neighboring uses. Similar to the proposed project, mining of the vested rights area would have greater potential to cause land use conflicts than the project as proposed.

d. Ability to Accomplish Project Objectives

Under this alternative, the proposed project and mining of the proposed expansion parcel would not occur. Construction of one residence, a second unit, and associated residential development on that property would occur. However, mining of the MR-zoned area on the existing quarry property could continue. This mining would partially meet the project objectives of continuing to provide aggregate for use within the County.

e. Conclusions

The No Project and Reasonably Foreseeable Development Alternative would result in more significant impacts than the project as proposed. As noted previously, this is because under this alternative the applicant could continue to mine its vested rights MR area on the existing quarry parcel. The alternative would eliminate one of the three remaining significant project impacts (the impact on eastbound Porter Creek Road views), the secondary impact associated with possible EIR-recommended roadway widening, and the cumulatively-considerable contribution to the significant cumulative impact on this same view. It would result in a new significant visual impact and have greater impacts as regards biological resources, traffic, public services, cultural resources, and land use and could have greater impacts as regards geology, and hydrology and water quality. The alternative would have similar impacts as regards air quality and hazards and hazardous materials. The proposed project is environmentally superior to this alternative.

3. Alternative 2, Reduced Production Alternative

a. Description

Under the Reduced Production Alternative, the maximum allowable production would be reduced to the level that is used as the baseline for this EIR, namely 305,000 cubic yards per year, which is about 40% less than proposed. Otherwise, this alternative would be the same as the proposed project. The alternative would include the same proposed Zone Change to add the Mineral Resource (MR) combining zone and the Surface Mining Conditional Use Permit/Reclamation Plan to allow mining operation on the expansion parcel. Aggregate would be mined and processed as proposed. Additional overburden would still be added to the Overburden Storage Area for the first three years of operation. Similar to the project as proposed, this alternative does not include additional mining of the vested rights MR area north of the already-mined area on the existing quarry parcel. Any future mining of the vested rights MR area would require County approval of a new use permit and reclamation plan.

Over the 20-year life of the use permit, less rock would be removed from the expansion site than would occur under the proposed project. This could result in a smaller footprint for the quarry, but this would not necessarily be the case as the same area could be mined, just not as deep. Mitigation measures required for the project would apply to this alternative, as warranted.

b. Basis for Selection

The Reduced Production Alternative was included to provide an alternative that primarily would reduce off-site environmental impacts compared to the proposed project, specifically traffic, air quality, and noise impacts resulting from the reduced number of truck trips that would be required to haul aggregate under this alternative.

c. Environmental Impacts

Geology, Soils, and Seismicity

Because less total aggregate would be removed during the 20-year use permit period, the alternative could reduce the area that would be disturbed, but as noted above, this would not necessarily be the case. Mining would have approximately the same impacts as identified for the project. As was described for the project as proposed, mining under this project alternative could result in significant but mitigatable impacts from unstable slopes due to local rock conditions or as a result of seismic activity, including potential rock falls above Porter Creek Road. The ravine fill in the Overburden Storage Area could fail, but this impact can be mitigated. Potential impacts from blasting would be similar to that identified for the project, and can be mitigated. Similar measures required for the stability of the final highwall, backfill, and reclamation fill slopes for the project would be required for this alternative. To summarize, the alternative would not substantially decrease geologic-related impacts. However, the mitigation measures recommended for the project would be required for this alternative, and they would reduce all impacts to a less-than-significant level.

If in the future a new use permit was approved to allow additional mining of the remaining MR lands on the property, or deepening of the quarry, the project could combine with that future mining to cause similar cumulative geologic impacts as would occur for the proposed project. In both cases, the project, with recommended mitigation measures implemented, would make a less-than-cumulatively considerable contribution to those cumulative impacts.

Hydrology and Water Quality

It is possible, though not certain, that this alternative could reduce the overall area being mined. However, the impacts to drainage and water quality would be approximately the same as for the proposed project. In both cases, peak flows would be detained on site. Mining would result in erosion and potential escape of water pollutants to Porter Creek under the project and this alternative, and mitigation measures recommended for the project would also apply to this alternative. In neither case would future mining cause downstream flooding or reduce flows to adversely affect salmonids. The alternative would reduce the demand for groundwater to existing levels, so there would be no impact on groundwater resources. However, this was found to be a less-than-significant impact for the project as proposed (with recommended mitigation). Depending on where the footprint of this alternative is located, it could eliminate or reduce the impact of reducing the groundwater recharge area in Sub-basin A and, consequently reduce potential impacts to an off-site residence's well. The EIR recommends a mitigation for this impact to reduce it to a less-than-significant level. To summarize, this alternative could reduce or eliminate the impact on groundwater recharge to a neighboring well.

Otherwise, the alternative would have similar hydrologic impacts as the proposed project.

If in the future a new use permit was approved to allow additional mining of the remaining MR lands on the property, or deepening of the quarry, the project could combine with that future mining to cause similar cumulative hydrologic impacts as would occur for the proposed project. In both cases, the project, with recommended mitigation measures implemented, would make a less-than-cumulatively considerable contribution to those cumulative impacts.

Biological Resources

Though it is possible that less of the proposed expansion area may be disturbed under this alternative, it is expected that the population of Jepson's linanthus, given its proximity to the existing working face of the quarry, would be removed both by the proposed project and this alternative. The same mitigations would apply and would reduce the project impact to a less-than-significant level. The alternative would have similar, though potentially reduced, impacts on active nests; mitigations recommended for the project would apply and reduce this impact to a less-than-significant level. While no special-status fish, amphibians, or turtles were found on the site, this EIR recommends mitigation measures to ensure that such special-status species are not affected by quarry expansion. These same measures would apply to this alternative and would reduce the impact to a less-than-significant level. The alternative would have similar sedimentation and water quality impacts to off-site special-status species as the project. The same measures recommended for the project would apply to this alternative and would reduce the impact to a less-than-significant level. As with the project, it is expected that this alternative would remove Tributary E, and the same mitigation would be required, which would reduce the impact to a less-than-significant level. Less timberland would be converted, but the potential loss of timberland is not considered a significant impact for the project. In summary, this alternative could reduce the amount of habitat that is disturbed but this is not certain. Otherwise, the alternative would have similar impacts as the proposed project.

If in the future a new use permit was approved to allow additional mining of the remaining MR lands on the property, or deepening of the quarry, the project could combine with that future mining to cause similar cumulative biological impacts as would occur for the proposed project. In both cases, the project, with recommended mitigation measures implemented, would make a less-than-cumulatively considerable contribution to those cumulative impacts except for the cumulative impact on wildlife movements, which would remain significant for this alternative.

Traffic

Because this alternative would maintain existing traffic volumes, it would not result in any new adverse traffic impacts (i.e., there would be no increase in traffic over existing levels). Accordingly, it would eliminate the two significant traffic impacts resulting from the project and the project's cumulatively-considerable contribution to two significant cumulative traffic impacts; no traffic mitigations would be required for this alternative.

Intersection improvements have been identified in this EIR to improve unacceptable intersection operations to acceptable levels of service, but because the traffic conditions would not worsen under this alternative, the applicant would not be required to participate in the funding or construction of those improvements under this alternative. This EIR also identifies areas of roadway hazard for bicyclists and other vehicles along the roadway system and identifies measures to reduce that hazard. Again, because the alternative would eliminate traffic impacts, the applicant would not be required to participate in the funding or construction of those improvements. The alternative would eliminate the need to widen Mark West Springs and Porter Creek Roads, thereby eliminating the significant impacts on environmental resources that could accompany this EIR-recommended widening.

To summarize, this alternative would maintain traffic on the roadway system at existing levels and eliminate the significant traffic impacts and the secondary impacts associated with EIR-recommended roadway widening that would result from the proposed project.

Noise

The one potentially significant noise impact for both the project and this alternative would result from removal of overburden in the Overburden Storage Area. In both cases, a mitigation is available to reduce the impact to a less-than-significant level. There would be no increase in traffic noise since this alternative would not increase the number of haul trips beyond existing conditions. This traffic noise would not be significant for the proposed project or at a cumulative impact level. Blasting for the project could cause building damage to two residences to the west of the expansion area. Mitigation is required when expansion and blasting reaches 600 feet from these residences, which would apply to this alternative if warranted. With the reduced production, it is possible that expansion would not reach within 600 feet of these residences, so no impact or mitigation may be needed. To summarize, the alternative would cause basically the same noise impacts as the project except for a small reduction in traffic noise impacts and, possibly, blasting impacts.

If in the future a new use permit was approved to allow additional mining of the remaining MR lands on the property, or deepening of the quarry, the project could combine with that future mining to cause similar cumulative noise impacts as would occur for the proposed project. In both cases, the project, with recommended mitigation measures implemented, would make a less-than-cumulatively considerable contribution to those cumulative impacts.

Air Quality and Climate Change

Because there would be no increase in haul truck traffic for this alternative, there would be no increase in emissions of air pollutants or GHG. This alternative would also generate fewer emissions of criteria air pollutants than the project (see Table 4.6-8 that shows the increase in emissions from the project over the baseline, which is the same as this alternative). Though the alternative would reduce emissions, this impact was already found to be less-than-significant for the project as proposed. However, the emission of ozone precursors was identified as a significant cumulative impact. This alternative would eliminate the project's cumulatively-considerable contribution to this significant cumulative impact.

Similarly, the alternative would reduce the emission of toxic air contaminants generated at the site, but, again, this impact was found to be less-than-significant for the project as proposed. Because the alternative would not increase haul truck traffic, it would not increase the emission of diesel particulate matter (DPM) along the roadway system, and would eliminate any impact associated with DPM emissions. The risk of exposure to asbestos would be the same as for the project, and this impact can be reduced to a less-than-significant level. To summarize, the alternative would eliminate additional air pollutant and GHG emissions that the project would generate.

If in the future a new use permit was approved to allow additional mining of the remaining MR lands on the property, or deepening of the quarry, the project could combine with that future mining to cause similar cumulative air quality impacts as would occur for the proposed project. This alternative would make a less-than-cumulatively considerable contribution to those cumulative impacts.

Visual Quality

Though the mining expansion area could be reduced with this alternative, this area is mostly not visible from public vantage points. It is possible, depending on where the expansion occurs, that the ridge on the north side of Porter Creek Road would not be reduced as much as would occur under the project. In that case, more of the ridge and existing vegetation and less blue sky would be visible from westbound and eastbound vantage points along that road. It is unlikely, though possible, that the significant visual impact (which is also considered a cumulatively-considerable contribution to the cumulative impact on this view) on eastbound drivers on Porter Creek Road could be reduced or even eliminated. View changes resulting from the project on vantage points on Mountain Home Road are almost not noticeable and considered less-than-significant for the project as well as this alternative.

If in the future a new use permit was approved to allow additional mining of the remaining MR lands on the property, or deepening of the quarry, the project could combine with that future mining to cause similar cumulative visual impacts as would occur for the proposed project. Both the project and this alternative would make a less-than-cumulatively considerable contribution to those cumulative impacts except for the impact to the view from eastbound Porter Creek Road, as described above.

Public Services and Utilities

Neither the project nor this alternative is expected to have significant impacts on emergency medical or police protection providers. Mitigation for fire protection is recommended for the project and this alternative to ensure that vegetation is managed to reduce the potential for fire ignitions. The alternative would reduce production but would be expected to have similar impacts as the project. In both cases, the project and cumulative impacts would be reduced to a less-than-significant level with recommended mitigation.

Hazards and Hazardous Materials

The same fuels, lubricants, explosives and other potentially hazardous materials that would be used for the proposed project would be used for this alternative, though there would be about a 40% reduction in the amount of materials transported, stored, and use. The project and cumulative impacts of transport, storage, and use of these materials can be reduced to a less-than-significant level for both the project and this alternative.

Cultural and Paleontological Resources

It is possible that the alternative could reduce the footprint of the quarry expansion. However, project and cumulative impacts to cultural and paleontological resources would be mitigated to a less-than-significant level for the project and the alternative.

Land Use and Plan Consistency

Similar to the proposed project, this alternative would not result in any significant project or cumulative land use impacts. The alternative would have similar consistency with the County General Plan as the proposed project.

d. Ability to Accomplish Project Objectives

Under this alternative, mining of the proposed expansion area would occur. The alternative would meet most of the project objectives although to a lesser extent than the proposed project. The difference is that there would be an approximate 40% reduction in the amount of aggregates produced and sold over the next 20 years.

e. Conclusions

The Reduced Production Alternative would eliminate the two significant project traffic impacts, the significant secondary impact associated with the EIR-recommended roadway widening, and the cumulatively-considerable contribution to two significant cumulative traffic impacts and the cumulative air quality impact as well as reduce other off-site impacts on air quality, climate change, noise, and visual resources. Otherwise, it would have similar on-site impacts, and all of these (except for the significant project and cumulative visual impact on eastbound drivers on Porter Creek Road) can be reduced to a less-than-significant level for both the project and this alternative. Given the reduction in impacts, this alternative is environmentally superior to the proposed project.

4. Alternative 3, Reduced Mining Footprint

a. Description

Under the Reduced Mining Footprint Alternative, the quarry expansion would be reduced to the "Active Mine Area" as shown on Figure 6-1. This alternative would eliminate The proposed MR zoning in the following four areas:

1. The western portion of the proposed expansion area.

2. The area containing the population of Jepson's linanthus.

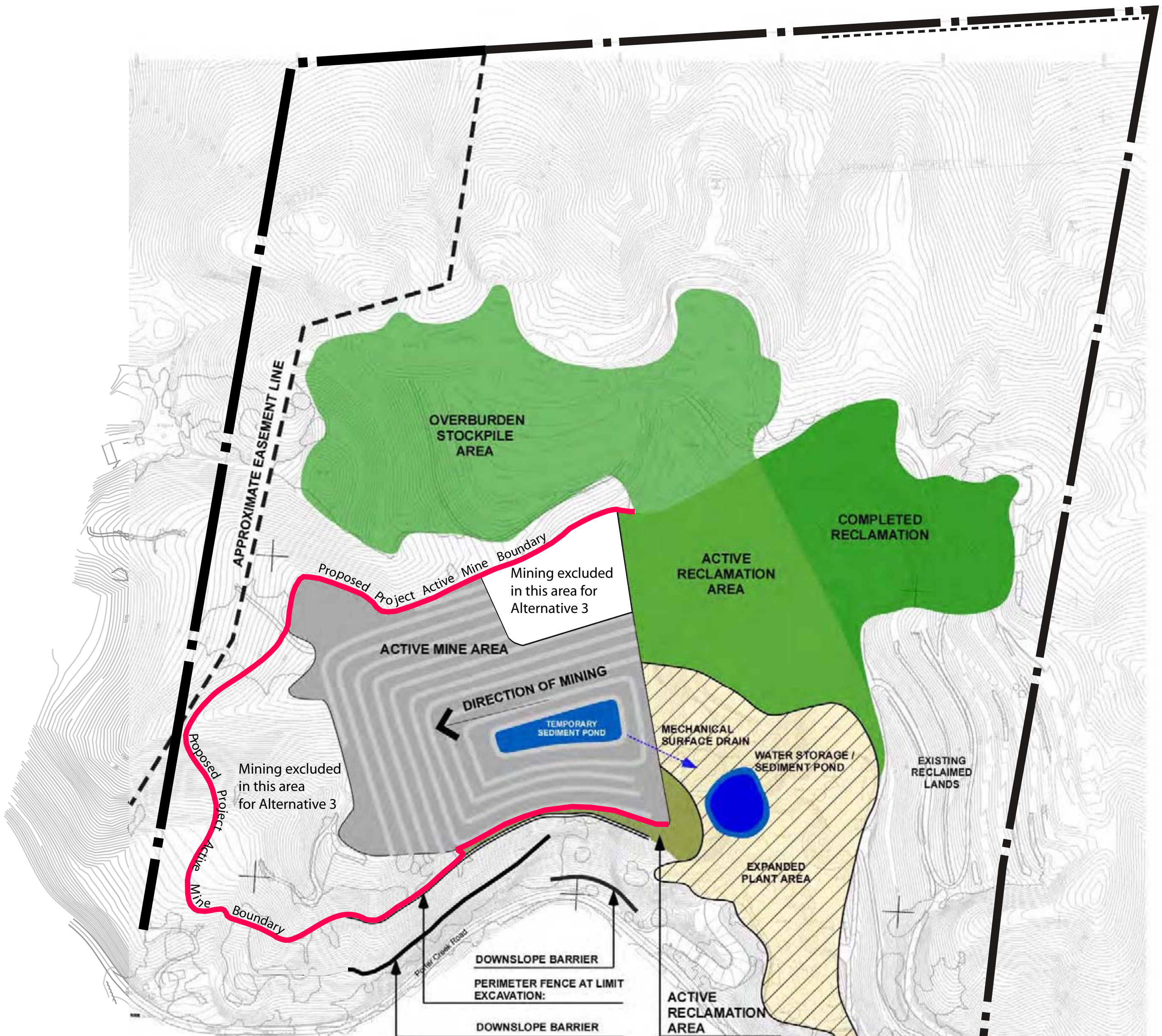

Figure 6-1
FIGURE 3-9
ECT ALTER ATI E 3 S TE MAP
MINING AND RECLAMATION SEQUENCE: STEP 2

Legend (see text for explanation)

Pr pe y Bou y

Mark West uar y Expan on

od an Company, Inc.
1060 Maxwell Dr ve
an a Rosa, CA 95401-5038

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- SOU H PORTIO : Base po phic map by Del a Geo ic u r the dir io of G n Vall y Con in in s and bas d on aeria ph ph d d July 23, 201 .
- NORTH PORTIO : Base po phic map by Del a Geo ic u r the dir io of G n Vall y Con in in s and bas d on aeria ph ph fl n in Feb y and Mar , 20 7.

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Scale
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Nor

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D : 10/ 2

1 Acre

1/4

3. The 0.7 acres in the Franz Creek watershed at the north end of the expansion area.

4. The small area between the “20-Year Mining Area” and the Overburden Stockpile Area (as shown on Figure 3-4).

The requested annual production rate of 500,000 cubic yards would be maintained as part of this alternative, but since limited the mine area is reduced then less rock will be available over the 20-year life of the use permit. Absent a mining plan for this alternative, it is estimated that the amount of available aggregate would be reduced by as much as 40%. The Reclamation Plan would be revised to reflect the smaller footprint of the mining, but it would provide similar reclamation methods and targets as proposed for the project.

Future mining of other portions of the vested rights MR area or the Overburden Stockpile Area, or deepening of the quarry would require County approval of a new use permit and reclamation plan.

b. Basis for Selection

The Reduced Mining Footprint Alternative was included to provide an alternative that would reduce on-site as well as some off-site environmental impacts compared to the proposed project, including on-site impacts such as landslide activation; water quality and groundwater impacts; and biological impacts to special-status species, waters of the U.S., and other biological resources.

c. Environmental Impacts

Geology, Soils, and Seismicity

The alternative would reduce the area that would be mined by as much as 40%. Nevertheless, mining would still have approximately the same impacts as identified for the project. As was described for the project as proposed, mining under this project alternative could result in significant but mitigatable impacts from unstable slopes due to local rock conditions or as a result of seismic activity. Potential impacts from blasting would be similar to those identified for the project, and they can be mitigated. Similar measures required for the stability of the final highwall, backfill, and reclamation fill slopes for the project would be required for this alternative. One potential impact that this alternative eliminates is the potential activation of the dormant landslide in the southwest corner of the expansion area, since mining under this alternative would not occur in that area. However, this impact can be mitigated to a less-than-significant level for the proposed project. The potential for rocks loosened by mining to fall onto Porter Creek Road would also be reduced for this alternative as mining would not extend as far west. Accordingly, the rock fall barrier would not need to be extended as far west. The alternative would have less impacts than the proposed project because it would reduce potential slope stability impacts and the area to be disturbed on the expansion parcel. However, impacts for both the project and this alternative could be reduced to a less-than-significant level.

If in the future a new use permit was approved to allow mining of the remaining MR lands on the property or deepening of the quarry, the project could combine with that future mining to cause similar cumulative geologic impacts as would occur for the proposed project. In both cases, the project, with recommended mitigation measures implemented, would make a less-than-cumulatively considerable contribution to those cumulative impacts.

Hydrology and Water Quality

This alternative would reduce the overall area being mined. Most of Tributary E would not be removed under this alternative. Additionally, the alternative would eliminate mining expansion into the 0.7 acres of the Tributary B watershed that drains to Franz Creek, Nevertheless, the impacts to drainage and water quality would be approximately the same as for the proposed project. In both cases, peak flows would be detained on site. Mining would result in erosion and potential escape of water pollutants to Porter Creek under both the project and this alternative, and mitigation measures recommended for the project would also apply to this alternative. Because mining of the reduced expansion area could be completed sooner than would be the case for the proposed project, the potential escape of sediments and other pollutants to Porter Creek would not occur for as long a time. However, in neither case would future mining cause downstream flooding or reduce flows to adversely affect salmonids. The alternative could reduce the demand for groundwater, so there could be less impact on groundwater reserves. However, this was found to be a less-than-significant impact for the project as proposed. The alternative would have a reduced impact as regards reducing the groundwater recharge area in Sub-basin A and, consequently potential impacts to an off-site well. The EIR recommends a mitigation for this impact to reduce it to a less-than-significant level, but this mitigation would likely not be needed for this alternative. The alternative would eliminate any changes to the watershed or flows to Franz Creek. To summarize, the alternative would reduce project and cumulative impacts on drainage and water quality, but all impacts could be reduced to a less-than-significant level for both the proposed project and this alternative.

If in the future a new use permit was approved to allow mining of the remaining MR lands on the property or deepening of the quarry, this alternative could combine with that future mining to cause similar cumulative hydrologic impacts as would occur for the proposed project. In both cases, the project, with recommended mitigation measures implemented, would make a less-than-cumulatively considerable contribution to those cumulative impacts.

Biological Resources

This alternative would reduce several potentially significant impacts to biological resources. In general, not as much of the natural habitat on the site would be eliminated under this alternative. The population of the special-status species of Jepson's linanthus that would be removed by the project would be preserved under this alternative. The alternative would have similar, though potentially reduced, impacts on active bird nests. However, mitigations recommended for the project would apply and would reduce this impact to a less-than-significant level. While no special-status aquatic wildlife were found on the site, this EIR recommends mitigation measures to ensure that such special-status species are not affected by quarry expansion. These same measures would apply to this alternative and would reduce the impact to a less-than-significant level. The alternative would have similar sedimentation and water quality impacts to off-site special-status species as the project, though these impacts would likely not occur for as many years. The same measures recommended for the project would apply to this alternative and would reduce the impacts to a less-than-significant level. It is expected that this alternative would not remove most of Tributary E nor the headwaters of Tributary B; however, the same mitigation measures recommended for the project regarding the tributaries would apply to this alternative and would reduce the impact to a less-than-significant level. Like the project, this alternative would have less-than-significant impacts on wildlife as the result of blasting or blocking travel corridors. Less timberland would be converted, but this loss of timberland is not considered a significant impact for the project. The project would reduce the cumulative impacts, since it would reduce the active mining area and eliminate potential future mining of the area between the project's proposed active mining area and the Overburden Stockpile Area. This eliminates the potential future impact of removing Wetland A and the remaining natural section of Tributary A. These wetland features would remain as potential habitat for California red-legged frog, hillside yellow-legged frog, and northwestern pond turtle. The alternative would reduce the project's contribution to the significant cumulative impact of habitat fragmentation and blockage of wildlife movement, but the impact would still remain cumulatively-considerable. The alternative is superior to the project because it eliminates impacts to a special-status species, reduces the loss of waters of the U. S., and eliminates cumulative impacts to wetlands.

If in the future a new use permit was approved to allow mining of the remaining MR lands on the property or deepening of the quarry, the project could combine with that future mining to cause similar cumulative biological impacts as would occur for the proposed project. In both cases, the project, with recommended mitigation measures implemented, would make a less-than-cumulatively considerable contribution to those cumulative impacts except for the significant cumulative impact of blockage of wildlife movement due to habitat fragmentation and fencing. Both the project and this alternative would make a cumulatively-considerable contribution to this significant cumulative impact.

Traffic

The alternative would have similar traffic impacts as the proposed project, including the two traffic safety impacts along the Porter Creek Road/Mark West Springs Road corridor) on motorists, pedestrians, and bicyclists; the secondary environmental impacts associated with the EIR-recommended roadway widening; the cumulative congestion impact at the Mark West Springs Road/Riebli Road intersection; and the cumulative traffic safety impact. Though these impacts may not last as long given the limit to the available aggregate under this alternative, the same traffic mitigations would be required.

Noise

The alternative would have similar noise impacts as the proposed project, again, with the caveat that mining could end sooner than the 20-year permit period given the decreased amount of aggregate available for mining. Expansion of the quarry would not cause significant noise impacts either for the project or this alternative. The one potentially significant noise impact would result from removal of overburden in the Overburden

Storage Area, and this impact could occur under either the project or this alternative. In both cases, mitigation would reduce the impact to a less-than-significant level. Traffic noise would not be significant for the proposed project or this alternative. Blasting for the project could cause building damage to two residences to the west of the expansion area. Mitigation is required when expansion and blasting reaches 600 feet from these residences. Under this alternative, expansion would not reach within 600 feet of these residences, so there would be no impact. To summarize, the alternative would cause basically the same noise impacts as the project except for elimination of blasting impacts to off-site residences.

If in the future a new use permit was approved to allow mining of the remaining MR lands on the property, or deepening of the quarry, the project could combine with that future mining to cause similar cumulative noise impacts as would occur for the proposed project. In both cases, the project, with recommended mitigation measures implemented, would make a less-than-cumulatively considerable contribution to those cumulative impacts.

Air Quality and Climate Change

This alternative would have similar air quality and climate change impacts as the proposed project. It would generate a similar amount of pollutants, though possibly for not as long a period of time. All emission impacts can be reduced to a less-than-significant level for both the project and this alternative. The risk of exposure to asbestos would be the same as for the project, and this impact can be reduced to a less-than-significant level. To summarize, the alternative would result in similar site-specific emissions of criteria pollutants, toxic air contaminants, and GHG, though impacts may not last as long.

If in the future a new use permit was approved to allow mining of the remaining MR lands on the property or deepening of the quarry, this alternative could combine with that future mining to cause similar cumulative air quality impacts as would occur for the proposed project. This alternative would make a less-than-cumulatively considerable contribution to those cumulative impacts.

Visual Quality

Though the expansion area would be reduced, the area that would not be mined under this alternative is not visible from public vantage points. The ridge north of Porter Creek Road would be lowered at its east end, so the significant impact on eastbound drivers on Porter Creek Road seeing more solar panels would remain significant for this alternative. View changes resulting from the project on vantage points on Mountain Home Road are almost not noticeable and are considered less than significant for the project as well as this alternative.

If in the future a new use permit was approved to allow mining of the remaining MR lands on the property or deepening of the quarry, the project could combine with that future mining to cause similar cumulative visual impacts as would occur for the proposed project. Both the project and this alternative would make a less-than-cumulatively considerable contribution to those cumulative impacts, except for the impact both would have on the view from eastbound Porter Creek Road.

Public Services and Utilities

Neither the project nor this alternative is expected to have significant project or cumulative impacts on emergency medical or police protection providers. Mitigation for fire protection is recommended for both the project and this alternative to ensure that vegetation is managed to reduce the potential for fire ignitions. The alternative would reduce production but would be expected to have similar impacts as the project. In both cases, the impacts would be reduced to a less-than-significant level with recommended mitigation.

Hazards and Hazardous Materials

The same fuels, lubricants, explosives and other potentially hazardous materials that would be used for the proposed project would be used for this alternative. The impacts of transport, storage, and use of these materials can be reduced to a less-than-significant level for both the project and this alternative.

Cultural and Paleontological Resources

The alternative would reduce the footprint of the quarry expansion, thus reducing the potential impacts to unknown cultural and paleontological resources. The exploratory mine pits on the west side of the proposed footprint would be avoided for this alternative. However these pits do not impact a significant cultural resource. Project and cumulative impacts to cultural and paleontological resources would be mitigated to a less-than-significant level for the project and the alternative.

Land Use and Plan Consistency

Similar to the proposed project, this alternative would not result in any significant project or cumulative land use impacts. The alternative would have similar consistency with the County General Plan as the proposed project.

d. Ability to Accomplish Project Objectives

Under this alternative, mining of a reduced portion of the proposed expansion area would occur. The alternative would appear to meet all the project objectives except that there would be as much as a 40% reduction in the amount of aggregate that is produced and sold.

e. Conclusions

The Reduced Mining Footprint Alternative would reduce on-site impacts of the proposed project on geology, hydrology, and particularly biological and wetland resources, and it may reduce the duration of off-site impacts associated with traffic. The alternative would not eliminate the three significant project impacts, the significant secondary impact associated with the EIR-recommended roadway widening, nor the cumulatively-considerable contributions to significant cumulative impacts. Given the reduction in on-site impacts, this alternative is environmentally superior to the proposed project. However it is not environmentally superior to Alternative 2.

5. Alternatives Considered But Rejected as Infeasible

Other alternatives were considered for inclusion in this EIR, but were rejected because they would not meet most of the project applicant's basic objectives; would not avoid or substantially lessen the potential impacts of the proposed project; were considered legally infeasible, economically unviable; or for other reasons, as described below.

Alternative Location

In determining whether alternative locations for the project need to be considered in an EIR, CEQA Guidelines Section 15126.6(2)(A) provides:

> The key question and first step to analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.

CEQA Guidelines Section 15126.6(1) provides:

> Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the applicant can reasonably acquire, control or otherwise have access to the alternative site.

A specific "alternative location" analysis is not warranted because 1) the proposed project is generally consistent with the General Plan, 2) the project is consistent with the ARM Plan in that the project site is an identified potential quarry site, and 3) the rezoning required for the project is to place the project site in the Mineral Resource Zone, which is an overlay zoning classification that allows mineral extraction on sites that have valuable minerals, which have been determined to be present on the site.

The applicant does own and operate the Blue Rock Quarry near Forestville, Sonoma County. This quarry currently operates an approved use permit. In 2006, an EIR was prepared and certified on the expansion of this quarry. It is unknown whether there are any other properties containing mineral reserves identified in the ARM Plan that are for sale. The EIR prepared for the Roblar Road Quarry identified two alternate sites near that quarry. It concluded that these properties were not for sale. As importantly, development of quarries on those sites would have impacts similar to the proposed Roblar Road Quarry.

Development of a quarry in any off-site undeveloped and natural areas would have the potential to result in new environmental impacts depending on the physical characteristics of the site, and/or result in a shift in environmental impacts of a similar nature and magnitude to those that would otherwise occur at the project site.

If the County were to approve an alternative location, it would likely result in the project applicant pursuing its vested rights as described for Alternatives 1A and 1B, and these alternatives would have more impacts than the proposed project.

6. Environmentally Superior Alternative

There are four alternatives to the project as proposed under consideration. Table 6.1-1 compares the project alternatives to the project and the mitigated project and identifies whether the alternative reduces a significant impact, or cumulatively-considerable contribution to a significant cumulative impact, to a less-than-significant level.

Alternative 2 (Reduced Production) would be the environmentally superior alternative because it eliminates the two significant traffic impacts, the secondary impact associated with EIR-recommended roadway widening, two cumulatively-considerable contributions to two significant cumulative traffic impacts, and a cumulatively-considerable contribution to the significant cumulative air quality impact. It also reduces other impacts, including impacts regarding traffic, noise, and emissions of air pollutants and greenhouse gas.

As was mentioned previously, it is possible that if the County approves a No Project Alternative that the applicant could terminate mining and choose not to continue to mine its vested rights area on the existing quarry parcel. If that were to occur, then either of the No Project Alternatives would have the least environmental impacts. However, it is unknown whether the applicant would make this choice. Either of the No Project Alternatives would also be the environmentally superior alternative if eventual mining of all MR-zoned lands were considered for impact comparison (i.e., the long-term impacts of the proposed mining plus mining of all other MR-zoned lands). This is because the No Project Alternatives do not extend the MR zoning to the expansion parcel, thereby eliminating long-term mining impacts on that parcel. If this approach was used, and one of the No Project Alternative was identified as the environmentally superior alternative, then the CEQA Guidelines require that a second “superior” alternative be identified from the remaining options (i.e., the alternatives other than the no project alternatives). In this case, Alternative 2 would be environmentally superior to the proposed project and Alternative 3.

Table 6.1-1
Comparison of Project Alternatives

Area of Impact	Project as Proposed	Project as Proposed with Inclusion of EIR-Recommended Mitigations	Alternative 1A, No Project and No Subsequent Development	Alternative 1B, No Project and Reasonably Foreseeable Development	Alternative 2, Reduced Production	Alternative 3, Reduced Mining Footprint
Geology	PS	LTS	Possibly Greater	Possibly Greater	Similar	Lesser
Hydrology	PS	LTS	Possibly Greater	Possibly Greater	Lesser	Lesser
Biological Resources	PS	LTS	Greater	Greater	Similar	Lesser
Traffic and Circulation	PS	SU	Greater	Greater	Lesser	Similar
Noise	PS	LTS	Similar	Similar	Lesser	Similar
Air Quality/Climate Change	PS	LTS	Similar	Similar	Lesser	Similar
Visual Resources	PS	SU	Greater	Greater	Similar	Similar
Hazards	PS	LTS	Similar	Similar	Similar	Similar
Public Services	PS	LTS	Greater	Greater	Similar	Similar
Cultural Resources	PS	LTS	Similar	Greater	Similar	Similar
Land Use	LTS	LTS	Similar	Greater	Similar	Similar
Environmental Rating	Would have potentially significant impacts on most environmental resources.	Reduces project Impacts to LTS except for 2 traffic impacts, 1 visual impact, 1 SU secondary impact, and project contributions to 5 SU cumulative impacts.	Eliminates 1 SU project impact, 1 SU secondary impact, & project contribution to 2 SU impacts. Results in a new SU visual impact. **Not superior to the project**	Eliminates 1 SU project Impact, 1 SU secondary impact, & project contributions to 2 SU impacts. Results in a new SU visual impact **Not superior to the project**	Eliminates 2 SU project impacts, 1 SU secondary impact, and contributions to 3 SU cumulative impacts. **Environmentally superior alternative**	Reduces impacts to geologic, hydrologic, and biological resources, but would not reduce any SU impacts to LTS. **Superior to the project but not to Alternative 2**

7.0 REPORT PREPARERS, PERSONS CONTACTED, AND BIBLIOGRAPHY

Report Preparers

This report was prepared under the direction and guidance of the Sonoma County Permit and Resource Management Department: Rich Stabler, Environmental Specialist; Sigrid Swedenborg and, Project Planner; and Scott Briggs, Environmental Review Division Manager (until retirement in May 2012 and then an "Extra Help" County employee for this EIR). The report was prepared under contract between the County of Sonoma and Leonard Charles and Associates. The following firms and individuals assisted in the report preparation:

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8.0 APPENDIX

The Appendix of this EIR contains the following:

A. ROCK FALL BARRIER REPORT
B. PROJECT RECLAMATION PLAN
C. GEOTECHNICAL BACKGROUND DATA
D. HYDROLOGIC BACKGROUND DATA
E. BIOLOGICAL RESOURCES BACKGROUND DATA
F. TRAFFIC BACKGROUND DATA
G. AIR QUALITY BACKGROUND DATA
H. NOISE AND VIBRATION BACKGROUND DATA