4.9 NOISE

4.9 NOISE

INTRODUCTION

This section examines specific noise impacts related to implementation of the OCMP and project alternatives. The main issues addressed in this section include:

- noise impacts associated with off-channel mining;
- increased off-site truck traffic;
- cumulative noise effects; and
- noise impacts associated with vibration and nuisance noise.

The following setting information is derived from several sources, including individual noise studies for the five mining permit applications received by the County, and the Noise Element of the Yolo County General Plan. Specific noise level data were obtained from noise measurements conducted as part of individual mining permit applications. Information on traffic noise levels was obtained from new traffic noise modeling which incorporates the latest traffic information from the Traffic and Circulation section of this EIR.

SETTING

Environmental Noise

Environmental noise is typically measured in terms of A-weighted decibels (dBA).[1] Environmental noise fluctuates over time, and different types of noise descriptors are used to account for this variability. Common noise descriptors include the energy-equivalent noise level (L_{eq}) and the community noise equivalent level (CNEL).[2] The CNEL is commonly used in establishing noise exposure guidelines for specific land uses. Generally, a three-dBA increase in ambient noise levels represents the threshold at which most

[1] A decibel (dB) is a unit of sound energy intensity. Sound waves, traveling outward from a source, exert a sound pressure (commonly called "sound level") measured in dB. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response of the typical human ear at commonly encountered noise levels.

[2] L_{eq}, the energy equivalent noise level (or "average" noise level), is the equivalent steady-state continuous noise level which, in a stated period of time, contains the same acoustic energy as the time-varying sound level actually measured during the same period. CNEL, the community noise equivalent level, is a weighted 24-hour average noise level. With the CNEL descriptor, noise levels between 7:00 p.m. and 10:00 p.m. are adjusted upward by 5 dB and noise levels between 10:00 p.m. and 7:00 a.m. are adjusted upward by ten dBA to take into account the greater annoyance of nighttime noise as compared to daytime noise.

people can just detect a change in the noise environment; an increase of 10 dBA is perceived as a doubling of loudness. A more detailed discussion of the fundamental concepts of environmental noise is contained in Section 7.3 of this EIR.

Existing Noise Environment

The major noise sources in the study area are associated with transportation (i.e., vehicles traveling on the local and regional roadway network). Other noise sources include agricultural operations, mining, and aircraft activity at Woodland-Watts Airport.

The acoustical environment at any particular receiver location depends mainly on its proximity to the various noise sources in the study area. At locations close to roadways, the dominant noise sources are individual vehicle passbys. At receiver locations set further back from roadways (beyond 1000 feet), traffic noise tends to be relatively steady with respect to time and individual vehicle passbys are not discernible. The steady traffic noise can be thought of as background sound on top of which single events, such as airplanes, dogs barking and local car passbys are heard.

Traffic Noise

The project area is served by regional freeways and highways in the state system (see Figure 4.8-1). Regional north-south access is provided by Interstates 5 and 505 (I-5 and I-505, respectively), both of which are conventional, four-lane divided freeways. State Route (SR) 16 also traverses the project area, running in a generally east-west direction; it is a standard two-lane highway. The local roadway system is comprised of rural, two-lane County roads, various public streets located mainly in the unincorporated towns of Esparto, Madison and Capay, and private access roads (paved and unpaved). On some of the less traveled roadways, (e.g., CR 14) vehicle passbys are often minutes apart. On more traveled roads, such as Route 16, traffic is more or less continuous.

Although sound levels from individual vehicle passbys are the same, roadways with higher traffic volumes generate higher average noise levels (L_{eq}). This is why the L_{eq} and the CNEL are used to describe the change in noise environment due to increased traffic volumes. Table 4.9-1 shows the CNEL at a distance of 100 feet from the centerline of the major roadways in the study area. Table 4.9-1 also shows the distance from the roadway centerline at which the CNEL is equal to 60 dB. This is sometimes referred to as the CNEL 60 dB contour distance.

The loudest transportation facility in the planning area is I-505, which generates a CNEL of 70 to 71 dB at 100 feet. State Route 16 generates a CNEL of 67 to 68 dB at 100 feet. The County roads which traverse the planning area generate CNEL levels of 62 dB or less at 100 feet. County roads currently used for hauling aggregate materials from existing mining operations (Roads 19, 20, and 89) generate the highest noise levels of all County roads. Existing traffic noise levels are summarized in Table 4.9-1.

Table 4.9-1: Existing Traffic Noise Exposure

Roadway	Segment	CNEL at 100 feet from centerline	Distance to CNEL 60 dB
Road 14	5 to 505	58 dB	76 ft
	505 to Rd 89	51 dB	27 ft
	Road 89 to Road 85	51 dB	24 ft
Road 17	5 to 505	44 dB	8 ft
Road 19	Rd 94B to Rd 20	58 dB	79 ft
	Rd 20 to I-505	58 dB	76 ft
	I-505 to Rd 87	60 dB	104 ft
Road 20(KY Av)	Rd 97 to Rd 96	62 dB	138 ft
	Rd 96 to end	62 dB	128 ft
Route 16	Rd 98 to Rd 97	68 dB	333 ft
	Rd 97 to Rd 93	68 dB	318 ft
	Rd 93 to I-505	67 dB	306 ft
	I-505 to Rd 89	68 dB	358 ft
	Rd 89 to Rd 86A	67 dB	304 ft
	Rd 86A to Rd 85	66 dB	241 ft
Road 96	Rte 16 to Road 20	56 dB	55 ft
Road 94B	Rte 16 to Main St	52 dB	29 ft
	Main St to Rd 19	58 dB	69 ft
Solano Access	north of Rte 16	59 dB	93 ft
Road 89	Rte 16 to Cache Cr	60 dB	98 ft
Road 87	Rte 16 to Cache Cr	58 dB	69 ft
	Cache Cr to Rd 19	57 dB	66 ft
	Rd 19 to Rd 16	58 dB	73 ft
Road 85	Cache Cr. to Rd 16A	53 dB	33 ft
	Rd 16A to Rd 14	52 dB	28 ft
I-505	south of Rte 16	71 dB	559 ft
	Rte 16 to Rd 19	70 dB	497 ft
	north or Rd 19	70 dB	497 ft

Source: Charles M Salter Associates, Inc, 1996

Agriculture

The majority of the land in the planning area is used for agriculture. Noise sources associated with agricultural activities include field and crop maintenance, hauling, and crop dusting from small aircraft. The noise from these sources mostly occurs within the confines of the agricultural fields, and is seasonal. A characteristic of agricultural noise is short periods of noisy activities separated by long periods of little or no noise-producing activities.

Mining Operations and Hauling

Noise-generating activities associated with surface mining operations include:

Mining. This activity consists of extracting sand and gravel aggregate material and transporting it to a processing plant. Noise-generating equipment used in mining includes drag lines, scrapers, and sometimes dredges. Aggregate material is generally transported to the processing plant by the scrapers, but on-site haul trucks or conveyers are also used.

Processing. The processing of aggregate material is typically done at a stationary processing plant on the site. Noise-producing activities include crushing, sorting and loading of aggregate materials. Noise generated during processing is considered fixed-source noise.

Hauling. Aggregate materials, once processed, are hauled from the mining site to construction sites within the Sacramento-Fairfield area. Noise is generated on access roads, designated haul routes (County roads) and on SR 16 and I-505, as haul trucks travel to and from the plant sites.

Woodland-Watts Airport

The Woodland-Watts airport is located along Road 94B just north of Route 16. It is used primarily for general aviation. The CNEL 60 contours (year 2000) for the airport would remain primarily on airport property . There is a small area at the south end of the airport where the contours extend approximately 1,500 feet south of Route 16.

Ambient Noise Measurements

The noise studies for the mining permit applications contain data from noise measurement surveys.[3] The measurements indicate that existing ambient noise levels are 40 to 50 dBA L_{eq} and are primarily affected by distant surface traffic.

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[3]Brown-Buntin Assoc., "Environmental Noise Studies for Teichert Aggregates: a) Long-Term Woodland, 29 Nov. 1995; b) Long-Term Esparto, 29 Nov. 1995; c) Mast Site Excavation, 29 Nov. 1995; d) Esparto Operation, 15 Sept. 1993; d) Brown-Buntin Associates, "Environmental Noise Analysis Cache Creek Aggregates" 10 Jan. 96. These studies are on file and available for public review at the Yolo County Community Development Agency.

Noise-Sensitive Receivers

Residences

Population centers in the planning area include the City of Woodland, and the communities of Madison, Esparto, and Capay. Residences are primarily located outside the channel area, but are in some cases within 1,500 feet of the channel. Agricultural residences are found at very low densities (typically, one residence per agricultural parcel), and may be located close to a County road or toward the center of the parcel. The noise studies conducted for the proposed mining operations identify homes near the off-channel mining areas. Table 4.9-2 summarizes the residential receivers in the study area.

Other Noise-Sensitive Receivers

Most other noise-sensitive receivers are located outside the planning area. The primary medical facility is the Woodland Memorial Hospital (Woodland, CA). Schools and day care centers in the planning area are located in the City of Woodland and the communities of Esparto, Madison and Capay. These include Esparto High School on route 16 and the Madison Migrant Center Daycare on Route 16 near Road 89. Currently, there are no public recreational facilities located along Cache Creek. Existing recreational areas within the planning area and away from the creek include: the Esparto Community Park, the Madison Community Park, and the Flier's Club (a private golf course and clubhouse).

Regulatory Setting

Yolo County Code

Two existing regulations for this area contained in the Yolo County Code are Mining Ordinance of 1979, Section 10-3.509 and Yolo County Code, Reclamation Ordinance of 1979, Section 10-5.515. The noise standards in the two ordinances are identical.

Activities exceeding an exterior noise level of 80 dB(A) between 6:00 am and 6:00 pm, measured at the property site boundary.

Activities exceeding an exterior noise level of 65 dB(A) between 6:00 pm and 6:00 am, measured at the property site boundary.

Yolo County General Plan

The Yolo County General Plan (adopted July 1983) provides the following noise policies:

N1 Noise, Basic - Yolo County shall regulate, educate, and cooperate to reduce excessive noise levels within the environment and particularly those noise levels which impinge upon the home environment.

TABLE 4.9-2
RESIDENCES NEAR THE PROPOSED MINING OPERATIONS

Residence Location	Mining Site	Proximity of Mining Site to Residence
Road 87 (Garcia)	Syar	240 ft. north of property line
Route 16 (6,500 ft. west of I-505)	Solano	1,900 ft. south of mining boundary
Route 16 (8,000 ft. west of I-505)	Solano	1,700 ft. south of mining boundary
Route 16 (10,400 ft. west of I-505)	Solano	1,600 ft. south of mining boundary
Road 20	Solano	850 ft. north of mining boundary
15810 Road 95 (Muller)	Teichert-Woodland	Across CR 95 north of Muller parcel
6965 Road 94A (Metzger)	Teichert-Woodland	Between Muller and Haller parcel
Woodland Stallion Station	Teichert-Woodland	560 ft. north of Coors parcel
17600 Road 94B	Teichert-Woodland	300 ft. south of Storz parcel
17636 Road 94B	Teichert-Woodland	600 ft. southeast of Storz parcel
Mast Residence	Teichert-Esparto	North of Mast site
Syar Residence	Teichert-Esparto	1,100 ft. west of Reiff site
Road 85	Cache Creek Aggregates	180 ft. west of mining boundary
Road 87 (2,000 ft. west of centerline)	Cache Creek Aggregates	1,400 ft. northeast of mining boundary

Source: Syar Industries Madison Off-Channel Mining Noise Study, Dobbs Acoustics (26 November 1995); Solano Concrete Mining Permit Noise Study, Dobbs Acoustics (15 November 1995); and Environmental Noise Studies for Teichert Aggregates, Brown-Buntin Associates, 29 November 1995 and 15 September 1993; Environmental Noise Analysis Cache Creek Aggregates, Brown-Buntin Associates, 10 January 1996. These studies are all on file and available for public review at the Yolo County Community Development Agency.

N2 Noise/Land Use - Yolo County shall regulate the location and operation of land uses to avoid or mitigate harmful or nuisance levels of noise.

N3 Noise, Prevent and Control - Noise shall be prevented, avoided, and suppressed by controlling noises at the source, providing barriers or buffers, by the implementation of a noise ordinance and by means of wise land use planning and implementation.

N4 Noise Ordinance - Yolo County shall adopt a comprehensive Noise Ordinance. (A noise ordinance has not been adopted by the County to date).

N5 Development Review - Yolo County shall review all new development and redevelopment in terms of the Standards of Noise Avoidance or Control.

N6 Basic Compatibility - Yolo County will review all new developments, public and private, for noise compatibility with surrounding uses to protect the occupants of nearby lands from undesirable noise levels and shall discourage new residential development in areas subject to legal, long term, excessive noise.

N7 Development Control/Noise - Yolo County shall review development plans for noise compatibility of the proposed use with the surrounding uses and planned uses, and shall incorporate noise reduction, avoidance, or mitigation techniques as necessary. In addition to other ordinances, standards, or devices, the following may be used to accomplish these policies:

Provide open space, berms or walls, or landscaped areas between occupied dwellings and noise generators.

Require specific plans, subdivision maps, or zoning standards to require deep lots in order to locate dwellings farthest from noise generators.

Require effective sound barriers for new residential developments adjacent to existing freeways and highways.

N8 Implementation - Yolo County shall achieve these policies by the application of available review, guidance, and regulatory devices including:

Placing future development within areas of noise compatible land uses.

Supporting efforts to reduce noise levels.

Coordination with transportation agencies to reduce noise through design and location of new facilities.

Application of design standards to avoid or mitigate noise problems, including structure design, materials, and location.

N9 Mitigation and Reduction - Yolo County will require mitigation to reduce noise to acceptable levels throughout the County and particularly within home environments. Reduction of noise shall be sought at the source, along its path, and/or at receiver points if such noise is determined to be excessive.

N10 County Noise Control - Yolo County shall develop a program to reduce or control noise generated from sources under the County's jurisdiction.

N11 Standards - Yolo County shall set and enforce measurable standards for noise reduction and control on construction projects, equipment purchase contracts let by the County, and as part of development review of private construction projects subject to review and approval by the County.

N12 Noise and Safety/Airports - Yolo County shall regulate and guide land use in the vicinity of airports to ensure the safety of surrounding persons and those in the aircraft. Plans and regulations to avoid conflicts, minimize safety hazards, and to minimize the level and effects of noise shall be applied.

N13 Coordination - Yolo County shall coordinate with other governmental agencies as well as the private sector in efforts to combat, alleviate, or mitigate excessive, hazardous, or annoying noise.

N14 Noise Insulation - Noise insulation standards shall be enforced by the Building Department.

N15 Noise/State Highways - Yolo County encourages continuation of the State Roadway Noise Abatement Program(s).

N16 Integrate With Other Elements - The Noise Element shall be integrated with Land Use, Safety, Open Space, Scenic Highways, Circulation, Conservation, and other elements of the General Plan as well as the Energy Plan.

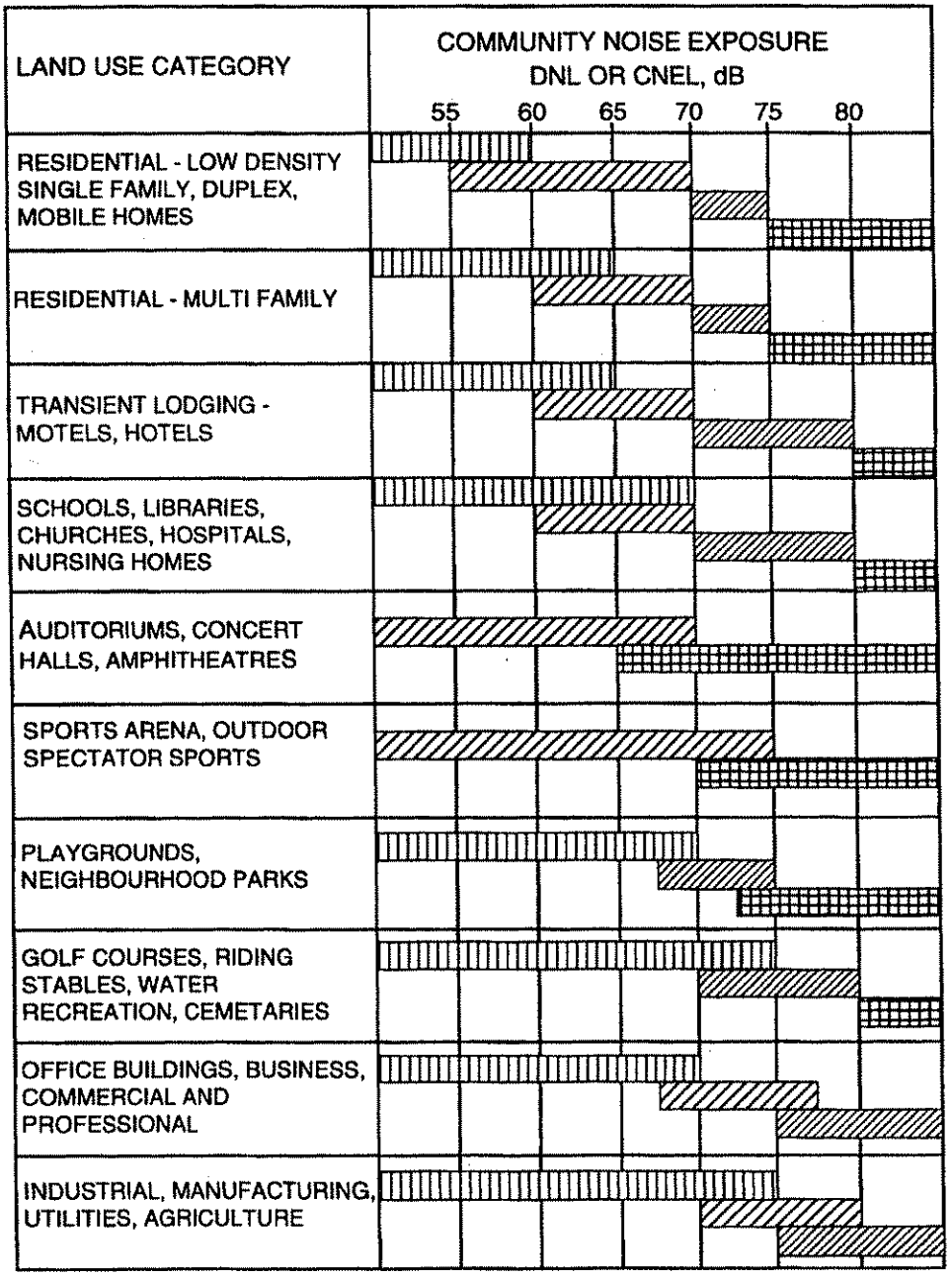
The current Yolo County General Plan does not have quantitative standards. The County recommends that the guidelines contained in the State of California's "Guidelines for the Preparation and Content of Noise Elements of the General Plan" be used (see Table 4.9-3). Most noise regulations and compatibility standards address common transportation and industrial noise. However, certain noise sources can generate annoyance at lower sound levels. These sources usually include a tonal or impulsive character or contain information such as speech. In addition, ground vibration can be generated by certain industrial activities which can cause annoyance unrelated to acoustical noise standards.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

- Activities exceeding an exterior noise level of 80 dB(A) between 6:00 a.m. and 6:00 p.m., measured at the property site boundary.
- Activities exceeding an exterior noise level of 65 dB(A) between 6:00 p.m. and 6:00 a.m., measured at the property site boundary.
- Activities that would expose receptors in residential areas or other noise-sensitive land uses to long-term noise levels exceeding 60 dB(A) CNEL.
- Substantially raise ambient noise levels:
  0-3 dB L_{eq} increase -- not significant
  4-5 dB L_{eq} increase -- possibly significant
  6 dB or greater increase -- significant
- Create vibration or nuisance noise.

Table 4.9-3: Land Use Compatibility For Community Noise Environments State of California, General Plan Guidelines



NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development clearly should not be undertaken.

Impact 4.9-1
Exposure to Unacceptable Noise Levels from Mining, Processing, Hauling, Reclamation, and Post-Reclamation Activities On Site

Draft OCMP and Implementing Ordinances

The OCMP would allow off-channel mining to be considered in the area shown in Figure 3.4-2. Noise is generated by almost all phases of mining activities. Table 4.9-4 shows estimated noise levels from the dominant noise sources of the different mining phases.

During the initial phases of mining, scrapers are used to remove the topsoil (or overburden). The scrapers make successive passes over the same area and haul the topsoil to stockpiles for later use in reclamation. The characteristics of the scraper noise are similar to that of truck noise near a roadway.

The noise level shown in the Table 4.9-4 represents the time average noise level of scraper passbys at a distance of 50 feet, assuming approximately 30 scraper passbys in an hour. At receiver locations close to the mining area, the initial phases are the noisiest because there is line-of-sight to the equipment. During later phases, the scrapers would be located down in the pit and the edge of the pit would block the line-of-sight between the equipment and adjacent receivers, providing some acoustical shielding.

Receivers located farther from the mining area are exposed to mining noise which is relatively constant. This is because the equipment is roughly the same distance from the receiver even though it is moving around the site. Fluctuations in scraper noise are due to either starting and stopping of the equipment, or changes in acoustical shielding as the scrapers climb out of the pit to carry material to the processing plant. Noise measurements were conducted at the edge of an off-channel mining pit.[4] The noise level was approximately 50 dB L_{eq}. During the measurement there were three scrapers and a bulldozer operating at 300-1000 feet from the measurement location.

Material extracted from the pits are transported to the processing plant. At the processing plant, the material is sorted by size and type of aggregate and then stock-piled. The processing plant contains many sources of noise, including conveyers, motors, crushers and screens. At receivers located near the plant, these noise sources combine together, creating a relatively steady state noise level. Usually, the dominant noise producers are the screens used to sort the aggregate and the crushers. Noise is produced by the aggregate impacting metal surfaces. The stockpiles of aggregate typically provide some acoustical shielding for receivers located near a processing plant. Another noise source near the processing plant is the loading of trucks for delivery on site. These trucks follow

[4]B.D. Dobbs, Solano Concrete Cache Creek Site Expansion, Madison, CA, October 1992.

a prescribed route on the site and then leave the site using the County roads. The noise associated with off-site truck movement is discussed under Impact 4.9-2.

TABLE 4.9-4
DOMINANT MINING/RECLAMATION NOISE SOURCES

Noise Source	Activity	L_{eq} at 50 feet
Scrapers[1]	Mining, Reclamation	67 dB
Plant Operations[1]	Processing	85 dB
Truck Movement[2]	Hauling	66 dB
Tractors[3]	Pre-Mining/Post-Reclamation	58 dB

Sources:
1 "Environmental Noise Analysis, Teichert Aggregates, Long-Term Woodland Operation," Brown-Buntin, 29 November 1995;
2 FHWA-RD-77-108 (assumes 56 trucks per hour);
3 "Noise from Construction Equipment," 1971, U.S. E.P.A. (assumes one pass-by every five minutes).

Large areas of land are proposed for off-channel mining. This will require operators to divide up the lands into smaller sections that would be mined sequentially. After one section is mined, extraction operations would be moved to the next area while the first section is reclaimed. As a result of this sequential mining receivers close to a particular parcel would not be exposed to the highest mining noise exposure for the entire 30 year period under the OCMP.

Reclaiming previously mined land for agricultural uses involves activities very similar to the initial phases of mining. Scrapers and bulldozers are the dominant noise source. The noise levels depend on the distance to the equipment and their elevation with respect to the edge of the pit. Areas being reclaimed for habitat or open water would require the same types of equipment but would probably be less intensive and might be completed in less time.

Agricultural activities would return to about 988 acres of the 2,211 acres mined. Post-reclamation noise-generating agricultural activities would be similar to existing agricultural activities; the lowered fields associated with agricultural reclamation would not have an appreciable effect on noise levels, except when agricultural equipment is close to the toe of the slope near the edge of the field. Table 4.9-3 shows an estimate of noise from tractors on agricultural land. Nearby receivers would experience maximum noise levels of 80 dB during passby at a distance of 50 feet. The L_{eq} would be 58 dB, assuming one passby by every five minutes. Performance Standard 2.5-11 in the Draft OCMP addresses noise:

PS 2.5-11 From 6:00 a.m. to 6:00 p.m., noise levels shall not exceed an average noise level equivalent (L_{eq}) of eighty (80) decibels (dBA) measured at the property boundaries of the site. However, noise levels may not exceed an average noise level equivalent (L_{eq}) of sixty (60) decibels (dBA) for any nearby off-site residences or other noise-sensitive land uses.

From 6:00 p.m. to 6:00 a.m., noise levels shall not exceed an average noise level equivalent (L_{eq}) of sixty-five decibels (dBA) measured at the property boundaries of the site.

In most cases, the above performance standard would be adequate to limit noise from on-site mining to a CNEL of 60 dB or less at sensitive receivers. However, the CNEL is not referenced in the performance standard. If there was evening or nighttime operations the CNEL 60 dB standard of significance could be exceeded, even though the Draft OCMP performance standard is satisfied. This would be a significant impact.

Alternative 1a: No Project (Existing conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. All regulations in place as of December 1, 1995 are assumed to be in effect, including existing "interim" County surface mining regulations, the Williamson Act and SMARA.

According to the County staff, there has been only one noise complaint related to previous mining activities, in response to nighttime operations.[5] Aggregate operators have indicated that they have not received noise complaints from existing mining or reclamation activities, with the exception of those occurring in the nighttime hours.[6] Therefore, it is assumed that the existing daytime noise levels are not problematic while nighttime noise can generate complaints. Noise effects of permitted off-channel mining have been previously analyzed in the short-term mining project EIRs, and mitigation measures were set forth to minimize potential adverse effects. Since there has been no persistent and on-going complaints, noise from this no-project alternative is therefore considered a less-than-significant impact.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. All regulations in place as of December 1, 1995 are assumed to be in effect, including existing "interim" County surface mining regulations, the Williamson Act and SMARA. Noise effects of permitted off-channel mining have been previously analyzed in the short-term mining project EIRs, and mitigation measures were set forth to minimize potential adverse effects. Noise effects from

[5] Mr. David Morrison, Yolo County Community Development Agency, telephone conversation February 27, 1996.

[6] Dan Reiff, Teichert Aggregates, telephone conversation 26 Feb. 96;
Ben Adamo, Cache Creek Aggregates, telephone conversation 26 Feb. 96;
Tal Baily, Syar Industries Inc, telephone conversation, 26 Feb. 96.

continued in-channel operations would be the same as described above for alternative 1a. This would be a less-than-significant impact.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside of Yolo County. Since there would be no mining allowed in the study area, there would be a substantial decrease in mining noise and associated truck traffic. This is a less-than-significant impact.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. Noise effects associated with mining and reclamation would be eliminated. The noise effects of plant operation would be less than that described above for the proposed project.

Since less tonnage would be processed under this alternative than the OCMP the plant would likely not require nighttime operation. As a result, the existing regulatory standards would be adequate to satisfy the standards of significance. This would be considered a less-than-significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under this alternative, the dominant noise source from each mining phase would be similar to those proposed under the project. A shallower mining depth would not reduce this noise exposure of nearby receivers (mining at deeper depths tends to be less noisy due to the extra distance and acoustical shielding provided by the edges of the pit). Therefore, this would be considered a significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. Most of the noise effects of the proposed project would occur under this alternative, but at slightly reduced levels due to the restricted allocations. Therefore, this would be considered a significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. Therefore, this alternative would generally have the same implications for increased noise levels in the planning area,

but the duration of those impacts would be reduced due to the shorter mining permit periods. This would be considered a significant impact.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative the on-site noise sources associated with mining and processing would be the same as the proposed OCMP. The noise sources associated with the reclamation would be expanded to lands not proposed for mining in order to generate pit fill material. This could expose additional sensitive receivers, beyond those adjacent to mining areas, to unacceptable noise levels. This would be considered a significant impact.

Mitigation Measure 4.9-1a (OCMP, A-4, A-5a, A-5b, A-6)

The performance standards in the Off-Channel Surface Mining Ordinance (Section 10-4.418) should be modified so that the residential noise limit is a CNEL of 60 dB rather than the currently specified L_{eq} of 60 dB. This change should also be made in the Off-Channel Mining Plan. CNEL is the proper descriptor because it is a 24-hour average noise level with penalties for nighttime and evening hours when residents are more sensitive to noise. It is also the descriptor required for the Noise Elements of General Plans and the descriptor that was used in the previous (1977) Noise Element of the Yolo County General Plan.

The change in residential noise limit from an L_{eq} to CNEL may require modifications in the mining permit application noise studies. It should be noted that, in the absence of significant nighttime and evening mining operations, the two descriptors would be more or less interchangeable.

Mitigation Measure 4.9-1b (OCMP, A-4, A-5c, A-6)

From 6:00 a.m. to 6:00 p.m., noise levels shall not exceed an average noise level equivalent (L_{eq}) of eighty (80) decibels (dBA) measured at the property boundaries of the site. However, noise levels may not exceed an average noise level equivalent (L_{eq}) of sixty (60) decibels for any nearby off-site residences or other noise-sensitive land uses.

From 6:00 p.m. to 6:00 a.m., noise levels shall not exceed an average noise level equivalent (L_{eq}) of sixty-five (65) decibels (dBA) measured at the property boundaries of the site.

Noise levels may not exceed a community noise equivalent level (CNEL) of sixty (60) decibels (dBA) for any nearby off-site residence or other noise-sensitive land uses.

Mitigation Measure 4.9-1c (OCMP, A-4, A-5a, A-6)

The following should be added to the OCMP as a new performance standard:

> *Mining activities shall not exceed the noise limit of CNEL 60 dB at existing residences. An existing residence shall be considered the property line of any residentially zoned area or, in the case of agricultural land, any occupied residential structures. Achieving the noise standards could involve setbacks as proposed in the Off-Channel Surface Mining Ordinance (Section 10.4.425), the use of quieter equipment adjacent to residences, or the construction of landscaped berms between mining activities and residences.*

Implementation of this mitigation would reduce this impact to a less-than-significant level of the OCMP and Alternatives 4, 5a, 5b, and 6.

Mitigation Measure 4.9-1d (A-1a, A-1b, A-2, A-3)

None required.

Impact 4.9-2
Exposure to Unacceptable Increases in Noise Generated by Off-Site Truck Traffic

Draft OCMP and Implementing Ordinances

Existing truck traffic in the planning area is from mining, agricultural, and other commercial activities. Designated haul routes would be used by trucks that receive and deliver aggregate. In addition, truck traffic would be generated by County maintenance of the Cache Creek channel. Truck traffic from mining operations would increase over existing levels with or without the OCMP.

Table 4.9-5 shows existing and future cumulative traffic noise levels with and without the Project (OCMP) along the major roadways in the planning area. The traffic noise levels are calculated using the Federal Highway Administration's traffic noise prediction model (FHWA-RD-77-108). The FHWA model uses hourly traffic volumes, travel speeds and truck percentages to obtain an hourly noise level (L_{eq}). The L_{eq} is equal to the CNEL. Traffic information is obtained from the Traffic and Circulation section of this EIR.

To determine the project's contribution to roadway noise levels, a comparison is made between the cumulative noise levels with and without the project. Table 4.9-5 shows that the increase in traffic noise caused by the OCMP would be two decibels or less. This is a less than significant impact.

Alternative 1a: No Project (Existing Conditions)

Under this alternative traffic noise exposure would be up to 10 dB less than the "cumulative-no-project" conditions (see Table 4.9-6) This is a less-than-significant impact.

Table 4.9-5: Existing and Future Traffic Noise With and Without Project

Roadway	Segment	CNEL in dB at 100 feet from centerline		
		Existing	Cumulative No Project	Cumulative Plus Project
Road 14	5 to 505	58	64 (+6)	64 (+6)
	505 to Rd 89	51	61 (+10)	62 (+11)
	Road 89 to Road 85	51	60 (+9)	62 (+11)
Road 17	5 to 505	44	46 (+2)	46 (+2)
Road 19	Rd 94B to Rd 20	58	62 (+4)	62 (+4)
	Rd 20 to I-505	58	61 (+3)	61 (+3)
	I-505 to Rd 87	60	65 (+5)	65 (+5)
Road 20(KY Av)	Rd 97 to Rd 96	62	66 (+4)	67 (+5)
	Rd 96 to end	62	62 (+0)	63 (+1)
Route 16	Rd 98 to Rd 97	68	71 (+3)	71 (+3)
	Rd 97 to Rd 93	68	71 (+3)	71 (+3)
	Rd 93 to I-505	67	70 (+3)	70 (+3)
	I-505 to Rd 89	68	71 (+3)	71 (+3)
	Rd 89 to Rd 86A	67	70 (+3)	70 (+3)
	Rd 86A to Rd 85	66	69 (+3)	69 (+3)
Road 96	Rte 16 to Road 20	56	59 (+3)	59 (+3)
Road 94B	Rte 16 to Main St	52	56 (+4)	56 (+4)
	Main St to Rd 19	58	60 (+2)	60 (+2)
Solano Access	north of Rte 16	60	60 (+0)	62 (+2)
Road 89	Rte 16 to Cache Cr	60	64 (+4)	66 (+6)
Road 87	Rte 16 to Cache Cr	58	60 (+2)	60 (+2)
	Cache Cr to Rd 19	57	60 (+3)	60 (+3)
	Rd 19 to Rd 16	58	60 (+2)	60 (+2)
Road 85	Cache Cr. to Rd 16A	53	60 (+7)	60 (+7)
	Rd 16A to Rd 14	52	61 (+9)	62 (+10)
I-505	south of Rte 16	71	74 (+3)	74 (+3)
	Rte 16 to Rd 19	70	73 (+3)	73 (+3)
	north or Rd 19	70	73 (+3)	73 (+3)

Source: Charles M Salter Associates, Inc, 1996

Note: Number in parentheses is Change in CNEL with respect to existing conditions

Table 4.9-6: Comparison of Traffic Noise Exposure for Alternatives

Roadway	CNEL in dB at 100 feet from centerline										
	Existing	Cumulative No Project	OCMP	Alt 1a	Alt 1b	Alt 2	Alt 3	Alt 4	Alt 5a	Alt 5b	Alt 6
Road 14, west of I-505	51	61	62 (+1)	51 (-10)	61 (0)	51 (-10)	51 (-10)	59 (-2)	58 (-3)	62 (+1)	62 (+1)
Road 19, west of I-505	60	65	65 (0)	64 (-1)	65 (0)	63 (-2)	62 (-3)	63 (-2)	64 (-1)	65 (0)	65 (0)
Route 16, east of I-505	67	70	70 (0)	70 (0)	70 (0)	70 (0)	70 (0)	70 (0)	70 (0)	70 (0)	70 (0)
Road 89, north of SR 16	60	64	66 (+2)	63 (-1)	64 (0)	60 (-4)	64 (0)	60 (-4)	62 (-2)	66 (+2)	66 (+2)
Road 85, north of Road 16A	52	61	62 (+1)	52 (-9)	61 (0)	52 (-9)	52 (-9)	59 (-2)	59 (-2)	63 (+2)	62 (+1)

Source: Charles M Salter Associates, Inc, 1996

Note: Number in parentheses is change in CNEL
with respect to Cumulative-No-Project condition

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under this alternative, traffic noise exposure would be equal to the cumulative no project condition. This is a less-than-significant impact.

Alternative 2: No Mining (Alternative Site)

Under this alternative, traffic noise exposure would be up to 10 dB less than the cumulative no project conditions. This is a less-than-significant impact.

Alternative 3: Plant Operation Only (Importation)

Under this alternative, traffic noise exposure would be up to 10 dB less than the cumulative no project conditions. This is a less-than-significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under this alternative, traffic noise exposure would be up to 4 dB less than the cumulative no project conditions. This is a less-than-significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under this alternative, traffic noise exposure would be up to 3 dB less than the cumulative no project conditions. This is a less than significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under this alternative, the traffic noise exposure would increase 2 dB or less with respect to the cumulative no project conditions. This is a less-than-significant impact.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, traffic noise exposure would increase by 2 dB or less with respect to the cumulative no project conditions. This is a less-than significant impact.

Mitigation Measure 4.9-2a (OCMP, A-1a, A-1b, A-2, A-3,A-4, A-5a, A-5b,A-6)

None required.

Impact 4.9-3
Contribution to Increase in Cumulative Noise

Draft OCMP and Implementing Ordinances

Potential cumulative impacts are addressed primarily through the traffic noise analysis which compares existing conditions with future cumulative traffic noise. The other potential for cumulative noise impacts would result from multiple mining operations.

The effect of multiple mining operations on cumulative noise levels would not be significant because the ambient noise at receivers close to an individual mining operation would be dominated by that mining operation. Other, more distant, mining operations would not be as perceptible. If a receiver is located equidistant from two or more mining operations, the distance to the receiver would be large. The mining noise at these distances (approximately 1 mile) would be close to the existing ambient level, and there would be no significant increase.

For most roads, including the haul routes, the cumulative increase in truck traffic would generate an increase in noise levels of 5 dB or less over existing conditions. County Roads 14, 85 and 89 would have increases greater than 5 dB. County Roads 19 and 20 would have increases of 4 or 5 dB and the CNEL at 100 feet would be greater than 60 dB. These increases along County Roads 18, 19, 20, 85 and 89 would generate a significant impact at residences along these roadway segments.

Alternative 1a, No Project (Existing Conditions)

Under this alternative, the greatest increase in traffic noise over the existing conditions would be 4 dB (see Table 4.9-6). This would occur on Road 19 and would generate a future CNEL greater than 60 dB at 100 feet. Therefore, this would be a significant impact for residences along this roadway segment.

Alternative 1b, No Project (Existing Permits and Regulatory Condition)

Under this alternative truck traffic would increase as individual mining operates at maximum levels. The additional truck traffic would be expected to cause a significant increase in noise along haul routes for operators where no mining is currently occurring. Residences along County Roads 14 and 85 would be exposed to increases of 9-10 dB. Residences along County Roads 19 and 89 would be exposed to 4 or 5 dB increases and the CNEL would be greater than 60 dB at 100 feet. This is a significant impact.

Alternative 2, No Mining, (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside of Yolo County. Therefore, potential

noise from increased truck traffic would occur in the vicinity of the alternate site(s). Traffic noise level increases over the existing conditions would be 3 dB or less along roads in the study area. This is a less-than-significant impact.

Alternative 3, Plant Operation Only (Importation)

Under this alternative truck traffic would increase since the processing plants that are currently not operating at maximum levels would operate at maximum levels in the future. The trucks would be loaded with materials entering and existing the plant. The FHWA noise prediction model does not differentiate between trucks that are loaded and unloaded. Therefore, it is assumed trucks generate similar levels regardless of whether they are loaded or not. This alternative would cause traffic noise to increase by 4 dB along County Road 89. Along the other roads, the increase would be 3 dB or less over the existing conditions. The increase along road 89 would be significant since the CNEL is greater than 60 dB.

Alternative 4, Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural. Therefore, the potential impacts would be similar to those described above for the proposed project. Since significant increases in traffic noise over existing conditions would occur along County Roads 14 and 85, this is a significant impact.

Alternative 5a, Decreased Mining (Restricted Allocation)

Under this alternative truck traffic would increase as individual mining operations begin operating at maximum levels. This would generate a significant impact for homes along County Roads 14, 85 and 19. This is a significant impact.

Alternative 5b, Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. Therefore, this alternative would have the same general effects as the proposed project, but the period over which they would occur would be of shorter duration. This is a significant impact

Alternative 6, Agricultural Reclamation (With Mining Operations as Proposed)

Under Alternative 6, the OCMP would not allow for alternative forms of reclamation, and a minimum performance standard of 80 percent agricultural reclamation would be established. Therefore, the potential impacts would be the same as described above for the proposed project. This is a significant impact.

Mitigation Measure 4.9-3a (OCMP, A-4, A-5a, A-5b, A-6)

The following performance standard should be added to the OCMP and its implementing ordinances:

> *Operators shall provide acoustical analysis for future truck and traffic noise associated with the individual operations along County roadways identified as experiencing significant impacts due to increased traffic noise. The study should identify noise levels at adjacent noise-sensitive receptors and ways to control the noise to the "normally acceptable" goal of a CNEL of 60 dB and reduce the increase over existing conditions to 5 dB or less. Typical measures that can be employed include construction of noise barriers (wood or masonry), earthen berms, or re-routing of truck traffic.*

Mitigation Measure 4.9-3b (A-2)

None required.

Mitigation Measure 4.9-3c (A-1a, A-1b, A-3)

Implementation of this mitigation would reduce this impact to a less-than-significant level for the OCMP and Alternatives 1a, 1b, 3, 4, 5a, 5b, and 6 if mitigation is feasible. Since feasibility is unknown at program level, the impact is considered significant and unavoidable.

> *Existing mining ordinances should be modified to require an acoustical analysis for future truck and traffic noise associated with individual operations along County roadways identified as experiencing significant impacts due to increased traffic noise. The study should identify noise levels at adjacent noise-sensitive receptors and ways to control the noise to the "normally acceptable" goal of a CNEL of 60 dB and reduce the increase over existing conditions to 5 dB or less. Typical measures that can be employed include construction of noise barriers (wood or masonry), earthen berms, or re-routing of truck traffic.*

Impact 4.9-4
Generation of Vibration or Nuisance Noise

Draft OCMP and Implementing Ordinances

The majority of noise sources associated with mining and reclamation are diesel equipment. This equipment has the same noise characteristics as traffic and other agricultural equipment. Therefore, nuisance noise is not expected to be common. The greatest potential for nuisance noise would be from back-up beepers on trucks and other earth-moving equipment, particularly during nighttime and evening hours due to heightened sensitivity. Often the operation of this equipment is planned so that backing up is not necessary. Another potential source of nuisance noise is the use of public address systems for paging. This is usually concentrated near the processing plant and the office areas.

Back-up beepers are required to notify on-site personnel that a heavy vehicle is in the vicinity and moving backwards. Back-up beepers must generate sound levels that are audible above the noise generated by the heavy vehicle. Back-up beepers usually have two sound level ranges, a low and high range. The setting depends on the noise generated by the vehicle. A typical sound level from a back-up beeper is 96 dBA at 4 feet.

To determine whether a back-up beeper is a nuisance, its sound level is compared with ambient noise levels. If the back-up beeper is at or below the ambient noise level, then it would not be considered to be a nuisance. According to calculations, back-up beepers would generate sound levels of 35 dBA at a distance of 1,500 feet. This sound level is 5 dB below the typical ambient noise level in the project vicinity. Beyond 1,500 feet, back-up beeper noise would tend to blend in to the background, and although audible, not be considered a nuisance noise.

During the day, back-up beepers would be less annoying than at night. The OCMP performance standards would be adequate to mitigate any potential impact from daytime back-up beepers, since back-up beepers would not be expected to interfere with speech or normal day-to-day activities. At night when people are more sensitive to the noise and the ambient is quieter, a back-up beeper could cause annoyance if it is occurring within 1,500 feet of residences. Use of back-up beepers within 1,500 feet of residences at night would be a significant impact.

Activities and equipment associated with mining and reclamation under the OCMP do not generate significant ground vibration. Blasting would not be used for aggregate extraction. The mining equipment does generate some vibration; however, the distance required to achieve acceptable noise levels is generally adequate to provide acceptable ground vibration levels. Vibration would not be considered a significant impact.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels for each producer. Since there have been only isolated complains on file regarding mining noise, impacts under Alternative 1a for nuisance noise would be less than significant.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed, based on currently-approved maximum annual allocations. Since there have been only isolated complaints regarding mining, noise associated with back-up beeper and vibrations would not be considered a significant impact.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plans would be voided. Since there would be no mining, there would be no nuisance noise or vibration and therefore this would be a less-than-significant impact.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided but existing plants would continue to operate at approved levels. If residents are located within 1,500 feet of the plants operating at night, back-up beepers could cause nuisance. This is a potentially significant impact.

Alternative 4: Shallow Mining (Alternative Methods/Reclamation)

Under this alternative, mining activities could occur at new locations at shallower depths. If residents are located within 1,500 feet, nighttime mining could cause nuisance. Noise associated with this alternative would be a significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under this alternative, the OCMP and its implementing ordinances would be adopted but mining proposals would be restricted to one half the current annual allocation. If residents are located within 1,500 feet, nighttime mining could cause nuisance. Noise associated with this alternative would be a significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under this alternative, the OCMP and its implementing ordinances would be adopted but individual permit and renewal periods would be shortened. If residents are located within 1,500 feet, nighttime mining could cause nuisance. Noise associated with this alternative would be a significant impact.

Alternative 6: Agricultural Reclamation (With Mining Operation as Proposed)

Under this alternative, the on-site noise sources associated with mining and processing would be the same as the proposed OCMP. Residences located within 1500 feet could be exposed to an impact due to nighttime operations. Operation of mining under Alternative 6 is a significant impact.

Mitigation Measure 4.9-4a (A-1a, A-1b, A-2)

None required.

Mitigation Measure 4.9-4a (OCMP, A-3, A-4, A-5a, A-5b, A-6)

The following should be added to the OCMP and its implementing ordinances as a new performance standard:

> *If mining occurs within 1500 feet of residences, equipment used during nighttime activities shall be equipped with non-sonic warning devices consistent with OSHA regulations, which may include fencing of the area to avoid pedestrian traffic, adequate lighting of the area, and placing an observer in clear view of the equipment operator to direct backing operations. Prior to commencement of operations without sonic warning devices, operators shall file a variance request with the Cal OSHA Standards Board showing that the proposed operation would provide equivalent safety to adopted safety procedures, including sonic devices.*

Implementation of this mitigation would reduce this impact to a less-than-significant level for the OCMP and Alternatives 3, 4, 5a, 5b, and 6.