4.7 AIR QUALITY

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INTRODUCTION

This section examines potential impacts on air quality associated with implementation of the OCMP and project alternatives. The main issues addressed within this section include:

- potential emission of particulates (PM_{10});
- potential emission of ozone precursors (ROG and NO_X);
- cumulative effects on attainment of state and federal air quality standards; and
- potential impacts on sensitive receptors.

The following air quality setting is based on documents prepared by the Yolo-Solano Air Quality Management District (YSAQMD), United States Environmental Protection Agency (EPA) and the California Air Resources Board (CARB).

SETTING

Description of Regional Environment

The primary factors that determine air quality are the location of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions, however, are also important. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The planning area lies in the southern portions of the Sacramento Valley, a broad, flat valley bounded by the coastal ranges to the west and the Sierra Nevada to the east. A sea level gap in the Coast Range (the Carquinez Strait) is located about 50 miles to the southwest, and the intervening terrain is very flat. The prevailing wind direction is southerly, which is the wind direction when marine breezes flow through the Carquinez Strait. Marine breezes dominate during the spring and summer months, and show a strong daily variation. Highest average windspeeds occur in the afternoon and evening hours; lightest winds occur in the night and morning hours. During fall and winter, when the sea breeze diminishes, northerly winds occur more frequently, but southerly winds still predominate.

Like most areas of California, the planning area is subject to inversions (layers of very stable air) that can trap pollutants near the ground. This is most likely to occur during the winter months when radiational cooling during the night results in a ground-based

inversion. Such inversions usually dissipate a few hours after the sun rises, but under certain conditions may remain throughout the day.

The project area is within the Yolo-Solano Air Quality Management District (AQMD), which is part of the Sacramento Valley Air Basin. The Yolo-Solano AQMD is comprised of Yolo County and the eastern half of Solano County. The San Francisco Bay Area Air Basin lies to the west, and the San Joaquin Valley Air Basin is located to the south. Considerable transport of pollutants occurs between these air basins, so that air quality in Yolo County is partially determined by the release of pollutants elsewhere. In turn, pollutants generated in Yolo County affect air quality in areas to the north and east.

Description of Local Environment

The planning area encompasses about 14.5 miles of the Cache Creek basin, from Capay Dam to the town of Yolo. The planning area is primarily farmland interspersed with aggregate processing operations along the creek bed. Unincorporated towns in the vicinity include Capay, Esparto, Madison and Yolo. The nearest city is Woodland, the county seat, located about 3 miles southeast of Cache Creek.

Major air pollutant sources in the planning area include vehicles travelling on U. S. Interstates 5 and 505, State Highway 16 and various county roads, agricultural activities and existing aggregate processing plants. Estimated existing annual emissions from aggregate processing plants are discussed later in this section (under Impact 4.7-1). These estimates are based on YSAQMD permit information, adjusted to 1995 production levels. Fugitive emissions, on-site vehicle exhausts, and on-site truck/employee vehicle exhausts were estimated independently, since these emission sources are not included in the YSAQMD emission calculations.

These plants all operate under permits issued by the YSAQMD. These plants are considered to utilize Best Available Control Technology (BACT), and have not been the subject of recent complaints or permit violations within the last few years.[1]

The closest air monitoring location to the project site is located in Woodland at 40 Sutter Street. This monitoring site, operated by the Yolo-Solano Air Quality Management District, measures levels of ozone and PM_{10}. During the 5 year period 1989-1993 no violations of the federal ozone or PM_{10} standards were recorded at Woodland. The more stringent state ozone standard was exceeded on from 1 to 9 days per year during this period, while the more stringent state PM_{10} standard was exceeded on from 7 to 16 days during this period.

The term "sensitive receptor" is often applied to facilities likely to be used by the elderly, children, infirm, or persons with particular sensitivity to air pollutants. Examples are

[1] Steve Speckert, Air Pollution Engineer, Yolo-Solano AQMD, telephone conversion with Donald Ballanti, January 18, 1996.

hospitals, schools and convalescent homes. There are two sensitive receptors located along roadways serving the planning area:

- Esparto High School (adjacent to SR 16 in Esparto)
- Madison Migrant Center Daycare (adjacent SR 16 east of Road 89)

REGULATORY FRAMEWORK

Air Quality Standards

Both the U. S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These standards represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. Table 4.7-1 identifies the major criteria pollutants, their characteristics, health effects and typical sources.

The federal and California state ambient air quality standards are summarized in Table 4.7-2 for important criteria pollutants. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and suspended particulate matter (PM_{10}).

Current Air Quality

The Yolo-Solano Air Quality Management District (YSAQMD) and the California Air Resources Board (CARB) maintain several air quality monitoring sites in Yolo County. Currently the CARB monitors ozone levels in Davis, while the YSAQMD monitors PM_{10} levels in West Sacramento. Prior to 1991, the YSAQMD also monitored ozone levels in Broderick and Woodland, carbon monoxide levels in Woodland, and PM_{10} levels in Woodland.

During the 5-year period of 1989-1993, exceedances were recorded in Yolo County for the state/federal ozone standards and state PM_{10} standards. Both pollutants are considered regional problems affecting the entire Sacramento Valley Air Basin. All other standards were met during this time.

Regional Air Quality Programs

The federal Clean Air Act of 1970 (as amended) and the California Clean Air Act of 1988 require that the State Air Resources Board, based on air quality monitoring data, designate portions of the state as "nonattainment areas" where the federal or state ambient air quality

Table 4.7-1: Major Criteria Pollutants			
Pollutant	**Characteristics**	**Health Effects**	**Major Sources**
Ozone	A highly reactive photochemical pollutant created by the action of sunshine on ozone precursors (primarily reactive hydrocarbons and oxides of nitrogen. Often called photochemical smog.	•Eye Irritation •Respiratory function impairment.	The major sources ozone precursors are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels.	•Impairment of oxygen transport in the bloodstream. •Aggravation of cardiovascular disease. •Fatigue, headache, confusion, dizziness. •Can be fatal in the case of very high concentrations.	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	Reddish-brown gas that discolors the air; formed during combustion.	•Increased risk of acute and chronic respiratory disease.	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide	Sulfur dioxide is a colorless gas with a pungent, irritating odor.	•Aggravation of chronic obstruction lung disease. •Increased risk of acute and chronic respiratory disease.	Diesel vehicle exhaust, oil-powered power plants, industrial processes.
PM-10	Solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time.	•Aggravation of chronic disease and heart/lung disease symptoms.	Combustion, automobiles, field burning, factories and unpaved roads. Also a result of photochemical processes.

Table 4.7-2: Federal and State Ambient Air Quality Standards			
Pollutant	**Averaging Time**	**Federal Primary Standard**	**State Standard**
Ozone	1-Hour	0.12 PPM	0.09 PPM
Carbon Monoxide	8-Hour 1-Hour	9.0 PPM 35.0 PPM	9.0 PPM 20.0 PPM
Nitrogen Dioxide	Annual Average 1-Hour	0.05 PPM --	-- 0.25 PPM
Sulfur Dioxide	Annual Average 24-Hour 1-Hour	0.03 PPM 0.14 PPM --	-- 0.04 PPM 0.25 PPM
PM-10	Annual Average 24-Hour	50 $\mu g/m^3$ 150 $\mu g/m^3$	30 $\mu g/m^3$ 50 $\mu g/m^3$
Lead	30-Day Avg. Month Avg.	-- 1.5 $\mu g/m^3$	1.5 $\mu g/m^3$ --

PPM = Parts per Million
$\mu g/m^3$ = Micrograms per Cubic Meter

standards are not met. Because of the differences between the national and state standards, the designation of nonattainment areas is different under the federal and state legislation.

Under the federal Clean Air Act Yolo County is designated a "severe nonattainment" area for the federal ozone standard, and "attainment" or "unclassified" for other pollutants. Under the California Clean Air Act the county is a "serious nonattainment" area for the state ozone standard, and is also considered "nonattainment" for the state PM_{10} standard.

Authority for air quality planning is divided. Local air pollution control districts have full regulatory authority for achieving the state standards, while the designated Metropolitan Planning Organization (in this case Sacramento Council of Governments) has air quality planning responsibility under the federal law.

The current regional air quality plan for Yolo County is the Yolo-Solano Air Quality Management District's *Air Quality Attainment Plan.*[2] Although the District is "nonattainment" for both ozone and PM_{10}, the AQAP focuses on ozone. The goal of the

[2] Yolo-Solano Air Quality Management District, *Air Quality Attainment Plan*, 1992.

AQAP is to establish controls that reduce mobile and stationary source emissions through three programs:

- Public Education Program;
- Mobile Source Control Program; and
- Stationary Source Control Program.

The California Legislature, when it passed the California Clean Air Act in 1988, recognized the relative intractability of the PM_{10} problem and excluded it from the basic planning requirements of the Act. The Act did require the CARB to prepare a report to the Legislature regarding the prospect of achieving the State ambient air quality standard for PM_{10}. This report recommended a menu of actions, but did not recommend imposing a planning process similar to that for ozone or other pollutants for achievement of the standard within a certain period of time.

YSAQMD Rules/Regulations

The Yolo-Solano Air Quality Management District (YSAQMD) is the primary agency responsible for protecting human health and property from the harmful effects of air pollution within the boundaries of the District (all of Yolo County and the northeastern half of Solano County). The District is required to adopt an Air Quality Attainment Plan and is empowered to achieve and maintain the state and federal ambient air quality standards in all areas affected by emissions sources under its jurisdiction. The YSAQMD regulates, permits and inspects stationary sources of air pollution, and also implements transportation control measures designed to reduce emissions from mobile sources.

All currently operating aggregate facilities within the planning area operate under permits issued by the YSAQMD. The YSAQMD rules and regulations determine the conditions under which permits are issued. For the aggregate industry, the relevant rules and regulations are:

Rule 2.3: Limits the opacity of pollutant plumes.

Rule 2.5: Prohibits the release of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause or have natural tendency to cause injury or damage to business or property.

Rule 2.11: Limits the loading of particulate matter in plumes.

Rule 2.19: Establishes maximum allowable emission rates based on process weight.

Rule 3.1: Provides for the issuance of permits for new or modified sources of air pollution.

Rule 3.4: Provides for the review of new and modified stationary sources of pollutants, including emissions offsets, by which authorities to construct may be granted without interfering with the attainment or maintenance of ambient air quality standards. Requires the use of Best

Available Control Technology and offsets for new or modified sources exceeding specified emission levels.

For facilities with asphalt batch plants, the following additional rules would also apply:

Rule 2.28: Limits the emission of organic compounds from the use of cutback and emulsified asphalt in paving materials.

Rule 8.1: Establishes standards of performance for asphaltic concrete plants.

YSAQMD Regulation IX also establishes control requirements and emissions limits for certain toxic air contaminants. To date, rules have been adopted regarding emissions of benzene, hexavalent chromium, ethylene oxide, arsenic, cadmium, nickel, perchloroethylene and asbestos-containing serpentine rock. Aggregate processors in general and lower Cache Creek aggregate facilities in specific are not considered sources of these controlled toxic substances.

The YSAQMD calculates emissions for each permitted stationary source based on capacity of the equipment and emission factors for that equipment. For aggregate processing the District uses emission factors from the Fourth Edition of AP-42.[3] The Fifth Edition of AP-42[4] contains greatly reduced emission factors for aggregate processing, however, the California Air Resources Board only recently approved these lower emission factors. As a result, the potential emission from sources within the planning area will be revised downward in the project-level EIRs.

Yolo County General Plan

The Yolo County General Plan includes policies related to air quality and the reduction of air pollutant emissions. The following specific policies from the Circulation (CIR) and Conservation (CON) Elements of the General Plan apply to the proposed project:

CIR 20 Yolo County shall seek to avoid or mitigate all formes of possible, air, water or noise pollution from construction or operation of the transportation system.

CIR 21 Yolo County shall actively support systems of transit and transport, patterns and densities of development, and technological or organizational means to reduce or mitigate air pollution problems in the community, the County, and the region.

CON 15 Yolo County shall maintain or improve air quality by means of the following actions:

Coordination with the Yolo-Solano Air Pollution Control District.

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[3] U. S. Environmental Protection Agency, *Compilation of Air Pollutant Emissions Factors*, AP-42, Fourth Edition, 1985.

[4] U. S. Environmental Protection Agency, *Compilation of Air Pollutant Emissions Factors*, AP-42, Fifth Edition, 1995.

Coordination with the Sacramento Council of Governments, Air Quality Management Plan.

Development of redevelopment project approval only with avoidance or appropriate mitigation of probable air pollution.

Land use and transportation planning and implementation.

Support of transportation systems that generate less air pollution problems.

Planning and implementing more compact urban forms to stabilize or reduce aggregate commuting and other travel distance requirements.

Continue to improve the County waste collection and disposal to avoid waste burning.

Protect air quality levels required for agricultural productivity.

Implementation of the Air Quality Management Plan adopted by the Sacramento Area Council of Governments.

Yolo County Resource Conservation District (RCD) Agricultural Land Preservation and Protection Policy

The Yolo County RCD is empowered by state law to develop and carry out natural resource conservation programs that protect county resources. One policy deals with air quality:

Policy III. 5.C: Proposals for urban growth or proposals requiring a significant increase in water use, losses to groundwater recharge, increased flooding or overall increase in air pollution will be discouraged unless plans for alternative water supply (through development or conservation) and air pollution reduction are also provided for review, approval, and subsequent implementation.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The YSAQMD has published thresholds of significance to be used in evaluating air quality impacts of projects.[5] The OCMP would have a significant impact on air quality if it would exceed the following quantitative thresholds:

- Reactive Organic Gases (ROG): 82 lbs/day (15 tons/year);
- Oxides of Nitrogen (NO_x): 82 lbs/day (15 tons/year);
- Carbon Monoxide (CO): 550 lbs/day (100 tons/year); or
- Particulate Matter (PM_{10}): 82 lbs/day (15 tons/year).

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[5] Yolo-Solano Air Quality Management District, *Draft Air Quality Handbook*, 1994.

For projects where the major sources of CO are vehicles, exceedance of the 550 pounds per day (100 tons/year) threshold would not in itself necessarily represent a significant impact, in that carbon monoxide is a localized pollutant. Exceedance of the CO threshold indicates that the potential for violations of the CO ambient air quality standards along roadways and at major intersections needs to be considered.

YSAQMD guidance does not specify a threshold for sulfur dioxide (So_x). In this report, the impact threshold for So_x identified in the federal general conformity rule relating to the 1990 Clean Air Act Amendments is used as a threshold of significance. This rule identifies Sox emissions of 100 tons per day as a threshold in as SO_2 attainment area such as Yolo County.

The District has also identified qualitative thresholds. Projects would have a significant air quality impact if they would:

- Affect the attainment of the Federal or State ambient air quality standards by either violating or contributing to an existing or projected air quality violation;
- Generate vehicle trips that cause a CO hot spot;
- Subject sensitive receptors within one-fourth mile to toxic air emissions or elevated CO emissions;
- Result in the production or disposal of a material that poses a health hazard; or
- Create or subject sensitive receptors to an objectionable odor.

Impact 4.7-1
Potential Emissions of PM_{10}

Potential emissions of PM_{10} for existing conditions and for the project and alternatives have been estimated and are shown in Table 4.7-3. PM_{10} sources include process emissions, fugitive emissions, on-site equipment and vehicle exhausts, and off-site truck and auto emissions.

Process emissions are those related to stationary equipment used in the processing of aggregate. These sources include screens, conveyors, crushers, radial stackers and other equipment utilized to process or store aggregate as well as ancillary sources such as asphalt batch plants. Calculations of process emissions based on current permit process limits were obtained from the Yolo-Solano Air Quality Management District. For each proposed operation, future emissions were assumed to be proportional to the forecast maximum throughput under each alternative, assuming that control technology and other factors would remain constant. The composition of raw materials and proportion of various product types were assumed to remain constant at each of the processing facilities.

Table 4.7-3: Projected Maximum Emissions in Tons/Year

Alternative	Pollutant	Process Emissions	Fugitive Emissions	On-Site Equipment & Vehicle Exhaust	Total On-Site Emissions	Off-Site Truck and Auto Exhausts	Total	Change from Existing
Existing/ Alternative 1a	ROG	1.58	-	2.11	3.69	21.95	25.64	0.00
	NOx	13.52	-	24.60	38.12	96.57	134.69	0.00
	PM-10	56.70	89.12	2.36	148.18	27.81	175.99	0.00
	CO	6.51	-	8.01	14.52	93.60	108.12	0.00
	SOx	13.83	-	2.62	16.45	3.82	20.27	0.00
OCMP	ROG	4.59	-	6.39	10.98	77.19	88.17	19.72
	NOx	32.14	-	74.33	112.47	341.38	459.83	325.14
	PM-10	222.93	269.29	7.13	492.22	98.50	590.72	414.18
	CO	18.49	-	24.20	42.69	317.30	359.99	251.87
	SOx	71.92	-	7.93	79.85	12.95	92.80	72.57
Alternative 1b	ROG	2.88	-	3.26	6.14	26.19	32.33	6.69
	NOx	23.84	-	37.98	61.82	149.46	211.28	76.59
	PM-10	130.20	139.31	3.64	273.15	34.41	307.72	131.73
	CO	11.58	-	12.37	23.95	162.14	186.09	77.97
	SOx	48.81	-		52.86	6.61	59.47	39.20
Alternative 3	ROG	2.88	-	1.55	4.43	38.64	43.07	17.43
	NOx	23.84	-	13.70	37.54	217.17	254.71	120.02
	PM-10	130.20	5.98	1.22	137.40	49.56	186.96	10.97
	CO	11.58	-	17.59	29.17	230.67	259.84	151.72
	SOx	48.91	-	1.68	54.67	9.41	64.08	43.81
Alternative 4	ROG	0.81	-	1.35	2.16	14.12	16.28	-9.36
	NOx	4.93	-	15.75	20.68	62.47	83.15	-51.54
	PM-10	46.46	57.08	1.51	105.05	18.01	123.06	-52.93
	CO	3.01	-	5.13	8.14	67.26	75.40	-32.72
	SOx	20.49	-	1.68	22.17	2.74	24.91	4.64
Alternative 5a	ROG	1.46	-	2.13	3.59	25.83	29.42	3.78
	NOx	11.92	-	24.75	36.67	113.81	150.48	15.79
	PM-10	69.06	89.68	2.37	158.04	32.79	190.83	14.84
	CO	5.79	-	8.06	13.85	105.66	119.51	11.39
	SOx	24.45	-	2.64	27.09	4.31	31.40	11.13
Alternative 5b	ROG	3.60	-	5.79	9.39	70.45	79.84	54.20
	NOx	32.96	-	67.42	91.38	310.06	401.44	266.75
	PM-10	196.32	244.23	6.47	432.69	89.33	522.02	346.03
	CO	14.69	-	21.94	36.63	287.79	324.42	216.30
	SOx	62.33	-	7.19	69.52	11.74	81.26	60.99
Alternative 6	ROG	4.59	-	6.42	11.36	77.19	88.55	62.91
	NOx	32.14	-	79.69	117.83	341.38	459.21	324.52
	PM-10	222.93	274.09	7.66	504.68	98.50	603.18	427.19
	CO	18.49	-	28.58	47.07	317.30	364.37	256.25
	SOx	71.92	-	9.22	81.14	12.95	94.09	73.82

ROG = Reactive Organic Gases
NOx = Nitrogen Oxides
PM-10 = Particulate Matter, 10 Microns

Fugitive emissions are related to the movement of raw materials, aggregate or overburden. Fugitive sources include equipment and vehicles used in the excavation and transportation of materials such as scrapers and front end loaders. The excavation of raw materials, either by scraper (above ground water level) or by dragline crane (below ground water level) is considered to result in negligible fugitive emissions because of the high moisture content of the raw materials. The transport of these materials (and overburden), however, would take place on unpaved haul roads that, even with regular watering, would be a source of fugitive dust. These sources were estimated based on assumed average travel distances, road surface conditions, typical vehicle weights and other factors. Emissions from these sources were assumed to be directly proportional to the forecast throughput for the proposed mining operations under the OCMP, and the proposed amount of overburden utilized in reclamation.

On-site equipment and vehicle exhaust sources involved in aggregate handling, overburden transport, reclamation activities and dust control would include diesel powered scrapers, front-end loaders, motor graders, bulldozers, watering trucks and a dragline crane. Annual hours of use for each of these categories of equipment were estimated and exhaust emissions calculated. Emissions from these sources were assumed to be directly proportional to the forecast throughput for the proposed mining operations and the amount of overburden utilized in reclamation.

Off-site truck and exhaust emissions would be generated by diesel trucks hauling materials to and from the proposed mining operations and automobile trips made by employees. Diesel truck emissions were estimated based on 1997 EMFAC7-F emission factors for heavy-duty diesel vehicles, an average speed of 35 MPH, and an estimated round trip travel distance of 58 miles.[6] Emissions from employee trips were estimated using the URBEMIS-5 computer program.[7] Emissions from these sources were assumed to be directly proportional to the forecast throughput for the six aggregate processors.

Draft OCMP and Implementing Ordinances

PM_{10} emissions would increase substantially over current emissions with the implementation of the OCMP (see Table 4.7-3). This is due to increases in the amount of raw material excavated, processed, and transported from the site, as well the need to transport, store and redistribute overburden as part of the reclamation process.

To the extent that mining operations would temporarily or permanently remove land from active agricultural use, impacts would be partially offset by elimination of agricultural emissions for that period of time. Based upon estimates of County-wide agriculture

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[6] Based on the following assumed distribution of trips and average round trip distances: Solano County 60%, 70 miles; Yolo County 35%, 40 miles; other 5%, miles.

[7] California Air Resources Board, *URBEMIS Computer Program Version 5.0 User Guide: Vehicle-Related Emissions Estimation for Land Development Projects*, 1995.

emissions from pesticide use, tilling dust, agricultural windblown dust and farm equipment exhausts, typical agricultural activities in Yolo County generate annual emissions of 133.5 pounds of PM_{10} per acre.[8] Elimination of agricultural sources would have only a marginal effect in off-setting PM_{10} impacts.

The projected increase in PM_{10} emissions shown in Table 4.7-3 exceeds the YSAQMD threshold of significance of 15 tons per year; therefore, impacts on PM_{10} air quality would be considered significant over the 30-year life of the project.

After completion of all mining and reclamation activities, emissions from the planning area would be limited to those from agricultural activities. The creation of approximately 1,223 acres of non-agricultural uses (including open water, habitat, and slopes/roads), would reduce agricultural emissions of PM_{10} in Yolo County by roughly 82 tons per year.

Performance Standard 2.5-6 of the OCMP (Section 10.4.10 of the draft mining ordinance) would provide for following dust controls:

PS. 2.5-6 The following measures shall be implemented in order to control fugitive dust:

(a) All stockpiled soils should be vegetated, enclosed, covered, or adequately watered to keep soil moist at all times.

(b) All disturbed soil and unpaved roads shall be adequately watered to keep soil moist at all times.

(c) All inactive portions of the site shall either be seeded or watered until vegetation is grown or shall be stabilized using methods such as chemical soil binders, jute netting, or other YSAQMD approved methods.

Under the OCMP, the annual throughput for Cache Creek Aggregate, Syar, Teichert Esparto and Solano Concrete would exceed existing limitations contained in air pollution permits or Authority to Construct. This would require that permit modifications be obtained. Depending on the rules at the time of the request, new or additional emissions controls may be required if, for example, the definition of Best Available Control Technology (BACT) has changed since the issuance of the original permit. If the requested modifications result in potential new emissions exceeding District offset trigger quantities, operators may be required to create or purchase offsets.

Alternative 1a: No Project (Existing Conditions)

PM_{10} emissions would be unaffected by this alternative, as current levels of raw material excavated, processed, and transported from the area would continue (see Table 4.7-3).

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[8] California Air Resources Board, *Source Emissions Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions*, 1995.

Based on the YSAQMD threshold of significance of 15 tons per year, Alternative 1a would not have a significant effect on PM_{10} air quality.

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

PM_{10} emissions would increase substantially over existing emissions with this alternative due to assumed increases in the amount of raw material excavated, processed, and transported from the area (see Table 4.7-3). The projected increase in PM_{10} emissions shown in Table 4.7-3 exceeds the YSAQMD threshold of significance of 15 tons per year; therefore, impacts of Alternative 1b on PM_{10} air quality would be considered significant.

Alternative 2: No Mining (Alternative Site)

On-site emissions from processing plants would be eliminated with this alternative. Based on the YSAQMD threshold of significance of 15 tons per year, Alternative 2 would not have a significant effect on PM_{10} emissions.

Assuming that market demand for aggregate products is met at other processing plants outside the County, this alternative could result in secondary air quality impacts. As production is shifted to other plants, emissions of PM_{10} at those facilities would be increased by an amount similar to emissions eliminated from the planning area. This would shift impacts outside Yolo County, but PM_{10} emissions within the greater Sacramento Valley Air Basin would be expected to remain unchanged.

At the same time, additional diesel truck travel may be induced by this alternative. Haul distances to supply former lower Cache Creek aggregate users would be increased, resulting in increased diesel truck emissions within the region.

Alternative 3: Plant Operation Only (Importation)

PM_{10} emissions for fugitive sources and on-site equipment would be greatly reduced compared to current levels, while PM_{10} emissions from diesel truck traffic would be increased (Table 4.7-3). The net effect would be an overall increase of about 7 tons per year which is below the YSAQMD threshold of significance of 15 tons per year. This alternative could result in secondary air quality impacts. As mining is shifted to areas, emissions of PM_{10} at those facilities would be increased by an amount similar to emissions eliminated from the planning area. This would shift impacts outside Yolo County, but PM_{10} emissions within the greater Sacramento Valley Air Basin would be expected to remain unchanged.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

PM_{10} emissions would decrease below existing levels with implementation of this alternative due to decreases in the amount of raw material excavated, processed, and transported from the area (Table 4.7-3). However, because shallow mining would result

in a higher amount of overburden to be removed, stockpiled and redistributed per unit of aggregate extracted, this alternative would result in a generally higher emission per ton extracted compared to other alternatives. To the extent that this alternative removes land from active agricultural use, additional reductions in PM_{10} emissions would occur. Based on the YSAQMD threshold of significance of 15 tons per year, Alternative 4 would not have a significant effect on PM_{10} emissions.

After completion of all mining and reclamation activities, emissions from the planning area would be limited to those from agricultural activities.

Alternative 5a: Decreased Mining (Restricted Allocation)

PM_{10} emissions would increase above current levels with implementation of this alternative due to increases in the amount of raw material excavated, processed, and transported from the planning area (Table 4.7-3). The net effect would be an overall increase of about 10 tons per year which is below the YSAQMD threshold of significance of 15 tons per year.

Alternative 5b: Decreased Mining (Shorter Mining Period)

PM_{10} emissions would increase substantially with the implementation of Alternative 5b due to increases in the amount of raw material excavated, processed, and transported from the area, as well the need to transport, store and redistribute overburden as part of the reclamation process (Table 4.7-3).

The projected increase in PM_{10} emissions would exceed the YSAQMD threshold of significance of 15 tons per year, so impacts on PM_{10} air quality would be considered significant over the expected 15-year life of this alternative.

Under Alternative 5b the annual throughput for Cache Creek Aggregate, Syar, Teichert Esparto and Solano Concrete would exceed existing limitations contained in air pollution permits or Authority to Construct. This would require that permit modifications be obtained. Depending on the rules at the time of the request, new or additional emissions controls may be required if, for example, the definition of Best Available Control Technology (BACT) has changed since the issuance of the original permit. If the requested modifications result in potential new emissions exceeding District offset trigger quantities, operators may be required to create or purchase offsets.

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

PM_{10} emissions would increase substantially with the implementation of Alternative 6 due to increases in the amount of raw material excavated, processed, and transported from the area, as well the need to transport, store and redistribute overburden as part of the reclamation process (Table 4.7-3).

To the extent that operation of this alternative project removes land from active agricultural use PM_{10} impacts would be partially offset by elimination of agricultural emissions. Elimination of agricultural sources would have only a marginal effect in off-setting project PM_{10} impacts.

Equipment travel over unpaved roads is a substantial source of fugitive PM_{10} emissions. Although the mitigation measure described below would be an effective means of reducing these emissions, total elimination of emissions from equipment travel over unpaved roads would not reduce overall emissions to levels below the YSAQMD threshold of significance.

The projected increase in PM_{10} emissions would exceed the YSAQMD threshold of significance of 15 tons per year, so impacts on PM_{10} air quality would be considered significant over the 30-year life of the project.

After completion of all mining and reclamation activities, emissions from the planning area would be limited to those from agricultural activities.

Under Alternative 6 the annual throughput for Cache Creek Aggregate, Syar, Teichert Esparto and Solano Concrete would exceed existing limitations contained in air pollution permits or Authority to Construct. This would require that permit modifications be obtained. Depending on the rules at the time of the request, new or additional emissions controls may be required if, for example, the definition of Best Available Control Technology (BACT) has changed since the issuance of the original permit. If the requested modifications result in potential new emissions exceeding District offset trigger quantities, operators may be required to create or purchase offsets.

Mitigation Measure 4.7-1a (OCMP, A-1b, A-5b, A-6)

The following shall be added to the OCMP Performance Standards and proposed Off-Channel Surface Mining Ordinance regarding emission controls:

> *Wherever practical and economically feasible, portable or movable conveyor systems will be used to transport raw materials and overburden.*

Implementation of this mitigation would reduce this impact; however, it would remain a significant and unavoidable impact for the OCMP and Alternatives 1b, 5b and 6.

Mitigation Measure 4.7-1b (A-1a, A-2, A-3, A-4, A-5a)

None required.

Impact 4.7-2
Potential Emissions of Ozone Precursors (ROG and NO_X)

Emissions of ROG and NO_X have been estimated and are shown in Table 4.7-3. ROG and NO_X sources would include process emissions, on-site equipment and vehicle exhausts, and off-site truck and auto emissions.

Process emissions are those related to combustion-powered stationary equipment used in the processing of aggregate. These sources are limited to asphalt batch plants and gasoline dispensing equipment. Calculations of process emissions based on current permit process limits were obtained from the Yolo-Solano Air Quality Management District. Future emissions for the OCMP and alternatives were assumed to be proportional to the forecast throughput for each of the proposed mining applications submitted under the OCMP.

On-site equipment and vehicle exhaust sources involved in aggregate handling, overburden transport, reclamation activities and dust control would include diesel powered scrapers, front-end loaders, motor graders, bulldozers, watering trucks and a dragline crane. Annual hours of use for each of these categories of equipment were estimated and exhaust emissions calculated. Emissions from these sources were assumed to be directly proportional to the forecast throughput for the mining operations and the overburden utilized in reclamation.

Off-site truck and exhaust emissions would be generated by diesel trucks hauling materials to and from the mining sites and automobile trips made by employees. Diesel truck emissions were estimated based on 1997 EMFAC7-F emission factors for heavy-duty diesel vehicles, an average speed of 35 MPH, and an estimated round trip travel distance of 58 miles. Emissions from employee trips were estimated using the URBEMIS-5 computer program.[9] Emissions from these sources were assumed to be directly proportional to the forecast throughput for the proposed mining operations under the OCMP.

Draft OCMP and Implementing Ordinances

ROG and NO_X emissions would increase substantially with the implementation of the OCMP (see Table 4.7-3). These increases would be due to the amount of raw material excavated, processed, and transported from the area, as well the need to transport, store and redistribute overburden as part of the reclamation process.

The projected increase in ROG and NO_X emissions shown in Table 4.7-3 exceeds the YSAQMD threshold of significance of 15 tons per year for both pollutants, so project

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[9] California Air Resources Board, *URBEMIS Computer Program Version 5.0 User Guide: Vehicle-Related Emissions Estimation for Land Development Projects*, 1995.

impacts on ozone air quality would be considered significant over the 30-year life of the project.

The OCMP and proposed Off-Channel Surface Mining Ordinance (Section 10.4.11) provide for the following measures to reduce exhaust emissions:

PS. 2.5-7 All operational heavy equipment shall be kept in good working order to reduce emissions and minimize the leakage of oils and fuels.

Alternative 1a: No Project (Existing Conditions)

ROG and NO_X emissions would be unaffected by this alternative, as current levels of raw material excavated, processed, and transported from the area would continue. Based on the YSAQMD threshold of significance of 15 tons per year, Alternative 1a would not have a significant effect on ozone air quality.

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

ROG and NO_X emissions would increase substantially with the implementation Alternative 1b due to assumed increases in the amount of raw material excavated, processed, and transported from the area. The projected increase in NO_X emissions would exceed the YSAQMD threshold of significance of 15 tons per year, so impacts of Alternative 1b on ozone air quality would be considered significant.

Alternative 2: No Mining (Alternative Site)

On-site emissions from processing plants would be eliminated with this alternative. Based on the YSAQMD threshold of significance of 15 tons per year Alternative 2 would not have a significant effect on ozone air quality.

Assuming that market demand for aggregate products is met at other processing plants outside the County, this alternative could result in secondary air quality impacts. As production is shifted to other plants, emissions of ROG and NO_X at these facilities would be increased by an amount similar to emissions eliminated from the area. This would shift impacts outside Yolo County, but ozone precursor emissions within the greater Sacramento Valley Air Basin would be expected to remain unchanged.

At the same time, additional diesel truck travel may be induced by this alternative. Haul distances to supply former lower Cache Creek aggregate users would be increased, resulting in increased diesel truck emissions within the region.

Alternative 3: Plant Operation Only (Importation)

ROG and NO_X emissions for on-site equipment would be greatly reduced compared to current levels, while emissions from diesel truck traffic would be increased (see Table 4.7-

3). The net effect would be an overall increase of about 15 tons per year for ROG and an increase of 107 tons per year for NO_X. Based on the YSAQMD threshold of significance of 15 tons per year, this alternative would have a significant impact on ozone air quality.

This alternative could result in secondary air quality impacts. As mining is shifted to other sites, emissions of ROG and NO_X at these facilities would be increased by an amount similar to emissions eliminated from the area. This would shift impacts outside Yolo County, but ozone precursor emissions within the greater Sacramento Valley Air Basin would be expected to remain unchanged.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

ROG and NO_X emissions would decrease below current levels with implementation of this alternative due to decreases in the amount of raw material excavated, processed, and transported from the area. Based on the YSAQMD threshold of significance of 15 tons per year Alternative 4 would not have a significant effect on ozone air quality.

Alternative 5a: Decreased Mining (Restricted Allocation)

ROG and NO_X emissions would be very similar to current levels with implementation of this alternative. Projected changes in ROG and NO_X emissions would be below the YSAQMD threshold of significance of 15 tons per year, so impacts of this alternative on ozone air quality would not be significant.

Alternative 5b: Decreased Mining (Shorter Mining Period)

ROG and NO_X emissions would increase substantially with the implementation of Alternative 5b due to increases in the amount of raw material excavated, processed, and transported from the area, as well the need to transport, store and redistribute overburden as part of the reclamation process.

The projected increase in ROG and NO_X emissions shown in Table 4.7-3 exceeds the YSAQMD threshold of significance of 15 tons per year for both pollutants, so impacts on ozone air quality would be considered significant over the expected 15-year life of this alternative.

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

ROG and NO_X emissions would increase substantially with the implementation of Alternative 6 due to increases in the amount of raw material excavated, processed, and transported from the area, as well the need to transport, store and redistribute overburden as part of the reclamation process.

The projected increase in ROG and NO_x emissions would exceed YSAQMD threshold of significance of 15 tons per year, so impacts on ozone air quality would be considered significant over the 30-year life of the project.

Mitigation Measure 4.7-2a (OCMP, A-1b, A-3, A-5b, A-6)

The following should be added to the OCMP Performance Standards and proposed Off-Channel Surface Mining Ordinance regarding emission controls:

> *Wherever practical and economically feasible, portable or movable conveyor systems shall be used to transport raw materials and overburden.*

OCMP Performance Standard 2.5-7 and proposed Off-Channel Surface Mining Ordinance Section 10.4.11 should be amended as follows:

> *All ~~operational heavy equipment~~ internal combustion engine driven equipment and vehicles shall be kept tuned according to the manufacturers specifications and properly maintained to minimize the leakage of oils and fuels. No vehicles or equipment should be left idling for a period of longer than 5 minutes.*

Even total elimination of emissions from scraper travel over unpaved roads would not, however, reduce impacts to levels below the YSAQMD threshold of significance.

Impacts on ozone air quality would remain significant and unavoidable after implementation of this measure for the OCMP and Alternatives 1b, 3, 5b and 6.

Mitigation Measure 4.7-2b (A-1a, A-2, A-4, A-5a)

None required.

Impact 4.7-3
Cumulative Effects on Attainment of State and Federal Standards

Yolo County is considered nonattainment (standards have not been attained) for PM_{10} (state standard) and ozone (state and federal standard). To the extent that the OCMP and alternatives would increase production of aggregate products from the lower Cache Creek basin, existing sources of these PM_{10} and ozone precursors (ROG and NO_x) would be increased, adding to the emissions burden within Yolo County and within the Yolo-Solano Air Quality Management District. Also, a number of cumulative developments and operations are assumed to be reasonably foreseeable that would cumulatively increase regional emissions. Table 4.7-4 shows projected emissions from cumulative projects whose emissions can be easily quantified.

The following discussion assesses effects on attainment of the PM_{10} and ozone standards. It has been assumed that, for non-attainment pollutants, any cumulative increase in emissions would be considered significant.

It should be noted that changes in production assumed for the OCMP and alternatives would likely have effects on production at other aggregate processing areas within the larger Sacramento Valley Air Basin. These changes are likely to offset emission changes within the planning area, i.e., increased production of emissions at the planning area could be offset by reduced emissions at other aggregate processing plants within the air basin.

Draft OCMP and Implementing Ordinances

PM_{10} and ozone precursor emissions would increase substantially with the implementation of the OCMP due to increases in the amount of raw material excavated, processed, and transported from the area, as well the need to transport, store and redistribute overburden as part of the reclamation process. When considered with the emissions of cumulative projects (Table 4.7-4), cumulative emissions would be expected to delay by a small amount the eventual attainment of the state PM_{10} and state/federal ozone standards within the YSAQMD. There is, however, no current estimate of when state standards for PM_{10} or ozone will be attained in Yolo County. This impact is considered significant.

The OCMP (Performance Standard 2.5-6) and proposed Off-Channel Surface Mining Ordinance (Section 10.4.10) provide for dust controls. The OCMP (Performance Standard 2.5-7) and proposed Off-Channel Surface Mining Ordinance (Section 10.4.11) provide for measures to reduce exhaust emissions. This would be a significant and unavoidable impact.

Alternative 1a: No Project (Existing Conditions)

PM_{10} and ozone precursor emissions would be unaffected by this alternative, as current levels of raw material excavated, processed, and transported from the area would continue. This alternative would not affect the eventual attainment of the state PM_{10} and state/federal ozone standards within the YSAQMD. This would be a less-than-significant impact.

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

PM_{10} and ozone precursor emissions are expected to increase substantially with the implementation of Alternative 1b due to assumed increases in the amount of raw material excavated, processed, and transported from the area. When considered with the emissions of cumulative projects (Table 4.7-4), cumulative emissions would be expected to delay by a small amount the eventual attainment of the state PM_{10} and state/federal ozone standards within the YSAQMD. There is, however, no current estimate of when state standards for PM_{10} or ozone will be attained in Yolo County. This impact is considered significant and unavoidable.

Alternative 2: No Mining (Alternative Site)

On-site emissions from processing plants would be eliminated with this alternative. This reduction in emissions would accelerate slightly the eventual attainment of the state PM_{10} and state/federal ozone standards within Yolo County, but the additional truck travel that results within the entire air basin could delay slightly attainment within the larger Sacramento Valley Air Basin. This would be a significant and unavoidable impact.

Alternative 3: Plant Operation Only (Importation)

PM_{10} and ozone precursor emissions for on-site equipment would be greatly reduced compared to current levels, while emissions from diesel truck traffic would be increased. The net effect would be an overall increase of about 7 tons per year for PM_{10}, 15 tons per year for ROG and 107 tons per year for NO_X. When considered with the emissions of cumulative projects (Table 4.7-4), cumulative emissions would be expected to delay by a small amount the eventual attainment of the state PM_{10} and state/federal ozone standards within the YSAQMD. There is, however, no current estimate of when state standards for PM_{10} or ozone will be attained in Yolo County. This impact is considered significant and unavoidable.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

PM_{10} and ozone precursor emissions would decrease below current levels with implementation of this alternative due to decreases in the amount of raw material excavated, processed, and transported from the area. This reduction in emissions would accelerate slightly the eventual attainment of the state PM_{10} and state/federal ozone standards within the YSAQMD. This would be a less-than-significant impact.

TABLE 4.7-4 Cumulative Project Emissions in Tons/Year

	ROG	NOx	PM-10
Automobile Emissions	10.20	9.42	1.30
Area Source Emissions	7.03	1.41	0.45
Total	17.23	10.82	1.75

Alternative 5a: Decreased Mining (Restricted Allocation)

PM_{10} and ozone precursor emissions would be very similar to current levels with implementation of this alternative. This alternative would not affect the eventual attainment of the state PM_{10} and state/federal ozone standards within the YSAQMD. This would be a less-than-significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

PM_{10} and ozone precursor emissions would increase substantially with the implementation of Alternative 5b due to assumed increases in the amount of raw material excavated, processed, and transported from the area. When considered with the emissions of cumulative projects (Table 4.7-4), cumulative emissions would be expected to delay by a small amount the eventual attainment of the state PM_{10} and state/federal ozone standards within the YSAQMD. There is, however, no current estimate of when state standards for PM_{10} or ozone will be attained in Yolo County. This impact is considered significant and unavoidable.

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

PM_{10} and ozone precursor emissions would increase substantially with the implementation Alternative 6 due to assumed increases in the amount of raw material excavated, processed, and transported from the area. When considered with the emissions of cumulative projects (Table 4.7-4), cumulative emissions would be expected to delay by a small amount the eventual attainment of the state PM_{10} and state/federal ozone standards within the YSAQMD. There is, however, no current estimate of when state standards for PM_{10} or ozone will be attained in Yolo County. This impact is considered significant and unavoidable.

Mitigation Measure 4.7-3a (A-1a, A-4, A-5a)

None required.

Mitigation Measure 4.7-3b (OCMP, A-1b, A-2, A-3, A-5b, A-6)

No enforceable mitigation measures are available.

Mitigation Measures 4.7-1a and 4.7-2a would help to reduce the severity of this impact, but it would remain significant and unavoidable for the OCMP and Alternatives 1b, 2, 3, 5b, and 6.

Impact 4.7-4
Potential Impacts on Sensitive Receptors

Receptors near excavation areas or processing plants may be affected by PM_{10} emissions and in some cases odors emanating from asphaltic concrete batch plants. The severity of PM_{10} and/or odor impacts at receptors near processing plants would be inversely proportional to the distance between the plant and the receptor.

Sensitive receptors located along roads used by project traffic would be subject to increased CO levels resulting from increased traffic. The roadway system providing access to the project area consists of a 4-lane freeway and a system of 2-lane rural roads. In

general, operating conditions are good on all these roadways, with minimum delay or congestion. Surface street intersections are stop sign controlled. The light volumes and low levels of congestion on these streets indicate that concentrations of carbon monoxide are likely to be quite low near the planning area. Even at intersections of major roads the volume of vehicles and amount of delay do not indicate a potential for carbon monoxide concentrations exceeding any state or federal standards.

Future carbon monoxide levels would be directly related to traffic volumes and anticipated changes in the rate of emission of carbon monoxide by vehicles. While future traffic volumes would increase, emission rates from vehicle are anticipated to steadily decrease. Thus, carbon monoxide impacts are not anticipated with the OCMP or alternatives.

The issue of PM_{10} impacts for receptors located in proximity to unpaved haul roads within aggregate facilities will be addressed within the project-level EIRs for individual aggregate operations.

Draft OCMP and Implementing Ordinances

On-site emissions of PM_{10} and potentially odor-producing asphaltic concrete production would be increased by the OCMP. This is a potentially significant impact.

The OCMP and proposed Off-Channel Surface Mining Ordinance (Section 10-4.424a and 10-4.424b) provide for following measures to reduce impacts on sensitive receptors:

PS. 7.5-1 New processing plants and material stockpiles shall be located a minimum of one-thousand (1,000) feet from public rights-of-way, public recreation areas, and/or off-site residences, unless alternate measures to reduce potential noise, dust, and aesthetic impacts are developed and implemented.

PS.7.5-6 Soil stockpiles shall be located a minimum of five-hundred (500) feet from public rights-of-way, public recreation areas, and/or off-site residences, unless alternate measures to reduce potential noise, dust, and aesthetic impacts are developed and implemented.

The above setbacks would be sufficient to reduce on-site PM_{10} and potential odor impacts to a level that is less-than-significant for OCMP.

Alternative 1a: No Project (Existing Conditions)

On-site emissions of PM_{10} and potentially odor-producing asphaltic concrete production would be unaffected by this alternative. This would be a less-than-significant impact.

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

On-site emissions of PM_{10} and potentially odor-producing asphaltic concrete production would be increased by this alternative. This is a potentially significant impact.

Alternative 2: No Mining (Alternative Site)

On-site emissions of PM_{10} and potentially odor-producing asphaltic concrete production would be eliminated by the alternative. This would be a less-than-significant impact.

Alternative 3: Plant Operation Only (Importation)

This alternative would result in decreased on-site emissions of PM_{10}, but potentially odor-producing asphaltic concrete production would be increased. This is a potentially significant impact that would be mitigated by OCMP Performance Standard 7.5-1 and proposed Off-Channel Surface Mining Ordinance Section 10-4.424a.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

On-site emissions of PM_{10} and potentially odor-producing asphaltic concrete production would be decreased by this alternative. This would be a less-than-significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

On-site emissions of PM_{10} and potentially odor-producing asphaltic concrete production would be unaffected by this alternative. This would be a less-than-significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

On-site emissions of PM_{10} and potentially odor-producing asphaltic concrete production would be increased by this alternative. This is a potentially significant impact that would be mitigated by OCMP Performance Standard 7.5-1 and proposed Off-Channel Surface Mining Ordinance Section 10-4.424a.

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

On-site emissions of PM_{10} and potentially odor-producing asphaltic concrete production would be increased by this alternative. This is a potentially significant impact that would be mitigated by OCMP Performance Standard 7.5-1 and proposed Off-Channel Surface Mining Ordinance Section 10-4.424a.

Mitigation Measure 4.7-4a (A-1b)

None available. This would be a significant and unavoidable impact of this alternative.

Mitigation Measure 4.7-4b (OCMP, A-1a, A-2, A-3, A-4., A-5a, A-5b, A-6.)

None required.