ATTACHMENT 7
ADDENDUM TO FINAL ENVIRONMENTAL IMPACT REPORT 87-EIR-3

Ellwood Quarry Revised Conditional Use Permit and Reclamation Plan
CA Mine ID# 91-42-0020

TO: Decision-Makers

FROM: Lisa Plowman, Director, Planning and Development
Staff Contact: Errin Briggs

DATE: March 2, 2021

RE: Ellwood Quarry Revised Conditional Use Permit and Reclamation Plan Project
17RVP-00000-00082 to 02CUP-00000-00006 &
18RVP-00000-00016 to 02RPP-00000-00001
APN: 079-100-017

CEQA DETERMINATION:

Because 87-EIR-3 was adopted for the ongoing Ellwood Quarry Mining and Reclamation Project, CEQA Guidelines § 15162 states that no subsequent EIR or ND shall be prepared unless one or more of the following have occurred: 1) substantial changes are proposed in the project which will require major revisions to the Supplemental EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; 2) substantial changes will occur with respect to the circumstances under which the project is undertaken which will require major revisions to the Supplemental EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or 3) new information of substantial importance which was not known and could not have been known at the time the previous Supplemental EIR was certified as complete has become available.

There are no substantial changes or changed circumstances under which the proposed project is to be undertaken. As described below, no new significant environmental effects or a substantial increase in the severity of previously identified significant effects under the adopted Environmental Impact Report (87-EIR-3) have been found with the proposed project. Further, there is no new information that the proposed project will have one or more significant effects not discussed in the adopted 87-EIR-3. The project proposes the same uses as previously analyzed, the analysis contained within 87-EIR-3 addresses the impacts that would be associated with the proposed project, and identifies measures that would mitigate those impacts to a less than significant level. Mitigation measures identified in 87-EIR-3 are incorporated into the conditions of approval of revision Case No. 17RVP-00000-00082 to Conditional Use Permit Case No. 02CUP-00000-00006.

Because none of the conditions in CEQA Guidelines § 15162 have occurred, no subsequent EIR is required for this project. Therefore, an Addendum to 87-EIR-3 is the appropriate document for the proposed time extension to 02CUP-00000-00006 and 02RPP-00000-00001 to extend the mining end date by 25 years.

Finding that CEQA §15164 (Addendum to an EIR or ND) applies to the Ellwood Quarry revised Conditional Use Permit and Reclamation Plan Project, Case No. 17RVP-00000-00082 to 02CUP-00000-00006 and 18RVP-00000-00016 to 02RPP-00000-00001. CEQA §15164 allows an addendum to be prepared when only minor technical changes or changes which do not create new significant impacts would result. Because the project revisions meet the conditions for the application of Public Resources Code Section 21166 and State CEQA Guidelines Section 15164, preparation of a new subsequent EIR or EIR is not required and this Addendum to Environmental Impact Report (87-EIR-3) may be used to fulfill the environmental review requirements for Case Nos. 17RVP-00000-00082 and 18RVP-00000-00016.

LOCATION:
This site is identified as Assessor Parcel Number 079-100-017, located on Ellwood Ranch about one-half mile north of Cathedral Oaks Road near the western end of the City of Goleta, Third Supervisorial District.

BACKGROUND:
Ellwood Quarry was originally proposed (and approved) in 1987 as a replacement for the Pulice Ranch Quarry, a nearby similar sand mine that had operated since 1962 and was nearing exhaustion of material reserves. The Pulice Ranch Quarry, located about 1,000 feet east of Ellwood Quarry, was closed and the site reclaimed in 1992. At that time, mining operations commenced at Ellwood Quarry. The primary offsite effect of the proposed Ellwood Quarry operation, the truck traffic required for sand transport, was limited by the conditions of approval of 86-CP-060 to the existing level of truck trips associated with the Pulice Ranch Quarry. Thus, no new truck traffic was found to be associated with the Ellwood Quarry and impacts on Traffic and Circulation were determined to be less than significant in 87-EIR-3.

Ellwood Quarry has operated over the past two decades in compliance with the conditions of approval of 02CUP-00000-00006 and 02RPP-00000-00001. Mitigation measures required during initial development of the quarry to address project impacts have been implemented. Required annual inspections by County staff have not identified any problems associated with this facility and have consistently found the facility to be in compliance with project conditions and SMARA standards.

In 1998 and 1999, construction of the nearby Winchester Commons and Mountain View housing developments occurred. During this period, complaints were received by the County regarding dust generation and truck traffic noise associated with the temporary construction and the pre-existing Ellwood Quarry operations. As the new housing developments are now completed, such a concentration of earth-moving and construction activity in the local area is not anticipated to recur.

PROPOSED PROJECT:

The project request is for a revision (Case No. 17RVP-00000-00082) to Conditional Use Permit 02CUP-00000-00006 and a revision (Case No. 18RVP-00000-00016) to Reclamation Plan 02RPP-00000-00001 to extend the life of the existing mining operation for 25 years to December 31, 2043. The existing Reclamation Plan was approved by the County Planning Commission in 2002 and the Conditional Use Permit (CUP) was approved by the Board of Supervisors in 2003. The CUP is scheduled to expire in August of 2018 while the Reclamation Plan is scheduled to expire on December 31, 2022. Sand excavated from the Ellwood Quarry is used for a number of construction, landscaping, and commercial purposes. All of the excavated material is saleable product and no mining waste is generated. Topsoil is stockpiled for use in reclamation. The total excavation volume approved under 02CUP-00000-00006 is 1,028,250 cubic yards. Of this total, 332,300 cubic yards of material remains within the limits specified in the original CUP and Reclamation Plan. At an average annual production rate of 16,000 cubic yards per year, it would require approximately 21 years to complete mining. Modification of the Reclamation Plan expiration date is requested. No other changes to the Reclamation Plan are proposed. Upon termination of mining, all mining equipment will be removed from the site. The truck scale, fuel tanks and office will remain for use as part of the ongoing Ellwood Ranch agricultural operations. The existing sedimentation basin located downstream of the mining site will remain. Ellwood Quarry is operated Monday through Friday (except national holidays) from 7:00 am to 4:30 pm. Sand is transported from the quarry site during these hours via large trucks operated by the quarry and by customers of the quarry. The project site is zoned AG-II-100, totaling 191 acres on Assessor's Parcel Number 079-100-017, and located at 1300 Ellwood Ranch Road in Goleta, CA, Third Supervisorial District.

CHANGES IN PROJECT IMPACTS:

The environmental effects of the Ellwood Quarry were evaluated in environmental impact report 87-EIR-3 as part of project approval in 1987. As indicated above, the proposed revision of the Conditional Use Permit to extend the life of the mining operation by 25 years reflects lower than anticipated material sales over the past decade and not an increase in mining area or the volume of excavation over the original approval. Daily operations at the quarry would continue with no substantial change over current conditions.

Agricultural Impacts

The Ellwood Quarry is located within agricultural preserve 77-AP-047. In accordance with the Williamson Act (1965), any commercial agricultural use is permitted within an agricultural preserve, however, local governments can identify compatible uses permitted within a preserve via a use permit (California Department of Conservation 2004). The County's Uniform Rules, governing the Agricultural Preserve program addresses the use of preserve land for mining purposes. Uniform Rule #4 says that "the mining, extraction and quarrying of natural resources are compatible to an agricultural preserve…"

The proposed project would have no new agricultural impacts, but would allow ongoing impacts to occur over a longer period of time. The agricultural areas that would be impacted from the

extended phasing of mining activities would be reclaimed in accordance with SMARA. The Reclamation Plan identifies end uses of open space and agriculture. Agricultural impacts associated with the proposed project are addressed by 87-EIR-3 and conditioned by 17RVP-00000-00082 to 02CUP-00000-00006 and 18RVP-00000-00016 to 02RPP-00000-00001. Therefore, the project would not increase the severity of existing impacts to agriculture previously analyzed under the 1987 Environmental Impact Report.

Aesthetics Impacts

The view of the quarry cut slope from offsite public viewing places is identified in 87-EIR-3 as a potentially significant (Class II) impact. In order to reduce this impact to a less than significant level, several measures were required under 86-CP-060. These include the maintenance of a 8-10 foot high berm on the southern side of the excavation area, limitations on the timing of excavation of the south-facing slope, a prohibition against the sidecasting of excavated sand over the south-facing slope, a prohibition on development of a new access road on the southern side of the quarry, and revegetation of the exposed cut slope as soon as possible. Ellwood Quarry has operated in conformance with these requirements and the current application does not propose that they be changed.

At the time of preparation of 87-EIR-3, the "most significant source of potential visual impact of the project" was the view of the site from US Highway 101. This is no longer an issue as the subsequently-developed Winchester Commons housing project has blocked all views of the quarry from Highway 101. The quarry is currently visible from several short segments of the new extension of Cathedral Oaks Road and from the east-bound segment of Calle Real from the Winchester Canyon overpass to the western end of Cathedral Oaks. The "Phase I" slope above the active quarry area is underlain by dark sandstone and silts of the Sespe Formation and visually appears similar to the surrounding hillside areas. Only a narrow horizontal band of light-colored sand in the active quarry area is visible. The quarry does not dominate the view from these points and only the upper portion of the quarry slope is visible. In any case, no new impacts on visual resources are anticipated.

Cumulative – 87-EIR-3 identified that impacts to visual resources were less than significant with mitigation. The EIR further determined that residual impacts were not significant. The time extension project would allow a continuation of existing cumulative visual/aesthetic impacts that with mitigation, would remain less than significant. Because the proposed project would continue site operations, aesthetic impacts associated with the proposed time extension are equal to or less than what was identified in the original EIR.

Air Quality Impacts

Emissions from sand transport trucks are identified in 87-EIR-3 as a significant and unavoidable impact on air quality. 87-EIR-3 analyzed the project assuming a total of 96 truck trips per day (48 trips in and 48 trips out). Operations in the past have exceeded 90 trips per day. The proposed revised Conditional Use Permit would reduce the current limit of 96 trips per day to 40 trips per day (20 trips in and 20 trips out). Recent existing operations average 12 truck trips per day (6 trips in and 6 trips out) at the quarry and represent existing conditions. The level of quarry operations evaluated in 87-EIR-3 anticipated a production rate of 80,000 to 100,000 cubic yards of sand per year. The actual average production over the previous eleven reported years (2006 - 2016) of

quarry operation has been only 13,963 cubic yards per year and represents the CEQA baseline. The average production rate is not expected to be exceeded over the remaining life of the mine. Thus, the annual vehicle exhaust emissions from the sand transport trucks have been and would continue to be reduced from that estimated in 87-EIR-3. Similarly, fugitive dust from truck sand loads and excavation activities would be less than estimated in 87-EIR-3.

Although greenhouse gases were not originally analyzed in 87-EIR-3, the applicant provided a complete air emissions calculation package to the County for this time extension request (Attachment 2), which was reviewed by the Santa Barbara County Air Pollution Control District (APCD). The air emission calculation package accounted for existing site operations as baseline, compared against the total potential emissions for the proposed time extension. The air emissions associated with the proposed time extension fall below APCDs thresholds of significance for particulates as well as greenhouse gases. While the time extension project would allow a continuation of existing on-site impacts originally considered significant by 87-EIR-3, the proposed time extension project would not exceed levels analyzed in 87-EIR-3 or current County CEQA air thresholds. As proposed, the project is consistent with 87-EIR-3 and existing mitigation measures identified in 87-EIR-3 are appropriate. No further environmental review would be necessary.

Cumulative – 87-EIR-3 identified that cumulative air quality impacts related to Nitrous Oxide emissions (NOx) was significant (Class I). The EIR identified options for mitigating cumulative impacts to air quality including limiting grading in surrounding projects to the extent feasible, phasing surrounding development projects and limiting the amount of NOx emissions generated at the site. While the surrounding development identified in the cumulative projects table in 87-EIR-3 has been built out, the time extension project would allow a continuation of existing on-site impacts originally considered significant by 87-EIR-3, and therefore, cumulative air quality impacts associated with NOx emissions would remain significant but would not substantially increase the previously-identified significant impact. Further, because the proposed project would reduce the level of peak hour and daily trips, air quality impacts associated with the proposed time extension are equal to or less than what was identified in the original EIR.

Noise Impacts

Noise generated by quarry operations and by sand transport trucks arriving and departing the site was identified as a potentially significant (Class II) impact in 87-EIR-3. Measures to reduce noise generation to a less than significant level were incorporated into the original Conditional Use Permit (86-CP-060) and remain a requirement of existing Conditional Use Permit (02CUP-00000-00006). These measures include the maintenance of an 8-10 foot berm in front of the active excavation area and limits on the hours of operation (7:00 am to 4:30 pm). No change in these requirements is proposed. The proposed project would have no new noise impacts, but would allow ongoing impacts identified in 87-EIR-3 to occur over a longer period of time. The project would not generate any increases in noise levels. Thus, no new impacts would be anticipated as a result of the proposed revised permit.

Cumulative – 87-EIR-3 identified that the quarry project would contribute to cumulative noise impacts in the surrounding area but that such impacts would not be significant with the implementation of mitigation measures included in the EIR. Similarly, the time extension project

would allow a continuation of existing noise impacts in the surrounding area but such impacts would continue to be less than significant with mitigation. Because the proposed project would reduce the level of peak hour and daily trips, noise levels associated with truck traffic for the proposed time extension are less than what was identified in the original EIR.

Traffic and Circulation Impacts
Impacts on traffic and circulation due to truck trips associated with sand deliveries from Ellwood Quarry are determined in 87-EIR-3 to be less than significant. This finding is based on the limitation of truck trips to the historic level associated with the adjacent and now-closed Pulice Ranch Quarry. The proposed revised Conditional Use Permit would reduce the current limit of 96 trips per day (48 trips in and 48 trips out) to 40 trips per day (20 trips in and 20 trips out). As proposed, the project is consistent with 87-EIR-3 and no additional impacts related to traffic and circulation are anticipated.

Cumulative – 87-EIR-3 identified that the quarry project would contribute to cumulative traffic impacts and included mitigation for cumulative impacts to traffic including a requirement to pay fees toward the County "Road Improvement Trust Fund." The applicant provided a June 22, 2018 "Baseline and Cumulative Traffic Analysis" prepared by Associated Transportation Engineers (ATE) for the project (Attachment 1). The ATE report describes existing conditions of the area road network, levels of service and a cumulative analysis. Cumulative traffic volumes were forecast for the study-area roadways and intersections assuming development of the approved and pending projects located within the study area. The report concludes that cumulative traffic would operate at LOS B or better at study-area intersections. The report also concludes that the Project generates 1 to 3 trips during the A.M. peak hour and 0 trips during the P.M. peak hour at study-area intersections. Because the proposed project would reduce the level of peak hour and daily trips, traffic levels associated with the proposed time extension are less than what was identified in the original EIR.

FINDINGS:

It is the finding of the Planning and Development Department that the previous environmental document, as herein amended, may be used to fulfill the environmental review requirements of the current project. Because the current project meets the conditions for the application of State CEQA Guidelines §15164, preparation of a new EIR is not required.

Discretionary processing of the Ellwood Quarry revised Conditional Use Permit and Reclamation Plan Project, Case No. 17RVP-00000-00082 to 02CUP-00000-00006 and Case No. 18RVP-00000-00016 to 02RPP-00000-00001, may now proceed with the understanding that any substantial changes in the proposal may be subject to further environmental review.

ATTACHMENTS:

1. Associated Transportation Engineers Baseline and Cumulative Traffic Analysis dated June 22, 2018
2. Ellwood Quarry Air Analysis dated December 1, 2017

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Since 1978

Richard L. Pool, P.E.
Scott A. Schell, AICP, PTP

June 22, 2018

17093.01L01

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345 Ellwood Canyon Road
Goleta, CA 93117

BASELINE AND CUMULATIVE TRAFFIC ANALYSIS FOR THE SANTA BARBARA SAND & TOPSOIL CUP EXTENSION, COUNTY OF SANTA BARBARA

Associated Transportation Engineers (ATE) has prepared the following baseline and cumulative traffic analysis for the Santa Barbara Sand & Topsoil CUP Extension (the "Project") located on Ellwood Canyon Road in the County of Santa Barbara. It is understood that the contents of the study will be used by the County of Santa Barbara for the project's environmental review.

PROJECT DESCRIPTION

The Project is proposing to extend the life of the existing Santa Barbara Sand & Topsoil mining operations by 25 years. An average of 13,000 CY of sand is estimated to be excavated and trucked offsite annually. Figure 1 (attached) shows the location of the Project site within Santa Barbara County.

BASELINE CONDTIONS

Street Network

The circulation system serving the Project site is comprised of regional highways, arterial streets, and local roads (see Figure 1). Access to the Santa Barbara Sand & Topsoil site is provided via Ellwood Canyon Road which connects to Cathedral Oaks Road. Cathedral Oaks Road extends south of Ellwood Canyon Road connecting to the interchange at US 101 and Hollister Avenue. The following text briefly describes the key roadways in the Project vicinity.

Cathedral Oaks Road, located south of Project site, is a 2- to 4-lane arterial roadway that extends north from Hollister Avenue and then proceeds easterly across the Goleta Valley. This roadway provides a secondary east-west surface street route through Goleta. The section of Cathedral Oaks Road in the study area contains two travel lanes with bike lanes.

Ellwood Canyon Road located east of the Project site, is a 2-lane local roadway that extends north from Cathedral Oaks Road providing access to the Project site and the surrounding rural land uses. Ellwood Canyon Road splits into Ellwood Ridge Road on the east and Ellwood Ranch Road on the west. Ellwood Ranch Road runs along the eastern frontage of the Project site.

Roadway Operations

Figure 2 shows the Existing baseline average daily traffic (ADT) volumes for the study-area roadway segments. Existing roadway volumes were obtained from updated traffic counts completed in November of 2017 (count data attached for reference). The operational characteristics of the study-area roadways were analyzed based on Santa Barbara County's and the City of Goleta's "Acceptable Capacity" rating system (summary of roadway capacities attached for reference). Table 1 shows the Existing ADT volumes and the Acceptable Capacity thresholds for study-area roadways.

Table 1
Existing Roadway Operations

Roadway Segment	Roadway Classification	Geometry	Acceptable Capacity	Existing ADT
Ellwood Canyon Road	Local Road	2 Lanes	5,000	250
Cathedral Oaks Road n/o Calle Real	Major Arterial	2 Lanes	14,300	3,200

Intersection Operations

Because traffic flow on urban arterials is most constrained at intersections, detailed traffic flow analyses focus on the operating conditions of critical intersections during peak travel periods. In rating intersection operations, ALevels of Service@ (LOS) A through F are used, with LOS A indicating free flow operations and LOS F indicating congested operations (more complete definitions of levels of service are attached for reference). The County of Santa Barbara and the City of Goleta have established LOS C as the minimum acceptable operating standard for intersections.

Existing peak hour volumes were obtained for the study-area intersections from traffic count data collected in November of 2017 for this study (traffic count data attached for

reference). Figure 2 shows the peak hour turning movements for the study-area intersections and Figure 3 shows existing lane geometry and traffic controls.

Levels of service were calculated for the unsignalized study-area intersections using the methodologies outlined in the Highway Capacity Manual (HCM)[1]. Table 2 summarizes results of the LOS calculations (worksheets attached).

Table 2
Existing Intersection Operations

Intersection	Control	A.M. Peak Hour		P.M. Peak hour	
		Delay	LOS	Delay	LOS
Calle Real/Winchester Canyon Road-US 101 NB Ramp	All-Way STOP	8.5 Sec	A	10.0 Sec	B
Calle Real/Cathedral Oaks Road	All-Way STOP	13.6 Sec	B	11.5 Sec	B
U.S. 101 SB Ramps/Cathedral Oaks Road	Two-Way STOP	10.2 Sec	B	9.7 Sec	A
Hollister Avenue/Cathedral Oaks Road	All-Way STOP	11.3 Sec	B	11.7 Sec	B

(a) Unsignalized intersection. LOS based on average weighted delay per vehicle in seconds.

The data presented in Table 2 show that the study-area intersections currently operate acceptably at LOS B or better.

PROJECT-GENERATED TRAFFIC VOLUMES

The traffic generated by the existing Santa Barbara Sand & Topsoil facility was quantified based on operational data provided by the applicant. The data included the average number of truckloads per day and the number of employees that travel to and from the site. The key statistics used for the trip generation analysis are listed below:

- 3 staff work on-site from 7:00 A.M. to 2:30 PM
- 20 Truckloads per day

Table 3 summarizes the trip generation estimates developed for the project based on the operational data.

[1] Highway Capacity Manual, Transportation Research Board, 2010.

Table 3
Santa Barbara Sand & Topsoil Trip Generation Estimates

Project Component	Quantity	ADT	A.M. Peak Hour Trips	P.M. Peak Hour Trips
Staff	3 Staff	6	3	0
Truck Deliveries	20 Per Day	40	2	0
Total		**46**	**5**	**0**

ADT = Average Daily Trips
Trip generation estimates based on operational information.

As shown in Table 3, the existing Santa Barbara Sand & Topsoil operations generate 46 ADT, with 5 trips during the A.M. peak hour period and 0 trips during the P.M. peak hour period (the facility closes at 3:00 P.M.).

Roadway Contributions

The Project's contribution to the roadway volumes in the study area are summarized in Table 4.

Table 4
Santa Barbara Sand & Topsoil Contribution to Roadway Volumes

Roadway Segment	Roadway Classification	Acceptable Capacity	Existing ADT	Project Trips
Ellwood Canyon Road	Local Road	5,000	250	46 ADT
Cathedral Oaks Road n/o Calle Real	Major Arterial	14,300	3,200	21 ADT

The data in Table 4 show that the Project accounts for 46 ADT on Ellwood Canyon Road and 21 ADT on Cathedral Oaks Road.

Intersection Contributions

The Project's contribution to the peak hour intersections volumes in the study area are summarized in Tables 5 and 6.

Table 5
Santa Barbara Sand & Topsoil Contribution to Intersection Volumes – A.M. Peak Hour

Intersection	Existing		Project Trips
	Delay	LOS	
US 101 NB Ramp-Calle Real/Winchester Canyon Road	8.5 Sec	A	2 Trips
Calle Real/Cathedral Oaks Road	13.6 Sec	B	3 Trips
U.S. 101 SB Ramps/Cathedral Oaks Road	10.2 Sec	B	3 Trips
Hollister Avenue/Cathedral Oaks Road	11.3 Sec	B	1 Trips

Table 6
Santa Barbara Sand & Topsoil Contribution to Intersection Volumes – P.M. Peak Hour

Intersection	Existing		Project Trips
	Delay	LOS	
US 101 NB Ramp-Calle Real/Winchester Canyon Road	10.0 Sec	B	0 Trips
Calle Real/Cathedral Oaks Road	11.5 Sec	B	0 Trips
U.S. 101 SB Ramps/Cathedral Oaks Road	9.7 Sec	A	0 Trips
Hollister Avenue/Cathedral Oaks Road	11.7 Sec	B	0 Trips

The data in Tables 5 and 6 show that the Project accounts for 1 to 3 trips during the A.M. peak hour and 0 trips during the P.M. peak hour at the study-area intersections.

CUMULATIVE ANALYSIS

Cumulative Traffic Volumes

Cumulative traffic volumes were forecast for the study-area roadways and intersections assuming development of the approved and pending projects located within the study area. The list of approved and pending projects used for the cumulative analysis was obtained from the City of Goleta and is attached for reference. Trip generation estimates were calculated for the cumulative projects using the rates presented in the ITE Trip Generation report or obtained from the environmental documents prepared for the projects (cumulative trip generation calculation worksheet attached). The traffic generated by the cumulative projects was added to the baseline traffic volumes based on the distribution percentages presented in existing traffic studies and environmental documents completed for developments in the study area. Figure 4 presents the Cumulative traffic volumes for the study-area roadways and intersections.

Cumulative Roadway Operations

Table 7 presents the cumulative traffic volume forecasts for study-area roadways and quantifies the Project's contribution to the cumulative roadway volumes.

Table 7
Santa Barbara Sand & Topsoil Contribution to Cumulative Roadway Volumes

Roadway Segment	Roadway Classification	Acceptable Capacity	Existing ADT	Project Trips
Ellwood Canyon Road	Local Road	5,000	250	46 ADT
Cathedral Oaks Road n/o Calle Real	Major Arterial	14,300	3,350	21 ADT

The data in Table 7 show that the study-area roadways would carry volumes within their acceptable capacity ratings under cumulative conditions. The Project could account for 46 ADT on Ellwood Canyon Road and 21 ADT on Cathedral Oaks Road.

Cumulative Intersection Contributions

Tables 8 and 9 present the cumulative levels of service for the study-area intersections and quantify the Project's contribution to the cumulative intersection volumes.

Table 8
Santa Barbara Sand & Topsoil
Contribution to Cumulative Intersection Volumes A.M. Peak Hour

Intersection	Cumulative		Project Trips
	Delay	LOS	
US 101 NB Ramp-Calle Real/Winchester Canyon Road	8.6 Sec	A	2 Trips
Calle Real/Cathedral Oaks Road	13.9 Sec	B	3 Trips
U.S. 101 SB Ramps/Cathedral Oaks Road	10.3 Sec	B	3 Trips
Hollister Avenue/Cathedral Oaks Road	11.5 Sec	B	1 Trips

Table 9
Santa Barbara Sand & Topsoil
Contribution to Intersection Volumes – P.M. Peak Hour

Intersection	Cumulative		Project Trips
	Delay	LOS	
US 101 NB Ramp-Calle Real/Winchester Canyon Road	10.2 Sec	B	0 Trips
Calle Real/Cathedral Oaks Road	11.6 Sec	B	0 Trips
U.S. 101 SB Ramps/Cathedral Oaks Road	9.7 Sec	A	0 Trips
Hollister Avenue/Cathedral Oaks Road	11.9 Sec	B	0 Trips

The data presented in Tables 8 and 9 show that the study-area intersections are forecast to operate acceptably at LOS B or better with Cumulative traffic volumes. The data also show that the Project accounts for 1 to 3 trips during the A.M. peak hour and 0 trips during the P.M. peak hour at the study-area intersections.

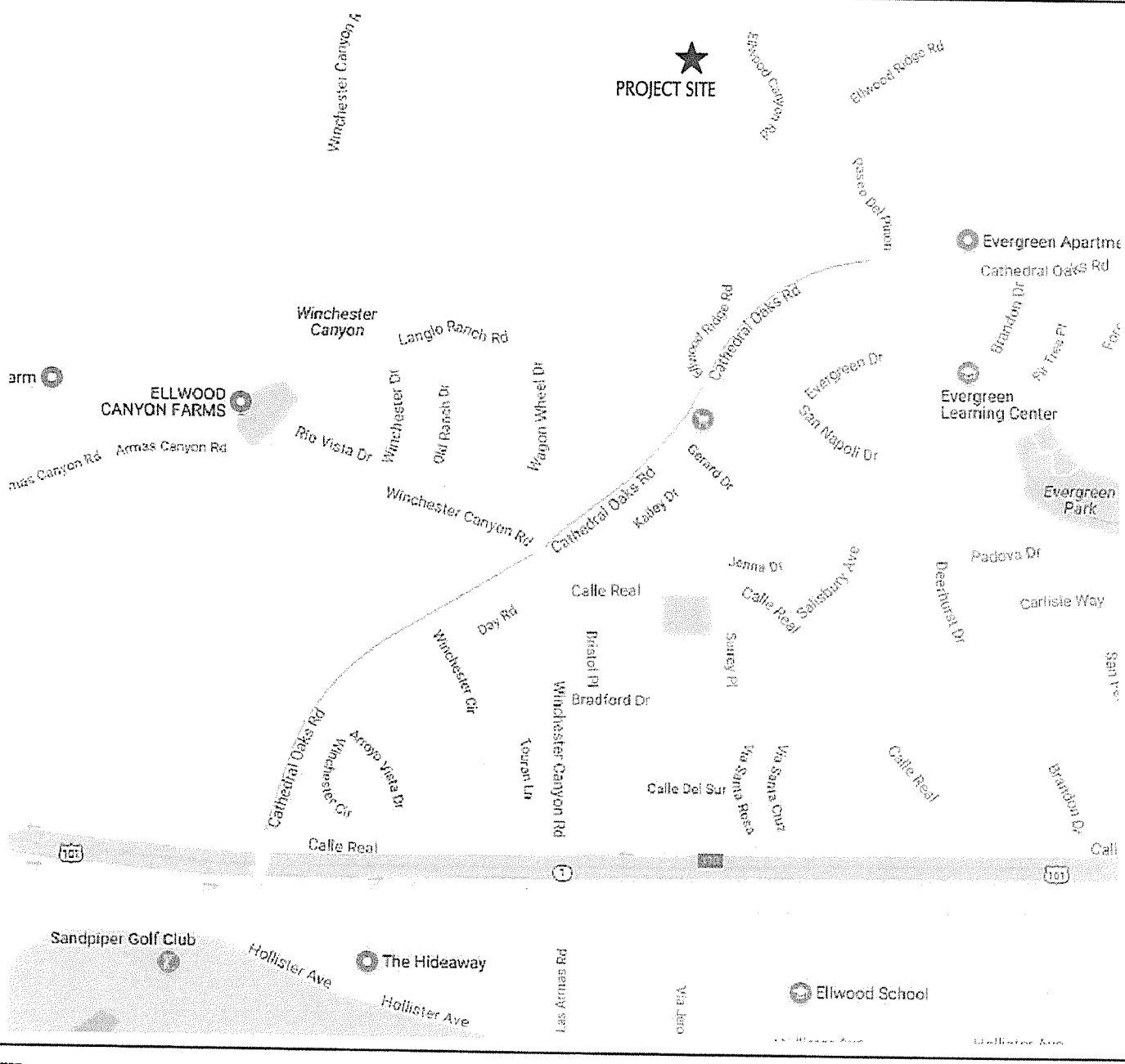
This concludes ATE's baseline and cumulative traffic analysis for the Santa Barbara Sand & Topsoil Project.

Associated Transportation Engineers

Scott A. Schell, AICP, PTP
Vice President

SAS/DLD/EKM

Attachments



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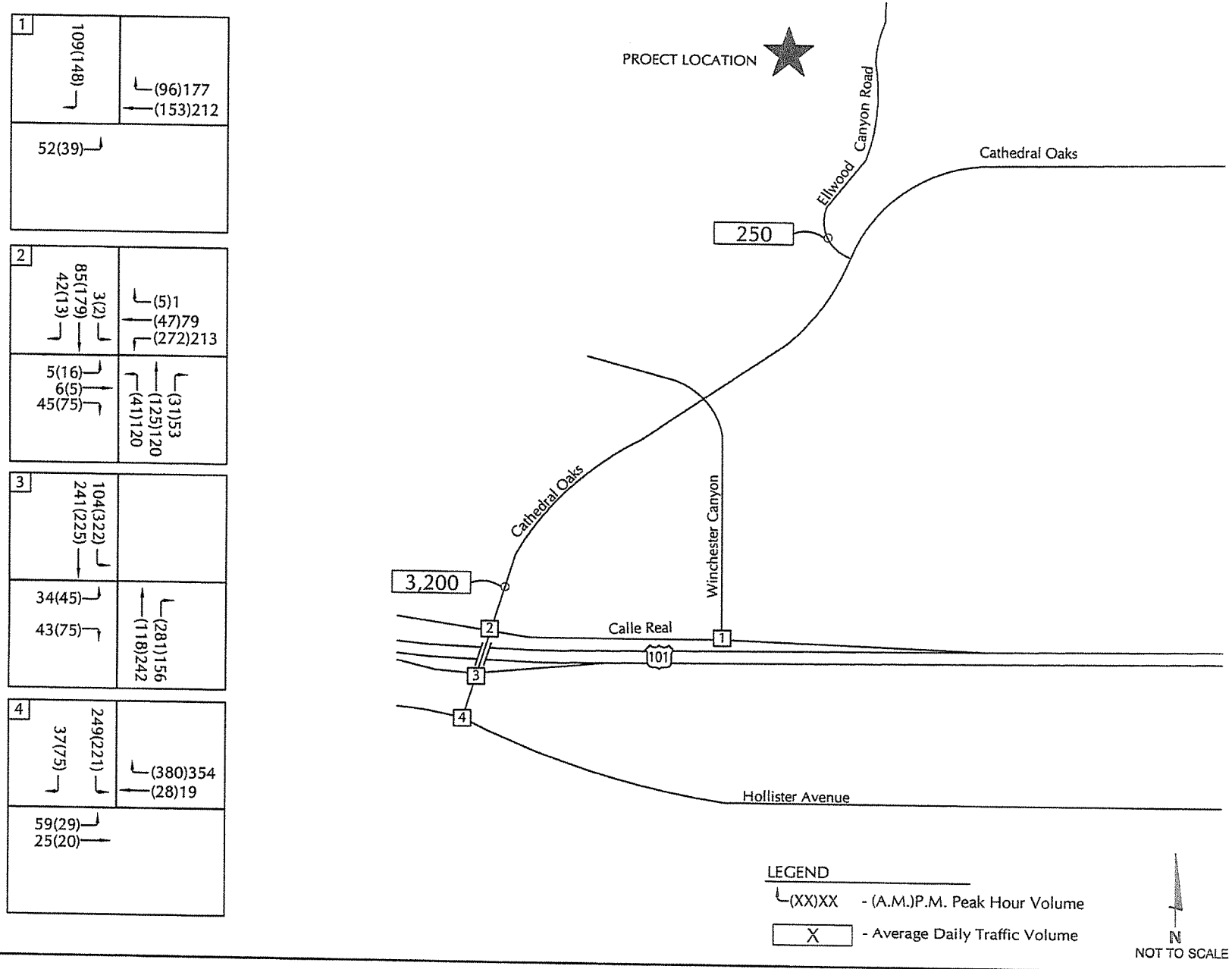
EXISTING STREET NETWORK AND PROJECT SITE LOCATION

FIGURE 1

EKM - ATE#17093



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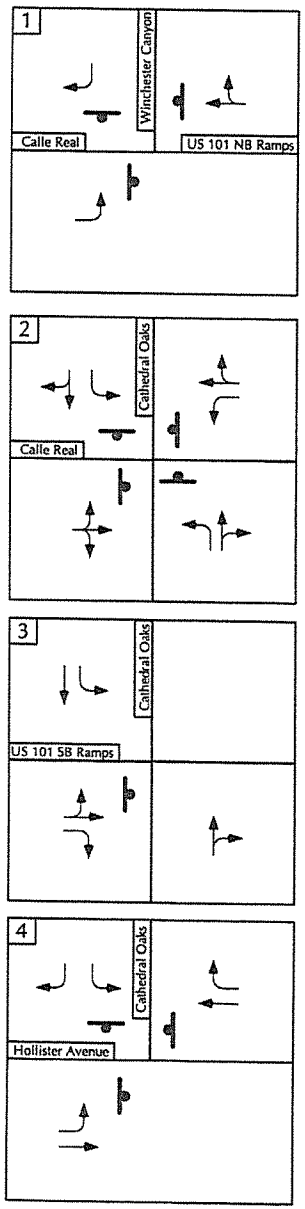
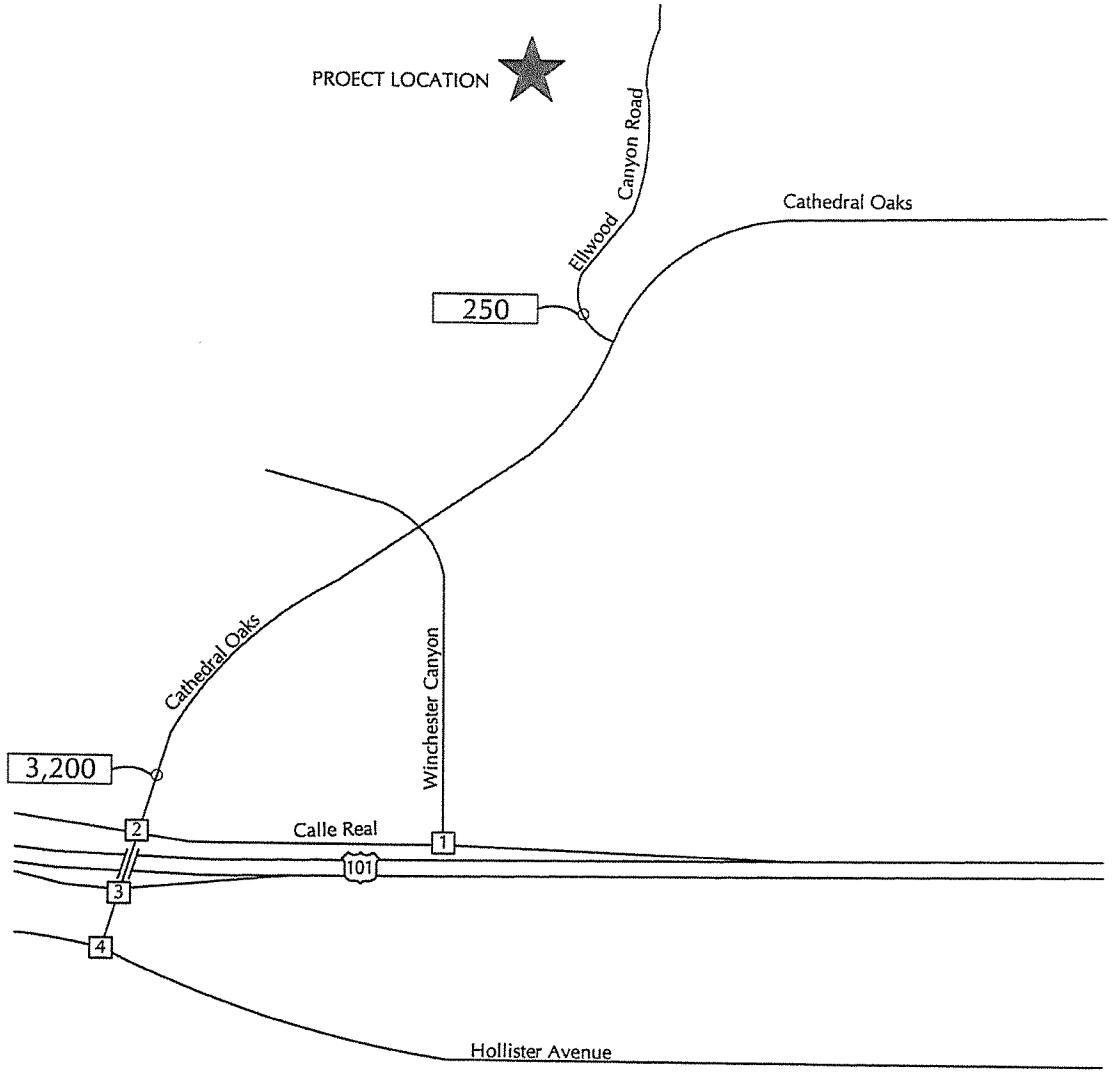
EXISTING AVERAGE DAILY AND PEAK HOUR TRAFFIC VOLUMES

FIGURE 2

EKM - ATE#17093





LEGEND

(XX)XX - (A.M.)P.M. Peak Hour Volume

X - Average Daily Traffic Volume

N

NOT TO SCALE

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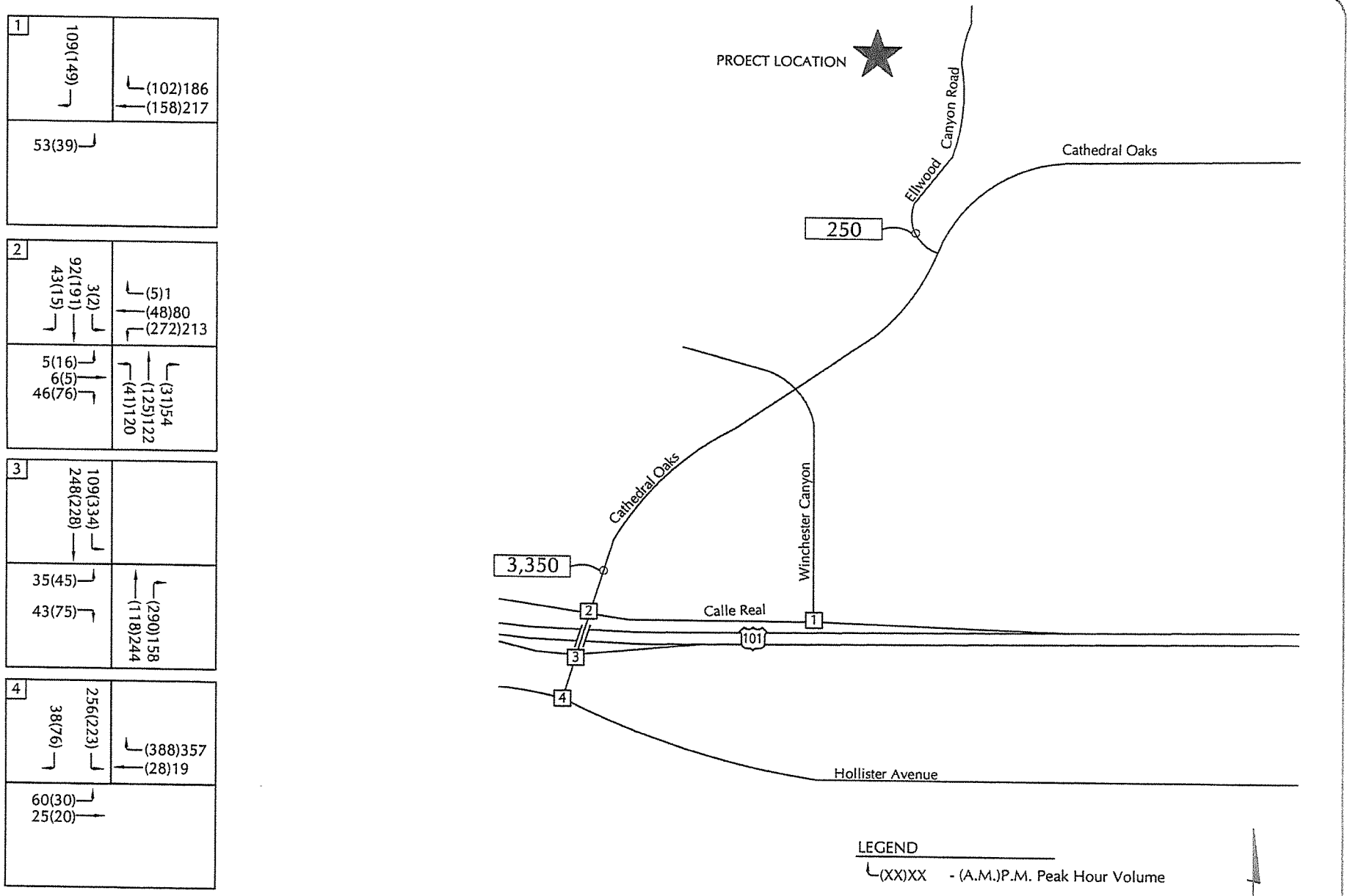
EXISTING LANE GEOMETRIES AND TRAFFIC CONTROLS

FIGURE 3

EKM - ATE#17093



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CUMULATIVE TRAFFIC VOLUME FORECASTS

FIGURE 4

EKM - ATE#17093

Associated Transportation Engineers
Trip Generation Worksheet (#17093.01)

CITY OF GOLETA CUMULATIVE PROJECT LIST

Land Use	Size	ADT		A.M. PEAK HOUR						P.M. PEAK HOUR					
		Rate	Trips	Rate	Trips	In %	Trips	Out %	Trips	Rate	Trips	In %	Trips	Out %	Trips
1. **Village at Los Carneros (a)**	464 Units	-	1,196	-	90	-	52	-	38	-	94	-	46	-	48
2. Fairview Commercial Center (b)	7,476 SFD	37.75	282	0.94	7	62%	4	38%	3	3.81	28	48%	13	52%	15
3. Harvest Hill Ranch (c)	6 SFD	9.44	57	0.74	4	25%	1	75%	3	0.99	6	63%	4	37%	2
4. **Islamic Society of Santa Barbara (d)**	6,183 SF	-	153	-	6	-	3	-	3	-	5	-	-	-	-
5. Citrus Village (e)	10 Units	7.32	73	0.46	5	23%	1	77%	4	0.56	6	63%	4	37%	2
6. **Old Town Village (f)**	175 Units	-	1,125	-	93	-	27	-	66	-	106	-	63	-	43
7. Marriot Residence Inn (g)	118 Rooms	4.46	526	0.34	40	53%	21	47%	19	0.36	42	48%	20	52%	22
8. **McDonalds Drive Thru Expansion (h)**	3,784 SF	-	20	-	2	-	1	-	1	-	2	50%	1	50%	1
9. 130 Robin Hill Road (i)	1,414 SF	4.96	7	0.70	1	88%	1	12%	0	0.63	1	13%	0	87%	1
10. **Schwann Self Storage (j)**	135,741 SF	-	216	-	17	60%	10	40%	7	-	17	47%	8	53%	9
11. **Cortona Apartments (k)**	176 Units	-	1,170	-	90	-	18	-	72	-	109	-	70	-	39
12. **Fuel Depot (l)**	2,396 SF	-	226	-	13	-	7	-	6		13	-	6	-	7
13. **Somera Medical Office Building (m)**	20,000 SF	-	615	-	41	-	32	-	9	-	60	-	17	-	43
14. **Shelby (n)**	60 Units	-	574	-	45	-	11	-	34	-	61	-	39	-	22
15. **Kenwood Village (o)**	60 Units	-	397	-	31	-	7	-	24	-	37	-	24	-	13
16. **Heritage Ridge (p)**	360 Units	-	1,970	-	174	-	34	-	140	-	183	-	123	-	60
17. **Cabrillo Business Park (q)**	23,882 SF	9.74	233	1.16	28	86%	24	14%	4	1.15	27	16%	4	84%	23
18. **Cabrillo Business Park (q)**	16,750 SF	9.74	163	1.16	19	86%	16	14%	3	1.15	19	16%	3	84%	16
19. **Cabrillo Business Park (q)**	31,585 SF	9.74	308	1.16	37	86%	32	14%	5	1.15	36	16%	6	84%	30
20. **Cabrillo Business Park (r)**	44,924 SF	11.26	506	0.42	19	75%	14	25%	5	0.49	22	15%	3	85%	19
21. **Cabrillo Business Park (r)**	44,004 SF	11.26	495	0.42	18	75%	14	25%	4	0.49	22	15%	3	85%	19
17-21 CBP TOTAL			1,705		121		100		21		126		19		107
22. **Calle Real Hotel (s)**	464 Units	-	1,196	-	90	-	52	-	38	-	94	-	46	-	48
23. *Fuel Depot (t)*	*1,667 SF*	-	*435*	-	*-1*	-	*0*	-	*-1*	-	*44*	-	*21*	-	*23*
24. Willow Industrial Park - Light Industrial(i)	146,000 SF	4.96	724	0.70	102	88%	90	12%	12	0.63	92	13%	12	87%	80
Willow Industrial Park - Office (q)	2,587 SF	9.74	25	1.16	3	86%	3	14%	0	1.15	3	16%	0	84%	3
25. **Providence School(u)**	- -	-	310	-	145	-	80	-	65	-	5	-	11	-	-6
26. Santa Barbara Honda (v)	7,103 SF	27.84	198	1.87	13	73%	9	27%	4	2.43	17	40%	7	60%	10
27. Sywest (i)	70,594 SF	4.96	350	0.70	49	88%	43	12%	6	0.63	44	13%	6	87%	38
28. **6100 Hollister Avenue (w)**	- -	-	1,370	-	167	-	99	-	68	-	91	-	28	-	63
29. **6210 Hollister Avenue (x)**	- -	-	1,437	-	85	-	64	-	21	-	117	-	47	-	70
30. **Direct Relief (y)**	- -	-	608	-	29	-	43	-	-14	-	59	-	9	-	50
TOTALS:			**18,877**		**1,614**		**924**		**690**		**1,651**		**703**		**943**

(a) Village at Los Carneros Project Final Environmental Impact Report, June 2014.
(b) Trip generation based on ITE Code #820 (Shopping Center).
(c) Trip generation based on ITE Code #210 (Single-Family Housing).
(d) Islamic Center Project Final Mitigated Negative Declaration, November 2013.
(e) Trip generation based on ITE Code #220 (Multi-Family Housing).
(f) Old Town Village Mixed-Use Project Traffic, Circulation and Parking Study, October 2014.
(g) Trip generation based on ITE Code #310 (Hotel).
(h) McDonalds Traffic Study, ATE, April 2018.
(i) Trip generation based on ITE Code #110 (General Light Industrial).
(j) Schwan Self-Storage Trip Generation Comparison and Soil Export Route Evaluation, ATE, 2017
(k) Cortona Apartments Project, Updated Traffic and Circulation Study, Novemeber 2012.
(l) Fuel Depot Traffic Impact Study, ATE, June 2018.
(m) Somera Medical Building Environmental Checklist Form and Initial Study, January 2014.
(n) 7400 Cathedral Oaks Road Project Traffic and Circulation Study, ATE, February 2011.
(o) Kenwood Village Project EIR Transportation and Traffic Study, ATE, 2015.
(p) Heritage Ridge Residential Project EIR, ATE, 2015.
(q) Trip generation based on ITE Code #710 (Office Building)
(r) Trip generation based on ITE Code #760 (Research & Development).
(s) Goleta Real Hotel TIA, Pinnacle Traffic Engineering.
(t) Fuel Depot Traffic Study, ATE, 2018.
(u) Providence School Updated Traffic, Circulation and Parking Study, ATE, December 2017.
(v) Trip generation based on ITE Code #840 (Auto Sales)
(w) 6100 Hollister Avenue, Traffic, Circulation and Parking Study, August 2016.
(x) 6210 Hollister Avenue, Traffic, Circulation and Parking Study, June 2017.
(y) Direct Relief International Project Revised Traffic, Circulation and Parking Study, ATE, December 2015.

ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	EKM
Agency/Co.	ATE
Date Performed	6/21/2018
Analysis Time Period	AM PEAK HOUR

Site Information

Intersection	01_AM_CUMULATIVE
Jurisdiction	CITY OF GOLETA
Analysis Year	2018

Project ID SANTA BARBARA SAND # 17094

East/West Street: CALLE REAL- US 101 NB RAMPS | North/South Street: WINCHESTER CANYON

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	39	0	0	0	158	102
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	0	0	149
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L		TR				R	
PHF	0.92		0.92				0.92	
Flow Rate (veh/h)	42		281				161	
% Heavy Vehicles	2		2				2	
No. Lanes	1		1		0		1	
Geometry Group	1		1				1	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0		0.0				0.0	
Prop. Right-Turns	0.0		0.4				1.0	
Prop. Heavy Vehicle	0.0		0.0				0.0	
hLT-adj	0.2	0.2	0.2	0.2			0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6			-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7			1.7	1.7
hadj, computed	0.2		-0.2				-0.6	

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20				3.20	
x, initial	0.04		0.25				0.14	
hd, final value (s)	4.78		4.10				4.04	
x, final value	0.056		0.320				0.181	
Move-up time, m (s)	2.0		2.0				2.0	
Service Time, t_s (s)	2.8		2.1				2.0	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	700		878				894	
Delay (s/veh)	8.1		9.0				7.9	
LOS	A		A				A	
Approach: Delay (s/veh)	8.1		9.0				7.9	
LOS	A		A				A	
Intersection Delay (s/veh)	8.6							
Intersection LOS	A							

ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	EKM
Agency/Co.	ATE
Date Performed	06/21/2018
Analysis Time Period	PM PEAK HOUR

Site Information

Intersection	01_PM_CUMULATIVE
Jurisdiction	CITY OF GOLETA
Analysis Year	2018

Project ID *SANTA BARBARA SAND # 17094*

East/West Street: *CALLE REAL- US 101 NB RAMPS*

North/South Street: *WINCHESTER CANYON*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	53	0	0	0	217	186
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	0	0	109
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L		TR				LT	R
PHF	0.88		0.88				1.00	1.00
Flow Rate (veh/h)	60		457				0	109
% Heavy Vehicles	2		2				2	0
No. Lanes	1		1		0		2	
Geometry Group	2		2				1	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0		0.0				0.0	0.0
Prop. Right-Turns	0.0		0.5				0.0	1.0
Prop. Heavy Vehicle	0.0		0.0				0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2			0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6			-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7			1.7	1.7
hadj, computed	0.2		-0.2				0.0	-0.6

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20				3.20	3.20
x, initial	0.05		0.41				0.00	0.10
hd, final value (s)	4.84		3.98				5.03	4.40
x, final value	0.081		0.505				0.000	0.133
Move-up time, m (s)	2.0		2.0				2.0	
Service Time, t_s (s)	2.8		2.0				3.0	2.4

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	750		896					838
Delay (s/veh)	8.3		11.0				8.0	8.1
LOS	A		B				A	A
Approach: Delay (s/veh)	8.3		11.0				8.1	
LOS	A		B				A	
Intersection Delay (s/veh)	10.2							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	EKM
Agency/Co.	ATE
Date Performed	06/21/2018
Analysis Time Period	PM PEAK HOUR

Site Information

Intersection	02_AM_CUMULATIVE
Jurisdiction	CITY OF GOLETA
Analysis Year	2018

Project ID *SANTA BARBARA SAND # 17094*

East/West Street: *CALLE REAL*

North/South Street: *CATHEDRAL OAKS*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	16	5	76	272	48	5
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	41	125	31	2	191	15
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		L	TR	L	TR	L	TR
PHF	0.87		0.87	0.87	0.87	0.87	0.87	0.87
Flow Rate (veh/h)	110		312	60	47	178	2	236
% Heavy Vehicles	2		2	2	0	0	2	2
No. Lanes	1		2		2		2	
Geometry Group	4b		5		5		5	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.2		1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.8		0.0	0.1	0.0	0.2	0.0	0.1
Prop. Heavy Vehicle	0.0		0.0	0.0	0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.5	0.5	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	-0.4		0.5	-0.0	0.5	-0.1	0.5	-0.0

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.10		0.28	0.05	0.04	0.16	0.00	0.21
hd, final value (s)	6.17		6.62	6.06	6.96	6.31	6.96	6.40
x, final value	0.189		0.574	0.101	0.091	0.312	0.004	0.419
Move-up time, m (s)	2.3		2.3		2.3		2.3	
Service Time, t_s (s)	3.9		4.3	3.8	4.7	4.0	4.7	4.1

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	579		547	600	522	574	0	562
Delay (s/veh)	10.3		17.8	9.4	10.4	11.9	9.7	13.6
LOS	B		C	A	B	B	A	B
Approach: Delay (s/veh)	10.3		16.5		11.5		13.6	
LOS	B		C		B		B	
Intersection Delay (s/veh)	13.9							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	EKM
Agency/Co.	ATE
Date Performed	06/21/2018
Analysis Time Period	PM PEAK HOUR '

Site Information

Intersection	02_PM_CUMULATIVE
Jurisdiction	CITY OF GOLETA
Analysis Year	2018

Project ID SANTA BARBARA SAND # 17094

East/West Street: CALLE REAL

North/South Street: CATHEDRAL OAKS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	5	6	46	213	80	1
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	120	122	54	3	92	43
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		L	TR	L	TR	L	TR
PHF	0.88		0.88	0.88	0.88	0.88	0.88	0.88
Flow Rate (veh/h)	63		242	91	136	199	3	152
% Heavy Vehicles	2		2	2	0	0	2	2
No. Lanes	1		2		2		2	
Geometry Group	4b		5		5		5	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.1		1.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.8		0.0	0.0	0.0	0.3	0.0	0.3
Prop. Heavy Vehicle	0.0		0.0	0.0	0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.5	0.5	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	-0.4		0.5	0.0	0.5	-0.2	0.5	-0.2

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.06		0.22	0.08	0.12	0.18	0.00	0.14
hd, final value (s)	5.92		6.46	5.96	6.44	5.72	6.74	6.01
x, final value	0.104		0.435	0.151	0.243	0.316	0.006	0.254
Move-up time, m (s)	2.3		2.3		2.3		2.3	
Service Time, t_s (s)	3.6		4.2	3.7	4.1	3.4	4.4	3.7

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	630		563	607	567	622	300	608
Delay (s/veh)	9.3		14.0	9.7	11.2	11.0	9.5	10.7
LOS	A		B	A	B	B	A	B
Approach: Delay (s/veh)	9.3		12.9		11.1		10.7	
LOS	A		B		B		B	
Intersection Delay (s/veh)	11.6							
Intersection LOS	B							

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HCS7 Two-Way Stop-Control Report

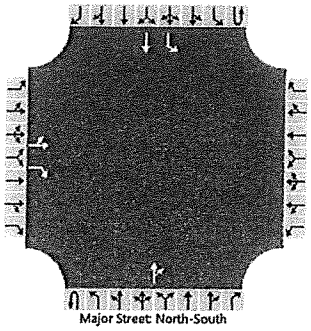
General Information

Analyst	EKM
Agency/Co.	ATE
Date Performed	06/21/2018
Analysis Year	2018
Time Analyzed	PM PEAK HOUR
Intersection Orientation	North-South
Project Description	EXISTING

Site Information

Intersection	US 101 SB/CATHEDRAL OAKS
Jurisdiction	CITY OF GOLETA
East/West Street	US 101 SB RAMPS
North/South Street	CATHEDRAL OAKS
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	0	0	0	1	0	0	1	1	0
Configuration		LT		R								TR		L	T	
Volume (veh/h)		35	0	43							244	158		109	248	
Percent Heavy Vehicles (%)		3	3	3										3		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No														
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		6.5	5.5	5.0										4.1		
Critical Headway (sec)		5.83	5.53	5.03										4.13		
Base Follow-Up Headway (sec)		3.5	4.0	3.3										2.2		
Follow-Up Headway (sec)		3.53	4.03	2.00										2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		38		47										118		
Capacity, c (veh/h)		376		1330										1116		
v/c Ratio		0.10		0.04										0.11		
95% Queue Length, Q_{95} (veh)		0.3		0.1										0.4		
Control Delay (s/veh)		15.6		7.8										8.6		
Level of Service (LOS)		C		A										A		
Approach Delay (s/veh)		11.3												2.6		
Approach LOS		B														

AWD: 9.7 SEC = LOS A

HCS7 Two-Way Stop-Control Report

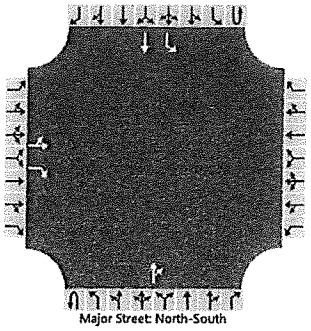
General Information

Analyst	EKM
Agency/Co.	ATE
Date Performed	06/21/2018
Analysis Year	2018
Time Analyzed	PM PEAK HOUR
Intersection Orientation	North-South
Project Description	EXISTING

Site Information

Intersection	US 101 SB/CATHEDRAL OAKS
Jurisdiction	CITY OF GOLETA
East/West Street	US 101 SB RAMPS
North/South Street	CATHEDRAL OAKS
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	0	0	0	0	1	0	0	1	1	0
Configuration		LT		R								TR		L	T	
Volume (veh/h)		45	0	75							118	290		334	228	
Percent Heavy Vehicles (%)		3	3	3										3		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No														
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		5.0	5.0	6.2										4.1		
Critical Headway (sec)		4.33	5.03	6.23										4.13		
Base Follow-Up Headway (sec)		3.5	4.0	3.3										2.2		
Follow-Up Headway (sec)		3.00	3.20	3.33										2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		49		82										363		
Capacity, c (veh/h)		426		788										1110		
v/c Ratio		0.11		0.10										0.33		
95% Queue Length, Q_{95} (veh)		0.4		0.3										1.4		
Control Delay (s/veh)		14.5		10.1										9.8		
Level of Service (LOS)		B		B										A		
Approach Delay (s/veh)		11.8												5.8		
Approach LOS		B														

AWD: 10.3 SEC = LOS B

ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	EKM
Agency/Co.	ATE
Date Performed	06/21/2018
Analysis Time Period	AM PEAK HOUR

Site Information

Intersection	04_EX_CUMULATIVE
Jurisdiction	CITY OF GOLETA
Analysis Year	2018

Project ID SANTA BARBARA SAND # 17094

East/West Street: HOLLISTER AVENUE | North/South Street: CATHEDRAL OAKS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	30	20	0	0	28	388
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	223	0	76
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	T	T	R			L	R
PHF	0.94	0.94	0.94	0.94			0.94	0.94
Flow Rate (veh/h)	31	21	29	412			237	80
% Heavy Vehicles	2	2	2	2			2	2
No. Lanes	2		2		0		2	
Geometry Group	5		5				1	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0	0.0	0.0	0.0			1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	1.0			0.0	1.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0			0.0	0.0
hLT-adj	0.5	0.5	0.5	0.5			0.2	0.2
hRT-adj	-0.7	-0.7	-0.7	-0.7			-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7			1.7	1.7
hadj, computed	0.5	0.0	0.0	-0.7			0.2	-0.6

Departure Headway and Service Time

hd, initial value (s)	3.20	3.20	3.20	3.20			3.20	3.20
x, initial	0.03	0.02	0.03	0.37			0.21	0.07
hd, final value (s)	6.33	5.83	5.43	4.73			5.28	4.48
x, final value	0.055	0.034	0.044	0.541			0.347	0.100
Move-up time, m (s)	2.3		2.3				2.0	
Service Time, t_s (s)	4.0	3.5	3.1	2.4			3.3	2.5

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	620	700	725	763			677	800
Delay (s/veh)	9.4	8.7	8.4	12.9			11.1	8.0
LOS	A	A	A	B			B	A
Approach: Delay (s/veh)	9.1		12.6				10.3	
LOS	A		B				B	
Intersection Delay (s/veh)	11.5							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	EKM
Agency/Co.	ATE
Date Performed	06/21/2018
Analysis Time Period	PM PEAK HOUR

Site Information

Intersection	04_PM_CUMULATIVE
Jurisdiction	CITY OF GOLETA
Analysis Year	2018

Project ID *SANTA BARBARA SAND # 17094*

East/West Street: *HOLLISTER AVENUE* | North/South Street: *CATHEDRAL OAKS*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	60	25	0	0	19	357
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	256	0	38
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	L	T	T	R			L	R
PHF	0.91	0.91	0.91	0.91			0.91	0.91
Flow Rate (veh/h)	65	27	20	392			281	41
% Heavy Vehicles	2	2	2	2			2	2
No. Lanes	2		2		0		2	
Geometry Group	5		5				1	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	1.0	0.0	0.0	0.0			1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	1.0			0.0	1.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0			0.0	0.0
hLT-adj	0.5	0.5	0.5	0.5			0.2	0.2
hRT-adj	-0.7	-0.7	-0.7	-0.7			-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7			1.7	1.7
hadj, computed	0.5	0.0	0.0	-0.7			0.2	-0.6

Departure Headway and Service Time

hd, initial value (s)	3.20	3.20	3.20	3.20			3.20	3.20
x, initial	0.06	0.02	0.02	0.35			0.25	0.04
hd, final value (s)	6.39	5.88	5.55	4.85			5.35	4.55
x, final value	0.115	0.044	0.031	0.528			0.418	0.052
Move-up time, m (s)	2.3		2.3				2.0	
Service Time, t_s (s)	4.1	3.6	3.3	2.5			3.3	2.6

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	542	675	667	740			669	820
Delay (s/veh)	9.9	8.9	8.4	12.8			12.1	7.8
LOS	A	A	A	B			B	A
Approach: Delay (s/veh)	9.6		12.6				11.6	
LOS	A		B				B	
Intersection Delay (s/veh)	11.9							
Intersection LOS	B							

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AIR QUALITY IMPACTS

This section describes the calculation methodologies used to determine the impacts associated with emissions of criteria pollutants and greenhouse gasses. Significance is determined by comparing the Project increment impacts to the appropriate significance threshold.

1.0 Criteria and GHG Pollutants

Criteria and GHG pollutant emissions were calculated for the following sources:

- **Off-Road Equipment**

Criteria emissions from diesel off-road equipment were calculated using emissions factors from CARB's OFFROAD2011 model documentation for criteria pollutant and from 40 CFR 98 for GHG pollutants. Emissions were calculated based on the actual horsepower of the equipment, appropriate load factors, and

- **Sand Processing – Off-site GHGs.** Sand processing is performed by a dedicated plant which is located directly adjacent to the active quarry area. This plant is grid powered through a 75 horsepower electric motor. GHG Emissions estimates are based upon hours of operation for stone processing and GHG Emission factors from US EPA Year 2014 eGRD.

- **Fugitive Dust.** Facility emissions sources of fugitive dust include:

  - **Unpaved Roads.** Emissions from vehicle travel over unpaved roads were estimated for the historical operations and maximum (worst case) operations. Emissions were estimated based on the AP 42, Section 13.2.2 methodology (Travel on Unpaved Surfaces, Industrial Sites).

  - **Off-Road Equipment.** Off-road equipment dust (PM) emissions were calculated based on the actual equipment utilized by the facility (see Table 1). Cycle time estimates based on Caterpillar Performance Handbook methodologies were used to determine the hours of operation for the grader and loader. AP-42, Section 11.9 (Western Surface Coal Mining – Overburden) emission factors were used for the emission calculations for the dozer. AP-42, Section 13.2.4 (Aggregate Handling and Storage) emission factors were used for the emission calculations for the loaders.

  - **Storage Piles and Disturbed surfaces.** Emissions from storage piles were estimated based on the emission factors from the Santa Barbara County Air Pollution Control District Permit to Operate (PTO) 07680-R9. The total acreage currently covered by storage piles and active mining operations was estimated Google Earth imagery (6/15/2017). Post project storage pile and active mining operations are based upon permitted limits in PTO 07680-R9.

  - **On-Road Equipment.** Combustion emissions from on-road vehicle trips were calculated using CARB's EMFAC2014 web tool and the approximate source/destination for each trip. For truck travel receiving processed sand, an average one-way travel distance

of 19 miles was used. This value was derived by the historical profile of product destinations: ~80% Santa Barbara locations; ~20% Santa Ynez locations. This is data based upon verbal input from facility operations. (One or two loads per year are for destinations outside of the county: Hollister or Temecula CA. Using 35 miles as the distance for a Santa Ynez location and 15 miles as the worst case Santa Barbara distance, a percent based average travel distance of 19 miles is derived. The current contract operator used for the quarry dozing operations is based in the Goleta area; 10 miles one-way was used for the distance in calculating the emissions from this activity.

Details of the emission calculations are included in Appendix A.

2.0 Summary of Project Devices and Activities

The following sections discuss the devices and activities associated with the Santa Barbara Sand mining operations. These sections compare the historical application of these devices and activities to their application under the Extended Mining Operations.

2.1 Off-Road Equipment

Off-road equipment are used harvest and handle sand and gravel from the Ellwood Ranch Quarry. A contract operator is used to remove the sand and gravel from the quarry to a raw material storage pile. The raw material storage pile is at the edge of the active quarry area (no haul truck are required). This activity is performed using a tracked dozer. Currently the contractor uses a Caterpillar Model D8 K for this activity. In recent years this activity has occurred two or three times per month. The dozer is delivered and used, then removed from the mining area typically on the same day. Active dozing typically is completed within a few hours. For worst case daily emission for the current and future activities, a 6 hour worst case day was used. Annual dozing operations are based upon cycle time estimates (ref: Caterpillar Performance Handbook) and annual tons of sand processed. For current activities, the average of the past five years of sand leaving the site was used (See Attachment A, Table 13). For post Extension of Mining Activities, the average annual production rate described in *02CUP-00000-000006 & 02RPP-00000-00001* was used: 45,722 cubic yards per year.

To move raw material from the storage pile to the plant hopper, and from the processed sand storage pile to trucks, a wheeled loader is used. Currently the facility uses the same Caterpillar Model 966 G for both of these activities. The annual hourly usage of this device for both activities is based upon the cycle time estimates and the annual quantities of process sand as described above. The daily activities is based upon the hourly usage divided by 52 weeks per year and 5 days per week operations. For current activities, this value was rounded up to 0.5 hours per day for both activities.

Water sprays are applied twice daily to all active areas disturbed by mining to control fugitive dust (as required by Santa Barbara County Air Pollution Control District Permit to Operate 07680-R9, Condition 6). This activity is performed using a 1986 International water spray truck. This fugitive dust mitigation is accomplished in less than one hour each day (total for both applications). To estimate the distance traveled for each application a spray coverage swath of 45 feet was used. It was estimated that the active quarry area can be covered in 3,775 feet of travel. The ingress and egress haul roads, as well as the area surrounding the processing plant can be covered in an additional 1,975 feet of travel. Therefore the total distance traveled for each application would be 5,750 feet

Table 1 below lists the off-road devices used, their historical usage, and their worst case usage under the extended mining operations.

Table 1
Off-Road Equipment

Devices	Model Year	Hp	Historical Usage		Post Project Usage		Usage Units
			Avg Daily	Avg Annual	Avg Daily	Annual	
Caterpillar D8 K Dozer	74 - 82	300	6.00	63.56	6.00	500.66	Hours
Caterpillar 966 G Wheel Loader (loading raw material into receiving hopper)	01 - 05	246	0.50	22.07	0.67	173.81	Hours
Caterpillar 966 G Wheel Loader (Loading Trucks from stock pile)	01 - 05	246	0.50	22.07	0.67	173.81	Hours
International Water Truck w/Cummins NTC 300	1986	300	1.00	260	1.00	260	Hours

2.2 On-Road Vehicles

On-road vehicles used include: truck/tractor used to transport final product to wholesale/retail locations, truck/tractor used to transport a dozer to and from the quarry and employee vehicles.

Table 2 below lists the on-road vehicles used, their historical usage, and their usage under the extended mining operations.

Table 2
On-Road Vehicles

Devices	Model Year	Hp	Historical Usage		Post Project Usage		Usage Units
			Worst Case Daily	Avg Annual	Worst Case Daily	Annual	
Semi-Truck/Tractor/Dump Truck (EMFAC T7 Vehicle) (vehicles receiving materials)	Varies	300 (est)	6.00	224.42	96	13440	One-way Trips
Semi-Truck/Tractor/Dump Truck (EMFAC T7 Vehicle) (vehicles receiving materials)	Varies	300 (est)	114.00	4263.98	1824	255360	One-way Miles
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7 Vehicle) (Delivering D8K Dozer)	Varies	300 (est)	1	30	1	104	One-way Trips
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7 Vehicle) (Delivering D8K Dozer)	Varies	300 (est)	10	300	10	1040	One-way Miles
Employee Commute Vehicles (EMFAC LDT)	Varies	185 (est)	9	2,340	9	2,340	One-way Trips
Employee Commute Vehicles (EMFAC LDT)	Varies	185 (est)	135	35100	135	35100	One-way Miles

2.3 Stone Processing Devices

The only device used to process the sand and gravel from the quarry is a single screening plant. The plant includes a receiving hopper, conveyor belt, the screen and a radial stacker. The plant is hydraulically operated with a hydraulic system powered by a 75 horsepower, electric motor (grid powered). Table 3 below lists the plant's historical usage, and its worst case usage under the extended mining operations.

Table 3
Sand Processing Devices

Devices	Hp	Historical Worst Case Day	Historical Annual Usage	Post Project Daily Usage	Post Project Annual Usage	Annual Change	Usage Units
Processing Plant	75	4	55.75	24	8760	8704.25	Hours

Note: Post Project usage based upon Santa Barbara County Air Pollution Control District PTO 07680-R9 limits.

2.4 Mining Activities

Table 4 below lists the activities involved with Ellwood Ranch Quarry operations which have an effect on the facility emission rates. This table illustrates the historical rates for these activities as well as the projected rates under the expanded mining and revised reclamation plan.

Table 4
Quarry Activities

Activity	Historical Usage	Post Project Usage	Change	Usage Units
Storage Piles - Raw Materials	10575	10575	0	Sq Feet Surface Area
Storage Piles - Processed Sand	10705	10705	0	Sq Feet Surface Area
Disturbed Area (Active Quarry)	6.25	10.51	4.3	Acres
Travel on un-paved Surfaces (Trucks receiving sand)	1475	1475	0	feet
Travel on un-paved Surfaces (Employee Vehicles)	640	640	0	feet

Note: Post Project storage piles and disturbed areas are based upon Santa Barbara County Air Pollution Control District PTO 07680-R9 limits

3.0 Emission Rates

Table 5 below summarizes the emission from the mining operations conducted by Lompoc Stone. Table 5a is a summary of the historical emissions from devices and activities. Table 5b is a summary of the potential emission rates based upon the expanded mining and revised reclamation plan operating at the mine's full potential capacity. Table 5c summarizes the potential incremental increase in emissions associated with this project.

Refer to Appendix A for details of the emission calculations (Tables 7 through 14)

Table 5
Project Emission Summary

Table 5a: Emissions From Historical Activities

	Worst Case Daily Emission (lbs)						Annual Emissions (tons)						GHG
	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	MT
Off Road Diesel Activities (Table 7a)	23.27	3.84	26.76	0.71	2.33	2.07	0.54	0.09	0.62	0.02	0.05	46.35	0.98
On-Road Activities (Table 8a)	1.65	0.13	3.90	0.01	0.08	4.44	0.13	0.00	0.09	0.00	0.00	0.00	39.04
On Site Fugitive Dust (Table 9a)					37.3	1.33					0.12	0.14	
Sand Processing (Table 10a)													0.88
Total Historical Activities	**24.93**	**3.97**	**30.67**	**0.72**	**39.7**	**7.84**	**0.66**	**0.09**	**0.70**	**0.02**	**0.18**	**46.49**	**40.90**

Table 5b: Potential Emissions From Extended Quarry Termination Date

	Worst Case Daily Emission (lbs)						Annual Emissions (tons)						GHG
	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	MT
Off Road Diesel Activities (Table 7b)	24.10	3.98	27.71	0.73	2.41	2.14	1.56	0.26	1.79	0.05	0.16	134.72	5.14
On-Road Activities (Table 8b)	7.56	1.61	55.54	0.13	0.82	43.82	0.56	0.11	3.89	0.01	0.06	0.02	854.15
On Site Fugitive Dust (Table 9b)					93.67	8.33					5.83	0.77	
Sand Processing (Table 10b)													138.24
Total Potential Emission from Future Activities	**31.65**	**5.59**	**83.26**	**0.86**	**96.9**	**54.29**	**2.12**	**0.37**	**5.68**	**0.06**	**6.04**	**135.52**	**997.53**

Table 5c: Project Emissions Increase Potential (Difference between Table 5b and 5a)

	Worst Case Daily Emission (lbs)						Annual Emissions (tons)						GHG
	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	MT
Off Road Diesel Activities	0.82	0.14	0.95	0.02	0.08	0.07	1.02	0.17	1.17	0.03	0.10	88.38	4.16
On-Road Activities	5.90	1.48	51.64	0.12	0.74	39.37	0.43	0.11	3.80	0.01	0.05	0.02	815.12
On Site Fugitive Dust	0.00	0.00	0.00	0.00	56.38	7.01	0.00	0.00	0.00	0.00	5.70	0.63	0.00
Sand Processing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	137.36
Project Emission Increases	**6.73**	**1.62**	**52.59**	**0.14**	**57.2**	**46.45**	**1.46**	**0.28**	**4.98**	**0.04**	**5.86**	**89.03**	**956.63**

2.4 Significance

This air quality impact quantification and justification indicates that any emissions increase associated with the extension of mining activities would be below the County's significance levels. For a comparison of the air quality analysis to County significance levels, please see Table 6 below.

Table 6
Air Quality Significance Thresholds

Pollutant	County Significance		Project Impact (Increase)		
	Short-Term	Long-Term	Short-Term	Long-Term	Significant?
Carbon Monoxide (CO)	Greater than 800 peak hour trips		90 Daily Trip Increase		No
Ozone Precursors (NOx & ROC)	240 lb/day	25 tons per year	52.59 lb/day NOx	4.98 TPY NOx	No
			1.62 lb/day ROC	0.28 TPY ROC	No
PM_{10}	See Note 1	See Note 1	57.20 lb/day PM10	5.86 TPY PM10	See Note 1
Green House Gasses (GHG)		1,000 MT per year		956.63 MT per Year	No

Note: No quantitative threshold has been established for short-term, construction related PM10 (which is 50 percent of total dust). Dust control measures are required under the County of Santa Barbara's Grading Ordinance for most projects. Santa Barbara County violates the state standard for PM10. Therefore, dust mitigation measures are required for all discretionary construction activities. As required by Santa Barbara County APCD PTO 07680-R9 Condition 6, watering of the facility roads and storage piles occurs as necessary (minimum twice daily) to prevent fugitive particulate emissions. Each outgoing load of sand or unprocessed material is watered for a minimum of one minute before leaving the facility

Appendix A

Ellwood Ranch Quarry
Air Quality Impacts

Emission Calculations Details

Santa Barbara Sand
Elwood Ranch Quarry

updated
12/1/2017

Table 5a: Emissions From Historical Activities

	Worst Case Daily Emission (lbs)						Annual Emissions (tons)						GHG
	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	MT
Off Road Diesel Activities (Table 7a)	23.27	3.84	26.76	0.71	2.33	2.07	0.54	0.09	0.62	0.02	0.05	46.35	0.98
On-Road Activities (Table 8a)	1.65	0.13	3.90	0.01	0.08	4.44	0.13	0.00	0.09	0.00	0.00	0.00	39.04
On Site Fugitive Dust (Table 9a)					37.3	1.33					0.12	0.14	
Sand Processing (Table 10a)													0.88
Total Historical Activities	**24.93**	**3.97**	**30.67**	**0.72**	**39.7**	**7.84**	**0.66**	**0.09**	**0.70**	**0.02**	**0.18**	**46.49**	**40.90**

Table 5b: Potential Emissions From Extended Quarry Termination Date

	Worst Case Daily Emission (lbs)						Annual Emissions (tons)						GHG
	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	MT
Off Road Diesel Activities (Table 7b)	24.10	3.98	27.71	0.73	2.41	2.14	1.56	0.26	1.79	0.05	0.16	134.72	5.14
On-Road Activities (Table 8b)	7.56	1.61	55.54	0.13	0.82	43.82	0.56	0.11	3.89	0.01	0.06	0.02	854.15
On Site Fugitive Dust (Table 9b)					93.67	8.33					5.83	0.77	
Sand Processing (Table 10b)													138.24
Total Potential Emission from Future Activities	**31.65**	**5.59**	**83.26**	**0.86**	**96.9**	**54.29**	**2.12**	**0.37**	**5.68**	**0.06**	**6.04**	**135.52**	**997.53**

Table 5c: Project Emissions Increase Potential (Difference between Table 5b and 5a)

	Worst Case Daily Emission (lbs)						Annual Emissions (tons)						GHG
	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	MT
Off Road Diesel Activities	0.82	0.14	0.95	0.02	0.08	0.07	1.02	0.17	1.17	0.03	0.10	88.38	4.16
On-Road Activities	5.90	1.48	51.64	0.12	0.74	39.37	0.43	0.11	3.80	0.01	0.05	0.02	815.12
On Site Fugitive Dust	0.00	0.00	0.00	0.00	56.38	7.01	0.00	0.00	0.00	0.00	5.70	0.63	0.00
Sand Processing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	137.36
Project Emission Increases	**6.73**	**1.62**	**52.59**	**0.14**	**57.2**	**46.45**	**1.46**	**0.28**	**4.98**	**0.04**	**5.86**	**89.03**	**956.63**

Santa Barbara Sand
Elwood Ranch Quarry

updated
12/1/2017

Table 6: Air Quality Significance Thresholds

Pollutant	County Significance		Project Impact (Increase)		
	Short-Term	Long-Term	Short-Term	Long-Term	Significant?
Carbon Monoxide (CO)	Greater than 800 peak hour trips		90 Daily Trip Increase		No
Ozone Precursors (NOx & ROC)	240 lb/day	25 tons per year	52.59 lb/day NOx	4.98 TPY NOx	No
			1.62 lb/day ROC	0.28 TPY ROC	No
PM_{10}	See Note 1	See Note 1	57.20 lb/day PM10	5.86 TPY PM10	See Note 1
Green House Gasses (GHG)		1,000 MT per year		956.63 MT per Year	No

[1] No quantitative threshold has been established for short-term, construction related PM10 (which is 50 percent of total dust). Dust control measures are required under the County of Santa Barbara's Grading Ordinance for most projects. Santa Barbara County violates the state standard for PM10. Therefore, dust mitigation measures are required for all discretionary construction activities. As required by Santa Barbara County APCD PTO 07680-R9 Condition 6, water of the facility roads and storage piles occurs as necessary (minimum twice daily) to prevent fugitive particulate emissions. Each outgoing load of sand or unprocessed material is water for a minimum of one minute before leaving the facility

Table 7a: Emission Detail - Off Road Diesel - Historical Operations

Max Daily and Annual Emissions

Equipment	Daily Hours	AVG Annual Hours	Daily Emission (lbs/day)						GHG	Total Emissions (tons)						GHG
			CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	lb/day	CO	ROC	NO_x	SO_2	PM_{10}	$PM_{2.5}$	MT
Caterpillar D8 K Dozer	6.00	63.56	17.86	2.95	20.54	0.54	1.79	1.59	1,546.02	0.09	0.02	0.11	0.00	0.01	8.19	0.57
Caterpillar 966 G Wheel Loader - Stock pile to plant	0.50	22.07	1.22	0.20	1.40	0.04	0.12	0.11	105.64	0.03	0.00	0.03	0.00	0.00	2.33	0.01
Caterpillar 966 G Wheel Loader - Truck loading	0.50	22.07	1.22	0.20	1.40	0.04	0.12	0.11	105.64	0.03	0.00	0.03	0.00	0.00	2.33	0.01
International Water Truck, 1986 Cummins NTC 300	1.00	260.00	2.98	0.49	3.42	0.09	0.30	0.26	257.67	0.39	0.06	0.44	0.01	0.04	33.50	0.39
Total Off-Road Diesel Engines - Historical Operations			**23.27**	**3.84**	**26.76**	**0.71**	**2.33**	**2.07**	**2,014.98**	**0.54**	**0.09**	**0.62**	**0.02**	**0.05**	**46.35**	**0.98**

Table 7b: Emission Detail - Off Road - Potential of Extended Quarry Termination Date

Max Daily and Annual Emissions

Equipment	Worst Case Daily Hours	Max Annual Hours	Daily Emission (lbs/day)						GHG	Total Emissions (tons)						GHG
Caterpillar D8 K Dozer	6.00	500.66	17.86	2.95	20.54	0.54	1.79	1.59	1,546.02	0.75	0.12	0.86	0.02	0.07	64.50	4.47
Caterpillar 966 G Wheel Loader - Stock pile to plant	0.67	173.81	1.63	0.27	1.88	0.05	0.16	0.15	141.25	0.21	0.03	0.24	0.01	0.02	18.36	0.14
Caterpillar 966 G Wheel Loader - Truck loading	0.67	173.81	1.63	0.27	1.88	0.05	0.16	0.15	141.25	0.21	0.03	0.24	0.01	0.02	18.36	0.14
International Water Truck, 1986 Cummins NTC 300	1.00	260.00	2.98	0.49	3.42	0.09	0.30	0.26	257.67	0.39	0.06	0.44	0.01	0.04	33.50	0.39
Total Potential of Off-Road Diesel Engines			**24.10**	**3.98**	**27.71**	**0.73**	**2.41**	**2.14**	**2,086.19**	**1.56**	**0.26**	**1.79**	**0.05**	**0.16**	**134.72**	**5.14**

Table 8a: On-road Activities - Historical Operations

	Parameters						Peak Day Emissions, lbs/day						GHG	Total Emissions, Tons						GHG
Source	Activity	Number of Vehicles per Day	Avg Daily Round-trip Distance	Average Annual Distance	EMFAC2011 Vehicle Class	Fuel	Avg Vehicle Speed (mph)	CO	ROC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	lb/day	CO	ROC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	MT
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7 Vehicle)	Receive and deliver sand to commercial venues	6	228	8626	T7 tractor construction	DSL	45	0.39	0.10	3.44	0.01	0.05	0.67	613.61	0.01	0.00	0.06	0.00	0.00	0.00	13.80
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7 Vehicle)	Transport D8 K Dozer to and from facility	1	20	600	T7 tractor construction	DSL	45	0.03	0.01	0.30	0.00	0.00	0.05	71.37	0.00	0.00	0.00	0.00	0.00	0.00	0.97
Pickup/Passenger Vehicles	Employee/operations vehicles	9	270	70200	LDT2	GAS	50	1.22	0.02	0.16	0.00	0.03	3.73	211.13	0.12	0.00	0.02	0.00	0.00	0.00	24.26
Total On-Road Activities - Historical Operations								**1.65**	**0.13**	**3.90**	**0.01**	**0.08**	**4.44**	**1096.10**	**0.13**	**0.00**	**0.09**	**0.00**	**0.00**	**0.00**	**39.04**

Table 8b: On-road Activities - Potential of Extended Quarry Termination Date

	Parameters						Peak Day Emissions, lbs/day						GHG	Total Emissions, Tons						GHG
Source	Activity	Number of Vehicles per Day	Avg Daily Round-trip Distance	Average Annual Distance	EMFAC2011 Vehicle Class	Fuel	Avg Vehicle Speed (mph)	CO	ROC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	lb/day	CO	ROC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	MT
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7 Vehicle)	Receive and deliver sand to commercial venues	96	3648	510720	T7 tractor construction	DSL	45	6.30	1.58	55.09	0.12	0.79	39.93	13017.71	0.44	0.11	3.86	0.01	0.06	0.02	826.52
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7 Vehicle)	Transport D8 K Dozer to and from facility	1	20	2080	T7 tractor construction	DSL	45	0.03	0.01	0.30	0.00	0.00	0.16	71.37	0.00	0.00	0.02	0.00	0.00	0.00	3.37
Pickup/Passenger Vehicles	Employee/operations vehicles	9	270	70200	LDT2	GAS	50	1.22	0.02	0.16	0.00	0.03	3.73	211.13	0.12	0.00	0.02	0.00	0.00	0.00	24.26
Total On-road Activities - Potential of Expanded Mining and Revised Reclamation Plan								**7.56**	**1.61**	**55.54**	**0.13**	**0.82**	**43.82**	**13,300.21**	**0.56**	**0.11**	**3.89**	**0.01**	**0.06**	**0.02**	**854.15**

Notes for the Table

1. Emissions calculations based on EMFAC2014 Update March 2015; Region: Santa Barbara County APCD; Scenario Year 2017; Season: Annual, Model Year: Aggregated & EMFAC 2011 Vehicle classifications
2. Peak day assumes that workers for all activities commute to the site

Santa Barbara Sand
Elwood Ranch Quarry

updated
12/1/2017

Table 9a: On Site Fugitive Dust Emissions Detail - Historical Operations

	Activity	Source	Source Units	Source Units per Day	Source Units per Year	PM_{10} Emission Factor	$PM_{2.5}$ Emission Factor	Emission Factor, Units	Mitigation Reduction percentage	Peak Day PM_{10} Emissions, lbs/day	Total PM_{10} Emissions, tons	Peak Day $PM_{2.5}$ Emissions, lbs/day	Total $PM_{2.5}$ Emissions, tons
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7	Receive and deliver sand to commercial venues	0.28	vehicle-miles	6.00	224.42	9.870	0.987	lbs/vehicle-miles	80%	3.3087	0.0619	0.3309	0.0062
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7	Transport D8 K Dozer to and from facility	0.28	vehicle-miles	1.00	30.00	9.870	0.987	lbs/vehicle-miles	80%	0.5514	0.0083	0.0551	0.0008
Pickup/Passenger Vehicles	Employee/operations vehicles	0.12	vehicle-miles	9.00	2340.00	9.870	0.987	lbs/vehicle-miles	80%	2.1534	0.2799	0.2153	0.0280
International Water Truck, 1986 Cummins NTC 300	Dust Suppression	1.09	vehicle-miles	2.00	104.00	9.870	0.987	lbs/vehicle-miles	80%	4.2994	0.1118	0.4299	0.0112
Caterpillar D8 K Dozer	Quarry mining	1.0	hours	6.00	63.56	17.806	0.404	lb/hr	80%	21.3677	0.1132	0.4843	0.0026
Caterpillar 966 G Wheel Loader - Stock pile to plant	Raw quarry materials to plant	372.5	Tons per Hr	0.50	22.07	0.00006	0.00001	lb/ton	80%	0.0024	0.0001	0.0004	0.0000
Caterpillar 966 G Wheel Loader - Truck loading	Load sand from stockpile to trucks	372.5	Tons per Hr	0.50	22.07	0.00006	0.00001	lb/ton	80%	0.0024	0.0001	0.0004	0.0000
Sand Plant	Procesing raw material	177.0	Tons per Hr	4.00	55.75	0.00104	0.00016	lb/ton	0%	0.7335	0.0051	0.1097	0.0008
Typical Raw material Storage Pile	Storage Pile	0.24	Acres	1.00	365	3.6	0.54	lb/acre/day	80%	0.1756	0.0001	0.0263	0.0048
Typical Processed Sand Storage Pile	Storage Pile	0.25	Acres	1.00	365	3.6	0.54	lb/acre/day	80%	0.1778	0.0001	0.0267	0.0049
Disturbed Area (Active Mining)	Active Disturbed Area	6.3	Acres	1.00	365	3.6	0.54	lb/acre/day	80%	4.5205	0.0023	0.6781	0.1238
Total On Site Fugitive Dust Emissions Detail - Hostorical Operations										**37.29**	**0.12**	**1.33**	**0.14**

Table 9b: On Site Fugitive Dust Emissions Detail - Potential of Extended Quarry Termination Date

	Activity	Source	Source Units	Source Units per Day	Source Units per Year	PM_{10} Emission Factor	$PM_{2.5}$ Emission Factor	Emission Factor, Units	Mitigation Reduction percentage	Peak Day PM_{10} Emissions, lbs/day	Total PM_{10} Emissions, tons	$PM_{2.5}$ Emissions, lbs/day	Total $PM_{2.5}$ Emissions, tons
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7	Receive and deliver sand to commercial venues	0.28	vehicle-miles	96.00	13440.00	9.870	0.987	lbs/vehicle-miles	80%	52.9388	3.7057	5.2939	0.3706
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7	Transport D8 K Dozer to and from facility	0.28	vehicle-miles	1.00	104.00	9.870	0.987	lbs/vehicle-miles	80%	0.5514	0.0287	0.0551	0.0029
Pickup/Passenger Vehicles	Employee/operations vehicles	0.12	vehicle-miles	9.00	2340.00	9.870	0.987	lbs/vehicle-miles	80%	2.1534	0.2799	0.2153	0.0280
International Water Truck, 1986 Cummins NTC 300	Dust Suppression	1.09	vehicle-miles	2.00	104.00	9.870	0.987	lbs/vehicle-miles	80%	4.2994	0.1118	0.4299	0.0112
Caterpillar D8 K Dozer	Quarry mining	1.0	hours	6.00	569.66	17.806	0.404	lb/hr	80%	21.3677	0.8915	0.4843	0.0202
Caterpillar 966 G Wheel Loader - Stock pile to plant	Raw quarry materials to plant	372.5	Tons per Hr	0.67	173.81	0.00006	0.00001	lb/ton	80%	0.0032	0.0004	0.0005	0.0001
Caterpillar 966 G Wheel Loader - Truck loading	Load sand from stockpile to trucks	372.5	Tons per Hr	0.67	173.81	0.00006	0.00001	lb/ton	80%	0.0032	0.0004	0.0005	0.0001
Sand Plant	Procesing raw material	177.0	Tons per Hr	24.00	8760.00	0.00104	0.00016	lb/ton	0%	4.4009	0.8032	0.6584	0.1202
Typical Raw material Storage Pile	Storage Pile	0.24	Acres	1.00	365.00	3.6	0.54	lb/acre/day	80%	0.1756	0.0001	0.0263	0.0048
Typical Processed Sand Storage Pile	Storage Pile	0.25	Acres	1.00	365.00	3.6	0.54	lb/acre/day	80%	0.1778	0.0001	0.0267	0.0049
Disturbed Area (Active Mining)	Active Disturbed Area	10.51	Acres	1.00	365.00	3.6	0.54	lb/acre/day	80%	7.6028	0.0038	1.1404	0.2051
Total On Site Fugitive Dust Emissions Detail -Potential of Expanded Mining and Revised Reclamation Plan - Revised Operations										**93.67**	**5.83**	**8.33**	**0.77**

Dependent Variables for Emission Factors

			PM2.5	PM10	
Emission Factors for Travel on Unpaved Surfaces	$E = k(s/12)^a(S/30)^d/(M/0.5)^c$	*k*	0.15	1.5	*AP-42 Section 13.2.2 (Industrial Sites)*
		a	0.9	0.9	
		b	0.45	0.45	

Emission Factor for Dozer, e.g. Dozing Over Burden	E, lb/hr = $(5.7 * s^{1.2})/(M^{1.3})$	0.75	PM10 Scaling Factor		AP-42 Section 11.9 Table 11.9-1 (Western Surface Coal Mining)
		0.017	PM2.5 Scaling Factor		

Emission Factor for Loaders	E, lb/ton = $k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$	k, 10*um*	0.35		AP-42 Section 13.2.4, Aggregate Handling and Storage Piles, Eq 1
		k, 2.5*um*	0.053		

Emission Factors for Plant	*0.001036*	lb/ton	*PM10*		*Per Santa Barbara County Air Pollution Control District PTO 07680-R9*
	0.0001550	lb/ton	*PM2.5*		*(Combined factors for hopper, belt screen & stacker)*

Emission Factors for Storage Piles and Distrubed Areas	*3.62*	lb/day/acre	*PM10*		*Per Santa Barbara County Air Pollution Control District PTO 07680-R9*
	0.54	lb/day/acre	*PM2.5*		

Independent Variables for Emission Factors

Silt loading in percent	*28.5*	%	Table 13.2.4-1: Stone quarrying and Processing, various limestone products
Material moisture content, %	*7.35*	%	Table 13.2.4-1: Stone quarrying and Processing, various limestone products
Mean wind speed	8.5	mph	Weather Spark - Average Weather in Santa Barbara California, United States
Loader Drop Height - Plant Hopper	5	ft	Plant Hopper is elevated
Loader Drop Height - Truck Loading	10	ft	
mean vehicle weight in tons	*2*	Light vehicles	
mean vehicle weight in tons	*35*	Heavy Vehicles	
Mean vehicle Speed on unpaved surface	*15*	mph	
Mitigation Reduction Precentage	*80%*	%	Per Santa Barbara County Air Pollution Control District PTO 07680-R9

Refer to Table 12 for production rates for mining devices (Dozer & loader)

Table 10a : Stone Processing Emissions Detail - Electrical Generation - Historical Operations

Device type	Device Rating, hp	Daily Operations, hr	Hours/yr	MWh/day	MWh/year	GHG lb/MWh	GHG lb/day	GHG MT/yr
Plant	75	4	55.75	0.22	3.12	622.16	139.18	0.88
Total Historical							**139.18**	**0.88**

Table 10b : Stone Processing Emissions Detail - Electrical Generation - Potential of Extended Quarry Termination Date

Device type	Device Rating, hp	Daily Operations, hr	Hours/yr	MWh/day	MWh/year	GHG lb/MWh	GHG lb/day	GHG MT/yr
Plant	75	24	8760	1.34	489.92	622.16	835.10	138.24
Total Project Potential							**835.10**	**138.24**

1. GHG Emission factors from US EPA Year 2014 eGRD (CAMX - WECC California): CO2 = 619.9 lb/MWh; CH4 = 0.0367 lb/MWh & N2O = 0.00450 lb/MWh
2. GHG Global Warming Potential from Table A-1 to Subpart C of Part 98: 1 CO2 = 1 kg CO2e; 1 kg CH4 = 25 kg CO2e & 1 kg N2O = 298 kg CO2e
3. 1 hp = 745.699872 watts

Table 11: Mining Device Exhaust Emission Factors

Equipment	HP	Type	Emission Controls	Load Factor, %	Emission Factors (gm/hp-hr)					
					CO	ROG	NO_x	SO_2	PM_{10}	GHG
Caterpillar 966 G Wheel Loader - Stock pile to plant	246	Diesel	Tier 0	75%	6.0000	0.9900	6.9000	0.1820	0.6000	519.463
Caterpillar 966 G Wheel Loader - Truck loading	246	Diesel	Tier 0	75%	6.0000	0.9900	6.9000	0.1820	0.6000	519.463
Caterpillar D8 K Dozer	300	Diesel	Tier 0	75%	6.0000	0.9900	6.9000	0.1820	0.6000	519.463
International Water Truck, 1986 Cummins NTC 300	300	Diesel	Tier 0	75%	6.0000	0.9900	6.9000	0.1820	0.6000	519.463
Pickup/Passenger Vehicles	185	Gasoline	See EMFAC Emission Factors for On Road Activities							
Semi-Truck/Tractor and Flatbed trailer (EMFAC T7 Vehicle)	300	Diesel	See EMFAC Emission Factors for On Road Activities							

References

1) Pound/hp-hr Emission Factors (Off Road Diesel) are calculated from Tierd Factors found in "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", US EPA, July 2010. (US EPA Document number EPA-420-R-10-018).

2) GHG EF's are from 40 CFR Pt 98 Subpart C, Tables C-1 & C-2, converted to gm/hp-hr using bsfc of 7000 BTU/hp-hr. The emission factors for gasoline equipment were converted directly to lb/hp-hr using the same bsfc and therefore, the emission factors in gm/hp-hr were not shown in the table above.

3) Pounds/hour calculated from load factor and hp rating

4) PM2.5 Emission Factors based upon SCAQMD Methodology to calculate Particulate Matter - PM10 to PM2.5 Ratios

5) Sulfur EF [g/bhp-hr] = [lb S/100 lb fuel] [lb fuel/gal fuel] [g S/lb S] [g-mole S/g S] × [g-mol SO2/g-mol S] [g SO2/g-mole SO2] [gal fuel/Btu] [Btu/bhp-hr]
(Used 0.05% Sulfur Fuel; Diesel density of 7.05 lb/gal; 137,000 Btu/gal; & 7800 Btu/bhp-hr)

Table 12: Mobile Device Emission Factors

EMFAC2014 Emission Rates
Region: Santa Barbara County APCD
Calendar Year: 2017
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Model Year: Aggregated

Based upon annual average temperature and humidity for the Santa Maria area: 88 & 72% RH
Start Exhaust Tailpipe Emissions (STREX) for gas engines assumes 8 hours (480 minutes) sitting periods.
Idle Exhaust Emission (IDLEX) factors not used as idling emissions are accounted for in On-site activities.

Input Category			CO		ROG							NOx		SOx		PM10				PM2_5				GHG		CO2		CH4	
EMFAC 2011 vehicle_class	fuel	speed_time	RUNEX	STREX	RUNEX	STREX	HOTSOAK	MODHURN	MDRESTLOSS	PDIURN	PRESTLOSS	RUNLOSS	RUNEX	STREX	RUNEX	STREX	RUNEX	STREX	PMBW	PMTW	RUNEX	STREX	PMBW	PMTW	RUNEX	STREX	RUNEX	STREX	RUNEX	STREX
LDT2	Gas	35	1.907645084	14.7623229	0.04760229	1.1170982	0.210563	0.003935	0.002203	0.048641	0.02864396	4.07722852	0.2601264	0.518845	0.0036985	0.00295346	0.0020857	0.006896291	0.009	0.03675	0.0019203	0.0063482	0.002	0.01575	387.8899118	270.7936699	387.5123	269.0547022	0.0179816	0.062808
LDT2	Gas	40	1.769370869	14.7623229	0.04187147	1.1170982	0.210563	0.003935	0.002203	0.048641	0.02864396	4.07722852	0.2503186	0.518845	0.003615	0.00295346	0.0018177	0.006896291	0.009	0.03675	0.0016728	0.0063482	0.002	0.01575	359.6357901	270.7936699	359.3071	269.0547022	0.0156987	0.062808
LDT2	Gas	45	1.655706057	14.7623229	0.03844642	1.1170982	0.210563	0.003935	0.002203	0.048641	0.02864396	4.07722852	0.2456637	0.518845	0.0034781	0.00295346	0.0016546	0.006896291	0.009	0.03675	0.0015319	0.0063482	0.002	0.01575	346.0826599	270.7936699	345.7812	269.0547022	0.0143695	0.062808
LDT2	Gas	50	1.56460699	14.7623229	0.03701509	1.1170982	0.210563	0.003935	0.002203	0.048641	0.02864396	4.07722852	0.2459697	0.518845	0.0034726	0.00295346	0.0016027	0.006896291	0.009	0.03675	0.001475	0.0063482	0.002	0.01575	345.9658627	270.7936699	345.37629	269.0547022	0.0137892	0.062808
LDT2	Gas	55	1.496838359	14.7623229	0.0373726	1.1170982	0.210563	0.003935	0.002203	0.048641	0.02864396	4.07722852	0.2512748	0.518845	0.0035079	0.00295346	0.0016237	0.006896291	0.009	0.03675	0.0014836	0.0063482	0.002	0.01575	358.3385904	270.7936699	358.04714	269.0547022	0.0139784	0.062808
LDT2	Gas	60	1.450306826	14.7623229	0.03659418	1.1170982	0.210563	0.003935	0.002203	0.048641	0.02864396	4.07722852	0.2620725	0.518845	0.0036868	0.00295346	0.0017284	0.006896291	0.009	0.03675	0.0015906	0.0063482	0.002	0.01575	385.5581263	270.7936699	385.2503	269.0547022	0.0146585	0.062808
LDT2	Gas	65	1.432901033	14.7623229	0.04404497	1.1170982	0.210563	0.003935	0.002203	0.048641	0.02864396	4.07722852	0.2792922	0.518845	0.0043178	0.00295346	0.0019974	0.006896291	0.009	0.03675	0.0017832	0.0063482	0.002	0.01575	430.5725551	270.7936699	430.2311	269.0547022	0.0162586	0.062808
T7 Tractor Construction	Dsl	35	1.109880958		0.32270397							7.6360643		0.0167777		0.0859687			0.036	0.06174	0.0827784		0.009	0.02646	1758.881986		1758.5863		0.0140598	
T7 Tractor Construction	Dsl	40	0.919474183		0.24651865							7.1790636		0.0160351		0.0838981			0.036	0.06174	0.0802572		0.009	0.02646	1681.396976		1681.1653		0.0111762	
T7 Tractor Construction	Dsl	45	0.783056297		0.19650094							6.849504		0.0154408		0.0855674			0.036	0.06174	0.0818657		0.009	0.02646	1618.849494		1618.4678		0.009127	
T7 Tractor Construction	Dsl	50	0.691256583		0.16745442							6.6234667		0.0149607		0.091077			0.036	0.06174	0.0871371		0.009	0.02646	1568.297102		1568.1338		0.0077776	
T7 Tractor Construction	Dsl	55	0.637357312		0.15119283							6.4872138		0.0145839		0.1004879			0.036	0.06174	0.0961408		0.009	0.02646	1528.783354		1528.6359		0.0070225	
T7 Tractor Construction	Dsl	60	0.621714128		0.14766593							6.4447012		0.0144278		0.1064812			0.036	0.06174	0.1018746		0.009	0.02646	1512.414739		1512.2705		0.0066689	
T7 Tractor Construction	Dsl	65	0.621714128		0.14766593							6.4447012		0.0144278		0.1064812			0.036	0.06174	0.1018746		0.009	0.02646	1512.414739		1512.2705		0.0066689	

Table 13: Mining and Reclamation Device Production Rates

Caterpillar D8 K Dozer Production Rate		Based on Caterpillar Handbook (Ed. 47) for CAT D8T
Uncorrected Maximum Production Rate, cu yd/hr	375	Average Dozing Distance ~ 400 ft
Correction Factors		
Hard to cut material	0.8	
Grade Correction	1.0	
Slot Dozing	1.2	
Average Operator	0.75	
Job Efficiency	0.5	
Weight Correction Factor	0.676	
Material density =	1.416	2832 lb/cu yd (SBC APCD PTO 076890-R9, Condition 2.a)
Estimated Production Rate	91.3	Cu Yd/hr
Estimated Production Rate	155.3	Ton/Hr

Caterpillar 966 G Wheel Loader Production Rate		Based on Caterpillar Handbook (Ed. 47) for CAT D8T
Excavator Bucket Capacity, cu yd	5	Cu Yd
Excavator Cycle Time	0.55	Min
Average Travel Distance	100	ft
Loaded travel time	0.2	Min
Unloaded travel time	0.2	Min
Operating Cycle Time	0.95	Min
Uncorrected Production Rate	545	Cu Yd/hr
Material density, ton/cu yd	1.416	2832 lb/cu yd (SBC APCD PTO 076890-R9, Condition 2.a)
Excavator Bucket Capacity, tons	7.08	Bucket capacity x material density
Uncorrected Excavator Production Rate, tons	447.2	Bucket capacity / cycle time
Bucket Load Factor	0.9	
Job Efficiency	0.833	
Estimated Production Rate, tons per hour	372.48	Production rate x efficiency
Estimated Production Rate, Cu Yd/hr	263.05	Production rate x efficiency

Santa Barbara Sand
Elwood Ranch Quarry

updated
12/1/2017

Table 14: Loads per Month and Annual Production Quantities

	2016	2015	2014	2013	2012
Jan	17.1	17.0	12.2	15.9	14.5
Feb	19.3	23.1	11.4	16.4	17.7
Mar	16.0	27.6	14.8	15.8	17.5
Apr	7.2	16.5	20.5	23.1	13.0
May	13.2	18.5	18.9	25.2	15.6
Jun	24.6	21.5	31.4	18.7	26.6
Jul	29.0	29.0	22.2	14.9	14.4
Aug	18.5	17.1	19.8	19.4	22.2
Sep	20.4	21.6	20.8	15.3	16.2
Oct	14.4	25.0	23.2	17.5	22.0
Nov	19.0	25.7	18.6	14.2	19.6
Dec	15.1	8.4	15.8	18.8	13.2
Total	213.8	251	229.6	215.2	212.5
Avg/mo	17.82	20.92	19.13	17.93	17.71
Annual total Tonnage	11,616	10,727	8,970	8,412	9,616
Annual Cubic Yards	6832.94	6310.00	5276.47	4948.24	5656.47
Max Loads per Month	31.4				