APPENDIX 3.1.4-1

Mineral Resources Report

MINERAL RESOURCE TECHNICAL REPORT
OTAY RANCH
VILLAGE 14 AND PLANNING AREAS 16/ AND 19
SAN DIEGO COUNTY, CALIFORNIA

Prepared for:

JACKSONPENDO DEVELOPMENT
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Project No. 11552.001

December 20, 2017

Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

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To: JacksonPendo Development
2245 San Diego Avenue, Suite 223
San Diego, CA 92110

Attention: Mr. Jim Jackson

Subject: Mineral Resource Technical Report, Otay Ranch, Village 14 and Planning Areas 16/19, San Diego County, California

In accordance with your request, we have performed a review and prepared this Mineral Resource Technical Report for the Otay Ranch Village 14 and Planning Areas 16/19 properties (Proposed Project) located in the Proctor Valley area of San Diego County, California.

Based on the results of our research and review, the site is similar to much of southwestern San Diego County in that it is underlain by Quaternary alluvium and metavolcanic rock that may possibly be mined and processed and utilized as a source of sand, gravel, and rock. We note that the northern most portion of the site has been locally classified by the State of California as a Mineral Resource Zone MRZ-3, and the site is bisected by a Quaternary alluvial stream deposit; both of which indicate the potential for mineral resources in the form of aggregate materials. Nevertheless, while the Proposed Project will encroach into these areas, locally much of this development is already within a 1,300-foot radius of existing development, or is otherwise in an area incompatible to mining, making resources not recoverable. It should also be noted that within the MRZ-3 zone, rock deposits are highly weathered and of a substandard quality. Elsewhere,

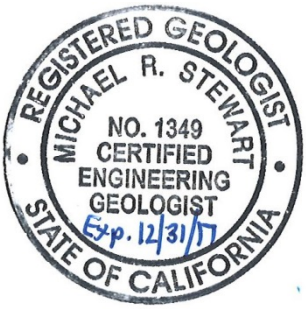
alluvial deposits are considered of substandard gradation. In addition, much of the alluvial deposits are located within an open space for sensitive environmental resources buffer area which would preclude mining of the alluvial resource. The majority of the site area also remains as open space and is outside of the Production-Consumption Boundary mapped by the County (1996).

This report has been prepared for submittal to the County of San Diego, per the County of San Diego Land Use and Environment Group's Guidelines for Mineral Resource Technical Report Format and Content requirements.

If you have any questions regarding our report, please contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.



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1.0 EXECUTIVE SUMMARY

In accordance with your request and authorization, this report was prepared to evaluate potential impacts to mineral resources due to implementation of the Otay Ranch – Village 14 and Planning Areas 16/19 project (Proposed Project) as depicted in Figure 1 and 2 (Site Location Map and Project Overview Map). This report provides a discussion of the Proposed Project and existing site conditions; a description of site geologic conditions and mineral resource potential; a discussion of relevant mineral resource regulations and guidelines; an evaluation of the significance of impacts to local mineral resources due to implementation of the Proposed Project; and a discussion of mitigation measures that may be necessary to reduce the impact on mineral resources to a less than significant level.

The Proposed Project encompasses approximately 1,284 acres in the Otay area of unincorporated San Diego County and is part of the overall Otay Ranch, an approximately 23,000 acre master-planned community in southern San Diego County. The Proposed Project proposes to develop the property with single-family residential neighborhoods, mixed-use commercial areas, community and public safety facilities, an elementary school, parks, open space and MSCP Preserve, and associated onsite and offsite circulation.

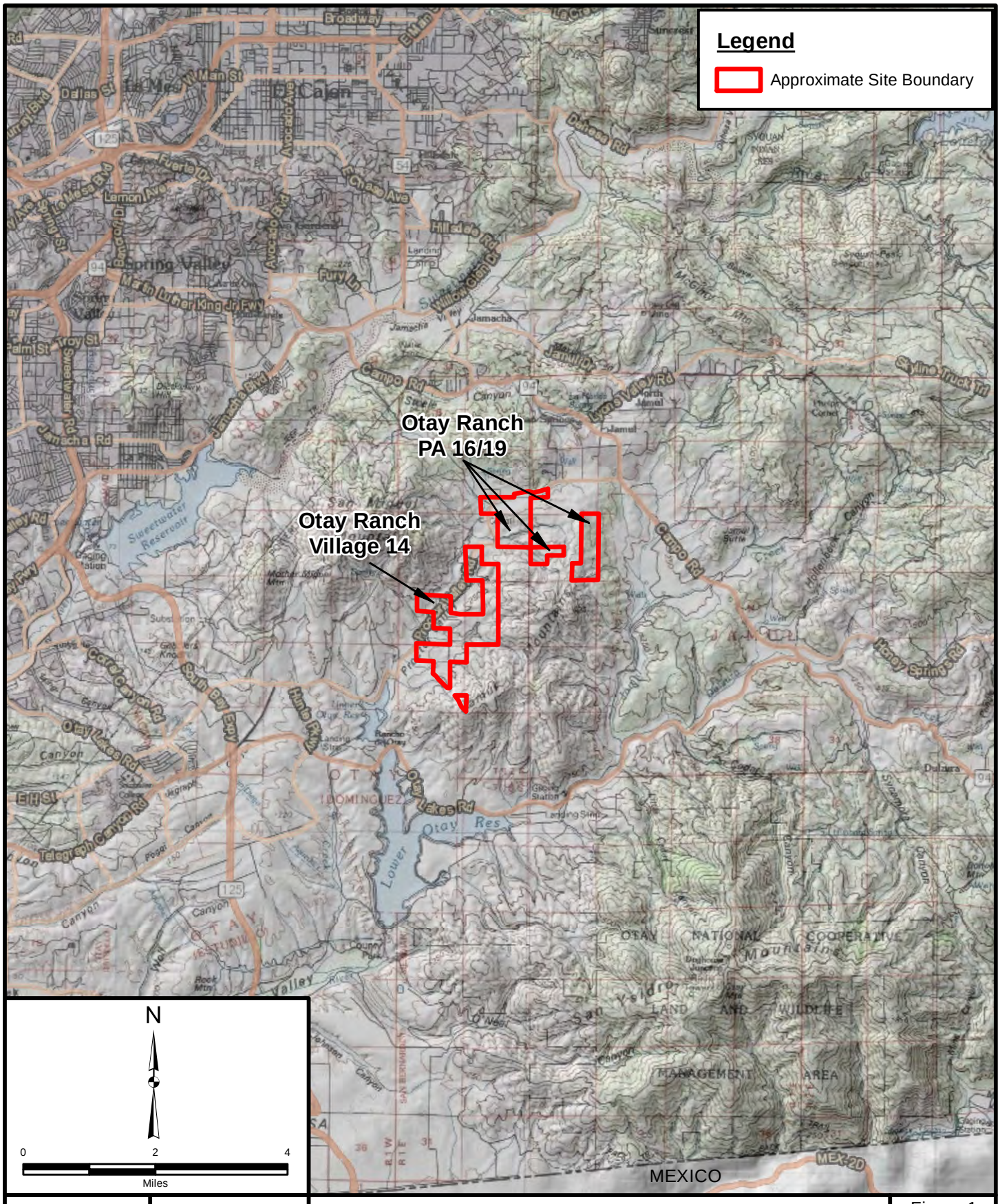
Our analysis of potential impacts to mineral resources included a review of State and County technical guidance documents, mineral resource classifications and maps, local land use plans, and site specific geologic and geotechnical data. It was concluded that implementation the Proposed Project would result in less than significant impacts to mineral resources and mitigation would not be required.

Based on the results of this research and review, the site is similar to much of southwestern San Diego County in that it is underlain by shallow alluvium and weathered metavolcanic rock that could possibly be mined and processed and utilized as a source of sand, gravel, and rock. As the site is similar to much of the regional area, it is not unique in this regard. Previous geotechnical studies of the site, including mapping (AGS, 2017a, 2017b) indicate the limited extent of workable surficial and alluvial deposits, and the weathered nature of the underlying metavolcanic rock. While the northern most portion of the site is categorized as MRZ-3 due to the proximity of granitic rock in the area, the Project Area is not being used currently for extraction. With the widespread

nature of similar geology comprising most of southwestern San Diego County, the site is not viewed as a unique critical resource from a geotechnical perspective. Areas similar in geologic composition to the subject site continue to exist as MRZ-3 zoned areas due to the lack of petition to the state Geologist for redesignation.

The Proposed Project contains no areas currently classified as MRZ-2. However, lacking substantial laboratory confirmation testing (i.e. grainsize analysis) of the Quaternary alluvium, the Quaternary alluvium may be considered consistent with a MRZ-2 resource for this study.

Nevertheless, when quantified relative to the entire extent of similar geologic exposures found across eastern San Diego County, site development could be considered of negligible relative loss. Specifically, areas underlain by alluvium located within 1,300 feet of the Proposed Project are currently located within both City MSCP Cornerstone Lands and County MSCP Preserve areas; therefore, the mineral resources within the 1,300-foot buffer zone surrounding the Project Area are already lost due to the above noted incompatible land use. Furthermore, besides the established environmental preservation of these areas, the shallow nature and the questionable quality of the alluvial deposits and the fact that the deposits are not located with “relatively fast access to Interstates and/or State routes to economically bring the product to market” (County of SD, 2008), confirm that these areas are already lost as a possible mineral resource.



Project: 11552.001	Eng/Geol: WDO/RCS
Scale: 1 " = 2 miles	Date: February 2017

Base Map: Bing Maps 2017
Thematic Information: Leighton
Author: (mmurphy)

SITE LOCATION MAP

Otay Ranch Village 14 and Planning Areas 16 and 19
San Diego County, California

Figure 1

Leighton

Map Saved as P:\Drafting\11552\001\Maps\11552-001_F01_SLM_2017-02-01.mxd on 2/14/2017 11:33:42 AM

2.0 INTRODUCTION

2.1 Purpose and Scope

The Project Area has been classified by the California Department of Conservation – Division of Mines and Geology (Update of Mineral Land Classification: Aggregate Materials in the Western San Diego Production-Consumption Region, 1997) as an area of "Potential Mineral Resource Significance" (MRZ-3). The County of San Diego has requested that a Mineral Resource Investigation Report be prepared to investigate mineral resources on and within 1,300 feet of the site to determine if they are significant, if their access would be permanently lost, and whether the loss would be considered significant under CEQA. This report presents the results of our review and assessment of the mineral resources for the 1,284-acre site in the southwestern area of San Diego County, California, as depicted in Figure 1 and 2 (Site Location Map and Project Overview Map). The scope of services included:

- A review of in-house geotechnical reports and aerial photographs pertinent to the area (Section 5.0).

- A reconnaissance of the site.

- Review of the site location relative to the current Mineral Resource Zonation (MRZ) and designations per the California Surface Mining and Reclamation Act (SMARA) of 1975.

- Preparation of this report summarizing the results of our technical study, including:

  - A discussion of the MRZ's located on, adjacent, and within the vicinity of the Proposed Project.

  - A discussion of all mine; quarries, and gemstone deposits (both historic and existing) within the vicinity of the Proposed Project.

  - A discussion of the regional and local geologic setting as it pertains to any mineral resources identified.

- Analysis of on-site and off-site impacts to the mineral resource, including indication of whether any mineral resources on the Proposed Project would be minable, processable, and marketable in the near future.

- A discussion of the economic value and significance of any impacts (if present) considering land use compatibility with the Proposed Project.

- A discussion of any appropriate mitigation measures and project design considerations.

2.2 Proposed Project Location and Description

The Proposed Project (defined below) is part of the overall Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas. The Proposed Project addressed by this technical report is located within a portion of Otay Ranch Village 14 and Planning Areas 16/19 in the Proctor Valley area of Otay Ranch as shown on Figure 1.

The underlying purpose of the Proposed Project is to implement the adopted Otay Ranch General Development Plan/Subregional Plan, Volume II (County of San Diego 1993), ("Otay Ranch GDP/SRP") and complete the planned development within Jackson Pendo Development Company's ("Applicant") ownership of Village 14 and Planning Areas 16/19. The Otay Ranch GDP/SRP is a component part of the County General Plan (County of San Diego 2011) and allows for a total of 2,123 homes in Otay Ranch Village 14 and Planning Areas 16/19. The Proposed Project's 1,119 homes represent a portion of the total 2,123 homes originally authorized in the Otay Ranch GDP/SRP.

The Proposed Project is designed to be consistent with the Otay Ranch GDP/SRP's Village Character Policy "to serve as a transitional area between urban densities to the west and Jamul to the east". The Proposed Project is therefore designed to provide a transitional village between the densities and character of eastern Chula Vista and the more rural community of Jamul. The Proposed Project proposes 1,119 homes of which 9941 are in Village 14 and 125 homes in Planning Areas 16/19.

The “Project Area” is the Applicant’s ownership within Otay Ranch Village 14 and Planning Areas 16/19 in addition to certain off-site areas for infrastructure as depicted in Figure 1. The Project Area covers approximately 1,283.6 acres owned by the Applicant and approximately 85.4 acres of Off-site improvements described below, for a total of 1,369 acres.

The specific plan for the Proposed Project is titled “Otay Ranch Village 14 and Planning Areas 16/19 Specific Plan.” The Proposed Project includes a Specific Plan, General Plan Amendments, EIR, Rezone, Tentative Map, and an Otay Ranch RMP Amendment. The Proposed Project is further defined in Section 1.0 of the EIR which is incorporated herein by reference. Except for the off-sites described below, the Proposed Project specifically excludes the State of California’s ownership in Village 14 and Planning Areas 16, which remains approved for development per the County’s General Plan and the Otay Ranch GDP/SRP. The underlying County General Plan and Otay Ranch GDP/SRP land uses on the State’s property will remain unchanged. In addition, the “Inverted L” is excluded from this analysis as it is not owned by the Applicant and is in the City of Chula Vista, (the property is owned by Otay Water District and the United States Fish and Wildlife Service).

“Otay Ranch Village 14” or “Village 14” as referred to herein is a discrete subset of the Proposed Project and reflects approximately 723.7 acres of the Applicant’s ownership located exclusively within Village 14 as depicted in Figure 2. Approximately 994 homes are planned around a Village Core in this area.

“Otay Ranch Planning Areas 16/19” or “Planning Areas 16/19” is a discrete subset of the Proposed Project and reflects approximately 559.8 acres of the Applicant’s ownership located exclusively within Planning Areas 16/19 as depicted in Figure 2. Approximately 125 homes are planned on one-acre and three-acre average lots in this area, as shown in Table 3 Planning Area 16/19 Site Utilization Plan Detail. 127.1 acres of Limited Development Area (“LDA”).

“Off-site Improvements” total approximately 85.4 acres of both temporary and permanent impacts. Off-Site Improvements include the following: Proctor Valley Road, including related wet and dry utilities, drainage facilities and trails; access roads in Planning Area 16; an off-site sewer pump station in the southern reach of Proctor Valley Road and off-site sewer facilities to connect to the Salt Creek Interceptor as planned since 1994.

The adopted Otay Ranch GDP/SRP requires the preparation of a Specific Plan, which includes a Site Utilization Plan to describe the land uses for the Proposed Project. Figures 3 and 4 depict the Surrounding Land use and proposed Site Utilization Plan, respectively.

Approximately 994 homes are planned in Village 14, set in three distinct areas (referred to herein as the South, Central and North Village 14). 878 of these homes will be single-family homes located in gated enclaves and 116 will be detached courtyard homes. Twelve neighborhoods are planned with approximate densities ranging from 0.2 to 10.0 dwelling units per acre. Otay Ranch Village 14 is planned around a “Village Core”, centrally located in the heart of the village. The Village Core is comprised of a 9.7-acre elementary school; a 7.2-acre Village Green (public park); a 1.7-acre Mixed Use Site with up to 10,000 square feet of commercial/retail uses; and a 2.3-acre public safety site for a fire station and satellite sheriff’s facility. Additional public and private parks, swim clubs, trails and recreational facilities will be situated throughout South, Central and North Village 14.

In addition to the homes in Village 14, there are 13 one-acre average sized estate lots proposed in Planning Area 19 and 112 three-acre average sized ranchettes proposed in Planning Area 16. Planning Area 16/19 neighborhoods will not be gated. The Limited Development Area may include public infrastructure, and/or be conserved within private lots with a conservation easement.

The Proposed Project’s Specific Plan is designed around an active lifestyle and wellness recreation theme and includes a park and recreation system including four public parks totaling approximately 15.2 acres. The remaining private recreation facilities include three private swim clubs, and numerous pocket parks totaling approximately 9.5 acres. An approximately 4.5 mile, 10-foot wide decomposed granite Community Pathway is proposed along Proctor Valley Road from Chula Vista to Jamul. The Proposed Project includes approximately 27.6 acres of open space, (exclusive of the 110.1 acres of open space included in the residential gross acres),127.1 acres of LDA and 426.7 acres of Otay Ranch RMP Preserve within the Applicant’s ownership. Of note, there is approximately 72.4 acres of Conserved Open Space within the Proposed Project that will be conserved by recording a biological open space easement.

In addition, it should be noted that the Proposed Project includes three options for internal circulation: (1) the Proctor Valley Road North Option, (2) the Preserve Trails Option and (3) the Perimeter Trail Option. The Draft EIR assesses each of these options and their respective impacts. Each of the options summarized below. For detailed descriptions with exhibits, see the Specific Plan Section VIII, Internal Circulation Options.

Proctor Valley Road North Option: The Proctor Valley Road North Option applies to the portion of Proctor Valley Road from Street AA in the North Village to Echo Valley Road, and includes two dedicated bike lanes (one on each side of the road) instead of the "sharrows" proposed in street section 10 of the Proposed Project. Generally, the Proctor Valley Road North Option would increase the right-of-way width from 40 feet to 64 feet starting from the intersection of Street AA northward to the Applicant's Village 14 ownership boundary; from 40 feet to 48 feet within the offsite improvement area owned by the State; and from 40 feet to 64 feet onsite within the Applicant's ownership north of the State's property to Echo Valley Road.

Preserve Trails Option: The Preserve Trails Option consists of two segments of existing, disturbed trails approximately 1.0-mile in length within the Project Area, east of the Development Footprint. These segments would be located within the Otay Ranch RMP Preserve. The Preserve Trails Option includes segments "A" & "B" as identified in the Otay Ranch GDP/SRP, which are also identified as segments 52 & 49 in the County of San Diego's Community Trails Master Plan (CTMP). Segment "A"/"52" is 2,350 lineal feet, located at the northern terminus of the Proctor Valley Community Pathway and extending east through the onsite Otay Ranch RMP Preserve to the eastern edge of the Echo Valley loop (CTMP Trail 53). Segment "B"/"49" is 2,328 lineal feet and is located between South and Central Village 14, along an existing, historic ranch road. This trail is located within onsite Otay Ranch RMP Preserve and bisects regional wildlife corridor R1. The Preserve Trails Option would retain these portions of trails in their existing conditions, which meet the CTMP primitive trail standard. No improvements to these Preserve Trails are contemplated.

Perimeter Trail Option: The Perimeter Trail Option is an approximately 3.6- mile perimeter trail located within the Development Footprint of South and Central Village 14. The Perimeter Trail Option is situated primarily within the Otay Ranch RMP 100-foot Preserve Edge. The Perimeter Trail Option is designed to CTMP primitive trail standards, and the trail tread varies from 2-6 feet. Due to topography,

trail grades range from 2% to the maximum grade allowed of 30%. The Perimeter Trail Option requires the construction of approximately 3,545 lineal feet (0.7 miles) of 5 to-7-foot-high retaining walls due to steep topography and drainage constraints. The Perimeter Trail Option would be graded as part of overall project grading and does not encroach into the Otay Ranch RMP Preserve. The perimeter trail would be accessed at public parks and trailheads and would be maintained by the County of San Diego.

Leighton and Associates has evaluated these options and they are not material to the information presented in this technical report.

3.0 EXISTING CONDITIONS

3.1 Topographic Setting

The Proposed Project is located within Township 17 South, Range 1 East, Sections 17, 18, 19, 20, and 30 on the USGS 7.5' Jamul Mountains quadrangle, generally along Proctor Valley Road between the City of Chula Vista and Jamul, California. The Project Area is more specifically located within Otay Ranch Village 14 and Planning Areas 16/19 as depicted in Figure 1 and 2 (Site Location Map and Project Overview Map).

The total Project Area encompasses approximately 1,284 acres, of which approximately 724 acres are within Otay Ranch Village 14 and 560 acres are within Planning Areas 16/19; and 84 acres are of offsite improvements. The Proposed Project area is in a natural state and is covered with a light to dense growth of annuals and some chaparral. A network of improved and unimproved roads provides access throughout the site.

Topography on site ranges from gently sloping terraces to moderately steep existing natural slopes approaching 1:1 (horizontal to vertical) slope inclinations. Two southerly flowing active drainages transect the site ultimately converging into a broad drainage adjacent to the existing Proctor Valley Road which drains into Upper Otay Lake. The existing elevations within the Proposed Project range from a high of approximately 1,345 feet above mean sea level (AMSL) in the northeastern portion of the site to a low of approximately 550 AMSL within an active drainage near the southern limit of Proposed Project.

3.2 Mineral Resource Potential

As mandated by the Surface Mining and Reclamation Act of 1975, the California State Mining and Geology Board classifies California mineral resources with the Mineral Resource Zones (MRZs) system. These zones have been established based on the presence or absence of significant sand and gravel deposits and crushed rock source area, e.g., products used in the production of cement. The classification system emphasizes Portland Cement Concrete (PCC) aggregate, which is subject to a series of specifications to ensure the manufacture of strong durable concrete. The following guidelines are presented in the mineral land

classification for the region (CGS, 1982 and 1996b).

- MRZ-1 - Areas where adequate geologic information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- MRZ-2 - Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that there is a high likelihood for their presence.
- MRZ-3 - Areas containing mineral deposits, the significance of which cannot be evaluated from available data.
- MRZ-4 - Areas where available information is inadequate for assignment to any other MRZ zone.

The Proposed Project is located within southwestern San Diego County which includes zones classified as MRZ-2 as shown in gray on Figure 5 (Highlighted Mineral Resource Zones). It should be noted that the Proposed Project does not contain MRZ-2 zones within or adjacent to the boundaries; the closest MRZ-2 zone to the Proposed Project is located to the southeast roughly 2.0 miles away (see Figure 6). The vast majority of existing MRZ-2 zones are mapped in Quaternary alluvial areas and Tertiary conglomerate deposits and therefore have irregular, organic limits defined by low-lying topographic drainages. Geologically, these areas are generally characterized by the presence of younger (Quaternary-aged) river channel, floodplain, and terrace deposits that have been eroded from the older (Tertiary to Cretaceous-aged) bedrock units, transported, and re-deposited. They consist of naturally loose mixtures of sands and rounded gravels. Laboratory testing has also confirmed the physical and chemical characteristics of these mapped deposits are appropriate for PCC-grade aggregate.

In contrast, the Proposed Project is located in an entirely different geologic province typical of the MRZ-2 zone described above in that it is a predominantly a metavolcanic rock site, with an MRZ-3 zone defined by generally granitic geologic unit limits along the north boundary of the site (Figure 6). In addition, the majority of the Proposed Project is located east and outside of the P-C Boundary which is an uncategorized zone. Specifically, all of Otay Ranch Village 14 is entirely located in the uncategorized zone, and the northern portions of Planning Area 16/19 are located in the MRZ-3 zone (Figure 6). Documented historical aggregate extraction operations have not been identified on the site.

It should be noted that the majority of the western San Diego region is mapped as a MRZ-3 zone (San Diego County, 2008). Generally, these areas geologically consist of the older bedrock units, including the crystalline and metavolcanic rocks that are mapped over nearly two thirds of the San Diego County. These areas are also commonly rugged mountainous terrain relatively isolated from existing development and infrastructure. As noted in the updated 1996 DMG classification report, these materials can be crushed to yield PCC-grade aggregate provided they possess the appropriate chemical characteristics. Despite considerable costs associated with crushing, additional processing, and transportation, crushed rock has been a feasible source when more economical alluvial materials are not readily available.

Reclassification of an MRZ-3 zone to a MRZ-2 designation is under the purview of the California State Geologist. The criteria includes determination that the "deposit is minable, processable, and marketable under the technologic and economic conditions that exist at present or which can be estimated to exist in the next 50 years and meets or exceeds (in 1996 equivalent dollars) $12,150,000 for construction materials (DMG, 1996b). Note this equated to $5,000,000 in 1978 dollars when the guidelines were first written.

It should be further noted that the lands surrounding the Proposed Project, including the land within 1,300 feet of the site boundary (Figure 8), are encompassed within the City of San Diego's (City) Multiple Species Conservation Program (MSCP) Subarea Plan (City MSCP, 1997) and the County's Final MSCP Plan (County MSCP, 1998). The goal of the City's MSCP is to provide for the permanent protection of plant and wildlife species within the Multi-Habitat Planning Area (MHPA). The City's MSCP contains General Planning Policies and Design Guidelines to be applied in the review and approval of development projects within or adjacent to the land within the Multi-Habitat Planning Area (MHPA), (City MSCP, p. 43.). The lands surrounding the Proposed Project are incorporated into the City's MSCP by way of the Cornerstone Lands Conservation Bank Agreement ("Cornerstone Lands"). The relevant Cornerstone Lands surrounding the Proposed Project consist of approximately 1,800 acres of watershed management lands near portions of Upper and Lower Otay Lakes. The Cornerstone Lands are subject to the City's MSCP General Planning Policies and Design Guidelines requiring the review and approval of projects within or adjacent to the Cornerstone Lands. For mining operations, the City's

MSCP states “[n]ew or expanded mining operations on lands conserved as part of the MHPA are incompatible with MSCP Preserve goals for covered species and their habitats unless otherwise agreed to by the wildlife agencies at the time the parcel is conserved.” (City MSCP, p. 45.) Likewise, the County’s MSCP Plan has an identical land use restriction on new or expanded mining activities unless otherwise agreed to by the wildlife agencies at the time of conservation. (County MSCP, p. 6-5.) No wildlife agency has agreed to allow for any new or expanded mining activities in either the City’s MSCP or the County’s MSCP Preserve areas. For this reason, the lands surrounding the Proposed Project cannot be subject to new or expanded mining activities. The Project Area is adjacent to and includes both City MSCP Cornerstone Lands and County MSCP Preserve areas; therefore, the mineral resources within the 1,300-foot buffer zone surrounding the Project Area are already considered to be lost due to the incompatible land uses (see areas classified as protected wildlife habitat on Figure 8).

3.2.1 Otay Ranch Village 14 and Planning Areas 16/19 - Proctor Valley Property

As shown on Figure 5 and 6, the site includes areas zoned as MRZ-3 and Uncategorized (outside of the PC Boundary). Because the site generally consists of a mountainous terrain although bisected by an alluvial stream valley, the site’s resource designation of MRZ-3 results from the presence of crystalline and metavolcanic rocks which, when crushed to suitable sizes, could be considered for construction material in the form of aggregate materials.

3.3 Geology

Otay Ranch Village 14 and Planning Areas 16/19 are located in the lower Peninsular Range Region of San Diego County, a subset of the greater Peninsular Ranges Geomorphic Province of California. The Peninsular Ranges Geomorphic province is approximately bounded to the east by Elsinore Fault Zone, to the north by the Transverse Ranges, the south by Baja California, and to the west by the Pacific Ocean.

This portion of the Peninsular Ranges is underlain by Jurassic and Cretaceous plutonic rocks of the Peninsular Ranges Batholith, which contains variably metamorphosed Mesozoic rocks. These basement rocks are non-conformably overlain by a thick sequence of relatively undisturbed sedimentary rocks ranging

from upper Cretaceous to Pleistocene in age.

The Project Area is located near the eastern edge of the coastal plain at the contact with the metavolcanic rocks of the Jamul Mountains. Geologically, the project site is underlain by two principle rock types, the Late Jurassic to early Cretaceous aged metavolcanic rocks of the Santiago Peak Volcanics and the Tertiary aged sedimentary rocks of the Otay Formation. The Otay Formation is informally subdivided into three subunits: an upper sandstone-claystone member; a middle gritstone member; and, a basal angular-clast fanglomerate member. Minor exposures of upper Pleistocene older alluvium exist locally as relatively flat lying river terraces and unconsolidated alluvium of Holocene age occupies the active drainages onsite.

A basement complex consisting of Mesozoic-aged prebatholithic volcanic and metavolcanic rocks underlies the Proposed Project at depth and are exposed at the surface at higher elevations in the easterly and northerly portions of the Proposed Project. The basement rocks are non-conformably overlain by Tertiary-aged sedimentary bedrock, which is subsequently mantled by Quaternary-aged surficial soil units. Approximate geologic contacts are shown on Figure 7. A brief description of the units mapped across the site is presented in the following sections.

3.3.1 Surficial Units

Surficial units onsite include undocumented artificial fill (Afu), topsoil/colluvium (unmapped), young alluvium (map symbol Qya), and older alluvium (map symbol Qoa). More detailed descriptions of these units are presented below.

Artificial Fill (Afu)

Artificial fill soils were observed locally at the Proposed Project site. The undocumented fills are primarily located along the current alignment of Proctor Valley Road as embankment fills for the road and associated culverts. Based on limited observed exposures, these materials can generally be described as clayey to gravelly sands with abundant rock fragments in a dry to slightly moist and loose to moderately dense condition. In addition, minor undocumented fills exist locally across the site as unimproved trails

and roads. In consideration of the limited extent of the material and the plan scale, these fills are not mapped.

Topsoil/Colluvium (not mapped)

Undifferentiated topsoil and colluvium exist throughout the Proposed Project site as a thin soil veneer. Thicker accumulations commonly occur near the base of slopes and natural topographic swales. As encountered, these materials ranged from less than one foot to four feet in thickness and are generally composed of silty to clayey sand and sandy clay in a dry to slightly moist and loose to moderately dense condition. Roots and minor to moderate porosity are common.

Alluvium (Qya)

Young alluvial deposits occupy the bottoms of the primary and tributary drainages onsite. These materials can generally be described as silty to clayey sand with gravel and small rock fragments in a dry to moist and loose condition and sandy clay in a moist and soft condition.

Older Alluvium (Qoa)

Older alluvium occurs onsite as moderately dissected terraces that flank modern drainage channels/valleys. The older alluvium consists of poorly bedded, poorly to moderately well consolidated sand to boulder-sized sediment in a clayey sand matrix. Clasts are generally subangular to subrounded. Matrix soils are commonly rubified and locally exhibit weak cementation.

3.3.2 Bedrock Units

Otay Formation – Fanglomerate (Tof)

The Otay Formation - Fanglomerate underlies much of the Project Area and occupies the lower flanks and valleys of the highlands to the east and north of the Project Area. The fanglomerate has a more subdued topography and is moderately to highly dissected. This unit is typified by thickly to massively bedded breccia

intertongued with a finer grained subunit consisting of claystone and sandstone. The breccia subunit is generally in a slightly moist to moist and moderately hard to hard condition. The breccia subunit is also composed of subangular to angular, gravel to cobble size clasts in a clayey sand matrix. Occasional to common boulder sized clasts were encountered in the borings and excavator test pits. Rock clasts appear to be locally derived from the Santiago Peak Volcanics. The clay matrix is commonly waxy, highly expansive, and is likely bentonitic. The finer grained subunit is generally comprised of olive gray to pale brownish yellow, sandy claystone and clayey sandstone in slightly moist to moist and soft to hard condition.

Santiago Peak Volcanics (KJm-v)

The site is underlain by Jurassic-aged Santiago Peak Volcanics at depth and outcrops at the surface primarily in the eastern and northern portions of the site. The contact between the Santiago Peak Volcanics and the overlying younger geologic units represents a significant geologic hiatus. This contact is irregular and reflects a relatively high relief Mesozoic landscape. Subsequent erosion has exhumed portions of this ancient landscape, creating modern topographic highs including San Miguel Mountain to the north and the Jamul Mountains to the east.

The Santiago Peak Volcanics are generally dense and mildly metamorphosed volcanic rocks. Composition of the volcanic rocks varies from basalt to rhyolite but is predominantly dacite and andesite (Kennedy and Tan, 2008). Typically, the meta-volcanics display crude to moderate bedding and foliation. Fracturing is poorly to moderately well developed. In general, outside of boulder areas, a weathered halo of only a few feet thick exists. Below this, the rock is very dense and hard.

4.0 MINERAL RESOURCE IMPACT ANALYSES

4.1 Methodology for Determination of Significance – County Guidelines

Considering the site characteristics described above, their significance is measured against the County of San Diego Department of Land Use Guidelines For Determining Significance and Report Format and Content Requirements For Mineral Resources ("County Guidelines") (DPLU, 2008). These characteristics are based on the State CEQA Guidelines, and establish a measurable standard for determining when an impact will be considered significant pursuant to CEQA.

Under the County Guidelines (County Guidelines, 2008, pp. 16-17.), a project would generally be considered to have a significant effect, if it proposes any of the following:

1. The project is:

- On or within the vicinity (generally up to 1,300 feet from the site) of an area classified as MRZ-2; or
- On land classified as MRZ-3; or
- Underlain by Quaternary alluvium; or
- On a known sand and gravel mine, quarry, or gemstone deposit; and

The project will result in the permanent loss of availability of a known mineral resource that would be of value to the region and the residents of the state; and
The deposit is minable, processable, and marketable under the technologic and economic conditions that exist at present or which can be estimated to exist in the next 50 years and meets or exceeds one or more of the following minimum values (in 1998 equivalent dollars):

- Construction materials (sand and gravel, crushed rock) $12,500,000.00.
- Industrial and chemical mineral materials (limestone, dolomite, and marble [except where used as construction aggregate]; specialty sands, clays,

phosphate, borates and gypsum, feldspar, talc, building stone and dimension stone) $2,500,000.

- Metallic and rare minerals (precious metals [gold, silver, platinum], iron and other ferro-alloy metals, copper, lead, zinc, uranium, rare earths, gemstones, and semi-precious materials, and optical-grade calcite) $1,250,000.00.

2. The project would result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Notably, the County Guidelines for Mineral Resources recognize that open space areas preserved for sensitive environmental resources effectively remove the ability for that land to be utilized for future extraction of mineral resources. (County Guidelines, 2008, p. 8.). Specifically, areas designated for the protection of sensitive environmental resources (Figure 8) that may be permanently inaccessible for future mining activities already contribute to a mineral resource loss. The Cornerstone Land MSCP Preserve area will be subject to a conservation easement upon conveyance. Therefore, the County Guidelines acknowledge that if a project site falls under Guidelines 1 and 2 and is already surrounded by residential, commercial, or other land uses that are incompatible to mining, the mineral resources for a project site and up to 1,300 feet from the project site boundary may not be considered a significant loss if the mineral resources have already been lost by those existing incompatible land uses (County Guidelines, 2008, p. 18.).

4.2 Impact Analysis

The following analysis utilizes County Guidelines dated July 30, 2008. Based on our use of those guidelines and our study, we conclude that no significant impact will occur from the Proposed Project. Specifically, no known mapped industrial and chemical materials nor metallic and rare minerals are known in the Proposed Project Area and within the setback determination area as shown on Figure 8. The Sections below provide the specific results of our determination of significance for the Proposed Project.

4.2.1 Land Use Compatibility

The remaining guideline for significance determination involves whether or not the deposit is minable or compatible under the present conditions, or conditions estimated to exist within a 50-year time-frame. In order to be minable, it must be considered compatible with existing land uses, and land uses projected along the 50-year future time line.

The Proposed Project property is located in an undeveloped area. As shown on Figure 2, surrounding land uses include single-family residences situated along the northern portion of the site. In order to provide an adequate buffer to achieve separation from noise and dust, a separation of 1,300 feet is typically utilized. Figure 8 illustrates those portions of the Project Area that are within areas where a 1,300 foot buffer would apply. Based on our analysis, much of the northern portion of the Project Area is already effectively a lost mineral resource because it is within a 1,300-foot buffer zone of existing adjacent residential developments.

In addition to the adjacent residential developments described above, the western parcels located adjacent to the Proposed Project are lands encompassed within the City of San Diego's MSCP Subarea Plan (City MSCP) and the County's MSCP Subarea Plan, and mining operations in those areas are restricted (Figure 8). For those areas that lie within the jurisdictional boundaries of both MSCPs, they are conserved and new or expanded mining activities are ***incompatible*** with the preserve goals. (City MSCP, p. 45; County MSCP, p. 6-5; and County Guidelines, 2008, p. 18.) Therefore, the mineral resources within the 1,300 foot buffer zone surrounding the Project Area that are within the MSCPs, are not considered a significant mineral resource loss since they already have been lost by the existing incompatible land uses.

A portion of the Project Area (206 acres) will impact the mapped MRZ-3 resulting in that portion being lost to possible future mining efforts. However, due to the weathered nature of the impacted mapped metavolcanic rock, it is our professional opinion that the metavolcanic rock is not considered a quality minable resource based on the discussion below.

In addition, when the Proposed Project's development is completed, the main Quaternary alluvium of the Proctor Valley area will be lost to possible future mining efforts. However, based on the relatively minor volume of Quaternary alluvium the deposit is not considered marketable regardless of lacking substantial laboratory confirmation testing (i.e. grainsize analysis) of the Quaternary alluvium. Nevertheless, the Quaternary alluvium may be considered consistent with a MRZ-2 resource for this study. Additional analysis regarding the marketability of the Quaternary alluvium is provided in the section below.

4.2.2 Marketability and Minimum Dollar Value

As stated previously, portions of the Proposed Project are situated on areas classified as both MRZ-3 and are uncategorized (outside P-C Region Boundary) with Quaternary alluvium. Based on our analysis, approximately 206 acres mapped as MRZ-3 would be lost by construction of the development (Figure 8). As previously mentioned in the text above, the metamorphosed volcanic rock deposit located within the MRZ-3 zone is not considered minable, processable, or marketable under the technologic and economic conditions existing today or that can be estimated 50 years from today. In order to mine such materials deep removals of overburden generally greater than 20 feet are necessary and only then may limited hard rock of adequate quality for mining purposes be exposed. In addition, the Proposed Project is not located near adequate access for transportation. Considering the above conditions, the marketability is considered nil and the minimum dollar value of the deposit therefore is not determined.

The entire area mapped as Quaternary alluvium (Qya) on the Regional Geologic Map (Figure 7 and 8) could also be considered a mineral resource based on Section 4.0 of the County Guidelines (2008). However, based on our review, we find that the mapped Quaternary alluvium is generally not consistent with significant Quaternary alluvial deposits associated with MRZ-2 and other previously mapped aggregate resource areas since it predominantly consists of fine sands, silts, and clays, with a lack of significant gravels. Nevertheless, as mentioned

above, lacking substantial laboratory confirmation testing (i.e. grainsize analysis) of the Quaternary alluvium, the Quaternary alluvium may be considered consistent with a MRZ-2 resource for this study. Currently, approximately 28 acres of the resource will be lost due to the proposed development (Figure 8).

Assuming hypothetically, that the Quaternary alluvium is consistent with a MRZ-2 zone and based on our site observations and the results of the (AGS, 2017a, 2017b) geotechnical report, we estimate the Quaternary alluvium could be removed to an average depth of roughly 10 feet below the ground surface amounting to roughly 671,000 tons of sand and aggregate. Assuming a price of $20.00 per ton, a density of 0.055 tons per cubic foot and a waste factor of approximately 20 percent, the value of material lost would be roughly $10,700,000 which would not exceed the threshold ($12,500,000) for the County's definition of a significant impact. As mentioned above, the MRZ-3 resource marketability is considered nil and the minimum dollar value of the deposit therefore is not determined.

Our price estimate above is based on resource prices (Hanson 2016 – Slaughterhouse Canyon Soils; and Vulcan verbal communication, 2016 – Carrol Canyon) for sand and aggregate material ($20.00 per ton).

4.3 Conclusions

4.3.1 Significance of Impacts

Based on our analysis, the project under Significance Guideline 1 would not be considered a significant mineral resource. The Project Area is not located on or within 1,300 feet of land classified as MRZ-2, and is not on a known sand and gravel mine, quarry, of gemstone deposit.

The Project Area is partially located on land classified as MRZ-3. However, based on the mapped geology, it is our opinion that the land classified as MRZ-3 at the project would not be reclassified as MRZ-2 because the geology consists of metavolcanics and not granite. Specifically, the observed metavolcanics are highly weathered at the surface. Accordingly, it is our professional opinion, based on mapping and experience, at least 20

feet of overburden overlies suitable, unweathered materials for mining. In addition, the metavolcanics are also generally highly fractured and; therefore, are considered of generally low quality for use as construction material.

The Project Area is partially underlain by Quaternary alluvium. However, based on our field mapping of the alluvium, we estimate that waste factors will exceed the assumed 20 percent that most commercial quarries consider when looking at economic feasibility. These elevated waste factors are related to the generally fine grained nature of the alluvium observed throughout Proctor Valley. When combined with the shallow topographic geometry of Proctor Valley, this elevated waste factor supports the opinion that the alluvial deposit would not be reclassified as MRZ-2. Further, as described below, the mapped alluvium is located generally within and adjacent to existing designated environmentally sensitive Preserve areas, which makes it an unfavorable mining resource and may already be considered incompatible to mining.

As noted above, potential mineral resources shown in Figure 8 are within areas identified as Preserve by several controlling habitat conservation plans. These include the County of San Diego MSCP, City of San Diego MSCP, and the Otay Ranch Resource Management Plan. While not necessarily precluded by these habitat conservation plans, mining within a Preserve area requires compliance with the controlling document(s) and appropriate permitting. For these reasons, mining the resources shown in Figure 8 may not be compatible with existing and planned land uses. (See County of San Diego CEQA Significance Guidelines – Mineral Resources, pp. 8, 15.)

For example, the largest area of potential mineral resources in the southwest portion of Proctor Valley is owned and managed as “Cornerstone Lands,” pursuant to the City of San Diego MSCP. As defined by Section 1.2 of the City of San Diego MSCP, these lands are owned by the City of San Diego Water Department and the City of San Diego’s Charter “restricts the use and disposition of water utility assets.” To comply with the requirements of the City of San Diego MSCP and the City Charter, “the City of San Diego intends to enter into a Conservation Land Bank Agreement with the wildlife agencies for the Cornerstone Lands,” through which “the

City will commit to phasing in conservation easements over all 10,400 acres of the Cornerstone Lands." Implementation of conservation easements "will restrict those lands [including portions of the areas shown in Figure 8] from being used for other purposes inconsistent with habitat preservation."

Section 1.4.2 of the City of San Diego MSCP states "New or expanded mining operations on lands conserved as part of the MHPA are incompatible with MSCP preserve goals for covered species and their habitats" subject to permitting and concurrence by the Wildlife Agencies "at the time the parcel is conserved." This would include assessing impacts and incorporating appropriate conditions to mitigate biological impacts, including impacts to covered species, and restoring mined areas. In addition, all other requirements of City of San Diego land use policies and regulations (e.g., Adjacency Guidelines, Conditional Use Permit) must be satisfied, and the mining operation shall meet noise, air quality and water quality regulation restrictions.

There are known sensitive resources on the lands owned by the City of San Diego and underlain by Quaternary Alluvium. These resources include a vernal pool restoration site, coastal sage scrub, Hermes copper habitat, and jurisdictional resources such as ephemeral drainages. In order to mitigate for impacts to these resources, appropriate permits would be required, including compliance with the requirements of the Federal government (Army Corps of Engineers), State of California (California Department of Fish and Wildlife) and Regional Water Quality Control Board (i.e., 401/404/1600 permits). Such permitting requirements would substantially limit if not entirely preclude these mineral resources from being mined due to the timeframe, costs, and probability of success in securing the appropriate approvals, especially in light of the geological constraints identified above.

With regard to Significance Guideline 2, based on our review, the project is not within a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

When quantified relative to the entire extent of similar geologic exposures found across eastern San Diego County, site development is considered a negligible relative loss of mineral resources.

4.3.2 Mitigation Measures and Design Considerations

No mitigation measures or design considerations are required for the Proposed Project. Based on our analysis, the Proposed Project does not impact existing mineral resources. The majority of the site is mapped outside of the P-C Region Boundary and is therefore uncategorized. A portion of the site is located in MRZ-3 and Quaternary alluvium. However, a large portion of the MRZ-3 is already effectively lost due to the presence of adjacent existing residential development and the Quaternary alluvium at the site is generally not considered as a high quality (PCC grade) aggregate source and is also lost due to the area being located in environmentally sensitive lands.

5.0 REFERENCES AND COMMUNICATIONS

Advanced Geotechnical Solutions, Inc. (AGS), 2017a, Geotechnical Review of Preliminary Grading Plan, Otay Ranch – Proctor Valley Village 14 and Planning Areas 16 & 19, County of San Diego, California, dated January 13, Report No. 1312-02-B-6

Advanced Geotechnical Solutions, Inc. (AGS), 2017b, Geotechnical Review of Tentative Map and Grading Plan, Otay Ranch – Proctor Valley Village 14 and Planning Areas 16 & 19, County of San Diego, California, dated March 24, Report No. 1312-02-B-6

California Geological Survey (CGS) (previously Division of Mines and Geology), 1982, Mineral Land Classification: Aggregate Materials in the Western San Diego County Production-Consumption Region, California, Kohler, S.L. and Miller, R.V. authors, CDMG Special Report 153.

————————, 1996b, Update of Mineral Land Classification: Aggregate Materials in the Western San Diego Production-Consumption Region, Miller, R.V. author, CDMG Open File Report 96-04.

————————, 1997-1998, Mines and Mineral Producers Active in California (1997-1998), CDMG Special Publication 103 (revised 1999).

————————, 2000, California Surface Mining Reclamation Policies and Procedures, CDMG Special Publication 051 (third revision).

_____, 2002, Geologic Map of the Jamul Mountains 7.5' Quadrangle, San Diego County, California: A Digital Database, Scale 1:24,000.

_____, 2010, 150th Anniversary Fault Activity Map of California.

County of San Diego, 2008, Department of Planning and Land Use and Environment Group, Guidelines for Determining Significance of Mineral Resources, First Revision, July 30, 2008.

REFERENCES AND COMMUNICATIONS (Continued)

County of San Diego, 2011, San Diego County General Plan Update EIR, Page 2.10, Minerals, August

City of San Diego, 1997, Multiple Species Conservation Program Subarea Plan, March 1997.

County of San Diego, 1998, *Final* Multiple Species Conservation Program, MSCP Plan, August 1998.

Kennedy, M.P., and Tan, S.S., 2008, Geologic Map of the San Diego Quadrangle, California, California Geologic Survey, 1:100,000 scale.

Surface Mining and Reclamation Act of California (SMARA) of 1975, California Public Resources Code (PRC), Division 2, Chapter 9, Sections 2710, et. seq.

Tan, S.S., Landslide Hazards in the Jamul Mountains, OFR 92-12, Map No. 29.

Todd, V.R., Preliminary Geologic Map of the El Cajon 30'x60' Quadrangle, 2004, USGS OFR 2004-1361

United States Geological Survey (USGS), 2002, The Mineral Industry of California: 2002 Minerals Yearbook.

USGS Topographic Map of the Jamul Mountains 7.5' Quadrangle, San Diego County, California, 1994.

Walsh, Steven L. and Demere, Thomas A., 1991, Age and Stratigraphy of the Sweetwater and Otay Formations, San Diego County California, in Abbot P.L. and May, J.A., eds., 1991, Eocene Geologic History San Diego Region, Pacific Section SEPM, Vol. 68, pp. 131-148.

Weber, Harold Jr., 1958-59, Geology and Mineral Resources of San Diego County, California, Plate 1, Scale 1"=2 miles, dated 1958-59.

REFERENCES AND COMMUNICATIONS (Continued)

Aerial Photographs

Aerial Photographs Reviewed for Report			
Year	**Flight ID**	**Photo ID**	**Photo Scale**
1928	SD	69B- 1, 2, 3 69C- 1, 2, 3 69D- 1, 2, 3	1" = 1000'
1960-1970	SDCT2/T11	2- 74 14- 28, 29, 30	1" = 1000'
1968	AXN	3JJ- 101, 102, 175	1" = 2800'
1970	SDC	13- 7, 8	1" = 2000'
1971	GS-VCSQ	1- 5	1" = 2600'
1973-1975	SDPD	14- 11, 12, 13 15- 14	1" = 1000'
1974	SDC ORTHOS	Jamul Mtn.	1" = 2000'
1974	SDPD	2- 3,4	1" = 2000'
1976	SAN DIEGO	235, 236, 247, 248	1" = 2000'
1978-1979	SDCO (WEST)	33- F1,F2 34- D22, D23, D24	1" = 1000'
1983	C11109 (CAS)	139, 140	1" = 2000'
1989	WAC (WEST)	18- 49, 51	1" = 2640'

FIGURES

Legend

Approximate Site Boundary

Otay Ranch PA 16/19

Otay Ranch Village 14

Campo Rd
Vista Diego Rd
Lyons Valley Rd
Olive Vista Dr
Jamul Dr
Vista Sage Ln
Vista Sage Pl
Marbon Way
Jefferson Rd
Scribes Canyon Rd
Proctor Valley Rd
Trail Dr
Maxfield Rd
Wanda Way
Hillside Dr
Short Ct
Campo Rd
Las Palmas
Adele Ln
Trails End Dr
Proctor Valley Ln
Bear Mountain Way
Abell Dr
Pioneer Way
Calle Alejandro
Melody Rd
Whispering Meadows Ln
Echo Valley Rd
Proctor Valley Rd
Proctor Valley Rd
Anita Ln

N

0 2,000 4,000

Feet

Image courtesy of USGS © 2017 Microsoft Corporation , Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

Project: 11552.001	Eng/Geol: WDO/RCS
Scale: 1 " = 2,000 '	Date: February 2017

Base Map: Revised Mineral Land Classification Map, Western San Diego County, by Russell V. Miller, 1996.

Author: Mmuprhy

PROPERTY OVERVIEW MAP

Otay Ranch Village 14 and Planning Areas 16 and 19
San Diego County, California

Figure 2

Leighton

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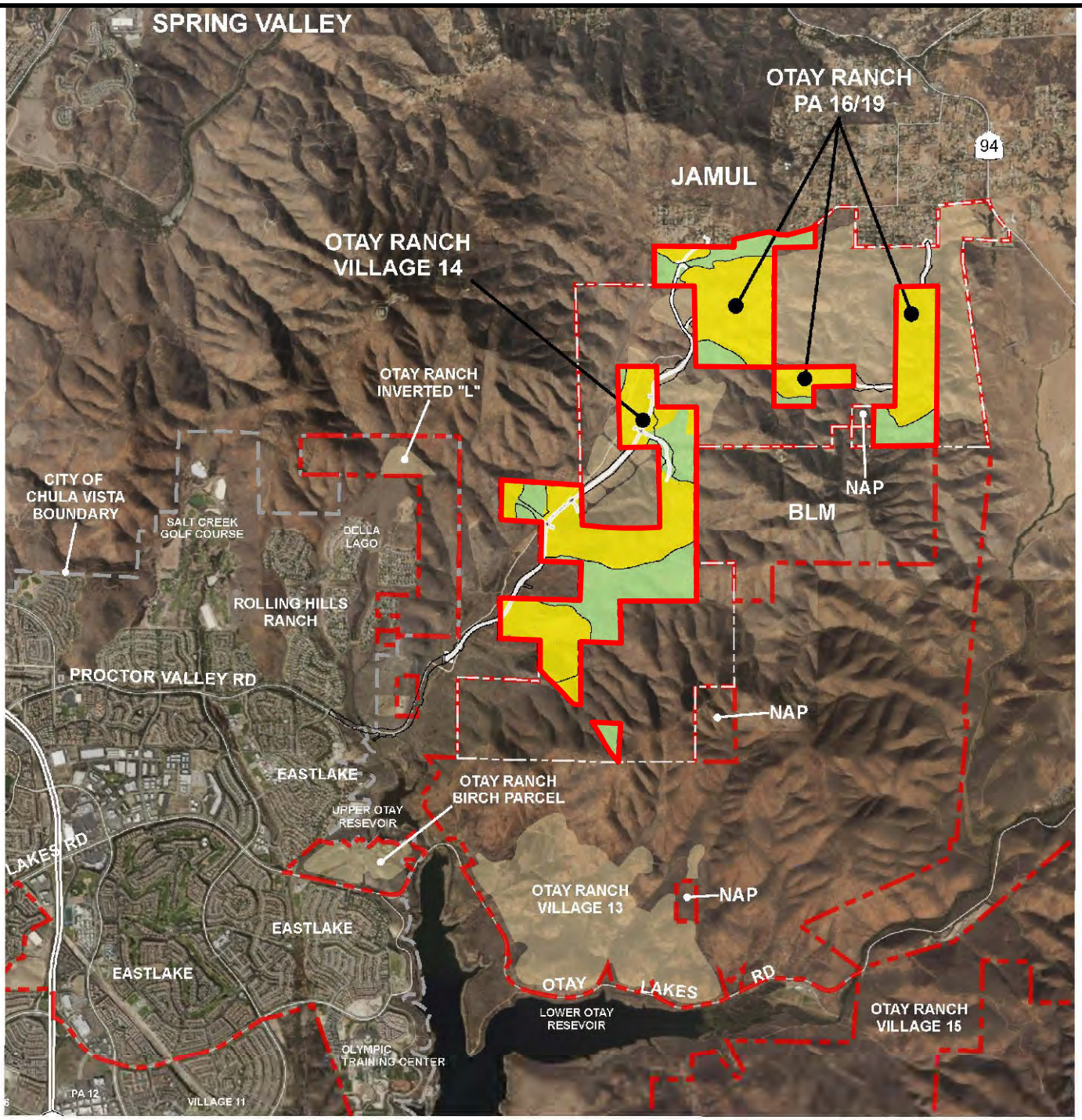

SOURCE: LUEG-GIS 2014 AERIAL IMAGERY

N

0 5,000 10,000

Feet

LEGEND

- SPECIFIC PLAN BOUNDARY
- PROPOSED SPECIFIC PLAN BOUNDARY
- OTAY V14 & PA16/19 VILLAGE BOUNDARY
- MUNICIPAL BOUNDARY
- V14 & PA16/19 DEVELOPMENT AREAS
- V14 & PA16/19 MSCP OPEN SPACE
- OTHER APPROVED DEVELOPMENT

Project: 11552.001	Eng/Geol: WDO/RCS
Scale: 1 " = 5,000 '	Date: February 2017

Base Map: Bing Maps 2017
Thematic Information: Leighton
Author: (mmurphy)

SURVOUNDING LAND USE MAP

Otay Ranch Village 14 and Planning Areas 16 and 19
San Diego County, California

Figure 3

Leighton

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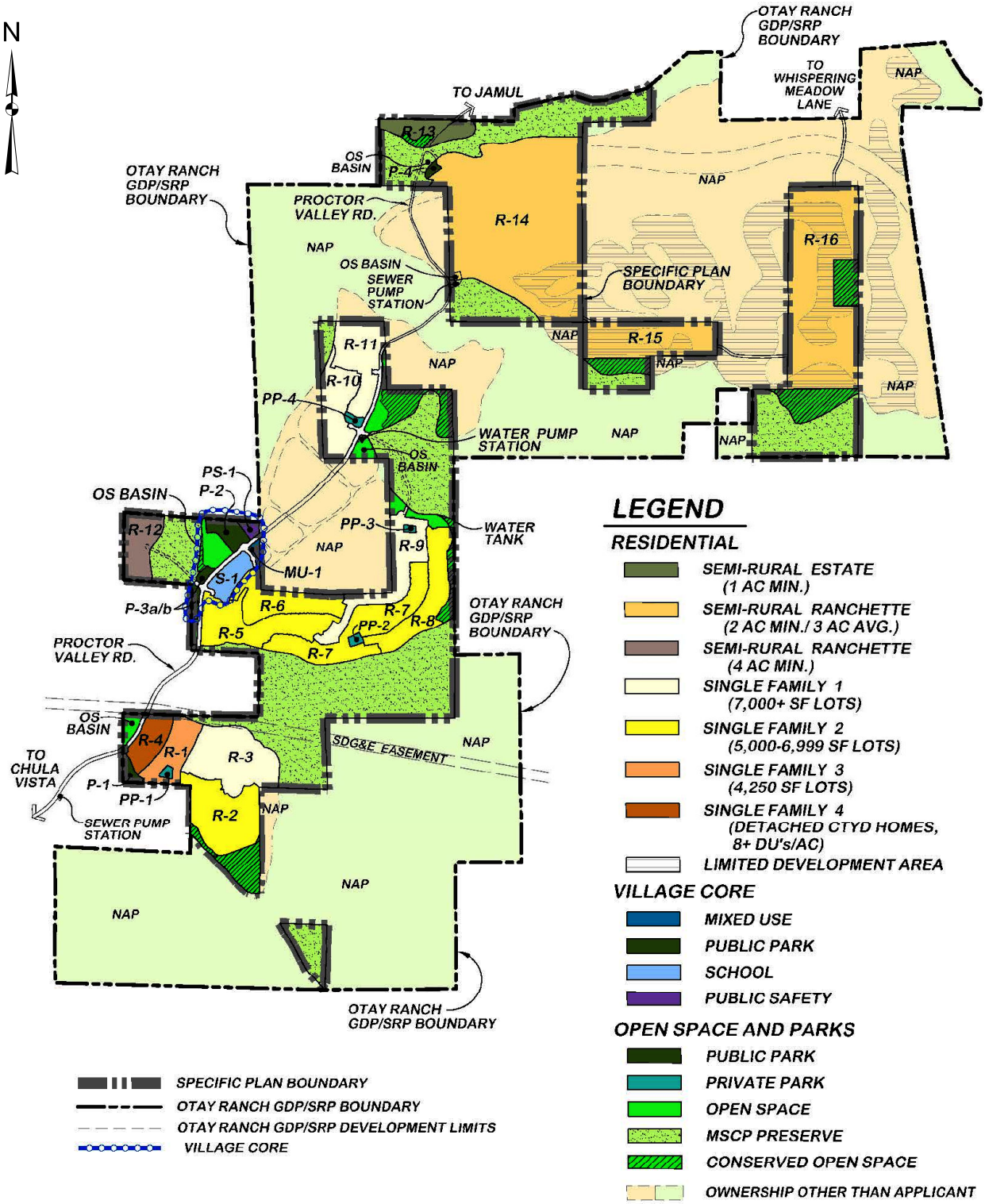

08-24-17

Project: 11552.001	Eng/Geol: WDO/RCS
Scale: 1 " = 3,000 '	Date: September 2017
Base Map: Specific Plan by Jackson Pendo, 8/24/2017.	
Author: (mmurphy)	

SITE UTILIZATION MAP

Otay Ranch Village 14 and Planning Areas 16 and 19
San Diego County, California

Figure 4

Leighton

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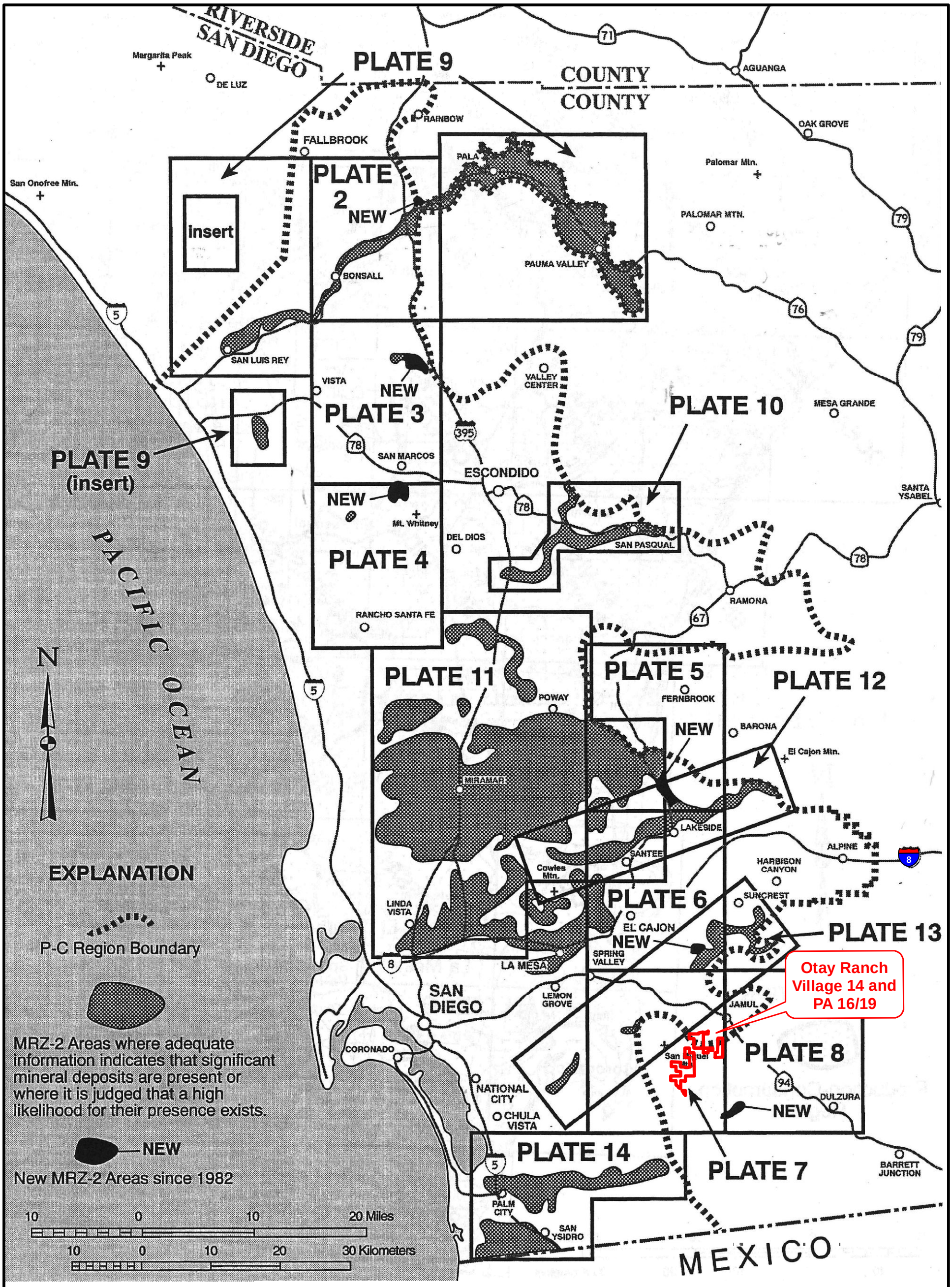

Project: 11552.001	Eng/Geol: WDO/RCS
Scale: 1 " = 5 miles	Date: February 2017
Base Map: ESRI ArcGIS Online 2017 Thematic Information: Leighton Author: kthomas (mmurphy)	

HIGHLIGHTED MINERAL RESOURCE ZONES

Otay Ranch Village 14 and Planning Areas 16 and 19
San Diego County, California

Figure 5

Leighton

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Legend

- Production-Consumption Region Boundary
- **MRZ-2** — Areas where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood exists for their presence.
- **MRZ-3** — Areas containing mineral deposits the significance of which cannot be evaluated from available data.
- Area newly classified MRZ-2.
- Approximate Site Boundary

MRZ-3

UNCATEGORIZED

Otay Ranch Village 14

Otay Ranch PA 16/19

UNCATEGORIZED

MRZ-2

N

0 2,000 4,000

Feet

Project: 11552.001	Eng/Geol: WDO/RCS
Scale: 1 " = 2,000 '	Date: February 2017

Base Map: Revised Mineral Land Classification Map, Western San Diego County, by Russell V. Miller, 1996.

Author: Mmuprhy

STATE MAPPED MINERAL RESOURCE ZONES

Otay Ranch Village 14 and Planning Areas 16 and 19
San Diego County, California

Figure 6

Leighton

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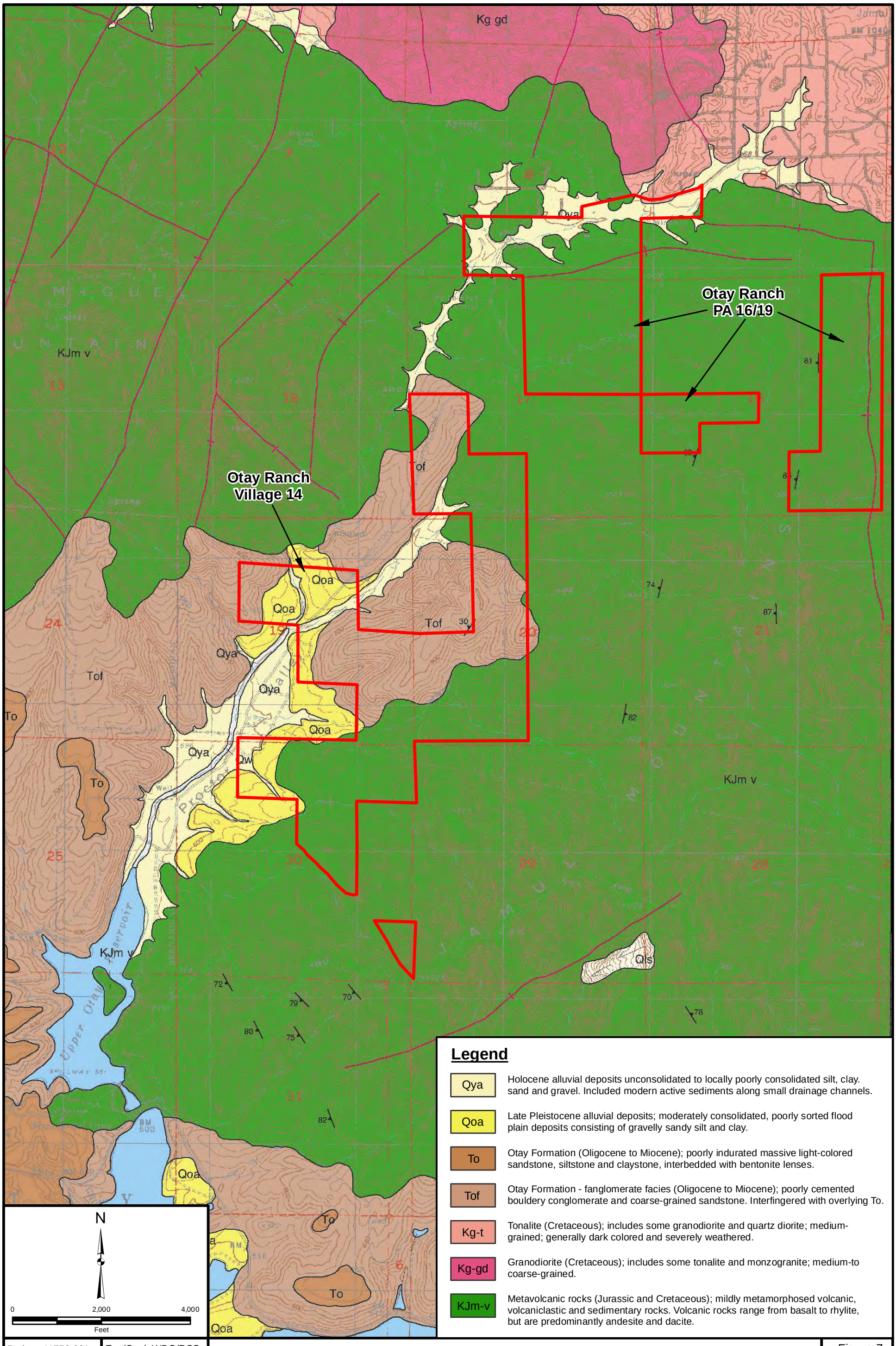


Legend

Qya	Holocene alluvial deposits unconsolidated to locally poorly consolidated silt, clay. sand and gravel. Included modern active sediments along small drainage channels.
Qoa	Late Pleistocene alluvial deposits; moderately consolidated, poorly sorted flood plain deposits consisting of gravelly sandy silt and clay.
To	Otay Formation (Oligocene to Miocene); poorly indurated massive light-colored sandstone, siltstone and claystone, interbedded with bentonite lenses.
Tof	Otay Formation - fanglomerate facies (Oligocene to Miocene); poorly cemented bouldery conglomerate and coarse-grained sandstone. Interfingered with overlying To.
Kg-t	Tonalite (Cretaceous); includes some granodiorite and quartz diorite; medium-grained; generally dark colored and severely weathered.
Kg-gd	Granodiorite (Cretaceous); includes some tonalite and monzogranite; medium-to coarse-grained.
KJm-v	Metavolcanic rocks (Jurassic and Cretaceous); mildly metamorphosed volcanic, volcaniclastic and sedimentary rocks. Volcanic rocks range from basalt to rhylite, but are predominantly andesite and dacite.

Project: 11552.001 | Eng/Geol: WDO/RCS

Scale: 1 " = 2,000 ' | Date: February 2017

Base Map: Geologic Map of the Jamul Mountains 7.5' Quadrangle, San Diego, County, California by Siang S. Tan, 2002.

Author: Mmurphy

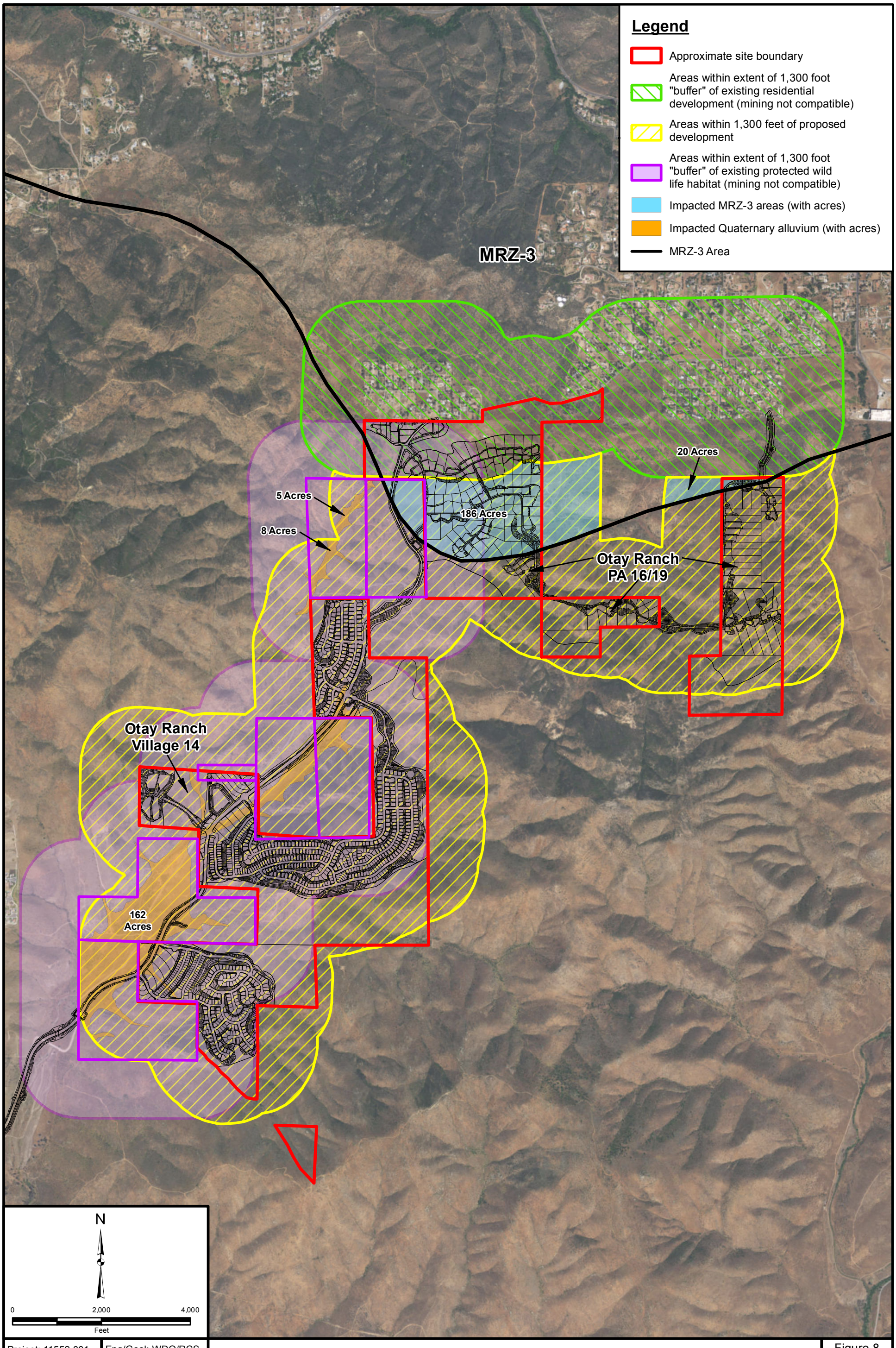
REGIONAL GEOLOGY MAP

Otay Ranch Village 14 and Planning Areas 16 and 19
San Diego County, California

Figure 7

Leighton

Map Saved as P:\Drafting\11552\001\Maps\11552-001_F07_RGM_2017-02-01.mxd on 2/14/2017 11:40:22 AM



Project: 11552.001	Eng/Geol: WDO/RCS
Scale: 1 " = 2,000 '	Date: June 2017
Base Map: Bing Maps, 2017.	
Author: Mmurphy	

SETBACK DETERMINATIONS MAP

Otay Ranch Village 14 and Planning Areas 16 and 19
San Diego County, California

Figure 8

Leighton

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