

3.4 Mineral Resources

This section provides a summary of the potential mineral resources impacts caused by implementation of the proposed Project. The analysis presented in this section is based on the Mineral Resource Evaluation Study and provided as **Appendix C-15** to this EIR.

The Otay Ranch PEIR, adopted in 1993, provided a program-level analysis of the existing conditions and potential impacts related to mineral resources for the entire Otay Ranch area, including the Project site. The Otay Ranch PEIR identified potential significant direct and cumulative impacts on commercially viable aggregate resources known to be present in the Otay River Valley and the adjacent Rock Mountain located within Rancho Otay approximately four miles southwest of the Project site. The Otay Ranch PEIR did not identify any locations within the Project site suitable for mineral extraction.

3.4.1 Existing Conditions

3.4.1.1 *General Geologic Setting*

Geologic mapping and subsurface exploration of the Project site were performed and documented in reports titled Area A TM-Level Geotechnical Investigation and Area B TM-Level Geotechnical Investigation (Geocon, Inc. 2010a), which are included as Appendices C-6 and C-7. The findings of the field investigation are summarized below.

The Project site is located within a transition area between the coastal plain of San Diego County and the foothills of the Peninsular Ranges, in the western region of the Peninsular Ranges geomorphic province. The coastal plain of San Diego County is underlain by a thick sequence of relatively undisturbed sedimentary rocks that range in age from the upper Cretaceous period through the late Tertiary period. The western region of the Peninsular Ranges is underlain by metavolcanic rock.

The geotechnical investigations identified the following surficial units and geologic formations on the Project site:

- **Undocumented Fill (Qudf).** Undocumented fill is present at several locations across the site within canyon drainages. In general, the fill consists of loose, slightly moist to moist, silt and sand with rock fragments and cobbles.
- **Topsoil (unmapped).** Topsoil with an average thickness of approximately 3 feet overlies the site. It is characterized as sandy to clayey with gravel and cobble. This surficial deposit does not qualify as a significant mineral deposit.
- **Lacustrine Deposits (Ql).** The areas of the Upper and Lower Otay ~~Lakes-Reservoir~~ and the canyon drainage between the two ~~lakes-reservoirs~~ are underlain by lacustrine deposits. These sediments, derived from the surrounding landforms, were deposited at the bottom or adjacent to the existing ~~lakesreservoirs~~. This soil is typically saturated and difficult to excavate for reuse as fill soil. Lacustrine deposits are not expected to be encountered during grading since they are generally located south of Otay ~~L~~Lakes Road or within the

connecting drainage with Upper Otay ~~Lake~~[Reservoir](#), outside of the proposed grading areas.

- **Alluvium (Qal).** The Project site contains limited deposits of alluvium within the drainage courses that traverse the site. On average, the thickness of alluvium deposits range between approximately 2 and 10 feet; however, deposits may be thicker in larger canyon drainages. The alluvium deposits consist of fine- to coarse-grained clayey and silty sand with abundant gravel, cobbles and boulders. Preliminary laboratory testing performed by the Project geotechnical consultant indicates that on-site alluvium deposits do not meet minimum aggregate quality levels, as these deposits tend to have deleterious quantities of silts and clays.
- **Colluvium (unmapped).** Colluvium is locally present on lower slope areas throughout the Project site. The colluvium consists of sandy clay with varying amounts of gravel and cobble. The thickness of colluvium generally ranges from approximately 2 to 7 feet, but can be thicker along the lower portions of canyons and toes of natural slopes.
- **Fanglomerate Deposits.** Fanglomerate deposits are located throughout the site and form gentle slopes in the south and southwestern portions of the Project site. This unit has an estimated maximum thickness of between 20 and 25 feet and typically consists of dense to very dense clayey to silty sandstone and occasional sandy claystone. Preliminary excavations indicate that up to 40 percent of the on-site fanglomerate deposits may be comprised of cobbles and boulders, with diameters up to 2 feet. Laboratory testing performed by the Project geotechnical consultant indicates that on-site fanglomerate deposits may be suitable for use as aggregate base and crushed rock.
- **Otay Formation.** Otay formation is located along most of the southern portion of the site. This unit consists of clayey sandstone and sandy claystone with interbeds of gravel, cobble, and boulders. Preliminary excavations indicate that up to 30 percent of the on-site Otay formation deposits may be comprised of cobbles and boulders, with diameters up to 2.5 feet.
- **Metavolcanic Rock.** Metavolcanic rock is present on the northern, northwestern, and northeastern portions of the site and is characterized as moderately strong to strong, highly to slightly weathered, and jointed. Highly weathered portions of the metavolcanic rock consist of highly expansive clay and soft rock. Preliminary laboratory testing performed by the Project geotechnical consultant indicates that on-site metavolcanic deposits may be suitable for use as aggregate base and crushed rock.

For a more detailed description and analysis of the on-site geology, refer to EIR Section 2.5, Geology and Soils.

3.4.1.2 Regional and Local Mineral Resources

Rapid growth in the San Diego area has increased the need for construction aggregate, particularly Portland cement concrete (PCC) aggregate and other mineable materials. The principal uses of these materials are for concrete, road base, utility trench backfill, and construction purposes.

Mining activity in the general vicinity of the Project site has typically produced dolomitic limestone; however, a few mines in the area have produced metals, including gold and lead. In the more immediate vicinity of the Project site, commodity mineral development is generally limited to aggregate production from alluvial sources or from quarries in the canyon sidewalls of channels; however, historically, limestone mining has also occurred.

The following are the mining operations located in the vicinity of the Project site that are considered regionally significant according to the California Division of Mines and Geology (CDMG) classification criteria:

- Hester's Granite Quarry is mined for boulders of weathered hornblende gabbro, which is either sold as decomposed granite or crushed and sold as rip-rap or crushed aggregate. The site is approximately 100 acres and is located approximately 7 miles north of the Project site.
- Otay Valley Rock Quarry produces aggregate crushed from the Santiago Peak Volcanics. The facility is approximately 580 acres and is located approximately 3 miles southwest of the Project site.

CDMG provides statewide Mineral Resource Zone (MRZ) maps. The above-listed mining operations and associated alluvial areas are generally designated as MRZ-2 by CDMG. A detailed explanation of the MRZ classifications is provided below under Surface Mining and Reclamation Act of 1975.

3.4.1.3 On-Site Mineral Resources

Based on site reconnaissance and research performed by T&B Planning Consultants in connection with the preparation of the Mineral Resource Evaluation Study, there is no information or reason to believe that any commercially viable mining resources exist on the Project site and no evidence was found that mining has ever occurred on the Project site. The Project site lacks well-developed alluvial sand and gravel deposits, and the bedrock is either a rocky fanglomerate or variable Santiago peak volcanics. There may be minor opportunities to obtain rock and aggregate materials during grading of the site; however, the quantities of these materials are expected to be limited to what could be used by the Project internally to supplement the material needs for construction of the proposed Project. Furthermore, any potential mining opportunities on the Project site would likely be well below the limiting threshold criteria for regionally significant mineral deposits, as described below.

3.4.1.4 Regulatory Setting

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (SMARA) mandated the initiation of a mineral land classification and designation process to help identify and protect mineral resources in the state that are subject to urban expansion and other irreversible land uses that would preclude mineral extraction. Classification is the process of identifying lands containing significant mineral deposits. Designation is the formal recognition by the State Mining and Geology Board of areas

containing mineral deposits of regional or statewide importance. CDMG established Guidelines for Classification and Designation of Mineral Lands to guide the classification and designation of mineral resources. Based on the Guidelines, to be considered significant for purposes of classification of mineral resources, a mineral deposit must meet the following criteria:

1. Marketability – the mineral deposit must be minable, processable, and marketable under the technologic and economic conditions that exist at present or are expected to exist in the next 50 years.
2. Threshold Value – for deposits that meet the marketability criteria, the deposit must meet a minimum threshold value. The threshold amount depends on the type of mineral material, as follows:
 - (i) construction materials – minimum threshold value of \$12,500,000
 - (ii) industrial and chemical mineral material – minimum threshold value of \$2,500,000
 - (iii) metallic and rare minerals – minimum threshold value of \$1,250,000

Mineral deposits that are considered significant based on the above criteria are further classified based on a determination of the MRZ in which the deposits are located. The state has established criteria with respect to MRZ classification that are based on a geologic appraisal of the mineral resource potential of the land. This appraisal includes research of geologic and mining-related literature, compilation of geologic maps, site investigations, sampling, surveys, and mapping, as appropriate. The following MRZ categories are used by the State Geologist in classifying the state's lands:

- MRZ-1 are areas where available geologic information indicates that no significant mineral deposits are present or where little likelihood exists for their presence.
- MRZ-2 are areas underlain by mineral deposits where geologic data show that significant measured or indicated resources are present. A typical MRZ-2 area would include an operating mine or an area where extensive sampling has indicated the presence of a significant mineral deposit.
- MRZ-3 are areas that contain known mineral deposits that may qualify as significant mineral resources, pending further exploration and evaluation. Further exploration within these areas could result in the reclassification of specific areas into the MRZ-2 category.
- MRZ-4 are areas where geologic information does not rule out either the presence or absence of mineral resources and further exploration and evaluation is required. Further exploration could result in the reclassification of MRZ-4 lands into the MRZ-1 or MRZ-2 categories.

3.4.2 Analysis of Project Effects and Determination as to Significance

3.4.2.1 Loss of a Known Mineral Resource

Guideline for the Determination of Significance

A project will generally be considered to have a significant effect if it proposes any of the following, absent specific evidence to the contrary. Conversely, if a project does not propose any of the following, it will generally not be considered to have a significant effect on mineral resources, absent specific evidence of such an effect.

The proposed Project is the following:

- 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 proposed 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
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 ferroalloy metals, copper, lead, zinc, uranium, rare earths, gemstones and semi-precious materials, and optical-grade calcite)	\$1,250,000

Rationale for Selection of Guideline

The Significance Guideline for loss of a known mineral resource is from the County of San Diego Guidelines for Determining Significance – Minerals (County of San Diego, July 30, 2008), which addresses question (a) of Section X in Appendix G of the CEQA Guidelines. A significant impact

would occur if the Project contains areas designated as MRZ-2 or MRZ-3 and the mineral resources present have been determined to be minable, process-able, and marketable under the technologic and economic conditions that exist at present or that can be estimated to exist in the next 50 years and meets or exceeds the State Geologist minimum dollar values for mineral resources.

Analysis

As described above and depicted in **Figure 3.4-1**, the Project site is not located within the area designated by CDMG as the Production-Consumption Region boundary for San Diego County. Therefore, no MRZ classification has been designated on the Project site and there is no information or reason to believe the Project site contains commercially valuable minerals. The nearest MRZ-designated site is the former Jamul Quarry, which is designated MRZ-2 and located approximately 0.5 mile (2,600 feet) east of the southeast corner of the Project site. That facility has ceased operations and would require County approval to resume mining.

The analysis in this section is based on the findings of a Project-specific geotechnical report prepared by Geocon, Inc., and a mineral resources technical review (**Appendix C-15**).

Off-Site Impacts from Proposed On-Site Land Uses

Mining operations generally require a setback of approximately 1,300 feet from incompatible land uses (residential, industrial, commercial) to minimize and/or avoid adverse effects associated with mining, which include, but are not limited to, noise, traffic, air quality, and visual quality. Accordingly, a significant impact would occur if the Project would introduce incompatible land uses within 1,300 feet of known, existing, or potential off-site mining operations, thereby indirectly making off-site mineral resources inaccessible.

The Project site is located in the vicinity of the Jamul Quarry, which is designated as an MRZ-2 zone. As depicted in **Figure 3.4-1**, approximately 16 acres in the extreme southeastern corner of the site, is within 1,300 feet from property designated MRZ-2. The on-site areas within 1,300 feet would be preserved as natural habitat; therefore, no incompatible land uses would be developed within 1,300 feet of a designated mineral resource area. Furthermore, the Jamul Quarry is no longer in operation; therefore, the Project would have no potential to introduce incompatible land uses in the immediate vicinity of a known, active quarry. Accordingly, implementation of the Project would not result in the permanent loss of availability of a known mineral resource that would be of value to the region or the residents of the state.

On-Site Impacts from Off-Site Land Uses

There are no incompatible land uses within 1,300 feet that would make mineral resources on-site inaccessible for extraction. Areas north of the site are characterized by undeveloped, natural hillsides and bluffs. An airfield, John Nichol's Field, used for gliders and ultralight aircraft, is located south of the Project site. Lower Otay [Lake-Reservoir](#) is also located south of the Project site. Territory to the immediate east of the Project site is primarily composed of undeveloped, natural hillsides; however, a quarry that is no longer in operation is located near the southeast corner of the site. Upper Otay [Lake-Reservoir](#) is located immediately west of the site. Existing

residential development west of the Project site is located more than 1,300 feet from the Project site and would not be incompatible with mineral resource extraction on the property.

Marketability

The geologic mapping and subsurface exploration performed by the Project geotechnical consultant indicates that the site is underlain with several deposits that have the potential to be classified as important mineral resources, including quaternary alluvium, fanglomerate deposits, and metavolcanic rock. The extraction of these resources has the potential to provide an economic benefit to San Diego County. The analysis below provides an evaluation of whether on-site geologic deposits are minable, processable, and marketable under the technologic and economic conditions that exist at present or that are estimated to reasonably exist in the future.

Alluvium

Alluvium is one of the most important mineral resources in San Diego County, as sand and gravel can be easily extracted from this geologic environment and processed for use in construction materials. Alluvial channel soils underlie the drainage courses that traverse the Project site; however, the Project site lacks well developed alluvium deposits, as these soils are limited in occurrence and extent on-site and typically range between 2 and 10 feet thick. Furthermore, preliminary laboratory testing indicates that these soils tend to have deleterious quantities of silts and clays, which would preclude the use of these deposits for fine aggregates. Accordingly, the Project site does not contain significant minable, processable, and marketable deposits of alluvium.

Fanglomerate Deposits

Fanglomerate deposits are a sedimentary rock type that can be quarried for use as construction materials (sand, gravel, crushed rock). Based on the subsurface exploration of the site, the fanglomerate deposits are primarily composed of undersized clastic sedimentary rocks that would not be suitable for commercial use due to composition and weathering. Segregation and processing of these deposits would be arduous and uneconomical, and would produce significant waste. Therefore, on-site fanglomerate deposits are evaluated as a less than significant mineral resource with little potential to be minable, processable, and marketable under existing conditions or reasonably foreseeable future conditions.

Metavolcanic Rock

Metavolcanic rocks can be quarried for use as coarse aggregates, which are typically used during construction as concrete, rip-rap, and decorative and/or dimension stone. Based on the mineral resources technical review, it is likely that on-site metavolcanic rock deposits would not be suitable for economic development as PCC-grade aggregate or Class 1 base and would require deep excavation with excessive overburden and would, therefore, be uneconomical to mine. Accordingly, it is determined that the Project site would produce very limited quantities of rock and related aggregate materials and does not contain significant deposits of minable, processable, and marketable metavolcanic rock.

Minimum Dollar Value

The Project site contains mineral deposits that are highly unlikely to exceed a value of \$12,500,000 because of the relatively low-quality alluvium, fanglomerate, and metavolcanic rock deposits on-site. Furthermore, on-site geologic deposits would be arduous and uneconomical to mine and process. As such, the property would not be a commercially valuable source of construction materials (sand, gravel, crushed rock), and implementation of the Project would result in a *less than significant impact* to mineral resources.

3.4.2.2 Delineated Mineral Resource Recovery Sites

Guidelines for the Determination of Significance

A significant impact to mineral resources would occur due to the following:

- 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.

Rationale for Selection of Guideline

The Significance Guideline for impacts to delineated mineral resource recovery sites is from the County of San Diego Guidelines for Determining Significance – Minerals. It addresses question (b) of Section X in Appendix G of the CEQA Guidelines, and requires identification of projects that would result in the loss of availability of mineral resources on lands zoned as S82 Extractive Use Zone.

Analysis

The Otay SRP designates the Project site as a “specialty village” composed of a resort hotel and related amenities, residential neighborhoods, neighborhood-serving uses, parks, mixed-use, and recreation areas. The Otay SRP does not propose or plan for operation of mineral resource extraction on the Project site. Therefore, any mining operation or mining activity would be inconsistent with the land uses planned for the proposed Project site.

Per the San Diego County Zoning Ordinance, mining and extractive uses are allowed within the S82 (Extractive Use) zone. The southern portion of the Project site is zoned S88 (Specific Plan) and the northern portion of the Project site is zoned S87 (Limited Control). The Project site does not include any territory zoned S82 (Extractive Use). Therefore, implementation of the Project would not result in the permanent loss of availability of a locally important mineral resource recovery site. Therefore, mining activities on the Project site would be inconsistent with the planned land uses and the impact related to a delineated mineral resource recovery site is considered *less than significant*.

3.4.3 Cumulative Impact Analysis

As growth in the region continues, mining and extraction activities are likely to be directly and indirectly impacted by new development. Mineral resources, particularly sand, gravel, and rock are a regional resource and are generally defined by the MRZ map of the County's Production-Consumption Region Boundary as designated by CDMG. As described above in Section 3.4.1.4 of the EIR, MRZ-2 zones are areas where geologic evidence shows the presence of a significant mineral deposit. Implementation of the proposed Project would not result in significant direct impacts to known mineral resources because no mining has occurred on the site. It does, however, contain rock suitable for crushing and used as aggregate in concrete or for road or utility bedding material.

In addition, although the former Jamul Quarry is located nearby to the east, the nearest proposed Project development area is over 1/4-mile from the former quarry site. Planned home sites in the southeast portion of the Project site are located below a proposed cut bank into a ridgeline that forms the southeastern Project boundary (see **Figure 1.0-3**) and are oriented with views toward the southwest. Thus, no residences have a direct line-of-sight relationship to the former Jamul Quarry site should it become operational in the future.

As discussed above, implementation of the proposed Project would not impact mineral resources designated by the CDMG, ~~though it would provide material for export during the site grading process~~. Therefore, *the proposed Project would not contribute to any significant cumulative mineral resource impacts* that may accrue from other projects in the region.

3.4.4 Significance of Impacts Prior to Mitigation

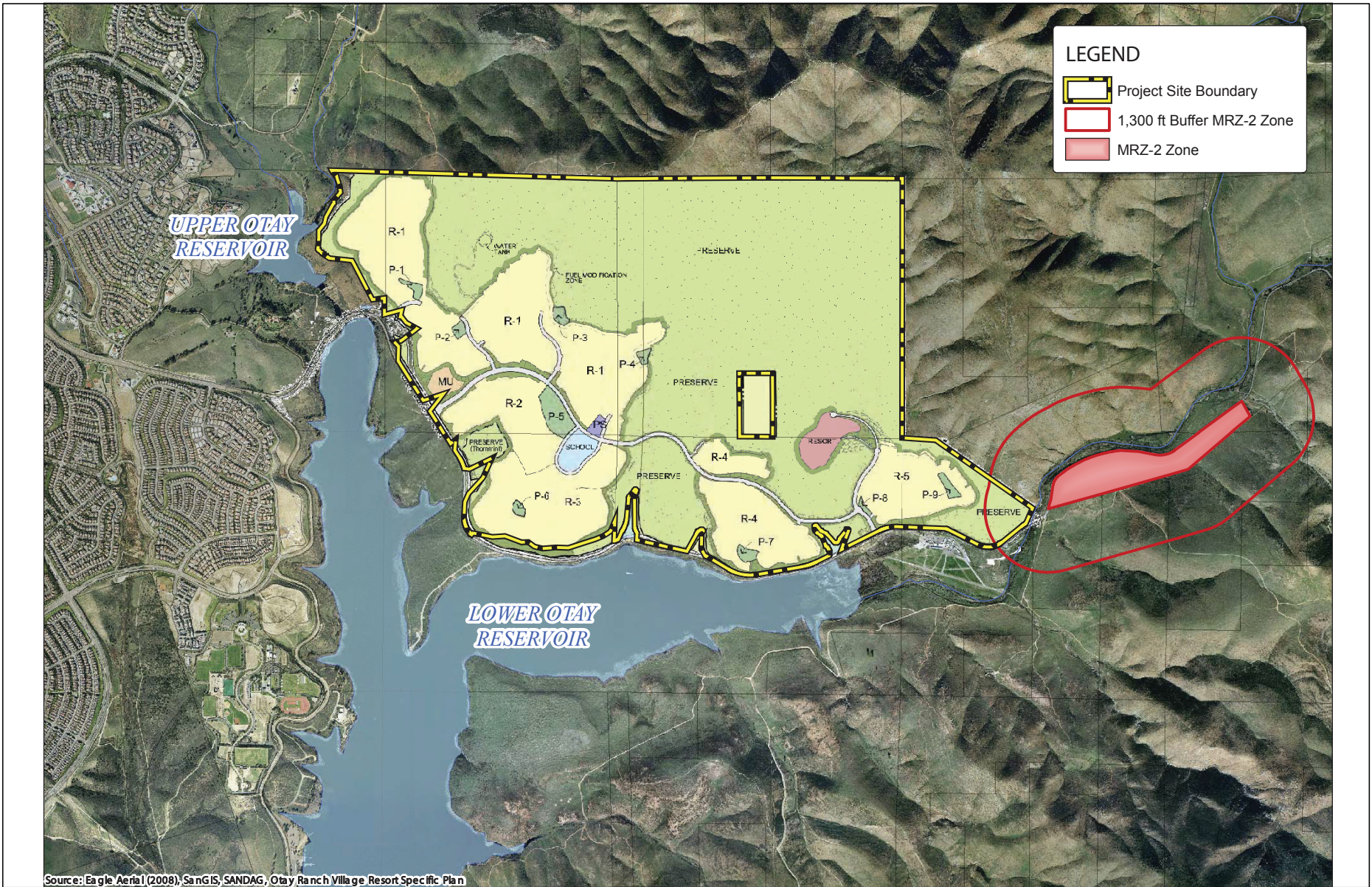
Based on the above analyses, implementation of the proposed Project would not result in any significant direct, indirect, or cumulative impacts to mineral resources.

3.4.5 Mitigation




As discussed above, implementation of the proposed Project would not result in any significant impacts to the availability of mineral resources. Therefore, no mitigation is required.

3.4.6 Conclusion

As discussed above, the Project site has no specific evidence of historic mining activity, lacks sufficient geologic materials for significant mining opportunities, and has no known commercially valuable mineral resources. In addition, the planned land uses and zoning for the Project site preclude mining activity. Therefore, implementation of the proposed Project would not result in loss of availability of a known mineral resource that would be of value to the region; and would not result in the loss of a mineral resource recovery site delineated on an adopted land use plan. Therefore, impacts related to mineral resources resulting from implementation of the proposed Project are considered *less than significant*.



LEGEND

-  Project Site Boundary
-  1,300 ft Buffer MRZ-2 Zone
-  MRZ-2 Zone

Source: Eagle Aerial (2008), SanGIS, SANDAG, Otay Ranch Village Resort Specific Plan

SOURCE: XXX XXXX

Figure 3.4-1
Mineral Resource Zones

