Mineral Resource Technical Report
Cottonwood Sand Mine
PDS2018-MPA-18-023/PDS2018-RP-18-001
JAMACHA, CA

Prepared for:

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Table of Contents

1.0 EXECUTIVE SUMMARY

This report presents the results of our review and assessment of the potential impacts of the Cottonwood Sand Mining project on the availability of Regionally Significant mineral resources for the approximately 250-acre Cottonwood Sand Mining Project in the Rancho San Diego area of San Diego County, Figure 1. This report has been prepared for 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. The scope of services included review of the site location relative to the current Mineral Resource Zonation (MRZ) and classification per the California Geological Survey.

Topographically, the site generally consists of a flat to gently sloping valley bottom situated within the Sweetwater River Valley on the south side of Willow Glen Drive, west of Jamacha Road, Figures 2 and 3. The valley generally runs in an east-west direction and drains in a westerly direction. Granitic rock outcrops dominate the elevated areas adjacent to both the north and south sides of the site. Most of the site includes accumulations of floodplain deposits that include loose sands and gravels, related to the Sweetwater River drainage area (Figure 4). In these areas, adequate information indicates that significant mineral deposits are present, or it is judged that there is a high likelihood for their presence. Accordingly, the California Geological Survey has classified the alluvial portions of the site as MRZ-2; mineral resource prized for their value in concrete applications. The sloping hillside areas bordering the site consist primarily of granitic bedrock. These adjacent areas have been designated as MRZ-3 areas by the California Geological Survey, Figure 6 (SR240).

Successful sand and gravel mining operations are well documented along the Sweetwater River drainage with at least three sites having historically been mined, including the Sloan Canyon Sand Mine (approximately 3 miles to the east); Cottonwood Sand Pit (located adjacent to the project site on the south); and the Nelson & Sloan Sand Pits (located approximately 2 miles to the west). These sites are no longer active.

The project proposes to close an existing golf course operation, followed by removal of alluvial sand and gravel from within a 214-acre portion of a larger 279-acre ownership. The project proposes to be conducted within 3 individual mining phases that will transition from the west to east, recovering approximately 5.7 million tons of PCC sand. Following the completion of each phase of mining, reclamation will begin on the area previously mined. Each phase will then be restored to an end use of open space and recreation trails on the north and south sides.

2.0 INTRODUCTION

2.1 Purpose and Scope

This report presents the results of a review and assessment of the mineral resources for the approximately 250-acre Cottonwood Sand Mining Project in the Rancho San Diego area of San Diego County. The scope of service includes:

- A reconnaissance of the site.

- Review of the site location relative to the current Mineral Resource Zones (MRZ) and classifications per the California Geological Survey Special Report 240.

- 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 project site.
    - A review of all quarries and sand mining sites (both historic and existing) within the vicinity of the 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 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.

This section describes mineral resources on the project site and in the project area and identifies potential impacts to mineral resources that would result from implementation of the proposed project. The analysis is based on existing mineral resources information and guidelines for determining significance contained in the County of San Diego County Guidelines for Determining Significance and Report Format and Content Requirements for Mineral Resources (County Guidelines for Mineral Resources), approved on July 30, 2008.

3.0 Existing Conditions and Land Use History

The project site generally consists of a flat to gently sloping valley that includes accumulations of floodplain deposits (loose sands and gravels) related to the Sweetwater River drainage. Granitic rock outcrops dominate the slopes and ridges on either side of the valley. Sand and gravel mining operations have been conducted at numerous locations along the Sweetwater River valley including several sand mining efforts within the subject property. Previous sand mining operations have resulted in a few sub-grade pits along the edge of the golf course. Subsequent to sand mining, a number of grading permits were issued to establish golf features. These permits allowed the removal of approximately 500,000 tons of alluvial sand.

Sand removal was followed by the placement of fill materials within the golf course. Fill materials originated from offsite sources.

Valle De Oro Community Plan designates the property as Open Space and indicates the goals of preserving open space in project design. Zoning for the property includes S80, Open space; S90, Holding Area; and S88, Specific Plan. The S80 and S90 zoning assignments allow extractive use with the issuance of a Major Use Permit. The S88 zoning districts allows Site Preparation with the issuance of a Major Use Permit.

4.0 Mineral Resource Occurrence

The California Geological Survey (CGS) classifies the regional significance of mineral resources in the state, in accordance with the California SMARA. Mineral Resource Zones (MRZ) are designated to indicate the significance of mineral deposits. The primary goal of classification is to ensure that the mineral potential of land is recognized by local government decision makers and considered before they make land use decisions that could preclude mining. The highest priority areas are those within the state that are subject to urban expansion or other irreversible land uses that would preclude mineral extraction.

The State Mining and Geology Board (SMGB) prioritizes areas to be classified and/or designated. The highest priority areas are those within the state that are subject to urban expansion or other irreversible land uses that would preclude mineral extraction. Areas where such a possibility is perceived to be most severe, such as Western San Diego County, are given highest priority.

The area comprising approximately the western third of the County was classified into distinct Mineral Resource Zones (MRZs) according to the California Mineral Land Classification System in 1982 (San Diego County 2008). This report was subsequently updated in 2017 by Special Report 240.

Special Report 240 classified 167 acres of the 250-acre project site as MRZ-2. This classification is based on drilling and testing information completed in 2006 (TerraMins, Inc., 2006) and relates to the location, quality, and quantity of PCC-grade aggregate (Portland Cement Concrete) as follows:

<u>MRZ-1</u>

MRZ-1 designates 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-1 is applied by the California Geologic Survey to lands where well-developed lines of reasoning, based on economic-geologic principles and adequate data, indicate that the likelihood for occurrence of significant mineral deposits is nil or slight.

<u>MRZ-2</u>

MRZ-2 designates areas underlain by mineral deposits where geologic data indicates that significant measured or indicated mineral 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.

The 1982 classification identified 22 sectors in the unincorporated County as having aggregate deposits, of which 19 are still extractable. MRZ-2 areas or sectors that meet the SMGB's guidelines, are eligible to be designated as having aggregate resources of regional or statewide significance.

A portion of the Cottonwood Sand Mine property was classified as MRZ-2 by the California Geological Survey in 2017 (CGS Special Report 240, 2017). The project site is identified as Sector HH and includes channel and floodplain deposits of the Sweetwater River for an area of 167 acres extending from approximately 1.6 miles along Willow Glen Drive, east of Jamacha Road in the unincorporated community of Rancho San Diego.

MRZ-3

MRZ-3 designates areas that contain known mineral deposits that may qualify as mineral resources. Further exploration work within these areas could result in the reclassification of specific localities into the MRZ-2 category. Most of the rest of the land in the Western San Diego Production-Consumption (P-C) Region is MRZ-3, except a few small areas that are MRZ-4.

MRZ-4

MRZ-4 designates areas where geologic information does not rule out either the presence or absence of mineral resources. The distinction between the MRZ-1 and MRZ-4 categories is important for land-use considerations. The MRZ-4 classification does not imply that there is little likelihood for the presence of mineral resources but rather there is a lack of knowledge regarding mineral occurrence. Further exploration could result in the reclassification of MRZ-4 lands.

5.0 Regulatory Framework

Federal

There are no applicable federal regulations.

State

Surface Mining and Reclamation Act [Public Resources Code §2710-2797]

Urban preemption of prime mineral deposits and conflicts between mining and other uses throughout California led to the passage of the SMARA, which establishes policies for the conservation, development, and reclamation of mineral lands. It also contains specific provisions for the classification of mineral lands by the state Geologist. SMARA requires all cities and counties to incorporate in their general plans the mapped designations approved by the State Mining and Geology Board (SMGB).

Local

County of San Diego General Plan

The County's General Plan, Conservation and Open Space Element (Chapter 5), contains a goal (Goal COS-10) and nine policies (COS-10.1 – COS-10.9) intended to achieve an adequate supply of mineral resources to support economic growth projected under the General Plan, and comply with the requirements of SMARA with regard to the conservation of mineral resources and the permitting and reclamation of mining sites (San Diego County 2011).

County of San Diego Zoning Ordinance [Sections 2800, 2880, and 2900]

Section 2800 (S80 Open Space) of the Zoning Ordinance, describes the intent of the S80 zoning classification that is used to provide appropriate controls for land generally unsuitable for intensive development. Extractive uses are allowed with the issuance of a Major Use Permit.

Section 2880 (S88 Specific Planning Area) of the Zoning Ordinance, describes the intent of the S88 zoning classification that is used to accommodate Specific Planning Area Use Regulations. Site Preparation, an extractive use, is allowed with the issuance of a Major Use Permit.

Section 2900 (S90 Holding Area) of the Zoning Ordinance, describes the intent to prevent isolated or premature land uses from occurring on lands for which adequate public services and facilities are unavailable. Mining and Process is allowed with the issuance of a Major Use Permit.

County of San Diego Grading, Clearing and Watercourses Ordinance

San Diego County Code, Title 8, Division 7 (Sections 87.701 and following), entitled Grading, Clearing, and Watercourses Ordinance, establishes the procedures and protocols related to surface mining activities to implement the minimum requirements associated with SMARA as well as the County's permit requirements for surface mining (San Diego County 2012).

6.0 Analysis of Project Effects and Determination as to Significance

For the purpose of this Mineral Resources technical report, the significance thresholds are based on criteria provided in the County Guidelines for Determining Significance and Report Format and Content Requirements for Mineral Resources (County Guidelines for Mineral Resources), approved July 30, 2008.

6.1 Impact MR-1: Loss of Available Resources and Marketability

Guidelines for the Determination of Significance

Based on the County Guidelines for Mineral Resources, a significant impact would occur with implementation of the proposed project if:

Mineral Resources

6.1.1 The project site is located on or within the vicinity 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;

6.1.2 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,

6.1.3 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	$12,500,000
Industrial and chemical minerals	$2,500,000
Metallic and rare minerals	$1,250,000

Analysis

The proposed project would extract up to 5.7 million tons of Portland Cement Concrete (PCC) grade sand from approximately 214 acres within the 279–acre project site that is located along the Sweetwater River channel.

The proposed project would include the removal and processing of all economically available materials within the project site. Economic limitations are based on the potential collateral impacts that would result from an aggressive sand extraction program that would recover all potentially available resources, while also limiting the likely impacts to sensitive environmental constraints. The project is designed to avoid extraction directly within the river channel in an effort to avoid impacts to the hydraulic functions of the Sweetwater River channel and State and Federally regulated waters, plus eliminate the potential for impacts to water conveyance by Sweetwater Authority. Although extraction below the water table is anticipated in two areas of the site, areas of open water will be backfilled to eliminate the potential for open water evaporation.

High-quality aggregate resources that are present in the project site are known to be in short supply in San Diego County and, as a result, have the potential to be extremely marketable (San Diego County 2008). A 2017 study published by the State of California (California Geological Survey Special Report 240) upgrades the classification from MRZ-3 to MRZ-2 for 167 acres (Sector HH) of the project site. The change in classification was based on a geological investigation completed in 2004. However, no estimate of the quantity of resources found on the site is provided in the CGS report. The volume of material to be extracted by the Project (5.7 million tons) was determined by a drilling program designed to identify the presence of economically available materials within the project site.

Assuming a price of $15.00 per ton, a density of 0.055 ton per cubic foot, and a waste factor of approximately 20 percent, the gross value of the total 5.7-million tons of aggregate material mapped as MRZ-2 is estimated to be approximately

$68,400,000.

6.2 Impact MR-2: Loss of Locally Important Mineral Resource

Guidelines for the Determination of Significance

Based on the County Guidelines for Mineral Resources, a significant impact would occur with implementation of the proposed project if it 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.

Analysis

As discussed above, the onsite mineral resources are known to be in short supply in San Diego County. Per the County's Zoning Ordinance, approximately 243 acres of the project site are zoned as S90, Holding Area Use Regulations, approximately 32 acres are zoned as S88, Specific Planning Area, and approximately 4 acres are zoned S80, Open Space. The proposed project would extract all economically available mineral resource within the project site during the proposed 10-year mining period. The proposed end uses following mining, include the creation of native plant communities with recreational trails and other uses allowed by the General Plan and Zoning Ordinance.

Future mining activities would not be anticipated because all economically available resources would have been extracted by the proposed Project. For this reason, the Project would not be expected to result in significant impacts to mineral resources.

6.3 Cumulative Impact Analysis (Impact MR-3 and MR-4)

Impact MR-3: Loss of Available Resources and Marketability

The geographic context for the analysis of cumulative impacts in regard to mineral resources is considered to be San Diego County. According to the County General Plan, a California Geological Survey report (Special Report 240) provided an estimate of aggregate consumption in the western San Diego region and concluded that in order to satisfy the future demand of aggregate through the year 2065, approximately 760-million tons of aggregate would be needed. This report estimates that 271-million tons of permitted aggregate resources were available in the County, which would meet only 36 percent of the projected 50- year demand. In addition, the 1996 report concluded that it would not be possible to mine all identified resources, as access to these resources could become restricted by competing conservation measures such as the Multiple Species Conservation Plan (MSCP) (San Diego County 2011). In order to meet aggregate demand within the County, substantial volumes of aggregate are being imported from sources outside the County, which has increased the price of aggregate due to high transportation costs (County of San Diego 2011).

A cumulative impact would occur if other cumulative development projects would result in the loss of available and marketable mineral resources in areas of the county classified as MRZ-2 or MRZ-3. Development of cumulative projects could

result in the loss of mineral resources, including but not limited to, constructing impervious surfaces on a site, which would preclude future mining activities, or dedication of open space, conservation easements, MSCP designations, or something similar, which would preclude the site from future mining activities. As stated above the geographic context for cumulative impacts to mineral resources is county-wide. Development projects throughout the County have eliminated access of available marketable resources and comprise a cumulative impact.

As described above in Section 2.5.2 the proposed project does not have a direct impact on the loss of availability of a marketable mineral resource and therefore, does not contribute to a loss of availability of marketable mineral resources. As a result, the project does not contribute to a cumulatively considerable significant impact regarding the loss of availability of marketable mineral resources**.**

Impact MR-4: Loss of Locally Important Mineral Resource

Cumulative development activities in the County, in conjunction with the limited availability of local mineral resources, have resulted in a short supply of locally available construction aggregate resources. Development projects within the County have reduced the supply and accessibility of locally important mineral resources within the County. However, implementation of the project recovers all economically available MRZ-2 resources found on the project site. Therefore, no significant cumulative impact exists regarding the availability of locally important mineral resources.

The project is proposed to extract up to approximately 5.7 million tons MRZ-2 resources; which is the total quantity of resources available at the site.

6.4 Significance of Impacts Prior to Mitigation

The following is a summary of impacts related to mineral resources would occur with project implementation:

Impact MR-1: The proposed project is located on a site primarily classified as MRZ-2 and would result in recovery of all economically available mineral resources. No impacts are anticipated.

Impact MR-2: Implementation of the proposed project will result in the extraction of all economically available, locally important mineral resources found on the project site. The Classification of the resource as MRZ-2 by the California Geological Survey was completed after the County's General Plan was adopted and is not identified, therein. Because the project would recover all economically available mineral resources present on the project site, no impacts related to the recovery of mineral resources have been identified.

Impact MR-3: Implementation of the proposed project in combination with other past, present, and anticipated development projects in the County will recover all economically available resources on the project site. Recovery of these resources reduces the potential for a cumulative resource recovery loss that results from a variety of competing regulations.

Impact MR-4: Implementation of the proposed project would recover all economically available resources on the project site. In contrast to other past, present, and anticipated development projects that would limit recovery of important mineral resources, and therefore limit the availability of local mineral resources in the County, the project would recover all economically available resources on the project. As a result, no cumulatively considerable significant impact related to the loss of locally important mineral resources would occur.

6.5 Conclusion

No Impacts have been identified. The proposed project would extract up to approximately 5.7-million tons of locally important mineral resources from the Sweetwater River channel. The quantity of resources proposed for recovery by the project includes all economically available resources on the project site.

7.0 References

California Geological Survey Department of Conservation. Special Report 240. Update of Mineral Land Classification: Portland Cement Concrete-Grade Aggregate In the Western San Diego County Production-Consumption Region, California. 2017.

County of San Diego, Department of Planning and Land Use (DPLU), 2007a, Guidelines for Determining Significance and Report Format and Content Requirements, Mineral Resources, dated July 30, 2007.

Attachment:

Figures

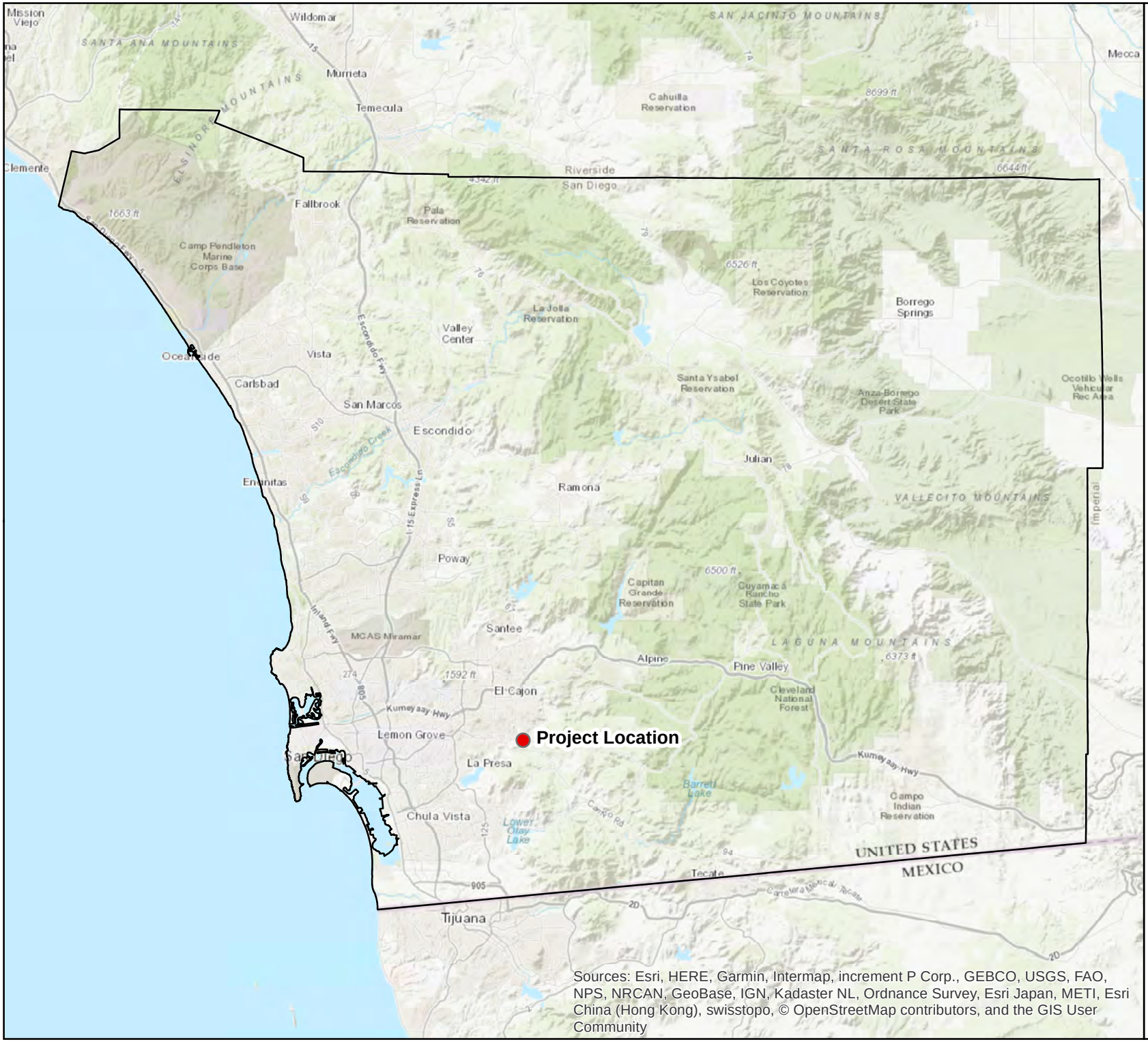

Figure 1
Cottonwood Sand Mine
Site Location Map

Legend

County Boundary

N
W
E
S

0 5 10 Miles

1 in = 11 miles

EnviroMINE Inc.

Date: 3/11/2020

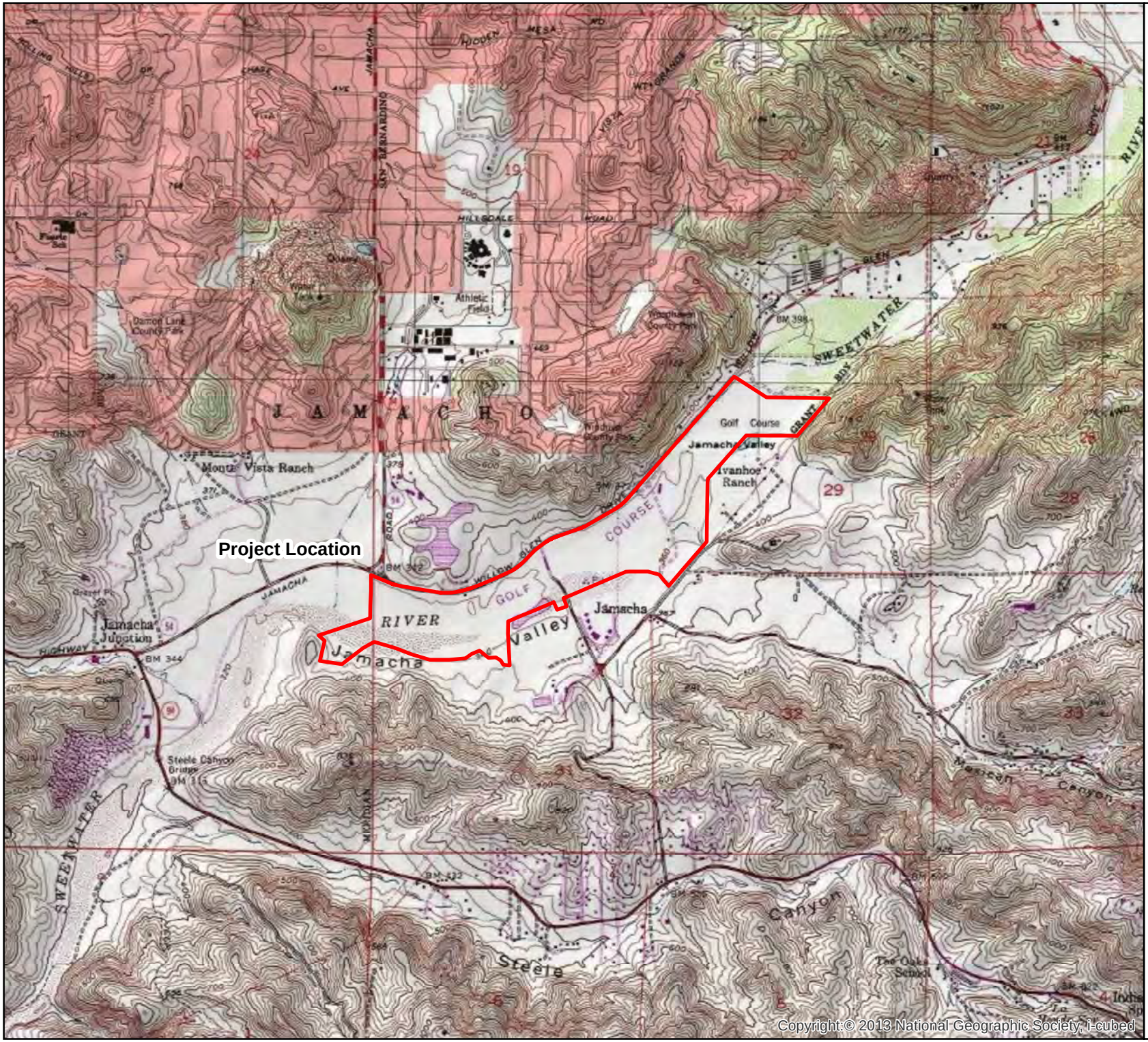

Figure 2
Cottonwood
Sand Mine
USGS Topo Map

Legend

Project Location

N
W E
S

0 0.225 0.45 Miles

1 in = 0 miles

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Date: 3/11/2020

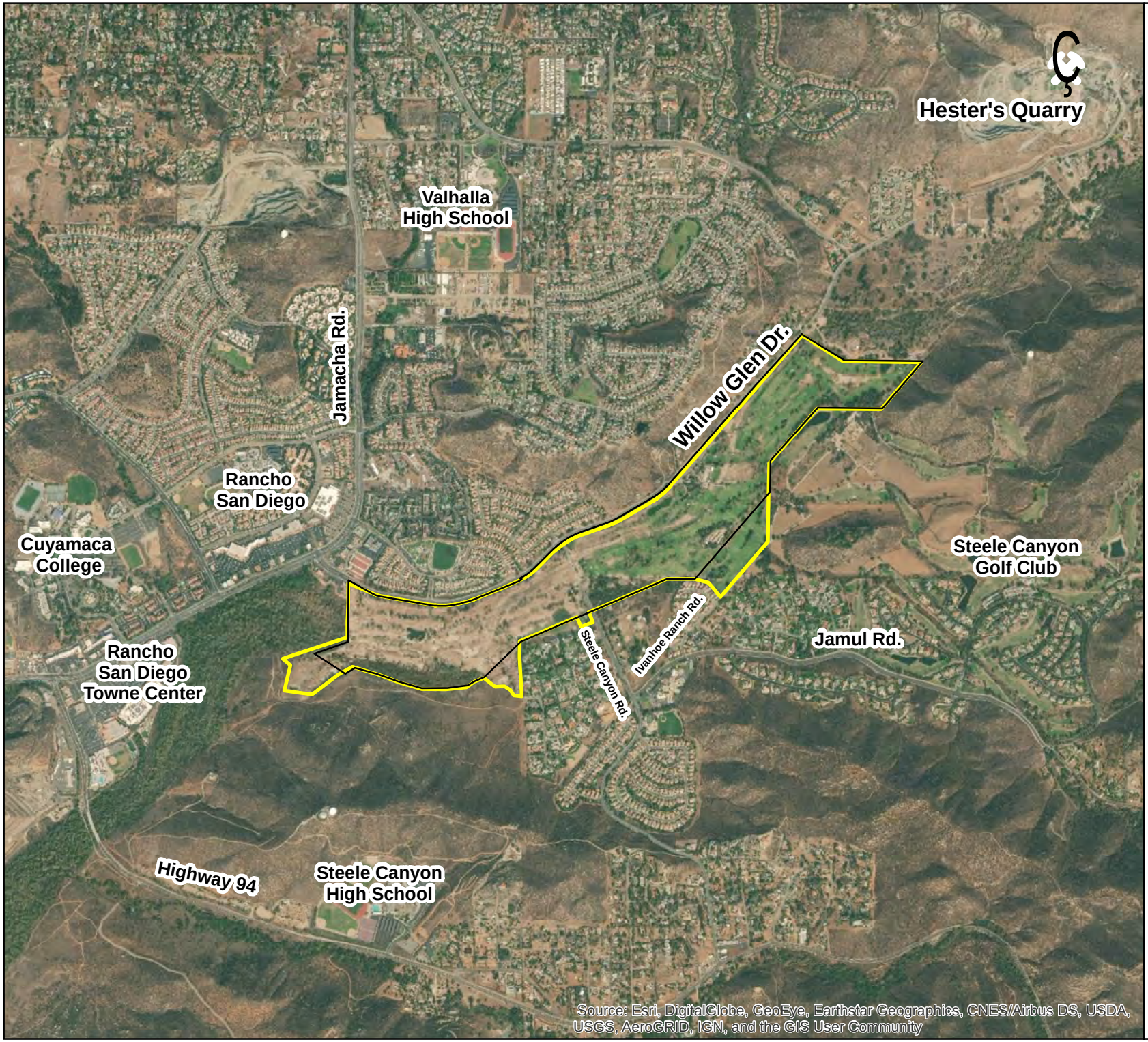

Figure 3
Cottonwood
Sand Mine
Proposed Project
Location Map

Legend

- MUP Boundary
- Property Boundary

N
W E
S

Feet
0 1,500

1 in=2,000 feet

EnviroMINE Inc.

Date: 3/11/2020

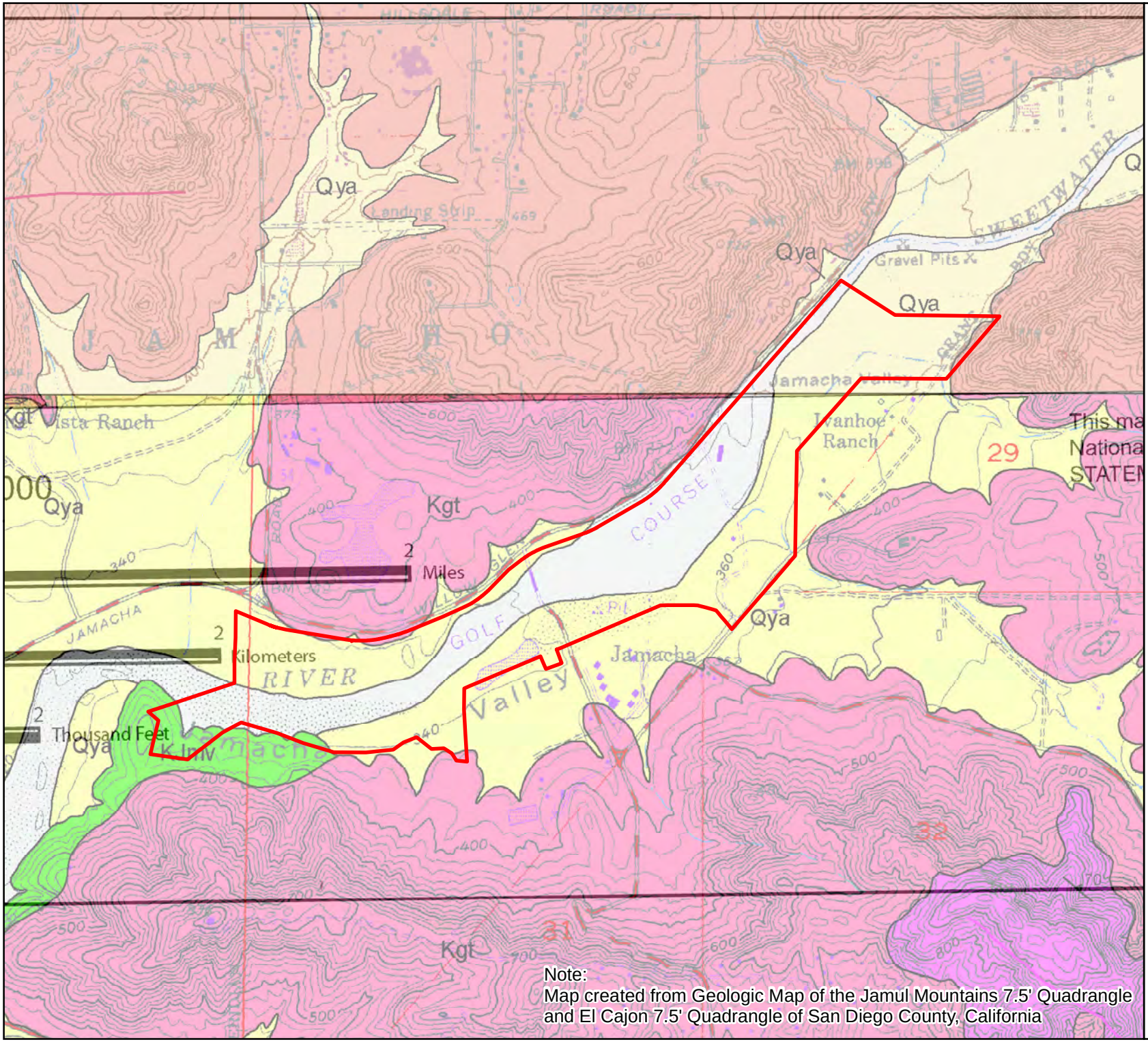

Figure 4
Cottonwood Sand Mine
Regional Geology Map

Legend

Project Boundary

DESCRIPTION OF MAP UNITS

N
W
E
S

Feet
0
1,500

1 in=1,500 feet

EnviroMINE Inc.

Date: 3/11/2020

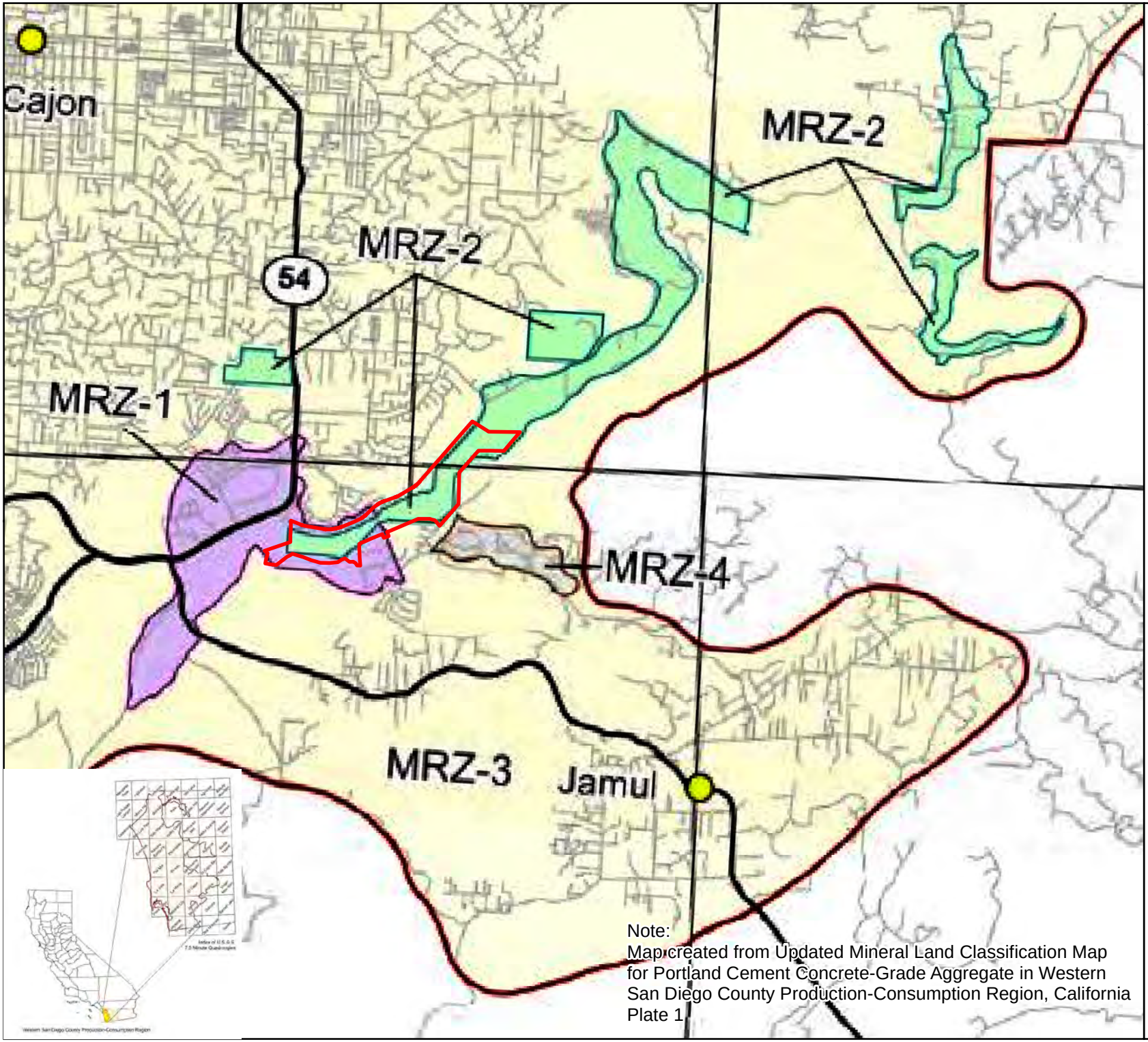

Figure 5
Cottonwood
Sand Mine
State Mapped Mineral
Resource Zones
(from SR-240)

Legend

Project Boundary

MRZ-1: Areas where available geologic information indicates that little likelihood exists for the presence of significant mineral resources

MRZ-2: Areas where geologic information indicates that significant measured or indicated Portland Cement Concrete-grade aggregate resources are present.

MRZ- 3: Areas containing known or inferred mineral occurrences of undetermined mineral resource significance

MRZ-4: Areas where available information is inadequate to assign to any other MRZ category

Western San Diego County P-C Region

City/Town

Interstate Highway

State Highway

Major Road

Secondary Road

County Boundary

International Boundary

N
W
E
S

Feet
0
5,000

1 in=5,000 feet

Note:
Map created from Updated Mineral Land Classification Map for Portland Cement Concrete-Grade Aggregate in Western San Diego County Production-Consumption Region, California Plate 1

EnviroMINE Inc.

Date: 3/11/2020