PRELIMINARY GEOTECHNICAL ASSESSMENT

DAVIS INNOVATION CENTER

YOLO COUNTY, CALIFORNIA

Submitted to:
SKK Developments
c/o John Hodgson
The Hodgson Company
1117 18th Street
Sacramento, CA 95811

Prepared by:
ENGEO Incorporated

October 20, 2014

Project No:
11626.000.000

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c/o John Hodgson
The Hodgson Company
1117 18th Street
Sacramento, California 95811

Subject: Davis Innovation Center
Yolo County, California

PRELIMINARY GEOTECHNICAL ASSESSMENT

Dear Mr. Hodgson:

We are glad to present this preliminary geotechnical assessment report of the subject site located in Yolo County, California. The purpose of this report is to identify potential geotechnical and geologic constraints for planning purposes. This report presents findings and conclusions based on our review of available literature, aerial photographs, topographic maps, geologic maps, and in-house geotechnical reports pertinent to the site.

If you have any questions or comments regarding this report, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

Paul Cottingham, CEG

Mark Gilbert, GE

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

ENGEO prepared this preliminary geotechnical assessment report for the Davis Innovation Center in Yolo County, California. The purpose of this report is to identify potential geotechnical and geologic constraints for planning purposes. This report presents the results of our review of available literature, aerial photographs, topographic maps, geologic maps, and in-house geotechnical reports pertinent to the site. No subsurface exploration was performed.

For our use, we received a Preferred Land Use Plan exhibit for the Davis Innovation Center by AECOM, dated September 26, 2014.

This report was prepared for the exclusive use of our client and their consultants for planning purposes. In the event that any changes are made in the character, design or layout of the development, we must be contacted to review the conclusions contained in this report to determine whether modifications are necessary. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without our express written consent.

1.2 PROJECT DESCRIPTION

1.2.1 Project Location

The approximately 207-acre project site is located north of West Covell Boulevard and west of John Jones Road (fronting Highway 113) in Yolo County, California. Figure 1 displays a Site Vicinity Map showing the limits of the site.

The Sutter Hospital and a City of Davis water tank are located to the east and south of the site. Additionally, residential developments are located south and north of the site with agricultural land to the west and north.

1.2.2 Project Overview

As shown on the Land Use Plan, Figure 2, preliminary development plans include a hotel, convention center, 3- to 6-story tech offices, 2- to 3-story flex space building, and retail. The project will likely also include detention basins and open space.

2.0 FINDINGS

2.1 AERIAL PHOTOGRAPH REVIEW

We reviewed historic aerial photographs of the subject site for numerous years between 1957 and 2014. Aerial photographs showed the site has been used as agricultural land. We summarize our aerial photo observations below:

- 1957 – A residence with multiple structures was located in the southeast corner of the site. The remainder of the site was farmed fields with various irrigation ditches generally along field boundaries.

- 1968 – A small basin or pond appeared in the central portion of the site. The residential development appeared to the north of the site.

- 1974 –Irrigation ditches appeared reconfigured in the northern portion of the site.

- 1993 – Grading began for the Sutter Hospital to the east.

- 1998 – An east-west oriented soil stockpile appeared in the central portion of the site.

- 2003 – A large structure in the southeast corner of the site was removed. The City of Davis water facility appeared to the east and south of the site. Irrigation ditches appeared reconfigured in the northern portion of the site.

- 2005 –Irrigation ditches appeared reconfigured again in the northern portion of the site. A paved road appeared oriented east-west though the northern portion of the site.

- 2006 – The remaining structures in the southeast corner of the site had been removed.

- 2010 – The former residence area in the southeast corner of the site appeared to be utilized as a parking lot and construction yard. Improvements to this area appeared to include asphalt and gravel areas and a small detention pond.

- 2011 – The parking lot and construction yard in the southeast corner of the site was removed.

- 2014 – Irrigation ditches in the northern portion of the site appeared to have been removed.

Figure 3, Site Features, depicts key site features observed in the aerial photographs.

2.2 TOPOGRAPHIC MAP REVIEW

We reviewed historic topographic maps with dates ranging from 1907 and 1992. We summarize our observations below:

- 1907 – Buildings were mapped in the southwest and east edges of the site. Roads were mapped along the current alignments of West Covell Boulevard and Highway 113.

- 1915 – A drainage ditch was mapped from the east edge of the site to the southeast.

- 1952 – Three buildings were mapped near the southeastern portion of the site. Previous buildings were not mapped. A well was mapped in the southwest corner of the site. An irrigation ditch extended north and east from the well.

- 1968 – The residential development was constructed on the neighboring land to the north.

- 1975 – Highway 113 and the Covell Boulevard interchange were mapped as newly developed.

- 1992 – The Davis City limit line was mapped along the east edge of the site.

2.3 SITE RECONNAISSANCE

We performed a reconnaissance on October 14, 2014 to observe the surface conditions at the site. We summarize our observations as follows:

- The majority of the site was disked and relatively free of grass and weeds. In the disked areas, the soil was easily penetrated with the hand probe approximately 12 inches.

- In general, surface soil appeared to be silty clay with moderate to high plasticity. Soil was generally a grayish color over the majority of the site and reddish brown in the northwest portion.

- An east-west oriented stockpile was located in the central portion of the site. The stockpile was approximately 4 to 6 feet tall, about 1,000 feet long, and about 50 to 70 feet wide.

- Irrigation ditches were located as depicted on Figure 3 and were approximately 2 to 3 feet deep. In some locations, extensive desiccation cracking was apparent in the bottom of the ditches.

- The former residence/construction yard area in the southeast corner of the site was covered with thick weeds and appeared to be slightly higher than the field to the north. Portions of this area were covered with gravel as well as broken concrete fragments.

- An irrigation well was located in the southwest corner of the site and a smaller irrigation well was located in the western edge of the site near John Jones Road.

- An east-west oriented asphalt concrete road lined with palm trees extended west from John Jones Road into the site. The entrance included walls and a gate. Electricity and communication vaults were located near the end of the road. We observed extensive cracking in the asphalt parallel to the road edge, likely caused by expansive soil.

Disked Field Looking North

Desiccation Cracking in Irrigation Ditch

Soil Stockpile, Looking West

Palm Tree Lined Road, Looking East

2.4 GEOLOGIC CONDITIONS

2.4.1 Regional Geologic Setting

The site is located in the Great Valley geomorphic province. The Great Valley is an elongate, northwest trending structural trough bound by the Coast Range on the west and the Sierra Nevada on the east. The Great Valley has been and is presently being filled with sediments primarily derived from the Sierra Nevada.

2.4.2 Geologic Units

The following geologic units are mapped at the site (Helley, 1985) as shown on Figure 3, Geologic Map.

Quaternary (Holocene) Basin Deposits (Qb) – This relatively young deposit (less than 10,000 years old) consists of dark grey to black silt and clay deposited by modern day alluvial processes with thickness that can range from 3 feet to 120 feet. This deposit underlays the majority of the site.

Upper Modesto Formation (Qmu) – The Upper Modesto Formation is an alluvial deposit that generally consists of unweathered gravel, sand, silt, and clay derived primarily from the Tioga glaciation in the Sierra Nevada. The sediments in this formation are typically very stiff or dense. This formation is mapped in the southern portion of the site.

Lower Modesto Formation (Qml) – The Lower Modesto Formation is an alluvial deposit similar to the Upper Modesto Formation, except older and slightly more weathered with an increased clay content from more advanced soil development. The weathering of this deposit commonly results in a distinct reddish color. This formation is mapped in the northwest portion of the site.

2.4.3 Groundwater Conditions

Based on review of groundwater elevation data from the California Department of Water Resources (DWR) water data library, groundwater is likely 10 to 40 feet deep in the site vicinity.

We summarize the recent DWR groundwater data in the table below:

TABLE 2.4.3-1
Groundwater Data

State Well No.	Approximate Distance From Site (feet)	Groundwater Depth Below Ground Surface (feet)	Year Recorded
08N02E04E001M	800	11	1986
		40	1991
09N02E32M001M	3,800	12	2006
		38	2013
08N01E01J002M	6,700	24	2011
		33	2014

Fluctuations in the level of groundwater may occur due to variations in rainfall, irrigation practice, well pumping, and other factors.

2.4.4 Regional Seismicity

The site is not located within a currently designated Alquist-Priolo Earthquake Fault Zone and no known surface expression of active faults is believed to exist within the site. Fault rupture through the site, therefore, is not anticipated.

The site does lie within a seismically active region, as California has numerous faults that are considered active. Generally, a fault is considered active if it has ruptured within the Holocene epoch (11,700 years before present). The following table summarizes the distances to mapped, active regional faults and estimated maximum magnitude within approximately 50 miles using the USGS Spatial Query tool. Refer to Figure 3 for a Regional Faulting and Seismicity Map that depicts nearby active faults and historic earthquake epicenters and magnitudes.

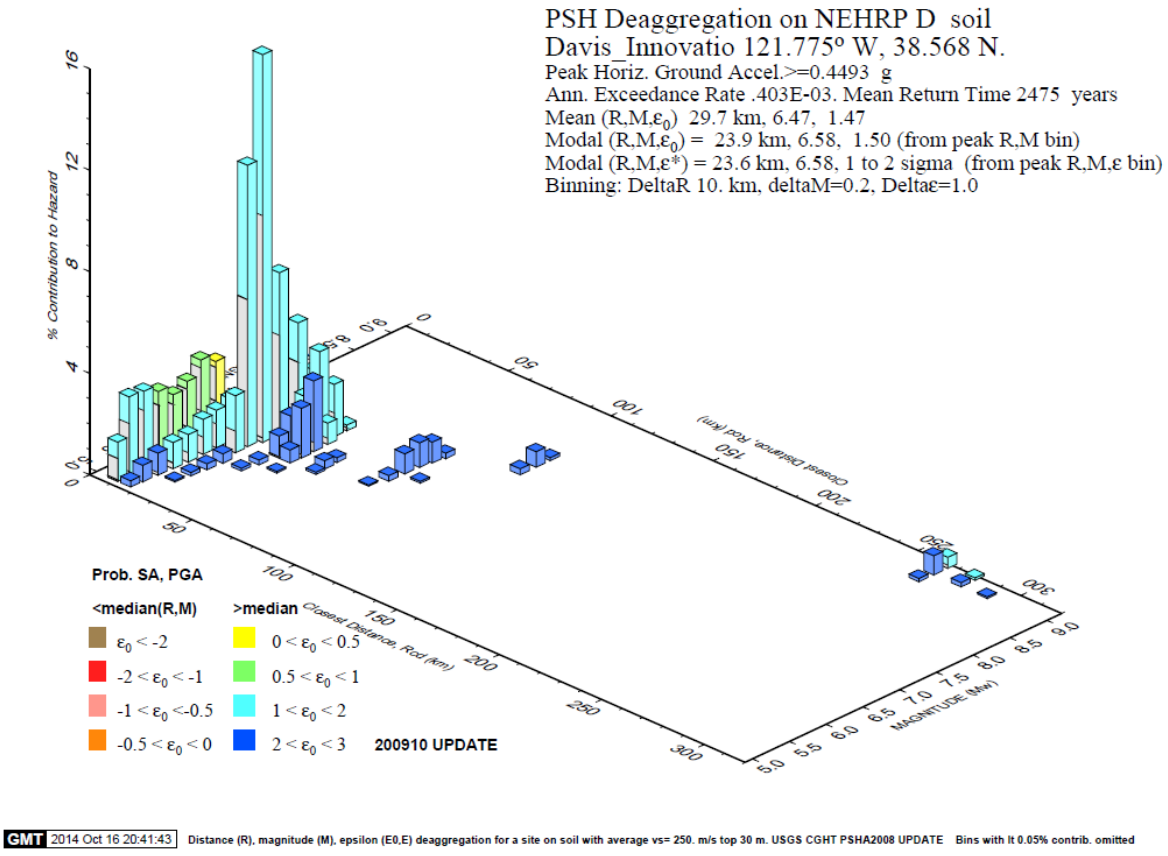
TABLE 2.4.4-1
Distances to Mapped 2008 USGS Regional Active Faults*

Fault	Approximate Distance (miles)	Maximum Moment Magnitude (Avg. of Hanks and Ellsworth)
Great Valley 4a, Trout Creek	12	6.5
Great Valley 4b, Gordon Valley	15	6.7
Great Valley 3, Mysterious Ridge	17	7.0
Great Valley 5, Pittsburg Kirby Hills	22	6.6
Hunting Creek-Berryessa	24	7.0
Green Valley Connected (Concord)	25	6.7
West Napa	34	6.6
Great Valley 2	45	6.4
Bartlett Springs	47	7.3
Greenville Connected	47	6.9
Hayward-Rodgers Creek RC+HN+HS	47	7.3
Hayward-Rodgers Creek HN+HS	48	6.9
Maacama-Garberville	50	7.4
Mount Diablo Trust	50	6.6

* The USGS 2008 National Seismic Hazard Maps were used to develop the 2013 California Building Code seismic parameters.

The Foothill Fault System, located as close as 43 miles from the site, is not mapped in the USGS database and is not considered active, but could be capable of a large magnitude earthquake.

Probabilistic seismic hazard analysis (PSHA) combines the probabilities of all earthquake scenarios with different magnitudes and distances with predictions of resulting ground motion intensity, to compute seismic hazard. The 2008 USGS Interactive Deaggregation tool results are shown below for the site.



2.5 GEOTECHNICAL DATA

We reviewed various in-house reports in the Davis region. Our review indicates that surface clays in the region can exhibit moderate to high shrink/swell potential with variations in moisture content. Additionally, young Quaternary deposits (such as Holocene Basin Deposits mapped over the majority of the site) could be potentially compressible under new loads. The Upper and Lower Modesto Formations (mapped in the northern and southern portions of the site) generally consist of relatively dense sandy, silty, and clayey material.

2.6 GEOLOGIC AND GEOTECHNICAL HAZARDS

2.6.1 Seismic Hazards

Seismic hazards can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. Common secondary seismic hazards include ground shaking, ground lurching, soil liquefaction, lateral spreading, tsunamis, and seiches. Our opinions regarding the risks of these primary and secondary hazards are provided below.

Ground Rupture. Since there are no known active faults crossing the project site and it is not within a designated Alquist-Priolo Special Study Zone, the risk of ground rupture is considered low, in our opinion.

Ground Shaking. An earthquake of moderate to high magnitude generated within the region could cause considerable ground shaking at the project site. To mitigate the shaking effects, all structures should be designed using sound engineering judgment and the latest California Building Code (CBC) requirements as a minimum. The site may experience different levels of ground shaking as a result of varying soil types and depth to bedrock. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake; however, it is reasonable to expect that a well-designed and well-constructed structure will not collapse in a major earthquake (SEAOC, 1996).

Liquefaction. Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary loss of shear strength because of pore pressure buildup under the cyclic shear stresses associated with ground shaking from earthquakes. Based on the fine-grained silt and clay anticipated in the Quaternary Basin deposits and the relatively dense nature of the Upper and Lower Modesto formations, the risk of liquefaction is considered low, in our opinion. This should be confirmed during a design-level geotechnical study.

Lateral Spreading. Lateral spreading is a failure within a nearly horizontal soil zone due to liquefaction or cyclic softening, which causes the overlying soil mass to move toward a free face, or down a gentle slope. Based on the relatively flat topography in the vicinity of the site, it is our opinion that the risk of lateral spreading is negligible.

Ground Lurching. Ground lurching is a result of the rolling motion imparted to the ground surface during energy released by an earthquake. Such rolling motion can cause ground cracks to form in weaker soils that can be damaging to improvements. The potential for the formation of these cracks is considered greater at contacts between thick alluvium and shallow bedrock. Based on the depth to bedrock and vicinity to active faults, the risk of ground lurching impacts is negligible, in our opinion.

Tsunamis and Seiches. Tsunamis are long sea waves, generated by sea floor displacements associated with earthquakes. These waves can reach great heights when they encounter shallow water. Based on the vicinity of the site to the ocean and review of California Geologic Survey Tsunami Inundation Maps, it is our opinion that the risk of tsunami inundation is negligible.

2.6.2 Expansive Soil

Based on our geologic review and review of limited subsurface data we anticipate expansive soil may be encountered in project component locations. Expansive soils change in volume with changes in moisture. They can shrink or swell and cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations.

2.6.3 Weak and Compressible Soils

Holocene Basin Deposits are mapped underlying the majority of the site. These deposits could be potentially weak and compressible under new loads.

2.6.4 Existing Fills

Based on our aerial photograph review and site reconnaissance, we identified an existing fill stockpile in the central portion of the site. In addition, it appears historic irrigation ditches throughout the northern portion of the site have been filled. Non-engineered low density stockpiled fills can undergo excessive settlement, especially under new fill or building loads.

2.6.5 Shallow Groundwater

Groundwater is reported in the area as shallow as 10 feet from the ground surface. Depending on the proposed improvement depths at the site, shallow groundwater could affect the development. It is possible that dewatering could be necessary during deep utility installation.

2.6.6 Excavatability

Based on our review and our experience in the area, conventional earthwork equipment will be able to excavate the deposits underlying the site, in our opinion.

2.6.7 Landslides

Landslides are the downslope movement of earth materials and can cause severe damage to buildings or improvements. The primary factors contributing to landslide occurrence are over-steepened slopes, low strength earth materials, changes in vegetation, and pore water pressure. Based on the relatively flat topography of the site and surrounding areas, it is our opinion that the risk of landsliding is negligible.

2.6.8 Volcanic Hazards

Volcanic hazards include lava flows, eruption blasts, pyroclastic flows, lahars, and ash fall. We reviewed the map titled “Areas subject to potential hazards from future eruptions in California” from the U.S. Geological Survey Bulletin 1847, 17p (Miller, 1989). Based on this map, the Davis area is not located within a potential volcanic hazard zone.

2.6.9 Soil Erosion or Loss of Top Soil

Considering site topography and current land uses, the proposed project will not likely cause an increase in erosion or loss of top soil at the site. During construction a stormwater pollution prevention plan (SWPPP) and erosion control plan for the project should be incorporated in accordance with State of California requirements.

2.6.10 Naturally Occurring Asbestos

Naturally occurring asbestos (NOA) is a fibrous mineral that occurs naturally in rocks and soil in some locations within California. Generally, NOA is associated with ultramafic or altered volcanic rock formations. Natural weathering and human activities may disturb NOA-bearing rock or soil and release mineral fibers into the air, which pose a human heath risk by inhalation. We reviewed the Division of Mines and Geology report titled "A General Location Guide for Ultra Mafic Rocks in California – Areas more likely to Contain Naturally Occurring Asbestos" dated August 2000. Based on this map and distance from bedrock, it is our opinion that the risk of encountering NOA at the site is low.

2.6.11 Flooding

The City of Davis is located in a historic flood plain and is protected from flooding by levee systems along the Sacramento River, Yolo Bypass, Putah Creek and other tributaries. The FEMA Flood Insurance Rate Map (FIRM) number 06113C0584G, dated June 18, 2010, identifies the majority of the site in Zone A, which is mapped as "subject to inundation by the 1-percent-annual chance flood". Based on this map, the site would be subject to flooding.

2.7 CONCLUSIONS

Based on our document review, we conclude that the proposed Davis Innovation Center project is feasible from a geotechnical and geologic perspective. The primary geologic and geotechnical hazards that will likely impact the project are:

- Seismic ground shaking
- Compressible soils
- Expansive soil
- Flooding
- Existing Fills

The geotechnical and geologic hazards described in this report are commonly encountered in California. These hazards can be successfully mitigated using proper engineering and construction techniques.

A site-specific geotechnical report should be performed for design of the project. The design-level geotechnical report should include subsurface exploration, laboratory testing and engineering analysis. Based on the results of the site-specific analysis, the design-level report should address:

- Geotechnical Conditions
- Seismic Hazards
- CBC Seismic Parameters
- Earthwork Recommendations
- Foundation Recommendations
- Pavement Recommendations

The geotechnical report should include a summary of the site, soil, and groundwater conditions, seismicity, laboratory test data, exploration data and a site plan showing exploratory locations and improvement limits. The report should be signed by a licensed California Geotechnical Engineer.

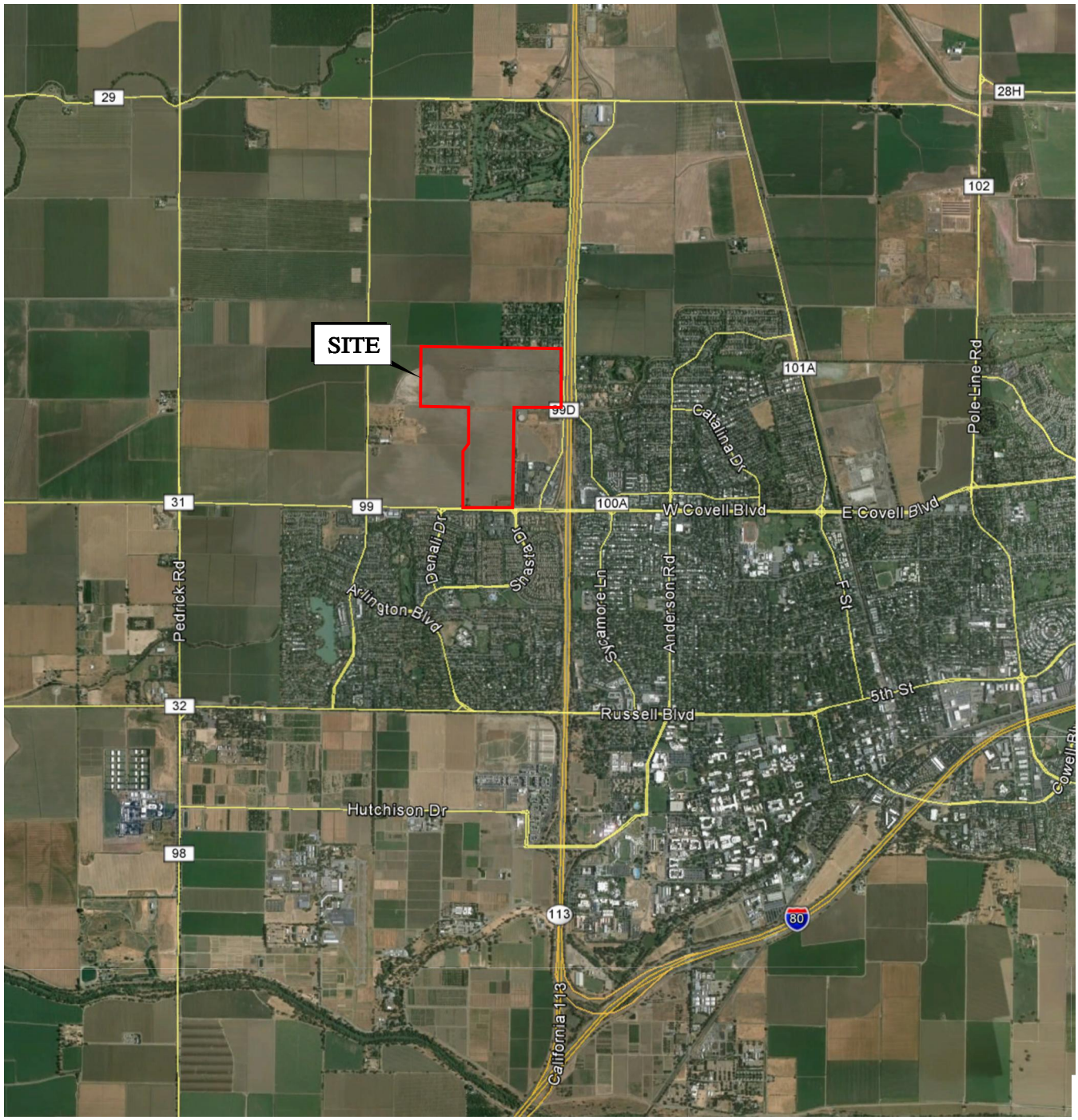
3.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

We strived to perform our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty is expressed or implied. This report is based upon review of limited available data in the site vicinity; no exploration was performed to determine the actual subsurface soil and groundwater conditions at the site.

If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional information and opinions, if any. It is the responsibility of the owner to transmit the information in this report to the appropriate organizations or people involved. The conclusions contained in this report are solely professional opinions and are valid for a period of no more than 2 years from the date of report issuance. This document must not be subject to unauthorized reuse, that is, reusing without written authorization of ENGEO. Such authorization is essential because it requires ENGEO to evaluate the document's applicability given new circumstances, not the least of which is passage of time.

FIGURES

FIGURES



BASE MAP SOURCE: GOOGLE EARTH PRO

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VICINITY MAP

DAVIS INNOVATION CENTER

DAVIS, CALIFORNIA

PROJECT NO.: 11626.000.000		FIGURE NO. 1
SCALE: AS SHOWN		
DRAWN BY: SRP	CHECKED BY: PC	

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ORIGINAL FIGURE PRINTED IN COLOR

LEGEND

- HOSPITALITY
- DETENTION
- OPEN SPACE/ MULTI-PURPOSE DRAINAGE FEATURES
- TECH OFFICES
- FLEX SPACES
- OFF-STREET BIKE TRAIL
- BIKE OVERCROSSING
- PROJECT SITE BOUNDARY

Development Land Use Summary

Land Use	Allocated Acres	% of Land Use	Potential Building Sq. Ft	Potential FAR	Building Type	SF per Employees	Potential Total Employees
Hotel/Exhibition/Visitor Center	3.9	2%	200,000	1.18	Hotel- 200 bed, convention center, demonstration space, restuarants	800	250
Tech Office	91.2	44%	3,000,000	0.76	3-6 stories of traditional tech offices, R&D work spaces, incubation spaces for start-ups, and other ancilliary employee-oriented retail/supporting services (such as, resturants, investment firms, paralegal services, day-care etc)	250	12000
R&D/Flex space	43.6	21%	800,000	0.42	2-3 story large floor plate flex spaces, R&D labs	300	2667
Open space/ landscaping/ drainage	52	25%					
Roads/Circulation	16.3	8%					
TOTAL	207	100%	4,000,000				14,917

N

0 FEET 500

0 METERS 250

BASE MAP SOURCE: SKK DEVELOPMENTS

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LAND USE PLAN
DAVIS INNOVATION CENTER
DAVIS, CALIFORNIA

PROJECT NO.: 11626.000.000
SCALE: AS SHOWN
DRAWN BY: SRP CHECKED BY: PC

FIGURE NO. 2

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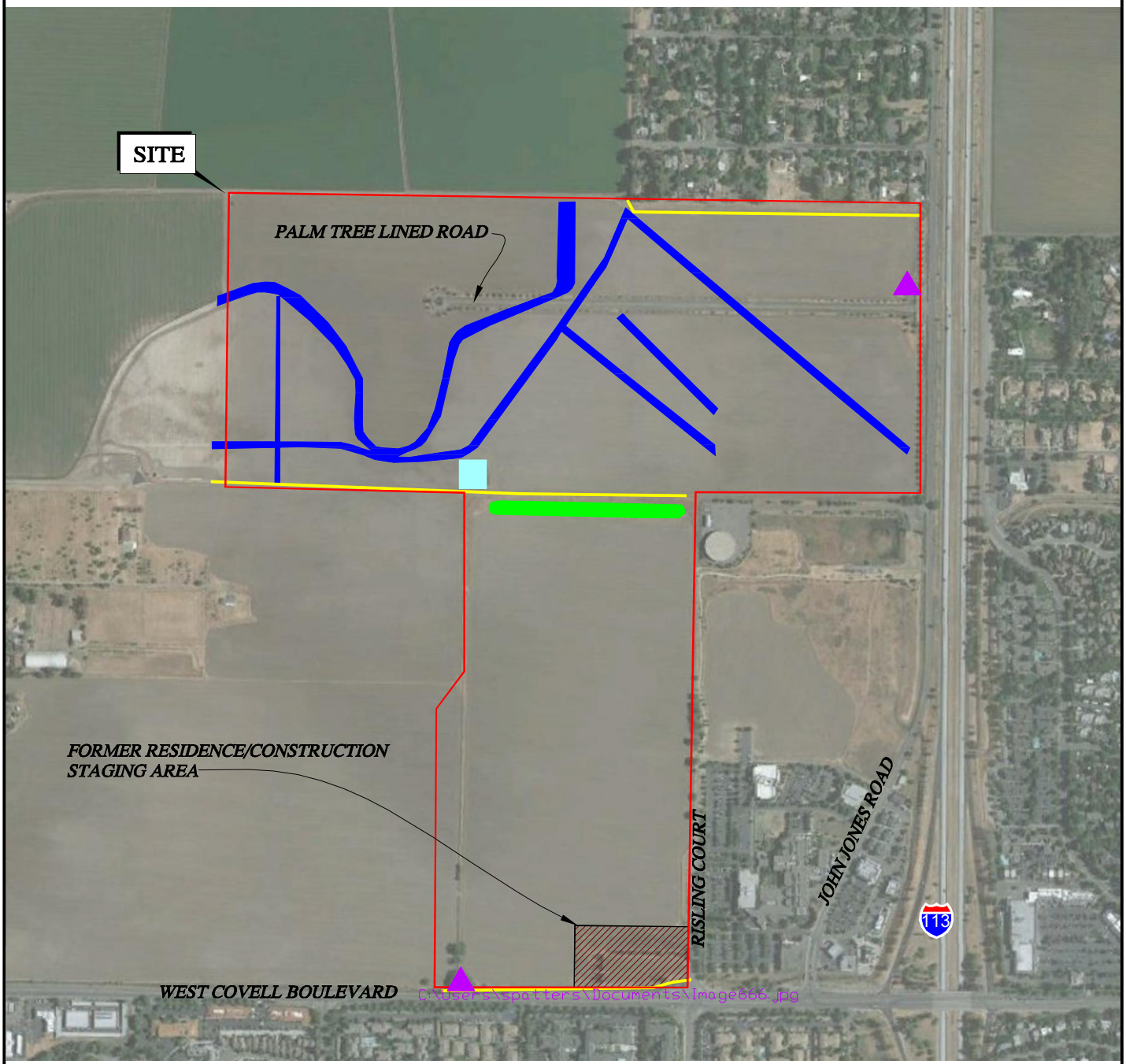

N

0 FEET 800

0 METERS 400

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- EXISTING WELL
- CURRENT DRAINAGE DITCH
- HISTORIC DRAINAGE DITCH
- EXISTING STOCKPILE
- EXISTING BASIN

BASE MAP SOURCE: GOOGLE EARTH PRO

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SITE FEATURES

DAVIS INNOVATION CENTER

DAVIS, CALIFORNIA

PROJECT NO.: 11626.000.000		FIGURE NO. 3
SCALE: AS SHOWN		
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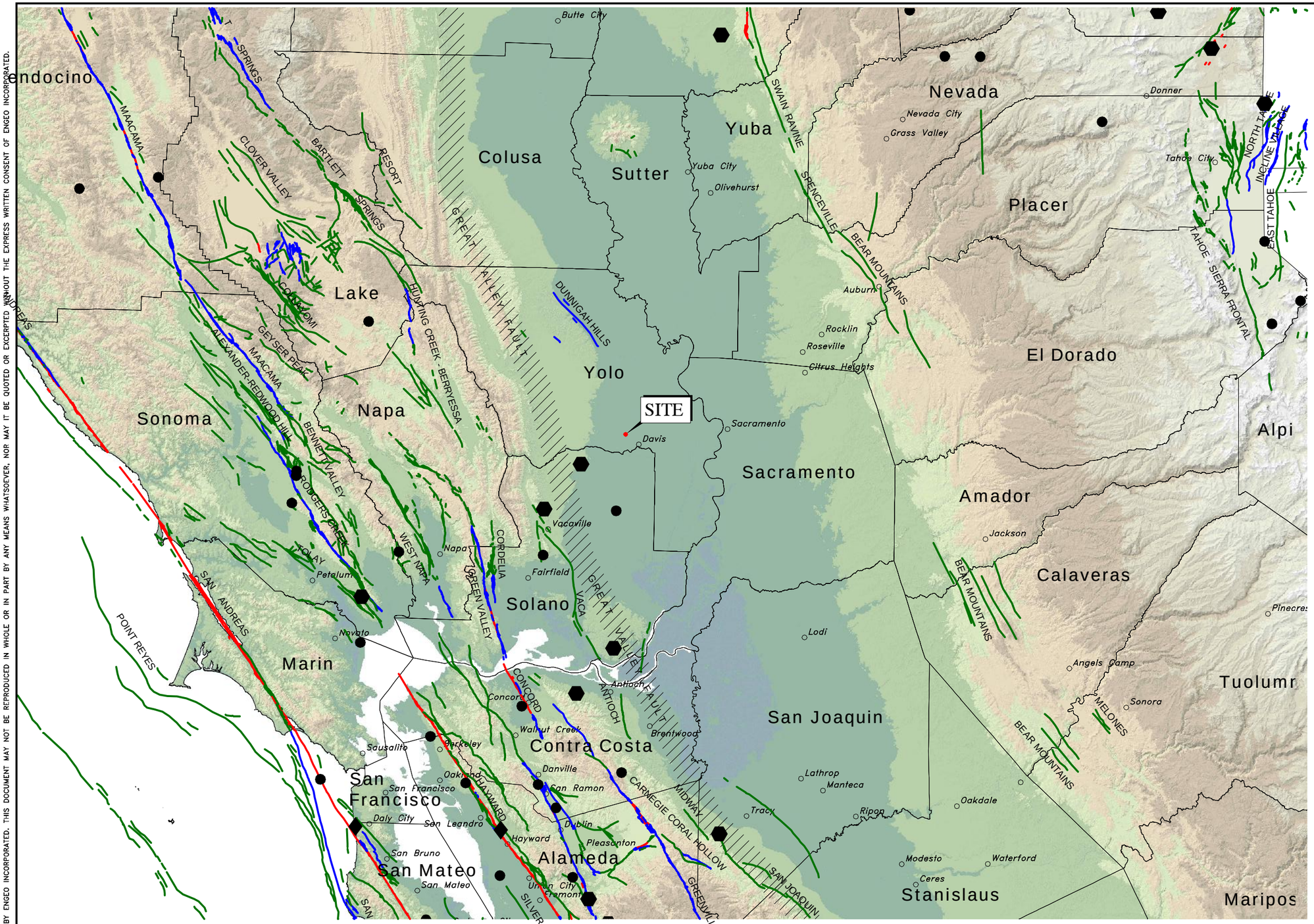

EXPLANATION

- MAGNITUDE 7+
- MAGNITUDE 6-7
- MAGNITUDE 5-6
- HISTORIC FAULT
- HOLOCENE FAULT
- QUATERNARY FAULT
- HISTORIC BLIND THRUST FAULT ZONE

BASE MAP SOURCE:
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATASET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, NOVEMBER, 2010
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800–2000)

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REGIONAL FAULTING AND SEISMICITY

DAVIS INNOVATION CENTER
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PROJECT NO.: 11626.000.000		FIGURE NO 4
SCALE: AS SHOWN		
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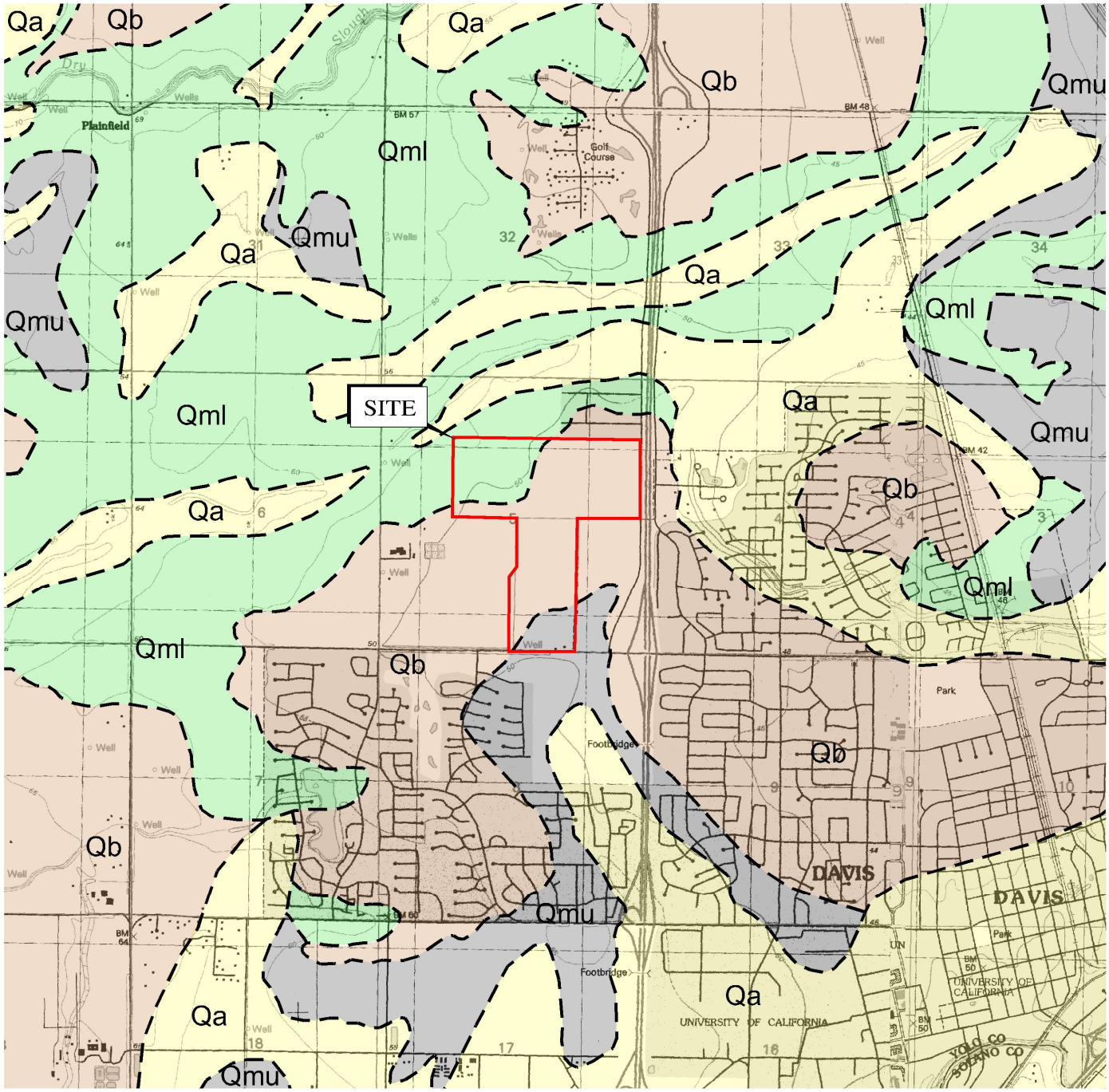

N

0 FEET 3000

0 METERS 1500

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- Qa — QUATERNARY ALLUVIUM (HOLOCENE)
- Qb — QUATERNARY BASIN DEPOSITS (HOLOCENE)
- Qmu — UPPER MODESTO FORMATION
- Qml — LOWER MODESTO FORMATION
- — — — GEOLOGIC CONTACT

BASE MAP SOURCE: HELLEY–HARWOOD, 1985

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GEOLOGIC MAP

DAVIS INNOVATION CENTER

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PROJECT NO.: 11626.000.000		FIGURE NO. 5
SCALE: AS SHOWN		
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