

# **APPENDIX C**

## Geologic Hazards Assessment

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March 26, 2018  
Project No. 403246001

Mr. Jett McCormick  
LBA Realty Fund V, L.P.  
3347 Michelson Drive, Suite 200  
Irvine, California 92612

Subject: Geologic Hazards Assessment  
1605 Industrial Avenue  
San Jose, California

Dear Mr. McCormick:

In accordance with your authorization on March 16, 2018, we have performed a desktop geologic study to assess potential geologic hazards for the property located at 1605 Industrial Avenue in San Jose, California (Figure 1). The subject property is irregular in shape, covers an area of about 10.2 acres, and is located along the eastern side of Highway 880 just north of the Highway 880 and Highway 101 interchange (Figure 2). This report presents the findings and conclusions from our geologic hazards assessment for the subject property.

## SCOPE OF SERVICES

Our scope of services for this study included a review of readily available background materials including topographic maps, regional geologic maps and reports, geologic and seismic hazard maps, selected historical aerial photographs, and the safety element from the General Plan for the City of San Jose (2011).

## GENERAL GEOLOGIC CONDITIONS AND GEOLOGIC HAZARDS

The site is located within Santa Clara Valley, which is a broad alluvial valley situated at the southern end of San Francisco Bay in the Coast Ranges geomorphic province of California. Santa Clara Valley lies between the Santa Cruz Mountains to the west and the Diablo Range to the east. The Coast Ranges are comprised of northwesterly trending mountain ranges and structural valleys formed by tectonic processes commonly found around the Circum-Pacific belt. Basement rocks have been sheared, faulted, metamorphosed, and uplifted, and are separated by thick blankets of Cretaceous and Cenozoic sediments that fill structural valleys and line continental margins. The San Francisco Bay Area has several ranges that trend northwest, parallel to major strike-slip faults such as the San Andreas, Hayward, and Calaveras. Major tectonic activity associated with these

and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement.

According to regional geologic maps covering the subject property, the site is underlain by Holocene age alluvial soils deposited by nearby Guadalupe and Coyote Creeks (Helley et al., 1994; Knudsen et al., 2000; Wesling and Helley, 1989; and Witter et al., 2006). These deposits typically consist of silt and clay interspersed with layers of sand and gravel. The silt and clay deposits can compress under heavy loads and are also expansive.

Geologic hazards reviewed for this study included ground surface rupture due to faulting, liquefaction, dynamic settlement, strong ground motion, expansive soils, dam inundation and flooding, erosion, sea level rise, tsunami inundation, and land subsidence. These and other issues are discussed in the following sections:

### **Ground Surface Rupture**

The site is not located within an Alquist-Priolo Earthquake Fault Zone as established by the California Geological Survey (CGS, 2007) or the City of San Jose (2011). The projected trace of the Silver Creek fault lies about 1,000 feet southwest of the property; however, this fault is not considered active and does not pose a ground rupture hazard to the site (Wentworth et al., 2010). The probability of damage from surface fault rupture is considered to be low.

### **Liquefaction and Dynamic Settlement**

The site is located within a liquefaction hazard zone (Figure 3) as established by the California Geological Survey (CGS, 2007) and the City of San Jose (2011). Regional studies of liquefaction susceptibility by the U.S. Geological Survey (Knudsen et al., 2000 and Witter et al., 2006) indicate that the site has a moderate to high susceptibility to liquefaction during a moderate to large magnitude earthquake on a nearby fault. Evidence of liquefaction including sand boils and lateral spreading occurred within a few miles of the site during the 1906 San Francisco and 1989 Loma Prieta earthquakes (Knudsen et al., 2000).

In addition to liquefaction, which occurs in wet, loose sandy soils, earthquakes can also induce dynamic settlement of dry loose sandy sediments. The potential for dynamic settlement will need to be addressed in conjunction with liquefaction during future geotechnical evaluations.

## **Strong Ground Motion**

The potential for future strong ground motion due to earthquakes is considered significant. Future geotechnical evaluations and design studies should be performed in accordance with the most recent version of the California Building Code (CBSC, 2016) and other applicable seismic codes.

## **Expansive Soils**

The alluvial soils underlying the site are known to be expansive. Highly to moderately expansive soils are subject to excessive shrink/swell, which can damage overlying pavements and foundations. Mitigation measures to reduce the impact of expansive soils on future structures will be needed. Chemically treating the expansive soils with lime to reduce the expansion characteristics should be considered.

## **Dam Inundation and Flooding**

Based on maps included in the City of San Jose General Plan (2011), the site is located within an inundation path for Anderson Dam (Figure 4), which is located in the nearby East Bay Hills. The depth of water is not included in the information provided in the general plan.

The site is located within a FEMA flood zone, designated as Zone D (Figure 5). Zone D is defined as an area with a risk to flooding due to levee failure. The nearest levee is the Coyote Creek levee, which is located about 0.34 miles from the property.

## **Erosion**

The surficial soils are considered susceptible to erosion. Drainage and landscaping should be designed to prevent excessive erosion from occurring.

## **Sea Level Rise and Tsunami Inundation**

According to the City of San Jose General Plan (2011), the site is not located within an area that is likely to be impacted by future sea level rise. In addition, regional studies by the State of California (2009) regarding tsunami inundation indicate that the site lies outside of the tsunami inundation zone for the southern end of San Francisco Bay.

## **Regional Land Subsidence**

Regional land subsidence due to groundwater withdrawal occurred in Santa Clara Valley during the early and later parts of the last century, and over the last 30 years has been controlled by groundwater management practices led by the Santa Clara Valley Water District. Studies by the U.S. Geological Survey (Poland and Ireland, 1988) indicate that as much as 8 feet of land subsidence occurred as of 1982 in the central portion of San Jose. The estimated amount of land

subsidence that occurred beneath the site is about 6 feet, according to maps included in the Poland and Ireland (1988) study. Current groundwater management practices have drastically reduced subsidence rates, which are currently monitored by Federal and local agencies.

## **Other Considerations**

The site is currently occupied by an industrial facility, and prior to that was used for agricultural purposes. Undocumented fill materials may underlie the site that will need to be removed and replaced as engineered fill. Undocumented fill materials may contain unwanted debris that may require removal and offsite export.

## **CONCLUSIONS AND RECOMMENDATIONS**

Based on our preliminary review, it is our professional opinion that the site is suitable for future development from a geotechnical viewpoint. The likelihood of surface ground rupture, dam and tsunami inundation, flooding, sea level rise, regional land subsidence, and corrosive soils to impact the site is considered low.

The adverse impacts of strong ground motion, liquefaction, dynamic settlement, expansive soils, and erosion can be mitigated and should be addressed during future geotechnical evaluations and design studies. The impact that existing and previous land use practices will have on site development should also be considered during future planning and design phases.

## **LIMITATIONS**

This report is intended for feasibility purposes only. It does not provide sufficient data for design or to prepare an accurate bid by contractors. Our conclusions, recommendations, and opinions are based on a desktop study of readily available documents that cover the subject property. No subsurface exploration or sampling was performed. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

Our opinions and recommendations are provided in accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding our opinions and conclusions.

Ninyo & Moore appreciates the opportunity to provide services on this project.

Respectfully submitted,  
**NINYO & MOORE**



David C. Seymour, PG, CEG  
Principal Engineering Geologist



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Principal Engineer

DCS/TKW/st

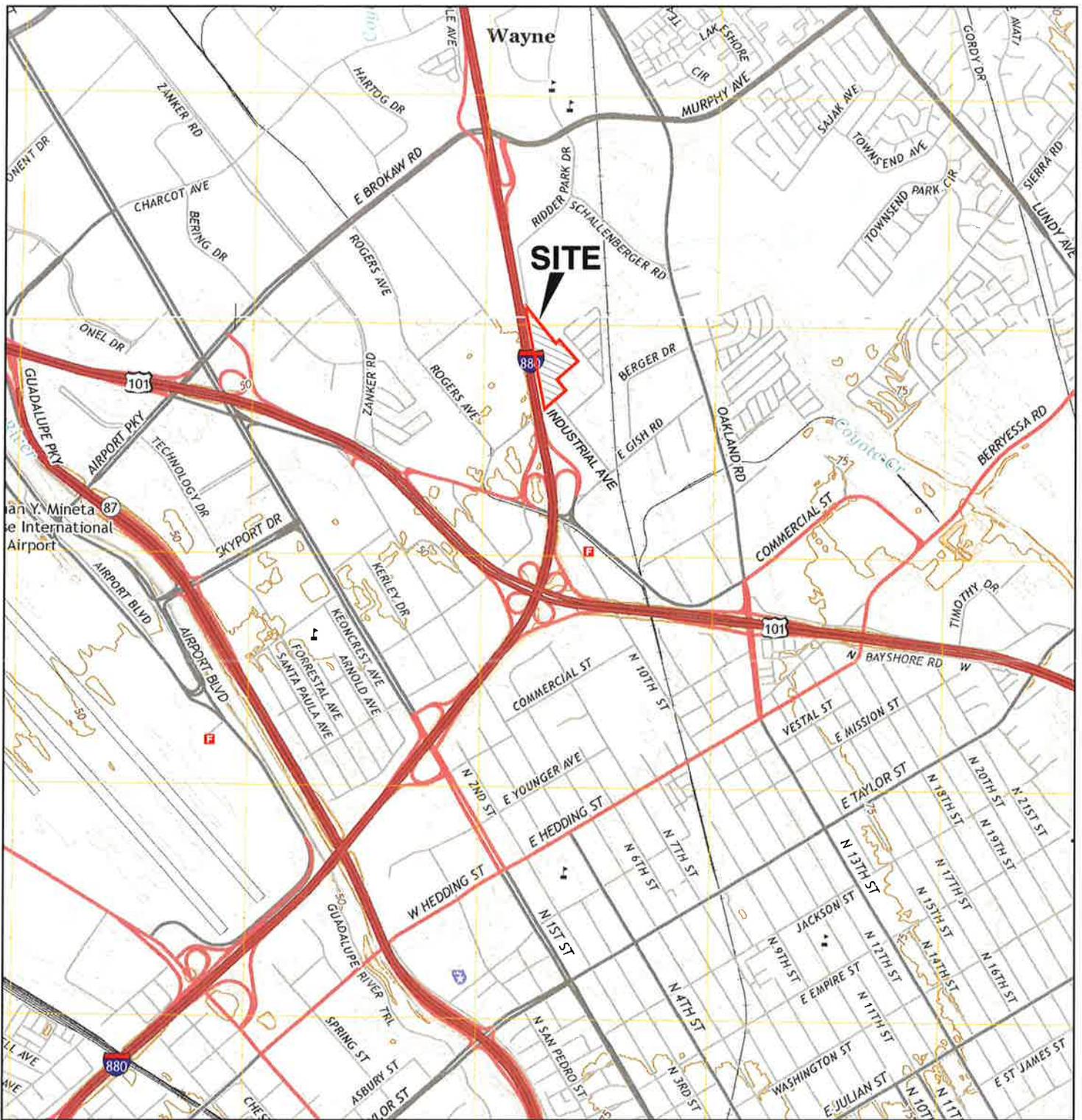
- Attachments: References  
Figure 1 – Site Location  
Figure 2 – Aerial Image  
Figure 3 – Seismic Hazard Zones  
Figure 4 – Dam Inundation  
Figure 5 – FEMA Flood Zone

Distribution: (1) Addressee (via e-mail)



## REFERENCES

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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE | REFERENCE: USGS, 2015



FIGURE 1

**Ninyo & Moore**  
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**SITE LOCATION**  
LBA REALTY  
1605 INDUSTRIAL AVENUE  
SAN JOSE, CALIFORNIA  
403246001 | 03/18



03/18/2018 10:51 AM

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE | REFERENCE: GOOGLE EARTH, 2018



FIGURE 2

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**AERIAL IMAGE**

LBA REALTY  
1605 INDUSTRIAL AVENUE  
SAN JOSE, CALIFORNIA

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**LEGEND**



**LIQUEFACTION:**  
 Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. | REFERENCE: CGS, 2002, 2004



**FIGURE 3**

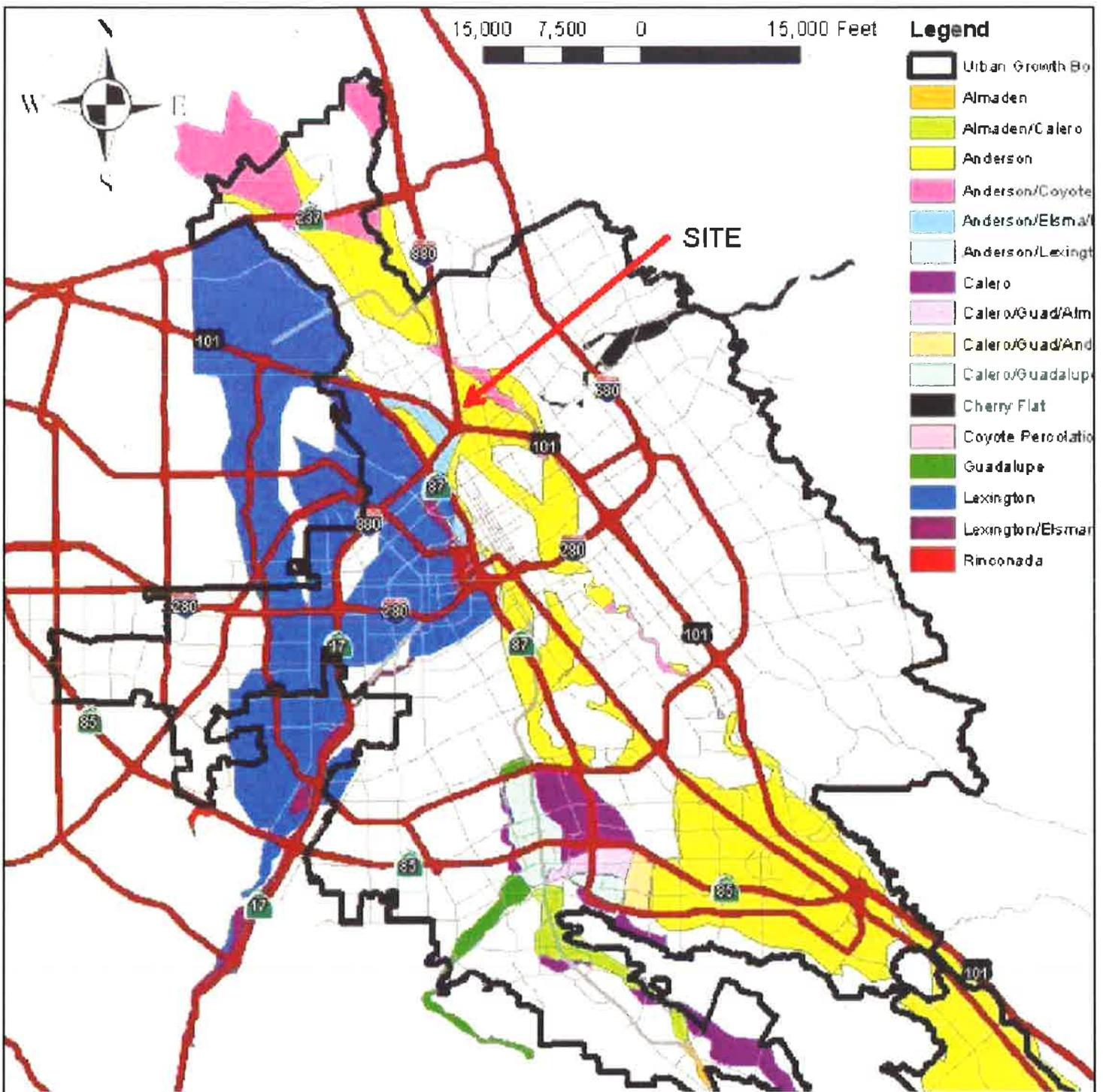
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**SEISMIC HAZARD ZONES**

LBA REALTY  
 1605 INDUSTRIAL AVENUE  
 SAN JOSE, CALIFORNIA

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- Legend**
- Urban Growth Bo
  - Almaden
  - Almaden/Calero
  - Anderson
  - Anderson/Coyote
  - Anderson/Elsma/
  - Anderson/Lexingt
  - Calero
  - Calero/Guad/Alm
  - Calero/Guad/And
  - Calero/Guadalupe
  - Cherry Flat
  - Coyote Percolatio
  - Guadalupe
  - Lexington
  - Lexington/Elsmar
  - Rinconada

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE  
 REFERENCE: ABAG DAM FAILURE, APPENDIX F OF SAN JOSE GENERAL PLAN, 2011



FIGURE 4

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**DAM INUNDATION**  
 LBA REALTY  
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