Correia Middle School Sports Complex Project
Draft EIR

Appendix C

EIR Level Geology and Soils Evaluation

Prepared by Ninyo & Moore

December 1, 2014

EIR LEVEL GEOLOGY AND SOILS EVALUATION CORREIA MIDDLE SCHOOL ATHLETIC MASTER PLAN SAN DIEGO, CALIFORNIA

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December 1, 2014
Project No. 107523001

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Ms. Kathie Washington
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Subject: EIR Level Geology and Soils Evaluation
Correia Middle School
Athletic Master Plan
San Diego, California

Dear Ms. Washington:

In accordance with your request and authorization, we have performed an EIR level geology and soils evaluation for the Correia Middle School Athletic Master Plan project in San Diego, California. The attached report presents our methodology, findings, opinions, and recommendations regarding the geology and soils conditions at the site.

We appreciate the opportunity to be of service on this project.

Respectfully submitted,
NINYO & MOORE

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EXECUTIVE SUMMARY

The proposed Correia Middle School Athletic Master Plan project is anticipated to include the renovation of the existing grass fields and asphalt-paved courts at the southeastern portion of the existing Correia Middle School campus in the Point Loma community of San Diego, California (Figure 1). Specifically, a new softball field with fencing, bullpens, and bleachers, new combination football/soccer fields, a new concession stand, new track and field facilities, new hardscaped tennis/basketball courts, and a new two-story classroom/restroom facility are proposed (Figure 2).

Geologic and geotechnical constraints evaluated for the project include:

- Surface and near-surface soils at the project are fill soils, young alluvial flood plain deposits, and old paralic deposits. Geotechnical constraints related to soils at the project are:
    - *Fill Soils* - Fill soils placed without engineering supervision may be loosely or inadequately compacted, may contain oversize materials unsuitable for reuse in engineered fills, and may contain unsuitable organic or expansive materials and debris that may preclude their use in engineered fills. In addition, the fill soils at this site are known to contain burn ash waste. The contractor should be prepared to handle and dispose of these materials in accordance with the referenced soil management plan (Ninyo & Moore, 2007b). The extent and nature of existing fill soils and recommended mitigation measures should be evaluated by subsurface investigation and laboratory testing.
    - *Expansive soils* - Although the site soils are expected to be relatively granular and thus non-expansive, the extent of expansive soils and recommended mitigation measures should be evaluated by subsurface investigation and laboratory testing.
    - *Corrosive soils* - Based on previous work in the project area, the soils at the project site are not classified as corrosive. However, due to the potential presence of burn ash debris and the close proximity to an estuary, consideration should be given to classifying the site as corrosive. The nature and extent of corrosive soils and recommended mitigation measures should be further evaluated by subsurface investigation and laboratory testing
- The closest known major active fault is the Rose Canyon Fault, which is located approximately 2 miles east of the project. Additionally, the potentially active Point Loma fault is mapped approximately 400 feet southwest of the site. Geotechnical constraints related to faulting and seismic events at the project are:
    - *Ground Shaking* - The project has a moderate potential for strong ground motions due to earthquakes on nearby active faults.
    - *Liquefaction* - The granular soils below the water table may be subject to liquefaction and dynamic settlement during a nearby seismic event. The extent of liquefiable earth materials underlying the site and recommended mitigation measures should be evaluated by subsurface investigation and laboratory testing.

1. INTRODUCTION

In accordance with your request, Ninyo & Moore has completed an Environmental Impact Report (EIR) level geology and soils evaluation for the proposed Athletic Master Plan project (the project), located at the existing Correia Middle School in the Point Loma community of San Diego, California (Figure 1). The area of the proposed Athletic Master Plan project is the existing athletic fields on the southwestern portion of the existing campus.

Our evaluation is based on geologic reconnaissance, published and non-published reports, aerial photographs, in-house data, and the assessment of the potential geologic hazards in the project area. The purpose of this survey was to estimate the potential for existing environmental impacts to the area from geologic or soils conditions on or in proximity to the project, and to discuss measures that can be implemented to reduce or mitigate the potential impacts with respect to the design and construction of the proposed project.

2. SCOPE OF SERVICES

Ninyo & Moore's scope of services for this geology and soils evaluation included the activities listed below:

- Review of readily available regional, local, and site-specific geologic and geotechnical reports.
- Review of readily available background information including topographic, soils, mineral resources, geologic, and seismic and geologic hazard maps, and stereoscopic aerial photographs.
- Performance of a geologic reconnaissance of the site vicinity.
- Compilation and analysis of the data obtained from our background reviews and site reconnaissance.
- Preparation of this report documenting findings and providing opinions and recommendations regarding possible geologic and soil impacts at the site. The findings were evaluated with respect to questions A through H listed in Section 6, "Geology and Soils" within Appendix G, "Environmental Checklist Form" of the "Guidelines for Implementation of the California Environmental Quality Act (CEQA)."

3. REGULATORY FRAMEWORK

Geologic resources and geotechnical hazards within the proposed project area are governed by the City of San Diego. The City's Building Division plans contain conservation and safety elements for the protection of geologic features and avoidance of geologic hazards. The procedures for construction related earthwork and excavation are established by these local grading ordinances developed by the City of San Diego Engineering Department. The site is also governed by the regulations of the California Code of Regulations (CCR), 2010 California Building Code (CBC).

The CBC is promulgated under CCR, Title 24, Parts 1 through 12, also known as the California Building Standards Code, and is administered by the California Building Standards Commission (CBSC). The CBSC is responsible for administering California's building codes.

4. SITE DESCRIPTION AND BACKGROUND

Correia Middle School is located at 4302 Valeta Street in San Diego, California (Figure 1). The school site encompasses approximately 19 acres, occupied by school buildings and facilities on the northeastern portion of the property and athletic fields on the southeastern portion of the property. The area of the proposed Athletic Master Plan project consists of the existing athletic fields on the southeastern portion of the property (Figure 2). Elevations across the project range from approximately 56 feet above mean sea level (MSL) on the southern portion of the project near Cleator Community Park to approximately 50 feet MSL at the northern end of the project near Valeta Street.

Several previous geotechnical and environmental evaluations have been performed at the site by Ninyo & Moore and are listed in the References. The following subsections briefly describe the geotechnical and environmental data obtained from site characterization activities that are relevant to this project.

The school site was constructed as a relatively level mesa with cut and fill slopes along the western and southern edges of the property. In general, the east-northeast and west-southwest areas of the site were filled in with earth materials cut from other portions of the site. According to a review of topographic maps of the site (County of San Diego, 1953 and 1978), up to 45 feet of fill

is present under the northeastern portion of the site. According to a 1958 site plan prepared by Clyde Hufbauer Architects, “miscellaneous dumped material” was reported to be mixed with the fill soil used in the athletic field areas during construction.

The City of San Diego Solid Waste Local Enforcement Agency (LEA) has indicated that several historic refuse disposal sites were located in the vicinity of Correia Middle School and Cleator Community Park. It is believed that debris from a nearby refuse disposal site was mixed with fill material during construction of the school site. Indicators of burned waste (e.g., fused glass and ceramic shards) have been observed along the slopes adjacent to Famosa Boulevard as well as the area between the school athletic fields and Cleator Community Park.

5. PROJECT DESCRIPTION

Based on our review of the conceptual site plan (LPA, 2011), the Athletic Master Plan project is anticipated to include the renovation of the existing grass fields and asphalt-paved courts at the southeastern portion of the property. Specifically, a new softball field with fencing, bullpens, and bleachers, new combination football/soccer fields, a new concession stand, new track and field facilities, new hardscaped tennis/basketball courts, and a new two-story classroom/restroom facility are proposed.

6. GEOLOGY AND GEOLOGIC HAZARDS

The following sections present our findings relative to regional and site geology, geologic hazards (e.g., landslides or expansive soils), groundwater, faulting and seismicity, and agricultural soils.

6.1. Regional Geologic Setting

The project site is situated in the coastal foothill section of the Peninsular Ranges Geomorphic Province. The province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California (Norris and Webb, 1990; Harden, 1998). The province varies in width from approximately 30 to 100 miles. In general, the province consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the southern California batholith.

The Peninsular Ranges Province is traversed by a group of sub-parallel faults and fault zones trending roughly northwest (Jennings, 2010). Several of these faults are considered active. The Rose Canyon, Elsinore, San Jacinto, and San Andreas faults are active fault systems located northeast of the project area and the Coronado Bank, San Diego Trough, and San Clemente faults are active faults located west of the project site. Major tectonic activity associated with these and other faults within the regional tectonic framework consists primarily of right-lateral, strike-slip movement. Specifics of faulting are discussed in following sections of this report.

6.2. Site Geology

Recently published geologic maps for this area include the San Diego 30' x 60' Quadrangle (Kennedy and Tan, 2008). As shown on Figure 3, geologic mapping indicates that the near-surface geology at the project includes the Quaternary-age old paralic deposits (Kennedy and Tan, 2008). Although not mapped at the site, artificial fill materials and young alluvial flood plain deposits have been encountered in a previous geotechnical evaluation at the site (Ninyo & Moore, 2009c). The site is anticipated to be underlain by the following units:

- Qaf: Artificial Fill - Although not depicted in the geologic maps, based on our previous studies at the site fill is present in the area of the proposed project (Ninyo & Moore, 2009c). These materials were described as brown, loose to medium dense, silty sand and sandy silt. Burned waste including fused glass and ceramic shards are present in some of the fill materials (Ninyo & Moore, 2009c).

- Qya: Young alluvial flood plain deposits (Holocene and late Pleistocene) - Although not depicted on geologic maps of the site, young alluvial deposits were encountered during previous subsurface evaluations at the site (Ninyo & Moore, 2009c). These materials as encountered were described as loose to medium dense, silty and clayey sand.

- Qop_6: Old paralic deposits, Unit 6 (late to middle Pleistocene) - Based on review of available geologic maps as well as our previous evaluations, the surficial soils are underlain by old paralic deposits. These materials are described as brown and reddish brown, poorly cemented, silty and clayey sand. This unit is also designated as the Bay Point Formation on earlier geotechnical maps (Kennedy, 1975).

6.3. Groundwater

Based on our previous environmental and geotechnical evaluations at the site (Ninyo & Moore, 2006, 2007a, 2007c, 2008, 2009c, and 2010), groundwater is anticipated at an elevation of 6 to 10 feet above MSL. Groundwater levels can fluctuate due to seasonal variations, groundwater withdrawal or injection, and other factors. Based on the local and regional topography, groundwater in the site vicinity is anticipated to flow toward the north or west-northwest.

According to the Water Board Basin Plan, the site is located in the Mission San Diego Hydrologic Subarea. Beneficial uses of groundwater in this subarea include agricultural, industrial, and processing, as well as potential use for municipal. However, these beneficial uses do not apply to areas located west of Interstate 5, which includes Correia Middle School; therefore, the site is exempt from beneficial uses.

6.4. Faulting and Seismicity

As shown on Figure 4, there are several active faults in the region of the project and therefore, the project area is considered to be seismically active (as is most of southern California). The closest known major active fault is the Rose Canyon Fault, which is capable of generating an earthquake magnitude of 7.2 (California Geological Survey [CGS], 2003). The Rose Canyon Fault is located approximately 2 miles east of the site (Figure 4).

As shown on Figures 3 and 5, a strand of the northwest-southeast-trending Point Loma fault has been mapped approximately 400 feet southwest of the site. The Point Loma fault is mapped as being buried and is considered to be potentially active (i.e., a fault that exhibits evidence of ground displacement in the last 2,000,000 years). Based on inferred, buried nature of this fault and that the fault is not mapped as crossing the site, we consider the seismic parameters associated with the closest known active fault, the Rose Canyon fault, more appropriate for design purposes.

In general, hazards associated with seismic activity include ground surface rupture, strong ground motion, liquefaction, and tsunamis. These hazards are discussed in the following sections.

6.4.1. Ground Surface Rupture

Ground surface rupture due to active faulting is not considered likely in the project area due to the absence of any known active faults underlying the site. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

6.4.2. Strong Ground Motion

The 2010 CBC recommends that the design of structures be based on the peak horizontal ground acceleration (PGA) having a 2 percent probability of exceedance in 50 years which is defined as the Maximum Considered Earthquake (MCE). Based on a Probabilistic Earthquake Hazard Analysis computer program by Blake (Blake, 2001), the calculated peak ground acceleration for the Maximum Considered Earthquake (PGA_{MCE}) at the site, defined as having a 2 percent probability of exceedance in 50 years, with a statistical return period of approximately 2,475 years, is 0.62g (20 percent of the acceleration of gravity). The calculated peak ground acceleration for the Design Earthquake (PGA_{DE}), defined as two-thirds of PGA_{MCE} is 0.41g. The requirements of the governing jurisdictions and applicable building codes should be considered in the design of structures.

As noted, the nearest known active fault is the Rose Canyon Fault, located approximately 2 miles east of the project site. Additionally, as shown on Figures 3 and 5, a strand of the Point Loma fault has been mapped approximately 400 feet southwest of the site. This fault is considered to be potentially active, and does not cross the site. Table 1 below lists principal known active faults that may affect the subject site, the maximum moment magnitude (M_{max}) and the fault types as published for the CGS by Cao et al. (2003). The approximate fault to site distance was calculated by the computer program FRISKSP (Blake, 2001).

Table 1 – Principal Active Faults

Fault	Approximate Distance miles (km)[1]	Maximum Moment Magnitude (M_{max})[1]	Fault Type[2]
Rose Canyon	2 (3.2)	7.2	B
Coronado Bank	10.4 (16.8)	7.6	B
Newport-Inglewood (Offshore)	30.5 (49.0)	7.3	B
Elsinore (Julian Segment)	42.4 (68.2)	7.1	A
Elsinore (Temecula Segment)	45.2 (72.8)	6.8	A
Earthquake Valley	48.2 (77.5)	6.5	B
Elsinore (Coyote Mountain Segment)	52.7 (84.8)	6.8	A
Palos Verdes	55.3 (89.0)	7.1	B
Elsinore (Glen Ivy)	62.1 (99.9)	6.8	A

Notes:
[1] Cao, et al., 2003.
[2] California Building Code (CBC), 2010; Cao, et al., 2003.

6.4.3. Liquefaction and Seismically Induced Settlement

Liquefaction is the phenomenon in which loosely deposited, saturated granular soils (located below the water table) with clay contents (particles less than 0.005 mm) of less than 15 percent, liquid limit of less than 35 percent, and natural moisture content greater than 90 percent of the liquid limit undergo rapid loss of shear strength due to development of excess pore pressure during strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to rapid rise in pore water pressure, and it eventually causes the soil to behave as a fluid for a short period of time. Liquefaction is known generally to occur in saturated or near-saturated cohesionless soils at depths shallower than 50 feet below grade. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking.

The liquefaction potential at the project site was evaluated during a previous evaluation Ninyo & Moore performed at the site (Ninyo & Moore, 2009c). Our liquefaction evaluation was based on the encountered groundwater depth, subsurface information, laboratory test results, our evaluation of the site modified PGA_{DE}, and our experience in the site vicinity. Our 2009 evaluation estimated that granular earth materials, located be-

low the groundwater table, are potentially liquefiable to depths of up to approximately 30 feet below existing grades. From this, we estimated that dynamic settlement of approximately ½ inch could occur as the result of a major nearby seismic event.

6.4.4. Tsunamis and Seiches

Tsunamis are long wavelength seismic sea waves (long compared to the ocean depth) generated by sudden movements of the ocean bottom during submarine earthquakes, landslides, or volcanic activity. Based on the inland location and elevation of the project, the potential for a tsunami to impact the site is not a design consideration.

Seiches are oscillations of enclosed or partially enclosed bodies of water often generated by seismic activity. Although an unnamed pond is present on the north side of the project site, the pond is at an elevation approximately 50 feet lower than the project site. The potential for seiches to impact the property is thus not a design consideration.

6.5. Geologic Hazard Map

Per the City of San Diego's seismic safety element (2008) the school campus and its immediate vicinity are mapped with the hazard category 52. Category 52 is defined as "other level areas, gently sloping to steep terrain with favorable geologic structure, low risk."

6.6. Landsliding

Based on our review of referenced geologic maps, literature, topographic maps, and stereoscopic aerial photographs, no landslides or indications of deep-seated landsliding were noted underlying the project site. As such, the potential for significant large-scale slope instability at the site is not a design consideration.

6.7. Flood Hazards

Based on review of Federal Emergency Management Agency (FEMA) Mapping Information Platform website (2013), the site located is not within mapped floodplains, flood zones, or active floodways. Based on this review and our reconnaissance, the potential for dam inundation and significant flooding at the site are not design considerations.

6.8. Expansive Soils

Expansive soils generally result from specific clay minerals that have the capacity to shrink or swell in response to changes in moisture content. Shrinking or swelling of foundation soils can lead to damage to foundations and engineered structures, including tilting and cracking. Review of regional geologic maps, geologic reconnaissance, and site-specific subsurface exploration at the project, indicates that the near surface soils consist predominately of silt and sand, indicating the soils at the project may be expected to have a low potential for expansion. The nature and extent of expansive soils at the project should be further evaluated by subsurface investigation and laboratory testing.

6.9. Corrosive Soils

Caltrans corrosion (2003) criteria define as soils with more than 500 parts per million (ppm) chlorides, more than 0.2 percent sulfates, or a pH less than 5.5. Based on laboratory testing performed on soil samples during previous Ninyo & Moore projects at the project site and Caltrans corrosion (2003) criteria, those soils were not classified as corrosive. The nature and extent of corrosive soils should be further evaluated by subsurface investigation and laboratory testing.

6.10. Agricultural Soils

Based on the United States Department of Agriculture (USDA) website (USDA, 2013), the Marina loamy coarse sand was the topsoil mapped in the project area prior to grading and construction of the existing school site. This soil was described as being used for prime farmland with a slight to moderate erosion potential. Based on the graded condi-

tion of the property, the potential for additional loss of agricultural soils due to further development of the study area is considered low.

6.11. Mineral Resources

According to the California Geological Survey Open File Report 96-04 the project area is located in Mineral Resource Zone 3 (MRZ-3). MRZ-3 areas are locations in San Diego County that have been identified as areas that contain known mineral deposits that may qualify as a mineral resource.

7. CONCLUSIONS

Based on our review of the referenced background data and our geologic field reconnaissance it is our opinion that geologic and geotechnical considerations at the project site include the following:

- Surface and near-surface soils at the project are fill soils, young alluvial flood plain deposits, and old paralic deposits. Geotechnical constraints related to soils at the project are:
    - Fill Soils - Fill soils placed without engineering supervision may be loosely or inadequately compacted, may contain oversize materials unsuitable for reuse in engineered fills, and may contain unsuitable organic or expansive materials and debris that may preclude their use in engineered fills. In addition, the fill soils at this site are known to contain burn ash waste. The contractor should be prepared to handle and dispose of these materials in accordance with the referenced soil management plan (Ninyo & Moore, 2007b). The extent and nature of existing fill soils and recommended mitigation measures should be evaluated by subsurface investigation and laboratory testing.
    - Expansive soils - Although the site soils are expected to be relatively granular and thus non-expansive, the extent of expansive soils and recommended mitigation measures should be evaluated by subsurface investigation and laboratory testing.
    - Corrosive soils - Based on previous work in the project area, the soils at the project site are not classified as corrosive. However, due to the potential presence of burn ash debris and the close proximity to an estuary, consideration should be given to classifying the site as corrosive. The nature and extent of corrosive soils and recommended mitigation measures should be further evaluated by subsurface investigation and laboratory testing.

- The closest known major active fault is the Rose Canyon Fault, which is located approximately 2 miles east of the project. Additionally, the potentially active Point Loma fault is mapped approximately 400 feet southwest of the site. Geotechnical constraints related to faulting and seismic events at the project are:
    - Ground Shaking - The project has a moderate potential for strong ground motions due to earthquakes on nearby active faults.
    - *Liquefaction* - The granular soils below the water table may be subject to liquefaction and dynamic settlement during a nearby seismic event. The extent of liquefiable earth materials underlying the site and recommended mitigation measures should be evaluated by subsurface investigation and laboratory testing.

The conditions described above would increase the cost and duration of grading and construction of the project, but would not preclude development of the project.

8. RECOMMENDATIONS

Based on the geologic and geotechnical considerations at the project site presented in the previous section, our general recommendations are presented below. These recommendations assume that a complete geotechnical evaluation will be conducted and specific geotechnical recommendations for design and construction will be provided at that time.

- The on-site materials may contain burn ash waste. The contractor should be prepared to handle and dispose of these materials in accordance with the referenced soil management plan (Ninyo & Moore, 2007b).
- Ground Shaking - Proposed structures should be designed appropriately to mitigate strong ground shaking in the event of an earthquake on a nearby fault.
- Liquefaction - Although granular soils located below the groundwater table may be subject to liquefaction and dynamic settlement during a nearby seismic event, this would not preclude the development of the proposed structures. The following recommendations may be implemented during construction to mitigate this condition: removal and replacement of soils susceptible to static settlement or liquefaction; densification of these soils; or lowering of the groundwater table.

- Expansive soils - Although the site soils are expected to be relatively granular and thus non-expansive, the extent of expansive soils and recommended mitigation measures should be evaluated by subsurface investigation and laboratory testing. If expansive soils are present on the project site, the following mitigative measures may be implemented during construction: the soils may be removed from distress sensitive areas and placed in deeper fill areas; the soils may be excavated and removed from the site; or the expansive soils may be treated (i.e., lime treatment) to mitigate their potential for expansion.

- Corrosive Soils - If corrosive soils exist on the site, a corrosion engineer may be required to assist in the design of improvements in contact with the soil.

9. IMPACT ANALYSIS

Based upon the results of our Geology and Soils Evaluation, our opinions, and recommendations are provided in the following sections.

9.1. Significance Thresholds

In evaluating the significance of potential environmental concerns in a particular study area, the criteria to consider, as they relate to geologic and soil conditions, are presented in the CEQA Guidelines. In accordance with the scope of work, the findings of this study were evaluated with respect to Questions A through E of Section 6 “Geology and Soils” with in Appendix G of the CEQA Guidelines (2009).

9.2. Project Impacts and Significance

Based on the above criteria and the results of the evaluation, the potential impact by geologic and soil conditions at the project have been identified, and are discussed below.

A. Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of known fault?

Ground surface rupture due to active faulting is not considered likely on or adjacent to the project due to the absence of known active faults underlying the site. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

ii. Strong seismic ground shaking?

The project has a moderate potential for strong ground motions due to earthquakes on nearby active faults.

iii. Seismic related ground failure, including liquefaction?

Based on previous subsurface evaluations at the subject site, it is our opinion that granular soils below the groundwater table may be subject to liquefaction and dynamic settlement during a nearby seismic event.

iv. Landslides?

No landslides have been observed on and adjacent to the project; therefore the potential for landslides is considered low.

B. Would the project result in substantial soil erosion or the loss of topsoil?

The potential for substantial soil erosion or loss of topsoil due to the proposed project improvements is considered low since the site was previously graded and developed for use as a school.

C. Would the project be located on geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Granular soils below the groundwater table may be subject to liquefaction and dynamic settlement during a nearby seismic event.

D. Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

The project soils are expected to have a low potential for expansion.

10. LIMITATIONS

The field evaluation and geotechnical analyses presented in this report have been conducted in accordance with current engineering practice and the standard of care exercised by reputable geotechnical consultants performing similar tasks in this area. No warranty, implied or expressed, is made regarding the conclusions, recommendations, and professional opinions expressed in this report. Variations may exist and conditions not observed or described in this report may be encountered. Our preliminary conclusions and recommendations area based on an analysis of the observed conditions and the referenced background information.

The purpose of this study was to evaluate geologic and geotechnical conditions within the project site and to provide a geotechnical reconnaissance report to assist in the preparation of environmental impact documents for the project. A comprehensive geotechnical evaluation, including subsurface exploration and laboratory testing, should be performed prior to design and construction of structural improvements.

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Ninyo & Moore, 2011b, Operations & Maintenance Plan, Correia Middle School, 4302 Valeta Street, San Diego, California, Project No. 105338072: dated December 27.

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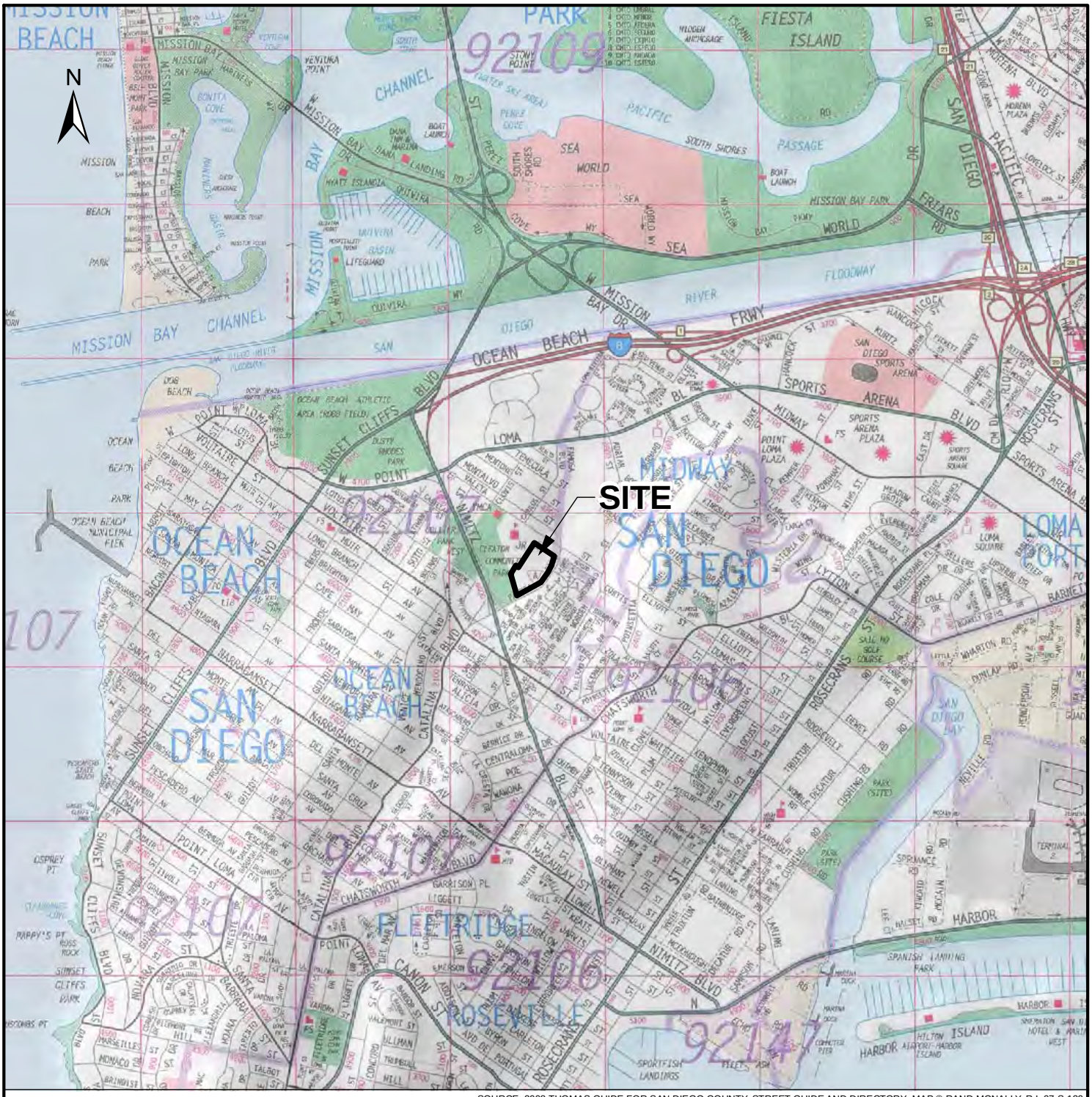
United States Geological Survey, 2012, Point Loma 7.5-Minute Quadrangle, San Diego County, California, Scale 1:24,000.

AERIAL PHOTOGRAPHS				
Source	**Date**	**Flight**	**Numbers**	**Scale**
USDA	March 31, 1953	AXN-4M	93-94	1:24,000



SOURCE: 2008 THOMAS GUIDE FOR SAN DIEGO COUNTY, STREET GUIDE AND DIRECTORY; MAP © RAND MCNALLY, R.L.07-S-129

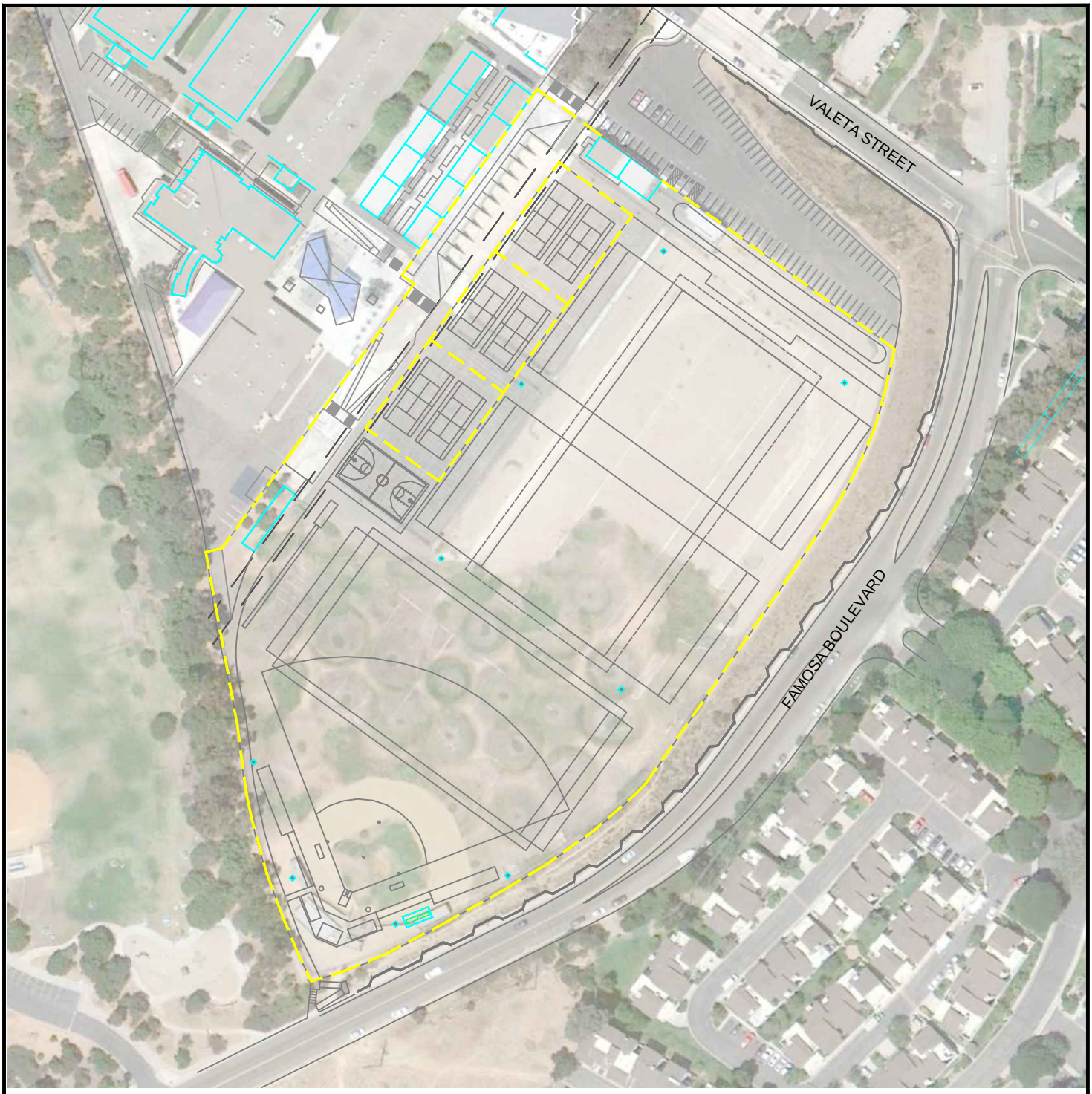
NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

SCALE IN FEET

0 1,200 2,400 4,800

Ninyo & Moore		SITE LOCATION	FIGURE
PROJECT NO.	DATE	CORREIA MIDDLE SCHOOL ATHLETIC MASTER PLAN SAN DIEGO, CALIFORNIA	1
107523001	12/14		

1_107523001_SL.mxd 5/3/2013 AOB



N

SCALE IN FEET

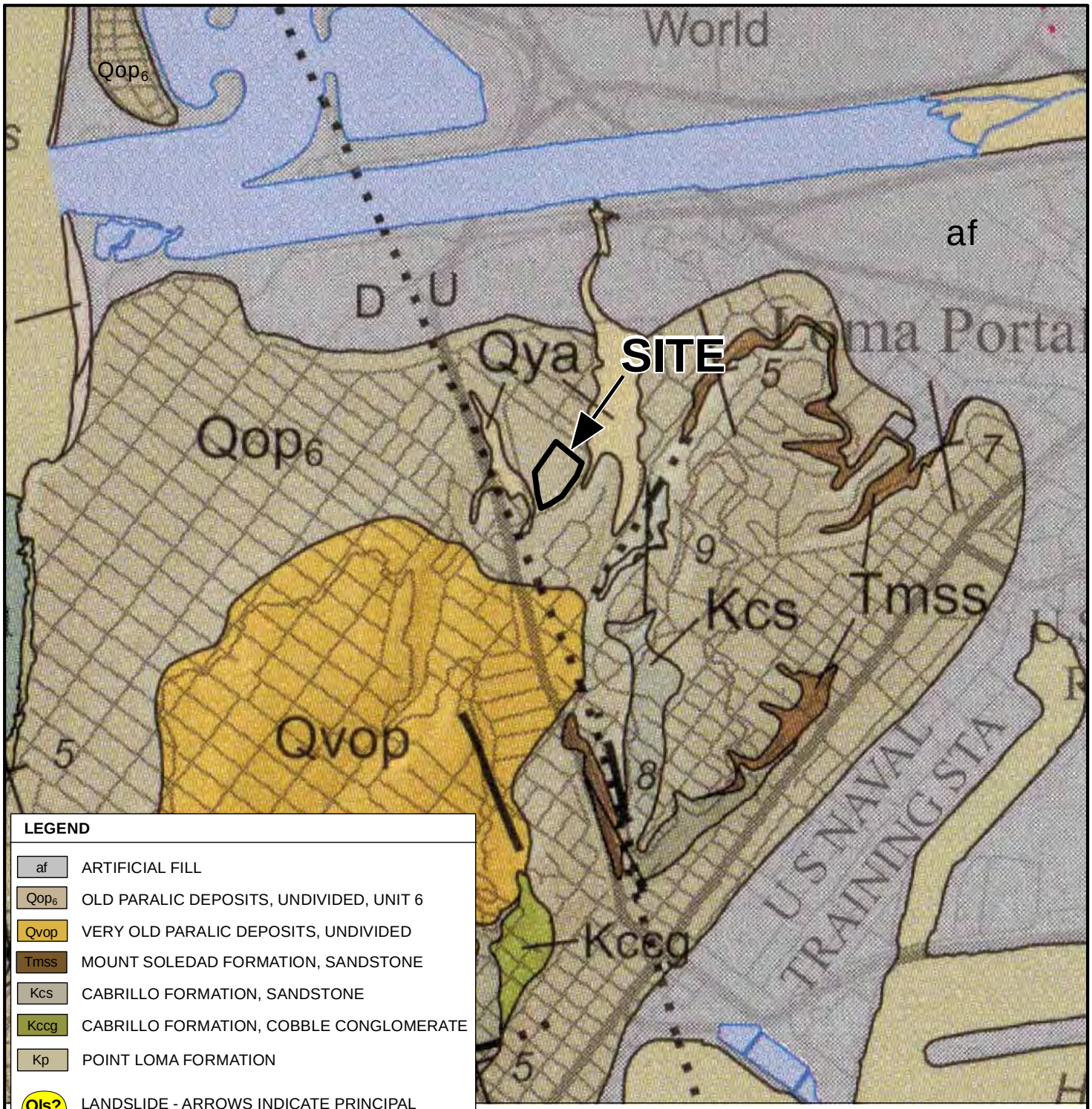
0 150 200

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE

SOURCE: LPA, DATED 5/20/11.

2_107523001_sp.dwg

Ninyo & Moore		SITE PLAN	FIGURE
PROJECT NO.	DATE	CORREIA MIDDLE SCHOOL ATHLETIC MASTER PLAN SAN DIEGO, CALIFORNIA	2
107523001	12/14		



SOURCE: KENNEDY, M.P., AND TAN, S.S., 2008, GEOLOGIC MAP OF THE SAN DIEGO 30' X 60' QUADRANGLE, CALIFORNIA

LEGEND

af	ARTIFICIAL FILL
Qop_6	OLD PARALIC DEPOSITS, UNDIVIDED, UNIT 6
Qvop	VERY OLD PARALIC DEPOSITS, UNDIVIDED
Tmss	MOUNT SOLEDAD FORMATION, SANDSTONE
Kcs	CABRILLO FORMATION, SANDSTONE
Kccg	CABRILLO FORMATION, COBBLE CONGLOMERATE
Kp	POINT LOMA FORMATION
Qls?	LANDSLIDE - ARROWS INDICATE PRINCIPAL DIRECTION OF MOVEMENT, QUERIED WHERE EXISTENCE IS QUESTIONABLE
65 / U D	FAULT - SOLID WHERE ACCURATELY LOCATED, DASHED WHERE APPROXIMATE, DOTTED WHERE CONCEALED. ARROW AND NUMBER INDICATE DIRECTION AND ANGLE OF DIP OF FAULT PLANE
15	STRIKE AND DIP OF BEDS, INCLINED

NOTES: ALL DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

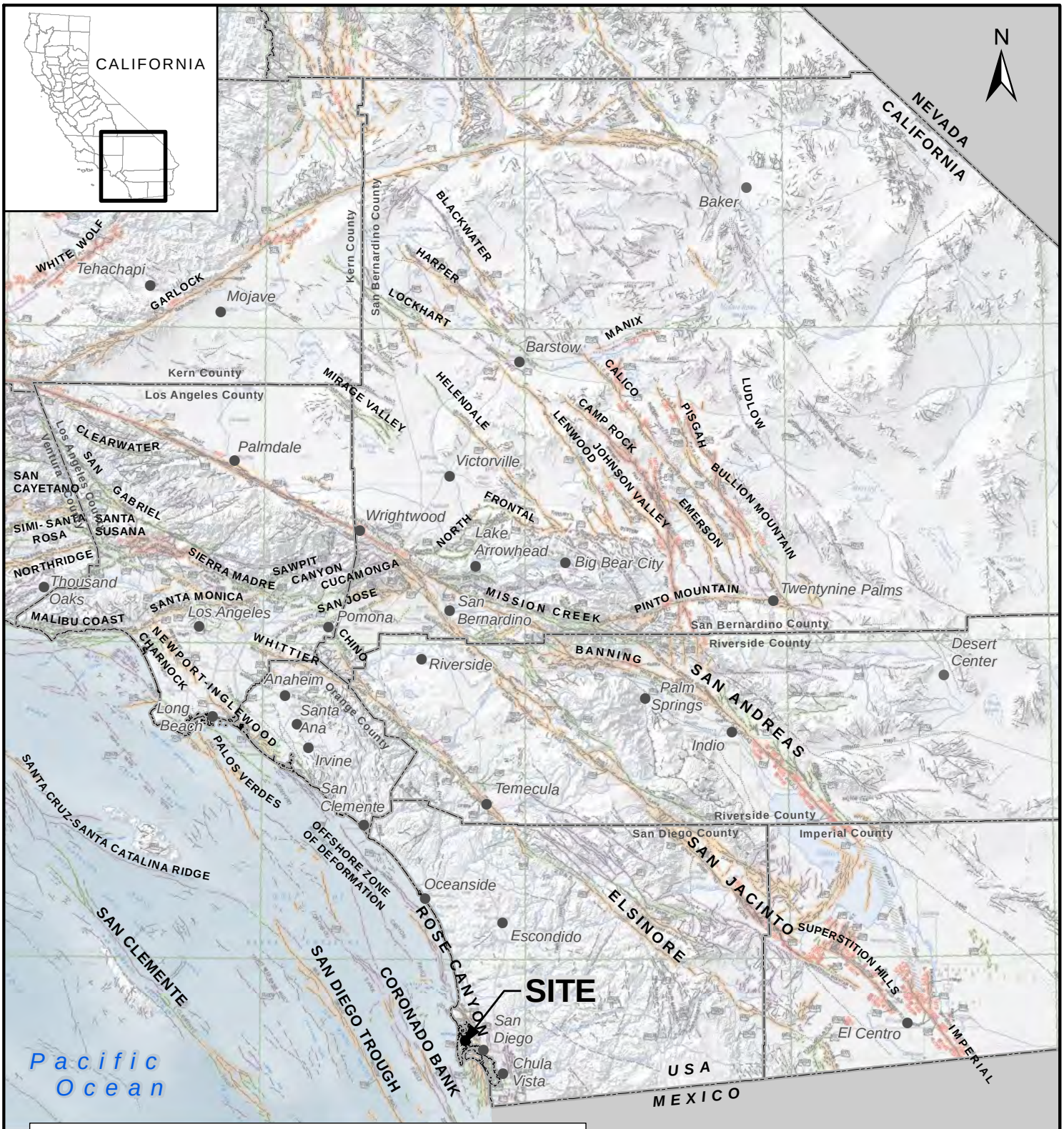
N

APPROXIMATE SCALE

0 2,000 4,000 FEET

3_107523001_G.mxd AOB

Ninyo & Moore	GEOLOGY	FIGURE
PROJECT NO. / DATE	CORREIA MIDDLE SCHOOL ATHLETIC MASTER PLAN SAN DIEGO, CALIFORNIA	3
107523001 / 12/14		



LEGEND

CALIFORNIA FAULT ACTIVITY

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- LATE QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (POTENTIALLY ACTIVE)
- STATE/COUNTY BOUNDARY

SOURCE: JENNINGS, C.W., AND BRYANT, W.A., 2010, FAULT ACTIVITY MAP OF CALIFORNIA, CALIFORNIA GEOLOGICAL SURVEY.

SCALE IN MILES

0 30 60

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

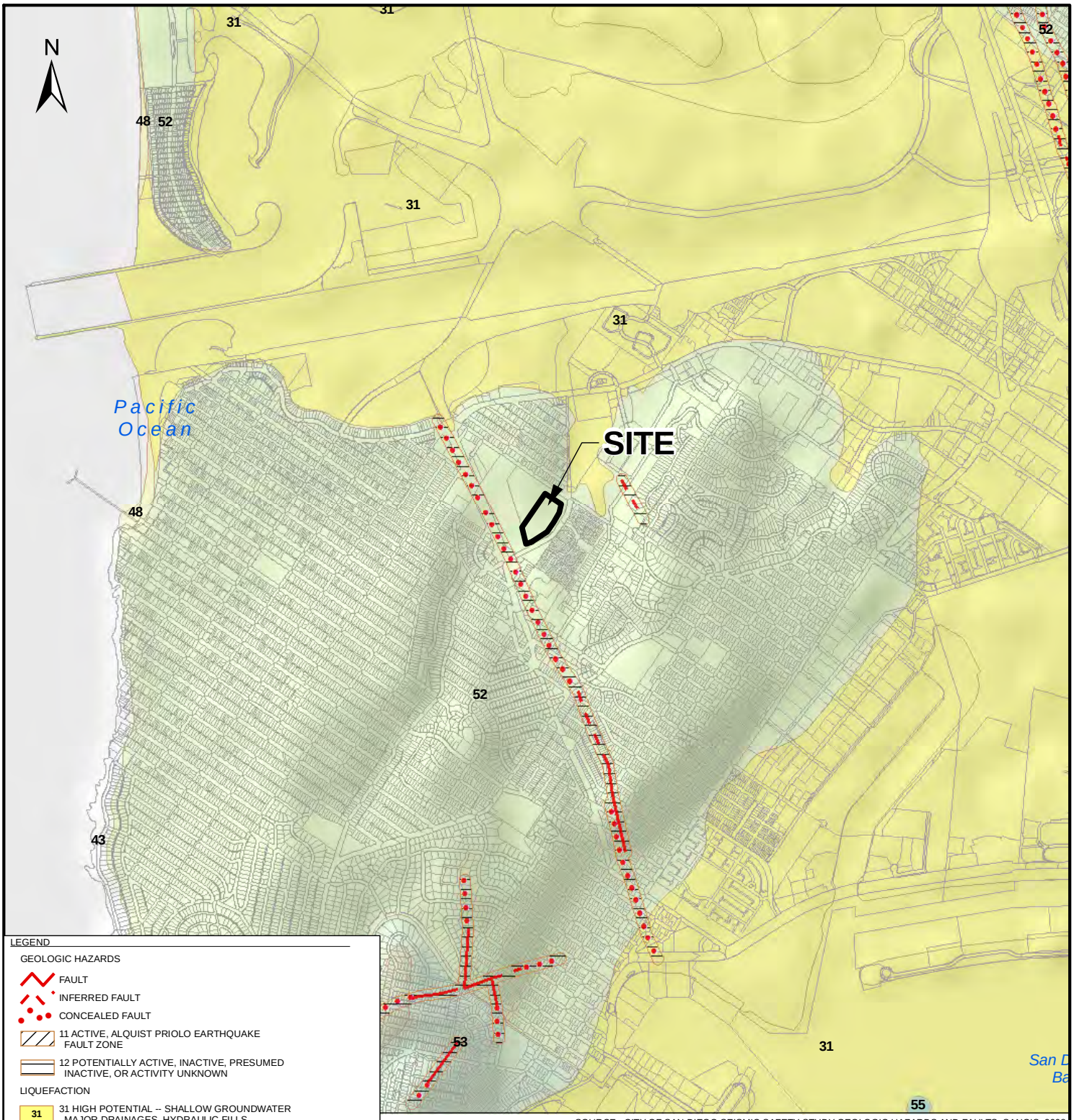
FAULT LOCATIONS

FIGURE 4

PROJECT NO.	DATE
107523001	12/14

CORREIA MIDDLE SCHOOL
ATHLETIC MASTER PLAN
SAN DIEGO, CALIFORNIA

4_107523001_FL.mxd AOB



SOURCE: CITY OF SAN DIEGO SEISMIC SAFETY STUDY GEOLOGIC HAZARDS AND FAULTS, SANGIS, 2008

LEGEND

GEOLOGIC HAZARDS

- FAULT
- INFERRED FAULT
- CONCEALED FAULT
- 11 ACTIVE, ALQUIST PRIOLO EARTHQUAKE FAULT ZONE
- 12 POTENTIALLY ACTIVE, INACTIVE, PRESUMED INACTIVE, OR ACTIVITY UNKNOWN

LIQUEFACTION

- 31 — 31 HIGH POTENTIAL -- SHALLOW GROUNDWATER MAJOR DRAINAGES, HYDRAULIC FILLS

COASTAL BLUFFS

- 43 — 43 GENERALLY UNSTABLE UNFAVORABLE JOINTING, LOCAL HIGH EROSION
- 48 — 48 GENERALLY STABLE BROAD BEACH AREAS, DEVELOPED HARBOR

OTHER TERRAIN

- 52 — 52 OTHER LEVEL AREAS, GENTLY SLOPING TO STEEP TERRAIN, FAVORABLE GEOLOGIC STRUCTURE, LOW RISK
- 53 — 53 LEVEL OR SLOPING TERRAIN, UNFAVORABLE GEOLOGIC STRUCTURE, LOW TO MODERATE RISK
- 55 — 55 MODIFIED TERRAIN (GRADED SITES) NOMINAL RISK

SCALE IN FEET

0 1,500 3,000 6,000

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore	GEOLOGIC HAZARDS	FIGURE
PROJECT NO. / DATE	CORREIA MIDDLE SCHOOL ATHLETIC MASTER PLAN SAN DIEGO, CALIFORNIA	5
107523001 / 12/14		

5_107523001_GH.mxd AOB