Draft Geotechnical Summary Report
SR-710 Tunnel Technical Study
Los Angeles County, California

Prepared For:
California Department of Transportation
100 South Main Street
Los Angeles, CA 90012

Prepared By:
CH2M HILL
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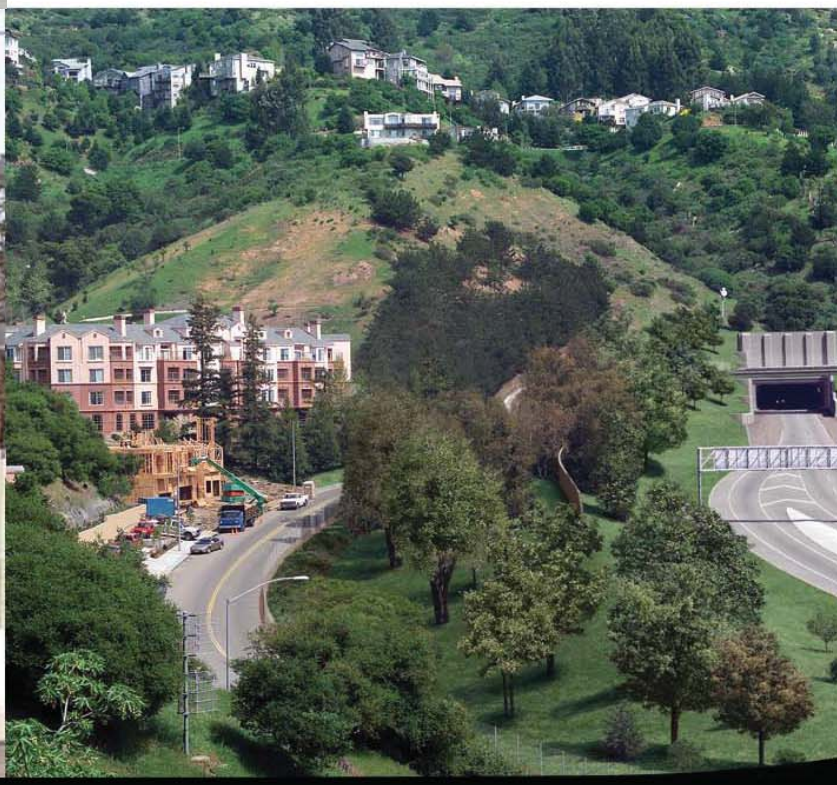
October 2009

Volume I of V



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Appendix F Environmental Site Assessment

Acronyms and Abbreviations

µg/L	micrograms per liter
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichlorethane
1,2-DCE	1,2-dichloroethene
1,2,3-TCP	1,2,3-trichloropropane
APEQFZ	Alquist-Priolo Earthquake Fault Zone
ASTM	American Society for Testing and Materials
ATV	acoustic televiewer
bgs	below ground surface
Cal-OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CCl_4	carbon tetrachloride
CDMG	California Division of Mines and Geology
CDOGR	California Division of Oil and Geothermal Resources
CDWR	California Department of Water Resources
CGS	California Geological Survey
CIP	cast-in-place
cis-1,2-DCE	cis-1,2-dichloroethene
ClO_4	perchlorate
Cr^{6+}	hexachrome
DTSC	Department of Toxic Substances Control
ECIS	East Central Interceptor Sewer
EFZ	earthquake fault zone
EIS	environmental impact study
EPB	earth-pressure balance
EPFT	Elysian Park Fold and Thrust Belt
ESA	Environmental Site Assessment
FS	feasibility study
ft/s	feet per second

g	gravitational acceleration
GPS	global positioning system
GRO	gasoline-range organics
H_2S	hydrogen sulfide
HDPE	high-density polyethylene
I-	Interstate
ISA	initial site assessment
LACDPW	Los Angeles County Department of Public Works
LADPW	City of Los Angeles Department of Public Works
LEL	lower explosive limit
LOTB	log of test boring
LUST	leaking underground storage tank
M	earthquake magnitude
M_L	earthquake Richter magnitude
M_W	earthquake moment magnitude
MASW	multi-channel analyses of surface waves
MCL	maximum contaminant level
Metro	Metropolitan Transportation Authority
mm/yr	millimeters per year
MSGW	Main San Gabriel Watermaster
msl	mean sea level
MTBE	methyl tertiary butyl ether
NATM	New Austrian Tunneling Method
NDMA	n-nitrosodimethylamine
NEIS	Northeast Interceptor Sewer Line
NISZ	Newport-Inglewood Structural Zone
NO_3	nitrate
NOS	North Outfall Sewer
NPL	National Priorities List
OU	Operable Unit
PAH	polyaromatic hydrocarbon
PBA	peak bedrock acceleration
PCB	polychlorinated biphenyl

PCE	tetrachloroethene
PGA	peak ground acceleration
PPE	personal protective equipment
PRP	potentially responsible party
psi	pounds per square inch
RBMB	Raymond Basin Management Board
ReMi	refraction microtremor
RI	remedial investigation
ROD	Record of Decision
RQD	rock quality designation
RWQCB	Regional Water Quality Control Board
SC	Steering Committee
SCAG	Southern California Association of Governments
SCEC	Southern California Earthquake Center
SEM	sequential excavation method
SR-	State Route
TAC	Technical Advisory Committee
TBA	tertiary butyl alcohol
TBM	tunnel boring machine
TCE	trichloroethylene
TPH	total petroleum hydrocarbons
UCS	unconfined compressive strength
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VLBI	very long baseline interferometry
VOC	volatile organic compound

Glossary of Terms

Alluvium. Accumulated material that was transported and deposited at a site by means of flowing water such as a stream or river.

Anticline. An upward-curving (convex) fold in rock that resembles an arch. The central part contains the oldest section of rock.

Aquifer. A permeable formation that stores and transmits groundwater in sufficient quantity to supply wells.

Aquitards. Semipervious layer above or below an aquifer.

ATV. Acoustic televiewer measurement, which provide high-resolution oriented images of the borehole walls in "pseudo-color."

Bar. Unit of measure of hydrostatic pressure equal to approximately one atmosphere or 33.5 feet of head.

Basement Complex Rocks. Undifferentiated rocks, commonly igneous and metamorphic, that underlie younger rocks, commonly sedimentary, in a given area.

Bedrock. Earth materials below the surface soil deposits. Bedrock is typically harder and stronger than the surface soil.

Caliper measurements. Measurements that evaluate the size and shape of a borehole.

Contamination plume. A three-dimensional zone of groundwater and/or soil contamination.

Epoch. One subdivision of a geologic period, often chosen to correspond to a stratigraphic series. Also used for a division of time corresponding to a paleomagnetic interval.

Fault. A zone in the earth along which one side has moved relative to the other. Sudden movements on faults cause earthquakes.

Fernando Formation. Bedrock generally consisting of layers or beds of claystone and siltstone.

Foliation. Aligned layers of minerals characteristic of some metamorphic rocks. Foliation forms in metamorphic rocks when pressure and heat change the shape, size or orientation of existing minerals or changes the minerals creating a parallel rock fabric.

Formation. A distinctive body of rock. Geologists name formations after the localities where they were first studied, or where they are especially well exposed.

Fracture. Any break in rock along which no significant movement has occurred.

Geologic structure. The geometric relationship of bedrock formations, faults, folds, and fractures.

Graben. A down-dropped block bounded by normal faults.

Hydraulic conductivity. A measure of the permeability of a rock or soil; the volume of flow through a unit surface area in unit time with unit hydraulic pressure difference as the driving force.

Igneous. Pertains to rock formed when molten rock (magma) cools and solidifies (crystallizes).

In situ testing. Testing at natural or original location/place.

Joint. A narrow fracture in rock along which there has been no significant movement of either side. Joints commonly form in parallel sets.

Lineament. Linear topographic features or alignments of vegetation. Lineaments could be the surface expression of faults.

Metamorphic rock. Bedrock that has been altered by the earth's internal heat and/or pressure.

NEIS. North East Interceptor Sewer. Sewer tunnel constructed in Los Angeles that was completed in 2005.

Normal Fault. A fault in which the hanging-wall block moved down relative to the foot-wall block.

Outcrop. A segment of bedrock that appears at the earth's surface.

Packer Tests. An in situ test method to evaluate the hydraulic conductivity of a bedrock formation.

Permeability. A measure of the ability of a material (typically, a rock or unconsolidated material) to transmit fluids.

Piezometers. A partly slotted pipe installed in the ground to monitor groundwater levels.

Physiography. A description of the physical nature of natural features.

Pressuremeter tests. An in situ test performed inside a borehole to estimate modulus and limit pressure of the bedrock.

Puente Formation. Bedrock generally consisting of layers or beds of sandstones, siltstones, diatomaceous siltstones, and/or mudstones.

Sedimentary rock. A rock formed by the accumulation and cementation of mineral grains transported by wind, water, or ice to the site of deposition or chemically precipitated at the depositional site.

Seismic reflection testing. A test using seismic waves produced by mechanical vibration or blasting, to measure seismic velocity directly under the wave generator.

Seismicity. The world-wide or local distribution of earthquakes in space and time; a general term for the number of earthquakes in a unit of time.

Slip. Movement of an active fault.

Stratigraphy. The science of the description, correlation, and classification of strata including the interpretation of the depositional environments of those strata.

Superfund site. Superfund is the common name for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) a United States federal law designed to clean up abandoned hazardous waste sites.

Surface wave testing. Measuring surface waves generated by dynamic sources such as hammers, weight drops, electromechanical shakers, vibroseis, and bulldozers to evaluate the properties of subsurface material.

Syncline. A downward-curving (concave) fold in rock that resembles the letter "U." The central part contains the youngest section of rock.

Topanga Formation. Bedrock generally consisting of conglomerate, sandstone, and siltstone.

Tuff. A rock composed of volcanic ash.

Weathering. The set of all processes that decay and break up bedrock—a combination of physical fracturing and chemical decomposition.