

## 5. Environmental Analysis

### 5.6 GEOLOGY AND SOILS

This section of the Draft PEIR evaluates the potential for implementation of the City of Clovis General Plan Update to impact geological and soil resources in the Plan Area. The information in this section is based in part on geologic and fault maps from the California Geological Survey.

#### 5.6.1 Environmental Setting

##### 5.6.1.1 REGULATORY SETTING

State laws, regulations, plans, or guidelines that are potentially applicable to the proposed project are summarized below.

##### State

###### *California Building Code*

Current law states that every local agency enforcing building regulations, such as cities and counties, must adopt the provisions of the California Building Code (CBC) within 180 days of its publication. The publication date of the CBC is established by the California Building Standards Commission, and the code is also known as Title 24, Part 2 of the California Code of Regulations. Local jurisdictions often adopt local, more restrictive amendments that are based on local geographic, topographic, or climatic conditions. These codes provide minimum standards to protect property and public safety by regulating the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. The CBC contains provisions for earthquake safety based on factors including occupancy type, the types of soil and rock onsite, and the strength of ground shaking with specified probability of occurring at a site. The 2013 CBC took effect on January 1, 2014.

###### *California Plumbing Code*

New septic systems would be required to meet regulations for septic systems in Appendix K of the California Plumbing Code, California Code of Regulations, Title 24, Part 5. The 2013 California Plumbing Code took effect on January 1, 2014.

###### *Statewide General Construction Activity Permit and Storm Water Pollution Prevention Plans*

The State Water Resources Control Board (SWRCB) issued a statewide general National Pollution Discharge Elimination System (NPDES) permit for stormwater discharges from construction sites (NPDES No. CAS000002) in 2009, Order No. 2009-0009-DWQ; amended most recently by Order No. 2012-0006-DWQ in July 2012. Under this Statewide General Construction Activity permit, discharges of stormwater from construction sites with a disturbed area of one or more acres are required to either obtain individual NPDES permits for stormwater discharges or be covered by the General Permit. Coverage by the General Permit is accomplished by completing and filing a Notice of Intent with the SWRCB and developing and implementing a Storm Water Pollution Prevention Plan (SWPPP). Each applicant under the General Construction Activity Permit must ensure that a SWPPP is prepared prior to grading and is implemented during construction. The SWPPP

## 5. Environmental Analysis

### GEOLOGY AND SOILS

must list BMPs implemented on the construction site to protect stormwater runoff and must contain a visual monitoring program; a chemical monitoring program for “nonvisible” pollutants to be implemented if there is a failure of BMPs; and a monitoring plan if the site discharges directly to a water body listed on the state’s 303(d) list of impaired waters.

#### *Requirements for Geotechnical Investigations*

Requirements for geotechnical investigations for subdivisions requiring tentative and final maps and for other specified types of structures are in California Health and Safety Code Sections 17953 to 17955 and in Section 1802 of the CBC. Testing of samples from subsurface investigations is required, such as from borings or test pits. Studies must be done as needed to evaluate slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on load-bearing capacity, compressibility, liquefaction, differential settlement, and expansiveness.

#### **City of Clovis**

Subdivisions in the City of Clovis are required to install an approved sewer connection to the property line of each lot, per City Municipal Code Section 9.110.050(G).

#### **County of Fresno**

Public sewers must be provided to the property line of all divided parcels in unincorporated Fresno County with a net area of 36,000 square feet (0.83 acre) or less, per Fresno County Ordinance Section 17.72.360. Developments in unincorporated Fresno County that would install septic tanks would have percolation tests conducted at sites of proposed tanks and/or leach fields to ensure that treated wastewater could adequately percolate into soil, per requirements of the Fresno County Environmental Health System (EHS). The EHS has minimum standards for septic systems regarding percolation rates, shallow bedrock, and shallow water table (EHS 2013).

#### **5.6.1.2 EXISTING CONDITIONS**

##### **Geologic Setting**

###### *Regional Setting*

The Plan Area is in the San Joaquin Valley; the foothills of the Sierra Nevada begin several miles east of the City. The San Joaquin Valley is the southern of two valleys that make up the Great Valley geomorphic province, an alluvial plain about 400 miles long and 50 miles wide. The Coast Ranges bound the San Joaquin Valley on the west.

###### *Local Setting*

The Plan Area is underlain by Quaternary alluvial fan sedimentary deposits and Pleistocene nonmarine sedimentary deposits (CGS 2012) (see Figure 5.6-1, *Geologic Map*). The Quaternary Period extends from the present to 1.8 million years before present (mybp), and the Pleistocene Epoch extends from 11,500 years before present to 1.8 mybp. The Plan Area is on a very slight southwest slope of about 0.2 percent grade; elevations in

## 5. Environmental Analysis

### GEOLOGY AND SOILS

the incorporated portion of the City range from about 335 feet above mean sea level (amsl) at the southwest corner of the Plan Area to 435 feet amsl at the northeast corner. Elevations in the Sphere of Influence (SOI) range up to about 390 feet amsl at both the northern and eastern SOI boundaries.

The terrain in the eastern and northeastern parts of the Plan Area is cut by numerous gullies and small canyons. The overall grade in those areas remains similar to that of the City and SOI; elevations in the Plan Area reach 584 feet amsl.

#### *Faulting and Seismicity*

The Clovis Fault extends northwest-southeast from just north of the Plan Area, across the northeastern corner, to just east of the southeast Plan Area boundary (see Figure 5.6-2, *Regional Fault Map*). The Clovis Fault is not mapped as active, and is mapped as showing no recognized displacement in the Quaternary Period, that is, within the last 1.6 million years. No other faults within 50 miles of the Plan Area are mapped on the 2010 Fault Activity Map of California (CGS 2013) (see Figure 5.6-2).

### Geologic Hazards

#### *Seismic Hazards*

##### *Liquefaction and Related Ground Failure*

Liquefaction is a process whereby strong earthquake shaking causes sediment layers that are saturated with groundwater to lose strength and behave as a fluid. This subsurface process can lead to near-surface or surface ground failure that can result in property damage and structural failure. If surface ground failure does occur, it is usually expressed as lateral spreading, flow failures, ground oscillation, and/or general loss of bearing strength. Sand boils (injections of fluidized sediment) can commonly accompany these different types of failure.

In order to determine a region's susceptibility to liquefaction, the following three major factors must be analyzed:

- The intensity and duration of ground shaking.
- The age and texture of the alluvial sediments. Generally, the younger, less well compacted sediments consisting of sand and silty sand tend to have a higher susceptibility to liquefaction.
- The depth to the groundwater. Liquefaction occurs in saturated soil; in general, groundwater depths shallower than 10 feet below surface are most susceptible to liquefaction.

Depth to groundwater in 2012 ranged from 160 feet along the west City boundary to 70 feet at the east City boundary, 30 to 40 feet at the southeast SOI boundary, and slightly less than 30 to about 20 feet at the eastern Plan Area boundary (FID 2013). Areas of the San Joaquin Valley in Fresno County are not considered conducive to liquefaction due to soil types—either too coarse or too high in clay content (Fresno County 2000).

##### *Seismic Ground Settlement*

Soils in the Clovis area are not subject to seismic ground settlement (Fresno County 2000).

## 5. Environmental Analysis

### GEOLOGY AND SOILS

#### *Earthquake-Induced Landslides*

The Plan Area is not susceptible to earthquake-induced landslides due to very slight grades.

#### *Other Geologic Hazards*

##### *Ground Subsidence*

The main cause of ground subsidence is withdrawal of groundwater. The most damaging effects of subsidence have been ground fissures in areas of differential ground subsidence (LACWD 2013). No significant land subsidence is known to have occurred in the last 50 years as a result of land development, water resources development, groundwater pumping, or oil drilling (FID 2006). Regional ground subsidence in the Plan Area was mapped as less than one foot by the US Geological Survey in 1999 (Galloway and Riley 1999). However, groundwater levels in the San Joaquin Valley are forecast to hit an all-time low in 2014 (UCCHM 2014). Groundwater levels in the Kings Groundwater Basin are managed by nine public agencies and one private company within the Fresno Regional Groundwater Management Plan area, which is the northern part of the Kings River Subbasin encompassing the Fresno-Clovis Metropolitan Area and some surrounding areas of the San Joaquin Valley in Fresno County (FID 2006).<sup>1</sup> Lands within the Fresno Regional Groundwater Management Plan area will be observed for land subsidence, and if land subsidence becomes a problem, the Fresno Regional Groundwater Management Plan will be amended to include preventive and mitigative measures for land subsidence.

##### *Expansive Soils*

Expansive soils shrink or swell as the moisture content decreases or increases; the shrinking or swelling can shift, crack, or break structures built on such soils. Based on a generalized assessment for Fresno County, soils with moderately high to high expansion potential are present along parts of the northern edge of the non-SOI Plan Area and in the easternmost part of the City of Clovis' Non-SOI Plan Area (Fresno County 2000).

##### *Soil Erosion*

Erosion is the movement of soil from place to place and is a natural process. The main natural agents of erosion in the region are wind and flowing water. Erosion can be accelerated dramatically by ground-disturbing activities if effective erosion control measures are not used. Soil can be tracked off of construction sites by vehicles and carried off sites by wind and water.

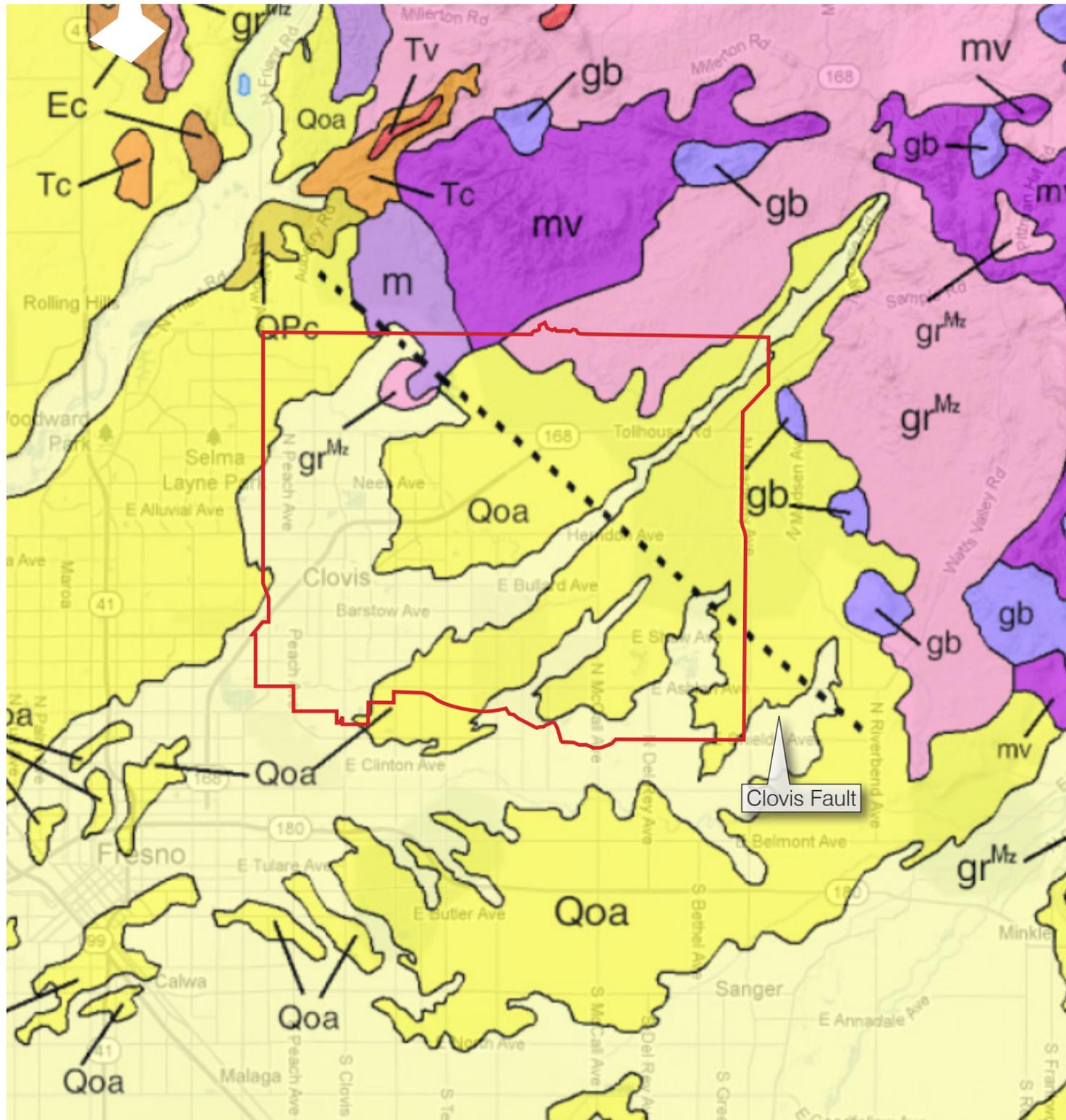
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<sup>1</sup> The 10 entities are the Fresno Irrigation District, the County of Fresno, the City of Fresno, the City of Clovis, the Fresno Metropolitan Flood Control District, the City of Kernan, the Bakman Water Company, the Garfield Water District, the Malaga County Water District, and Pinedale County Water District.

# 5. Environmental Analysis

Figure 5.6-1

## Geologic Map



### LEGEND

- Ec Sandstone, shale, conglomerate; moderately to well consolidated. Eocene.
- gb Gabbro and dark dioritic rocks; chiefly Mesozoic.
- gr<sup>Mz</sup> Mesozoic granite, quartz monzonite, granodiorite, and quartz diorite.
- m Undivided pre-Cenozoic metasedimentary and metavolcanic rocks of great variety. Mostly slate, quartzite, hornfels, chert, phyllite, mylonite, schist, gneiss, and minor marble.
- mv Undivided pre-Cenozoic metavolcanic rocks. Includes latite, dacite, tuff, and greenstone; commonly schistose.
- Qoa Older alluvium, lake, playa, and terrace deposits. Quaternary.
- QPc Pliocene and/or Pleistocene sandstone, shale, and gravel deposits; mostly loosely consolidated.
- Tc Undivided Tertiary sandstone, shale, conglomerate, breccia, and ancient lake deposits. Tertiary.
- Tv Tertiary volcanic flow rocks; minor pyroclastic deposits.

Geologic Time Scale	Millions of Years before Present
Pleistocene Epoch	1.8-0.0115 [11,500 years ago]
Quaternary Period	1.8-present
Pliocene Epoch	5.3-1.8
Tertiary Period	65.5-1.8
Pre-Cenozoic	Older than 65.5
Mesozoic	251-65.5

— Plan Area Boundary



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## 5. Environmental Analysis GEOLOGY AND SOILS

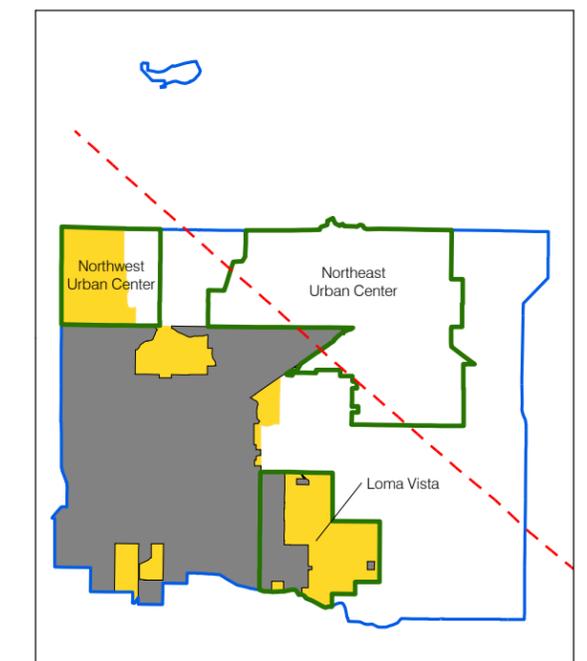
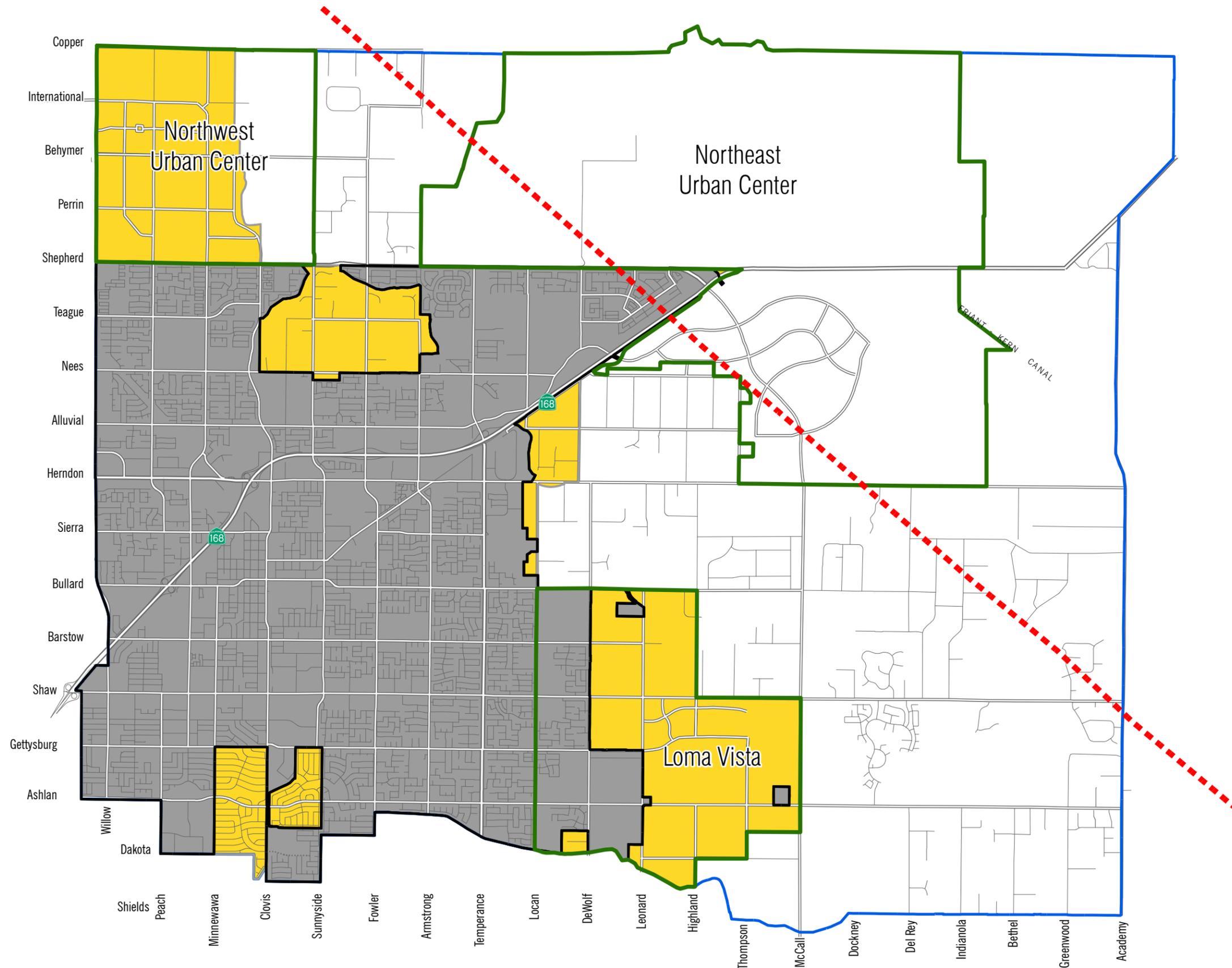
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# 5. Environmental Analysis

Figure 5.6-2

## Regional Fault Map

- - - Pre-Quaternary Fault
- City Boundary
- Sphere of Influence Boundary
- Urban Center Boundary
- Plan Area Boundary



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Environmental Impact Report



## 5. Environmental Analysis

### GEOLOGY AND SOILS

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## 5. Environmental Analysis GEOLOGY AND SOILS

### Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

- G-1 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 a known fault. (Refer to Division of Mines and Geology Special Publication 42.)
  - ii) Strong seismic ground shaking.
  - iii) Seismic-related ground failure, including liquefaction.
  - iv) Landslides.
- G-2 Result in substantial soil erosion or the loss of topsoil.
- G-3 Be located on a 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.
- G-4 Be located on expansive soil, as defined in Table 18-1B of the Uniform building Code (1994), creating substantial risks to life or property.
- G-5 Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Thresholds G-1.i and G-1.ii

These impacts will not be addressed in the following analysis.

### 5.6.2 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

## 5. Environmental Analysis GEOLOGY AND SOILS

### 5.6.2.1 ACREAGE

At ultimate full buildout of the General Plan Update, about 42,493 acres, or 89 percent, of the Plan Area would be developed land uses; the remainder of the Plan Area would be designated Open Space (4,277 acres) or Water (1,042 acres).

### 5.6.2.2 PERMITTED DEVELOPMENT POTENTIAL

Permitted development potential under the proposed General Plan Update in 2035 and full buildout conditions, compared to existing conditions, is shown in Table 5.6-1. As shown, full buildout of the proposed General Plan Update would permit development of an additional 65,100 residential units and 38.25 million square feet of non-residential land uses compared to existing (2013) conditions, accommodating an estimated additional 179,300 residents and 54,000 workers.

**Table 5.6-1 Buildout Statistical Summary**

	Acres	Residential Units	Household	Population	Nonresidential Buildings, Square Feet	Employment
<b>Existing Conditions (2013)</b>	<b>47,805</b>	<b>42,000</b>	<b>40,500</b>	<b>115,000</b>	<b>13,050,000</b>	<b>31,500</b>
City	14,859	36,500	35,000	100,000	12,600,000	30,000
SOI	5,633	2,000	2,000	6,000	200,000	1,000
Non-SOI	27,313	3,500	3,500	9,000	210,000	500
<b>Proposed General Plan Update (2035 Scenario)</b>	<b>47,805</b>	<b>67,200</b>	<b>63,900</b>	<b>184,100</b>	<b>37,410,000</b>	<b>62,400</b>
City	14,859	45,400	43,100	124,400	30,625,000	50,000
SOI	5,633	13,200	12,600	36,100	2,545,000	6,300
Non-SOI	27,313	8,600	8,200	23,600	4,240,000	6,100
<b>Proposed General Plan (Full Buildout)</b>	<b>47,805</b>	<b>107,100</b>	<b>101,800</b>	<b>294,300</b>	<b>51,300,000</b>	<b>85,500</b>
City	14,859	46,000	43,700	126,800	32,300,000	52,500
SOI	5,633	22,600	21,500	61,800	7,700,000	15,000
Non-SOI	27,313	38,500	36,600	105,700	11,300,000	18,000
<b>Proposed General Plan Update (2035 Scenario) less Existing Conditions</b>	<b>8</b>	<b>25,200</b>	<b>23,400</b>	<b>69,100</b>	<b>24,360,000</b>	<b>30,900</b>
City	0	8,900	8,100	24,400	18,025,000	20,000
SOI	0	11,200	10,600	30,100	2,345,000	5,300
Non-SOI	0	5,100	4,700	14,600	4,030,000	5,600
<b>Proposed General Plan Update (Full Buildout) less Existing Conditions</b>	<b>8</b>	<b>65,100</b>	<b>61,300</b>	<b>179,300</b>	<b>38,250,000</b>	<b>54,000</b>
City	0	9,500	8,700	26,800	19,700,000	22,500
SOI	0	20,600	19,500	55,800	7,500,000	14,000
Non-SOI	0	35,000	33,100	96,700	11,090,000	17,500

## 5. Environmental Analysis GEOLOGY AND SOILS

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**Impact 5.6-1: Substantial hazards from liquefaction or earthquake-induced ground settlement are not expected in the Plan Area; however, project-specific geotechnical investigations would be required to evaluate potentials for liquefaction and for earthquake-induced ground settlement on individual project sites. [Thresholds G-1.iii]**

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### *Impact Analysis:*

#### **2035 Scenario**

The 2035 Scenario would permit development of 25,200 additional residential units and 24.36 million additional square feet of nonresidential land uses compared to 2013 conditions, accommodating net increases of 69,100 residents and 30,900 workers.

Substantial hazards from liquefaction resulting from buildout of the General Plan Update are not expected because soil types in the Plan Area are either too coarse or too high in clay content to be susceptible to liquefaction. However, the assessment cited here is a generalized assessment covering all of Fresno County. Site-specific evaluation of liquefaction potential as part of geotechnical investigation for each development and redevelopment site under the proposed General Plan Update would be required.

Soils in the Clovis area are not subject to seismic ground settlement, also based on a generalized assessment covering all of Fresno County (Fresno County 2000). As with liquefaction hazard, site-specific evaluation of hazard from seismic ground settlement would be required as part of geotechnical investigations for each project.

#### **Full Buildout**

Full buildout of the proposed General Plan Update would permit development of 65,100 additional residential units and 38.25 million additional square feet of nonresidential land uses compared to existing (2013) conditions, accommodating estimated increases of 179,300 residents and 54,000 workers.

The analysis above for the 2035 Scenario also applies to full buildout of the General Plan Update.

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**Impact 5.6-2: Implementation of the General Plan Update would not subject people or structures to substantial hazards from earthquake-induced landslides. [Threshold G-1.iv]**

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### *Impact Analysis:*

#### **2035 Scenario**

The Plan Area is not susceptible to earthquake-induced landslides due to very slight grades. Hilly areas along the northwestern Plan Area boundary were referenced in the Initial Study. However, the northwest corner of the Plan Area is nearly flat, with a south slope of about 0.2 percent grade. Developments near the northwest corner of the Plan Area would not subject people or structures to substantial hazards from earthquake-induced landslides.

## 5. Environmental Analysis

### GEOLOGY AND SOILS

#### Full Buildout

The analysis for the 2035 Scenario also applies to the full buildout.

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**Impact 5.6-3: Buildout of the proposed General Plan Update would not subject people or structures to substantial hazards from ground subsidence. [Threshold G-3 (part)]**

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#### *Impact Analysis:*

##### 2035 Scenario

The main cause of ground subsidence is withdrawal of groundwater. Groundwater levels in the Kings Groundwater Basin are managed by nine public agencies and one private company within the Fresno Regional Groundwater Management Plan area. Land elevations are monitored at more than 20 points in the Fresno Regional Groundwater Management Plan area boundary through a Global Positioning System (GPS) control network. Groundwater depletion in the Central Valley between 2003 and 2010 is estimated at over 16 million acre-feet. Freshwater loss, including groundwater depletion, from the Sacramento and San Joaquin River Basins between November 2011 and November 2013 is estimated at about 16 million acre-feet (UCCHM 2014). If land subsidence becomes a problem, the Fresno Regional Groundwater Management Plan will be amended to include preventive and mitigation measures for land subsidence (FID 2006). Impacts would be less than significant.

#### Full Buildout

The analysis for the 2035 Scenario also applies to the full buildout.

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**Impact 5.6-4: Implementation of the proposed General Plan Update could result in substantial soil erosion. [Threshold G-2]**

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#### *Impact Analysis:*

##### 2035 Scenario

Buildout in the 2035 Scenario would permit development of 25,200 additional residential units and 24.36 million additional square feet of nonresidential land uses compared to 2013 conditions. Development and redevelopment projects pursuant to the proposed General Plan Update would disturb large amounts of soil. Grading and construction of projects would typically expose bare soil temporarily. Thus, grading and construction activities could accelerate soil erosion.

Construction projects of one acre or more are regulated under the General Construction Permit, Order No. 2012-0006-DWQ, issued by the SWQCB in 2012. Projects obtain coverage by developing and implementing a SWPPP specifying best management practices (BMPs) that would be used by the project to minimize pollution of stormwater. Categories of BMPs are described in Table 5.6-2.

5. Environmental Analysis  
GEOLOGY AND SOILS

**Table 5.6-2 Construction BMPs**

Category	Purpose	Examples
Erosion Controls	Cover and/or bind soil surface, to prevent soil particles from being detached and transported by water or wind.	Mulch, geotextiles, mats, hydroseeding, earth dikes, swales.
Sediment Controls	Filter out soil particles that have been detached and transported in water.	Barriers such as straw bales, sandbags, fiber rolls, and gravel bag berms; desilting basin; cleaning measures such as street sweeping.
Wind Erosion Controls	The aims and methods of wind erosion control are similar to those of erosion control described above.	See <i>Erosion Controls</i> above.
Tracking Controls	Minimize the tracking of soil offsite by vehicles.	Stabilized construction roadways and construction entrances/exits; entrance/outlet tire wash.
Non-stormwater Management Controls	Prohibit discharge of materials other than stormwater, such as discharges from the cleaning, maintenance, and fueling of vehicles and equipment. Conduct various construction operations, including paving, grinding, and concrete curing and finishing, in ways that minimize non-stormwater discharges and contamination of any such discharges.	BMPs specifying methods for: paving and grinding operations; cleaning, fueling, and maintenance of vehicles and equipment; concrete curing; concrete finishing.
Waste Management and Controls (i.e. good housekeeping practices)	Management of materials and wastes to avoid contamination of stormwater.	Spill prevention and control, stockpile management, and management of solid wastes and hazardous wastes.

Projects developed pursuant to the proposed General Plan Update would prepare and implement SWPPPs.

**Full Buildout**

The above analysis for the 2035 Scenario would also apply to full buildout of the General Plan Update, except that the scale of development and redevelopment would be larger: 65,100 additional residential units and 38.25 million additional square feet of nonresidential land uses compared to 2013 conditions. After implementation of BMPs in project-specific SWPPPs, erosion impacts would be less than significant.

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**Impact 5.6-5: Buildout of the General Plan Update could expose people and structures to substantial hazards arising from expansive soils. [Threshold G-4]**

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***Impact Analysis:***

**2035 Scenario**

Development in the 2035 Scenario would allow for a net increase of about 25,200 residential units and 2.436 million square feet of nonresidential land uses. Based on a generalized assessment for Fresno County, soils with moderately high to high expansion potential are present along parts of the northern edge of the City of Clovis' non-SOI Plan Area, and in the easternmost part of the non-SOI Plan Area (Fresno County 2000).

## 5. Environmental Analysis

### GEOLOGY AND SOILS

Implementation of the General Plan Update could subject people and structures to substantial hazards from expansive soils.

Each project developed pursuant to the General Plan Update would require a site-specific geotechnical investigation. The geotechnical investigation would include testing of subsurface site soils for expansion index and assessment of expansiveness of site soils. The geotechnical investigation would include recommendations for remedial grading and foundation design to minimize hazards to people and structures from expansive soils.

#### Full Buildout

The above analysis for 2035 Scenario would also apply to full buildout, except that the development capacity would be greater—net increases of 65,100 residential units and 38.25 million square feet of nonresidential land uses compared to 2013 conditions. After compliance with recommendations in project-specific geotechnical investigations, hazards arising from expansive soils would be a less than significant impact.

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#### Impact 5.6-6: Soil conditions may not adequately support proposed septic tanks. [Threshold G-5]

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##### *Impact Analysis:*

#### 2035 Scenario

Subdivisions in the City of Clovis are required to install an approved sewer connection to the property line of each lot, per City Municipal Code Section 9.3.203. Public sewers must be provided to the property line of all divided parcels in unincorporated Fresno County with a net area of 36,000 square feet (0.83 acre) or less, per Fresno County Ordinance Section 17.72.360. Proposed land use designations permitting development at densities of under 0.83 units per acre are Agriculture (AG), Rural Residential (RR), and Very Low Density Residential (VL). Amounts of land with these three designations in the proposed land use plan are shown in Table 5.6-3. As shown, in over 95 percent of the City and in 80 percent of the SOI, new developments would be required to install sewer laterals.

Developments in unincorporated Fresno County that would install septic tanks would have percolation tests conducted at sites of proposed tanks and/or leach fields to ensure that treated wastewater could adequately percolate into soil, per requirements of the Fresno County Environmental Health System (EHS). The EHS has minimum standards for septic systems regarding percolation rates, shallow bedrock, and shallow water table (EHS 2013). New septic systems would also be required to meet regulations for septic systems in Appendix K of the California Plumbing Code, California Code of Regulations, Title 24, Part 5. Impacts would be less than significant.

## 5. Environmental Analysis GEOLOGY AND SOILS

**Table 5.6-3 Acres of Proposed Land Use Designations Permitting Development at Densities below 0.83 Residential Units per Acre**

	City		SOI		Non-SOI Plan Area		Total	
	Acres	Percent of Total Area	Acres	Percent of Total Area	Acres	Percent of Total Area	Acres	Percent of Total Area
Agriculture (AG), 1 DU/20 AC	0	0%	68	1%	5,521	20%	5,589	12%
Rural Residential (RR), 1 DU/2 AC	17	<1%	941	17%	10,147	37%	11,105	23%
Very Low Density Residential (VL) <sup>1</sup> 0.6-2.0 DU/AC	563	4%	108	2%	104	<1%	775	2%
<b>Total</b>	<b>580</b>	<b>&lt;5%</b>	<b>1,117</b>	<b>20%</b>	<b>15,772</b>	<b>&lt;58%</b>	<b>17,469</b>	<b>37%</b>

<sup>1</sup> The range of permitted density in the Very Low Density Residential (VL) designation is 0.6 to 2.0 units per acre; thus, it is assumed that most development in that designation would be at densities requiring sewers (0.83 acre or more) per the Fresno County Ordinance Section 17.72.360.

### Full Buildout

The above analysis for the 2035 Scenario also applies to full buildout. Note, however, that about 90 percent of the land with designations permitting development at densities where septic tanks would be allowed is in the non-SOI Plan Area; thus, far more septic tanks could be built pursuant to full buildout of the General Plan Update compared to the 2035 Scenario. Impacts would be less than significant.

### 5.6.3 Relevant General Plan Policies and Development Code Sections

The following are relevant policies of the proposed Clovis General Plan and Development Code Update that would reduce potential geological impacts of future development in the Plan Area.

#### General Plan

##### *Environmental Safety Element*

**Goal 1:** Minimized risk of injury, loss of life, property damage, and economic and social disruption caused by natural hazards.

- **Policy 1.3 Geologic and seismic risk** - Prohibit development on unstable terrain, excessively steep slopes, and other areas deemed hazardous due to geologic and seismic hazards unless acceptable mitigation measures are implemented. Require that underground utilities be designed to withstand seismic forces and accommodate ground settlement.
- **Policy 1.5 Critical and public facilities** - Locate and design critical and public facilities to minimize their exposure and susceptibility to flooding, seismic and geological effects, fire, and explosions. Ensure critical use facilities (e.g. hospital, police, and fire facilities) can remain operational during an emergency.

## 5. Environmental Analysis

### GEOLOGY AND SOILS

#### 5.6.4 Existing Regulations

##### 5.6.4.1 STATE

- California Code of Regulations Title 24, Part 2: California Building Code
- California Code of Regulations Title 24, Part 5: California Plumbing Code
- California Health and Safety Code Sections 17953 to 17955: Requirements for geotechnical investigations
- California Public Resources Code Sections 2621 et seq.: Alquist-Priolo Earthquake Fault Zoning Act
- California Public Resources Code Section 2695: Seismic Hazard Mapping Act

##### 5.6.4.2 FRESNO COUNTY

- Fresno County Environmental Health System: septic tank standards
- Fresno County Ordinance Section 17.72.360: Sewer requirement

##### 5.6.4.3 CITY OF CLOVIS

- Municipal Code Section 9.110.050(G) (Sewer Requirement)

#### 5.6.5 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and compliance with the General Plan Update policies, the following impacts would be less than significant for the 2035 Scenario and Full Buildout: 5.6-1, 5.6-2, 5.6-3, 5.6-4, 5.6-5, and 5.6-6.

#### 5.6.6 Mitigation Measures

No mitigation measures are required for the 2035 Scenario or Full Buildout

#### 5.6.7 Level of Significance After Mitigation

Impacts would be less than significant for the 2035 Scenario and Full Buildout.

#### 5.6.8 References

California Geological Survey (CGS). 2012, January 26. *2010 Geologic Map of California*.  
<http://www.quake.ca.gov/gmaps/GMC/stategeologicmap.html>.

———. 2013, May 29. 2010 Fault Activity Map of California. <http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html>.

Fresno Irrigation District (FID). 2006, December. Fresno Area Regional Groundwater Management Plan.  
[http://fresnofloodcontrol.org/water\\_resources/Fresno%20Area%20Regional%20GWMP%20Final.pdf](http://fresnofloodcontrol.org/water_resources/Fresno%20Area%20Regional%20GWMP%20Final.pdf).

## 5. Environmental Analysis GEOLOGY AND SOILS

———. 2013, September 3. Fresno Area Regional Groundwater Management Plan. Annual Report. Depth to Water in Wells (Spring 2012).

Galloway, D.L., and Riley, F.S., 1999, San Joaquin Valley, California—Largest human alteration of the Earth's surface: *in* Land Subsidence in the United States, Galloway, D.L., Jones, D.R., and Ingebritsen, S.E., eds., U.S. Geological Survey Circular 1182, pp. 23-34, <http://pubs.usgs.gov/circ/circ1182/>.

Los Angeles County Waterworks Districts (LACWD). 2013, March 14. Antelope Valley Groundwater Restoration and Subsidence Mitigation Project.  
<ftp://dpwftp.co.la.ca.us/pub/PDD/Wash%20DC%20Docs/4%20-%20Fact%20Sheets%20&%20Correspondence/Funding%20Priorities/Antelope%20Valley%20Groundwater%20Restoration%20and%20Subsidence%20Mitigation%20Project%20%28Fact%20Sheet%29.pdf>.

## 5. Environmental Analysis GEOLOGY AND SOILS

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