4.10 MINERAL RESOURCES

4.10.1 METHODOLOGY

The Initial Study for the Project stated that no impacts on mineral resources would occur with the Project. However, comments received during the NOP comment period raised issues related to oil resources on the Project Site. Thus, this Draft EIR section describes the affected environmental and regulatory setting for mineral resources and discusses the potential impacts of the implementation of the Inglewood Oil Field Specific Plan (Project or Specific Plan) to non-fuel mineral resources (e.g., sand, gravel, stone [aggregate], metals and industrial minerals) and petroleum resources (i.e., oil and natural gas). Direct, indirect, and cumulative impacts are addressed for each threshold criteria below, and growth-inducing impacts are described in Sections 6.0, CEQA-Mandated Analyses, of this Draft EIR.

CEQA does not specifically define mineral resources. Therefore, the definition of mineral resource from the Department of Conservation, State Mining and Geology Board, and the United States Bureau of Mines, and United States Geological Survey will be used for this Draft EIR. These agencies define mineral resources as "a concentration of naturally occurring solid, liquid, or gaseous material in or on the Earth's crust in such form and amount that economic extraction of a commodity from the concentration is currently or potentially feasible". As such, both non-fuel mineral resources as well as petroleum resources are discussed.

Throughout this Draft EIR, the City's portion of the Inglewood Oil Field (77.8 acres) is referred to as the "Project Site" or the "City IOF". The entire surface boundary limits of the Inglewood Oil Field, including lands within both the City and County, is referred to as "Inglewood Oil Field". The off-site portion of the Inglewood Oil Field that is within the jurisdiction of the County of Los Angeles is referred to as the "County IOF".

4.10.2 ENVIRONMENTAL SETTING

The Project Site is not known to contain non-fuel mineral deposits (e.g., sand and gravel) of any economic importance or any otherwise "classified" mineral deposits. Also, there are no sand and gravel extraction sites or quarries in or near the Project Site.

However, the Project Site is a known source of petroleum resources, as evidenced by the presence of existing oil and gas wells and related facilities on the Inglewood Oil Field, including the Project Site. Section 2.0, Environmental Setting of this Draft EIR discusses existing oil and gas extraction activities and facilities on the City IOF at the time of NOP issuance. As indicated, there are 69 wells with top-hole locations in the City IOF, of which 41 are active/potentially active, including 26 production, 10 injection wells, and 5 idle wells. Additionally, the City IOF contained 28 plugged/abandoned wells (DOGGR 2015a).

Oil and Gas Resources

The Inglewood Oil Field produced nearly 2.66 million barrels of oil; 1.27 million cubic feet of gas; and 127.46 million barrels of water in 2014. The Inglewood Oil Field was the 3rd largest producer of oil and the 2nd largest producer of gas in California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) District 1, which includes the majority of Los Angeles County and all of Orange, San Diego, San Bernardino, Riverside and Imperial counties (DOGGR 2015b). Table 4.10-1 shows historic production of the Inglewood Oil Field.

TABLE 4.10-1
HISTORIC OIL AND GAS PRODUCTION IN THE INGLEWOOD OIL FIELD

	Millions of Barrels of Oil			Billions of Cubic Feet of Gas		
Year*	IOF	CA	% of CA	IOF	CA	% of CA
2014	2.7	205.3	1.3	1.3	194.5	0.7
2013	2.7	199.5	1.4	1.3	208.4	0.6
2012	2.8	197.5	1.4	1.4	168.2	0.9
2009	2.8	229.8	1.2	1.5	276.7	0.5
2008	3.1	238.6	1.3	1.5	296.9	0.5
2007	3.1	243.2	1.3	1.7	312.2	0.6
2006	3.3	249.3	1.3	2.2	327.2	0.7
2005	2.9	255.8	1.1	2.7	322.9	0.8
2004	2.8	267.6	1.1	2.1	326.4	0.7

IOF: Inglewood Oil Field; CA: State of California

*Years 2010 and 2011 were not available for review.

Sources: DOGGR 2005, 2006, 2007, 2008, 2009, 2010, 2013, 2014, 2015b.

As shown in Table 4.10-1, the Inglewood Oil Field has been contributing approximately 1.1 to 1.4 percent of the total oil production in the State of California. Natural gas production at the Inglewood Oil Field has contributed 0.5 to 0.9 percent of the total natural gas production in the State of California. The Inglewood Oil Field was the second largest oil and gas production field in the State of California from 2004 through 2009. Petroleum resources from the Inglewood Oil Field are an element of the local employment base and the overall economy. With new recovery techniques being developed and coming into use, oil and gas production should continue to be economically relevant.

Aggregate Materials Resources (Sand and Gravel)

Construction aggregate is California's primary mineral resource. As required by the Surface Mining and Reclamation Act (SMARA) of 1975, the California Geological Survey (CGS) defines several geographic areas that collectively cover a single mineral classification study area as "Production-Consumption Regions" (P-C Regions). The CGS identifies Mineral Resource Zones for each P-C Region, mine/quarry, or other geographic area included in a mineral classification study. Mineral Resource Zones (MRZs) are areas classified by the presence or absence of significant sand, gravel, or stone deposits that are suitable as sources of aggregate, as described below.

- **MRZ-1:** Mineral Resource Zone where adequate information indicates that no significant mineral deposits are present or likely to be present.
- MRZ-2: Mineral Resource Zone where adequate information indicates that several mineral
 deposits are present or that there is a high likelihood of their presence so development
 should be controlled.
- **MRZ-3:** Mineral Resource Zone where the significance of mineral deposits cannot be determined from the available data.
- MRZ-4: Mineral Resource Zone where there is insufficient data to assign any other MRZ
 designation.

Lands not addressed by the CGS regarding their mineral content, either within a P-C Region or outside a mineral classification area, are defined as "unclassified".

As shown on Exhibit 4.10-1, the Project Site is located in MRZ-1 and MRZ-3, with the eastern end of the site designated as MRZ-1 and the rest of the site as MRZ-3 (DOC 1979).

Aggregate Mines

Based on information contained in the California Department of Conservation, Office of Mine Reclamation (OMR) database, there are no aggregate mines within the Project Site boundaries (OMR 2016).

Other Mineral Resources

Based on information contained in the California Department of Conservation, Office of Mine Reclamation (OMR) database, there are no other mineral resource (e.g. shale, diatomite, clay or gypsum) mines within the Project Site boundaries (OMR 2017).

4.10.3 REGULATORY SETTING

State

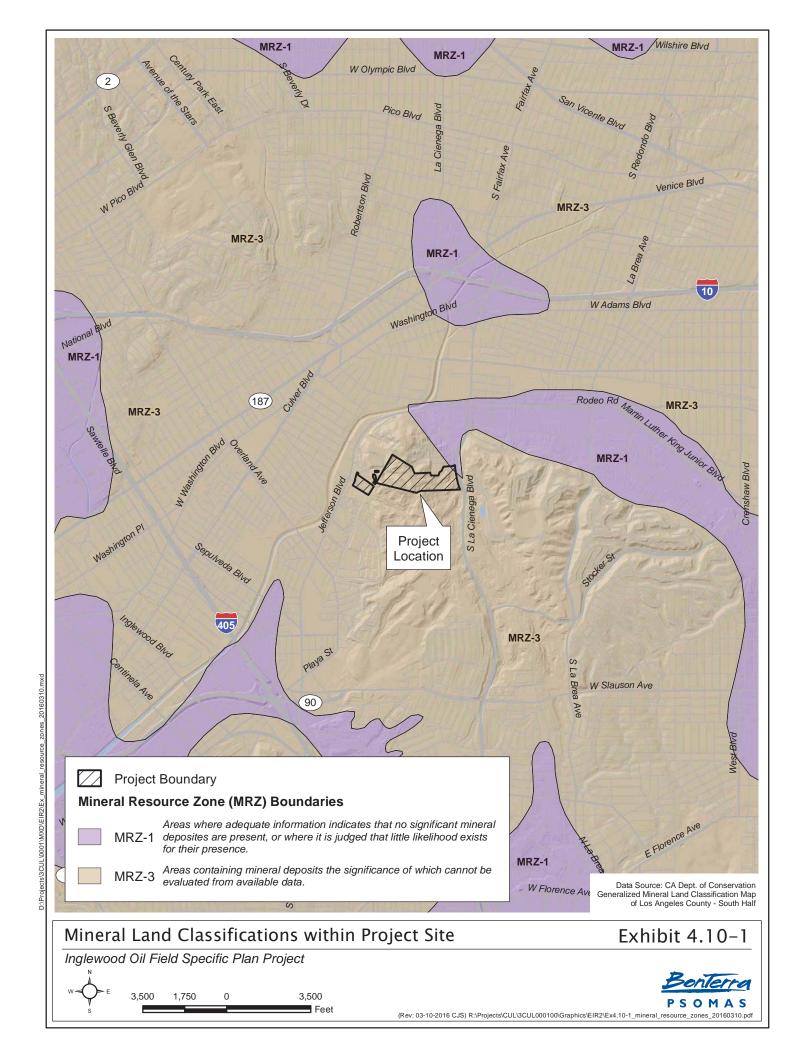
Surface Mining and Reclamation Act

The SMARA of 1975 provides comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. SMARA also encourages the production, conservation, and protection of the state's mineral resources. As required by SMARA, the State Geologist is to classify land into MRZs according to its known or inferred mineral potential. One of the goals of mineral land classification is to ensure that mineral potential of land is identified and considered before local government decision makers make land use decisions that could limit the ability to mine resources. Section 2715 of SMARA includes the following relevant to the proposed Project:

No provision of this chapter or any ruling, requirement, or policy of the board is a limitation on any of the following:

- (a) On the police power of any city or county or on the power of any city or county to declare, prohibit, and abate nuisances. . .
- (e) On the power of any lead agency to adopt policies, standards, or regulations imposing additional requirements on any person if the requirements do not prevent the person from complying with the provisions of this chapter.
- (f) On the power of any city or county to regulate the use of buildings, structures, and land as between industry, business, residences, open space (including agriculture, recreation, the enjoyment of scenic beauty, and the use of natural resources), and other purposes.

As such, the requirements of the Specific Plan are in accordance with SMARA.



Mineral Resources and Mineral Hazards Mapping Program

The CGS provides geologic expertise and information about California's diverse non-fuel mineral resources. As required by the SMARA) of 1975, the State Geologist classifies these resources in an effort to locate economically significant mineral deposits and potential areas of deposits based upon scientific data. Information relating to California's non-fuel resources, naturally occurring mineral hazards, and active and historic mining activities are collected to classify land under the Mineral Resources and Mineral Hazards Mapping Program. As described above, the CGS defines several geographic areas that collectively cover a single mineral classification study as P-C Regions. The CGS identifies MRZs for each P-C Region, mine/quarry, or other geographic area included in a mineral classification study. MRZs are areas classified by the presence or absence of significant sand, gravel, or stone deposits which are suitable as sources of aggregate. Construction aggregate is California's primary mineral resource.

California Department of Conservation

The California Department of Conservation is the primary agency with regard to mineral resource protection. The Department is charged with conserving earth resources (Public Resources Code Sections 600-690) and has four program divisions that address mineral resource issues:

- California Geological Survey (CGS) provides scientific products and services about the state's geology, seismology and mineral resources. They also provide the SMARA Land Classification maps.
- Division of Oil, Gas, and Geothermal Resources (DOGGR) provides regulatory programs that emphasize the wise development of oil, natural gas, and geothermal resources. They also provide well location and production data.
- Office of Mine Reclamation provides oversight of local governments as they administer SMARA within their respective jurisdictions. The primary focus is on existing mining operations and the return of those mined lands to a usable and safe condition.
- State Mining and Geology Board develops policy direct regarding the development and conservation of mineral resources and reclamation of mined lands.

DOGGR Regulations

The California Department of Conservation's Division of Oil, Gas, and Geothermal Resources (DOGGR) was formed in 1915 to implement regulations in the California Public Resources Code and California Code of Regulations that pertain to the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells. Section 2.0, Environmental Setting of this Draft EIR, provides an overview of some of these regulations.

Local

Culver City General Plan

While several elements of the General Plan discuss oil and gas production within the limits of Culver City, none of these elements contain or describe explicit goals and policies related to oil and gas production.

Conservation Element

The Conservation Element of the General Plan mentions the Inglewood Oil Field and that the time will come when the use of the land for oil and gas production will cease to be economical and that other uses of the land will be explored at that time. The Element also acknowledges that pressures to develop the land with more intensive development will increase as the wells become less productive and the scarcity of land in the western section of Los Angeles County increases.

Public Safety

In the Public Safety Element, fire hazards resulting from the production of petroleum products is acknowledged. The Element recognizes oil extraction as a significant industry and that the close proximity of the numerous oil wells located in the southeastern area of the City to the residential areas increases public exposure to potential fire hazards. The Public Safety Element also discusses subsidence and identifies the removal of natural gas and petroleum deposits as being the most common cause of subsidence.

Recreation

In the Recreation Element, it is mentioned that possible future development of the oil fields in the Baldwin Hills area for single-family residential use could result in future park dedications.

Seismic Safety Element

The Seismic Safety Element describes how subsidence has been attributed to oil production and/or water injection within the planning area of the City that contains a portion of the Inglewood Oil Field.

Culver City Municipal Code

Chapter 11.12, Oil, Gas and Hydrocarbons of the Culver City Municipal Code (CCMC) provides the City's existing regulations for the continuation of nonconforming oil and gas production and related activities in the City. These regulations include permitting, operational and other requirements that need to be followed by the Oilfield Operator for activities within the City IOF. Upon adoption of the Inglewood Oil Field Specific Plan, CCMC Chapter 11.12 would be repealed and updated and superseded by the drilling Regulations contained in the Inglewood Oil Field Specific Plan.

4.10.4 SPECIFIC PLAN AND REGULATORY REQUIREMENTS

Specific Plan Drilling Regulations

While there are no specific requirements for non-fuel mineral resources, the Inglewood Oil Field Specific Plan contains the regulations and standards that the City would impose on oil and gas drilling and extraction activities in the City IOF. The Specific Plan does not put restrictions on the total volumes of oil and gas allowed to be produced within the City IOF; however, it does restrict the number of new wells allowed to be drilled within the City IOF to two new wells for the first two years and, if the Community Development Director determines that the Specific Plan is protective of the public health, safety, and welfare and the environment, then three wells per year may be drilled. A summary of the Specific Plan requirements is provided in Section 3.0, Project Description of this Draft EIR.

Regulatory Requirements

- **RR MIN-1** All oil and gas drilling, extraction and related activities at the City IOF shall comply with pertinent State regulations, as enforced by DOGGR.
- RR MIN-2 All oil and gas drilling, extraction and related activities at the City IOF shall comply with pertinent City regulations, as contained in the Culver City Municipal Code, as may be amended by the proposed Inglewood Oil Field Specific Plan.

4.10.5 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project would have a significant adverse environmental impact on mineral resources if it would:

- **Threshold 10-1:** Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
- **Threshold 10-2:** Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

4.10.6 IMPACT ANALYSIS

Threshold 10-1: Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Non-Fuel

The Project Site is not known to contain sand and gravel deposits of any economic importance or any otherwise "classified" non-fuel mineral deposits under SMARA. The CGS conducted a series of mineral land classification studies under the authority of the SMARA of 1975. The Project Site is located in the MRZs of MRZ-1 and MRZ-3 (DOC 1979). MRZ-1 indicates that no significant mineral resources are present or it is judged that little likelihood exists for their presence. MRZ-3 indicates a mineral resource zone where the significance of mineral deposits cannot be determined from the available data.

Based on information contained in the California Department of Conservation, OMR database, there are no aggregate or other mineral resource (shale, diatomite, clay or gypsum) mines within the Project Site boundaries (OMR 2017). Therefore, Project implementation would not result in the loss of availability of a known non-fuel mineral resource that would be of value to the region and residents of the State, nor would it create the loss of availability of a locally important mineral resource recovery site. No impacts are anticipated and no mitigation is required.

Petroleum Resources

The Culver City General Plan does not identify any local mineral resource recovery sites but mentions the oil wells in the City's hillside areas (Culver City 1973). Existing oil and gas extraction activities on the Project Site are expected to continue with implementation of the Project since the proposed Specific Plan allows for, over time, the continued use of the existing and active City IOF. It is unknown whether oil/gas production would intensify or not with implementation of the Specific Plan because oil production varies year to year depending on the price of oil, other economic considerations, the latest technologies, etc.

Petroleum resources in the Inglewood Oil Field are considered of value to the region and the residents of the State, with the Inglewood Oil Field producing nearly 2.7 million barrels of oil and 1.23 billion cubic feet of gas in 2014, as shown on Table 4.10-1 above. The Inglewood Oil Field is the 3rd largest producer of oil and the 2nd largest producer of gas in DOGGR District 1, which includes the majority of Los Angeles County and all of Orange, San Diego, San Bernardino, Riverside and Imperial counties (DOGGR 2015b).

While the City IOF is only a 77.8-acre portion of the larger approximately 1,000-acre Inglewood Oil Field, continued oil and gas production on the Project Site would be considered a beneficial use as it relates to the availability of valuable mineral resources and their use for the production of gasoline, heating oil, diesel fuel, jet fuel, propane, asphalt, and petrochemical products and for direct use for energy (i.e., natural gas use). These products and uses support communities, business and industry, and development in Culver City, Los Angeles County, and the State.

Natural Gas

As discussed in Section 6.5, Appendix F – Energy Impacts of this Draft EIR, the estimated natural gas consumption to the proposed Project's Maximum Buildout Scenario of 30 new wells, the natural gas consumption for the City IOF would be 45 thousand cubic feet (mcf¹) per year (or approximately 124 mcf per day [mcfd].

In 2006, the entire Inglewood Oil Field produced approximately 5,700 mcfd from 436 active producing oil wells (LACDRP 2008). This equated to an average of approximately 13 mcfd of natural gas per active producing oil well. Scaling the estimated natural gas production proportionally to the proposed Project's Maximum Buildout Scenario of new 30 wells, the natural gas production for the City IOF is estimated to be 392 mcfd. Based on these values (124 mcfd consumption and 392 mcfd production), the Project would consume approximately 32 percent of the natural gas produced in the City IOF. As such, the Project would generate more natural gas than it would consume. Therefore, the Project would not result in the loss of natural gas resources that are of value to the region or the State.

Gasoline/Diesel Fuel

As discussed in Section 6.5, Appendix F – Energy Impacts of this Draft EIR, the estimated gasoline usage at the Project Site with the Maximum Buildout Scenario (30 new active wells) would be 3,028 gallons of gasoline per year. Since the Specific Plan only allows a maximum of three new wells to be drilled in any given year (assuming the third well is approved by the Community Development Director as set forth in Section 31.B.1 of the Specific Plan), the maximum diesel fuel usage for drilling new wells would be approximately 7,759 gallons in one year. During well stimulation activities, as much as 7,800 gallons of diesel fuel could be required by well stimulation equipment per well (NVG 2014). As outlined in the Maximum Buildout Scenario in Section 3.0, Project Description, the maximum number of wells estimated to have well stimulation treatment during one year is one well. Therefore, it is assumed that 7,800 gallons of diesel fuel would be used during well stimulation activities in the Maximum Buildout Scenario. This would bring the total diesel fuel consumed to be 15,559 gallons per year within the Project Site and 3,028 gallons per year of gasoline.

In 2006, the entire Inglewood Oil Field produced approximately 8,700 barrels per day (365,400 gallons per day) of oil from 436 active producing oil wells (LACDRP 2008). This equated to an average of approximately 20 bpd of oil (840 gallons per day) per active producing oil well.

msf is an abbreviation denoting a thousand cubic feet of natural gas. One million cubic feet is denoted as mmcf. The "m" in mcf comes from the ancient Roman letter M, which stood for one thousand.

Current active wells on the City IOF include 26 production wells and 10 production water injection wells.

Assuming the same ratio of production to injection wells for future wells, at the Maximum Buildout Scenario within the Project Site, there would be 22 future production wells and 8 future injection wells. Assuming the same average oil production rates per well are still valid at full buildout, the average approximate oil production per day at the Project Site would be approximately 440 bpd (18,480 gallons per day) of oil. Assuming production is 365 days of the year, the annual oil production at the Project Site would be approximately 160,600 barrels per year (6,745,200 gallons per year) from the 30 new wells. While activities at the Project Site would result in an overall gasoline and diesel fuel consumption increase per year (3,028 gallons and 15,559 gallons respectively), the Project would send over 6.7 million gallons per year of oil to refineries for gasoline and diesel fuel processing. One barrel of oil can produce 19 gallons of gasoline or 12 gallons of diesel fuel (EIA 2016). The Project would require 159 barrels of oil for gasoline usage and 1,297 barrels of oil for diesel fuel usage for a total of 1,456 barrels of oil per year for fuel supplies for the Project. This is approximately 0.42 percent of the total oil that would be sent to refineries based on Project Site production. As such, the Project would generate more oil than it would consume.

The extraction of oil and gas resources from the City IOF is expected to continue only until underlying resources are spent or become financially infeasible to extract. The Specific Plan does not place any restrictions on the quantity of oil and gas that may be extracted from the City IOF. There would be no direct or indirect adverse impact on mineral resources and the implementation of the Specific Plan would not result in the loss of local mineral resources that are of value to the region and the State. Impacts would be less than significant and no mitigation is required.

Threshold 10-2: Would the Project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Non-Fuel

As mentioned under Threshold 10-1, there are no non-fuel mineral resources located within the Project Site boundaries. There are no non-fuel mineral resources identified in the Culver City General Plan (Culver City 1973), including the Land Use Element (Culver City 1996). Therefore, there would be no loss in availability of a locally important mineral resource recovery site as delineated on a local general plan, specific plan, or other land use plan.

Petroleum Resources

As mentioned previously, while several elements of the General Plan discuss oil and gas production within the limits of Culver City, none of these elements contain or describe explicit goals and policies related to oil and gas production or other non-fuel mineral resources. Existing oil and gas production activities on the Project Site are expected to continue over time, in accordance with the requirements of the proposed Specific Plan, which allows for the continued use of the existing and active City IOF. The Project would not require a General Plan Amendment or otherwise conflict with the goals and policies of the City's General Plan. The Project, as described further in Section 4.9, Land Use, is consistent with the General Plan and impacts would be less than significant and no mitigation would be required.

4.10.7 CUMULATIVE IMPACTS

As discussed above, the Project would have no impacts to non-fuel mineral resources. The Project would allow continued production of available petroleum and gas resources in the City IOF, allowing for the continued beneficial use of these resources to provide energy to support communities, business and industry, and development. As further described in Section 6.5, Appendix F – Energy Impacts, oil and gas production activities at the City IOF would generate more oil and gas resources than they would require. Therefore, the Project would not contribute to a cumulatively considerable adverse impact related to the loss of availability of mineral resources. No mitigation is required

4.10.8 MITIGATION MEASURES

No significant adverse impacts on mineral resources (non-fuel and petroleum resources) have been identified and no mitigation measures are required.

4.10.9 LEVEL OF SIGNIFICANCE

Impacts to mineral resources (non-fuel and petroleum resources) would be less than significant. Table 4.10-2 below summarizes the significance finding of each threshold addressed in this section before and after mitigation, where applicable.

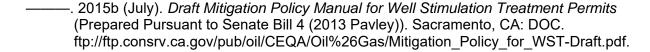
TABLE 4.10-2 SIGNIFICANCE SUMMARY

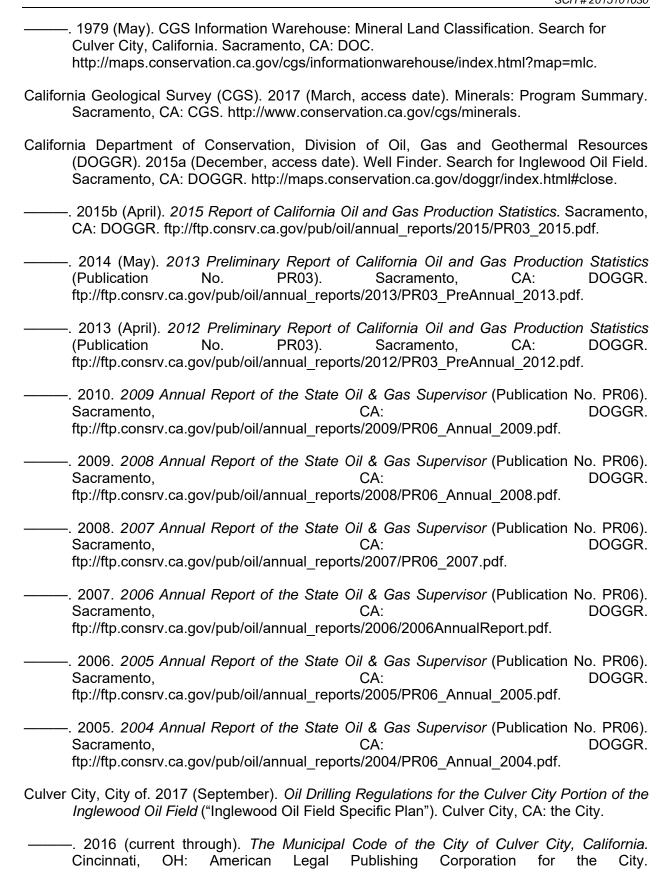
	Threshold	Project Level of Significance	Mitigation Measure(s)	Level of Significance after Mitigation		
10-1	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	Less than Significant	N/A	Less than Significant		
10-2	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	Less than Significant	N/A	Less than Significant		
N/A: not applicable						

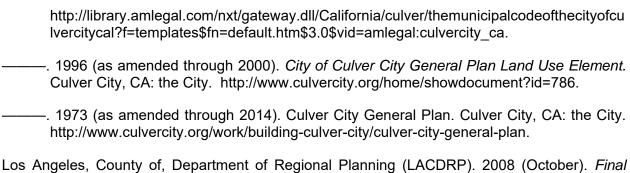
4.10.10 REFERENCES

California Department of Conservation, Office of Mine Reclamation (OMR). 2017 (March, access date). Mines Online. Search for Culver City, California. Sacramento, CA: OMR. http://maps.conservation.ca.gov/mol/index.html.

California Department of Conservation (DOC). 2015a (June). Final Environmental Impact Report, Analysis of Oil and Gas Well Stimulation Treatments in California. Sacramento, CA: DOC.







- Los Angeles, County of, Department of Regional Planning (LACDRP). 2008 (October). Final Environmental Impact Report, Baldwin Hills Community Standards District. Los Angeles, CA:

 LACDRP. http://www.inglewoodoilfield.com/res/docs/baldwin_hills_community_standards_district_f inal_eir%20.pdf.
- NVG Today (NVG). 2014 (October 22, posted date). Special Report: NatGas Gains Traction as Fuel for Oil and Gas E&P. NGV Today. http://www.ngvtoday.org/2014/10/22/special-report-natgas-gains-traction-as-fuel-for-oil-and-gas-ep/.
- United States Energy Information Administration (EIA). 2016 (October 18, last updated). Frequently Asked Questions: How many gallons of gasoline and diesel fuel are made from one barrel of oil? Washington, D.C.: EIA. http://www.eia.gov/tools/faqs/faq.cfm?id=327&t=9.

This page intentionally left blank