

**United States Department of the Interior  
Bureau of Land Management  
Bakersfield Field Office**

**Environmental Assessment**

**Innex California, Inc.  
Four Applications for Permit to Drill in Kettleman Middle Dome  
DOI-BLM-CA-C060-2022-0071-EA**

# Table of Contents

<b>Chapter 1. Introduction .....</b>	<b>1</b>
1.1 Background .....	1
1.2 Purpose and Need.....	1
1.3 Conformance with BLM Land Use Plans .....	1
1.4 Relationship to Statutes, Regulations and Related Plans .....	2
<b>Chapter 2. Proposed Action and Alternatives.....</b>	<b>5</b>
2.1 Alternative 1 (Proposed Action) .....	5
2.2 Alternative 2 (No Action) .....	7
<b>Chapter 3. Affected Environment &amp; Environmental Impacts .....</b>	<b>9</b>
3.1 Air Quality.....	10
3.1.1 Affected Environment .....	10
3.1.2 Environmental Impacts.....	15
3.2 Climate Change .....	20
3.2.1 Affected Environment .....	20
3.2.2 Environmental Impacts.....	22
3.3 Biological Resources.....	27
3.3.1 Affected Environment .....	27
3.3.2 Environmental Impacts.....	28
3.4 Paleontological Resources.....	29
3.4.1 Affected Environment .....	29
3.4.2 Environmental Impacts.....	29
3.5 Soil Resources .....	30
3.5.1 Affected Environment .....	30
3.5.2 Environmental Impacts.....	31
3.6 Water Quality and Quantity .....	31
3.6.1 Affected Environment .....	31
3.6.2 Environmental Impacts.....	32
3.7 Environmental Justice .....	32
3.7.1 Affected Environment .....	32
3.7.2 Environmental Impacts.....	33
<b>Chapter 4. Cumulative Impacts .....</b>	<b>34</b>
4.1 Methodology .....	34
4.2 Cumulative Impacts Analysis.....	34
4.2.1 Air Quality.....	35
4.2.2 Climate Change .....	37
4.2.3 Environmental Justice .....	41
<b>Chapter 5. Consultation and Public Involvement.....</b>	<b>42</b>
<b>Chapter 6. References.....</b>	<b>43</b>

## **Chapter 1. Introduction**

### **1.1 Background**

On 03/31/2022, Innex California Inc. (Innex) submitted four (4) Applications for Permits to Drill (APD) to drill Wells: KMDU 33-30, 42-30, 45-30, and 53-30 on federal Mineral leases CAS0019275A & CAS0019275C in Section 30, T23S, R19E, Mount Diablo Base Meridian (MDBM) in Kings County, CA. The proposed project would occur on private lands containing Bureau of Land Management (BLM) administered mineral estate within the Kettleman Middle Dome Oilfield. Project implementation would include the clearing and grading of two existing well pads and existing access roads, the installation of associated power poles and pipelines, and the drilling of four new wells.

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA); relevant federal and applicable state laws and regulations; and BLM policy. The purpose of this document is to disclose and analyze the environmental consequences that are anticipated from the clearing and grading of two existing well pads and existing access roads, the installation of associated power poles and pipelines, and the drilling of four new wells on federal mineral leases CAS0019275A & CAS0019275C in the Kettleman Middle Dome Oilfield. BLM will decide whether to approve, approve with conditions, or deny the four APDs submitted by Innex.

### **1.2 Purpose and Need**

The purpose of the proposed action is to respond to the APDs submitted by CRPC to drill six new oil wells and stage associated facilities required to increase production on federal mineral leases CACA004999 & CAS019301C.

The need for the action is established by BLM's responsibility under the Mineral Leasing Act of 1920 as amended, the Mining and Minerals Policy Act of 1970, the Federal Land Policy and Management Act of 1976, the National Materials and Minerals Policy, Research and Development Act of 1980 and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 to allow reasonable access to develop a federal oil and gas lease.

### **1.3 Conformance with BLM Land Use Plans**

Title 43 CFR 1610.5 requires resource management authorizations and actions conform to the approved resource management plan. The proposed action has been substantively reviewed for conformance with the Bakersfield Resource Management Plan (RMP) approved on December 22, 2014. The BLM has determined the proposed action conforms with the land use plan as the proposed action is specifically provided for in the land use plan objective MM-O-1 "Facilitate reasonable, economical, and environmentally sound exploration and development of leasable minerals while minimizing impacts to other resources" (BLM, 2014; pg 75). The proposed action is located on leases CAS0019275A & CAS0019275C which were issued prior to the 2014 Bakersfield RMP. The 2014 Bakersfield RMP recognizes all valid existing rights (BLM, 2014; pg 1).

## **1.4 Relationship to Statutes, Regulations and Related Plans**

### Oil and Gas Laws and Regulations

The BLM manages lands that contain a number of extractable minerals including oil and gas, which are managed in accordance with the *Mineral Leasing Act* of 1920, as amended; the *Mining and Minerals Policy Act* of 1970; the *Federal Onshore Oil and Gas Leasing Reform Act* of 1987; 43 CFR Part 3160-Onshore Oil and Gas Operations (including Onshore Orders 1, 2, 6, and 7) and 43 CFR Part 3170-Onshore Oil and Gas Production; the *Energy Policy Act* of 2005; and other laws, regulations, orders, and also in accordance with all applicable state, county, and local laws and ordinances. BLM requires existing lessees to strictly adhere to all laws, regulations, and policies that govern oil and gas leases, while at the same time recognizing that existing leases grant the lessee certain rights. No additional requirements can be placed on an existing lessee that conflict with the rights already granted, however the lessee may elect to commit to new measures discussed with BLM.

Onshore Order No. 1 identifies the requirements necessary for approving proposed oil and gas exploration, development, and servicing of wells on all Federal and Indian oil and gas leases. This includes all components required for the management of fluid minerals including completed Form 3160-3, well plat, drilling plan, surface use plan, bonding, operator certificate, onsite inspection, processing, reclamation, and Sundry Notices. Onshore Order No. 1 also identifies processing timelines and the valid period of approvals. Onshore Order No. 2 provides requirements and standards for drilling and abandonment. 43 CFR 3173 establishes standards to ensure that oil and gas are properly and securely handled to prevent loss and theft, and to enable accurate measurement and production accountability. 43 CFR 3174 establishes minimum standards for the accurate measurement of all oil. 43 CFR 3175 establishes minimum standards for the accurate measurement of gas. Onshore Order No. 6 provides the requirements and standards for conducting oil and gas operations in an environment known to or expected to contain hydrogen sulfide (H<sub>2</sub>S) gas. Onshore Order No. 7 provides the methods and approvals necessary to dispose of produced water associated with oil and gas operations.

### Endangered Species Act

The Endangered Species Act of 1973 (ESA) requires federal agencies to complete consultation with the United States Fish and Wildlife Service (FWS) for actions which “may affect” a federally listed species or designated critical habitat. The ESA also requires federal agencies to use their authorities to carry out programs for the conservation of endangered and threatened species.

### Clean Air Act

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has state air quality jurisdiction over the project area. The San Joaquin Valley is classified as nonattainment for ozone and PM<sub>2.5</sub>. Section 176(c) of the Clean Air Act (CAA), as amended (42 U.S.C. 7401 et seq.) and Regulations 40 CFR Part 93, Subpart B (with respect to conformity of general Federal actions to the applicable State Implementation Plan (SIP)) apply to projects within nonattainment and maintenance areas. Under those authorities “no department, agency or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan.” Under CAA 176(c) and 40 CFR Part 93 Subpart B, a federal agency must make a determination that a Federal action conforms to the applicable implementation plan before the action is taken.

### National Historic Preservation Act of 1966, as amended

Section 106 of the National Historic Preservation Act (NHPA) requires agencies to make a reasonable and good faith effort to identify historic properties that may be affected by an agency's undertakings and take those effects into account in making decisions. The BLM process for implementing this NHPA requirement is set forth in the *State Protocol Agreement Among the California State Director of the Bureau of Land Management and the California State Preservation Officer and the Nevada State Historic Preservation Officer (2019)*. Pursuant to 36 CFR 800.8(a), the BLM has coordinated compliance with Section 106 and its implementing regulations at 36 CFR 800 with the steps taken to meet the requirements of the National Environmental Policy Act (NEPA).

### Paleontological Resources Preservation Act (PRPA)

This Act was passed as part of the Omnibus Public Lands Management Act of 2009 as directed in 16 USC 470aaa-3 and requires Interior agencies to manage and protect paleontological resources on Federal land. This includes developing plans for the inventory, monitoring, and scientific and educational use of paleontological resources. The Act also describes criteria for issuing permits to collect and study paleontological resources on Federal land.

### Clean Water Act

The Clean Water Act of 1977 establishes authority to regulate any action where pollutants may be discharged into waters of the United States. Section 303 of the federal Clean Water Act requires states to adopt water quality standards that "consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses." In California, these water quality standards and the administrative policies and procedures for protecting state waters are disclosed in regional water quality control board basin plans. These basin plans establish standards for groundwater in addition to surface waters, unlike the federal program.

The Clean Water Act also established the National Pollutant Discharge Elimination System (NPDES) permit program, regulating point source discharges of pollutants into waters of the United States. Section 402 of the Clean Water Act provides that storm water discharges associated with industrial activity and construction must be authorized under a NPDES permit. Clearing, grading, and excavation projects that disturb more than one acre are required to obtain a NPDES storm water discharge permit under United States Environmental Protection Agency (EPA) regulations, though certain regulations (e.g., 40 CFR parts 122.26 (a)(2), (e)(8), and (c)(1)(iii)) codify exemptions for oil and gas operations. Section 404 of the Clean Water Act establishes the authority to issue permits for dredged or fill material.

### Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) of 1974 regulates the nation's public drinking water supply to protect public health. SDWA authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water.

### Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) of 1976 establishes a regulatory structure for the management and disposal of solid and hazardous wastes. Solid wastes consist of any discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from

industrial, commercial, mining, and agricultural operations, and from community activities. Solid wastes include both hazardous and nonhazardous waste. A waste may be considered hazardous if it is ignitable, corrosive, reactive, or contains certain amounts of toxic chemicals. Subtitle C of RCRA creates a cradle-to-grave management system for hazardous waste, governing the generation, transportation, treatment, storage, and disposal of hazardous wastes. Subtitle D regulates the management of nonhazardous solid waste, establishing minimum federal technical standards and guidelines for state solid waste plans to promote environmentally sound management of solid waste.

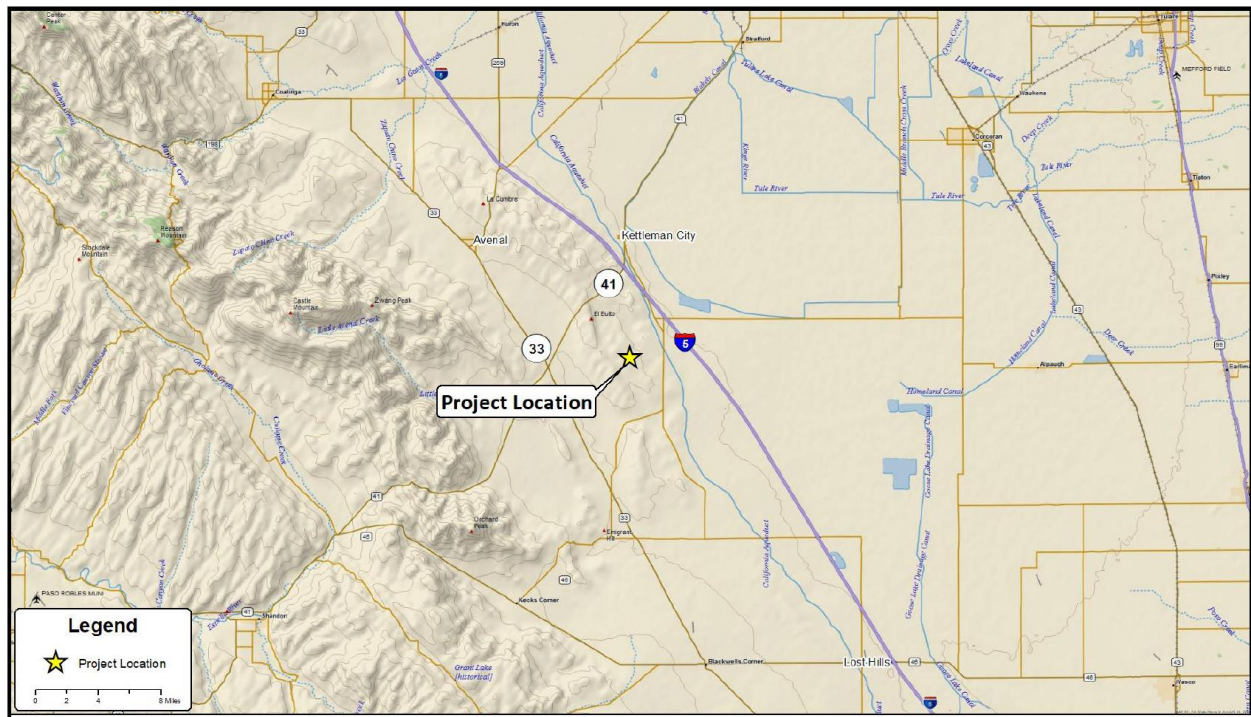
Oil and gas exploration and production (E&P) wastes that are intrinsically derived from primary field operations are exempt from Subtitle C hazardous waste regulations, although Subtitle D, other federal regulations, and state regulations still apply. Exempt E&P wastes include any produced fluids or waste otherwise generated by contact with the oil and gas production stream during the removal of produced water or other contaminants from the product. Some specific E&P wastes designated as exempt include produced water, drilling fluids, drill cuttings, rig-wash, work-over wastes, and well completion, treatment, and stimulation fluids. Examples of non-exempt wastes include unused fracturing fluids or acids, waste solvents, used equipment lubricating oils, and caustic or acid cleaners.

## Chapter 2. Proposed Action and Alternatives

### 2.1 Alternative 1 (Proposed Action)

Innex California Inc. (Innex) submitted four (4) Applications for Permits to Drill (APD) to drill Wells: KMDU 33-30, 42-30, 45-30, and 53-30 on federal Mineral leases CAS0019275A & CAS0019275C in Section 30, T23S, R19E, Mount Diablo Base Meridian (MDBM) in Kings County, CA. The proposed project would occur on private lands containing Bureau of Land Management (BLM) administered mineral estate within the Kettleman Middle Dome Oilfield. Project implementation would include the clearing and grading of two existing well pads and existing access roads, the installation of associated power poles and pipelines, and the drilling of four new wells (**Figures 1, 2, & 3**).

The proposed wells are in the Kettleman Middle Dome Oilfield approximately 7-8 miles south of Kettleman City, in Kings County, California (**Figure 1**). Interstate 5, Utica Avenue, 25th Avenue, and existing dirt roads provide access to the Kettleman Middle Dome Unit (KMDU) and proposed well sites; therefore, no new access roads are required (**Figure 2**). Existing access routes and well sites will be redefined by clearing annual vegetation and grading as necessary. The existing access roads and proposed wells are shown in **Figure 2 and 3**.



**Figure 1** Project Vicinity Map

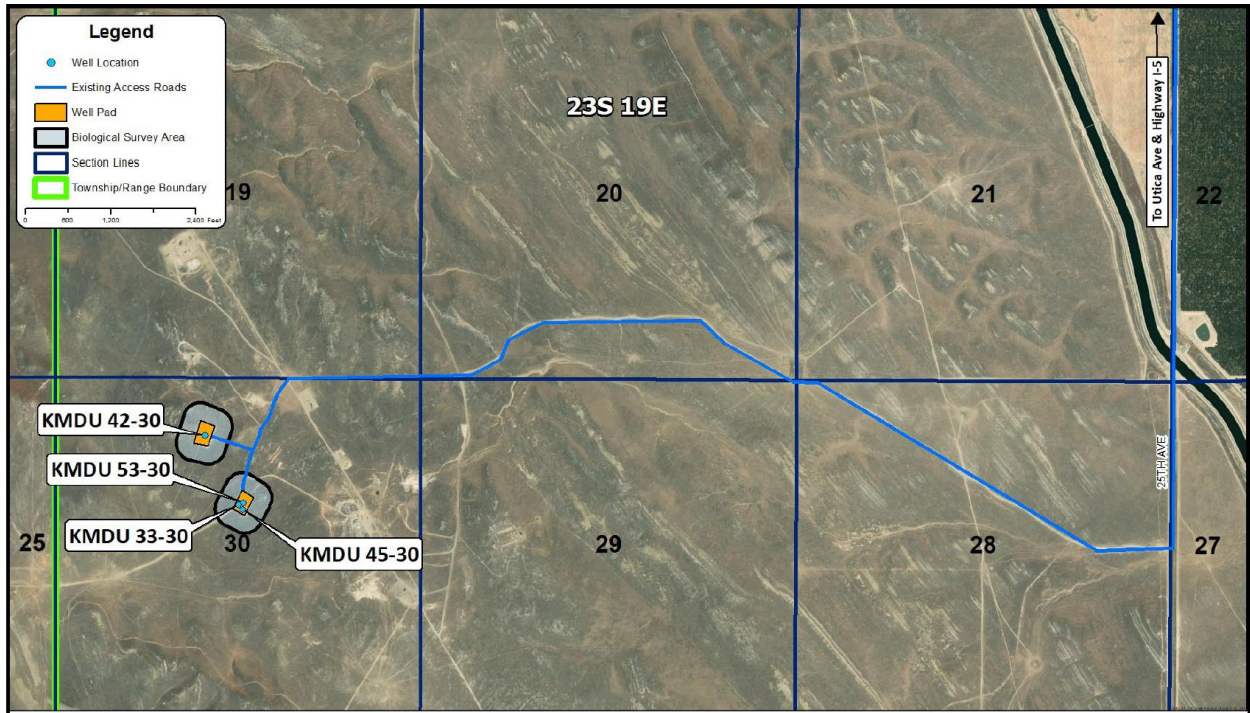


Figure 2 Project Location Map

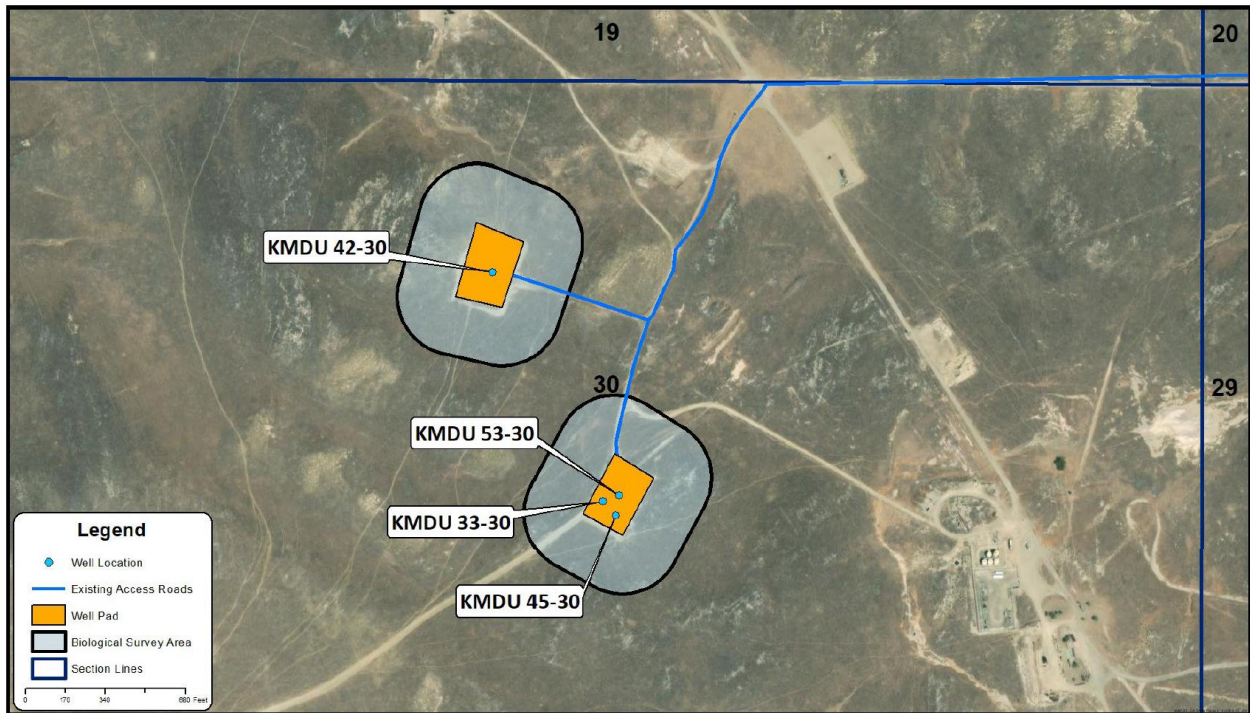


Figure 3 Project Location Map

No new habitat disturbance is associated with the project. Innex will only use existing, previously disturbed areas to avoid new surface disturbance and minimize potential impacts to listed species. Further, after drilling and completions, Innex will reclaim unused portions of the well location which are no longer necessary for use.

No temporary disturbance is proposed for the wells and no off-road travel will be required to install the pipelines associated with the wells. All the proposed pipelines will be in existing pipeline corridors and all vehicles used to install the pipelines will be on existing roads.

Revegetation of side slopes or areas not required for operation and maintenance (O&M) activities will be achieved using native seed supplied by the BLM. Reseeding will be performed to coincide with the rainy season (October – April). Existing access roads that are open cut to install the pipelines will be scheduled where rain is not anticipated within 24-48 hours of the proposed work. Further, trenches will not be left open greater than 48 hours and after the pipeline is installed, the trench will be backfilled and compacted for use as an oilfield lease road.

Innex proposes to use approximately 2,500 barrels of fresh water for drilling and dust abatement per well. All water would be obtained from a local private water station in Section 22, T23S, R19E and trucked to the project site. Fresh water would be applied to the surface for dust abatement and used during the drilling phase for intermediate/production casing and surface casing. Non-hazardous, water-based mud would be used in drilling operations. All cuttings and drilling fluids would be collected in large bins and hauled offsite to Innex's approved water injection well KMDU 11-29 located on private land in Section 29, T23S, R19E, MDBM.

Mitigating for adverse effects to paleontological resources is a management practice that preserves resources and accommodates development. For PFYC 3, 4, 5, and U classified geological formations, this mitigation is required for all project activities on BLM surface or private lands for which federal paleontological compliance requirements have not been waived. Paleontological resources are considered a part of the surface estate and therefore belong to the surface owner. Under current BLM policy, the surface owner may elect to waive monitoring and mitigation recommendations.

Innex proposes to use current best available technologies to drill and complete the proposed well; modern controls and monitoring would be in place to prevent failures of mechanical well integrity. All aspects of well completions and design are conducted according to American Petroleum Institute standards whereby specifications and recommended practices are detailed to ensure mechanical well integrity. For these reasons, well failures are not anticipated in the new wells proposed in the Kettlmen Middle Dome Oilfield. Innex has stated that there is no intention (and there is no authorization to conduct) well stimulation activities regulated by California Senate Bill No. 4 (hydraulic fracturing, matrix or fracture acidization) on the proposed wells.

The Design Features of this proposed project are outlined in **Appendix 1**. These Design Features serve as the Conditions of Approval (COAs) addressing various aspects crucial to the project's execution and environmental impact. These COAs encompass considerations for biological, cultural, and paleontological resources, as well as construction and interim reclamation procedures. Additionally, they detail management strategies and outline plans for final reclamation efforts. These COAs ensure that the proposed action adheres to regulatory standards and mitigates potential adverse effects on the surrounding ecosystem and community.

## **2.2 Alternative 2 (No Action)**

Under this alternative, BLM would not approve the four APDs submitted by Innex. By denying the applications, the federal lessee/operator would be denied the opportunity or right to develop and produce the federal mineral estate. Not approving this action would not affect demand for

petroleum products. Any new oil and gas development required to meet demand would be carried out by drilling a well or wells in some other location.

### **Chapter 3. Affected Environment & Environmental Impacts**

This chapter includes brief descriptions of the physical and regulatory environment for elements that may be affected by the proposed action as well as an analysis of the environmental impacts of the Proposed Action and No Action Alternatives.

#### ***Issues Considered but Eliminated from Further Analysis***

The following elements of the human environment were considered but determined to be either not present or unaffected by the proposed action and will therefore not be addressed further in this analysis:

- This project location does not occur within National Conservation Lands.
- The project does not contain essential fish habitat, and there are no wetlands or riparian zones in the project area.
- The proposed project would not affect recreational experience as it occurs within a BLM administered oil and gas lease that does not currently attract recreational use, nor is it anticipated to attract significant recreational use in the future.
- Visual resources would not be impacted since the project occurs within a Class IV Visual Resource Management area that is not visible from any main access road or highway and is not likely to attract attention.
- Pursuant to Section 106 of the National Historic Preservation Act, BLM Archaeologists conducted an assessment to determine whether the proposed undertaking would adversely affect historic properties. Assessment included a review of Bakersfield Field Office cultural program records. A Class III cultural resources inventory was conducted in 2023 which included the Area of Potential Effect (APE) for the four proposed well locations (BLM Cultural Resource Inventory Report # 6000-2023-041). No cultural resources were identified within the proposed project Area of Potential Effect (APE). Therefore, no additional investigation or mitigation required.
- Certified letters containing maps and a description of development activities that would occur within the project area for the 4 wells was mailed to Native American Tribes affiliated with the project area in 2023 (Tribal Notification Letter 23-17). No recipient provided a response to requesting consultation or further information regarding the proposed project.

#### ***Issues for Detailed Analysis***

- How would emissions generated by construction activities (e.g., generation of dust, burning of diesel) and subsequent operation of the well impact air quality?
- How would emissions generated by construction activities, subsequent operation of the well, and downstream use of the produced petroleum contribute to increases in Green House Gases (GHGs) (CO<sub>2</sub>e) impact climate change?
- How would construction activities (e.g., drill rig noise, vehicle traffic), ongoing operations (e.g., vehicle traffic) and habitat disturbance impact threatened and endangered species? How would the project impact the Kettleman Hills Area of Critical Environmental Concern's (ACEC) management goal to "provide suitable habitat for federal and state listed species and protection for natural systems and processes"?
- How would the project impact the Kettleman Hills ACEC's management objective to protect significant paleontological resources?

- How would construction activities (e.g., grading, drilling) impact soil productivity and erodibility?
- How would drilling through aquifers impact drinkable groundwater? How would construction and operations activities (potential for erosion, sediment carry, spills and leaks) impact surface water? How would the use of water for drilling and dust abatement impact availability of fresh water for other beneficial uses?
- How would air quality impacts and climate change contributions from the project affect low income and minority populations? How would the creation of jobs and additional revenue impact the local community?

### **3.1 Air Quality**

#### **3.1.1 Affected Environment**

Air quality and related health impacts are driven by pollutant concentrations in the air. Pollutant concentrations depend primarily on the rate at which pollutants are emitted within an air basin or it's co-located air district or counties. If pollutants are emitted at a higher rate than natural processes (such as rainfall, atmospheric chemical reactions, absorption on surfaces, or respiration) can remove them, air quality decreases.

The air resources analysis area for the proposed project area is the San Joaquin Valley Air Basin. At the state level, Clean Air Act (CAA) regulatory and enforcement duties lie with the California Air Resources Board (CARB) and regional or county air districts. At the federal level, the EPA has statutory authority under the CAA. The San Joaquin Valley Air Pollution Control District (SJVAPCD) is co-located with air basin, and SJVAPCD and CARB have been delegated CAA jurisdiction over it. The BLM does not have any statutory authority under the Clean Air Act and may not overrule agencies that do (16-285 - State of Wyoming et al v. United States Department of the Interior et al) but rather analyzes air resources impacts as part of NEPA analysis to inform approval of projects on Public Lands and to demonstrate compliance with Clean Air Act (CAA) General Conformity regulations.

The federal Clean Air Act (CAA), as amended, and the California Clean Air Act (CCAA) are the primary laws related to air quality. Provisions of the federal CAA that apply to BLM actions include the National Ambient Air Quality Standards (NAAQS), nonattainment area designation, rules that are part of state implementation plans (SIPs), air permitting including prevention of significant deterioration (PSD) and New Source Review (NSR), air toxics rules, and General Conformity. The EPA, CARB, and regional air districts have all issued rules to implement federal and state Clean Air Acts and SIPs.

EPA has identified seven criteria pollutants as indicators of air quality and has established for each of them a threshold concentration above which adverse effects on human health and the environment may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS) (<https://www.epa.gov/criteria-air-pollutants>). One set of limits (primary standard) protects health; another set of limits (secondary standard) is intended to prevent environmental and property damage. Under the federal CAA, the EPA has established NAAQS for: ozone, respirable particulate matter (PM<sub>10</sub>), fine particulate matter (PM<sub>2.5</sub>), carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide. California has established state Ambient Air Quality Standards for the same criteria pollutants, plus an additional three pollutants (visibility reducing

particulates, sulfates, and hydrogen sulfide). A geographic area that meets the primary standard is called an attainment area; areas that do not meet the primary standard are called nonattainment areas (<https://www.epa.gov/clean-air-act-overview>).

The SJVAPCD operates and maintains a network of air monitoring sites throughout the eight counties of the San Joaquin Valley Air Basin so that air quality can be compared to the NAAQS. In addition, CARB, the National Park Service, and tribal nations also operate air monitoring stations. In total, 38 air monitoring sites are currently in operation in the San Joaquin Valley. Data from these stations is used to calculate the EPA air quality index (AQI) within the SJVAPCD so criteria pollutant levels can be reported to the public in real time (<https://www.airnow.gov/>). The AQI is one way to evaluate how clean or polluted an area’s air is and whether associated health effects could be a concern. When the AQI value is between 0 and 50 (green), air quality is categorized as “good” and criteria air pollutants pose little or no risk. AQI between 51 and 100 (yellow) indicates moderate air quality posing little risk. An AQI of 100 indicates at least one pollutant is at the NAAQS concentration threshold. AQI values between 101 and 150 (orange) indicates a pollutant concentration above the NAAQS and air quality that might be unhealthy for sensitive groups. AQI values higher than 150 means generally unhealthy (red), very unhealthy (purple), or hazardous (maroon) air quality. The average number of days per year in each SJVAPCD county over a five-year period (2018-2022) for each AQI category is presented in Table 3.1.

**Table 3.1** SJVAPCD Five-Year Average Air Quality by County as shown by AQI, 2018 - 2022 (average days per year)

County	Good Days	Moderate Days	Unhealthy for Sensitive Groups Days	Generally Unhealthy Days	Very Unhealthy Days	Hazardous Days
Fresno	99.2 / 27.9%	166.2 / 46.7%	59.2 / 16.6%	14.8 / 4.2%	1.4	0
Kern	81.6 / 23.1%	151.4 / 42.9%	81.2 / 23.0%	18.8 / 5.3%	0.8	0.4
Kings	105.6 / 29.4%	197.2 / 54.8%	42.0 / 11.7%	7.4 / 2.1%	0	0.8
Madera	141.0 / 43.8%	147.6 / 45.8%	21.4 / 6.6%	5.8 / 1.8%	0.4	0
Merced	156.4 / 49.6%	130.8 / 41.5%	17.8 / 5.6%	5.2 / 1.6%	0	0
San Joaquin	176.2 / 52.8%	133.4 / 40.0%	13.0 / 3.9%	5.4 / 1.6%	0.4	0.2
Stanislaus	150.6 / 44.7%	146.6 / 43.6%	24.8 / 7.4%	7.2 / 2.1%	0.2	0
Tulare	85.4 / 24.1%	145.8 / 41.2%	82.6 / 23.3%	19.8 / 5.6%	0.8	0.2

Source: EPA Annual AQI Summary Data by County. ([https://aq5.epa.gov/aq5web/airdata/download\\_files.html#Annual](https://aq5.epa.gov/aq5web/airdata/download_files.html#Annual))

The data show that low air quality presents some health risk to residents throughout the air district and basin, and air quality in the most impacted counties exceeds at least one NAAQS on about one-third of days. These conditions have resulted in the district being designated as a federal non-attainment area for PM<sub>2.5</sub> and ozone under the NAAQS. Air quality has improved in some ways over recent years and the district has recently been designated as a federal maintenance area for PM<sub>10</sub>. Ozone is created in the atmosphere by a reaction involving nitrogen oxides (NO<sub>x</sub>), VOCs, and sunlight. Based on the EPA designations, the primary pollutants of concern for the Project area are NO<sub>x</sub> and VOC (ozone), PM<sub>10</sub>, and PM<sub>2.5</sub>. The remaining criteria pollutants are either unclassified or in attainment with the NAAQS.

There are ongoing efforts to improve air quality in the SJVAPCD led by agencies with Clean Air Act authority. The proposed project area is within the EPA Pacific Southwest Region 9 Planning Area; a State Implementation Plan (SIP) has been prepared for the planning area, which identifies sources of emissions and control measures to reduce emissions. The SJVAPCD has implemented these control measures by issuing District rules. In 2016, CARB updated the State Strategy for achieving emissions reductions toward bringing these areas into attainment with federal standards for ozone and PM<sub>2.5</sub>. A San Joaquin Valley Supplement to the 2016 State Strategy was adopted in October 2018.

District air quality plans that have been adopted and are relevant to the proposed Project include the *SJVAPCD 2016 Ozone Plan, 2013 Plan for the Revoked 1-Hour Ozone Standard, 2022 Plan for the 2015 8-Hour Ozone Standard, 2018 PM<sub>2.5</sub> Plan, and 2007 PM<sub>10</sub> Maintenance Plan*. EPA reclassified the District to Serious PM<sub>2.5</sub> nonattainment, effective December 2021. Following the reclassification, the District must submit a Serious Plan to reduce PM<sub>2.5</sub> concentrations to EPA by December 31, 2023. These plans outline the strategy for achieving federal air quality standards by specific dates and identify control measures to reduce criteria pollutant emissions. Control measures identified in the *2007 Ozone Plan* reduce ozone precursor emissions, NO<sub>x</sub> and Volatile Organic Compounds (VOCs). Particulate matter attainment strategies include control measures to reduce dust from unpaved roads and construction activities.

#### ***Applicable SJVAPCD Rules to Implement Air Quality Plans***

Once air quality attainment demonstration Plans are adopted, the reductions necessary to meet the respective reduction mandates contained in the Plan(s) are achieved through prohibitory rules implemented through the SIP. Compliance with applicable Rules, Regulations, and land use and zoning requirements ensures continued movement towards achieving the SJVAPCD attainment goals. Examples of SJVAPCD rules that may be applicable to the proposed project are described below.

*Rule 2280 (Portable Equipment Registration)*: Certain portable emissions units would be required for well drilling, service or workover rigs, pumps, compressors, generators, and field flares.

*Rule 4101(Visible Emissions)*: The purpose of this rule is to prohibit the emissions of visible air contaminants to the atmosphere.

*Rule 4401 (Steam-Enhanced Crude Oil Production Wells)*: The purpose of this rule is to limit the VOC emissions from steam-enhanced crude oil production wells.

*Rule 4402 (Crude Oil Production Sumps)*: The purpose of this rule is to limit VOC emissions from sumps.

*Rule 4623 (Storage of Organic Liquids)*: The purpose of this rule is to limit VOC emissions from the storage of organic liquids.

*Regulation VIII (Fugitive PM<sub>10</sub> Prohibitions)*: The purpose of Regulation VIII is to reduce ambient concentrations of particulate matter (PM<sub>10</sub>) by requiring actions to prevent, reduce, or mitigate anthropogenic fugitive dust emissions. Regulation VIII rules pertinent to the proposed project include, but are not limited to, the following:

Rule 8021 (Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities): This rule limits fugitive dust emissions (PM<sub>10</sub>) from construction, demolition, excavation, extraction, and other earthmoving activities. This rule applies to any such activity and other earthmoving activities, including, but not limited to, land clearing, grubbing, scraping, travel on-site, and travel on access roads to and from the site.

Rule 8031 (Bulk Materials): The purpose of this rule is to limit fugitive dust emissions from the outdoor handling, storage, and transport of bulk materials.

The BLM does not have authority to issue or enforce CAA rules; however, the BLM supports the actions of CAA-authorized agencies and encourages rule compliance on Public Lands.

### ***Air Emission Sources***

There are many sources of criteria pollutants in the SJVAPCD. Table 3.1 presents 2020 criteria pollutant emissions as estimated by the EPA, along with the percent contributed by each source category.

**Table 3.2** Sources of Criteria Pollutants in the SJVAPCD, 2020

<b>Source</b>	<b>tons per year</b>	<b>%</b>
Wildfire	1,715,443	78.70%
Mobile Sources	250,812	11.51%
Agriculture	108,753	4.99%
Solvent Use	29,293	1.34%
Waste Disposal	25,789	1.18%
Residential Fuel Combustion	21,576	0.99%
Commercial and Industrial Fuel Use	11,014	0.51%
Industrial Processes other than Petroleum and Natural Gas	8,164	0.37%
Oil & Gas Production	5,370	0.25%
Commercial Cooking	2,507	0.12%
Oil & Gas Midstream (transportation, refining, gas stations)	1,142	0.05%
<b>Total</b>	<b>2,179,863</b>	<b>100%</b>

Source: EPA. 2020 National Emissions Inventory (NEI) Online 2020 NEI Data Retrieval Tool. <https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>

As shown in Table 3.2, fires, mobile sources (cars, trucks, construction equipment), and agriculture caused about 95% of the air pollution in the SJVAPCD in 2020. For comparison, the previous NEI, which inventoried emissions for 2017, showed the same top three categories as sources for about 96% of SJVAPCD emission with wildfire the source of 76%. Oil & Gas Production operations and related Oil & Gas infrastructure were the source of about 0.30% of air pollution. Well construction emissions fall under the Mobile Sources category and the EPA did not separate them out in their analysis. BLM estimates that cumulative criteria pollutant emissions from all well construction approved on BLM California Public Land since the beginning of Fiscal Year 2023 plus the proposed action would total to 26.2 tons and would have represented about 0.010% of total mobile source criteria pollutant emissions in 2020. More information on the relationship between potential air emissions related to the proposed action and total emissions in the SJVAPCD are presented in the cumulative impacts analysis in Section 4.2.1.

***Hazardous Air Pollutants***

CAA regulations also address the release of hazardous air pollutants (HAPs): chemicals that are known or suspected to cause cancer or other serious health effects, such as reproductive effects, birth defects, or adverse environmental effects. In addition to federally listed HAPs, California also regulates State-identified Toxic Air Contaminants (TACs). HAPS and TACs are referred to as air toxics. EPA currently lists 189 compounds as HAPs, some of which, such as benzene, toluene, and formaldehyde, can be emitted from oil and gas development operations. NAAQS have not been set for HAPs; rather HAP emissions are controlled by source type- or industrial sector-specific regulations through National Emission Standards for Hazardous Air Pollutants (NESHAPs). Hydrogen sulfide (H<sub>2</sub>S) gas is not regulated under the NAAQS or as a HAP. However, it is known to be hazardous, and is monitored for worker health and safety at oil and gas sites.

Table 3.3 presents 2020 total HAP emissions in the SJVAPCD as estimated by the EPA, along with the percent of total HAPs from each source category.

**Table 3.3** Sources of Hazardous Air Pollutants in the SJVAPCD Counties, 2020

Source	tons per year	%
Wildfire	49,160	74.04%
Agriculture	7,561	11.39%
Mobile Sources	5,791	8.72%
Solvent Use	2,494	3.76%
Residential Fuel Combustion	804	1.21%
Waste Disposal	374	0.56%
Oil & Gas Midstream	92	0.14%
Oil & Gas Production	62	0.09%
Industrial Processes other than Petroleum and Natural Gas	40	0.06%
Commercial and Industrial Fuel Use	21	0.03%
Commercial Cooking	0	0.00%
<b>Total</b>	<b>66,398</b>	<b>100%</b>

Source: EPA. 2020 National Emissions Inventory (NEI) Online 2020 NEI Data Retrieval Tool. <https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>

Similar to criteria pollutants, the top three categories emitted 94% of all HAPs in 2020, with solvent use making up more than half of the remain 6%. Oil & Gas Production operations and related Oil & Gas infrastructure were the source of about 0.23% of HAP emissions in the air basin. As with criteria pollutants, well construction HAP emissions are included with mobile sources. Cumulative HAP emissions from all well construction approved on BLM California Public Land since the beginning of Fiscal Year 2023 plus the proposed action would totaled 0.019 tons and would have represented about 0.0034% of total mobile source criteria pollutant emissions in 2020. According to the EPA EJScreen mapping tool (<https://ejscreen.epa.gov/mapper/>), SJVAPCD overall shows air toxics cancer risk and air toxics hazard index below the 50th percentile and air toxic releases to air in the 40<sup>th</sup> percentile. More information on the relationship between potential HAP emissions related to the proposed action and HAP health risks in the SJVAPCD are presented in the cumulative impacts analysis in Section 4.2.1.

### ***General Conformity***

The classification of any area as a federal nonattainment and/or maintenance area brings an additional requirement for federal agencies. Section 176(c) of the CAA, as amended (42 U.S.C. 7401 et seq.), and regulations under 40 CFR, Part 93, Subpart B, state that “no department, agency or instrumentality of the federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan.” This means that under the CAA 176(c) and 40 CFR, Part 93, Subpart B (conformity rules), federal agencies must make a determination that proposed actions in federal nonattainment areas conform to the applicable EPA approved implementation plans (if pertinent) before the action is taken. See the heading General Conformity heading in Chapter 4 below for related analysis.

### **3.1.2 Environmental Impacts**

The proposed project would result in the emission of air pollutants, including the three criteria pollutants (ozone, PM<sub>10</sub>, and PM<sub>2.5</sub>) for which the San Joaquin Valley Air Basin has non-attainment or maintenance designations. Project-related emissions are divided into the following categories for purposes of analysis:

- **Well Development** emissions occur on the leased well site during site preparation, well drilling and construction, and production testing. Emission sources include: diesel drilling rig engines, drill pad construction equipment (i.e., dozers, backhoe, grader, etc.), equipment trucks, water trucks, drill rig crew trucks/vehicles, and portable lift equipment; worker commuting and material deliveries; and fugitive dust emissions as a result of soil disturbance and vehicle traffic on unpaved surfaces. The 6 proposed wells will not undergo fracking or any other post drilling treatments and no treatment-related emissions are expected.
- **Production** emissions occur at the leased well site and include travel for daily inspections. Criteria pollutants or hazardous air pollutants could also occur through venting or fugitive losses during maintenance, emissions from use of chemicals, and leakage from valves, fittings, piping, and the well head.
- **Mid-Stream** emissions occur away from the well site and include emissions from transportation and processing of produced fluids after they leave the wellhead and before crude oil enters a pipeline to a refinery. For the proposed action, a portion of mid-stream emissions related to the project come from an oil and gas handling facility, Facility C-1658. This facility processes fluids from multiple wells. It is subject to a set of CAA New Source Review air permits issued by the SJVAPCD and is not part of the APD. Air emissions from Facility 1658 and other midstream operations farther removed from the proposed well sites are monitored, regulated, limited, and mitigated by the SJVAPCD and CARB through the SIP under EPA oversight. Therefore, midstream emissions related to the proposed action and not expected to affect the NAAQS status of the SJVAPCD.
- **End-Use** emissions come from the refining of crude oil produced from the proposed wells and its eventual consumption as petroleum fuels and other products. Air emissions related to petroleum refining and consumption are regulated by air districts and CARB in California and by EPA and delegated state and local agencies in the rest of the country and are outside of BLM jurisdiction. There are many possibilities for the processing and

consumption of oil produced and the specific transportation, processing, and consumption of any barrel of oil produced are not reasonably foreseeable. Potential end-use emissions related to the proposed action are estimated by representing produced crude oil as the equivalent volume of gasoline refined and consumed in cars in the SJVAPCD as modeled by the Argonne National Laboratory Greenhouse gases, Regulated Emissions, and Energy use in Technologies (GREET) Well-to-Wheels (WTW) calculator.

Air emissions from the six proposed wells are reduced or mitigated by the following factors:

- CARB and SJVAPCD have established and enforce rules and permitting, inspection and monitoring requirements that reduce or mitigate emissions from the proposed wells.
- The proposed wells will not undergo hydraulic fracturing or other well stimulation processes.
- These wells are not expected to produce natural gas.

**General Conformity**

Where the Federal action is a permit, license, or approval for some aspect of a non-Federal undertaking, such as drilling and operating oil wells on Public Land, the relevant activity is the part, portion, or phase of the non-Federal undertaking that requires the Federal permit, license, or approval. The General Conformity rule applies to individual decisions, excluding leases, and does not include any provision requiring cumulative analysis. General Conformity applicability analysis is required for direct and indirect criteria pollutant emissions meeting the following conditions: 1) they are caused by the Federal action; 2) the agency (BLM) has a practical way to impose controls on them; 3) they are not subject to a CAA new source review permit. Based on these conditions, the BLM has determined that Well Development and Production Operation emissions are subject to General Conformity applicability analysis. Table 4.1 compares subject emissions of nonattainment pollutants with the General Conformity *de minimis* thresholds for the SJVAPCD to complete the applicability analysis.

**Table 3.4** General Conformity Applicability Analysis (tons per year)

Activity	PM <sub>10</sub>	PM <sub>2.5</sub>	VOC	NO <sub>x</sub>
Well Development (Max)	0.12	0.12	0.28	2.60
Well Development (Average)	0.00	0.00	0.01	0.09
Production Operations (Max)	0.72	0.68	0.72	0.72
Production Operations (Average)	0.72	0.68	0.72	0.72
Maximum Annual Total	0.84	0.80	1.00	3.32
Average Year Total	0.72	0.68	0.73	0.81
<b>General Conformity <i>De Minimis</i> Threshold</b>	<b>100</b>	<b>70</b>	<b>10</b>	<b>10</b>

Source: Attachment 1 - 2024 APD Emissions Tool INNEX KMD v2022.c

As shown in the table, maximum estimated well development and production emissions from the 4 proposed wells combined are below the *de minimis* threshold for each nonattainment criteria pollutant. This means that project emissions are expected to be consistent with the SIP and that a formal conformity determination under 40 CFR Part 93.153 is not required. Since the emissions conform to the SIP, they would not be likely to cause or contribute to an exceedance of the NAAQS or impair the ongoing SIP-based efforts to bring the SJVAPCD into attainment.

**Potential for Criteria Pollutant Impacts**

Table 3.5 presents estimated highest annual emissions of each criteria pollutant and total HAPs related to the project in the context of emissions of the same pollutants in the SJVAPCD and the State of California.

**Table 3.5** Estimated Maximum Annual Emissions related to Well Development, Production Operations, Mid-stream, and End-use with context (tons per year)

Activity	PM <sub>10</sub>	PM <sub>2.5</sub>	VOC	NO <sub>x</sub>	CO	SO <sub>2</sub>	HAPs
Well Development	0.1	0.1	0.3	2.6	2.6	0.0	0.1
Production Operations	0.7	0.7	0.7	0.7	2.8	0.0	1.7
Mid-Stream <sup>1</sup>	3.2	2.2	24.3	21.1	0.0	8.0	0.0
End-Use <sup>2,4</sup>	8.9	1.9	59.1	21.2	704.3	0.5	5.9
<b>Total</b>	<b>12.9</b>	<b>4.9</b>	<b>84.4</b>	<b>45.5</b>	<b>709.7</b>	<b>8.5</b>	<b>7.8</b>
<b>Context</b>							
SJVAPCD - Annual	187,145.5	125,056.3	365,611.6	86,815.1	1,404,148.2	11,086.1	66,398.2
California - Annual <sup>3</sup>	867,340.7	667,424.1	2,038,209.7	436,982.6	8,337,525.4	60,852.5	342,613.8

1 - Midstream emissions estimated as the GREET WTW Calculator Well to Pump (WTP) emissions, minus the average site-specific well operations emissions estimated by BLM for all pollutants except PM10 and PM2.5. These emissions come largely from facilities that require a permit issued by the SJVAPCD or other California air districts under the new source review (NSR) program and the applicable SIP or from vehicles over which BLM has no authority to impose controls. BLM does not have practical control or continuing program responsibility over these emissions.

2 - End use emissions estimated based on an equivalent volume for gasoline used as modeled by Argonne National Laboratory 2022. GREET WTW Calculator (<https://greet.es.anl.gov/tools>). BLM does not have practical control or continuing program responsibility over these emissions.

3 - Total annual pollutant emissions for the SJVAPCD, and the State of California reported by EPA in the 2020 National Emission Inventory (<https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>)

4 - End-Use HAP emissions estimated as 1/10th of VOC emissions

As shown in Table 3.5, total emissions of pollutants of concern for the Project area (PM<sub>10</sub>, PM<sub>2.5</sub>, VOC, and NO<sub>x</sub>) would add up to 12.9 + 4.9 + 84.4 + 45.5 = 147.7 tons or less each year. Total 2020 emissions of the same pollutants in SJVAPCD add up to 764,628.4 tons per year. This means total project-related well development, production related, midstream, and end-use criteria pollutant emissions would make up at most 0.02% of pollutant of concern emissions in SJVAPCD compared to 2020 emissions levels. (147.7 / 764,628.4 = 0.02%).

In addition to the General Conformity *de minimis* thresholds, the AQI can also illustrate the potential for the proposed emissions to have an impact on air quality. AQI generally increases with increasing pollutant emissions, but the relationship between AQI and emissions is complex, meaning that a change in emissions may not result in the same amount of change in the AQI. However, for discussion purposes we can consider that the 0.02 percent emissions increase described in the preceding paragraph would cause only a negligible increase in the AQI. In fact, it appears likely that the AQI change would be less than one point (1% of the AQI at the NAAQS concentration). The AQI is designed so that it takes a 50- or 100-point change to indicate a significant change in health risk. In fact, the EPA determined that changes less than one are not even large enough to report. This example illustrates the conclusion that the small pollutant of concern increase related to the project (0.02 percent) would have a negligible effect on air quality or on air-quality-related impacts.

As described in Section 3.1.1, CARB and the SJVAPCD have been delegated CAA authority by the EPA to monitor and manage air quality in California. There are several SJVAPCD rules that would minimize air quality impacts related to the proposed action, such as Rules 2280, 4101, 4401, 4402, 8021, and 8031. For example, applicant compliance with Regulation VIII (Rules 8021 and 8031) would minimize particulate emissions by requiring proponents to water unpaved access roads in the project area and to water soils prior to excavation and trenching and during backfilling while compacting. Proponent compliance with Rule 2280 would ensure that ROG/VOC and NOx emissions from portable units, such as the drilling rig, would be evaluated per the SJVAPCD's calculation methodologies, and any increase in emissions would be fully offset during the air permitting process. Current and proposed CARB rules limit emissions from cars, trucks, and construction equipment. Implementation of these existing and proposed regulatory requirements would offset the increase in potential emissions related to the proposed project.

***Potential for Hazardous Air Pollutant / Toxic Air Contaminant Impacts***

As described above, well development and oil production may result in HAP/TAC emissions. The two most prevalent oil well related TACs are hydrogen sulfide and diesel exhaust (diesel particulate matter or DPM). The specific HAP compounds and the amounts of these compounds emitted depend on the HAP content of the produced oil as well as well development and management techniques. The wells proposed in this project will not undergo hydraulic fracturing or other well stimulation procedures and so HAP/TAC emissions are limited to HAPs contained in the produced fluids and emitted by construction equipment.

Innex has estimated representative of HAP/TAC emissions from the proposed wells which are presented in Table 3.6. Similarly HAP/TAC emissions of the same compounds for the SJVAPCD and the State of California from the EPA National Emissions Inventory are also provided as context. Because of the many different transportation, processing, and end use possibilities for crude oil produced in SJVAPCD, it is not feasible to estimate detailed midstream or end-use HAP and TAC emissions related to the proposed action. However, these emissions are presented as total project HAP in Table 3.5 above.

**Table 3.6** Estimated Maximum Air Toxic (HAP/TAC) Emissions from Well Development and Production Operations by Compound with Context (pounds per year)

HAP/TAC <sup>1</sup>	Well Development	Production Operations	SJVAPCD <sup>6</sup>	State of California <sup>6</sup>
Diesel Exhaust Particulate <sup>2,3,4</sup>	38.10	0.93	not reported	35,770,000.0
Hydrogen Sulfide <sup>5</sup>	0.00	2114.45	not reported	3,177,200.0
1,3-Butadiene	4.17	27.40	3,074,981.5	16,757,041.4
Acetaldehyde	17.52	115.11	28,897,627.9	153,052,607.7
Acrolein	16.51	108.43	5,301,966.5	27,906,697.3
Benzene	9.97	65.48	6,050,289.2	34,948,871.6
butyr/isobutyraldehyde	0.31	2.01	not reported	not reported
Ethyl benzene	0.29	1.91	651,263.9	5,276,991.9
Formaldehyde	128.90	846.61	40,477,090.2	224,160,324.8
Hexane	0.00	0.02	1,369,323.1	10,481,703.2
Methanol	19.24	126.37	83,227,727.1	402,389,440.1

HAP/TAC <sup>1</sup>	Well Development	Production Operations	SJVAPCD <sup>6</sup>	State of California <sup>6</sup>
<b>Naphthalene</b>	0.61	4.02	5,110,731.3	27,543,187.3
<b>Polycyclic Organic Matter (POM)</b>	0.89	5.84	5,773,741.1	5,773,741.1
<b>Propylene</b>	0.23	1.50	not reported	not reported
<b>Styrene</b>	0.07	0.49	1,245,260.0	7,220,188.0
<b>Toluene</b>	3.51	23.06	7,496,955.6	50,895,027.0
<b>Vinyl Chloride</b>	0.05	0.30	4.1	35.7
<b>Xylene</b>	1.23	8.09	5,926,484.8	39,317,295.8
<b>Total Pounds</b>	<b>241.6</b>	<b>3,452.0</b>	<b>194,603,446</b>	<b>1,005,723,153</b>

1- for more information on the health effects of listed HAPs see: EPA. Health Effects Notebook for Hazardous Air Pollutants. <https://www.epa.gov/haps/health-effects-notebook-hazardous-air-pollutants>

Emission estimates were based on AP-42 Table 3.2 emission factors. Compound emission factors indicated in Table 3.4-2 of EPA - EMISSION FACTOR DOCUMENTATION FOR AP-42 SECTION 3.2, NATURAL GAS-FIRED RECIPROCATING ENGINES. Alpha-Gamma Technologies, Inc. July 2000 as having emission factors based solely on methode detection limts were excluded as speculative.

2- Diesel Exhaust Particulate (or Diesel Particulate Matter or DPM) is estimated as equal to Well Development PM2.5 as esti,ated by CalEEMOD. Diesel Particulate matter includes POM. Diesel particulate matter is identified as a toxic air contaminant in California but is not a federally listed HAP and is not included in the HAP emission totals presented in Tabel 4.1. See CARB, 1998 Health Risk Assessment for Diesel Exhaust for information on DPM health effects. <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/diesltac/partb.pdf>

3 - Production Operations DPM emissions estimated as engine PM10 emissions from site inspections done in a diesel-fueled pickup truck with emissions of 0.00002 g/lb/VMT and 4,745 miles per year (SJVAPCD, AB 2588 “Hot Spots” Air Toxics Profiles, March 27, 2017)

4- CA statewide emissions source: CARB. Almanac 2013 – Chapter 2: Current Emissions and Air Quality, page 2-6. 2013. <https://ww2.arb.ca.gov/sites/default/files/2021-01/chap213.pdf>

5- H2S emissions estimated by project proponent. For more information on sulfur dioxide health effects see: <https://ww2.arb.ca.gov/resources/hydrogen-sulfide-and-health>. H2S is is not a federally listed HAP and is not included in the HAP emission totals presented in Table 4.1.

6 - Annual HAP emissions for the SJVAPCD, and the State of California reported by EPA in the 2020 National Emission Inventory (<https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>). Total H2S emissions for California from the 2010 California Toxic Inventory (cti-2010.xlsx) <https://ww2.arb.ca.gov/sites/default/files/2023-07/cti-2010.xlsx>

BLM has considered air toxic (HAP and TAC) emissions from the proposed action in several ways to assess their potential for impacts:

- Beginning in the 1990s EPA studied oil exploration and production operations to determine if oil and gas exploration and production HAP emission impacts were significant enough to require regulation under the National Emission Standards for Hazardous Air Pollutants (NESHAP). Oil and gas production NESHAP rules and rule revisions were promulgated in 1999, 2001, 2007, and 2012. To date, only one type of oil exploration and production equipment, glycol dehydrators, has been identified as a significant source of HAP emissions requiring regulation. No glycol dehydrators or any other new processing operations are proposed as part of the project. BLM reviewed the EPA rulemaking and data on HAP emissions from representative single oil wells and found that in each case HAP emissions were below the threshold requiring controls under the NESHAP.
- In 2022, the California Legislature established a requirement for a health protection zone of 3,200 feet (0.6 miles) between residences and other sensitive receptors and oil wells. This requirement was intended to protect residents from health impacts of HAP/TAC emissions from well sites. Based on satellite imagery, the nearest potential residence to the project is located more than 6 miles west of any proposed well sites, well outside the specified health protection zone of the proposed wells. This indicates a very low likelihood of health impacts from wellsite emissions.

- The SJVAPCD includes a large number and variety of HAP and TAC emission sources including highways (a major source of diesel exhaust particulate), factories, and chemical facilities (See Table 3.3 above). Estimated maximum HAP and TAC emissions from the proposed action are 3,452 pounds per year. That would represent 0.0013% of the 130,320 tons (260,640,807 pounds) of HAP and TAC emissions reported in the SJVAPCD in 2020. Because the proposed wells are not located close to any receptors and their projected emissions are very small, the estimated wellsite emissions would not be expected to increase current HAP or TAC health impacts in the SJVAPCD.
- The State of California oversees a statewide program required by AB2588 that includes air toxics emissions reporting and health risk assessment covering air toxic sources, including sources in the midstream and end-use supply chain related to the proposed wells. The program includes a computer modeling package designed to allow facility operators to perform a basic air toxics risk prioritization. The package is called the Hotspots Analysis and Reporting Program Emission Inventory Module (HARP). HARP models air toxic concentrations at the nearest receptor to a facility being assessed and provides a prioritization score for use by air districts in determining whether that facility should conduct further risk assessment or further reporting. The SJVAPCD interprets prioritization scores as follows:

Prioritization	Prioritization Score	Outcome
Low Priority	Prioritization $\leq$ 1	Exempt from further requirements
Intermediate Priority	1 < Prioritization $\leq$ 10	Facility updates report every four years
High Priority	10 < Prioritization	Facility required to report a Health Risk Assessment

Production operation emissions from the 4 proposed wells were entered into SJVAPCD Air Toxics Hot Spots Facility Prioritization Score Calculator ([https://www.valleyair.org/busind/pto/emission\\_factors/Criteria/Toxics/Utilities/PRIORITIZATION%202016%20Air%20Toxic%20Hot%20Spots.xls](https://www.valleyair.org/busind/pto/emission_factors/Criteria/Toxics/Utilities/PRIORITIZATION%202016%20Air%20Toxic%20Hot%20Spots.xls)) and so were analyzed as if originating at a single location. Combining sources into a single location increases the modeled concentration at the receptor. Even so, the HARP prioritization score for the six proposed wells combined was 0.579, below the low priority threshold of 1, and indicating exemption from further analysis. The prioritization score for the well development phase of the project was much lower. BLM has reviewed the AB2588 program and concurs that it adequately assesses and informs the public on air toxic health risks.

**No Action:**

There would be no new impacts to air quality under the No Action Alternative because the proposed wells would not be drilled. Ongoing air quality issues and impacts described in Chapter 3 above would remain the same in absence of the proposed project.

**3.2 Climate Change**

**3.2.1 Affected Environment**

Climate change is a global process that is affected by the sum total of GHGs in the Earth’s atmosphere. The incremental contribution to global GHGs from a single proposed land management action cannot be accurately translated into its potential effect on global climate change or any localized effects in the area specific to the action. Currently, global climate models

are unable to forecast local or regional effects on resources as a result of specific emissions. However, there are general projections regarding potential impacts on natural resources and plant and animal species that may be attributed to climate change resulting from the accumulation of GHG emissions over time. GHGs influence the global climate by increasing the amount of solar energy retained by land, water bodies, and the atmosphere. GHGs can have long atmospheric lifetimes, which allows them to become well mixed and uniformly distributed over the entirety of the Earth’s surface no matter their point of origin. Therefore, potential emissions resulting from the proposed action can be compared to state, national and global GHG emission totals to provide context of their potential contribution to climate change impacts.

Further discussion of climate change science and predicted impacts, as well as the reasonably foreseeable and cumulative GHG emissions associated with BLM’s oil and gas leasing actions, are included in the *BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends* (BLM, 2023) (hereinafter referred to as the Annual GHG Report). This report presents the estimated emissions of greenhouse gases attributable to development and consumption of fossil fuels produced on lands and mineral estate managed by the BLM. The Annual GHG Report is incorporated by reference as an integral part of this analysis and is available at <https://www.blm.gov/content/ghg/2022/>.

Table 3.7 shows Global, National and State GHG emissions data for 2018 - 2022. GHG emissions include emissions from fossil fuel use across all sectors (residential, commercial, industrial, transportation, and electricity generation) as well as other source categories such as waste management.

**Table 3.7** Global and U.S. GHG Emissions 2018 - 2022 (Mt CO<sub>2</sub>/yr)

Scale	2018	2019	2020	2021	2022
Global <sup>1-3</sup>	51,800	52,600	50,800	52,800	57,400
U.S. <sup>4</sup>	5,990	5,914	5,250	5,586	6,343
California <sup>5</sup>	411	405	369	381	NA

Mt = Megatonnes or million metric tons

NA = Not Available

1 - UNEP Emission Gap Report 2018. <https://www.unep.org/resources/emissions-gap-report-2018>

2 - UNEP Emission Gap Report 2019. <https://www.unep.org/resources/emissions-gap-report-2019>

3 - For 2020, 2021 and 2022 - UNEP Emission Gap Report 2022. Table 2.1. <https://www.unep.org/resources/emissions-gap-report-2022>

4 - For 2023 - UNEP Emission Gap Report 2023 Page XVII. <https://www.unep.org/resources/emissions-gap-report-2023>

5 - EPA. Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2022. <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021>

6- CARB. 2000–2021 GHG Emissions Trends Report Data. [https://ww2.arb.ca.gov/sites/default/files/2023-12/2000\\_2021\\_ghg\\_inventory\\_trends.pdf](https://ww2.arb.ca.gov/sites/default/files/2023-12/2000_2021_ghg_inventory_trends.pdf)

The continued increase of anthropogenic GHG emissions over the past 60 years has contributed to global climate change impacts. A discussion of past, current, and projected future climate change impacts is described in Chapters 8 and 9 of the Annual GHG Report. These chapters describe currently observed climate impacts globally, nationally, and in each State, and present a range of projected impact scenarios depending on future GHG emission levels. These chapters are incorporated by reference in this analysis.

### ***Applicable Federal, State, and Local Regulations to Reduce Impacts of Oil and Gas Production on Climate Change***

On April 17, 2012, EPA issued Final Air Rules to reduce harmful air pollution from the oil and natural gas industry. In addition, EPA issued final updates to its 2012 VOC performance standard for storage tanks used in crude oil and natural gas production and transmission on August 5, 2013. In addition, on May 12, 2016, EPA issued final rules to reduce emissions of methane, smog-forming volatile organic compounds, and toxic air pollutants from new, reconstructed, and modified oil and gas sources; these final rules established updates to the New Source Performance Standards (NSPS) and the Source Determination Rule. The EPA also requires reporting of greenhouse gases from large GHG emissions sources in the United States through the Greenhouse Gas Reporting Program (GHGRP) (EPA, 2020). The facilities that would be built under the proposed action are not expected to have large enough direct GHG emissions to trigger GHGRP reporting.

The California Legislature passed the California Global Warming Solutions Act of 2006 [Assembly Bill 32 (AB 32)], creating a comprehensive, multi-year program to reduce greenhouse gas emissions in California. AB 32 requires the reporting of GHGs by major sources, applicable to industrial facilities, fuel suppliers, and electricity reporters. In 2022, CARB issued an updated Scoping Plan to address AB 32 and subsequent legislative actions and policies related to climate change. The 2022 Plan lays out a path to achieve targets for carbon neutrality and reduce anthropogenic greenhouse gas (GHG) emissions by 85 percent below 1990 levels no later than 2045, as directed by Assembly Bill 1279. The Plan intends to achieve significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands to reduce emissions and sequester carbon, and the capture and storage of carbon.

SJVAPCD has developed *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA and District Policy Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA*, intended to be applied to CEQA analysis. Although these policies are only available for CEQA analyses, the air district guidance may be generally applied by land-use agencies for reference. BLM concludes that the SJVAPCD requirement to quantify GHG emissions and to implement SJVAPCD Best Performance Standards to reduce GHG emissions would occur at the APD or Sundry stage, to be analyzed in a site-specific NEPA analysis. Therefore, this environmental assessment includes an analysis of GHG emissions for the proposed action.

### **3.2.2 Environmental Impacts**

#### **Proposed Action:**

The proposed action would result in emissions of GHGs that are known to contribute to global climate change. These emissions are associated with combustion sources such as diesel drill and completion/workover rig engines, drill pad construction equipment (i.e., dozers, backhoe, grader, etc.), equipment trucks, water trucks, drill rig crew trucks/vehicles, and portable lift equipment. Emissions of GHGs could also occur through venting or fugitive losses from valves and fittings, pumps, compressors, and the well head.

There are four general phases of post-lease development that would generate GHG emissions: 1) well development (well site construction, well drilling, and well completion), 2) well production

operations, 3) mid-stream (processing, refining, storage, and transport/distribution), and 4) end-use (combustion or other uses) of the fuels produced. While well development and production operation emissions occur on-lease and the BLM has program authority over these activities, mid-stream and end-use emissions typically occur off-lease where the BLM has no program authority.

The amount of oil or gas that may be produced by the proposed wells is not known. For purposes of estimating production and end-use emissions, potential wells are assumed to produce oil and gas in similar amounts to existing nearby wells. BLM downloaded records that included initial production data for a number of nearby representative wells from the CalGEM Wellfinder website (<https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx>) to use as a basis for production estimates. While the BLM has no authority to direct or regulate the end-use of the products, for this analysis, the BLM assumes all produced oil or gas will be combusted (such as for domestic heating or energy production). The BLM acknowledges that there may be additional sources of GHG emissions along the distribution, storage, and processing chains (commonly referred to as midstream operations) associated with production from the lease parcels. These sources may include emissions of methane (a more potent GHG than CO<sub>2</sub> in the short term) from pipeline and equipment leaks, storage, and maintenance activities. The specific details on these sources of emissions are highly speculative, therefore, the BLM has chosen to assume that mid-stream emissions associated with wells for this analysis will be similar to the national level emissions identified by the Department of Energy's National Energy Technology Laboratory (NETL, 2009) (NETL, 2019).

The emission estimates calculated for this analysis were generated using the assumptions previously described above using the BLM APD Emissions Tool. Emissions are presented for each of the four phases of post-lease development described above as follows:

- **Well Development** GHG emissions occur on the leased well site during site preparation, well drilling and construction, and production testing.
- **Production Operations, Mid-stream, and End-Use** emissions occur over the entire production life of a well, which is assumed to be 30 years for this analysis based on the productive life of a typical oil/gas field.
- **Production Operations** emissions result from wellhead operations, fugitives, and vehicle exhaust. Emission sources including storage tank breathing and flashing, truck loading, pump engines, heaters and dehydrators, pneumatic instruments or controls, flaring, and fugitives are located at the North Treatment unit.
- **Mid-stream** emissions occur from the transport, refining, processing, storage, transmission, and distribution of produced oil and gas. Mid-stream emissions are estimated by multiplying the estimated ultimate recovery (EUR) of produced oil and gas with emissions factors from NETL life cycle analysis of U.S. oil and natural gas. Additional information on emission factors can be found in the Annual GHG report (Chapter 6, Tables 6-8 and 6-10).
- For the purposes of this analysis, **End-Use** emissions are calculated assuming all produced oil and gas is combusted for energy use. End-use emissions are estimated by multiplying the EUR of produced oil and gas with emissions factors for combustion established by the EPA (Tables C-1 and C-2 to Subpart C of 40 CFR § 98). Additional information on

emission factors and EUR factors can be found in the Annual GHG Report (Chapter 6, Figure 6-3).

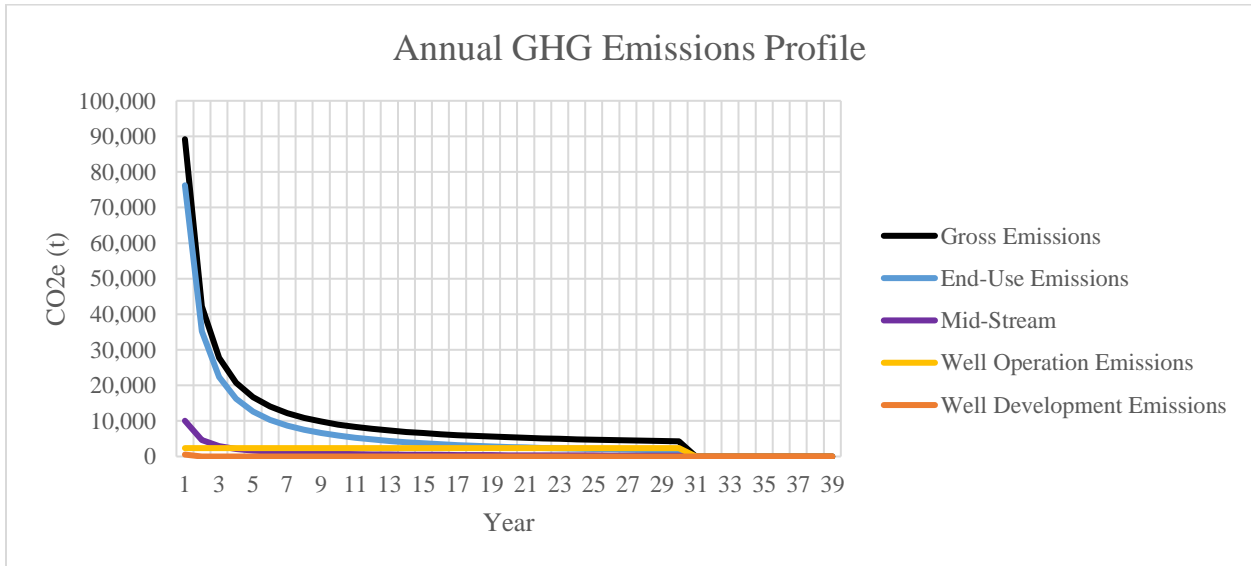
Table 3.8 presents the estimated direct (well development and production operations) and indirect (mid-stream and end-use) GHG emissions in metric tons (tonnes) for the subject leases over the average 30-year production life of the lease. Total CO<sub>2</sub>e emission estimated on either 100-year or 20-year time frame add up to 0.13 million metric tons (Megatonnes or Mt).

**Table 3.8** Estimated Production Life Emissions from Well Development, Production Operations, Mid-stream, and End-use (Metric tonnes)

Activity	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> e (100-yr)	CO <sub>2</sub> e (20-yr)
Well Development	540	0.04	0.020	547	549
Production Operations	70,680	3.60	0.600	70,951	71,141
Mid-Stream	33,080	35.56	0.561	34,293	36,167
End-Use	259,221	10.43	2.087	260,101	260,651
<b>Total</b>	<b>363,521</b>	<b>49.63</b>	<b>3.268</b>	<b>365,892</b>	<b>368,508</b>

Source: BLM APD Emissions Tool

GHG emissions vary annually over the production life of a well due to declining production rates over time. Figure 4 shows the estimated GHG emissions profile over the production life the proposed wells including well development, well production operations, mid-stream, end-use, and gross (total of well development, well production, mid-stream, and end-use) emissions.



**Figure 4** Estimated GHG Emissions Profile over the Production Life of the Proposed Wells

Source: BLM APD Emissions Tool

As Figure 4 shows, all categories of GHG emissions related to the proposed wells decrease as oil productions declines. Similar decreases occur for midstream and end-use criteria and HAP/TAC emissions.

To put the estimated GHG emissions for the proposed wells in a relatable context, potential emissions that could result can be compared to other common activities that generate GHG emissions and to emissions at the state and national level. The EPA GHG equivalency calculator

can be used (<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>) to express the potential average year GHG emissions on a scale relatable to everyday life. For instance, the projected average annual GHG emissions from potential development (total CO<sub>2e</sub> emissions from Table 3.8 divided by 30 years) of the subject lease are equivalent to 2,629 gasoline-fueled passenger vehicles driven for one year, or the emissions that could be avoided by operating 3 wind turbine as an alternative energy source or offset by the carbon sequestration of 14,520 acres of forest land.

Table 3.9 compares emission estimates over the 30-year life of the lease compared to the 30-year projected Federal emissions in the state and nation from existing wells, the development of approved APDs, and emissions related to reasonably foreseeable lease actions.

**Table 3.9** Comparison of the Life of Lease Emissions to other Federal Oil and Gas Emissions From Existing Wells, Development of Approved APDs, and Other Leasing Actions in the State and Nation (Mega Tonnes)

Reference	Mt CO <sub>2e</sub>	Life of Lease % of Reference
<b>Proposed Action - Production Life Total</b>	0.37	100.00%
<b>CA Reasonably Foreseeable Short-Term Onshore Federal (O&amp;G)</b>	51.49	0.711%
<b>CA Projected Long-Term Onshore Federal (O&amp;G)</b>	202.74	0.180%
<b>U.S. Reasonably Foreseeable Short-Term Onshore Federal (O&amp;G)</b>	6,033.00	0.006%
<b>U.S. Projected Long-Term Onshore Federal (O&amp;G)</b>	16,523.00	0.002%

1- Foreseeable Federal short-term and long-term emissions come from the APD Emissions Tool and BLM Specialist Report on Annual Greenhouse Gas Emissions, Tables 7-18 and 7-19.

2 - Short-term projections are based on existing production, approved permits, and potential new leases.

3 - Long-term projections are based on the projections from the U.S. Energy Information Administration’s energy outlook.

Compared to emissions from other existing and foreseeable short-term Federal oil and gas development, the life of lease emissions for the Proposed Action is between 0.180% to 0.711% of Federal fossil fuel authorization emissions in the state and between 0.002% to 0.006% of Federal fossil fuel authorization emission in the nation. In summary, potential GHG emissions from the Proposed Action could result in GHG emissions of 0.37 MT CO<sub>2e</sub> over the production life of the proposed wells.

The “social cost of carbon”, “social cost of nitrous oxide”, and “social cost of methane” – together, the “social cost of greenhouse gases” (SC-GHG) are estimates of the monetized damages associated with incremental increases in GHG emissions in a given year. Such analysis should not be construed to mean a cost determination is necessary to address potential impacts of GHGs associated with specific alternatives. These numbers were monetized; however, they do not constitute a complete cost-benefit analysis, nor do the SC-GHG numbers present a direct comparison with other impacts analyzed in this document. SC-GHG is provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making. For Federal agencies, the best currently available estimates of the SC-GHG are the interim estimates of the social cost of carbon dioxide (SC-CO<sub>2</sub>), methane (SC-CH<sub>4</sub>), and nitrous oxide (SC-N<sub>2</sub>O) developed by the Interagency Working Group (IWG) on the SC-GHG. Select estimates are published in the Technical Support Document (IWG 2021) and the complete set of annual

estimates are available on the Office of Management and Budget’s website. <sup>12</sup>

The SC-GHG associated with estimated emissions from development of the proposed wells are reported in Table 3.10. These estimates represent the present value (from the perspective of 2021) of future market and nonmarket costs associated with CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from potential well development and operations, and potential end-use, as described in Subsection 1.2.1. Estimates are calculated based on IWG estimates of social cost per metric ton of emissions for a given emissions year and BLM’s estimates of emissions in each year. They are rounded to the nearest \$1,000.

**Table 3.10** SC-GHGs Associated with Future Potential Development

	Social Cost of GHGs (2020 \$)			
	Average Value, 5% discount rate	Average Value, 3% discount rate	Average Value, 2.5% discount rate	95 <sup>th</sup> Percentile Value, 3% discount rate
<b>Development and Operations</b>	\$827,000	\$3,234,000	\$4,926,000	\$9,847,000
<b>Mid-Stream and End-Use</b>	\$4,136,000	\$14,854,000	\$22,223,000	\$44,748,000
<b>Total</b>	<b>\$4,963,000</b>	<b>\$18,088,000</b>	<b>\$27,149,000</b>	<b>\$54,595,000</b>

As detailed in the Annual GHG Report (BLM, 2022), which the BLM has incorporated by reference, the BLM also looked at other tools to inform its analysis, including the MAGICC model (see Section 9.0 of the Annual GHG Report). This model run suggests that “federal minerals emissions are predicted to have minimal impacts to future global climate change through the end of the century.” As this is an assessment of what BLM has projected could come from the entire Federal fossil fuel program, including the projected emissions from the proposed action, over the next 30 years, the reasonably foreseeable lease sale emissions contemplated in this EA are not expected to substantially affect the rate of change in climate effects, bring forth impacts that are not already identified in existing literature, or cause a change in the magnitude of impacts from climate change at the state, national, or global scales.

As shown in Table 4.5, the emissions from the proposed action would not significantly change current GHG emissions or the expected course of climate change in the State, given it is reasonably foreseeable that GHG emissions related to oil production in California will decrease.

In addition, The California Energy Commission (CEC), reported that nearly three-quarters of the crude oil refined in California was imported in 2022. (<https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/annual-oil-supply-sources-california>) The fraction of oil imported has increased from half in 2000 to three-quarters today as California production has decreased. Imports are reasonably foreseeable to increase further as California oil production declines and would therefore offset some or all of GHG reductions achieved unless demand for petroleum products is reduced.

## **No Action:**

Under the No Action Alternative, the BLM would not permit the 4 proposed wells. However, the proponent could apply for application to drill at other locations or at future times. Although no new GHG emissions associated with new Federal oil and gas development for the subject leases would occur under the No Action Alternative in the foreseeable future, the cumulative demand for energy is not expected to differ regardless of BLM decision-making (EIA, 2020) and currently observed and projected climate impacts would be expected to continue. The BLM has no information regarding what energy source could fill the energy demand if development does not occur on the subject leases. Although the change in emissions compared to the Proposed Action could range from a 98.5% decrease if hydroelectricity is substituted to a 110.7% increase if coal is substituted, see Table 10-3 in Section 10.0 of the Annual Report (BLM, 2022). Over the past decade the increasing mix of natural gas has contributed to lower emissions as it has replaced energy produced from coal. In 2022, high prices for natural gas and demand exceeding supply have resulted in some countries reactivating or delaying planned closures of coal fired power plants (Reuters, 2022). In the future, renewable energy is anticipated to become a larger part of the U.S. energy mix and reducing energy related carbon emissions. It has been estimated that with a 35% integration of wind and solar energy into the Western United States electric grid, there would be an additional 25-45% reduction in carbon emissions (BLM 2022). Based on this information there is potential for higher emissions over the short-term and reduced emissions over the long-term. The BLM cannot estimate the net effects across all energy markets to understand the mix of energy resources that will meet demand, and therefore can't provide an estimate of SC-GHG for the No Action Alternative.

## **3.3 Biological Resources**

### **3.3.1 Affected Environment**

The proposed project location is within existing well pads on BLM federal mineral leases CAS0019275A & CAS0019275C located on private surface lands that occurs within an area identified as “Green Zone” or wildlife corridor in the Bakersfield RMP and the 1998 *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS, 1998). A key component of the reserve and corridor linkage strategy is to maintain suitable amounts of habitat that are largely undisturbed by development activities. Habitat disturbance thresholds are criteria for maintaining long-term suitability of reserve areas (red zones) and habitat corridors (green zones). Reserve areas are managed with a 10% disturbance limit and habitat corridors are managed with a 25% disturbance limit. Limiting the amount of habitat (and ground) disturbance will allow sufficient habitat to remain intact, keep ecosystem processes functioning properly, and connect viable species populations across the landscape (see Bakersfield Proposed RMP/Final EIS, Appendix B, pp. 771-775).

This project occurs within the boundaries of the Kettleman Hills ACEC, which includes 6,726 acres of public land and 6,969 acres of federal mineral estate. The Kettleman Hills ACEC has a management goal to “provide suitable habitat for federal and state listed species and protection for natural systems and processes” (BLM, 2014; pg 131).

Federally listed plant species with potential to occur within the southern San Joaquin Valley area include Kern mallow (*Eremalche kernensis*), San Joaquin woolly-threads (*Monolopia congdonii*), California jewelflower (*Caulanthus californicus*), and Bakersfield cactus (*Opuntia basilaris* var.

*treleasei*). California jewelflower is not known to naturally exist in Kings County, and Bakersfield cactus is endemic to a limited area of central Kern County in the vicinity of the city of Bakersfield. Federally listed animal species include San Joaquin kit fox (*Vulpes macrotis*), blunt-nosed leopard lizard (*Gambelia sila*), giant kangaroo rat (*Dipodomys ingens*), and Tipton kangaroo rat (*Dipodomys nitratooides*). Additionally, this region contains the State listed San Joaquin antelope squirrel (*Ammospermophilus nelsoni*). There is no designated critical habitat for any threatened or endangered species on the project site or in the vicinity.

A field survey to identify the potential for the occurrence of these listed species in the general project area was conducted by Lisa Ashley (Booher Consulting, LLC) on July 6<sup>th</sup>, 2023.

The proposed project location is located within non-native annual grassland and valley saltbush scrub habitat that is moderately developed with oilfield infrastructure. Plant species observed on site include alkali saltbush (*Atriplex polycarpa*), red brome (*Bromus madritensis* ssp. *rubens*), fiddleneck (*Amsinckia menziesii*), totalote (*Centaurea melitensis*), white bursage (*Ambrosia dumosa*), tamarisk (*Tamarix* sp.) and annual sunflower (*Helianthus annuus*). Kern mallow, San Joaquin woolly-threads, California jewelflower, and Bakersfield cactus were not observed in or near the project area.

The biological surveys found no evidence of giant kangaroo rat (*Dipodomys ingens*) or Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*) in the vicinity of the project sites, nor were there any observations of San Joaquin antelope squirrel (*Ammospermophilus nelsoni*) or San Joaquin kit fox (*Vulpes macrotis*). There are no CNDBB records of giant kangaroo rat, Tipton kangaroo rat, nor San Joaquin antelope squirrel within the footprint or surrounding areas of the project. CNDBB records indicate a presumed extant population of San Joaquin kit fox within and surrounding the project area; the site date is June 10, 1981. No species-specific protocol surveys for blunt-nosed leopard lizard (*Gambelia sila*) were carried out for the current year. Protocol level surveys were conducted in 2008-2012 and 2014 throughout portions of the Kettleman Hills. No blunt-nosed leopard lizards were observed during any of the protocol level surveys. In addition, there are no CNDBB records of blunt-nosed leopard lizard within the project footprint or surrounding areas. Based on the field survey, there are no burrows suitable for use by blunt-nosed leopard lizard within the proposed project site.

### **3.3.2 Environmental Impacts**

#### **Proposed Action:**

Through clearing of vegetation, scraping, and grading of the existing well pads, project implementation would not disturb federally listed species potential habitat, as this habitat is absent from the project site and surrounding area. Based on field surveys, federally listed plant and animal species and their sign (scat, tracks, etc.) are absent from the project footprint and a 250-foot area around the project, therefore direct impacts, such as vehicle collisions, entrapment in open trenches or sumps, and ingestion of oil field fluids, would not be expected.

Considering the absence of species presence and potential habitat, the BLM concluded the project is not likely to adversely affect listed species. Consultation was completed on a programmatic basis for oil and gas development in the southern San Joaquin Valley in 2017 (2017 Oil and Gas Programmatic Biological Opinion 08ESMF00-2016-F-0683, “2017 BO”). The 2017 BO conservation program includes detailed monitoring, reporting, and survey requirements as well as

additional measures to avoid and minimize impacts to listed species. Applicable measures, based on habitat and species potential, are included in the proposed project description as Design Features. Implementation of these measures would reduce the potential for impacts.

For non-listed species, the same mechanisms of potential direct and indirect impact discussed in the 2017 BO would apply. Adherence to the provisions of the Design Features and the 2017 BO project specific authorization would result in similar protections for non-listed species.

**No Action:**

There would be no additional impacts to biological resources from the No Action Alternative. However, the rejection of the APDs would not alter the trajectory of listed species populations relative to APDs approval because the amount of disturbance is inconsequential on a regional scale. Also, under the No Action alternative, there would be no long-term off-site conservation of listed species habitat, and the impacts to habitat may only be postponed until the next APD is approved for the development of the mineral lease.

### **3.4 Paleontological Resources**

#### **3.4.1 Affected Environment**

Every geologic unit can be assigned a Potential Fossil Yield Classification (PFYC) class based on the probability and abundance of known vertebrate fossils and scientifically significant invertebrate and plant fossils (BLM 2007). The PFYC scheme ranges from very low (PFYC 1) to very high (PFYC 5) depending on the potential fossil yield (BLM 2016). Unknown fossil potential is assigned to geologic units that do not have a clear PFYC assignment (PFYC U). Typically, paleontological resource compliance is required or recommended for earthwork occurring within PFYC classes 3, 4, 5, or U rock units.

The project area is underlain by Etchegoin formation deposits (PFYC 4). Following the PFYC System of the BLM, a PFYC ranking of High (PFYC Class 4) is applied to deposits with Etchegoin formation in the study area. Furthermore, the project is located in the Kettleman Hills ACEC which has a management objective to “protect significant paleontological resources” (BLM, 2014; pg 131).

#### **3.4.2 Environmental Impacts**

**Proposed Action:**

The proposed well locations would occur on BLM lands containing BLM administered mineral estate. Federal paleontological compliance requirements for projects conducted under the Mineral Leasing Act are subject to the discretion of the surface landowner. As per BLM guidelines, for projects within PFYC 3 or above locations, a Paleontological Resource Mitigation Plan is to be followed. Mitigating for adverse effects to paleontological resources is a management practice that preserves resources and accommodates development. This mitigation is required for all project activities on BLM surface or private lands for which federal paleontological compliance requirements have not been waived. A Paleontological Mitigation Plan has been attached to the COAs and will be followed. Due to the mitigation measures proposed, the project will have no effect on paleontological resources.

**No Action:**

There would be no direct impacts to paleontological resources under the no action alternative. Any fossils would stay in place, and there would be no ground disturbance in the area. As a result, there would be no opportunity to study depositional environments or collect fossils where there are no natural exposures. Buried fossils do not provide opportunity for scientific investigation.

### **3.5 Soil Resources**

#### **3.5.1 Affected Environment**

One soil map unit occurs in the proposed project area: Kettleman-Cantua complex, 30 to 50 percent slopes (#129). This map unit is present on hills. The typical profile of these soils are loam from 0-39 inches and weathered bedrock below.

The above map unit has a water erosion K factor of 0.37. Values of K can range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Therefore, these soils have a moderate susceptibility to water erosion.

Kettleman-Cantua complex map unit is assigned to wind erodibility group 6. A wind erodibility group consists of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The wind erodibility group provides an indication of how susceptible areas disturbed by construction activities are to wind erosion. Soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. Therefore, there is a relatively low potential for wind erosion on the proposed project locations if soils are previously undisturbed.

The project location is within a previously developed oilfield lease with numerous access roads, wells, and facilities such as heater-treaters, pipelines, and power lines. Many of these soils are compacted from vehicle and heavy equipment use, and naturally occurring vegetative cover has been removed. As such, previously disturbed soils within the project area are particularly prone to erosion from water and wind.

The 2014 Bakersfield Resource Management Plan includes the following decision in relation to soil resources:

**[SR-D-1]** Design BLM programs and management activities and authorize projects to minimize impacts on soil productivity by implementing BMPs (Appendix 3). Specifically minimize disturbance of the following soils types:

- a) Serpentine Soils.
- b) Soils supporting Crusts” – hosting communities of cyanobacteria, mosses, lichens, and liverworts.
- c) Soils highly receptive to erosion or compaction; and
- d) Soils Hosting high levels of Valley Fever spores.

None of the above soil types occur in the proposed project area and therefore will not be impacted.

### **3.5.2 Environmental Impacts**

#### **Proposed Action:**

Soil disturbance would occur as a result of re-clearing and re-grading the existing well pads and existing access roads, staging site construction, and drilling operations. Topsoil and soil horizons would be removed and/or mixed, changing soil-water dynamics and removing nutrients from the project site. In addition, soils would be compacted, which could lead to surface water runoff, sediment carry, and water erosion concerns. Potential for water erosion is moderate to low, while there is a relatively low potential for erosion from wind at the project site. However, Innex would minimize and mitigate these impacts by conducting interim reclamation utilizing site-specific topsoil on the temporary staging areas, cut and fill slopes, and the sump subsequent to drilling operations, including all practicable measures to minimize erosion and stabilize disturbed soils. Also, Innex would conduct final reclamation at the project site when the wells are abandoned. In addition, Innex would comply with all relevant federal, and applicable state, and local air quality rules and regulations to reduce emissions of particulate matter originating from soil disturbance at the project site.

Innex is required to comply with all relevant federal, and applicable state, and local laws and regulations, including provisions of EPA regulation 40 CFR 112, Oil Pollution Prevention, and BLM California IM CA-92-124, Oil and Gas Guidelines for Undesirable Events (NTL-3A). Nonetheless, the potential remains for hydrocarbon and chemical leaks or spills to occur on the project site and contaminate soils during project implementation. Given the required regulatory compliance framework, the likelihood of these spills is low and the impacts to soils from spills would not be significant.

#### **No Action:**

There would be no additional impacts beyond existing activities to soil from the No Action alternative because the project would not occur.

### **3.6 Water Quality and Quantity**

#### **3.6.1 Affected Environment**

The proposed project is within the Tulare Lake Hydrologic Region in the San Joaquin Basin. The Kettleman Hills are bound on the east side by the Tulare Lake sub-basin and the west side by the Pleasant Valley sub-basin. Groundwater aquifers are contained in the Etchegoin, Temblor, Kreyenhagen, and McAdams formations in the Kettleman North Dome Oilfield, which have been treated as exempt aquifers because they: (1) do not currently serve as a source of drinking water, (2) will not in the future serve as a source of drinking water because they are hydrocarbon producing, (3) are so contaminated that it would be both economically and technologically impractical to render the water fit for human consumption, and (4) the total dissolved solids content of the groundwater is greater than 1,000 milligrams per liter and not reasonably expected to supply a public water system.

As stated in the Proposed Action, approximately 2,500 barrels of fresh water would be used for drilling; all water would be obtained from a local private owner located in Section 22, T23S, R19E, MDBM and trucked to the project location. Fresh water would be applied to the surface for dust abatement and used during the drilling phase for intermediate/production casing and surface casing.

Produced water would be processed by an existing facility operated by Innex in Section 29, T23S R29E and would be reinjected back into the Temblor and Vaqueros formations within the Kettleman North Dome Oilfield, subject to the Underground Injection Control permit received by California Geologic Energy Management Division (CalGEM).

### **3.6.2 Environmental Impacts**

#### **Proposed Action:**

Each well would require approximately 2,500 barrels of fresh water for drilling, dust control and pad construction; all water would be obtained from a local private owner located in Section 22, T23S, R19E, MDBM. The average amount of water expected to be produced during the operational phase of each well is 1,200 barrels of water per day. The produced fluids (oil and water) would be transported to the North Unit treatment facility in Section 4, T27S, R28E MDBM for processing. Following processing, the water would be sent to either the Pyramid Hill waterflood injection project or wastewater disposal wells Glide WD 464, Glide WD 473, and Glide WD 453. The water disposal project and the disposal wells are covered under an Underground Injection Permit issued by the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (CDOGGR), now named California Geologic Energy Management Division (CalGEM).

The Design Features of the Proposed Action would avoid direct and indirect impacts to underground sources of drinking water and surface waters. Although there is a groundwater aquifer that is not exempt from the waiver system set for by the Regional Water Quality Control Board, engineering controls such as casing and cementing would isolate any sources of groundwater during drilling operations. Surface waters are not expected to be directly or indirectly impacted because Berry would avoid modification to the adjacent drainage. Also, Berry would implement all applicable Design Features to avoid erosion, sediment carry, and other impacts to the adjacent drainage. In addition, water used and produced during the project would be recycled and/or reinjected back into the groundwater aquifer under an Underground Injection Permit issued by CalGEM.

#### **No Action:**

There would be no additional impacts to water quality and quantity from the No Action alternative because the project would not occur.

## **3.7 Environmental Justice**

### **3.7.1 Affected Environment**

The EPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. (<https://www.epa.gov/environmentaljustice/learn-about-environmental-justice>) Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each Federal agency to “identify and address . . . disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.” This includes Tribes. To comply, federal agencies must pay particular attention to potential impacts of agency decisions on minority and low-income populations.

The project is located within the San Joaquin Valley Air Basin (SJVAB). The SJVAB contains the following counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and the western portion of Kern (<https://ww2.valleyair.org/about/>). According to a report created by the BLM's Headwaters Economics tool (<https://headwaterseconomics.org/tools/blm-profiles/>), approximately 4,182,406 residents reside within the SJVAB (including Kings County), 69.3% of which are considered minority and 40% of which qualify as low-income. The minority and low-income populations in the SJVAB are higher than those within the State of California (64.2% and 28.5%, respectively). The SJVAB relies more heavily on the mining industry (including fossil fuels) for employment (0.47% of jobs) than the rest of California (0.14% of jobs). The mining industry in the SJVAB has the highest average annual salary when compared to other industries in the area. The Headwaters Economics report is included as Appendix 2.

### **3.7.2 Environmental Impacts**

#### **Proposed Project:**

As discussed previously, the project would have a direct impact on air quality in the SJVAB and would contribute to climate change. The direct impact on air quality could potentially result in health impacts to residents of the SJVAB. However, as discussed in Section 3.1.2, air impacts would be de minimis and, therefore, health impacts would be expected to be insignificant. Similarly, impacts to climate change would affect environmental justice populations due to the disproportionate impact climate change has on these communities (Beberian, et al., 2022).

The project would create new jobs. These additional jobs would primarily be filled from within the local community. The project would also create additional tax revenue for Kings County. By creating jobs and additional tax revenue, the project would have a positive impact on the local economy.

#### **No Action:**

The No Action Alternative would not create jobs or otherwise contribute to the local economy.

## Chapter 4. Cumulative Impacts

A cumulative impact, as defined in 40 CFR 1508.7, is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of which agency (federal or non-federal) or person undertakes such other action. The following section provides details of the cumulative impacts analysis conducted on the project for impacted resources.

### 4.1 Methodology

#### *Spatial and Temporal Bounds*

In order to determine the cumulative impact of an alternative on impacted resources, spatial and temporal bounds were defined for each resource. The spatial bounds consist of the geographic area which will be directly and/or indirectly impacted by the action, referred to as the resource study area (RSA). When possible and logical, natural boundaries are preferred for the RSA. Temporal bounds include the timeframe in which past, present, and reasonably foreseeable future actions must be identified and analyzed. The outer limit of the spatial and temporal bounds was defined as the place where effects of the project are no longer meaningful on their own.

#### *Past, Present, and Reasonably Foreseeable Future Actions*

Once spatial and temporal bounds were defined, past, present and reasonably foreseeable future actions that will take place within the RSA during the relevant temporal boundary were identified.

#### *Thresholds*

Next, thresholds for which to compare the combined effects of the action with past, present, and reasonably foreseeable future actions were identified. A threshold is a legal, administrative, or technical threshold which provides context for the relative significance of an impact when combined with other past, present, and reasonably foreseeable future impacts. A quantitative analysis is provided where possible; where quantification is infeasible, qualitative effects are described.

### 4.2 Cumulative Impacts Analysis

As discussed previously, cumulative impacts result from the incremental impact of the action when added to past, present, and reasonably foreseeable future actions. Therefore, only resources on which an incremental impact is expected are analyzed for cumulative impacts.

#### **Proposed Action:**

The following table summarizes the determination of the need for cumulative impacts analysis for each resource which was analyzed in detail in this assessment.

**Table 4.1** Summary of Impacts Expected to Result from Proposed Action

<b>Resource</b>	<b>Direct/Indirect Impacts</b>	<b>Analysis Required?</b>
<b>Air Quality</b>	Minor increase in NAAQS emissions.	Yes
<b>Climate Change</b>	Minor increase in greenhouse gases.	Yes
<b>Biological Resources</b>	No habitat disturbance.	No

<b>Resource</b>	<b>Direct/Indirect Impacts</b>	<b>Analysis Required?</b>
<b>Paleontological Resources</b>	Potential inadvertent discovery of paleontological materials not expected to cause impacts based on mitigation measures.	No
<b>Soil Resources</b>	Minimization, mitigation, and reclamation efforts eliminate impacts.	No
<b>Water Quality/Quantity</b>	Water quality/quantity not expected to be impacted based on Design Features.	No
<b>Environmental Justice</b>	Minor air quality and climate change impacts.	Yes

Since the project was determined to have no impact on biological resources, paleontological resources, soil resources, and water quality/quantity, no cumulative impact analysis was required for these resources. The remaining resources on which the project would have incremental impacts were included in the following analysis.

#### **No Action Alternative:**

Since the No Action Alternative would have no incremental contribution to past, present, and reasonably foreseeable future actions, no cumulative impact analysis is required.

#### **4.2.1 Air Quality**

This analysis considers the incremental effect of four additional oil wells in the Kettleman Dome oil field. The RSA for the proposed action (where the effects of the action will be felt) includes the SJVAPCD. As described above, the greatest air quality impacts related to oil production come from use of fuels made from the produced crude oil. These emissions are analyzed in this EA as midstream and end-use emissions. According to the CEC, about three quarters of oil used in California is imported into the State and therefore about three quarters of midstream and end-use emissions in California come from processing and use of imported oil. Of the remaining quarter, one-fifth comes from non-BLM lands. This means that the emissions and impacts from 80% of the crude oil processed and used in California are not related to the proposed action.

The remaining 20% of the crude oil used in California is produced from BLM Public Land. This production is governed by actions of local, state, and Federal agencies including the BLM. As discussed under the Federal Conformity heading in Chapter 4 above, BLM actions can only affect emissions from oil and gas development and production. Midstream (transportation, storage, processing) and end-use emissions are outside of BLM jurisdiction and practical control. Therefore, SJVAPCD Oil & Gas Production emissions estimated by the EPA in the NEI can represent the current cumulative air emissions, air quality, and climate impacts of past actions regarding oil and gas production. Table 4.1 presents maximum annual pollutant of concern emissions related to the proposed action in context with SJVAPCD emissions from oil & gas production and total SJVAPCD emission. For further context, see a breakdown of relative emissions and impacts from major emission source categories in the SJVAPCD presented in Table 3.2 above. Table 3.2 shows that oil and gas production make up only a small fraction of total criteria emissions in the SJVAPCD, less than 1%. Table 4.1 below shows that oil and gas production also cause less than 0.1% of the pollutants of concern that contribute to the SJVAPCD non-attainment status and health concerns.

**Table 4.2** Cumulative Analysis: Project-related Pollutant of Concern Emission Rates as Percentage of Past and Present Development

Activity	Totals	PM <sub>10</sub>	PM <sub>2.5</sub>	VOC	NO <sub>x</sub>	HAPs
	tons per year	tons per year	tons per year	tons per year	tons per year	tons per year
<b>Project Maximum</b>	<b>155</b>	13	5	84	46	8
<b>SJVAPCD Oil &amp; Gas Production Emissions 2020</b>	<b>4,593</b>	39	36	3,660	797	62
Project Maximum as percent	3.384%					
<b>SJVAPCD Total 2020</b>	<b>894,949</b>	187,145	125,056	365,612	86,815	130,320
SJVAPCD Oil & Gas Production 2020 as percent	0.513%					
Project Max as percent	0.017%					
<b>State of California Total 2020</b>	<b>6,166,492</b>	867,341	667,424	3,620,907	477,283	533,537
Project Max as percent	0.003%					

Source: Oil & Gas Production Emissions and Total annual pollutant emissions for the SJVAPCD, and State of California Total Emissions reported by EPA in the 2020 National Emission Inventory (<https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>)

Table 4.1 shows that past agency actions, including the many regulations and other actions taken by CARB and SJVAPCD to limit emissions and protect air quality, have kept air pollution and air quality impacts related to oil and gas production relatively low.

Table 4.1 also shows that the proposed action will increase total emissions of nonattainment pollutants or precursors in the SJVAPCD. However, as described above in the discussion of AQI, the increase is very small compared to ongoing emissions from other sources and would not be expected to degrade current air quality in any substantial or even discernable way. A similar analysis applies to HAP emissions. SJVAPCD residents are exposed to a substantial rate of ongoing HAP emissions and related health risks. The proposed wells would increase those emissions; however, as described above, the increase is too small to cause a discernable change to existing health risks.

BLM California analyzed a total of ten well APDs prior to this analysis since the beginning of Fiscal Year 2023. No other wells have been approved in Fiscal Year 2024. This cumulative increase would not be expected to have discernable effects relative to ongoing emissions from other source categories indicated by the 2020 results presented in Table 3.1. See Section 3.1.1 for more discussion of this point.

BLM reviewed data available from the CalGEM Well Finder website (<https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx>) to assess the future pollutant emission trends from the proposed wells. Individual records of a representative sample of wells in the vicinity of the proposed wells show that oil production declines rapidly beginning within weeks of when a new well comes online in the Kettleman Dome oil field and continues to decrease throughout its production life. This pattern of production decline, depicted in Figure 3.1 for GHG emissions, is typical for all emissions related to oil and gas wells. Most of the emissions related the proposed wells, including all the midstream and end use emissions, are directly related to production volumes and so future criteria and HAP emission rates related to the proposed wells

are expected to be lower than the rates analyzed in this EA. Therefore, future environmental and health risks related to these wells are expected to decrease from the levels described in this analysis.

Cumulative oil and gas emissions and related health risks in the air district are similarly related to the total number and age of wells. Both BLM and CalGEM ([https://www.bakersfield.com/news/state-takes-credit-for-issuing-23-fewer-oil-drilling-permits/article\\_b81a116c-5f36-11eb-a28c-937444d34f20.html](https://www.bakersfield.com/news/state-takes-credit-for-issuing-23-fewer-oil-drilling-permits/article_b81a116c-5f36-11eb-a28c-937444d34f20.html)) records show decreased rates of new drilling and increased rates of well abandonment in recent years. If this trend continues, future total oil and gas production industry criteria, GHG and HAP/TAC emissions would be expected to decline. Current California policy calls for significant reductions in fossil fuel use. Laws, regulation and other government actions have been taken to promote use of electric vehicles and to otherwise reduce the demand for petroleum. To the extent that these policies and actions can be effectively implemented, demand for petroleum products and drilling of new oil wells would be expected to decline and future cumulative air quality impacts, air toxics (HAP and TAC) health risks, and climate impacts related to fossil fuels will likely be reduced.

#### **4.2.2 Climate Change**

The analysis of GHGs contained in this EA includes estimated emissions from the lease as described above. Climate change is a global phenomenon with impacts related to the average concentration of GHGs in the atmosphere. Therefore, the area of analysis for the proposed action (where the effects of the proposed action will be felt) includes the entire United States of America. An assessment of GHG emissions from other BLM fossil fuel authorizations, including coal leasing and oil and gas leasing and development, is included in the BLM Specialist Report on Annual GHG Emissions (referred to as Annual Report, see Chapter 7). The Annual Report includes estimates of reasonably foreseeable GHG emissions related to BLM lease sales anticipated during the fiscal year, as well as the best estimate of emissions from ongoing production, and development of parcels sold in previous lease sales. It is, therefore, an estimate of cumulative GHG emissions from the BLM fossil fuel leasing program based on actual production and statistical trends.

The Annual Report provides an estimate of short-term and long-term GHG emissions from activities across the BLM's oil and gas program. The short-term methodology presented in the Annual Report includes a trends analysis of (1) leased federal lands that are held-by-production, (2) approved applications for permit to drill (APDs), and (3) leased lands from competitive lease sales occurring over the next annual reporting cycle (12 months), to provide a 30-year projection of potential emissions from Federal oil and gas lease actions over the next 12 months. The long-term methodology uses oil and gas production forecasts from the Energy Information Administration (EIA) to estimate GHG emissions out to 2050 that could occur from past, present, and future development of Federal fluid oil and gas. For both methodologies, the emissions are calculated using life-cycle-assessment emissions and data factors. These analyses are the basis for projecting GHG emissions from lease parcels that are likely to go into production during the analysis period of the Annual Report and represent both a hard look at GHG emissions from oil and gas leasing and the best available estimate of reasonably foreseeable cumulative emissions related to any one lease sale or set of quarterly lease sales.

Table 5 shows the aggregate GHG emissions estimate that would occur from Federal leases, existing and foreseeable, between the years 2022 and 2050, using the methodology described

above. The 5-year lease averages include all types of oil and gas leases, including leases granted under the Mineral Leasing Act as well as other authorities, that have been issued over the last five years. As such the projections made from the 5-year averages represent the potential for all types of future oil and gas development activity, and although not at exact acreages, include emissions that would be associated with the subject lease. However, they may also over-estimate the potential emissions from the 12-month cycle of competitive oil and gas leasing activities if the projected lease sale or development activity does not actually occur or is less than estimated.

**Table 4.2. Reasonably Foreseeable Projected Emissions from Federal Lease Development**

State (BLM Administrative Unit)	GHG Emissions from Past, Present, and Foreseeable Federal Lease Development (Mt CO <sub>2</sub> e per year)*
Alabama (ES)	9.34
Alaska	136.9
Arkansas (ES)	9.34
California	51.49
Colorado	243.1
Idaho	0.17
Illinois	0.31
Kansas (ES)	3.32
Kentucky (ES)	0.19
Louisiana (ES)	43.29
Michigan (ES)	1.95
Mississippi (ES)	2.89
Montana	58.82
Nebraska (WY)	0.21
Nevada	2.74
New Mexico	1,939.52
New York	0.01
North Dakota (MT)	379.63
Ohio (ES)	0.37
Oklahoma (NM)	20.43
Pennsylvania	0.46
South Dakota (MT)	2.31
Texas (NM)	49.55
Utah	187.84
Virginia	0.15
West Virginia (ES)	0.45
Wyoming	1,487.65
<b>Total</b>	<b>4,614.81</b>

\*Emissions obtained from 2021 Annual Report, Figure 5-1

The most recent short-term energy outlook (STEO) published by the EIA (<https://www.eia.gov/outlooks/steo/>) (EIA, 2023) predicts that the world’s oil and gas supply and consumption will increase over the next 18-24 months. The latest STEO projections are useful for providing context for the No Action discussion as the global forecast models used for the STEO are not dependent on whether the BLM issues onshore leases but are based on foreseeable short-term global supply and demand and include oil and gas development /operations on existing U.S. onshore leases. The most recent STEO includes the following projections for the next two years:

- U.S. liquid fuels consumption is projected to increase to 20.45 million barrels per day (b/d) in 2023 up from 20.28 million b/d in 2022 and further increase to 20.76 million b/d in 2024.
- U.S. crude oil production is expected to average 11.9 million b/d in 2022 and to rise to 12.4 million b/d in 2023 and 12.63 b/d in 2024.
- U.S. natural gas consumption is expected to average 86.4 Bcf/d in 2023, decreasing from 88.5 Bcf/d in 2022.
- U.S. LNG exports are expected to increase from 10.59 billion cubic feet/day (Bcf/d) in 2022 to 12.07 Bcf/d in 2023 and 12.73 Bcf/d in 2024.
- U.S. Coal production is expected to total 552 million short tons (MMst) in 2023 and 502.6 MMst in 2024 and decrease to 17% of total U.S. electricity generation in 2023 compared to 20% in 2022 driven by on-going retirement of coal-fired generating plants.
- Generation from renewable sources will make up an increasing share of total U.S. electricity generation, rising from 22% in 2022 to 24% in 2023 and 26% in 2024.

Recent events, both domestically and internationally, have resulted in abrupt changes to the global oil and gas supply. EIA studies and recent U.S. analyses (associated with weather impacts, etc.) regarding short-term domestic supply disruptions and shortages or sudden increases in demand demonstrate that reducing domestic supply (in the near-term under the current supply and demand scenario) will likely lead to the import of more oil and natural gas from other countries, including countries with lower environmental and emission control standards than the United States (EIA, 2021). Recent global supply disruptions have also led to multiple releases from the U.S. Strategic Petroleum Reserve in order to meet consumer demand and curb price surges.

The EIA 2023 Annual Energy Outlook (<https://www.eia.gov/outlooks/aeo/>) projects energy consumption increases through 2050 as population and economic growth outweighs efficiency gains. As a result, U.S. production of natural gas and petroleum and liquids will rise amid growing demand for exports and industrial uses. U.S. natural gas production increases by 15% from 2022 to 2050. However, renewable energy will be the fastest-growing U.S. energy source through 2050 as electricity generation shifts to using more renewable sources, domestic natural gas consumption for electricity generation is expected to decrease by 2050 relative to 2022. As a result, energy-related CO<sub>2</sub> emissions are expected to fall 25% to 38% below 2005 level, depending on economic growth factors. Further discussion of past, present and projected global and state GHG emissions can be found in Chapter 6 of the Annual Report.

Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad" (January 27, 2021), directs the executive branch to establish policies or rules that put the United States on a path to achieve carbon neutrality, economywide, by no later than 2050. This goal is consistent with IPCC's recommendation to reduce net annual global CO emissions between 2020 and 2030 in order to reach carbon neutrality by mid-century. Federal agencies are still in the process of developing policies that align with a goal of carbon neutrality by 2050. In the short-term, the order has a stated goal of reducing economy wide GHG emissions by 50 to 52% relative to 2005 emissions levels no later than 2030.

Carbon budgets are an estimate of the amount of additional GHGs that could be emitted into the atmosphere over time to reach carbon neutrality while still limiting global temperatures to no more than 1.5°C or 2°C above preindustrial levels. The IPCC Special Report on Global Warming of

1.5°C is the most widely accepted authority on the development of a carbon budget to meet the goals of the Paris Agreement. None of the global carbon budgets or pledges that countries have committed to stay within as part of the Paris Agreement are binding. Carbon budgets were originally envisioned as being a convenient tool to simplify communication of a complex issue and to assist policymakers considering options for reducing GHG emissions on a national and global scale. Carbon budgets have not yet been established on a national or subnational scale, primarily due to the lack of consensus on how to allocate the global budget to each nation, and as such the global budgets that limit warming to 1.5 °C or 2.0 °C are not useful for BLM decision making, particularly at the lease sale stage, as it is unclear what portion of the budget applies to emissions occurring in the United States.

However, stakeholders and members of the public have requested that the BLM consider comparing its predicted emissions in the context of global carbon budgets. Table 7-4 in the 2021 BLM Specialist Report provides an estimate of the potential emissions associated with BLMs fossil fuel authorizations in relation to IPCC carbon budgets. Total Federal fossil fuel authorizations including coal, natural gas and oil represents approximately 1.75 % of a suggested global carbon budget of 400-500 GtCO<sub>2</sub> needed to limit global warming to 1.5 C.

While continued fossil fuel authorizations will occur over the next decade to support energy demand and remain in compliance with the leasing mandates in the Inflation Reduction Act (IRA) passed in 2022, the U.S. Energy Information Administration International Energy Outlook expects renewable energy consumption to double between 2020 and 2050 and nearly equal liquid fuels consumption by 2050. The U.S. has committed to the expansion of renewable energy through infrastructure investments in clean energy transmission and grid upgrades include in the Bipartisan Infrastructure Investment and Jobs Act as well as clean energy investments and incentives included in the Inflation Reduction Act. The Department of Energy's Office of Policy developed a preliminary assessment that finds the IRA and BIL, in combination with past actions, are projected to reduce 2030 economy wide GHG emissions to 40% below 2005 level, even with continued oil and gas leasing in the near term. ([https://www.energy.gov/sites/default/files/202208/8.18%20InflationReductionAct\\_Factsheet\\_Final.pdf](https://www.energy.gov/sites/default/files/202208/8.18%20InflationReductionAct_Factsheet_Final.pdf))

### ***Greenhouse Gas Mitigation Strategies***

GHG emissions contribute to changes in atmospheric radiative forcing resulting in climate change impacts. GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's surface and act as a positive radiative forcing component. The buildup of these gases has contributed to the current changing state of the climate equilibrium towards warming. Chapters 8 and 9 of the Annual Report provides a detailed discussion of climate change science, trends, and impacts. The relationship between GHG emissions and climate impacts is complex, but a project's potential to contribute to climate change is reduced as its net emissions are reduced. When net emissions approach zero, the project has little or no contribution to climate change. Net-zero emissions can be achieved through a combination of controlling and offsetting emissions. Emission controls (e.g., vapor recovery devices, no-bleed pneumatics, leak detection and repair, etc.) can substantially limit the amount of GHGs emitted to the atmosphere, while offsets (e.g., sequestration, low carbon energy substitution, plugging abandoned or uneconomical wells, etc.) can remove GHGs from the atmosphere or reduce emissions in other areas. Chapter 10 of the Annual Report provides a more detailed discussion of GHG mitigation strategies.

Several Federal agencies work in concert to implement climate change strategies and meet U.S. emissions reduction goals all while supporting U.S. oil and gas development and operations. The EPA is the Federal agency charged with regulation of air pollutants and establishing standards for protection of human health and the environment. The EPA has issued regulations that will reduce GHG emissions from any development related to the proposed leasing action. These regulations include the New Source Performance Standard for Crude Oil and Natural Gas Facilities (49 CFR 60, subpart OOOOa) which imposes emission limits, equipment design standards, and monitoring requirements on oil and gas facilities. A detailed discussion of existing regulations and Executive Orders that apply to BLM management of federal lands as well as current Federal and state regulations that apply to oil and gas development and production can be found above and in Chapter 2 of the Annual Report.

### **4.2.3 Environmental Justice**

Since the impacts to environmental justice populations are dependent on impacts to air quality and climate change, cumulative impacts to environmental justice populations are the same as those to air quality and climate change.

## **Chapter 5. Consultation and Public Involvement**

### ***Biological Consultation***

Formal consultation with the U.S. Fish and Wildlife Service was initiated in 2016. The Fish and Wildlife Service issued a “No jeopardy” biological opinion on December 22, 2017 (Programmatic Biological Opinion on Oil and Gas Activities on Bureau of Land Management Lands in the San Joaquin Valley, 08ESMF00-2016-F-0683).

### ***Persons, groups, and agencies consulted***

Jennifer Nastor, Acting - Assistant Field Manager for Minerals  
Jere Jay, CEO of Innex California Incorporated.

### ***Summary of Public Participation***

The BLM posted notification that it was considering these NOSs/APD's on the E-Planning public website on April 18<sup>th</sup>, 2022. This notice initiated the 30-day scoping period. The BLM also posted copies of the Application for Permit to Drill (APD) in the front lobby of the Bakersfield Field Office for that 30-day period. Comments from the Center of Biological Diversity and Earth Justice were received. Comments have been addressed in this EA.

### ***Recipients of Native American Notification Letters (TNL#23-17)***

Tule River Indian Tribe  
Tejon Indian Tribe  
Santa Rosa Rancheria Tachi Yokut Tribe

### ***List of Preparers***

Zachary Day, Archaeologist, Cultural and Paleontological Resources  
Fernando Baños, Natural Resource Specialist  
Matthew Thomas, Natural Resource Specialist  
Frank Giles, Air Resource Specialist  
Rebecca Daniels, Planning & Environmental Coordinator

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### Clean Water Act

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### Resource Conservation and Recovery Act

40 CFR § 30.16

### Safe Drinking Water Act

§300f et seq. (1974) The Safe Drinking Water Act (SDWA) was established to protect the quality of drinking water in the U.S. This law focuses on all waters actually or potentially designed for drinking use, whether from above ground or underground sources.

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## Appendix 1. Design Features

The following design features are part of the proposed action:

Innex shall comply with all relevant federal, and applicable tribal, state, and local laws during project implementation.

### Biological Resources

Innex shall comply with all of the “Avoidance & Mitigation Actions” recommended by consulting biologists Lisa Ashley (Booher Consulting, LLC) in her July 6, 2023, Sensitive Species Review Form:

1. An Environmental Awareness Program will be conducted to orient all employees involved in Project activities in the field. The program will consist of a brief presentation in which biologists knowledgeable of endangered species biology and legislative protection will explain endangered species concerns. The program will also include a discussion of special-status plants and sensitive wildlife species. Species biology, habitat needs, status under Endangered Species Act(s), and biological mitigation and avoidance measures will be discussed.
2. Work area boundaries will be delineated with flagging, temporary fencing, or other markers to minimize surface disturbance associated with vehicle straying.
3. All Project activities will be confined to the approved Project sites, and within existing pre-disturbed areas (*i.e.*, existing access roads, well pads, etc.). No vehicle parking, off-road travel, or other Project activities will take place outside disturbed areas, or areas approved for Project use.
4. All excavated, steep-walled trenches will have exit ramps maintained at intervals no greater than 500 feet and at a slope no greater than 1:1. Trenches will be checked in the morning before beginning work and at the end of each day. Before trenches are filled, they will be thoroughly inspected for animals. If an animal does not exit the trench within a reasonable period, the BLM will be contacted for further guidance. All instances of a federally listed species discovered within a hole will be tallied and reported.
5. All construction pipes, culverts, or similar structures stored at the construction site overnight having a diameter of four (4) inches or greater will be inspected thoroughly for wildlife species before being buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight will be capped. If during construction a wildlife species is discovered inside a pipe, that section of pipe will not be moved or, if necessary, moved only once to remove it from the path of construction activity, until the wildlife species has escaped.
6. In order to minimize wildlife casualties, the daytime speed limit on unpaved roads not maintained by the county will be a maximum of 20 MPH.

7. All vehicle operators will check for wildlife under vehicles and equipment prior to operation. If any wildlife are observed, vehicles and equipment will not be moved until observed wildlife egresses.
8. All releases of potentially hazardous materials, including produced fluids, will be contained as close to the source site as possible. The released materials will be cleaned up immediately and disposed of properly. If a release of potentially hazardous materials, including produced fluids, occurs within federally listed species habitat, the monitoring biologist will be contacted immediately and will assist with clean up and containment. The Service and/or BLM will be notified of the release of potentially hazardous materials and the remedial action taken by the operator as soon as possible, but not later than 24 hours after the release occurs or is discovered. Within 48 hours of being notified of a release that may affect federally listed species, the BLM will issue additional clean-up provisions to the operator. Within 60 days of completing clean-up activities, a compliance report will be submitted by the monitoring biologist to the BLM.
9. All food-related trash items such as wrappers, cans, bottles or food scraps generated during project activities will be disposed of only in closed containers and regularly removed from the project site. Food items may attract wildlife species onto a project site, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife will be allowed.
10. To prevent harassment or mortality of wildlife species via predation, or destruction of their dens or nests, no domestic pets will be permitted on the lease.

#### Project Surveys and Monitoring

11. Pre-project surveys will be conducted by a monitoring biologist to determine if there has been any change since the reconnaissance level survey in the potential for Federally listed species occur, by identifying wildlife sign, important habitat features, and other indicators of habitat use. The pre-project surveys will occur no more than 14 days prior to the Project initiation start date. The pre-project survey area will consist of the area within the Project boundary, including access routes and approved cross-country travel routes, plus an additional appropriate survey area beyond the Project boundary. Pre-project surveys will include daytime line transect surveys which will be conducted by walking the survey area at approximately 30-to-90-foot intervals. Transect width will be adjusted based on factors such as vegetation height and topography.
12. Pre-construction nesting surveys will be conducted for migratory bird species in the existing well sites and buffer areas. If ground disturbing activities occur during the breeding season of most birds (February through mid- September), surveys for active nests will be conducted by a qualified biologist, no more than 10 days prior to the start of Project activities.
  - a. If no nests or nesting birds are found, Project activities may proceed, and no further mitigation measures will be required.

- b. If a migratory bird species is observed and suspected to be nesting, a 250-foot buffer area will be established to avoid impacts to the active nest. If active nest sites are found, a 500-foot exclusion buffer zone will be established. No Project activities will occur within these buffer zones until young birds have fledged.
13. A biological monitor will be present and onsite during all surface disturbing activities.

Species Specific Measures

14. Protective buffers shall be used to avoid any unauthorized incidental take of special-status species, and to minimize any incidental take, by separating the planned disturbance area from any locations where the qualified biologist has detected the presence of special-status species. Protective buffers shall be delineated using brightly colored stakes and/or flagging or similar materials and remain until construction activities are complete, at which time of completion the buffers must be removed. Protective buffers shall be established around active dens and/or burrows of special-status animal species, or populations of special-status plant species to avoid unauthorized take of protected species as listed in the table below. The protective buffer distance shall be increased if required to avoid unauthorized incidental take of any Protected Species as determined by a qualified biologist. Protective buffer distances and other avoidance measures that may be implemented to avoid impacts to Protected Species or Sensitive Species must be consistent with the U.S. Fish and Wildlife Service (USFWS) and/or the CDFW requirements and shall be implemented and overseen by the qualified biologist. Disturbance buffers for sensitive resources are listed below:

**Table 1-1: Disturbance Buffers for Sensitive Biological Resources**

<b>Sensitive Resource</b>	<b>Buffer Area</b>
Potential/Atypical San Joaquin kit fox dens	50 feet
Known San Joaquin kit fox den	100 feet
Natal San Joaquin kit fox den	Contact USFWS & CDFW
Rodent Burrows	50 feet
Burrowing owl burrow (breeding and non-breeding seasons)	CDFW Guidelines*
Listed bird species nest	0.5 mile
San Joaquin coachwhip, silvery legless lizard, coast horned lizard	30 feet
American badger (non-maternity dens)	50 feet
American badger (maternity dens)	200 feet
Special-status plants	50 feet

\*Setback distances for burrowing owl vary by time of year and level of Project impacts, ranging from 50 meters to 500 meters.

***Giant Kangaroo Rat, Tipton Kangaroo Rat, Short-Nosed Kangaroo Rat, and Tulare Grasshopper Mouse***

15. Maintain an exclusion zone around active burrows and precincts with a minimum of 50 feet. Actions within exclusion zones will be limited to essential vehicle and equipment operation on authorized roads and to foot traffic. Actions within exclusion zones will be confined to daylight hours unless, at the discretion of the Service/BLM, operations at other times of day would be beneficial to listed species. At the Service/BLM's discretion, the exclusion zone radius may be altered based on publication of new guidance, sensitivity of the site, proximity of existing disturbance, or other factors.

16. If project activities will take place within 50 feet of existing burrow and precinct entrances and in the judgment of the monitoring biologist, the combination of soil hardness and activity impact is not expected to collapse those burrows, then those project activities may take place under the supervision of the monitoring biologist.
  - a. Activities authorized by the monitoring biologist within 50 feet of burrow and/or precinct entrances will be documented and included in all reports, including the compliance report.
17. If the minimum exclusion zone cannot be maintained and the monitoring biologist believes activities will collapse burrows, then a trapping biologist may be required to implement a trap and release program at the Service/BLM's discretion. Project specific guidance on trapping, temporary holding, release location, and release method will be provided by the Service/BLM prior to the start of trapping.

***Blunt-Nosed Leopard Lizard (BNLL)***

18. All small mammal burrows that may serve as potential for special-status species will be flagged and avoided by Project activities. Burrows identified near work areas will be flagged for avoidance during final pre-construction surveys. Potential BNLL burrows measure 1.5 inches or more in at least one dimension and that cannot be confirmed as collapsed.
19. If project activities will take place within 50 feet of existing burrow entrances and in the judgment of the monitoring biologist, the combination of soil hardness and activity impact is not expected to collapse those burrows, then those project activities may take place under the supervision of the monitoring biologist and additional BNLL surveys will not be required.
  - a. Activities authorized by the monitoring biologist within 50 feet of burrow entrances will be documented and included in the post-activity compliance report.
20. Since BNLL are known or likely to occur, the following BNLL active season measures will be implemented when appropriate. This includes during construction and subsequent operations and maintenance (O&M) activities.
  - a. The monitoring biologist or field contact representative will notify BLM that active season measures are being implemented. Initial notification may be by phone message or email.
  - b. The monitoring biologist will be onsite for project activities during appropriate temperatures for BNLL activity.
  - c. When possible, project activities will be conducted at night or during blunt-nosed leopard lizard inactivity periods.
  - d. The Service/BLM may require the monitoring biologist to escort all traffic through any area where blunt-nosed leopard lizards have been observed.

- e. All personnel will be advised to reduce speeds to 10 mph on sections of the access/egress route with potential to support blunt-nosed leopard lizards.
- f. If a blunt-nosed leopard lizard is observed, the BLM will be provided with the GPS coordinates of the sighting within 48 hours. Written documentation, including GPS coordinates of lizard observations, will be included in all reports.
- g. The monitoring biologist will complete daily compliance reports. Daily compliance reports will be summarized in a weekly compliance report; the weekly compliance report will be sent to BLM. The weekly report will describe actions taken to avoid blunt-nosed leopard lizard impacts. The weekly report may be submitted by email to BLM.
- h. When the monitoring biologist determines that temperature patterns at the project site no longer support blunt-nosed leopard lizard activity for the season and receives agreement from BLM, active season measures may be discontinued.
- i. A report will be submitted to BLM within 60 days of the decision to discontinue active season measures. If 60 days is an insufficient time period for completion of the compliance report, a formal extension of a reasonable timeframe can be requested. Extension requests can be submitted by email.
- j. The Service/BLM may require a written BNLL active season O&M Plan. The O&M Plan would outline the practices and mitigation measures that would be implemented to avoid impacts to BNLL from O&M activities.
- k. Should a blunt-nosed leopard lizard be encountered during construction activities during the inactive season, the BLM and Service will be notified of the discovery within 24 hours by phone and by email.

***San Joaquin Coachwhip***

- 21. Project activities will avoid potential San Joaquin coachwhip burrows by a minimum of 30 feet. If San Joaquin coachwhips are observed during Project implementation, they will be unharmed and allowed to leave the Project site on their own accord.

***San Joaquin Kit Fox***

- 22. Innex will implement measures in the USFWS's *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011) if dens are identified during pre-project surveys.
  - a. Project activities should avoid den(s) that could be used by San Joaquin kit fox.
  - b. Protective exclusion zones will be placed around all known and potential dens identified during preconstruction surveys. Exclusion zones should be comprised of large, flagged stakes connected by rope or cord, or by survey laths or wooden stakes prominently flagged with survey ribbon. Exclusion zones will be implemented at the following distances measured outward from entrance:

Potential or Atypical den	50 feet
Known den	100 feet

- c. Exclusion zones must be observed. Only essential vehicle operation on existing roads and foot traffic should be permitted within the exclusion zones. Otherwise, all construction, vehicle operation, material storage, or any other type of surface disturbing activity should be prohibited or greatly restricted within exclusion zones.
  - d. Exclusion zones around kit fox dens will be maintained until all Project related activities have been completed. At that time, all staking will be removed to avoid attracting subsequent attention to the dens.
  - e. If a natal/pupping den is discovered within the proposed Project site, or within 200-foot of work areas, the BLM should be notified immediately. Under no circumstances should the den be disturbed or destroyed without prior authorization from the USFWS and CDFW.
23. If protective exclusion zones cannot be maintained, and the den can be avoided during construction activities, the den(s) may be temporarily plugged with one-way doors or materials such as sandbags, rocks, etc. until construction is complete. If this option is utilized, the temporary plug will be removed at the end of construction, by or under the supervision of an approved biologist.
- a. Prior to temporary plugging of any den using methods other than one-way doors, the den will be monitored for a minimum of five (5) consecutive nights to determine its current status. Activity at the den will be monitored by placing tracking medium or an infra-red beam camera at the entrance.
    - i. If no kit fox activity is observed during this period, the den will be plugged immediately upon the conclusion of monitoring to preclude subsequent use.
    - ii. Only when the den is determined to be unoccupied may the den be temporarily plugged by or under the supervision of an approved biologist. If the animal is still present after five or more consecutive nights of discouraging use and monitoring, an approved biologist will contact the service/BLM to obtain further guidance.
24. If, in the opinion of the monitoring biologist, a kit fox den exclusion zone cannot be maintained, and the den cannot be avoided during construction, then limited destruction may be allowed. Den(s) will be monitored in accordance with the USFWS *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011).
25. Destruction of any known or natal/pupping den requires take authorization/permit from the USFWS and CDFW.

***American Badger***

- 26. Occupied American badger dens detected during pre-disturbance surveys must be flagged and ground-disturbing activities avoided within 50 feet of the den. Maternity dens must be

avoided and a minimum 200-foot buffer from disturbance will be maintained during pup-rearing season (February 15 through July 1). Maternity dens must be avoided to the maximum extent feasible in the opinion of the qualified biologist. If an active maternity den is proposed to be disturbed, the qualified biologist, shall consult with the CDFW to identify any appropriate additional minimization measures, which the qualified biologist determines with the wildlife agencies, that can be feasibly implemented based on field conditions.

***Burrowing Owl***

- 27. Occupied burrowing owl burrows shall not be disturbed during the species nesting season (February 1 through August 31). The following distances shall be maintained between all disturbance areas and burrowing owl nesting sites.

**Table 1-2:** Setback Distances for Burrowing Owl Nesting Sites by Level of Proposed Project Impacts

Time of Year	Level of Disturbance		
	Low	Medium	High
April 1 – Aug 15	656 feet (200 meters)	1,640 feet (500 meters)	1,640 feet (500 meters)
Aug 16 – Oct 15	656 feet (200 meters)	656 feet (200 meters)	1,640 feet (500 meters)
Oct 16 – Mar 31	164 feet (50 meters)	328 feet (100 meters)	1,640 feet (500 meters)

***Golden Eagle and Other Special-Status Raptors***

- 28. If Project activities are to take place during the typical bird breeding season (March 1 through September 15), additional pre-construction surveys for golden eagle and other special-status raptors will be conducted by a qualified biologist no more than 10 days prior to the start of Project activity.
  - a. If no golden eagles or other special-status raptor species are found nesting within ½-mile of the Project site, then no further avoidance or mitigation measures will be required, and Project activities may proceed.
  - b. If a golden eagle or other special-status raptor species is found nesting within ½-mile of the Project site, a ½-mile no disturbance buffer shall be put into effect. If the ½-mile no-disturbance buffer cannot be feasibly implemented, CDFW will be contacted to assist with providing and implementing additional avoidance measures.

***Tricolored Blackbird***

- 29. If project activities take place during the typical bird breeding season (February 1 through September 15), a qualified wildlife biologist will conduct surveys for nesting tricolored blackbirds no more than 10 days prior to the start of implementation to evaluate presence/absence of nesting birds in proximity to well development activities and to evaluate potential project-related impacts. In the event that a tricolored blackbird nesting colony is detected during surveys, consultation with the CDFW is warranted to discuss how to implement the project and avoid take, or if avoidance is not feasible, to acquire an

ITP, pursuant to Fish and Game Code section 2081(b) prior to any ground disturbing activities.

### ***San Joaquin Woollythreads and Kern Mallow***

30. Surface disturbance should be scheduled after seed set and prior to germination. This period is generally from May to September but varies relative to yearly temperature and precipitation patterns.
31. If project activities are conducted during the growing season of San Joaquin woollythreads or Kern mallow (January to April) and when reference populations are flowering, additional surveys may be necessary to define population boundaries and exclusion zones.
32. Maintain an exclusion zone around populations with a minimum radius of 50 feet as measured outward from the individual plant, cluster of plants, or mapped population boundaries. Actions within exclusion zones will be limited to essential vehicle and equipment operation on authorized roads and to foot traffic. The locations of federally listed plants will be avoided and temporarily fenced or prominently flagged by or under the supervision of a botanist to prevent inadvertent encroachment by vehicles and equipment during the activity. If the minimum exclusion zone cannot be maintained, the Service/BLM will be contacted for further guidance.
33. In areas where soil will be disturbed by earthmoving equipment, the topsoil will be stockpiled. If the site is to be reclaimed within one year, the topsoil will be replaced. If reclamation will occur later than one year, any topsoil removed will be used as part of restoration measures on nearby suitable areas. Topsoil will not be stockpiled for longer than the beginning of the next growing season. The disturbance, stockpiling, and/ or use of topsoil will be reported in the compliance report.

### ***Other Special-Status Plants***

34. Special-status plants will be avoided by at least 50 feet from the outer edge of a plant population or specific habitat type required by special-status plant species. If buffers cannot be maintained, then consultation with CDFW may be warranted to determine appropriate minimization and mitigation measures for impacts to special-status plant species. If a State-listed plant species is identified during botanical surveys, consultation with CDFW is warranted to determine if the Project can avoid take. If take cannot be avoided, take authorization is warranted. Take authorization would occur through acquisition of an ITP, pursuant to Fish and Game Code section 2081(b).

### **Cultural Resources**

In the event of unanticipated discovery of cultural resources during project implementation, the BLM Field Office Cultural Staff and Field Manager (661-391-6000) shall be immediately notified by personnel responsible for the project. All work at the site of discovery, and in any other locations where damage to the cultural resource could occur, shall also cease until written approval to proceed is issued by the BLM.

If human remains are inadvertently discovered on BLM land, all activity will immediately cease surrounding the unanticipated discovery. The holder will ensure that the discovery is secured and protected and will immediately notify the BLM Field Manager (661-391-6000). The BLM will adhere to current regulations regarding the treatment of human remains (Native American Graves Protection and Repatriation Act, 43 CFR 10). Access and use of the area can proceed with written approval from the Field Manager once the appropriate level of review has been determined and completed.

### Paleontological Resources

In the event of inadvertent discovery of paleontological resources during project implementation, the BLM Field Office Paleontological Specialist and the BLM Field Manager (661-391-6000) shall be immediately notified by personnel responsible for the project. All work shall cease at the site of discovery and in any other locations where damage to the discovery may occur until written approval has been provided by the BLM.

Additionally, pursuant to the Paleontological Resources Protection Act (PRPA), BLM lands were evaluated for potential to contain Paleontological Resources within the Bakersfield Field Office management area. The proposed well APD locations are within Potential Fossil Yield Classification 4 (High) geological formations; Etchegoin Formation (Potential Fossil Yield Classification (PFYC) System). As such, a Paleontological Mitigation Plan as developed for the Kettleman Dome Oil field has been attached to the Conditions of Approval.

### Construction and Interim Reclamation

All permanent above-ground structures (e.g., production equipment, etc.) not subject to safety requirements shall be painted to blend with the natural color of the landscape. The paint used will be a color which simulates “Standard Environmental Colors.” The colors selected for the project location are Covert Green or Carlsbad Canyon.

At the beginning of construction, any topsoil (approximately the top four to six inches of soil) shall be removed from the project area and stockpiled on an existing pad or previously disturbed surface near the project site. After well completion, topsoil will be re-applied to the cut and fill slopes, as well as the sump (if required). “Well completion” is a technical term used to describe the final phase of well drilling; “well completion” is not synonymous with the final phase of project implementation. Prior to applying topsoil to the sump (if required), the sump will be cleaned, ripped to a minimum depth of 12 inches, and re-contoured to match the surrounding topography. Remaining topsoil will be stockpiled on an existing well pad or other previously disturbed surface and retained for future reclamation. Topsoil will be retained for no more than one year. If the topsoil is not redistributed within one year, the operator may receive a WO or INC.

All practicable measures will be taken to minimize erosion and stabilize disturbed soils. The following types of interim stabilization or similar methods may be used if necessary: jute netting, hydro-mulch, straw wattles, or crimped straw mulch.

No fencing will be used for cut and fill slopes. However, fencing and signage may be used to protect the reclaimed sump (if required) from unauthorized disturbance. Fencing may remain until the reclaimed sump has achieved revegetation goals and has been released by the BLM.

### Management of Noxious Weeds

A site-specific weed control Environmental Assessment (EA) and a Pesticide Use Proposal (PUP) must be completed before any use of pesticides on BLM lands. This can be a lengthy process and requires specific information, public notification, and review by the BLM State Office. Currently, the applicant does not have these approvals in place. Therefore, no herbicide treatment is authorized at this time.

### Final Reclamation

Disturbed lands shall be re-contoured to conform with existing undisturbed topography unless the BLM determines that re-contouring would result in negative impacts to special status species. No depressions shall be left that trap water or form ponds. All portions of final reclamation may be subject to additional cultural resources and paleontological inventory and may require a permit. The reclaimed landscape shall have characteristics that approximate the visual quality of the adjacent area and consider location, scale, shape, color, and orientation of major landscape features and meet the needs of the planned post disturbance land use.

Final reclamation shall specifically achieve the following:

1. The reclaimed area shall be stable and exhibit none of the following characteristics:
  - a. Large rills or gullies (greater than 6 inches deep).
  - b. Perceptible soil movement or head cutting in drainages.
  - c. Slope instability on, or adjacent to, the reclaimed area in question.
2. The soil surface must be stable and have adequate surface roughness to reduce runoff and capture rainfall and snow melt. Additional short-term measures, such as the application of mulch, shall be used to reduce surface soil movement.
3. Vegetation production and species diversity (including shrubs) shall approximate the surrounding undisturbed area (50-150% of the adjacent species composition and cover). The vegetation shall stabilize the site and support the planned post disturbance land use, provide for natural plant community succession and development, and be capable of renewing itself. This shall be demonstrated by:
  - a. Successful onsite establishment of species included in the planting mixture or other desirable species.
  - b. Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production.
4. Habitat Restoration
  - a. Restoration will be required on unused portions of the project area or oil and gas lease, including abandoned, unused, or unnecessary roads, when deemed necessary by the BLM to maintain or improve habitat values. Restoration will be required when reserve area (Red Zone) and habitat corridor (Green Zone) limits are exceeded and when a project or lease is abandoned. Restoration activities will be supervised by an onsite monitoring biologist.
  - b. The following are examples of actions that may be required as part of restoration:
    - i. All trash will be removed from the site and disposed of properly.
    - ii. All cement, asphalt, and oil-contaminated soils will be removed from the site and disposed of properly.
    - iii. All pipelines and other oilfield infrastructure no longer in use will be removed from the site and disposed of properly.

- iv. Topographic contours will be restored to the maximum extent possible.
- v. Non-compacted soils or areas previously deep ripped will be disced to a depth of approximately 8 inches.
- vi. Compacted sites will be deep ripped to a depth of 12 to 18 inches.
- vii. Slopes greater than 30 per cent will be treated by erosion control methods such as discing along the contour, imprinting, mulching, or installing wattles.
- viii. Sites will be seeded using methods such as drill or broadcast seeding with a site-appropriate seed mix, approved by the BLM Botanist. Exact seeding mixes and rates will depend on the site characteristics, the species chosen, and the current availability of native seed. Seed mixes will include dominant shrubs and native grasses and herbs compatible with the adjacent plant community. The best time for seeding is generally late summer to early fall prior to the onset of the rainy season.
- ix. Sites will be considered restored when it can be documented that they support functional, native habitat. Evidence of attainment of this goal will be provided by the project applicant. Restoration in drainages, streambeds, and similar habitats where water is a substantial component may require conformance with conditions of a CDFW Streambed Alteration Agreement or other state or local permit. Demonstration of restoration may include documentation of:
  - 1. Visual continuity or similarity with adjacent native, undisturbed habitat or a designated reference site.
  - 2. Topography that follows natural contours and allows for the natural flow of water across the landscape.
  - 3. Indiscernible boundary lines or areas between the disturbed and undisturbed areas.
  - 4. Presence of habitat that supports threatened and endangered species.
  - 5. Vegetation community composition within the normal or desired range. Ratios of native and non-native plants within normal or desired parameters. Presence and abundance of reproducing plants. Presence and abundance of biological soil crusts.
  - 6. Evidence or presence of animals or animal sign on the site. Presence and abundance of desired species. Evidence, presence, and abundance of reproducing species.
  - 7. Evidence of species diversity for both plants and animals.
  - 8. Evidence of soil stability (minimal erosion).
  - 9. Absence of signs of vehicle or other trespass. Absence of trash and contaminated soils.

## **Appendix 2. Headwaters Report**



# **Bureau of Land Management (BLM) Socioeconomic Profile**

## **Bakersfield Field Office**

### **Selected Geographies:**

**San Joaquin County, CA; Merced County, CA; Stanislaus County, CA; Fresno County, CA; Madera County, CA; Kern County, CA; Tulare County, CA; Kings County, CA**

### **Comparison Geography:**

**California**

### **Report Date:**

**May 15, 2024**

# BLM Socioeconomic Profile

## Bakersfield Field Office

### About the BLM Socioeconomic Profile (SEP) Tool

#### What is the BLM Socioeconomic Profile (SEP) Tool?

The [BLM Socioeconomic Profile \(SEP\)](#) tool delivers an easily understood report that provides an overview of socioeconomic conditions using indicators relevant to public land management. The report includes accurate and reliable county-level indicators. This tool also explains the context necessary to understand how these indicators describe the relationship between activities authorized on BLM-managed lands and surrounding communities.

#### How to use this report

This report is intended for multiple audiences for a variety of uses. BLM staff can use these reports to:

- Develop socioeconomic baselines for National Environmental Policy Act (NEPA) analyses.
- Facilitate community engagement between the BLM, surrounding communities, and stakeholders by improving the BLM's and the public's understanding of baseline socioeconomic conditions and the extent to which the BLM contributes to those conditions.
- Learn about the economic and demographic conditions and trends near BLM-managed lands.
- Run consistent reports over time, and to track changes on individual or multiple BLM units.

#### Where do these data come from?

The BLM Socioeconomic Profile (SEP) tool adapted two existing Headwaters Economics on-line tools: the Economic Profile System (EPS) and Populations at Risk (PAR).

EPS and PAR use data from the Bureau of Labor Statistics, Census Bureau, U.S. Department of Commerce, and other reliable public sources. These tools are currently used by federal land managers, state and local elected officials, planners, city managers, journalists, and researchers throughout the country.

Headwaters Economics recommends that citations from SEP use the cited data source that is provided at the bottom of each Data and Graphics section. For example, poverty rates may be cited using: U.S. Department of Commerce. 2018. Census Bureau, American Community Survey Office, Washington, D.C.

More specifics on data sources can be found at the [SEP](#) webpage. Also see the "Additional Resources" section of the report for links to key data resources and suggestions for supplementing the data in this report.

#### What are the limitations of this report?

This report, and the reports available through EPS and PAR, provide valuable information on historical and existing economic and demographic conditions for a defined area. However, these reports do not:

- Contain information or modelling capabilities to conduct social or economic impact analyses.
- Contain information or modelling capabilities to conduct economic efficiency analysis and/or cost-benefit analysis.
- Evaluate many of the social and economic issues and values related to public land management, particularly perspectives and values of affected individuals and communities.
- Contain sub-county demographic or economic data (*with the exception of the EPS Demographics and PAR reports*).
- Provide specific data on the use of resources on BLM-managed lands (e.g., recreational visits or livestock grazing) or estimates of the economic contribution of activities on BLM-managed lands to the regional economy.

#### Need technical assistance?

For technical questions, contact Patty Hernandez Gude at [eps@headwaterseconomics.org](mailto:eps@headwaterseconomics.org) or telephone 406-599-7425.

# BLM Socioeconomic Profile

## Bakersfield Field Office

### Table of Contents

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Land Ownership .....	1
Overview .....	2
Jobs by Industry (Current) .....	3
Jobs by Industry (Change since 2000) .....	4
Wages by Industry .....	5
Non-Labor Income .....	6
Migration and Natural Population Change .....	7
Poverty .....	8
Minority Populations .....	9
Other Socioeconomic Indicators .....	10
Federal Land Payments .....	11
Additional Resources .....	12

*Click the links above for quick access to report sections.*

# BLM Socioeconomic Profile

Bakersfield Field Office

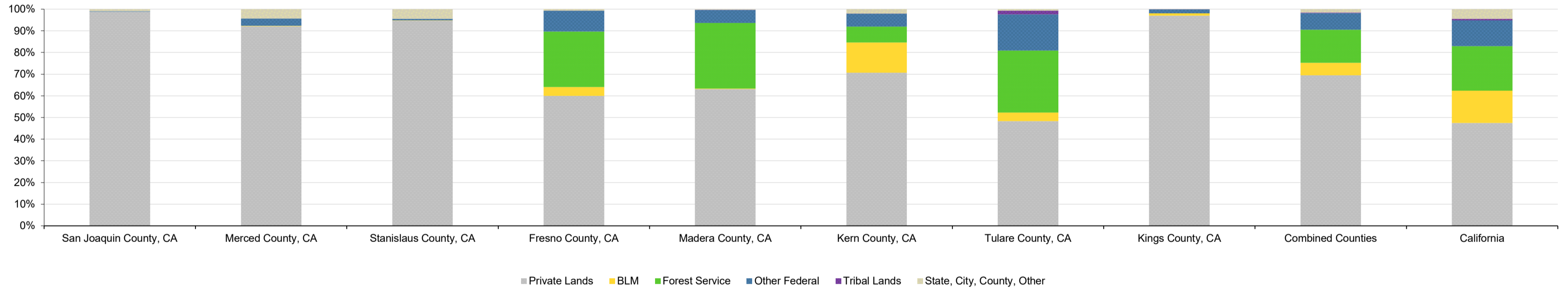
## Land Ownership

Land Ownership, Acres	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
Total Area	912,023	1,266,337	968,905	3,847,122	1,378,073	5,224,096	3,096,749	890,579	17,583,884	101,159,181
Private Lands	901,498	1,165,650	917,051	2,305,397	869,108	3,694,783	1,495,422	863,924	12,212,833	48,059,266
Federal Lands	1,227	45,108	8,517	1,511,437	504,713	1,420,880	1,526,135	25,910	5,043,927	47,915,621
BLM	0	3,940	1,340	158,484	3,335	725,748	122,143	9,982	1,024,972	15,079,691
Forest Service	0	0	0	983,961	417,160	380,506	886,394	0	2,668,021	20,781,511
Other Federal	1,227	41,168	7,177	368,992	84,218	314,626	517,598	15,928	1,350,934	12,054,419
Tribal Lands	0	0	0	1,750	1,234	918	54,366	174	58,442	677,062
State, City, County, Other	9,298	55,578	43,339	28,536	3,020	107,515	20,827	570	268,683	4,506,753

### Percent of Total

Private Lands	98.8%	92.0%	94.6%	59.9%	63.1%	70.7%	48.3%	97.0%	69.5%	47.5%
Federal Lands	0.1%	3.6%	0.9%	39.3%	36.6%	27.2%	49.3%	2.9%	28.7%	47.4%
BLM	0.0%	0.3%	0.1%	4.1%	0.2%	13.9%	3.9%	1.1%	5.8%	14.9%
Forest Service	0.0%	0.0%	0.0%	25.6%	30.3%	7.3%	28.6%	0.0%	15.2%	20.5%
Other Federal	0.1%	3.3%	0.7%	9.6%	6.1%	6.0%	16.7%	1.8%	7.7%	11.9%
Tribal Lands	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	1.8%	0.0%	0.3%	0.7%
State, City, County, Other	1.0%	4.4%	4.5%	0.7%	0.2%	2.1%	0.7%	0.1%	1.5%	4.5%

Land Ownership, Percent of Land Area



Based on data from the following source(s): U.S. Geological Survey, Gap Analysis Program. 2018. Protected Areas Database of the United States (PADUS) version 2.0

# BLM Socioeconomic Profile

## Bakersfield Field Office

### Land Ownership

#### What is described in this section?

This section reports total acreage for the selected geographies and by land ownership type (i.e., private land, public land (federal and non-federal), and tribal land). The table shows this information and further subdivides Federally-managed lands into those managed by the BLM, the U.S. Forest Service, and other federal agencies. The graphic depicts the relative occurrence of each land ownership type for each selected geography.

No publicly available federal database contains summary statistics on the area of land by ownership. For this report, these statistics were calculated using Geographic Information System (GIS) tools and these two existing datasets:

U.S. Census Bureau's TIGER/Line County Boundaries: this annually updated dataset contains geospatial data on administration boundaries, such as state and county, for the U.S. (see: <https://www.census.gov/geo/maps-data/data/tiger-line.html>)

U.S. Geological Survey's Protected Areas Database (PAD-US): this dataset contains geospatial data that inventories "public parks and other protected open space." This translates to all non-private lands in the U.S. PAD-US differentiates by land ownership. (See <https://gapanalysis.usgs.gov/padus/>)

Although every attempt was made to use the best available GIS land ownership dataset, these data sometimes have errors or become outdated. Please report any inaccuracies to [eps@headwaterseconomics.org](mailto:eps@headwaterseconomics.org).

These data are not specific to socioeconomics. For NEPA analyses it is common for land area estimates to be included to describe other aspects relevant to the impact analysis. The source of those estimates may differ from the data sources listed above.

#### Why is this relevant to the BLM?

Land ownership patterns provide important context for understanding the potential socioeconomic impacts of BLM management decisions in a given area. This context is a starting point that can be used to highlight several socioeconomic considerations. Some examples are:

Different land owners and managers have different interests, objectives, and constraints. Understanding these differences can improve understanding of potential challenges that may arise when considering different land management decisions. The BLM can use this information to ensure relevant entities are identified and targeted during the scoping and public comment periods of the NEPA process.

In areas with a high proportion of public lands (including non-federal), public land management actions can have a relatively large effect on economic activity and quality of life in local communities.

In areas with significant tracts of federal lands, state and local governments may rely heavily on federal land payments and revenue sharing (e.g., payments associated with federal mineral revenues and timber sales) and state and local tax revenues (e.g., severance and ad valorem taxes and sales and lodging taxes) generated from activities on federal lands. For more information on federal land payments see the section covering this topic at the end of this report.

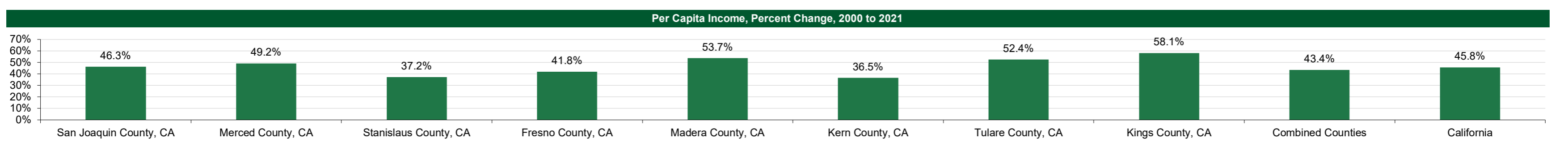
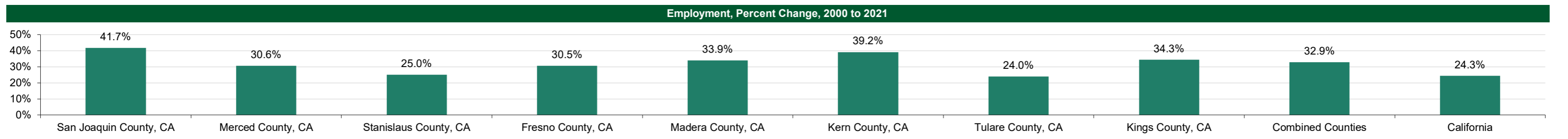
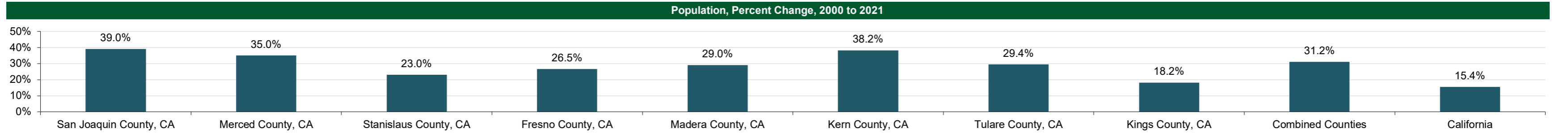
In areas with relatively few public lands, it is likely that public lands play a relatively minor role in the local economy. However, those public lands may still serve important roles such as providing public access to recreation areas for which there are few substitutes.

# BLM Socioeconomic Profile

Bakersfield Field Office

## Overview

	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
<b>Population</b>										
Population, 2000	567,885	212,258	449,471	801,288	123,587	663,803	368,627	129,835	3,316,754	33,987,977
Population, 2021	789,410	286,461	552,999	1,013,581	159,410	917,673	477,054	153,443	4,350,031	39,237,836
<b>Employment</b>										
Employment, 2000	254,521	83,061	205,267	400,136	51,446	310,380	172,135	49,518	1,526,464	19,228,895
Employment, 2021	360,664	108,476	256,489	522,348	68,862	431,960	213,428	66,518	2,028,745	23,906,353
<b>Per Capita Income</b>										
Per Capita Income, 2000 (2022 \$)	\$42,649	\$33,719	\$41,218	\$39,159	\$32,154	\$36,376	\$34,004	\$29,486	\$37,918	\$56,764
Per Capita Income, 2021 (2022 \$)	\$62,405	\$50,307	\$56,544	\$55,535	\$49,418	\$49,638	\$51,825	\$46,630	\$54,377	\$82,744



Based on data from the following source(s): U.S. Department of Commerce, 2022. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

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Data and Graphics | Section 2

### Overview

#### What is described in this section?

This section shows population, employment, and per capita income in 2000 and the most recent year data are available. The graphs show how these indicators have changed since 2000.

Population estimates reported in this section come from the Census Bureau's Population Estimates Program (PEP). These estimates include the total resident population (citizens and non-citizens). PEP produces estimates on July 1 of every year by adjusting decennial census base counts using existing data series such as births, deaths, Federal tax returns, Medicare enrollment, and immigration.

Employment estimates for the most recent year are reported by the Department of Commerce Bureau of Economic Analysis (BEA). The BEA employment estimates represent "the number of jobs, full-time plus part-time, by place of work" and include "wage and salary jobs, sole proprietorships [i.e., self-employed], and general partners [i.e., partners which can include corporations and other legal entities]." Jobs by Industry are shown in the next section of this report.

Per capita income is a common measure of the financial well-being of an area, and is calculated by dividing total personal income by total population. Total personal income estimates are reported by the BEA by place of residency and include wages and salaries, supplements to wages and salaries, and proprietors' income (i.e. labor earnings), as well as non-labor income (i.e. dividends, interest, and rent; and transfer payments). All income figures in this report are adjusted for inflation for the year reported (i.e. shown in real terms). Note that these estimates of income differ from those developed through the Census Bureau's American Community Survey and should not be compared with those estimates (which are also found in the EPS reports called "Demographics.")

#### Why is this relevant to the BLM?

Population, employment, and per capita income are three of the most basic indicators for describing the socioeconomic context of an area. Presented together these indicators provide initial insight into the magnitude, trends, and relationships between the population, the economy, and individual wealth within a defined region. For example, while there are exceptions, areas with population, employment, and per capita income growing faster than surrounding areas are likely attracting or retaining people due to certain factors such as employment opportunities, potential for higher earnings, and potential for improved quality of life.

This context serves as a starting point for understanding how people in an area may interact with, or be affected by, BLM decisions. For example, an area with a small population and relatively low growth rates may be more sensitive to land management decisions that have the potential to meaningfully affect local economic activity or demographics. Conversely, an area with a large population and a high number of employment opportunities is unlikely to be highly dependent on BLM-managed lands from an economic activity perspective. However, there may be higher demands on BLM-managed lands near larger population and economic centers and a higher likelihood of conflict between diverse stakeholders.

Trends in one area that substantially deviate from those in surrounding areas suggest additional research may be useful to better understand causes and what role public land management decisions might have in the area. Additional research would also be useful when trends for these indicators within one area appear at odds.

# BLM Socioeconomic Profile

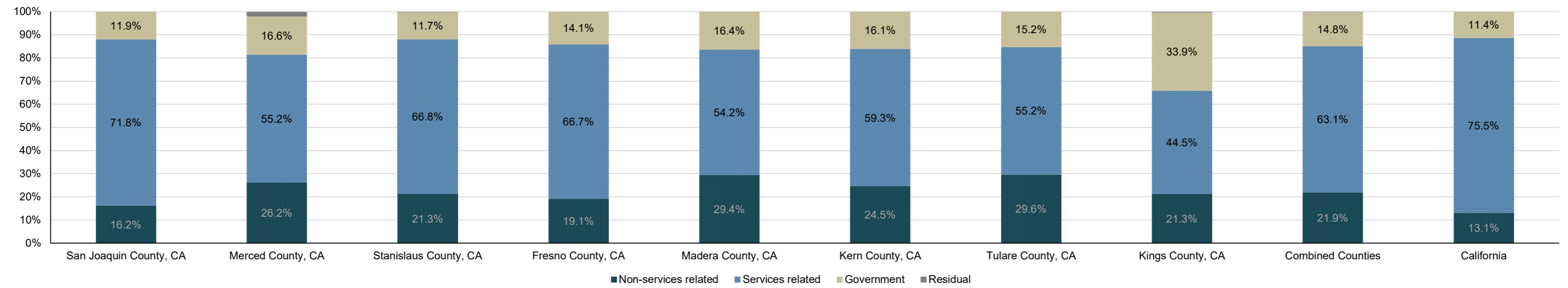
Bakersfield Field Office

## Jobs by Industry (2021)

	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
Total number of jobs	360,664	108,476	256,489	522,348	68,862	431,960	213,428	66,518	2,028,745	23,906,353
Non-services related	58,511	28,423	54,668	99,909	20,259	105,949	63,242	14,147	445,108	3,142,910
Farm	9,173	9,282	9,639	17,758	3,912	16,690	15,748	4,589	86,791	229,419
Forestry, fishing, & ag. services	7,899	4,130	7,240	27,278	9,298	44,973	23,785	3,319	127,922	250,669
Mining (including fossil fuels)	241	-10	-35	500	134	8,507	157	-14	9,598	33,528
Construction	18,874	4,928	14,897	26,250	3,326	21,873	9,879	1,524	101,551	1,253,884
Manufacturing	22,324	10,073	22,857	28,123	3,589	13,906	13,673	4,701	119,246	1,375,410
Services related	259,057	59,873	171,235	348,563	37,296	256,293	117,706	29,026	1,279,649	18,038,748
Utilities	1,574	324	339	2,687	258	1,773	741	150	7,846	85,390
Wholesale trade	12,592	2,434	6,748	17,262	1,156	9,394	5,336	784	55,706	731,178
Retail trade	33,657	10,891	28,665	48,409	5,758	41,370	21,101	5,511	195,362	2,031,941
Transportation and warehousing	56,997	7,101	17,196	34,296	2,372	30,656	11,808	2,559	162,985	1,371,207
Information	1,702	339	1,097	3,795	353	2,186	844	157	10,473	643,367
Finance and insurance	13,380	3,010	8,001	21,064	1,606	11,800	6,288	1,352	66,501	1,191,722
Real estate and rental and leasing	14,450	3,139	9,741	18,871	2,168	13,904	6,816	1,432	70,521	1,250,434
Professional and technical services	11,205	2,410	9,497	20,388	1,785	17,089	5,130	1,220	68,724	2,093,532
Management of companies	2,133	913	1,632	3,177	428	3,429	722	169	12,603	277,998
Administrative and waste services	22,409	3,990	13,300	26,901	3,118	20,986	11,504	1,247	103,455	1,526,406
Educational services	6,472	567	2,211	6,371	276	3,610	1,664	282	21,453	543,623
Health care and social assistance	37,479	11,523	36,375	77,436	9,778	45,693	20,019	7,389	245,692	2,822,918
Arts, entertainment, and recreation	3,891	864	2,954	6,004	901	4,242	1,755	543	21,154	566,938
Accommodation and food services	22,586	6,581	18,993	33,053	3,819	27,515	12,962	4,038	129,547	1,575,223
Other services, except public admin.	18,530	5,787	14,486	28,849	3,520	22,646	11,016	2,793	107,627	1,346,871
Government	43,096	17,959	30,084	73,876	11,307	69,718	32,480	22,543	301,063	2,724,695
Residual	0	2,221	502	0	0	0	0	202	2,925	0

All employment data are reported by place of work. Estimates for data that were not disclosed are indicated with tildes (~).

Jobs by Industry, Percent of Total, 2021



Based on data from the following source(s): U.S. Department of Commerce, 2022. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

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### Jobs by Industry (2021)

#### What is described in this section?

This section shows employment by industry based on data reported by the U.S. Department of Commerce Bureau of Economic Analysis (BEA) for the most recent published year. The BEA employment estimates represent "the number of jobs, full-time plus part-time, by place of work" and include "wage and salary jobs, sole proprietorships [i.e., self-employed], and general partners [i.e., partners which can include corporations and other legal entities]."

For this report, employment is grouped into three broad categories:

- (1) Non-services related industries (construction, utilities, farming, mining, and manufacturing, and natural resource industries).
- (2) Services related industries.
- (3) Government (federal military and civil services, state and local government employment, and government enterprise).

Some employment data are withheld by the BEA to avoid the disclosure of potentially confidential information. In many cases, Headwaters Economics is able to use supplemental data from the U.S. Department of Commerce to estimate these data gaps. These values are indicated with tildes (~). When an estimate is not possible, a value of "na" is reported. Residual employment is also accounted for in this section. Residual employment is the number of jobs remaining after accounting for reported or estimated jobs in the three categories above.

#### Why is this relevant to the BLM?

These employment data illustrate the various sectors that currently exist in a regional economy. The Jobs by Industry "snapshot" helps identify drivers of the local economy and the level of economic diversity. Further inferences can be drawn by comparing the proportion of employment in a sector across geographies. For example, if the farm sector accounts for 10 percent of the jobs in one county, but 1 to 3 percent in several adjacent counties, it is reasonable to conclude that the farm sector plays a particularly important role in that county.

These data can also describe the relative contribution of activities authorized on BLM-managed lands to the regional economy, particularly for non-services industries. For example, if 10 percent of total employment in a specific county is in the mining industry and there are several large mining operations (including oil and gas) authorized on BLM-managed lands in that county, then one can conclude that mineral activities on public lands constitutes an important driver for the regional economy. These types of comparisons can be drawn for all activities that occur on BLM-managed lands. In the case of recreation, there is no stand-alone sector, but comparisons to various service related industries affected by visitor expenditures provide some insight.

Socioeconomic baseline sections in NEPA documents often include employment by industry. It is appropriate to include this information when an issue has been identified related to how jobs or the regional economy will be affected by the federal action under review. These data provide context and baseline employment data that are necessary to interpreting employment impacts.

# BLM Socioeconomic Profile

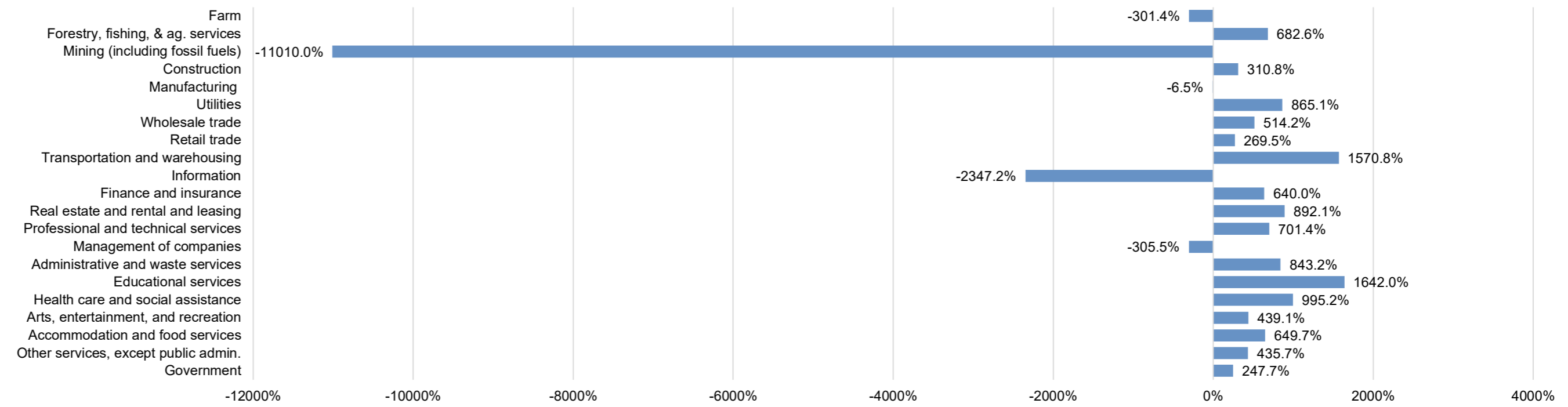
Bakersfield Field Office

## Jobs by Industry (Change from 2001 to 2021)

	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
Total change in jobs	100,145	25,886	45,361	122,608	18,296	123,241	44,760	17,643	497,940	4,564,895
Non-services related	-3,594	-331	-4,727	-7,222	-7,909	19,693	-216	-1,171	-13,777	-305,722
Farm	-5,126	-1,205	-2,002	-7,945	-2,399	-4,258	-4,914	-128	-27,977	-60,496
Forestry, fishing, & ag. services	1,058	445	106	-3,742	na	19,551	1,322	155	28,193	60,867
Mining (including fossil fuels)	-68	-31	-100	-13	na	-1,100	79	-2	-1,101	-4,544
Construction	1,730	1,412	241	5,425	639	3,797	2,087	-16	15,315	190,781
Manufacturing	-1,188	-290	-2,972	-947	237	1,703	1,642	1,162	-653	-492,330
Services related	98,365	19,077	46,119	120,475	13,871	92,793	38,193	10,153	439,046	4,760,078
Utilities	427	35	103	1,251	133	603	196	35	2,803	9,041
Wholesale trade	4,848	289	279	3,368	403	2,359	962	28	12,516	3,627
Retail trade	3,000	1,843	1,895	6,817	1,316	9,619	3,850	1,014	29,354	77,971
Transportation and warehousing	42,717	4,417	11,164	23,462	1,230	20,667	6,105	1,784	111,546	795,922
Information	-2,080	-214	-1,529	-2,156	-356	-911	-507	-204	-7,957	14,086
Finance and insurance	4,065	1,411	1,871	5,711	604	3,827	1,279	496	19,264	339,037
Real estate and rental and leasing	5,831	1,105	3,500	7,272	796	6,266	2,991	242	28,003	489,030
Professional and technical services	2,574	466	1,762	5,809	1,325	3,609	971	388	16,904	562,709
Management of companies	-618	-87	-1,174	-760	-60	490	-566	-14	-2,789	-18,504
Administrative and waste services	7,878	1,467	2,161	10,073	1,222	6,730	4,083	31	33,645	294,021
Educational services	2,852	345	893	2,721	119	1,604	672	104	9,310	221,422
Health care and social assistance	13,575	4,979	16,184	41,445	4,550	20,661	9,478	3,806	114,678	1,310,856
Arts, entertainment, and recreation	294	21	707	1,099	356	793	258	266	3,794	108,785
Accommodation and food services	7,857	1,890	5,875	8,417	1,250	10,301	5,494	1,676	42,760	327,746
Other services, except public admin.	5,145	1,110	2,428	5,946	983	6,175	2,927	501	25,215	224,329
Government	5,374	3,833	3,467	9,355	3,198	10,755	2,792	5,710	44,484	110,539
Residual	0	2,645	502	0	-6,682	0	3,559	609	633	0

All employment data are reported by place of work. Estimates for data that were not disclosed are indicated with tildes (~).

Percent Change in Jobs by Industry, 2001 to 2021, Combined Counties



Based on data from the following source(s): U.S. Department of Commerce, 2022. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

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### Jobs by Industry (Change from 2001 to 2021)

#### What is described in this section?

This section compares current employment by industry, as presented in the *Jobs by Industry* section and as discussed in its accompanying study guide, to 2001 employment levels as reported by the BEA. To maintain consistency across reporting periods, current and historic employment estimates are reported based on the 2001 North American Industrial Classification System (NAICS).

As discussed in the previous study guide, employment sectors have been grouped into three broad categories:

- (1) Non-services related industries (construction, utilities, farming, mining, and manufacturing, and natural resource industries).
- (2) Services related industries.
- (3) Government (federal military and civil services, state and local government employment, and government enterprise).

Some employment data are withheld by the BEA to avoid the disclosure of potentially confidential information. In many cases, Headwaters Economics is able to use supplemental data from the U.S. Department of Commerce to estimate these data gaps. These estimates are indicated with tildes (~). When an estimate is not possible, a value of "na" is reported. Residual employment is also accounted for in this section.

#### Why is this relevant to the BLM?

While current employment levels can provide a snapshot of economies, comparing how employment has changed over time can provide insight into how local economies have changed, which industries may be growing or declining, and whether local economies are becoming more or less diverse.

BLM management decisions can affect employment opportunities, especially in natural resource dependent industries. Changes in employment levels are particularly of interest when they have occurred in sectors where a high percentage of local employment is concentrated. If a meaningful change in employment is shown in one of these concentrated employment sectors, additional investigation into the driving factor(s) is recommended. Changes in employment may be largely attributable to national or local market factors (for example, a decline in home construction nationally would reduce the demand for timber and decrease employment in the forestry sector or an increase in oil prices could lead to increased oil and gas development and higher employment in the mining sector). Alternately, observed changes in local employment in certain sectors may be attributable to BLM land management decisions, such as the authorization of a large development project that affects public land use.

It may also be relevant to consider changes in employment in industries that may not seem dependent on natural resources. For example, unlike other natural resource dependent industries, employment associated with recreation is not captured in a single economic sector. Instead, recreationists who spend money in hotels, restaurants, ski resorts, gift shops, and elsewhere support employment in retail trade; passenger transportation; arts, entertainment, and recreation; and accommodations and food sectors. If employment in one of these sectors has meaningfully changed, it may be appropriate to consider the possible link to changes in recreational use on BLM management lands.

When management decisions could impact employment in counties surrounding BLM managed lands, socioeconomic baseline reports should explain how local employment opportunities have changed over time.

# BLM Socioeconomic Profile

## Bakersfield Field Office

### Wages by Industry

Employment and Wages in 2021, Aggregated Region	Wage & Salary Employment	% of Total Wage & Salary Employment	Avg. Annual Wages (2022 \$s)	California Avg. Annual Wages (2022 \$s)
Total	1,514,062		\$57,216	\$92,600
Private	1,239,298	81.9%	\$53,894	\$93,366
Non-Services Related	389,801	25.7%	\$55,392	\$100,541
Natural Resources and Mining	205,873	13.6%	\$43,333	\$47,175
Agriculture, forestry, fishing & hunting	198,358	13.1%	\$40,898	\$44,005
Mining (incl. fossil fuels)	7,515	0.5%	\$107,593	\$125,640
Construction	72,945	4.8%	\$70,899	\$85,555
Manufacturing (Incl. forest products)	110,983	7.3%	\$67,570	\$128,782
Services Related	849,371	56.1%	\$53,184	\$91,817
Trade, Transportation, and Utilities	303,534	20.0%	\$54,392	\$68,309
Information	7,614	0.5%	\$87,273	\$271,325
Financial Activities	40,550	2.7%	\$75,474	\$154,908
Professional and Business Services	113,987	7.5%	\$60,865	\$124,497
Education and Health Services	224,462	14.8%	\$58,899	\$65,687
Leisure and Hospitality	124,203	8.2%	\$26,119	\$42,849
Other Services	35,011	2.3%	\$43,850	\$53,380
Unclassified	10	0.0%	\$56,125	\$60,089
Government	274,764	18.1%	\$72,203	\$87,944
Federal Government	28,494	1.9%	\$85,982	\$98,487
State Government	41,100	2.7%	\$77,394	\$100,607
Local Government	205,170	13.6%	\$69,249	\$82,707

Wages & Employment by Major Industry, Combined Counties, 2021



Based on data from the following source(s): U.S. Department of Labor. 2022. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Washington, D.C.

# BLM Socioeconomic Profile

## Bakersfield Field Office

### Wages by Industry

#### What is described in this section?

This section focuses on average annual wages by industry for wage and salary jobs in the aggregated region. It is important to note that the aggregated region is not broken out by county, whereas earlier industry and job numbers were given on a county by county basis. For this report, industries are separated into government and private sectors. Private sector industries are further classified as Non-Services Related or Services Related. The table shows:

**Wages and Salary Employment:** The number of filled jobs, whether full or part-time, temporary or permanent, by place of work. Major exclusions include self-employed workers, most agricultural workers on small farms, all members of the Armed Forces, elected officials in most states, most employees of railroads, some domestic workers, most student workers at schools, and employees of certain small nonprofit organizations.

**Percent of Total Employment:** The share of total wages and salary employment attributable to each sector.

**Average Annual Wages:** The average annual wage for each sector in the aggregated region (total annual wages and salaries divided by total wage and salary employment). Wages include bonuses, stock options, severance pay, profit distributions, cash value of meals and lodging, tips and other gratuities, and, in some states, employer contributions to certain deferred compensation plans such as 401(k) plans. Employer contributions to other benefits (such as health insurance and pensions) are not included.

These data are from the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW). Other sections of this report use different data that is from the BEA. BEA data are different because it includes proprietors, accounts for the value of benefits, and is summarized into slightly different industry categories.

Depending on the counties selected, some data may not be available due to disclosure restrictions that prevent the BLS from publishing identifiable information provided by respondents. Industry level totals for states and the U.S. include the undisclosed data suppressed at the county level.

#### Why is this relevant to the BLM?

While total employment is often used as a key economic indicator, it is also important to consider the wages associated with different types of jobs available in an area and how these jobs relate to BLM management decisions. This information can be particularly useful when evaluating a project on BLM-managed lands that is likely to affect specific industries.

Particularly in rural areas, some of the highest wage jobs are in the manufacturing and natural resource dependent industries (e.g., forestry, oil and gas drilling and support services, and mining) that are often associated public lands. Usually, these high wage industries employ fewer people than other sectors. Some services-related industries also offer high wages (e.g., information, financial activities, and professional and business services). Furthermore, even if the average wages for a given sector are relatively low, that sector may still be an important driver of the local economy if it supports a significant share of the total jobs in the area. Finally, wages provide a good counter-part to the per capita income figure. In some areas per capita income can be high (sometimes driven by a high proportion of non-labor income) while wages are low. A good indicator of an overall strong local economy is when both per capita income and wages are relatively high.

These data can provide a more complete picture of the effects of activities authorized on BLM-managed lands, especially when compared to the employment changes reported in the *Jobs by Industry* sections. For example, the BLM is analyzing the authorization of a new mine or a timber sale. Wage data for *Mining (incl. fossil fuels)* and *Agriculture, forestry, fishing & hunting* sectors, respectively, can provide useful baseline information for these likely affected sectors.

# BLM Socioeconomic Profile

Bakersfield Field Office

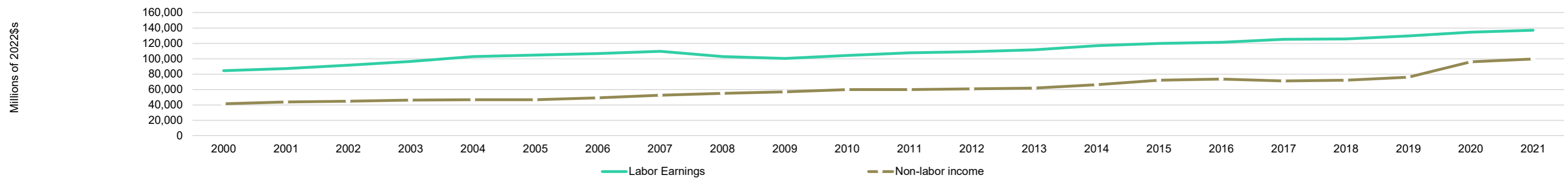
## Non-labor Income

Non-Labor Income in 2021	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
Personal Income (thous. of 2022 \$s)	49,263,405	14,410,885	31,268,934	56,289,716	7,877,717	45,551,191	24,723,338	7,155,123	236,540,309	3,246,678,643
Non-Labor Income	18,808,606	6,526,679	13,081,016	24,889,949	3,323,366	18,715,833	11,114,344	3,109,974	99,569,767	1,207,525,727
Dividends, Interest, Rent	5,231,869	1,569,073	3,968,015	6,911,794	935,942	5,244,796	2,716,614	919,210	27,497,312	577,729,741
Age-Related Transfer Payments	3,838,235	1,205,033	2,931,708	4,588,385	801,256	4,114,266	1,990,881	560,887	20,030,651	219,943,594
Hardship-Related Payments	6,954,641	2,652,310	4,151,128	9,710,358	1,023,507	6,157,209	4,623,186	1,073,276	36,345,615	273,502,448
Other Transfer Payments	2,783,862	1,100,263	2,030,166	3,679,412	562,661	3,199,562	1,783,663	556,602	15,696,190	136,349,945
Labor Earnings	30,454,799	7,884,206	18,187,918	31,399,767	4,554,350	26,835,358	13,608,995	4,045,149	136,970,542	2,039,152,916

### Percent of Total Personal Income

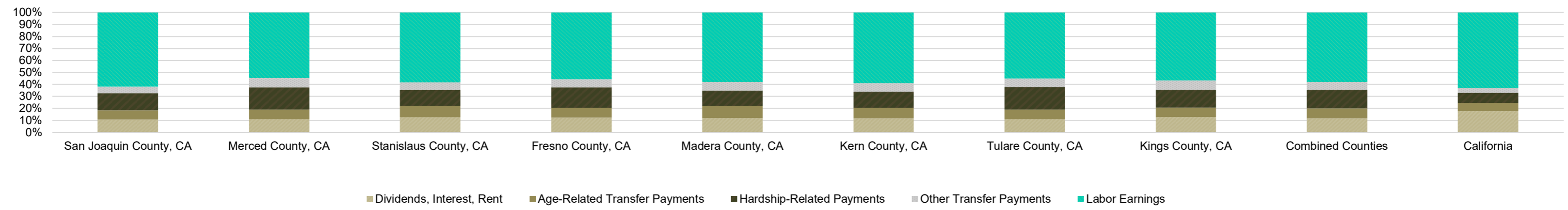
Non-Labor Income	38.2%	45.3%	41.8%	44.2%	42.2%	41.1%	45.0%	43.5%	42.1%	37.2%
Dividends, Interest, Rent	10.6%	10.9%	12.7%	12.3%	11.9%	11.5%	11.0%	12.8%	11.6%	17.8%
Age-Related Transfer Payments	7.8%	8.4%	9.4%	8.2%	10.2%	9.0%	8.1%	7.8%	8.5%	6.8%
Hardship-Related Payments	14.1%	18.4%	13.3%	17.3%	13.0%	13.5%	18.7%	15.0%	15.4%	8.4%
Other Transfer Payments	5.7%	7.6%	6.5%	6.5%	7.1%	7.0%	7.2%	7.8%	6.6%	4.2%
Labor Earnings	61.8%	54.7%	58.2%	55.8%	57.8%	58.9%	55.0%	56.5%	57.9%	62.8%

Components of Personal Income, Combined Counties



Non-labor income accounted for 53 percent of real personal income growth (\$110,776M) between 2000 and 2021.

Non-Labor & Labor Income, Percent of Total Personal Income, 2021



Based on data from the following source(s): U.S. Department of Commerce, 2022. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C.

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Data and Graphics | Section 6

### Non-labor Income

#### What is described in this section?

This section describes the components of non-labor income and how they have changed over time, as reported by the Bureau of Economic Analysis (BEA).

The table reports total personal income (by place of residence) for the most recent year available and divides this income into labor earnings (e.g., wages and salary, including benefits and proprietor's income) and non-labor income. Non-labor income includes:

**Dividends, Interest, and Rent:** This is generally considered to be income generated by investments.

**Age-Related Transfer Payments:** These include Medicare and Social Security benefits.

**Hardship-Related Transfer Payments:** These include Medicaid, Food Stamps (SNAP), Supplemental Security Income (SSI), Unemployment Insurance, and other income maintenance benefits.

**Other Transfer Payments:** These include all transfer payment not included in the other categories, including veterans' benefits, government-provided education and training subsidies, Workers' Compensation Insurance, railroad retirement and disability, and other government retirement and disability payments.

The line graph in the middle of the page shows the change in labor and non-labor income since 2000. The bar graph at the bottom of the page shows the relative contribution of each type of income to total personal income.

#### Why is this relevant to the BLM?

Non-labor income can represent a significant proportion of total personal income, particularly in rural areas and small cities – and the proportion has grown rapidly in many areas over the last three decades. Some populations may rely more on investment income, others on retirement benefits, and still others on welfare-related income streams.

A high proportion of non-labor income, and rapid growth in non-labor income that exceeds state or national averages, might indicate that a place is attractive to retirees. The in-migration of people who bring investment and retirement income with them is often associated with a high quality of life, good health care facilities, and affordable housing. Non-labor income can also be important to places with struggling economies, either as a source of income maintenance for the poor or as a more stable form of income in areas with declining industries and employment opportunities. Income maintenance payments can also be important to households living in seasonal recreation based economies. The natural amenities in these communities may support a high quality of life, but the high cost of living and limited employment opportunities during the off-season can make it difficult for some residents to maintain a stable life style. Sometimes non-labor income is a high percent of total personal income simply because labor income is small. This would be an indicator of hardship because of the lack of a robust labor market. In contrast, growth in both non-labor and labor income is generally seen as a sign of a strong local economy.

Non-labor income may be relevant to public land decisions because the data provide insight on the people that reside in the area. If investment income is significant and growing, understanding the role public lands play in attracting and retaining these types of individuals is relevant. If age-related transfer payments are significant and growing, it may be important to consider whether public land resources are meeting the needs of an aging population. If poverty-related transfer payments are significant and growing, it may be an indicator that environmental justice issues related to public lands management should be considered.

# BLM Socioeconomic Profile

Bakersfield Field Office

## Migration and Natural Population Change

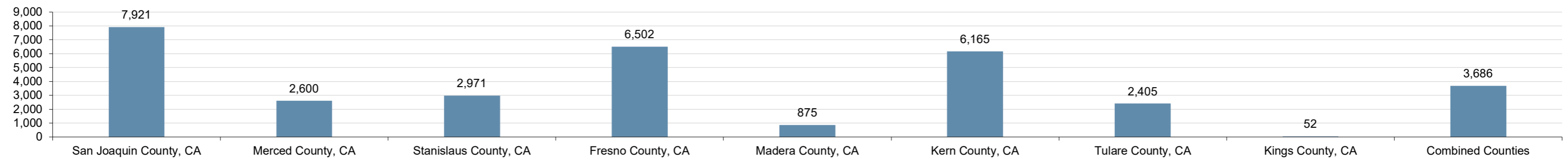
	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
Average Annual Population Change, 2010-2022	7,921	2,600	2,971	6,502	875	6,165	2,405	52	3,686	149,614
From Natural Change	4,348	2,285	3,159	7,973	1,090	7,277	4,137	1,429	3,962	206,228
From Net Migration	3,602	296	-187	-1,476	-216	-1,119	-1,756	-1,399	-282	-54,133
From Residual	-29	19	0	6	1	6	23	23	6	-2,482

### Factors Contributing to Population Change\*, 2010-2022

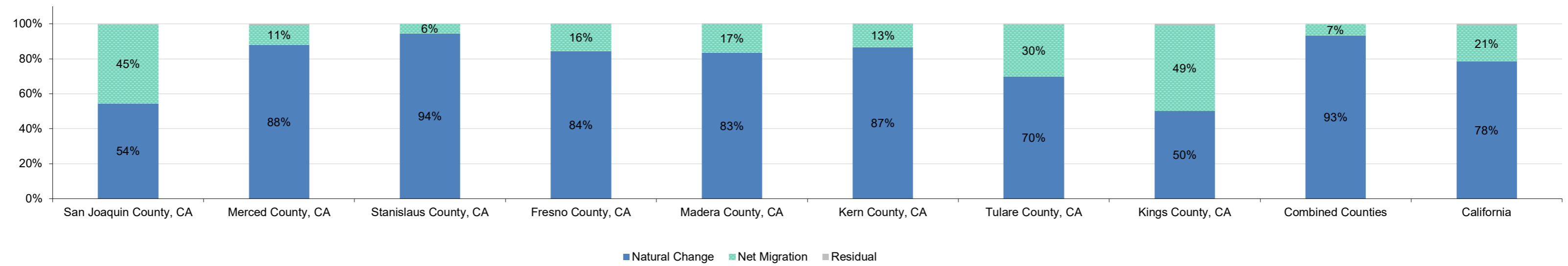
Natural Change	54.5%	87.9%	94.4%	84.3%	83.4%	86.6%	69.9%	50.1%	93.2%	78.5%
Net Migration	45.1%	11.4%	5.6%	15.6%	16.5%	13.3%	29.7%	49.1%	6.6%	20.6%
Residual	0.4%	0.7%	0.0%	0.1%	0.1%	0.1%	0.4%	0.8%	0.1%	0.9%

The residual is a minor statistical correction made by the U.S. Census, and represents change in the population that cannot be attributed to any specific demographic component of population change.

Average Annual Population Change, 2010-2022



Factors Contributing to Population Change\*, 2010-2022



\* The absolute value of the individual component of population change divided by the sum of the absolute values of the three components (natural change, net migration, and the residual).

Based on data from the following source(s): U.S. Department of Commerce, 2023. Census Bureau, Population Division, Washington, D.C.

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Data and Graphics | Section 7

## Migration and Natural Population Change

### What is described in this section?

This section reports average annual population change, and factors contributing to that change, from the U.S. Census Bureau's Population Estimates Program (PEP). Factors that affect population change include natural causes, such as births and deaths, and the migration of residents in or out of a geographic region. Overall population change is equal to the sum of natural change and migration. This includes migration by both international and domestic residents. These data represent the average annual change since 2000. Given the estimates are annualized it is possible that changes in certain years may differ in a meaningful way from the averages reported here.

The average annual population change is provided in both tabular and graphic form. The bottom graphic shows the relative role of natural change and net migration in the overall change in population. The percentages in the bottom graph convey the amount of overall population change that can be attributable to each factor.

The PEP makes a minor statistical correction called a "residual" to ensure state and county population estimates sum to the national total. The residual represents the change in the population that cannot be attributed to any specific demographic component of population change.

### Why is this relevant to the BLM?

Understanding a community and its sense of place includes considering if people are attracted to, or moving away, from it. Identifying population trends (i.e., population growth or decline), and the factors contributing to these changes over time, can provide a starting point. If an area has experienced substantial growth that is primarily attributable to in-migration, for example, this may be an indication that desirable jobs opportunities are increasing, that the area supports a high quality of life, or both. Similarly, if the population of an area is declining due to out-migration, it would be important to understand the potential reasons, such as the loss of employment opportunities in specific industries, youth leaving for education or new opportunities, or elderly people leaving for better medical facilities.

Recognizing how and why populations surrounding BLM-managed lands are changing can be relevant to a wide range of BLM management decisions. Decisions affecting job opportunities and the livelihoods of surrounding residents, recreation access and opportunities, scenic quality, or demands placed on public services and local infrastructure are just a few examples of management decisions that may have different implications depending on local population trends. If a BLM management decision could affect the factors that have been driving population change in recent years, then this information should be included in a socioeconomic baseline.

For more detailed information about demographics for a given area (including sub-county areas), create an EPS Demographics report at <https://headwaterseconomics.org/eps>.

# BLM Socioeconomic Profile

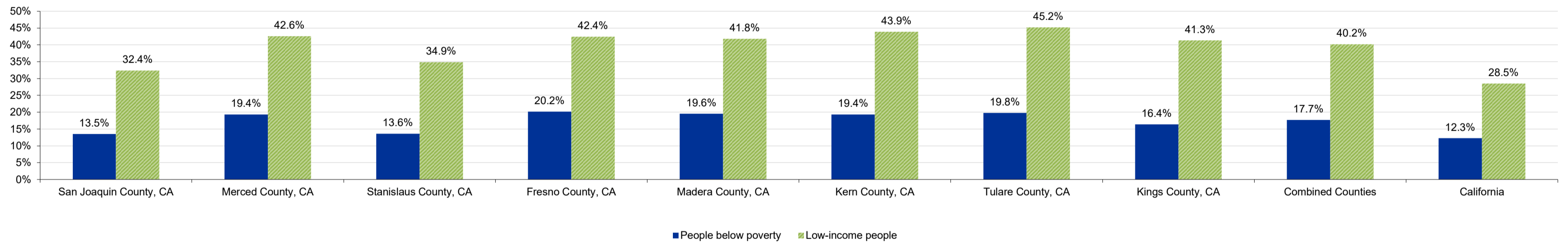
## Bakersfield Field Office

### Poverty (Identifying Environment Justice Populations)

Poverty, 2021*	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
People	753,690	272,659	546,308	985,123	147,824	874,826	464,801	137,175	4,182,406	38,701,352
Families	176,001	61,928	130,428	226,632	34,345	203,732	108,873	33,975	975,914	9,060,746
People below poverty	101,951	52,771	74,272	198,793	28,921	169,289	91,866	22,449	740,312	4,741,175
Families below poverty	18,516	10,093	13,882	36,437	5,019	31,709	17,845	4,672	138,173	791,378
Low-income people	244,100	116,189	190,474	417,878	61,831	384,229	210,036	56,686	1,681,423	11,040,032
<b>Percent of Total</b>										
People below poverty	13.5%	19.4%	13.6%	20.2%	19.6%	19.4%	19.8%	16.4%	17.7%	12.3%
Families below poverty	10.5%	16.3%	10.6%	16.1%	14.6%	15.6%	16.4%	13.8%	14.2%	8.7%
Low-income people	32.4%	42.6%	34.9%	42.4%	41.8%	43.9%	45.2%	41.3%	40.2%	28.5%

**High Reliability:** Data with coefficients of variation (CVs) < 12% are in black to indicate that the sampling error is relatively small.  
**Medium Reliability:** Data with CVs between 12 & 40% are in orange to indicate that the values should be interpreted with caution.  
**Low Reliability:** Data with CVs > 40% are displayed in red to indicate that the estimate is considered very unreliable.

Individuals & Families Below Poverty, 2021\*



\* ACS 5-year estimates used. The 2021 estimate is based on data collected between 2017 and 2021.

Based on data from the following source(s): U.S. Department of Commerce. 2022. Census Bureau, American Community Survey Office, Washington, D.C.

# BLM Socioeconomic Profile

## Bakersfield Field Office

### Poverty (Identifying Environment Justice Populations)

#### What is described in this section?

This section includes people and families living in poverty and low-income people as reported by the Census' American Community Survey (ACS) 5-year estimates. The Census Bureau uses a set of income thresholds that vary by family size and composition to define who is living in poverty. The BLM follows the EPA (<https://www.epa.gov/ejscreen/overview-socioeconomic-indicators-ejscreen>) in defining low-income individuals as those who live at or below 200% of the poverty threshold. For more information, see the BLM Environmental Justice Implementation IM (<https://www.blm.gov/policy/im2022-059>) and attachment.

The official definition of poverty uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps).

The Census Bureau defines a family as a group of two or more people who reside together and who are related by birth, marriage, or adoption. Families are identified based on responses to a census question on "relationship to the householder." If an individual or group of individuals (such as housemates) are not living with family members, their individual incomes are compared with their applicable individual poverty threshold.

Poverty and income status cannot be determined for people in institutional group quarters (i.e., correctional facilities, nursing homes, and mental hospitals), college dorms, military barracks, and living situations without conventional housing (excluding shelters). Additionally, poverty status cannot be determined for unrelated individuals under the age of 15 (i.e., foster children) because income questions are asked of people age 15 and older.

#### Why is this relevant to the BLM?

The BLM is required to identify low-income populations that may constitute environmental justice populations and to consider whether BLM management decisions may result in disproportionately high and adverse human health or environmental effects to these populations (see Executive Order 12898). The Presidential Memorandum released with E.O. 12898 directed all federal agencies to analyze environmental justice (EJ) as part of their NEPA reviews. The BLM Environmental Justice Implementation IM sets thresholds and minimum requirements for this EJ analysis.

A low-income population is either a group of individuals living in geographic proximity to one another, or a geographically dispersed/transient set of individuals (such as migrant workers or Native Americans) who experience common conditions of environmental exposure or effect. A location has a low-income population if 50% or more of its residents are low-income; the percentage of low-income residents is the same or higher than that of a reference area; or other data indicate a low-income population is present.

Because affordability factors into decisions about where to live and about what goods and services to purchase, households with limited financial resources have a lower capacity to reduce their exposure to health and environment hazards. Low-income households may also have different natural resource consumption patterns, relying more heavily on public lands for subsistence resources and uses such as hunting, fishing, gathering edible plants, and collecting forest products and materials to heat their homes. While some people engage in these activities for recreation, many low-income households depend on this harvesting to provide for themselves and their families. Low-income households are also more sensitive to fee increases for uses of public lands.

Low-income populations identified in this section could be affected by a BLM management decision. However, depending on the decision, it may be more appropriate to consider demographic data at the sub-county level. Furthermore, while these data help to identify the presence of a low-income population, further analysis is required to determine potential impacts to that population. This analysis will not identify low-income populations that are affected by a potential BLM decision but do not all live in the same place. For additional information and best practices on scale and content of EJ scoping and analysis, see the BLM EJ IM and attachment.

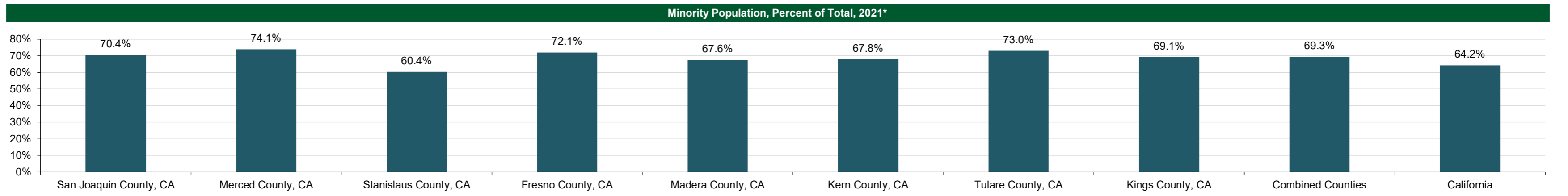
# BLM Socioeconomic Profile

Bakersfield Field Office

## Minorities (Identifying Environment Justice Populations)

Race and Ethnicity, 2021*	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
<b>Total Population</b>	771,406	279,150	550,842	1,003,150	156,304	905,644	470,999	151,887	4,289,382	39,455,353
White alone	358,383	128,897	356,790	544,633	85,946	564,183	279,500	86,371	2,404,703	20,553,732
Black or African American alone	53,843	8,057	16,361	45,282	4,645	48,741	7,835	10,019	194,783	2,233,258
American Indian alone	6,006	3,267	6,215	12,048	2,155	8,842	5,675	2,264	46,472	360,607
Asian alone	127,533	20,945	31,925	106,953	3,559	43,812	17,195	5,868	357,790	5,887,396
Native Hawaii & Other Pacific Is. alone	4,717	797	3,233	1,687	1,36	1,214	745	344	12,873	148,278
Some other race alone	91,957	93,978	62,746	159,057	42,360	124,568	95,442	28,637	698,745	6,036,865
Two or more races	128,967	23,209	73,572	133,490	17,503	114,284	64,607	18,384	574,016	4,235,217
Hispanic or Latino (of any race)	326,185	170,730	264,020	541,344	92,400	495,742	309,737	84,369	2,284,527	15,593,787
Not Hispanic or Latino	445,221	108,420	286,822	461,806	63,904	409,902	161,262	67,518	2,004,855	23,861,566
Not Hispanic & White alone	228,197	72,416	218,243	279,940	50,655	291,410	127,123	46,860	1,314,844	14,109,297
<b>Total Minority Population</b>	<b>543,209</b>	<b>206,734</b>	<b>332,599</b>	<b>723,210</b>	<b>105,649</b>	<b>614,234</b>	<b>343,876</b>	<b>105,027</b>	<b>2,974,538</b>	<b>25,346,056</b>
<b>Percent of Total</b>										
White alone	46.5%	46.2%	64.8%	54.3%	55.0%	62.3%	59.3%	56.9%	56.1%	52.1%
Black or African American alone	7.0%	2.9%	3.0%	4.5%	3.0%	5.4%	1.7%	6.6%	4.5%	5.7%
American Indian alone	0.8%	1.2%	1.1%	1.2%	1.4%	1.0%	1.2%	1.5%	1.1%	0.9%
Asian alone	16.5%	7.5%	5.8%	10.7%	2.3%	4.8%	3.7%	3.9%	8.3%	14.9%
Native Hawaii & Other Pacific Is. alone	0.6%	0.3%	0.6%	0.2%	0.1%	0.1%	0.2%	0.2%	0.3%	0.4%
Some other race alone	11.9%	33.7%	11.4%	15.9%	27.1%	13.8%	20.3%	18.9%	16.3%	15.3%
Two or more races	16.7%	8.3%	13.4%	13.3%	11.2%	12.6%	13.7%	12.1%	13.4%	10.7%
Hispanic or Latino (of any race)	42.3%	61.2%	47.9%	54.0%	59.1%	54.7%	65.8%	55.5%	53.3%	39.5%
Not Hispanic or Latino	57.7%	38.8%	52.1%	46.0%	40.9%	45.3%	34.2%	44.5%	46.7%	60.5%
Not Hispanic & White alone	29.6%	25.9%	39.6%	27.9%	32.4%	32.2%	27.0%	30.9%	30.7%	35.8%
<b>Total Minority Population</b>	<b>70.4%</b>	<b>74.1%</b>	<b>60.4%</b>	<b>72.1%</b>	<b>67.6%</b>	<b>67.8%</b>	<b>73.0%</b>	<b>69.1%</b>	<b>69.3%</b>	<b>64.2%</b>

**High Reliability** Data with coefficients of variation (CVs) < 12% are in black to indicate that the sampling error is relatively small.  
**Medium Reliability** Data with CVs between 12 & 40% are in orange to indicate that the values should be interpreted with caution.  
**Low Reliability** Data with CVs > 40% are displayed in red to indicate that the estimate is considered very unreliable.



\* ACS 5-year estimates used. The 2021 estimate is based on data collected between 2017 and 2021.

Based on data from the following source(s): U.S. Department of Commerce, 2022. Census Bureau, American Community Survey Office, Washington, D.C.

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## BLM Socioeconomic Profile

Bakersfield Field Office

### Minorities (Identifying Environment Justice Populations)

#### What is described in this section?

This section reports the size of minority populations as reported by the Census' ACS 5-year estimates.

**Race:** ACS respondents can self-identify race as "White," "Black or African American," "American Indian and Alaska Native," "Asian" and "Native Hawaiian or Other Pacific Islander".

**Some Other Race:** This includes all other responses not included above. Respondents providing write-in entries such as multiracial, mixed, interracial, or a Hispanic/Latino group (for example, Mexican, Puerto Rican, or Cuban) in the "Some other race" write-in space are included in this category.

**Two or More Races:** This includes people who either checked two or more race response check boxes, provided multiple write-in responses, or submitted some combination of check boxes and write-in responses.

**Ethnicity:** ACS respondents identify themselves as either Hispanic or Latino or Not Hispanic or Latino. The terms Hispanic and Latino are generally used to denote people living in the United States with cultural ties to Latin America or other Spanish speaking countries. Individuals self-identifying as having a Hispanic, Latino, or Spanish heritage can do so by selecting from categories listed on the Census questionnaire "Mexican, Mexican American, or Chicano;" "Puerto Rican;" "Cuban;" or "other Spanish, Hispanic, or Latino." People who identify as being of Spanish, Hispanic, or Latino culture can be of any race or combination of races.

For the purpose of environmental justice, the BLM defines a minority individual as a person whose race is not White or a person who is Hispanic or Latino (or both). Thus the **"Total Minority Population"** is calculated by subtracting those who identify as both "Not Hispanic or Latino" and "White alone" from "Total Population."

#### Why is this relevant to the BLM?

Understanding the values, beliefs, and attitudes of minority populations is important to public land managers working to meet the needs of the public, or when evaluating potentially adverse impacts on populations. Minority populations also have a higher likelihood of being exposed to health and environmental risks than non-minority populations.

The BLM is required to identify minority populations that may constitute environmental justice populations and to consider whether BLM management decisions may result in disproportionately high and adverse human health or environmental effects to these populations (see Executive Order 12898). The Presidential Memorandum released with E.O. 12898 directed all federal agencies to analyze environmental justice (EJ) as part of their NEPA reviews. The BLM Environmental Justice Implementation IM (<https://www.blm.gov/policy/im2022-059>) sets thresholds and minimum requirements for this EJ analysis. E.O. 12898 uses the terms "minority" and "low-income" to identify two sets of populations whose members have been regularly excluded from important decision-making processes in ways that adversely impact their health and environment and have created a disproportionate distribution of environmental amenities and burdens. The BLM uses the term "minority" in that context, while recognizing that it is often inaccurate demographically and hides significant differences between groups of people and their experiences.

The Council on Environmental Quality (CEQ) guidance on Environmental Justice states that minority EJ populations are considered to be present when (a) the minority population of the affected area exceeds 50% or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (typically the county or state). The BLM uses 110% as the threshold for meaningfully greater. For more detail, see the BLM EJ IM and attachment.

Minority EJ populations could be affected by a BLM management decision. Depending on the decision, it may be more appropriate to consider sub-county level data. Furthermore, while these data help identify the presence of a minority population, further analysis is required to determine potential impacts to that population. This analysis will not identify populations that are potentially affected by a BLM decision but do not all live in the same place.

# BLM Socioeconomic Profile

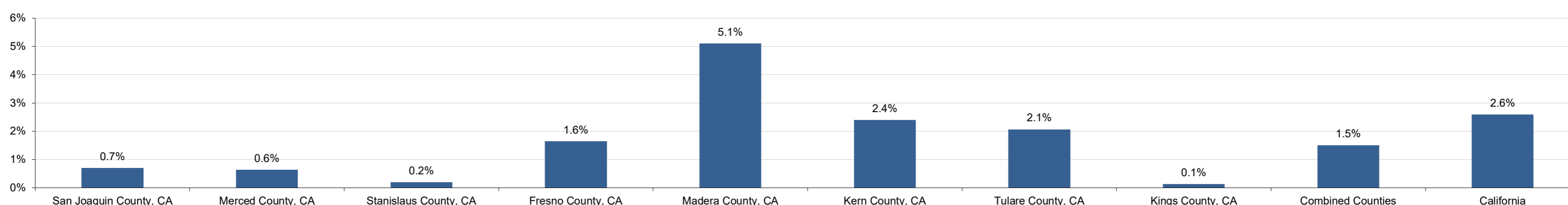
Bakersfield Field Office

## Other Socioeconomic Indicators

	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
<b>Unemployment</b>										
Avg. Annual Unemployment Rate, 2022	5.2%	7.7%	5.4%	6.4%	6.1%	6.9%	8.2%	7.0%	6.5%	4.2%
<b>Median Age</b>										
Median Age, 2010*	32.3	29.3	32.5	30.4	33.2	30.6	29.4	30.8	na	34.9
Median Age, 2021*	34.6	31.3	34.4	32.6	34.3	32.1	31.3	32.1	na	37.0
<b>Housing</b>										
Total Housing Units, 2021*	249,018	86,767	182,606	336,509	49,512	299,810	149,859	46,145	1,400,226	14,328,539
Occupied	94.2%	94.1%	95.9%	93.4%	88.0%	91.6%	93.2%	93.8%	93.3%	92.2%
Vacant	5.8%	5.9%	4.1%	6.6%	12.0%	8.4%	6.8%	6.2%	6.7%	7.8%
Seasonal, recreational, occasional	0.7%	0.6%	0.2%	1.6%	5.1%	2.4%	2.1%	0.1%	1.5%	2.6%
<b>Commuting</b>										
Workers 16 years and over, 2021*	314,888	103,796	227,453	403,192	56,553	346,503	181,690	55,733	1,689,808	18,283,118
Worked in county of residence	71.9%	68.6%	73.0%	91.0%	64.5%	93.4%	83.8%	75.2%	82.0%	83.5%
Mean travel time to work (minutes)	33	29	29	22	27	22	21	22	26	26
<b>Education</b>										
Total Population 25 yrs or older	488,393	165,461	348,982	619,376	98,573	552,243	278,465	94,259	2,645,752	26,797,070
Bachelor's degree or higher	19.5%	14.1%	17.9%	22.6%	16.4%	17.6%	15.2%	14.3%	18.5%	35.3%

**High Reliability:** Data with coefficients of variation (CVs) < 12% are in black to indicate that the sampling error is relatively small.  
**Medium Reliability:** Data with CVs between 12 & 40% are in orange to indicate that the values should be interpreted with caution.  
**Low Reliability:** Data with CVs > 40% are displayed in red to indicate that the estimate is considered very unreliable.

Seasonal, Recreational Housing, 2021\*



\* ACS 5-year estimates used. The 2021 estimate is based on data collected between 2017 and 2021.

Based on data from the following source(s): U.S. Department of Labor, 2023. Bureau of Labor Statistics, Local Area Unemployment Statistics, Washington, D.C.; U.S. Department of Commerce, 2022. Census Bureau, American Community Survey Office, Washington, D.C.

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Data and Graphics | Section 10

## Other Socioeconomic Indicators

### What is described in this section?

This section summarizes additional indicators that can provide insight into the socioeconomic characteristics of an area and that may be relevant to BLM management decisions.

Annual **unemployment rate** is reported for the most recent year. The Bureau of Labor Statistics estimates this rate by dividing the number of people who are jobless, looking for jobs, and available for work by the size of the labor force. Only persons 16 years and over in the civilian non-institutional population are included in this statistic.

Four additional topics from Census Bureau's American Community Survey (ACS) 5-year estimates are provided.

**Median Age:** The age that divides the population (including those who live in group quarters) into two numerically equal groups (i.e., half the people are younger than this age and half are older).

**Housing:** A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied as separate living quarters (or, if vacant, intended for occupancy). Group quarters such as college residence halls, nursing facilities, military barracks, and correctional facilities are not included in housing unit counts. Vacant units classified as "Seasonal, Recreational, or Occasional Use" refers to units used, or intended for use, only in certain seasons or for weekends or other occasional use throughout the year.

**Commuting:** Includes individuals 16 years and older that worked during the prior week by county of residence. For these workers, the percent that worked in that county as well as mean travel time are summarized.

**Education:** Population count of those 25 years or older (including the group quarters population) and the proportion of that population that has completed a bachelor's degree or higher.

### Why is this relevant to the BLM?

These indicators are used to provide context about an area that may be affected by public land management decisions.

The rate of unemployment provides information on the strength of the local economy and the availability of workers. This baseline indicator is useful for understanding potential impacts of BLM decisions that could affect economic activity and employment opportunities. Note that this statistic does not include discouraged workers who are unemployed but not looking for work because few opportunities for paid employment exist, as is the case in many remote Alaska villages, for example.

The other four topics in this section provide insight into the types of communities surrounding BLM-administered land and how the area may be affected by BLM project-level decisions. For example, a relatively high or low median age may be an indication of a certain type of community (for example, retirement or university towns). Similarly, high vacancy rates due to seasonal, recreational, or occasional use (i.e., "second homes") often indicate the desirability of a place for recreation and tourism. Information on vacancy rates and commuting patterns can be useful for evaluating potential impacts associated with BLM project-level decisions. Areas with low vacancy rates could struggle to accommodate any population influxes connected with new projects on BLM managed land. High in-commuting rates may indicate the presence of a "bedroom" community in an adjacent county and/or the presence of a regional service center. This scenario can separate tax revenues from demands for services, complicating fiscal planning for local governments. Education is often correlated with the capacity and resiliency of a community and its ability to respond to potential changes in the local economy.

# BLM Socioeconomic Profile

Bakersfield Field Office

## Federal Land Payments by Geography of Origin

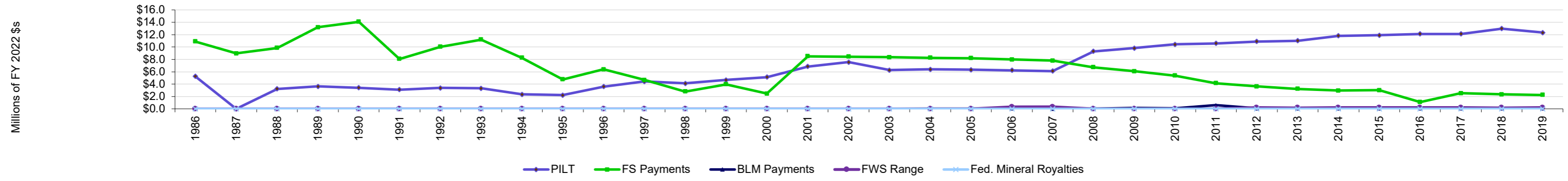
	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
Total Federal Land Payments to State and Local Gov., FY 2019 (FY 2022 \$)	7,397	195,949	67,319	4,756,860	1,794,691	3,534,888	4,445,666	29,688	14,832,459	162,602,480
PILT	7,002	110,607	10,279	3,590,025	1,330,491	3,289,273	3,979,296	26,392	12,343,364	58,505,692
Forest Service Payments	0	0	0	1,144,701	463,279	180,217	452,089	0	2,240,286	32,099,871
BLM Payments	0	450	18	22,135	921	32,276	2,787	3,296	61,883	17,463,964
USFWS Refuge Payments	395	84,892	57,023	0	0	33,121	11,494	0	186,925	1,075,339
Federal Mineral Revenue Payments	0	0	0	0	0	0	0	0	0	53,457,613

### Percent of Total

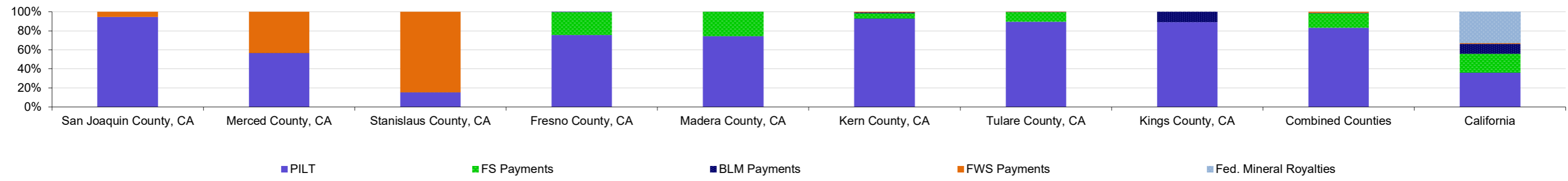
	San Joaquin County, CA	Merced County, CA	Stanislaus County, CA	Fresno County, CA	Madera County, CA	Kern County, CA	Tulare County, CA	Kings County, CA	Combined Counties	California
PILT	94.7%	56.4%	15.3%	75.5%	74.1%	93.1%	89.5%	88.9%	83.2%	36.0%
Forest Service Payments	0.0%	0.0%	0.0%	24.1%	25.8%	5.1%	10.2%	0.0%	15.1%	19.7%
BLM Payments	0.0%	0.2%	0.0%	0.5%	0.1%	0.9%	0.1%	11.1%	0.4%	10.7%
USFWS Refuge Payments	5.3%	43.3%	84.7%	0.0%	0.0%	0.9%	0.3%	0.0%	1.3%	0.7%
Federal Mineral Revenue Payments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	32.9%

This page shows payments disbursed directly to state and local governments. States may share a portion of their payments with counties. These state "pass through" disbursements are not reported here. For more information see [https://headwaterseconomics.org/wp-content/uploads/EPS\\_Federal\\_Land\\_Payments\\_Documentation.pdf](https://headwaterseconomics.org/wp-content/uploads/EPS_Federal_Land_Payments_Documentation.pdf).

Components of Federal Land Payments per Fiscal Year, Combined Counties



Components of Federal Land Payments, FY 2019, Combined Counties



Based on data from the following source(s): U.S. Department of Interior. 2020. Payments in Lieu of Taxes (PILT), Washington, D.C.; U.S. Department of Agriculture. 2020. Forest Service, Washington, D.C.; U.S. Department of Interior. 2018. Bureau of Land Management, Washington, D.C.; U.S. Department of Interior. 2020. U.S. Fish and Wildlife Service, Washington, D.C.; U.S. Department of Interior. 2020. Office of Natural Resources Revenue, Washington, D.C.

## BLM Socioeconomic Profile

Bakersfield Field Office

### Federal Land Payments by Geography of Origin

#### What is described in this section?

This section describes federal payments made to compensate state and local governments for non-taxable federal lands within their borders. Payments are funded by federal appropriations (e.g., Payments in Lieu of Taxes (PILT) and Secure Rural School programs) and from receipts received by federal agencies from activities on federal public lands (e.g., timber, grazing, and minerals). Some payments are made to state governments while others are made directly to the counties. For payments made to states, some funds may be passed on to the county of origin, but this process differs across states. The table reports both the total payments received and the share of each payment type for the fiscal year (Oct. 1 – Sept. 30) available. The five components of federal payments include:

**PILT:** These payments compensate county governments for non-taxable federal lands within their borders. PILT payments are calculated by the Department of Interior based on a complex formula that factors in a county's population, revenue sharing payments it receives under other laws, and the amount of Federal land within the affected county. PILT payments are subject to a population cap and are affected by congressional appropriations. See: <https://www.doi.gov/pilt>.

**Forest Service Payments:** These payments are based on USFS receipts and must be used for county roads and local schools. They include the 25% Fund, the Secure Rural Schools and Community Self-Determination Act, and the Bankhead-Jones Farm Tenant Act.

**BLM Payments:** These payments are based on a portion of receipts generated on BLM-administered lands, including grazing fees collected under the Taylor Grazing Act and timber receipts generated on Oregon and California Railroad Revested (O&C) grant lands. BLM also makes payments to counties with O&C lands under the Secure Rural Schools and Community Self-Determination Act. See Table 3-30 in BLM's Public Land Statistics for more information (<https://www.blm.gov/about/data/public-land-statistics>).

**USFWS Refuge Payments:** These payments are equal to a portion of receipts collected from activities on National Wildlife Refuges, a percentage of the market value of the land, or a minimum per acre amount, whichever is greater. USFWS payments are paid directly to the counties where USFWS lands are located.

**Federal Mineral Royalties, Bonus Bids, and Rents:** The U.S. Office of Natural Resources Revenue (ONRR) collects revenues associated with federal "leasable" minerals (i.e., oil, natural gas, coal, and certain non-energy solid minerals) and geothermal energy. These revenues include lease sale revenues (i.e., bonus bids, fees, and first year's rent), annual rents on mineral leases, and production royalties. ONRR distributes 49% of the revenues collected back to the [state of origin](#). The exception is revenues associated with geothermal leasing and production, which are paid directly to counties.

Government distributions of federal land payments may be underreported for counties due to data limitations from USFWS, ONRR, and some states that make discretionary distributions of mineral payments and some BLM payments. As noted above, federal mineral payments are largely distributed to states. States' distributions of these revenues to counties are not tracked in this report.

#### Why is this relevant to the BLM?

These programs can represent a significant portion of local government revenue in rural counties with large federal land holdings.

These data can be used to describe the potential fiscal impact of changes in authorized activities on BLM-managed lands or changes in land ownership. For example, BLM decisions related to land exchange, disposal, or acquisition have implications on PILT payments (and also state and local property taxes). Furthermore, exploring the proportion of total annual county revenues provided by PILT payments offers insight into the importance of this revenue stream for the county.

Data Sources: U.S. Department of Interior. 2020. Payments in Lieu of Taxes (PILT). , Washington, D.C.; U.S. Department of Agriculture. 2020. Forest Service. , Washington, D.C.; U.S. Department of Interior. 2018. Bureau of Land Management. , Washington, D.C.; U.S. Department of Interior. 2020. U.S. Fish and Wildlife Service. , Washington, D.C.; U.S. Department of Interior. 2020. Office of Natural Resources Revenue. , Washington, D.C.; reported by Headwaters Economics' Populations at Risk, [headwaterseconomics.org/eps](http://headwaterseconomics.org/eps).

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Study Guide | Section 11

# BLM Socioeconomic Profile

## Bakersfield Field Office

### Additional Resources

#### What is the BLM Socioeconomic Profile (SEP) Tool?

The SEP tool relies largely on federal data published by the Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS), and Census Bureau (Census). The advantages of these sources include complete U.S. coverage, annual updates, and consistent methodologies across time and space. Below are links to the programs that collect and manage the data used in this report.

- **Census**

This report includes data from two Census programs. Population counts often differ between the programs due to different methods and reporting periods.

Population Estimates Program  
<https://www.census.gov/programs-surveys/popest.html>  
American Community Survey  
<https://www.census.gov/programs-surveys/acs>

- **BEA**

Regional Economic Accounts  
<https://www.bea.gov/data/economic-accounts/regional>  
Methodologies and definitions (in particular, see Local Area Personal Income)  
<https://www.bea.gov/resources/methodologies>

- **BLS**

Quarterly Census of Employment and Wages (QCEW)  
<https://www.bls.gov/cew/>  
Local Area Unemployment Statistics  
<https://www.bls.gov/lau/>

#### Economic Profile System (EPS)

The 14 reports available through EPS provide easy access to more detailed information on demographics, economics, and land use. Of particular note are the demographic and industry-specific reports.

EPS's Agriculture report can provide additional perspective on the farm sector within a given area, such as the number of farms by crop and livestock type, farm business income and expenses, and wage and employment by farm type. This information can be useful, for example, when the BLM is evaluating a management decision that could affect livestock grazing. The Mining (including Oil & Gas) report provides additional detail on employment, income, and wages associated with different types of mineral activities in a given area. The Timber and Tourism reports are other EPS industry reports with additional information related to specific activities occurring on BLM-managed lands. The EPS Demographics report provides sub-county data such as demographics for cities, towns, and places.

#### Other Resources

There are numerous other sources of economic, demographic, and social data that could supplement the information available in the SEP and EPS reports. Examples include:

- Other government sources such as the Energy Information Administration and USDA's Census of Agriculture.
- State and local sources that may have data available that either fills in gaps or provides more accuracy at small geographic scales. Such sources of data include state and local employment departments, city and county governments (e.g., building departments, departments of motor vehicles, or county tax assessors), local and state Chambers of Commerce, and local and state economic development commissions. As noted in the *Federal Land Payments by Geography of Origin* section, the ONRR distributes 49% of the collected federal mineral revenues back to the state of origin (with the exception of revenues associated with geothermal leases). Federal mineral payments can represent significant revenues for counties. Because these reports do not track for how states distribute federal mineral revenues to counties, additional research should be conducted for areas with high leasable mineral production from public lands. Reviewing state and county budgets, or contacting these entities, can provide the information and data needed to understand these revenue streams.
- Other secondary data sources including industry associations or advocacy groups and academic literature.