



U.S. Department of the Interior  
Bureau of Land Management

# Environmental Assessment

## Snowy River CO<sub>2</sub> Sequestration Project ePlanning NEPA Number DOI-BLM-MT-C020-2023-0070-EA February 2024

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# Table of Contents

1	Introduction.....	4
2	Alternatives.....	15
3	Affected Environment and Environmental Consequences .....	23
4	Consultation and Coordination .....	69
5	List of Appendices .....	73

## Figures

Figure 1-1	Snowy River CO2 Sequestration Project Details.....	6
Figure 2-1	Project Sequence .....	17
Figure 3-1	MDEQ Air Quality Monitoring Stations and Class I Areas.....	25
Figure 3-2	Visibility Trends at Northern Cheyenne (NOCH1) IMPROVE Monitor .....	27
Figure 3-3	Population Changes from the USGS’s TAWS Report for Sage-Grouse Cluster D-021 Compared to Neighboring Clusters on Short (using data from 2002 to 2022) and Recent (using only data from 2014-2022) Temporal Scales (Coates et al. 2023).....	56
Figure 3-4	Overall Montana Sage-Grouse Population Estimates from 2002 to 2022 (MTFWP 2022).....	58

## Tables

Table 2-1	Proposed ROW Surface Elements on BLM-Administered Lands.....	15
Table 2-2	Pipeline Construction and Operation Requirements (acres).....	19
Table 2-3	Well Pad Construction and Operation Requirements (acres).....	20
Table 2-4	Access Road Permanent ROW Requirements .....	20
Table 2-5	Pump Station Permanent ROW Requirements (acres) .....	21
Table 2-6	North Electric Transmission Line Corridor .....	22
Table 3-1	Criteria Pollutant Ambient Background Concentrations 2020-2022.....	26
Table 3-2	Global Warming Potentials and Atmospheric Lifetimes.....	30
Table 3-3	Criteria Air Pollutants and HAP Emissions from Construction Activities.....	35
Table 3-4	Operational and Monitoring Emissions (U.S. Tons Per Year) .....	36
Table 3-5	Greenhouse Gas Emissions from Construction Activities (U.S. Tons per group).....	37
Table 3-6	Greenhouse Gas Emissions from Operational and Monitoring Activities .....	38
Table 3-7	Greenhouse Gas Emission Scaled Comparisons (Million Tons CO <sub>2</sub> e annually [rounded]).....	38
Table 3-8	Net Greenhouse Gas Emissions (U.S. Tons CO <sub>2</sub> e Annually).....	39
Table 3-9	Greenhouse Gas Equivalencies .....	41
Table 3-10	Present Value of Estimated SC-GHG for GHG Emissions Associated with the Proposed Project over a 30-year lifespan.....	43
Table 3-11	Eligible Properties within the Physical Area of Potential Effects .....	44
Table 3-12	Demographic Profile of Carter and Fallon Counties, Montana .....	46
Table 3-13	Housing Characteristics of Carter and Fallon Counties, Montana .....	47

Table 3-14 Project Workforce.....	49
Table 3-15 Average Sage-Grouse Male Attendance at CA Leks .....	57
Table 3-16 Reports of WNV in Carter County and Surrounding Counties using CDC (2023) Reports ...	59
Table 3-17 Temperature Departure from Normal by Month from 2017 to 2022 in Fahrenheit Using NOAA (n.d.a) Historical Data.....	60
Table 3-18 Precipitation Departure from Normal by Month from 2017 to 2022 in Inches using NOAA (n.d.a) Historical Data .....	61
Table 3-19 Distances (in miles) from a Lek to the Closest Structure/Activity Type.....	64

## **Appendices**

Appendix A – List of Document Preparers / Reviewers

Appendix B – Acronyms and Abbreviations

Appendix C – List of References

Appendix D – Sound Level Contours Figure

Appendix E – Air Quality Analysis Calculations

# 1 Introduction

## 1.0 Background

Geologic sequestration is the long-term containment of supercritical carbon dioxide (CO<sub>2</sub>) into subsurface geologic formations. The goal of geologic sequestration of CO<sub>2</sub> is to trap CO<sub>2</sub> emitted from stationary anthropogenic sources permanently underground with the ultimate goal to reduce emissions of greenhouse gases (GHGs) from these sources into the atmosphere. CO<sub>2</sub> for sequestration is first captured from a large stationary source, such as a coal-fired power plant or chemical production facility or through a direct air capture facility. Although CO<sub>2</sub> is initially captured as a gas, it is compressed into a supercritical fluid—a relatively dense fluid intermediate to a gas and a liquid. The CO<sub>2</sub> is injected through specially designed wells into deep geologic formations. These formations include, for example, large deep saline reservoirs (underground basins containing salty fluids) and oil and gas reservoirs no longer in production. Formations are selected based on geologic characteristics indicating that they can safely contain the CO<sub>2</sub> for long-term storage. Impermeable rocks above the target reservoir, , keep the CO<sub>2</sub> in a supercritical fluid state and prevent migration into shallower groundwater or into other formations.

Under the Safe Drinking Water Act (SDWA), the U.S. Environmental Protection Agency (EPA), is tasked with protecting public health by regulating and overseeing the nation’s public drinking water supplies. The SDWA provides authorities for regulating underground injection of fluids and serves as the framework for regulation of geologic sequestration of CO<sub>2</sub>. In 1980, EPA promulgated regulations for Underground Injection Control (UIC) Classes I to V to protect underground sources of drinking water by preventing injection wells from contaminating underground sources of drinking water (40 CFR Parts 144-148). In 2010, EPA published a final rule that revised the UIC Program to include geologic sequestration of CO<sub>2</sub> for long-term storage and established UIC Class VI, a new class of wells solely for geologic sequestration of CO<sub>2</sub> (76 FR 56982). Well performance standards and other requirements established in the UIC Class VI Rule are based on the distinctive features of CO<sub>2</sub> injection compared to other types of injection. These requirements are the most rigorous of the UIC Program. They include performance standards for well construction, operation and maintenance, monitoring and testing, reporting and recordkeeping, site closure, financial responsibility, emergency response, plugging, and post-injection site care.

UIC Class VI projects are subject to applicable permits for use and access of federal, state, county, and/or private lands and associated pore space. This Environmental Assessment (EA) will address the review of the proposed Bureau of Land Management (BLM) Rights-of-Way (ROW), pursuant to 43 CFR 2800 and Title V of the Federal Land Policy and Management Act of 1976 (FLPMA), as amended, for use of public lands for a UIC Class VI operation in Carter County, Montana.

### 1.1 Summary of Proposed Project

Denbury Carbon Solutions, LLC, a wholly owned subsidiary of Denbury Inc. (collectively, Denbury) proposes to construct the Snowy River CO<sub>2</sub> Sequestration Project (Project) in Carter County, Montana on lands managed by the BLM, the State of Montana (Montana Department of Natural Resources and Conservation, Trust Land Management Division), and on lands that are privately owned. On November 18, 2021, Denbury submitted an SF-299 Application for

Transportation and Utility Systems and Facilities on Federal Lands (SF-299). The SF-299 requested ROWs for a 30 year-term for the construction and operation of the following elements on BLM-administered lands: access roads, well pads, main bulklines (i.e., main supply pipelines), flowlines (i.e., branch supply pipelines), pump stations and offices, and for use of federal underground pore space to sequester CO<sub>2</sub>. Denbury estimates injecting approximately 150 million tons of CO<sub>2</sub> over the course of 20 years. This is equivalent to annual GHG emissions from more than 1.6 million cars. The proposed well pads would be used to operate UIC Class VI injection wells that would inject CO<sub>2</sub> from the existing Denbury Cedar Creek Anticline (CCA) Pipeline, which is a 105-mile pipeline transporting CO<sub>2</sub> from the Bell Creek Oilfield in Powder River County, Montana, to the CCA Enhanced Oil Recovery unit development in Fallon County, Montana. The permitting of the UIC Class VI injection wells would be under a separate review and authorization by the EPA Region 8. The proposed Project elements and existing CO<sub>2</sub> pipeline are shown in Figure 1-1.

On September 8, 2023, Denbury submitted a Plan of Development (POD) to support its SF-299 application. The POD outlines the construction procedures, environmental requirements, site-specific Project plans, and design features that would be implemented by Denbury during the construction, operation, and reclamation stages of the Project to mitigate environmental impacts. The Project POD (Denbury 2023), including details of related resource plans and protection measures, is available on the Project's BLM ePlanning website (<https://eplanning.blm.gov/eplanning-ui/project/2026556/510>).

## 1.2 Purpose and Need

The purpose and need for the BLM is to respond to the SF-299 application submitted by Denbury to construct, operate, maintain, and terminate the following elements: access roads, well pads, bulklines, flowlines, pump stations and offices, and for use of federal underground pore space to sequester CO<sub>2</sub> in Carter County, Montana.



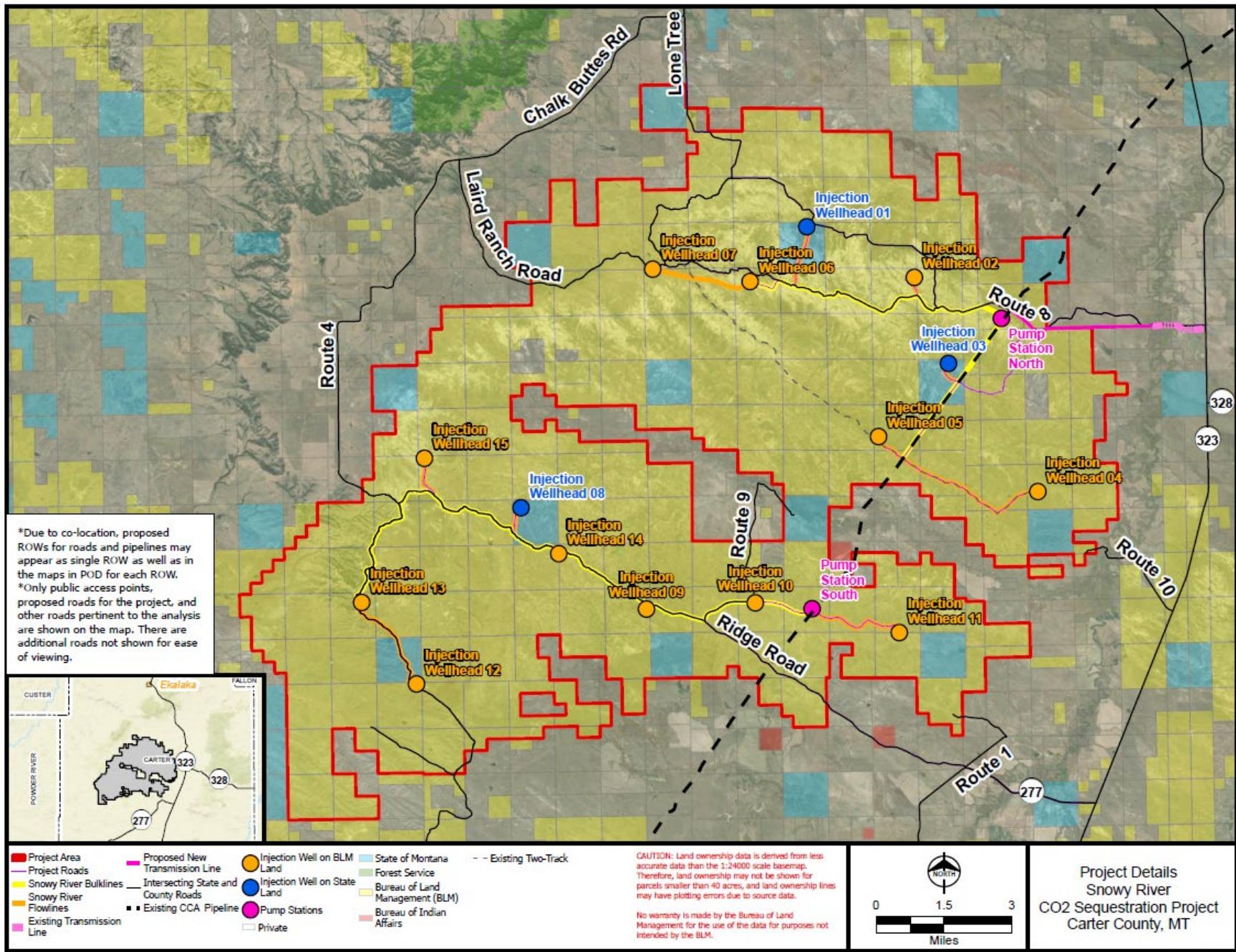


Figure 1-1 Snowy River CO<sub>2</sub> Sequestration Project Details

### 1.3 Decision to be Made

The BLM would determine whether to approve the SF-299 application and associated POD for the proposed action and, if so, with what stipulations to the short-term and long-term ROW grants.

### 1.4 Land Use Plan Conformance

The proposed action is in accordance with the decisions contained in the 2015 Miles City Field Office (MCFO) Record of Decision (ROD) and approved Resource Management Plan (RMP). The proposed action would be located within greater sage-grouse (*Centrocercus urophasianus*) Priority Habitat Management Area (PHMA). In the 2015 MCFO RMP, PHMAs are listed as avoidance areas for major and minor ROWs (Management Decision 3 on pages 2-9 and 2-10). Chapter 6 of the 2015 MCFO RMP defines avoidance areas as “Areas with sensitive resource values in which ROWs and surface disturbing and disruptive activities would be strongly discouraged. ROW avoidance areas are to be avoided but may be available for location of ROWs with special stipulations / mitigation.” Although the proposed action would be in a PHMA, this proposed action is in compliance with BLM sage-grouse management decisions based on Denbury’s implementation of avoidance measures and adherence to stipulations and mitigation requirements.

The State of Montana established the Montana Sage Grouse Habitat Conservation Program in 2014 with the objective of sustaining viable sage-grouse populations and conserving habitat. In 2015, the *Executive Order Amending and Providing for Implementation of the Montana Sage Grouse Conservation Strategy* (EO 12-2015) was issued to clarify aspects of the program. The BLM has formally adopted and implemented the state’s approach to analyzing disturbance as outlined in EO 12-2015 Attachments D (*Stipulations for Uses and Activities*) and H (*Definitions*). Section 3.5 discusses the results of the analysis that was completed using Montana Sage Grouse Habitat Conservation Program tools and describes the avoidance, minimization, and mitigation measures that Denbury would implement for the Project.

### 1.5 Relationship to Statutes, Regulations, Other NEPA Documents

The Project crosses federal, state, and private land and is subject to federal, state, and local permit requirements. Denbury would comply with applicable federal, state, and local laws, plans, and permits required for the proposed action. See Table 2-11 in the POD for a list of the federal, state, and local permits and/or approvals required prior to construction and operation of the proposed action. The BLM ROW grants would be issued pursuant to 43 CFR 2800 and Title V of the FLPMA, as amended. The ROW grants would be subject to the terms and conditions in 43 CFR 2800, the terms and conditions and stipulations specified, and mitigations set forth in the application and POD. Denbury requested a ROW term for a period of 30 years (renewable).

Coordination with regulatory agencies is summarized in Chapter 4 of this EA.

### 1.6 Issues Identified for Analysis

Site-specific resource concerns were identified by the BLM during its review of the POD and consideration of substantive scoping comments. The BLM focuses its analysis on issues that are

truly significant to the action in question. Issues have a cause-effect relationship with the proposed action, are within the scope of analysis, and are amenable to scientific analysis. The issues and resources considered for the proposed action and the rationales for continued analysis of the resources are discussed below.

### *1.6.1 Issue 1. Air Resources and Climate Change*

- a) What are the potential impacts to air resources from the estimated magnitude of criteria pollutants, volatile organic compounds (VOCs), hazardous air pollutants (HAPs) from Project construction, operations, and reclamation activities?
- b) What are the potential impacts to air resources from the estimated amount of GHGs from drilling, construction, reclamation, and operations (pumps/facilities) as well as the social cost of greenhouse gases (SC-GHG) and impacts from the cumulative CO<sub>2</sub> being sequestered?

### *1.6.2 Issue 2. Cultural Resources*

- a) What is the proposed action's effect to Historic Properties within the Area of Potential Effects (APE)?
- b) How would the Chalk Buttes Traditional Cultural Property (TCP) be affected by the proposed action? Would the effects be significant?

### *1.6.3 Issue 3. Socioeconomics*

- a) What are the potential impacts to local social and economic conditions that may include changes in population and housing; community facilities and public services; employment and tax revenues; land use, transportation routes, and property access; and economic analysis for the proposed action?
- b) Are any adverse impacts disproportionately falling on an environmental justice community?

### *1.6.4 Issue 4. Wildlife (Sage-Grouse and Sage-Grouse Habitat)*

- a) What are the potential impacts to greater sage-grouse populations and associated habitat from construction, reclamation, and operation activities from the proposed ROWs as a result of the deviations from the 5 percent disturbance cap and U.S Geological Survey (USGS) conservation buffers?

## **1.7 Issues Identified but Eliminated from Further Analysis**

The following resources were determined to not be present within or adjacent to the proposed action area and were therefore excluded from further analysis: Areas of Critical Environmental Concern; Backcountry Conservation Areas; 100-year floodplains; source water protection areas, municipal water sources, forestry resources and woodland products; lands with wilderness characteristics; special status species plants; wild horses and burros; Wild and Scenic Rivers; and Wilderness and Wilderness Study Areas.

In addition, the BLM determined that several resources are present within the proposed action area but would not be affected to a degree that detailed analyses are required at this time. Based



on the rationales described below and the design features discussed in Chapter 2 and the POD, the BLM determined that impacts to these resources do not require further evaluation.

### *1.7.1 Public Access, Permitted Uses, and Safety*

The proposed action would not result in changes to existing access to public lands and would have minimal disruptions to permitted uses in the area. Denbury would implement a traffic management plan for all Project stages, and proposed Project activities would not occur on a continuous basis. Construction, drilling, operations, maintenance, and reclamation activities would take place in a phased approach over a 20-year period. During injection, operation, and maintenance activities, Denbury proposes to restrict traffic to one vehicle for well inspections between the hours of 8:00 a.m. and 7:00 p.m.

The Project would use approximately 25 miles of existing developed roads (Lone Tree Road, Ridge Road, and Hammond Road) and 27 miles of existing two-track roads. Fourteen miles of the existing developed roads and 25 miles of existing two-track roads are on BLM-administered lands. Existing roads would be maintained in their existing condition; no grading or improvements are proposed. Weed-free mats would be used to facilitate access of construction equipment and drill rigs during wet weather. County road agreements for road maintenance and bonding for surface disturbances for the life the Project would be in place prior to county road use.

Approximately five miles of new access roads (four miles on BLM-administered lands) would be created. Three miles would be spurs off existing roads that end at wells or pump stations, and two miles would extend along the existing CCA pipeline corridor. Except for a 0.25-mile road that would be graded and graveled for access to the Pump Station North, each new road would be maintained as a two-track road. New roads would not create access to currently inaccessible public lands; existing roads already provide public access in the area.

Existing hard-surfaced roads used would be maintained in an operable condition to allow access for the public and/or landowners. If temporary lane or road closures are required for public safety, Denbury would coordinate with the appropriate agency (BLM, Carter County, Montana Department of Transportation, etc.) and emergency response organizations to minimize traffic disruptions. Denbury would implement a traffic plan that addresses public safety, traffic control, and access to minimize traffic disruptions.

There are five hunting outfitters with special recreation permits within the Project area. The proposed construction, drilling, operations, maintenance, and reclamation activities would take place in a phased approach over a 20-year period and would predominately be outside of the prime hunting season for the five permits, resulting in minimal disruption to hunting activities. As noted above, Denbury would coordinate with BLM for temporary road closures and/or reroutes, which would assist BLM in informing recreationists of scheduled activities.

The proposed action would not interfere with existing land and realty authorizations.

The phased construction and operation over a 20-year period and committed measures outlined in the POD would not result in changes to existing grazing permits. There are currently 17 grazing allotments with a total of approximately 14,000 permitted BLM Animal Unit Months

(AUMs) where surface ROWs associated with the proposed action would occur. Fourteen allotments would have negligible AUMs, less than 1 percent in each allotment, affected as a result of the proposed permanent ROWs. The 17 allotments would have a combined total of 56 AUMs disturbed due to temporary disturbance from pipelines and short-term ROWs for workspace. Temporary removal of grazing infrastructure (such as fences, gates, cattleguards, and water pipelines) during construction activities would be addressed with the permittee via landowner agreements. Upon completion of construction, grazing infrastructure that meets BLM standards would be replaced, and areas of temporary disturbance would be reclaimed in accordance with the Reclamation, Mitigation, and Monitoring Plan (POD Appendix G). Denbury would seed disturbed areas with a BLM-recommended seed mix and would treat and monitor invasive/noxious weeds. See *Vegetation* below.

Based on noise modeling of the pump stations, which are the facilities that would generate noise during Project operations, there would be no changes to the existing ambient sound levels at the closest residences, which are 3.4 miles from Pump Station North and 2.2 miles from Pump Station South. Additional details about the noise modeling and methodology are provided in POD Appendix V. A figure that shows the modeled sound level contours surrounding each proposed pump station is included in Appendix D of this EA.

The proposed action would not result in substantial visual changes to the landscape. The POD includes a Reclamation, Mitigation, and Monitoring Plan that meets or exceeds visual resource management (VRM) requirements to meet the guidelines for VRM Class III and VRM Class IV outlined in the 2015 MCFO RMP. Denbury would select paint and material colors that blend in with the surrounding landscape. Moreover, infrastructure placement along existing disturbances and well placement further facilitates meeting VRM Class III and VRM Class IV requirements.

Denbury has prepared an Emergency Response Plan for the Project (POD Appendix W), which provides techniques and guidelines for achieving an efficient, coordinated, and effective response to emergencies involving Denbury's personnel or facilities. The plan details how Denbury would address potential emergencies such as fire during construction and operation, fluid leakage to the surface, natural disasters (e.g., tornado, blizzard), spills, and releases. It includes compliance with U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) regulatory requirements. Denbury would host annual tabletop drills for its operations personnel and local response officials. The BLM would be notified of training and emergency events associated with the Project.

There are no known sources of hazardous material areas within the Project area and there are none proposed for the Project. Denbury would dispose of waste in accordance with regulatory requirements.

### *1.7.2 Native American Religious Concerns*

Chapter 4 describes BLM's coordination with 17 Native American tribes. No known tribal religious concerns have been identified.

### *1.7.3 Water Quality and Aquatics*

Section 5.4 of the POD describes wetland and waterbodies that are within the Project area. No

waterbodies are listed under Section 303(d), and none are navigable waters. Dead Boy Creek, a tributary of Box Elder Creek, is the only fish-bearing intermittent stream that intersects a ROW element. There are no pallid sturgeon (*Scaphirhynchus albus*) or potential habitat for the species in the Project area. Pipelines would be installed under wetlands, streams, and riparian areas using trenchless construction techniques to minimize surface water quality impacts and protect aquatic species habitat. Construction equipment and vehicles would cross three wetlands, approximately 0.1 acres total, on temporary, weed-free wetland mats. Four new culverts or low-water crossings would be installed to maintain surface water connections of streams and wetlands; the crossings would be designed in accordance with the BLM 9113 Roads Manual. Non-functioning, existing culverts along Denbury's proposed access routes would be repaired or replaced, as needed. Temporary and permanent impacts to Waters of the United States (U.S.) would be subject to the general, state, and Montana Department of Environmental Quality (MDEQ) Section 401 Water Quality Certification permit conditions for applicable U.S. Army Corps of Engineers (USACE) Nationwide Permits (NWPs). Denbury's Reclamation, Mitigation, and Monitoring Plan includes procedures to control erosion and reduce the potential for sediment to be transported offsite or into wetlands or streams. In addition, phased development would result in smaller amounts of disturbance at any given time, which would allow for expedited reclamation. Spill prevention, containment, and response procedures outlined in Section 6.1 of the POD would be implemented to protect groundwater and surface waters from accidental spills or leaks.

Underground sources of drinking water (USDWs) would be protected through compliance with EPA UIC Class VI regulatory requirements<sup>1</sup>. EPA UIC regulations are designed to protect USDWs by preventing the movement of contaminants out of injection formations and into USDWs. The UIC program regulates all aspects of the injection wells including project siting, well construction, injection operations, testing and monitoring, emergency response, financial responsibility, and eventual plugging and closure of the wells and injection sites. For this project, CO<sub>2</sub> would be injected only in aquifers with a higher level of salinity that prevents its use as a drinking water aquifer (a Class VI requirement). EPA would complete a comprehensive review of Denbury's UIC Class VI well permit applications (for well construction permits and injection permits) using the most current, site-specific geologic data which would be obtained from the proposed stratigraphic well (Injection Well 03). The data would be used to complete required permit modeling to ensure compliance with UIC Class VI regulations and protection of USDWs. Testing and monitoring requirements include integrity testing of injection wells, monitoring of the CO<sub>2</sub> plume, and monitoring of groundwater above the confining zone. A summary of the UIC Class VI permitting process is provided in POD Appendix A.

Section 5.5 of the POD describes surface and groundwater sampling and analysis that has been completed in the Project area. The POD Appendix S includes an inventory and analytic sampling results of surface and subsurface water sources in the area and within 1 mile of the Project area. There are no source water protection areas within or adjacent to the proposed action.

#### *1.7.4 Vegetation*

Vegetation would be disturbed during construction and injection operations; however, impacts are anticipated to be short-term due to phased development which would allow for expedited reclamation and the co-location of facilities along existing disturbances. Denbury would

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<sup>1</sup> <https://www.epa.gov/uic/class-vi-wells-used-geologic-sequestration-carbon-dioxide>

implement a Reclamation, Mitigation, and Monitoring Plan that meets or exceeds 2015 MCFO RMP requirements to restore and maintain vegetation community and diversity. The plan (POD Appendix G) outlines procedures for re-establishing native vegetation to provide site stability for surface disturbing activities within the ROW areas during construction, reclamation, and post-reclamation activities. The plan includes site-specific BLM-recommended seed mixes, monitoring requirements, and reporting to the BLM during reclamation efforts to ensure BLM standards are met and that disturbances, including but not limited to areas used for grazing and wildlife habitat, are promptly reclaimed. A third-party environmental inspector would be employed to provide oversight, monitor, and report on compliance with the ROW stipulations, permit conditions, and procedures and commitments outlined in the POD and associated appendices during construction and reclamation activities.

Denbury has prepared a comprehensive Noxious Weed Management Plan (POD Appendix J) that meets the 2015 MCFO RMP objectives to prevent the expansion or eliminate the occurrence of invasive, non-native, or noxious weed species within the proposed ROWs. Moreover, in 2022, Denbury obtained a BLM Pesticide Use Permit and initiated the monitoring and treatment of noxious weed populations within and additional BLM lands surrounding the proposed ROWs. Denbury would continue annual monitoring and treatment of noxious weeds prior to Project construction and throughout the life of the Project.

### *1.7.5 Wildlife and Habitat*

Applicant committed measures identified in the POD and the associated Reclamation, Mitigation, and Monitoring Plan meet or exceed 2015 MCFO RMP requirements to restore and maintain vegetation community health, connectivity, and diversity associated with wildlife habitats. The seed mix that would be used for reclamation is based on BLM-recommended grouped ecological site descriptions including Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and other native plant species that provide critical habitat to wildlife. Noxious weed monitoring and treatment would enhance habitat reclamation. In addition, Denbury commits to complete construction, drilling, routine maintenance, and reclamation activities from July 16 to November 30 in any given year to mitigate disturbance to grouse, migratory birds, raptors, and winter big game areas. The condensed construction schedule would avoid sage grouse nesting, breeding, and early-brood rearing seasons (March 15 through July 15); migratory bird and songbird nesting season (May 1 through July 15); avoid bald and golden eagle breeding season (March through July), and reduce disturbances during the crucial winter range season for big game species including pronghorn (*Antilocapra americana*) and mule deer (*Odocoileus hemionus*) and sage-grouse, which generally occurs between December and April. Moreover, the phased development of the eight groups over a 20-year period would result in negligible changes to resources. Winter flights completed by Montana Fish, Wildlife and Park in 2020 found large groupings of pronghorn (80+ individuals) to the east of the Project area near Box Elder Creek, suggesting the area is important for pronghorn during harsh winter conditions. In addition to completing construction, drilling, routine maintenance, and reclamation activities between July 16 and November 30 in any given year..

In addition to restricting construction, drilling, routine maintenance, and reclamation activities, pipeline and injection well operations would be remotely monitored, and operational vehicle traffic for monitoring is expected be up to one vehicle visit per well per day, or less, depending

on weather and operation conditions.

Due to the uplisting of the northern long-eared bat (*Myotis septentrionalis* [NLEB]) during the application review process, the BLM assessed potential impacts that the proposed action may have on the species. The BLM completed three consecutive years of mist net surveys at Box Elder Creek, near the proposed action area, as part of a separate interagency project, with no NLEB individuals observed. Additionally, Burns and McDonnell completed two acoustic surveys within the Project area, and no NLEBs were identified. A complete list of bat species identified during acoustic surveys is provided in POD Appendix M. The NLEB has not been documented in Carter County; however, Carter is listed as a county where the NLEB may occur. White-nosed syndrome, a disease that is detrimental to bat species, was documented within Carter County in 2021 (Almberg et. al 2022). While the nearest documentation of the NLEB is more than 50 miles away at Devil's Tower in Wyoming and the Black Hills in South Dakota, approximately 780 acres of potential habitat exists for the species within the southwest portion of the Project area. However, no trees would be removed to construct or operate the Project, and no direct or indirect impacts are anticipated. No hibernacula are known to occur in the Project area. The proposed surface and subsurface disturbing features would not be expected to impact potential habitat. For these reasons it was determined that the proposed action will have *no effect* on the NLEB.

The BLM considered impacts to bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) within 1 mile of the Project area. Raptor nest surveys were conducted via helicopter in May 2022 and April 2023, and surveys for eagle winter roosts were completed in December 2022 and February 2023. One inactive golden eagle nest (BLM Nest ID GE03S58E2601), located 0.2 mile of proposed Injection Well 11, was found to be dilapidated in 2022. During 2023 surveys, this nest was not located and was likely destroyed by weather events. Although active and inactive eagle nests and several golden eagles were observed within the Project area, no other known nests are within 0.5 mile of proposed construction activities. Denbury does not propose removing trees or rock outcroppings to construct or operate the Project, and construction, drilling, routine maintenance, and reclamation activities would be conducted between July 16 and November 30, which is outside of raptor nesting season. Therefore, the BLM determined that further evaluation of impacts to bald and golden eagles was not necessary.

### *1.7.6 Geological, Paleontological, and Soil Resources*

There are no known mineral pits within the Project area. No federal minerals or cut materials from split estates would be used to develop the Project. Material used for Project development would be from commercial or private surface and mineral owners and would be permitted by appropriate entities, as required. There are no known mining claims, locatable operations, or coal leases/licenses within the Project area, and development potential is limited and unlikely.

The Project area has low potential for oil and gas development. There are no active oil and gas wells or leases within the Project area. All previously drilled wells have been plugged and abandoned. The Project does not propose development of hydrocarbons. The POD includes a well construction plan for the UIC Class VI wells. In addition, Denbury would include the BLM in the UIC permit reviews, which would allow BLM to review detailed well construction and

drilling parameters and provide comments on measures to ensure protection of federal hydrocarbon bearing zones with development potential.

Portions of Carter County are known to contain geologic formations containing erionite, a carcinogen regulated under the Toxic Substance Control Act. Erionite has been detected in samples from the Arikaree Sandstone (Beaucham, King, Feldmann, Harper, & Dozier, 2018), a formation which is present at the crest of the Ekalaka Hills, Blue Mud Hills, and the Chalk Buttes. Although the Arikaree Formation is not known to be present within the Project area, there is a potential for soils to contain detritus from the weathering of the surrounding hills and buttes. The POD includes precautionary measures, consistent to the National Institute for Occupational Safety and Health recommendations, to reduce or eliminate erionite exposure during earth disturbing activities within the ROW areas during construction, reclamation, and post-reclamation activities.

Denbury conducted a paleontological survey for the Project within an approximately 300-foot-wide study corridor along the proposed ROWs for surface elements. An Unanticipated Discoveries Plan (UDP) for Paleontological Resources has been prepared to help prepare everyone involved with the Project to know what to look for, and what to do if something of potential scientific interest is discovered. The UDP is provided as POD Appendix T. Additionally, a BLM-approved paleontologist would monitor all surface disturbing construction activities.

Soil resources would be addressed through the implementation of Denbury's Reclamation, Mitigation, and Monitoring Plan, which meets 2015 MCFO RMP requirements to reduce water/wind erosion and re-establish site stability. The Plan includes notification requirements to the BLM Authorized Officer prior to and during reclamation efforts to ensure they meet BLM standards. The POD includes project monitoring and oversight by a third-party environmental compliance inspector to ensure POD construction and reclamation measures are completed for the Project. Seed mixes are based on BLM grouped ecological site descriptions.



## 2 Alternatives

Alternatives were developed based on resource issues identified during the scoping period. Resource issues were discussed in Chapter 1.

### 2.1 Alternative 1 - No Action Alternative

Under the no action alternative, the BLM would not issue the proposed ROW grants for well pads, bulklines, flowlines, access roads, pump stations with offices, and federal pore space. Without ROW grants across federal lands, the proposed action would not be constructed, CO<sub>2</sub> would not be injected into the BLM pore space, and ROW applications for future transmission lines would not be submitted. Due to the federal landownership patterns, the State wells would not be developed. An estimated 150 million tons of CO<sub>2</sub> would not be injected into the ground for sequestration. Current land use across the area would be expected to continue.

### 2.2 Alternative 2 – Proposed Action Alternative

Denbury submitted an SF-299 application for ROW grants to construct, operate, maintain, and eventually terminate the following elements: well pads, bulklines, flowlines, access roads, pump stations with offices, and for use of federal underground pore space to sequester CO<sub>2</sub> in Carter County, Montana (see Figure 1-1). Denbury also proposes analysis of an anticipated transmission line in a 100-foot corridor to the northern pump station and need for a transmission line to the southern pump station. Table 2-1 provides the ROW and proposed corridor acreages and approximate dimensions for each surface element on BLM-administered lands.

**Table 2-1  
Proposed ROW Surface Elements on BLM-Administered Lands**

<b>Project Surface Element</b>	<b>Approximate Dimensions</b>	<b>Approximate ROW Requirements (acres)</b>
Well Pad Long-Term ROW (12)	300 feet x 300 feet	25
Well Pad Short-Term ROW (12)	150 feet x 150 feet	33
Bulklines Long-Term ROW	22.4 miles x 50 feet	134
Bulklines Short-Term ROW	22.4 miles x 25 feet	81
Flowlines Long-Term ROW	12.5 miles x 50 feet	76
Road ROW <sup>a</sup>	41.7 miles x 25 feet	129
Pump Stations / Offices (2)	660 feet x 330 feet	10
Electric Transmission Line Corridor to Pump Station North	2.3 miles x 100 feet	25 <sup>b</sup>
Electric Transmission Line Corridor to Pump Station South	Unknown	0

Project Surface Element	Approximate Dimensions	Approximate ROW Requirements (acres)
TOTAL		513

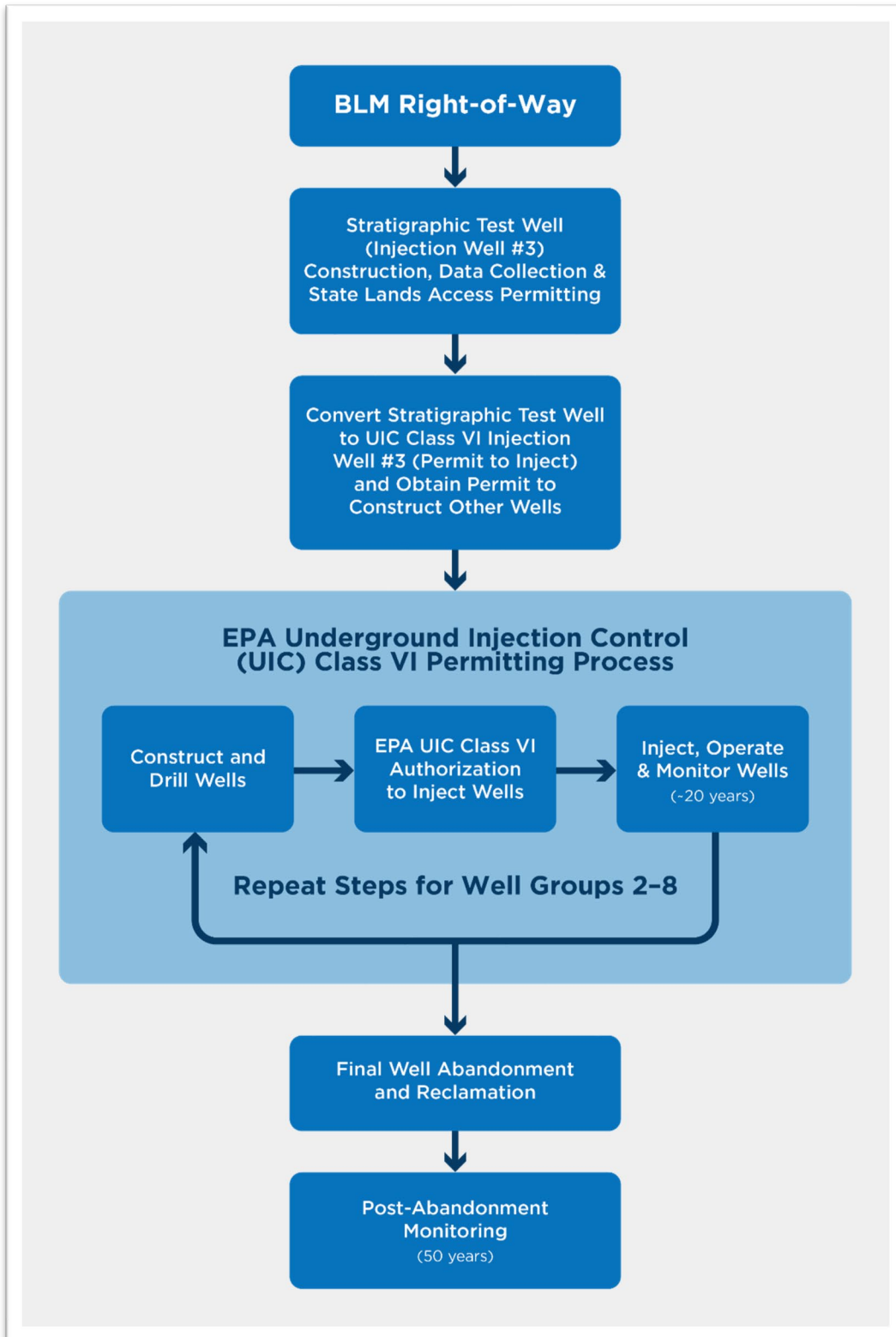
<sup>a</sup> Road ROWs include existing developed roads (14 miles), existing two-track roads (25 miles), and new access roads (4 miles).

<sup>b</sup> Includes acreage within a 100-foot-wide corridor used for this analysis. Actual ROW width is expected to be narrower. The transmission line will be constructed, and the ROW will be maintained by Southeastern Electric Cooperative. Actual ROW impacts will be assessed in a separate ROW application.

Subsurface formation pore space that would be utilized for CO<sub>2</sub> sequestration and storage would include approximately 100,200 acres under BLM-administered lands to approximate depths of 5,200 feet to 8,400 feet below ground surface. Denbury estimates injecting approximately 150 million tons of CO<sub>2</sub> over the course of 20 years. This is equivalent to annual GHG emissions from more than 1.6 million cars.

The Project location and subsurface pore space formation were selected based on the proximity to existing CO<sub>2</sub> pipelines; the suitability of the reservoir porosity, capacity, and seal continuity; and the low risk of seismic activity. In addition, the proposed location includes three landowners (the BLM, State of Montana, and a private landowner) in an area with low mineral development potential. Section 3 of the POD provides additional information about the geology of the Project area, including details of the storage intervals and sealing formations.

Denbury would develop the Project in stages with the first group of activities involving construction of one stratigraphic test well, followed by a sequential build-out of up to 15 injection wells, associated infrastructure, and CO<sub>2</sub> injection over a 20-year period. Because the full build-out of the Project would take place over a 20-year period, the Project sequence would not occur linearly for the overall Project. The permitting, construction, and injection stages for any group of wells (and associated infrastructure) would overlap. The proposed Project sequence is shown in Figure 2-1.



**Figure 2-1 Project Sequence**

### *2.1.1 Proposed Action Design Features*

The POD contains an extensive amount of design features and applicant-committed resource protection measures for all phases of the Project. This EA lists design features and applicant-committed measures in multiple sections to address specific components in the section. To limit repetition, key measures are summarized below. The POD, including details of related resource plans and protection measures, is available on BLM's ePlanning website<sup>2</sup>.

Denbury would conduct construction, drilling, routine maintenance, and reclamation activities, including vegetation clearing, between July 16 and November 30 in any given year to minimize disturbance to nesting and habitats associated with migratory birds, bald eagles, golden eagles, sage-grouse, and big-game. In addition, for water resources, vehicle and equipment servicing and refueling activities would take place, at a minimum, of 500 feet from the outer edge of riparian areas, wet areas, and drainages.

Additional resource protection measures including fugitive dust control, measures to reduce or eliminate erionite exposure, mosquito control, spill prevention and containment measures, and invasive and noxious weed control measures would also be employed.

A Reclamation, Mitigation, and Monitoring Plan outlines temporary erosion and sediment controls and topsoil management, reclamation, and revegetation practices that would be used for interim reclamation of temporarily disturbed areas and final reclamation upon completion, abandonment, and removal of the proposed facilities. It specifies use of BLM-recommended seed mixes that would facilitate the re-establishment of native vegetation and promote the succession of sagebrush establishment and recovery. A third-party environmental inspector would be employed to provide oversight, monitor, and report on compliance with the ROW stipulations, permit conditions, and procedures and commitments outlined in the POD and associated appendices during construction and reclamation activities.

A comprehensive Noxious Weed Management Plan to prevent the expansion or eliminate the occurrence of invasive, non-native, or noxious weed species within the proposed ROWs. Initiation of monitoring and treatment of noxious weeds within and additional BLM lands surrounding the proposed ROWs throughout the life of the Project.

Denbury would coordinate with the appropriate agency (BLM, Carter County, Montana Department of Transportation, etc.) and emergency response organizations to minimize traffic disruptions. Denbury would implement a traffic plan that addresses public safety, traffic control, and access to minimize traffic disruptions. Access to existing public roads would be maintained during construction. Monitoring would occur throughout all stages of the Project including prior to construction, during operation, and after reclamation.

A BLM-approved paleontologist would monitor construction activities during ground disturbance activities, and unanticipated discovery plans would be implemented if any paleontological or cultural resources are encountered. The Carter County Museum would be invited for monitoring of construction activities.

At the time of abandonment, Denbury would obtain any required authorizations from the BLM Authorized Officer or Montana State Lands Agent to abandon the well sites and associated facilities. Post-injection plugging, monitoring, and injection well closeouts would be completed

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<sup>2</sup> Available at <https://eplanning.blm.gov/eplanning-ui/project/2026556/510>.

in accordance with the EPA UIC permit. All infrastructure and facilities would be removed and disposed of or recycled in approved locations. Re-grading and revegetation of disturbed areas would be completed according to BLM standards and requirements, the procedures described in the POD, and Denbury’s *Reclamation, Mitigation, and Monitoring Plan*.

### 2.1.2 Description of Proposed Action Elements

#### *Pipelines (Bulklines and Flowlines)*

Denbury proposes to construct and operate approximately 23.7 miles of 16-inch diameter bulklines and 15.9 miles of 12-inch diameter flowlines on BLM land to transport CO<sub>2</sub> from the existing CCA pipeline to Class VI UIC injection wells. Approximately 1.3 miles of bulklines and 3.4 miles of flowlines would be constructed on State lands; no pipelines are proposed on private land. Approximately 35 miles (89 percent) proposed bulklines and flowlines are co-located with previously disturbed areas including utility and road corridors, where practicable, to minimize disturbance and avoid sensitive surface resources. Information from the resource surveys was used to design and reroute pipelines to avoid and minimize disturbances to sensitive resources (e.g., habitat, nests, leks) to the greatest practicable extent. Trenchless construction techniques (e.g., horizontal directional drilling) would be used to avoid impacts to waterways and minimize disturbances in wetlands. Pipelines would be constructed in accordance with U.S. Department of Transportation regulatory requirements outlined in 49 CFR §195.

The ROW for 16-inch bulklines would consist of a 50-foot-wide permanent ROW with a 25-foot-wide short-term ROW for temporary workspace. For the 12-inch flowlines, the permanent ROW would also be 50 feet wide, and no temporary workspace would be required during construction due to the reduced workspace requirements for smaller diameter pipes. See POD Section 4.2 and POD Appendix C for more details.

**Table 2-2  
Pipeline Construction and Operation Requirements (acres)**

<b>Project Element</b>	<b>BLM</b>	<b>State of Montana</b>	<b>Private</b>	<b>Total</b>
Bulkline Length (miles)	22.4	1.3	0.0	23.7
Bulkline Permanent ROW (acres)	134.5	7.9	0.0	142.4
Bulkline Short-term ROW (acres)	81.3	4.6	0.0	85.9
Flowline Length (miles)	12.5	3.4	0.0	15.9
Flowline Permanent ROW (acres)	76.4	20.4	0.0	96.7
Flowline Short-term ROW (acres)	0.0	0.0	0.0	0.0
Total Pipeline ROW Requirements (acres)	76.4	20.4	0.0	96.7

All mileages and acreages are approximate and derived from GIS. Acreages and mileages are based on NAD 1983 Albers BLM MT ND SD projection.

#### *Well Pads*

The proposed action would include construction of 12 well pads on BLM land. Three well pads would also be constructed on State land, and none proposed on private land. The wells pads would be used to drill and operate UIC Class VI injection wells to inject CO<sub>2</sub> into deep saline formations. An initial stratigraphic test well would be constructed on State land and permitted by the Montana Board of Oil and Gas Conservation, and a UIC permit would be submitted to EPA to convert it to Injection Well 03. The conversion of this well to an injection well, and each subsequent injection well, would be subject to UIC regulations, SDWA provisions, and Class VI

permit requirements. The EPA has authority for the administration of the Class VI UIC program, and EPA permits and authorizations must be obtained to construct (i.e. drill), operate, and terminate UIC Class VI wells. The well pads will be approximately 450-foot-wide by 450-foot-long (approximately 4.6 acres each) during construction. Well pads would be reduced to an operational area of 300-foot-wide by 300-foot-long (2.1 acres each). An approximately 20-foot-wide by 20-foot-long by 8-foot-tall shed would house monitoring equipment and valves would be constructed at each well. The metal sided sheds would be painted Carlsbad Canyon in accordance with BLM requirements to minimize impacts and blend in with the surroundings. Well pad construction and operation are described in POD Section 4.4. Each 300-foot-wide by 300-foot-long well pad would be graveled during the operation stage of the Project. Gravel would be removed, contours restored to the extent practicable, and disturbed areas would be revegetated after the wells are abandoned and the site is reclaimed. See POD Section 4.4 and POD Appendix C POD for more details.

**Table 2-3  
Well Pad Construction and Operation Requirements (acres)**

<b>Project Element</b>	<b>BLM</b>	<b>State of Montana</b>	<b>Private</b>	<b>Total</b>
Well Pad Permanent ROW	24.80	6.20	0.00	31.00
Well Pad Short-term ROW	30.46	8.21	0.00	38.67
Total Well Pad ROW Requirements	55.26	14.41	0.00	69.67

All acreages are approximate and derived from GIS. Acreages are based on NAD 1983 Albers BLM MT ND SD projection.

*Roads*

Denbury would access the Project using approximately 57 miles of access roads, of which approximately 42 miles are on BLM lands. Twenty-five miles (14 miles on BLM lands) are existing developed roads (Lone Tree Road, Hammond Road, and Ridge Road) that may require maintenance including surface grading, rolling, gravel additions, and/or replacement of existing infrastructure (i.e. cattle guards, culverts). An agreement with Carter County would be in place prior to use. Approximately 27 miles of existing two-track roads (25 miles on BLM lands) and five miles of new two-track roads (four miles on BLM lands) would also be used. Two-track roads would be maintained as such to deter increased vehicle travel, and weed-free mats would be used to facilitate access for construction equipment and/or drill rigs during wet conditions. The five miles of new two-track roads would be restored to preconstruction conditions during final reclamation. See POD Section 4.3 and POD Appendix C for more details.

**Table 2-4  
Access Road Permanent ROW Requirements**

<b>Project Element</b>	<b>BLM</b>	<b>State of Montana</b>	<b>Private</b>	<b>Total</b>
Existing Developed Road ROWs	13.6 miles	1.5 miles	9.5 miles	24.6 miles
	44.10 acres	6.20 acres	29.97 acres	80.27 acres
Existing Two-Track ROWs	24.5 miles	2.9 miles	0.0 miles	27.4 miles
	74.33 acres	8.66 acres	0.00 acres	82.99 acres
New Access Road ROWs	3.6 miles	1.3 miles	0.0 miles	4.9 miles
	10.97 acres	3.80 acres	0.00 acres	14.77 acres
Total Access Road ROW Requirements	41.7 miles	5.7 miles	9.5 miles	56.9 miles
	129.40 acres	18.66 acres	29.97 acres	178.03 acres



All mileages and acreages are approximate and derived from GIS. Acreages and mileages are based on NAD 1983 Albers BLM MT ND SD projection. Short-term ROW for access roads will not be required.

*Pump Stations (North and South)*

The action includes construction, operation, maintenance, and termination of two pump stations that would measure CO<sub>2</sub> flow from the CCA Pipeline and raise the CO<sub>2</sub> pressure for well injection, if necessary. Two single-story metal office buildings, each about 12 feet wide by 42 feet long by 20 feet tall, would also be constructed at each approximately 5-acre site. The buildings would be painted Carlsbad Canyon to blend into landscape. A chain link fence would be constructed to surround the entire facility and would be painted the same color as the building. Each site would be surfaced with gravel. Upon completion of the Project and after injection wells are plugged, Denbury would remove the pump stations and reclaim the areas in accordance with terms and conditions of the ROW agreement with the BLM. See POD Section 4.6 and POD Appendix F for more details.

**Table 2-5  
Pump Station Permanent ROW Requirements (acres)**

<b>Project Element</b>	<b>BLM</b>	<b>State of Montana</b>	<b>Private</b>	<b>Total</b>
Pump Station North ROW	5.0	0.0	0.0	5.0
Pump Station South ROW	5.0	0.0	0.0	5.0
<b>Total Pump Station ROW Requirements</b>	<b>10.0</b>	<b>0.0</b>	<b>0.0</b>	<b>10.0</b>

All acreages are approximate and derived from GIS. The acreages are based on NAD 1983 Albers BLM MT ND SD projection. Short-term ROW for pump stations will not be required.

*Proposed Corridor: Electric Transmission Line to Pump Stations North and South*

For analysis purposes, Denbury proposes a 100-foot corridor for a transmission line to Pump Station North. A ROW application for the corridor was not submitted as part of the proposed action because it is anticipated that prior to Group 2 construction, the owner operator of the transmission line, Southeastern Electric Cooperative, would submit a separate subsequent ROW application for the power line within the proposed corridor. The actual ROW width is expected to be less than 100 feet. Based on coordination between Denbury and Southeastern Electric Cooperative, an upgrade to about 1.2 miles of overhead electric distribution line on private property and a 3.6-mile extension of the existing power line is anticipated. Of these 4.8 miles of new and upgraded 240-kilovolt power line, approximately 2.3 miles would be on BLM land. The proposed route would be co-located along the existing Lone Tree Road to the extent practicable and along the CCA Pipeline ROW. Poles would be 24 feet tall and constructed to avoid wetlands, streams, and riparian areas. See POD Section 4.7 and POD Appendix C for more details.

Denbury anticipates a second transmission line will be required to provide power to Pump Station South, part of the Group 5 facilities. It is anticipated that Southeastern Electric Cooperative would also service the necessary power. Because of the extended timeframe on the Project to complete Group 5, there may be potential changes to transmission services in the area. As result, a transmission line corridor to Pump Station South is unknown at this time. Prior to initiating Group 5 construction, Denbury would coordinate with Southeastern Electric Cooperative to submit a separate application a ROW with a proposed route across BLM lands.

**Table 2-6  
North Electric Transmission Line Corridor**

<b>Project Element</b>	<b>BLM</b>	<b>State of Montana</b>	<b>Private</b>	<b>Total</b>
Existing Electric Transmission Line Length (miles)	0.0	0.0	1.2	1.2
Proposed Electric Transmission Line Length (miles)	2.3	0.0	1.3	3.6
Existing Electric Transmission Line 100-foot-wide corridor <sup>1</sup> (acres)	0.0	0.0	14.5	14.5
Proposed Electric Transmission Line 100-foot-wide corridor <sup>1</sup> (acres)	25.4	0.0	19.0	44.4

All acreages are approximate and derived from GIS. The acreages are based on NAD 1983 Albers BLM MT ND SD projection.

<sup>1</sup> Includes acreage within a 100-foot-wide corridor used for this analysis. Actual ROW width is expected to be narrower. The transmission line will be constructed, and the ROW will be maintained by Southeastern Electric Cooperative. Actual ROW impacts will be assessed in a separate ROW application.

### 2.3 Alternatives Considered but Eliminated

Multiple factors such as natural resources and associated habitats, existing disturbances, visual resources, and topography influenced the initial proposed Project design submitted in November 2021. Compared to Alternative B above, the initial Project design included:

- an additional 10-miles of linear infrastructure (i.e., bulklines, flowlines, and access roads), of which about 8 miles were sited on BLM-administered lands;
- an additional approximately 40 percent (5,650-acre) in overall disturbance, including an additional 50 percent (6,600-acre) of disturbance on BLM-administered lands; and
- an additional approximately 50 percent (1,300-acre) disturbances to sensitive resources (i.e., wetlands, waterbodies, lek habitat, and invasive species populations), including an additional 55 percent (1,050-acre) of disturbance on BLM-administered lands.

Due to resource surveys, the initial Project design was refined to meet 2015 MCFO RMP requirements, avoid and/or minimize disturbances to sensitive resources, and to make use of previously disturbed areas to the extent practicable. The proposed bulkline and flowline locations were moved to parallel existing developed and two-track roads, where practicable, resulting in 89 percent (35.1 miles) of co-location with existing roads. Bulkline 1 was relocated adjacent to the existing CCA pipeline, which would reduce the amount of new ROW needed to construct and operate the pipeline. Well pads were relocated closer to existing roads to reduce the lengths of new road construction and to avoid sage-grouse leks and surrounding sensitive habitat. An approximately 7-mile electric transmission line ROW that was initially proposed extending north of the Project area and a new electric substation were eliminated from the design for upgrading and extending an existing electric distribution line from the east.

## 3 Affected Environment and Environmental Consequences

### General Setting

The proposed Project area is located in the Northwestern Great Plains ecoregion and within the Central Rocky Mountain Foreland physiographic province of the unglaciated Missouri Plateau. The province consists predominantly of gently rolling plains with shallow creek valleys and broad flat divides. The landscape is semiarid with infrequent badland areas. Existing land cover includes grassland and sagebrush shrubland (USGS 2021).

### 3.1 Reasonably Foreseeable Environmental Trends and Planned Actions

There are ongoing activities in and around the area which include livestock grazing, noxious weed control, dispersed recreation/hunting, existing ROWs, oil and gas development in adjacent counties, and agriculture on privately owned lands.

The North Plains Connector was considered as a reasonably foreseeable future action in the area that has the potential to affect resources similar to those considered for analysis under the proposed action. The North Plains Connector is an approximately 395-mile, high voltage, direct current transmission line that would connect U.S. eastern and western electric grids (Grid United 2023). The transmission line would extend from Colstrip, Montana to Morton County, North Dakota and would cross BLM-administered land in the MCFO. Even though the ROW application for the North Plains Connector has been submitted to the BLM for processing, because the proposed route is still under development, this transmission line project is not included in this analysis.

### 3.2 Resource Issue 1 – Air Resources and Climate Change

#### 3.2.1 *Affected Environment*

The air resources section addresses regional ambient air quality, potential impacts to air resources, and climate change from the proposed action. Specific impacts associated with the build-out (construction and drilling) and operation of the proposed action are identified throughout this EA and generally encompass construction, drilling, and operational activities associated and connected with the proposed action. Emissions evaluated in association with the proposed action include mobile combustion emissions from construction and drilling as well as personnel commuting, road travel, and emissions associated with the operation of the CO<sub>2</sub> pipeline, pump stations, and underground CO<sub>2</sub> storage.

Climate impacts have the potential to be regional and global in scale as the GHG emissions are long lasting, and impacts are, by nature, cumulative. Thus, the relative contribution of the proposed action to regional and global impacts to climate associated with GHG emissions is assessed herein.

#### **Ambient Air Quality**

Emissions of criteria air pollutants may impact human health and welfare by contributing to the deterioration of ambient air quality. The specific extent that a source of emissions may impact air quality is affected by the regional weather patterns, nearby terrain, and background

concentrations, but generally, air quality emissions tend to disperse from their initial source. Thus, the highest concentrations of these pollutants are likely to occur near their respective emission sources, and the impacts of these emissions on human health would be realized to the greatest degree within the areas immediately surrounding an air pollutant source. Both the MDEQ and the EPA have established ambient air quality standards—called Montana Ambient Air Quality Standards (MAAQS) and National Ambient Air Quality Standards (NAAQS), respectively. The pollutants relevant to the proposed action are briefly summarized below:

- Carbon Monoxide (CO): CO is a colorless, odorless gas primarily produced by incomplete combustion in stationary and mobile sources.
- Nitrogen Dioxide (NO<sub>2</sub>): NO<sub>2</sub> is a compound primarily produced by the combustion of fossil fuels in stationary and mobile sources. Some oxides of nitrogen (NO<sub>x</sub>) convert into NO<sub>2</sub> after being emitted and are thus regulated as precursor pollutants.
- Ozone (O<sub>3</sub>): Ozone is rarely directly emitted into the atmosphere from sources. Rather, ozone is formed by chemical reactions between NO<sub>x</sub> and VOCs in the presence of sunlight. NO<sub>x</sub> and VOCs are both regulated as precursor pollutants.
- Particulate Matter (PM): Respirable particulate matter with a diameter of less than 10 microns (PM<sub>10</sub>) and fine particulate matter with a diameter of less than 2.5 microns (PM<sub>2.5</sub>): PM<sub>10</sub> and PM<sub>2.5</sub> are emitted from a variety of sources, including agricultural operations, industrial processes, combustion, construction and demolition activities, road dust, windblown dust, and wildfires.
- Sulfur Dioxide (SO<sub>2</sub>): SO<sub>2</sub> is a sulfur compound emitted by power plants, industrial facilities, combustion in mobile sources, and natural sources such as volcanoes.

It should be noted that the MAAQS are more stringent than the national standards for some pollutants. The MDEQ is the delegated authority under the federal Clean Air Act (CAA) to complete air quality monitoring and has installed and maintained air quality monitoring stations throughout the state, including counties located near the proposed Project area ([https://deq.mt.gov/files/Air/AirMonitoring/Documents/2023\\_ANMP.pdf](https://deq.mt.gov/files/Air/AirMonitoring/Documents/2023_ANMP.pdf)). Based on the nearby ambient monitoring network and additional EPA analysis, Carter County and the lands associated with the Project are currently designated attainment/unclassifiable for the NAAQS under the CAA. Note that Carter County, where the Project is located, does not currently have active monitoring stations.

The two nearest air quality monitoring stations, Miles City-Pines Hills monitor 30-075-0001 and Broadus monitor 30-017-0005 located in Broadus and Miles City, Montana respectively, are shown in Figure 3-1. Data quality was a factor in the selection of the monitor. The Miles City-Pines Hills monitor became active in 2022 and does not have three years of monitoring data; therefore, the Broadus monitor is the best representative monitoring site. Broadus monitor, the nearest and most representative ambient air quality site, located 63 km (approximately 39 miles) southwest from the center of the Project area is shown in Table 3-1.

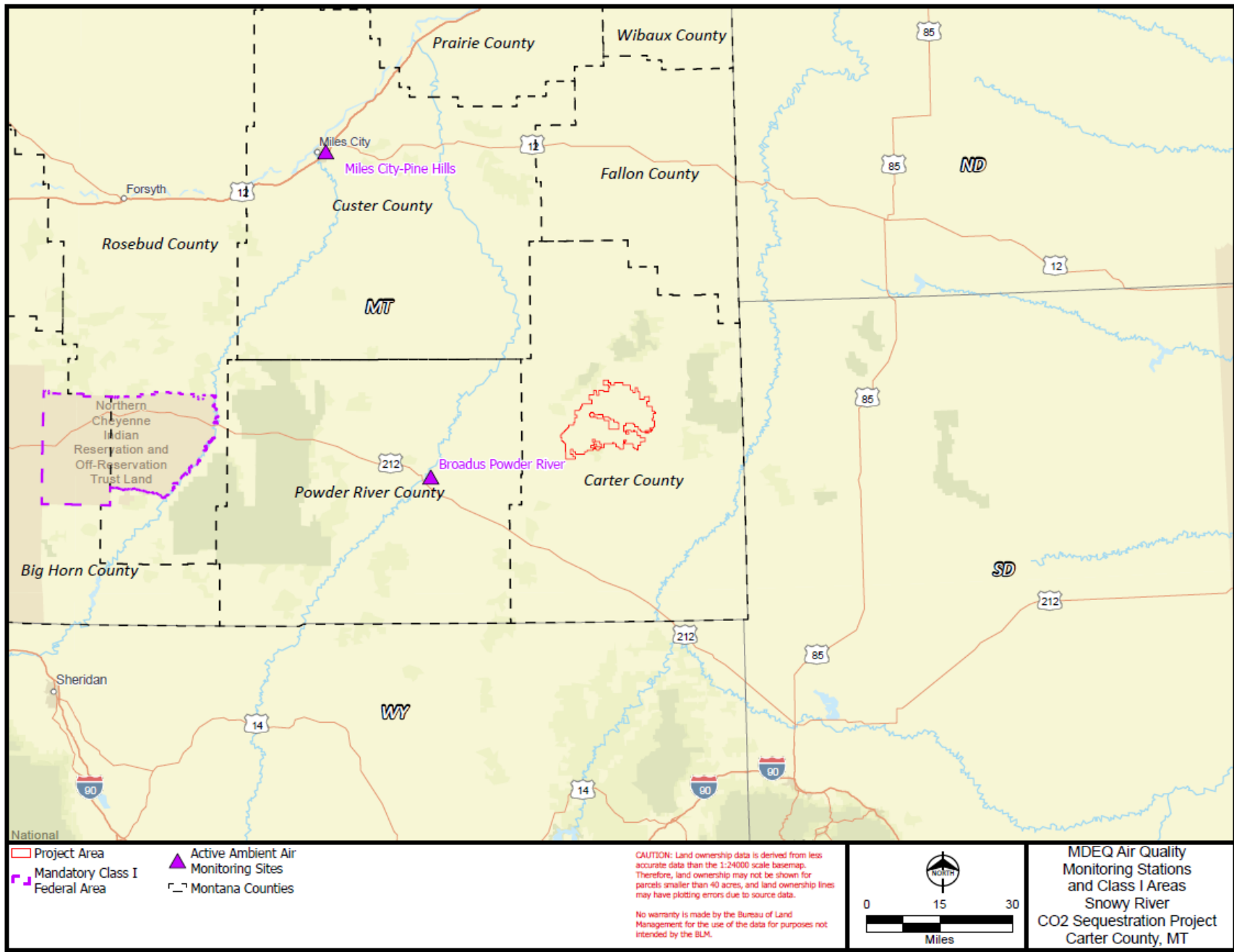


Figure 3-1 MDEQ Air Quality Monitoring Stations and Class I Areas

**Table 3-1  
Criteria Pollutant Ambient Background Concentrations 2020-2022**

<b>Pollutant</b>	<b>Location/County</b>	<b>Averaging Time</b>	<b>Concentration<sup>a,b</sup></b>	<b>NAAQS</b>	<b>% NAAQS</b>
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Broadus, MT (Powder River)	Annual	7.6	9 <sup>c</sup>	84%
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Broadus, MT (Powder River)	24-hour	29.5	35	84%
O <sub>3</sub> (ppm)	Broadus, MT (Powder River)	8-hour	0.063	0.070	90%
NO <sub>2</sub> (ppb)	Broadus, MT (Powder River)	Annual	0.9	53	1%
NO <sub>2</sub> (ppb)	Broadus, MT (Powder River)	1-hour	9.3	100	5%

Source: EPA Outdoor Air Quality Data Monitor Value Reports (<https://www.epa.gov/outdoor-air-quality-data/monitor-values-report>)

<sup>a</sup> Dataset includes all values (flagged exceptional events included).

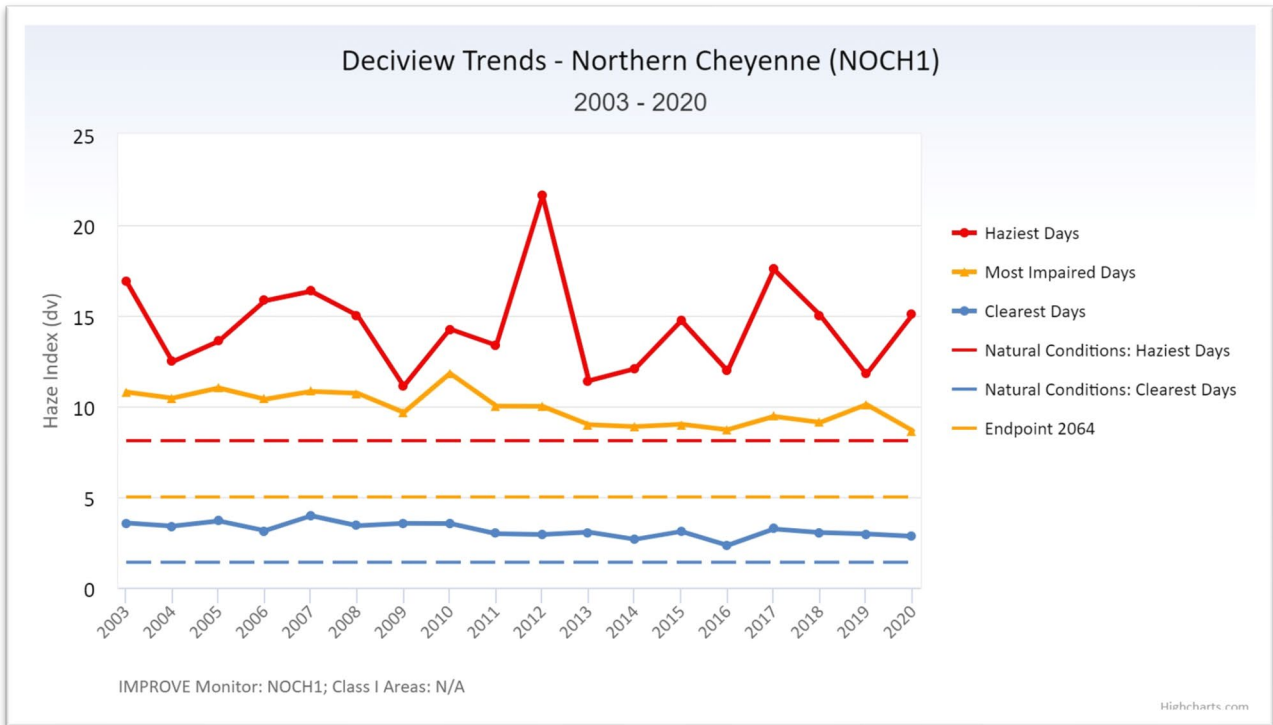
<sup>b</sup> Background concentrations were calculated following the form of the NAAQS standard as designated in the CAA.

<sup>c</sup> The PM<sub>2.5</sub> Annual NAAQS was updated on 2/7/2024 from 12 (µg/m<sup>3</sup>) to 9 (µg/m<sup>3</sup>).

Air Quality Related Values (AQRVs) for an area [including visual air quality (haze), and acid (nitrogen and sulfur) deposition] are not threshold standards, but levels of concern may be identified by the permitting authority. Atmospheric visibility is a measure of how far and how well an observer can see a distant and varied scene. The visual range is the greatest distance in miles that a person can see a large dark object viewed against the horizon sky. Light extinction or attenuation is a nonlinear measure of visibility and occurs in the atmosphere as a result of scattering and absorption. Pollutants from natural and anthropogenic sources contribute to haze by scattering and absorbing light. A deciview (dv) is a unit of measurement used to quantify human perception of visibility and is calculated from the natural logarithm of atmospheric light extinction. One (1) dv is roughly the smallest change in visibility (haze) that is barely perceptible. Because visibility at any one location is highly variable seasonally throughout the year, it is characterized by three groupings: 1) clearest 20% days, 2) average 20% days, and 3) haziest 20% days.

The Interagency Monitoring of Protected Visual Environments (IMPROVE) program collects visibility data at the Northern Cheyenne Reservation (NOCH1), as shown in Figure 3-2 (Federal Land Manager Environmental Database 2024). Average visual range is 60 to 90 miles (100 to 150 kilometers [km]) in many Class I areas in the western United States, equivalent to 13.6 to 9.6 dv, or about 50 to 70 percent of the visual range that would exist without anthropogenic air pollution from stationary and mobile sources (64 Fed. Reg. 35714). From 2000 to 2020, visibility data at Northern Cheyenne Reservation (NOCH1) has shown an improving trend for the clearest and haziest days. In general, measurements at IMPROVE sites in the region show improvement in visibility, since the first decade of the twenty-first century, by approximately 1 dv for the haziest days and 2 dv for the clearest days.





**Figure 3-2 Visibility Trends at Northern Cheyenne (NOCH1) IMPROVE Monitor**

Atmospheric deposition occurs when gaseous and particulate air pollutants are deposited on the ground, waterbodies, or vegetation. The pollutants may be deposited as dust or transported from the atmosphere in the form of rain, fog, or snow. When air pollutants such as sulfur and nitrogen are deposited into ecosystems, acidification or enrichment of soils and surface waters may occur. Atmospheric nitrogen and sulfur deposition may affect water chemistry, resulting in impacts to aquatic vegetation, invertebrate communities, amphibians, and fish. Deposition can also cause chemical changes in soils that alter soil microorganisms, plants, and trees. Although nitrogen is an essential plant nutrient, excess nitrogen from atmospheric deposition can stress ecosystems by favoring some plant species and inhibiting the growth of others. Information on wet and dry deposition at Class I areas within the analysis area can be found at EPA’s Clean Air Status and Trends Network monitoring program at <https://www.epa.gov/castnet/castnet-site-locations>.

Air quality and AQRVs are influenced by industrial sources, motor vehicles, agricultural practices, long-range emissions transport, and natural sources such as wildfire smoke. Projections of regional air quality on BLM lands is documented in several BLM reports such as the 2015 MCFO Air Resource Management Plan (BLM 2015), 2016 Montana/Dakotas State Office Photochemical Grid Modeling (PGM) Modeling Study Air Resources Impact Assessment–Final Report (BLM 2016), 2023 Draft MCFO SEIS, and North Dakota Field Office Draft RMP and EIS (BLM 2023). The 2015 and 2023 MCFO RMP evaluated near field impacts to air quality from oil and gas development as well as projections of visibility within the region, and the PGM study assessed regional impacts to air quality from future oil and gas development on BLM administered mineral estate in Montana, North Dakota, and South Dakota. The modeling (i.e., emissions and impact) scenarios did not produce emissions more than the NAAQS or state ambient air quality standards for O<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub> or CO. However,

the modeling study predicted impacts to visibility at Class I areas in eastern Montana and western North Dakota, in which a portion of the predicted impacts can be attributed to oil and gas development in the Bakken Formation and future federal oil and gas development (more than 0.5 and 1.0 dv thresholds) but not near the proposed Project area.

When discussing the effects of the proposed action, it must be noted that the affected environment varies in size depending on which of the specified impacts are being evaluated. With respect to impacts to ambient air quality and near-field visibility impacts, the areas near construction and subsequent operation of the proposed action would experience the highest pollutant concentration increases. Therefore, the affected environment in terms of the assessment of ambient air quality and near-field visibility impacts would be near (less than 50 km from) the proposed action. Additionally, a memorandum titled “Clarification of Prevention of Significant Deterioration (PSD) Guidance for Modeling Class I Area Impacts” was released by the EPA Office of Air Quality Planning and Standards in October of 1992. This memorandum states that typically Class I area analyses should be limited to sources that are located within 100 km of a Class I area. In some cases, large emitters (Title V and/or PSD facilities) outside of that 100 km radius from a Class I area should be analyzed in a Class I analysis. The nearest Class I area as noted above, the Northern Cheyenne Reservation, is approximately 130 km northwest of the proposed action. PSD reviews are triggered when a proposed project surpasses the emission thresholds set by federal or state permitting agencies. The proposed action is not expected to trigger these thresholds. Because the distance (greater than 100 km) and the minor source status of the proposed action, further analysis of impacts at the nearest Class I area were not evaluated.

EPA also regulates emissions of HAPs that are suspected to cause cancer or other serious health effects. Since the establishment of the Clean Air Act HAP list (CAA Section 112), the EPA has periodically modified the list through rulemaking. Currently, 187 pollutants are designated as HAPs (EPA 2022). Typically, HAPs associated with urban or industrial development include formaldehyde, benzene, toluene, ethylbenzene, xylenes, and n-hexane. Emissions of these pollutants within the analysis area are mostly associated with tailpipe emissions from mobile sources. The EPA developed a AirToxScreen Mapping Tool to evaluate impacts from existing HAP emissions across the nation. Using the EPA AirTox Screen Mapping Tool, the total cancer risk for Montana was below the upper limit of acceptable lifetime risk of 100 in 1 million people to develop cancer, as described in 40 CFR §300.430. In addition, the noncancer hazard index for Montana is below 1.0, indicating that air toxics will not likely cause adverse noncancer health effects.

### **Regulatory Setting**

The MDEQ administers various air quality permitting and registration programs to ensure compliance with the MAAQS, NAAQS, and VOC/HAP emissions through compliance with applicable rules and regulations, emissions limitations, testing, and best available control technology determinations. Additionally, implementation of best management practices (BMPs) are required to limit fugitive emissions of PM (BLM 2015). The BMPs to manage fugitive dust include:

- designing roads and well pads to reduce the amount of fugitive dust generated by traffic or other activities;

- application of water, non-toxic chemical dust suppressant, or gravel on unpaved surfaces during construction or drilling projects and in high-traffic production operations; and
- implementing vehicle speed limitations.

Federal EPA regulations to protect ambient air quality include New Source Performance Standards (NSPS) for stationary sources promulgated under 40 CFR Part 60, which are designed to control criteria air pollutant emissions. NSPS does not currently regulate fugitive CO<sub>2</sub> emissions or other criteria pollutants for Class VI injection wells, and is not applicable to the proposed Project. Similarly, National Emission Standards for Hazardous Air Pollutants (NESHAP) promulgated under 40 CFR Part 61 and 63, which are designed to control HAP emissions are not applicable to the proposed Project. A federal Title V Operating Permit Program also applies to all major stationary sources as specified in 40 CFR Part 70 of the CAA. The EPA has delegated authority to administer the program to the MDEQ. However, the proposed Project does not meet the definition of a major stationary source and not applicable in this case.

### **Climate Change**

Changes to climate from increases in atmospheric GHG concentrations may persist for decades or even centuries. Buildup of GHGs in the atmosphere from anthropogenic sources has been occurring since at least the start of the industrial revolution. Since the 1950s, many of the observed changes to Earth's climate are unprecedented and beyond the predicted climatic shifts that would otherwise be expected without anthropogenic contributions to GHG emissions (IPCC 2013). Anthropogenic sources of GHG emissions can be attributed mostly to fossil fuel production, exploration, and combustion, land use change, industrial activities, and agricultural practices (IPCC 2013). These activities have substantially increased atmospheric concentrations of GHG compounds compared to background levels. The mechanism by which increased GHG concentrations cause changes to climate is that each GHG molecule absorbs infrared energy from earth's surface which are then re-radiated by the molecule in all directions, including back down to Earth's surface. Thus, with increased concentrations of GHGs caused by anthropogenic emissions, more of the energy that would otherwise have escaped back into space are absorbed and re-radiated to earth's surface leading to warming and climatic shifts (IPCC 2013). The most common GHGs and their typical emission sources are as follows:

- Carbon dioxide (CO<sub>2</sub>): CO<sub>2</sub> is the most prevalent GHG and is produced by the combustion of fossil fuels, the combustion of biomass, and chemical reactions.
- Methane (CH<sub>4</sub>): CH<sub>4</sub> is emitted from combustion, production of fossil fuels, livestock, agriculture, and municipal solid waste landfills.
- Nitrous oxide (N<sub>2</sub>O): N<sub>2</sub>O is emitted from combustion, agricultural activities, and industrial processes.

GHG emissions are typically quantified as carbon dioxide equivalent (CO<sub>2</sub>e) emissions. Calculations of CO<sub>2</sub>e emission rates combine all GHG emissions (in this case CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions) into a single value considering the respective climate change effects from each pollutant. These climate change effects are presented in terms of each pollutant's GWP. Each GHG has a Global Warming Potential (GWP) that accounts for the intensity of each GHG's heat trapping effect and its longevity in the atmosphere. Table A-1 of 40 CFR Part 98 establishes the uses the GWPs and time horizon consistent with the Fourth Assessment Report, Climate Change Synthesis Report (IPCC 2007). The GWP for each GHG is provided in Table 3-2.

**Table 3-2  
Global Warming Potentials and Atmospheric Lifetimes**

<b>Greenhouse Gas</b>	<b>Atmospheric Lifetime (years)<sup>b</sup></b>	<b>Global Warming Potential (20-year time horizon)<sup>b</sup></b>	<b>Global Warming Potential (100-year time horizon)<sup>b</sup></b>
Carbon dioxide (CO <sub>2</sub> )	50–200	1	1
Methane <sup>a</sup> (CH <sub>4</sub> )	12	82.5	29.8
Nitrous oxide (N <sub>2</sub> O)	114	273	273
Sulfur hexafluoride (SF <sub>6</sub> )	3,200	18,300	25,200

<sup>a</sup> CH<sub>4</sub>-fossil; Methane from fossil fuel sources has a slightly higher emission metric than those from biogenic sources (CH<sub>4</sub>-nonfossil = 79.7 and 27.0 for the 20-year and 100-year GWPs respectively).

<sup>b</sup> IPCC AR6 GWPs.

Climate change would impact the proposed Project area, which is located within the northern-central part of the Great Plains region of the United States. The area would likely be affected by changes in temperature and precipitation. In the Northern Great Plains region as a whole, high temperature days (greater than 90°F) and cool days (less than 28°F) are expected to increase and decrease respectively by 30 days or more per year by mid-century. Winter and spring precipitation and the number of days with heavy downpours and snowfall are expected to increase (USGCRP 2018). Additional state level findings are described in the 2021 Montana Climate Assessment (Adams et al. 2021). Major findings of the climate assessment report include:

- Annual average temperatures, including daily minimums, maximums, and averages, have risen across the state between 1950 and 2020. The increases range between 2.0 and 3.0°F.
- More precipitation will be received in winter, spring, and fall with summers expected to become dryer than present. Overall increased precipitation that may be received by the state is expected to be offset by evaporation and transpiration due to higher average temperatures.
- Climate projections indicate continued warming in all geographic locations, seasons, and under all emission scenarios throughout the 21<sup>st</sup> century. By mid-century, Montana’s temperatures are projected to increase by approximately 4.5–6.0°F.

These temperature and precipitation variations within the larger Northern Great Plains region and states, where the proposed action is located, have had, and will continue to have impacts on the local area surrounding the proposed action. Very heavy precipitation events can increase flooding, nutrient runoff, and soil erosion, which impact local water and agricultural soil quality (USGCRP 2018). Increased winter temperatures can also lead to survival of pests and invasive weeds, which may impact local agriculture, terrestrial and aquatic ecosystems, and increase the pollen season for common allergens such as ragweed (USGCRP 2018). Increasing temperatures and number of days with temperatures over 100°F, as well as changing precipitation patterns, are likely to stress the local plant and animal populations (USGCRP 2018).

See the BLM Specialist Report on Annual GHG Emissions and Climate Trends for further discussion on climate impacts in the region (BLM 2022)<sup>3</sup>.

<sup>3</sup> Available at <https://www.blm.gov/content/ghg/2022/>.

## Regulatory and Policy Setting

GHGs are considered air pollutants under the Clean Air Act (42 United States Code § 7401, et seq.). In 2009, the Mandatory Greenhouse Gas Reporting Program (GHGRP) codified at 40 CFR Part 98, required the reporting of GHG data from large GHG emission sources (any facility emitting over 25,000 metric tons of CO<sub>2e</sub> annually). The proposed Project is a Subpart RR source category under the GHGRP.

Executive Order (EO) 14008, Tackling the Climate Crisis at Home and Abroad, was signed by President Biden on January 27, 2021. The EO focuses on prioritizing climate in foreign policy and national security and taking a government-wide approach to the climate crisis. The EO also establishes the National Climate Task Force, which “shall facilitate the organization and deployment of a Government-wide approach to combat the climate crisis. This Task Force shall facilitate planning and implementation of key federal actions to reduce climate pollution; increase resilience to the impacts of environmental justice; and spur well-paying union jobs and economic growth.”

EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, was signed by President Biden on January 20, 2021. Among other things, it established the Interagency Working Group (IWG) on the Social Cost of Greenhouse Gas Emissions to develop and promulgate costs for agencies to apply during cost-benefit analysis and rescinded the 2019 Council on Environmental Quality (CEQ) Draft NEPA Guidance on Consideration of Greenhouse Gas Emissions (84 Federal Register [FR] 30097). This previous draft guidance limited the consideration of long-term GHG emissions to expedite the NEPA process. The CEQ was also directed to review and update its guidance entitled Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (81 FR 51866). The CEQ issued additional interim guidance on January 9, 2023, titled, National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (88 FR 1196) directing federal agencies to consider all available tools and resources in assessing GHG emissions and climate change effects of their proposed actions under NEPA. This guidance, effective upon publication, builds upon and updates the CEQ’s 2016 Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews.

### *3.2.2 Environmental Effects—No Action Alternative*

A no action decision would remove any potential direct or indirect impacts from the construction of the Project. Foregoing construction would avoid emission sources from construction equipment, drilling, dust, and fugitive emissions. Under the no action, any emission sources currently surrounding the Project area would continue to operate, and the area would be expected to continue to meet all NAAQS and MAAQS standards. A no action decision would similarly eliminate any GHG emissions associated with the proposed action (4,734 tons CO<sub>2e</sub> from construction and 205 tons/year CO<sub>2e</sub> from operation, Table 3-3 and 3-4). However, the subsequential 150 million tons of CO<sub>2</sub> proposed to be injected as a result of this Project would not be sequestered.

## Cumulative Effects

### Air Quality

Under the no action alternative, the proposed action would not impact air resources and would not contribute to cumulative effects. Cumulative impacts to air quality related to a no action decision would be derived solely from current and reasonably foreseeable future activities within the Project area and the larger BLM MCFO RMP area. The BLM MCFO recently evaluated potential cumulative air quality impacts in its Draft Supplemental Environmental Impact Statement and Potential Resource Management Plan Amendment (SEIS) that was published on May 2023 (BLM 2023). The SEIS was prepared in response to a court order to complete a new coal screening and remedial NEPA analysis that considers no-leasing and limited coal leasing alternatives and discloses public health impacts of burning fossil fuels from the BLM MCFO planning area. The SEIS was under public comment until August 3, 2023, and the final document has yet to be published. The SEIS was prepared for the entire area managed by the BLM MCFO, approximately 2.7 million acres of BLM-administered surface lands and 11.9 million acres of BLM-administered mineral estate within 17 counties in eastern Montana, which includes the Project area. The SEIS analysis results provide an estimate of the expected air quality that could reasonably be foreseen in the Project area should the proposed Project not proceed. The SEIS Sections 3.3 and 3.4 are incorporated by reference and summarized below.

The SEIS quantifies annual emissions of criteria pollutants and HAPS based on current and reasonably foreseeable coal, oil, and gas development. Other BLM-authorized activities such as vegetation management, fire management, forestry and woodland products, livestock grazing, recreation, general BLM fleet travel, and road maintenance are incorporated into the air quality impacts analysis. The MCFO SEIS analyzed three action alternatives including a no action alternative, and it disclosed air quality as part of the analysis. Forecasted activity levels from oil and gas and other BLM-authorized activities are constant across the alternatives. Modeling for the alternatives with the highest downstream combustion impacts project future air quality and public health impacts would be similar when compared to present conditions. Overall, cumulative impacts in Montana from all sources included in the circa 2028 modeling are predicted to be below the NAAQS and MAAQS for NO<sub>2</sub> and SO<sub>2</sub> with O<sub>3</sub>, PM<sub>2.5</sub>, and PM<sub>10</sub> exceeding the standards in isolated areas throughout the state, mostly from the modeled natural source group that includes fires, biogenic emissions, windblown dust, and lightning NO<sub>x</sub>. The contributions from federal oil and gas and federal coal development are less than 1 percent at the location of the potential exceedances.

Furthermore, modeled cumulative nitrogen deposition is below the lowest critical load in Montana except at Fort Peck Reservation, Lostwood Wilderness, Medicine Lake Wilderness, North Absaroka Wilderness, Theodore Roosevelt, and Washakie Wilderness which are located outside the Project area. Contributions are minimal at these locations from the federal coal and oil and gas sectors, and never exceed more than two percent of the total nitrogen deposition. Sulfur deposition was below the critical load over the MCFO RMP area. For the proposed Project area, cumulative impacts from all sources are predicted (i.e., from all sources circa 2028) to be below the NAAQS and MAAQS as well as below nitrogen and sulfur deposition critical loads. For additional information, please refer to the 2023 Draft MCFO SEIS.

## Climate Change

Cumulative emissions of GHGs related to a no action decision would be derived from current and reasonably foreseeable activities within the proposed action Project area and larger MCFO RMP area since a no action decision would eliminate all direct and indirect GHG emissions from the proposed action. MCFO SEIS (2023) evaluated GHG emissions from the mining, transportation, and downstream combustion of federal coal produced at the two active mines are evaluated separately for existing, pending, and potential future subsequent federal coal leases. The forecasted activities from oil, gas, and other BLM-authorized activities are constant across alternatives. In the alternative with the highest emissions, an estimated 584.4 million metric tonnes CO<sub>2e</sub> are expected based on 20-year GWPs and accounting for federal coal direct, processing, transportation, and downstream combustion activities. Federal oil and gas and non-federal emissions are the same across all alternatives. The MCFO SEIS presents the effects from the downstream combustion of planning area coal and oil and gas as a monetized value through a social cost of GHG analysis.

An important note to this analysis is that the MCFO SEIS explicitly mentions the proposed action (the proposed CO<sub>2</sub> injection project in Carter County) as a responsive action to the 2050 net-zero goal outlined in EO-14008. However, the CO<sub>2</sub> that would be stored as a result of the proposed action was not incorporated in the projected emissions.

### *3.2.3 Environmental Effects—Alternative 2 (Proposed Action)*

The proposed action would include the construction and operation of the following elements on BLM-administered lands: access roads, well pads, bulklines, flowlines, pump stations and offices, and for use of federal underground pore space to sequester CO<sub>2</sub>.

Criteria air pollutants, HAPs, and GHGs emissions would result from four primary categories of activities: 1) road fugitive emissions from personnel commuting and equipment mobilization; 2) surface disturbance related to construction; 3) use of nonroad mobile and portable equipment for construction and well drilling; 4) operating and maintaining field assets. The air pollutant emissions resulting from construction and drilling of the proposed action would occur intermittently over a large area and over a period of several years. Construction and drilling is planned to be completed in eight groups. The air quality analysis was completed using the assumption that each construction group's activities would be completed in one year which would present the most conservative estimation of air emissions relating to construction and drilling activities. Therefore, construction and drilling impacts to air quality are based on group one through eight activities assumed to start in year 2026, the estimated disturbed surface area, and estimated personnel travel. Construction and drilling emissions associated with the proposed action would occur from July through November of each year. The construction and drilling emissions for the proposed action are provided in Appendix E. Construction and drilling impacts on climate change due to GHG emissions are discussed in the cumulative effects section.

The sequestration of 150 million tons of CO<sub>2</sub> would be made possible through construction and drilling of the proposed action. The expected direct emissions are from fugitive emissions at the new well pads and from the constructed CO<sub>2</sub> pipeline. Indirect effects of the Project, such as increased traffic on the new roads, are not expected to have a large impact on air quality due to the rural nature of the Project. Exhibits 1–11 of the Air Quality Analysis Calculations (Appendix

E) present estimated rates of air pollutant emissions that would result from field construction, drilling, operations, as well as an estimate CO<sub>2</sub> sequestration timeline.

### **Air Quality**

The air quality analysis provided was developed based upon a reasonably defined boundary of the Project's direct impacts. As such, direct air emissions for criteria pollutants and GHGs were quantified for construction activities, and indirect air emission from drilling and operational phases of the proposed Project are discussed below. Reference Section 3.2.1 for specific information on the impacts and regulatory status of criteria pollutants and GHGs.

The air quality analysis is based upon the best engineering planning information available at the time and reasonable assumptions. Assumptions have been made regarding equipment quantities and operational periods as the construction schedule has not been finalized at this stage. Furthermore, the boundary of this analysis was limited strictly to construction, drilling, and operational periods. The following non-inclusive list of assumptions was utilized to define the limits of these boundaries.

- Upstream emissions from construction materials and equipment are beyond the scope of this analysis.
- Upstream emissions from the sourcing of CO<sub>2</sub> that is being sequestered is beyond the scope of this analysis. The type and location of emissions sources for this project are unknown at this time.
- There are 12 wells that would be sited on BLM land and 3 wells that would be sited on State land. For this analysis, the emissions from the construction, drilling, and operation of all 15 wells and their associated infrastructure (i.e. pipelines, roads) are included due to the interconnected nature of the operational equipment.
- Injection wells will not require an additional energy source to operate; the wellhead would operate on induced pressure.
- Two electric pump stations would be constructed and operated as a part of the Project. This analysis does not analyze emissions associated with the purchase of electricity for the operation of these stations (scope 2 emissions).
- Construction and drilling is assumed to occur seasonally (July – November) between the years of 2026 and 2035. Operational emissions would continue year-round for 20 years after the completion of construction in 2035, and a 50-year post-closure monitoring period will occur.
- Operational emissions are limited to employee commuting, fugitive losses from pipelines, and any assumed fugitive leak rates from the pump stations, wellheads, or underground CO<sub>2</sub> storage. The proposed Project is a carbon sink, therefore, there are no additional downstream emission sources.

In-depth information regarding the assumptions and methodology utilized in the air quality analysis is located in Appendix E. The following analysis provides a reasonable estimate of emissions that would occur if the proposed Project proceeds and is not dependent on any other future projects the BLM or the State of Montana may choose to authorize.



Direct Emissions - Construction and Drilling Activities

Construction-related criteria air pollutant and HAP emissions associated with the following elements would occur from the following sources: access roads, well pads (construction and drilling activities), bulklines, flowlines, pump stations and offices. Each construction group has a combination of the above elements in various quantities. An outline of each expected construction element per group can be found in Appendix E. Air emissions from the construction of the Project would occur due to 1) vehicular emissions from increased traffic from the construction work force and construction deliveries, 2) internal combustion engine emissions from construction equipment, and 3) fugitive dust (PM10 and PM2.5) emissions from excavating, site preparation, and storage piles. For the most conservative estimation of construction emissions, it was assumed that each group takes one year to complete all activities; however, as the construction schedule is not finalized, the emissions from each group are presented on a tons per group basis. A summary of each construction group’s emissions of criteria air pollutants and HAP emissions are included in Table 3-3.

**Table 3-3  
Criteria Air Pollutants and HAP Emissions from Construction Activities  
(Controlled U.S. Short Tons Total Per Construction Group)**

<b>ROW Group</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>PM<sub>10</sub><sup>b</sup></b>	<b>PM<sub>2.5</sub><sup>b</sup></b>	<b>SO<sub>2</sub></b>	<b>VOC</b>	<b>HAPS</b>	<b>20- Year GWP CO<sub>2e</sub></b>	<b>100- Year GWP CO<sub>2e</sub></b>
Group 1	0.71	0.45	10.65	2.27	0.01	0.05	0.01	345	345
Group 2	2.65	1.20	22.99	4.36	0.02	0.17	0.03	1036	1035
Group 3	1.11	0.68	6.31	1.41	0.01	0.08	0.01	502	501
Group 4	1.26	0.71	11.49	2.36	0.01	0.09	0.01	519	518
Group 5	2.63	1.24	35.69	7.58	0.02	0.18	0.03	1172	1170
Group 6	0.83	0.55	6.00	1.13	0.01	0.06	0.01	321	320
Group 7	0.94	0.61	7.92	1.45	0.01	0.07	0.07	391	390
Group 8	1.09	0.65	9.99	2.19	0.01	0.08	0.01	456	455
<b>Construction Total<sup>a</sup></b>	<b>11.22</b>	<b>6.08</b>	<b>111.05</b>	<b>22.75</b>	<b>0.09</b>	<b>0.80</b>	<b>0.19</b>	<b>4,743</b>	<b>4,734</b>

<sup>a</sup> Construction Total represents a lifetime sum of construction emissions in U.S. short tons. The construction schedule has not been finalized but these emissions would occur over a span of multiple years.

<sup>b</sup> Fugitive dust emissions have been assumed to be controlled via reduction measures and mitigation.

Generally, construction emissions are temporary in nature, fall off rapidly with distance from the construction, and would not result in long-term impacts. Once construction activities are complete, emissions from equipment would cease. Although construction emissions from the proposed Project are projected to last several years, the location of construction activities within the Project area would change with each group often by multiple miles.

Indirect Emissions - Operational and Monitoring Activities

Air emissions from the operation of the Project would occur due to vehicular emissions from increased traffic from the work force and required deliveries; fugitive emissions from the operation of the bulklines and flowlines; and operational and maintenance activities related to the pump stations and wellheads. Operational emissions were quantified for multiple components of the Project: pipeline, pump station, and wellheads operation and maintenance, as well as a monitoring period. The pipeline and pump station operation scenario is representative of the time sequestration begins until the closure of the final well pads approximately 27 years later. The monitoring scenario represents the 50-year post-abandonment monitoring period. The emissions from each operational scenario are presented in Table 3-4. Criteria and HAP emissions associated with each operational scenario based on anticipated work force traffic and deliveries. Equipment that would operate for non-routine maintenance or emergencies is not included in this analysis.

**Table 3-4  
Operational and Monitoring Emissions (U.S. Tons Per Year)**

<b>Component</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>SO<sub>2</sub></b>	<b>VOC</b>	<b>HAPS</b>	<b>CO<sub>2e</sub></b>
Pipeline	0.56	0.07	0.02	0.02	4.42x10 <sup>-03</sup>	0.03	2.32x10 <sup>-04</sup>	117
Wellheads (each)	-	-	-	-	-	-	-	56
Pump Station (each)	-	-	-	-	-	-	-	17
Monitoring	0.49	0.03	0.01	0.01	3.86x10 <sup>-03</sup>	0.02	1.85x10 <sup>-04</sup>	15

Section 3.2.1, discusses the air quality and regulatory setting of the proposed Project. Total HAPs and each individual criteria pollutant are estimated to emit less than one ton per year primarily from mobile sources (automobiles). As such, minimal to no impacts to ambient air quality or public health are expected as a result of operation of the proposed Project. GHG impacts are discussed further in the Climate Change section.

**Emission Reduction Measures and Mitigation**

The proposed action construction and operations would include, among other options, implementation of the following measures to control emissions:

- installing temporary erosion and sediment control devices such as but not limited to silt fences, trench breakers, drainage channels or ditches, and tackifier for topsoil stockpiles;
- implementing dust abatement practices during construction and operation of the Project including but not limited to the application of non-chemical dust suppressants and imposing speed limits on access roads;
- construction equipment would be maintained in good working order to minimize trace gas emissions; and
- meeting or exceeding applicable industry standards and regulatory requirements, including the 2015 MCFO RMP BMPs during construction, drilling, operation, and

maintenance stages. Construction BMPs and mitigation are discussed in further detail in the POD.

### Climate Change

The GHG emissions potentially resulting from construction of the proposed action along with subsequent operation of the injection wells and pipeline are presented in Appendix E and are summarized below in the cumulative effects discussion. Construction GHGs emission would occur due to vehicular emissions from increased traffic from the construction work force, traffic from construction deliveries, and internal combustion engine emissions from construction equipment. Operational GHG emissions are expected to result from personnel commuting and fugitive CO<sub>2</sub> losses.

The pipeline, while operational, as well as the underground storage formation were assumed to have fugitive CO<sub>2</sub> losses. The pipeline has an assumed leakage factor of 0.0014 Gigagrams per kilometer of pipeline (IPCC 2006). Estimated losses from venting events and equipment located at the pump stations are based on preliminary engineering estimates. Estimated losses from wellhead equipment are based on the methodology prescribed in 40 CFR Subpart RR.

A leakage of CO<sub>2</sub> from the underground storage formation of 0.5 percent over a 100-year monitoring period was determined to be appropriate for the purposes of this analysis. Leakage rates ranging from no leakage to approximately 1 percent over 100 years have been cited in a variety of literature (NETL 2013, Alcalde et al. 2018). As the estimates are intended to be representative of poorly monitored and abandoned legacy wells, Denbury averaged these two rates to present a very conservative estimate of fugitive CO<sub>2</sub> emissions that may occur during the monitoring period.

The GHG emissions were estimated by construction group and by operation scenario as defined in the Air Quality Section. The GHG emissions were then quantified as a CO<sub>2</sub>e value. These emissions estimates are shown in Table 3-5 and Table 3-6.

**Table 3-5  
Greenhouse Gas Emissions from Construction Activities (U.S. Tons per group)**

Construction Group	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	20-Year GWP CO <sub>2</sub> e	100-Year GWP CO <sub>2</sub> e
Group 1	343	7.53x10 <sup>-03</sup>	5.37x10 <sup>-03</sup>	345	345
Group 2	1,031	3.29x10 <sup>-02</sup>	1.07x10 <sup>-02</sup>	1,036	1,035
Group 3	498	2.18x10 <sup>-02</sup>	6.51x10 <sup>-03</sup>	502	501
Group 4	516	2.26x10 <sup>-02</sup>	6.78x10 <sup>-03</sup>	519	518
Group 5	1,166	3.43x10 <sup>-02</sup>	1.19x10 <sup>-02</sup>	1,172	1,170
Group 6	318	1.86x10 <sup>-02</sup>	5.37x10 <sup>-03</sup>	321	320
Group 7	388	2.08x10 <sup>-02</sup>	5.81x10 <sup>-03</sup>	391	390
Group 8	453	2.09x10 <sup>-02</sup>	6.31x10 <sup>-03</sup>	456	455
Construction Total	<b>4,712</b>	<b>0.18</b>	<b>0.06</b>	<b>4,743</b>	<b>4,734</b>

\*Numbers may not add up due to independent rounding.

**Table 3-6  
Greenhouse Gas Emissions from Operational and Monitoring Activities  
(U.S. Tons Annual)**

Component	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	20-Year GWP CO <sub>2e</sub>	100-Year GWP CO <sub>2e</sub>
Pipeline	117	5.60x10-03	7.70x10-04	117	117
Pump Station (each)	17	-	-	17	17
Wellheads (each)	56	-	-	56	56
Monitoring	15	2.43x10-03	6.76x10-04	15	15

Projects with net-zero emissions are generally considered to not contribute to climate change, and projects with net-negative emissions generally have a climate benefit. The average state-wide CO<sub>2e</sub> emissions for the most recent 5 years of data available (2017-2021) was determined to be 60,799,395 tons per year (EPA 2023b). The worst-case annual Project CO<sub>2e</sub> emissions (Construction Group 5 and Operational Emissions), are calculated to be 1,695 tons per year. This equates to 0.003 percent of the statewide CO<sub>2e</sub> emissions. For reference, Table 3-7 summarizes the annual GHG emissions from the proposed Project’s worst case annual emissions, the state of Montana, and the United States, in million tons CO<sub>2e</sub> per year based on 100-year GWPs (EPA 2023a). However, when including the subsequential 150 million tons of CO<sub>2</sub> proposed to be injected as a result of this Project would total GHG emissions would be net-negative. GHG impacts are discussed further in the climate change section of cumulative actions.

**Table 3-7  
Greenhouse Gas Emission Scaled Comparisons (Million Tons CO<sub>2e</sub> annually [rounded])**

	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	100-Year GWP <sup>b</sup> CO <sub>2e</sub>
Project <sup>a</sup>	1.69x10 <sup>-03</sup>	1.12x10 <sup>-06</sup>	3.35x10 <sup>-06</sup>	1.70x10 <sup>-03</sup>
Montana <sup>c</sup>	35	16	12	61
United States <sup>c</sup>	5,734	914	467	7,235

<sup>a</sup> It should be noted that the worst-case Project year accounts for construction emissions which are temporary in nature.

<sup>b</sup> IPCC Fifth Assessment Report 100-year GWP values as utilized by the 2023 EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks.

<sup>c</sup> Gross CO<sub>2e</sub> emissions totals provided by EPA Greenhouse Gas Inventory Data exclude Land Use, Land-Use Change and Forestry effects and includes fluorinated gases which are excluded from the Project emission calculations.

## Cumulative Effects

### Air Quality

As discussed in Section 3.2.2, MCFO quantified future effects to air quality based on four potential future land use scenarios for the MCFO RMP area, which includes the proposed Project area, in the SEIS. The modeling from the most conservative emission scenario shows future air quality and public health impacts similar to present conditions. However, the analysis indicated

that cumulative nitrogen deposition could exceed critical loads of nitrogen deposition at some federal and tribal Class I areas.

The proposed Project would likely have negligible impacts on these areas regardless of the future land use scenario, as the Project has inherently low emissions from construction and operation compared to land uses such as coal, oil, and gas development. Further, the closest Class I area is over 50 miles from the proposed Project; and mitigation strategies would be implemented to control emissions, as described in the POD.

Climate Change

An important aspect of the proposed action is that once the first injection well (Injection Well 03) becomes operational, the Project would inject CO<sub>2</sub> into underground geologic formations for permanent CO<sub>2</sub> sequestration. As shown in Table 3-5 and Table 3-6, CO<sub>2</sub> is the largest contributor to GHG emissions from the construction and operation of the proposed Project. The amount of CO<sub>2</sub> this project would permanently sequester would be much greater than the GHG emissions created by the construction and operation of the proposed Project when comparing on a CO<sub>2</sub>e basis. Thus the Project would have net-negative emissions. The Project emissions, amount of CO<sub>2</sub>e sequestered, and net CO<sub>2</sub>e are shown in Table 3-8. Note that values presented in this table are reliant upon the assumption that each construction group would be completed in one year. The construction schedule is not finalized and therefore these numbers are considered a representative estimate.

**Table 3-8  
Net Greenhouse Gas Emissions (U.S. Tons CO<sub>2</sub>e Annually)**

Project Year	CO <sub>2</sub> e	CO <sub>2</sub> e Sequestered	100-Year GWP <sup>k</sup> NET CO <sub>2</sub> e	100-Year GWP Cumulative Net CO <sub>2</sub> e
Year 1 <sup>a</sup>	345	0	345	345
Year 2 <sup>b,c</sup>	1,208	500,000	-498,792	-498,448
Year 3 <sup>d</sup>	634	1,500,000	-1,499,366	-1,997,814
Year 4	932	2,500,000	-2,499,068	-4,496,882
Year 5	1,695	3,500,000	-3,498,305	-7,995,187
Year 6 <sup>e</sup>	973	4,500,000	-4,499,027	-12,494,213
Year 7	391	5,500,000	-5,499,609	-17,993,822
Year 8 <sup>f</sup>	456	6,500,000	-6,499,544	-24,493,367
Year 9 <sup>g</sup>	973	7,500,000	-7,499,027	-31,992,394
Year 10	973	7,500,000	-7,499,027	-39,491,421
Year 11	973	7,500,000	-7,499,027	-46,990,448
Year 12	973	7,500,000	-7,499,027	-54,489,475
Year 13	973	7,500,000	-7,499,027	-61,988,502
Year 14	973	7,500,000	-7,499,027	-69,487,530
Year 15	973	7,500,000	-7,499,027	-76,986,557
Year 16	973	7,500,000	-7,499,027	-84,485,584
Year 17	973	7,500,000	-7,499,027	-91,984,611
Year 18	973	7,500,000	-7,499,027	-99,483,638
Year 19	973	7,500,000	-7,499,027	-106,982,665

Project Year	CO <sub>2</sub> e	CO <sub>2</sub> e Sequestered	100-Year GWP <sup>k</sup> NET CO <sub>2</sub> e	100-Year GWP Cumulative Net CO <sub>2</sub> e
Year 20	973	7,500,000	-7,499,027	-114,481,693
Year 21	973	7,500,000	-7,499,027	-121,980,720
Year 22	917	7,000,000	-6,999,083	-128,979,803
Year 23	788	6,000,000	-5,999,212	-134,979,014
Year 24	693	5,000,000	-4,999,307	-139,978,321
Year 25	581	4,000,000	-3,999,419	-143,977,740
Year 26	469	3,000,000	-2,999,531	-146,977,271
Year 27	357	2,000,000	-1,999,643	-148,976,913
Year 28 <sup>h</sup>	245	1,000,000	-999,755	-149,976,668
Monitoring (Annual) <sup>i</sup>	7,515	0	7,515	-149,969,153

<sup>a</sup>Proposed Project start year. Group 1 construction emissions are the only emissions considered.

<sup>b</sup>Pipeline is assumed to become operation. Years 2 CO<sub>2</sub>e is calculated as Year 2 Construction Group + Operational Emissions. The tons CO<sub>2</sub>e sequestered is then subtracted out to present a net value.

<sup>c</sup>Wellhead 1 is assumed to become operational. Years 4-8 are calculated as Construction Group + Pipeline and Pump Station(s) Operational Emissions + Wellhead(s) Operational Emissions.

<sup>d</sup>Pump Station 1 assumed to become operational. Years 3-5 are calculated as Construction Group + Pipeline and Pump Station Operational Emissions.

<sup>e</sup>Pump Station 2 assumed to become operational. Years 6-8 are calculated as Construction Group + Pipeline and both Pump Station Operational Emissions.

<sup>f</sup>Year 8 is calculated as presented as the final year with construction emissions based on the assumption that Construction Groups 1-8 will each take one year to complete.

<sup>g</sup>Years 9 through 28 show only expected operational emissions based on the pipeline, pump stations, and wellheads.

<sup>h</sup>Well 3 (the first operational well) decommissions. Years 23-28 will see a reduction in operational wells by a multiple of two for each additional year.

<sup>i</sup>Year 28 is the assumed last year of injection based on 150 million tons of CO<sub>2</sub> being sequestered in total.

<sup>j</sup>Monitoring Emissions will continue on an annual basis for 50 years.

<sup>k</sup>IPCC Sixth Assessment Report 100-year Global Warming Potential Values. 20-year GWP values are available in Appendix E

The proposed action is expected to sequester a total of 150 million tons of CO<sub>2</sub> throughout the Project lifespan. The above table shows an estimated amount of CO<sub>2</sub> sequestered on an annual basis from the Project start year until year 28. Note that this does not perfectly align with the proposed 30-year ROW due to the assumption that each construction group would be completed in one year and that the first well (Injection Well 03) would become active in year 2 of the Project lifespan. Including the first year of monitoring activities, year 29, the 100-year cumulative net CO<sub>2</sub>e stored by the Project is -149,969,153 U.S. tons. The deviation from the project design of 150 million tons accounts for emissions from construction and any fugitive losses related to the Project. Ultimately, 99.98 percent of the designed 150 million tons is expected to be permanently sequestered. Further information regarding estimated annual emissions and annual sequestration amounts is available in Appendix E. For additional context, Table 3-9 shows the GHG emissions from each Project component converted into an equivalent value of gasoline power vehicles driven for one year. The net CO<sub>2</sub> sequestered value is included for comparative purposes.

**Table 3-9  
Greenhouse Gas Equivalencies**

<b>Project Component</b>	<b>CO<sub>2</sub>e Emissions (U.S. tons)</b>	<b>Greenhouse Gas Equivalency [# of gasoline-powered passenger vehicles driven for one year]<sup>a</sup></b>
Direct Emissions (Cumulative)	4,734	955
Indirect Emissions (Operational Annual)	190	39
Indirect Emissions (Monitoring Annual)	7,515	1,515
Net CO <sub>2</sub> Sequestered (Cumulative)	-149,969,153	-30,246,752

<sup>a</sup> Calculated according to methodology prescribed by EPA’s GHG Equivalencies Calculator (<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>)

Consistent with EO 14008 (discussed previously in Section 3.2.1, Climate Change Regulatory Setting), the United States has established an economy-wide target of reducing its net GHG emissions (including anthropogenic and natural GHG emissions as well as GHG removals by sinks) by 50 percent to 52 percent below 2005 levels in 2030 in its Nationally Determined Contribution under the Paris Agreement (UNFCCC 2021). The sequestration of CO<sub>2</sub> from the proposed Project, a GHG sink, would help achieve this national level goal.

Social Cost of Greenhouse Gases

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, in dollars, of the economic damages that would result from emitting one additional ton of a GHG into the atmosphere in a given year. The “social cost” puts the effects of climate change into economic terms to help policymakers and decisionmakers understand the economic impacts of decisions that would increase or decrease emissions. On January 20, 2021, President Biden issued E.O. 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. Section 1 of E.O. 13990 establishes an Administration policy to listen to the science; improve public health and protect our environment; ensure access to clean air and water; reduce GHG emissions; and bolster resilience to the impacts of climate change. Section 2 of E.O. 13990 calls for federal agencies to review existing regulations and policies issued between January 20, 2017, and January 20, 2021, for consistency with the policy articulated in the E.O. and to take appropriate action.

Consistent with E.O. 13990, the CEQ rescinded its 2019 “Draft National Environmental Policy Act Guidance on Considering Greenhouse Gas Emissions” and issued interim NEPA Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (CEQ 2023). This guidance, effective upon publication, builds upon and updates the CEQ’s 2016 Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews. While CEQ works on updated guidance, it has instructed agencies to consider and use all tools and resources available to them in assessing GHG through the use of social cost of GHG estimates (CEQ 2023).

Regarding the use of Social Cost of Carbon or other monetized costs and benefits of GHGs, the 2016 GHG Guidance noted that NEPA does not require monetizing costs and benefits. It also noted that “the weighing of the merits and drawbacks of the various alternatives need not be displayed using a monetary cost-benefit analysis and should not be when there are important qualitative considerations.”

Section 5 of E.O. 13990 emphasizes how important it is for federal agencies to “capture the full costs of GHG emissions as accurately as possible, including taking global damages into account” and establishes the IWG. In February of 2021, the IWG published *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide: Interim Estimates under E.O. 13990* (IWG 2021), and updates previous CEQ guidance from 2016. In accordance with the current directive, this subsection provides estimates of the monetary value of changes in GHG emissions that could result from selecting each alternative. 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, methane, and nitrous oxide developed by the IWG. 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>4</sup>.

The IWG’s SC-GHG estimates are based on complex models describing how GHG emissions affect climate and how they affect economic outcomes, including changes in agricultural productivity, damages caused by sea level rise, and declines in human health and labor productivity. One key parameter in the models is the discount rate, which is used to estimate the present value of the stream of future damages associated with emissions in a particular year. A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (i.e., future benefits or costs are a less significant factor in present-day decisions). The current set of interim estimates of SC-GHG have been developed using three different annual discount rates: 2.5 percent, 3 percent, and 5 percent (IWG 2021).

As expected with such a complex model, there are multiple sources of uncertainty inherent in the SC-GHG estimates. Some sources of uncertainty relate to physical effects of GHG emissions, human behavior, future population growth and economic changes, and potential adaptation (IWG 2021). To better understand and communicate the quantifiable uncertainty, the IWG method generates several thousand estimates of the social cost for a specific gas, emitted in a specific year, with a specific discount rate. These estimates create a frequency distribution based on different values for key uncertain climate model parameters. The shape and characteristics of that frequency distribution demonstrate the magnitude of uncertainty relative to the average or expected outcome.

To further address uncertainty, the IWG recommends reporting four SC-GHG estimates in any analysis. Three of the SC-GHG estimates reflect the average damages from the multiple simulations at each of the three discount rates. The fourth value represents higher-than-expected economic impacts from climate change. Specifically, it represents the 95th percentile of damages

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<sup>4</sup> <https://www.whitehouse.gov/omb/information-regulatory-affairs/regulatory-matters/#scghgs>



estimated, applying a 3 percent annual discount rate for future economic effects. This is a low probability but high damage scenario that represents an upper bound of damages within the 3 percent discount rate model. The estimates in Table 3-10 follow the IWG recommendations.

The SC-GHG were calculated using the estimated emissions from the proposed Project. These emissions were previously discussed in the above Climate Change section or Appendix E. These SC-GHG estimates represent the present value of future market and nonmarket costs associated with CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions. Estimates are calculated based on IWG estimates of social cost per metric ton of emissions for a given emissions year and Denbury’s estimates of emissions in each year. They are rounded to the nearest \$1,000. In Table 3-10, the social cost is shown for the build scenario, where it is assumed that the proposed Project moves forward. For comparison, the SC-GHG is presented for the Project independently and then with the CO<sub>2</sub> sequestration incorporated.

**Table 3-10  
Present Value of Estimated SC-GHG for GHG Emissions Associated with the Proposed Project over a 30-year lifespan**

Discount Rate	5%	3%	2.5%	3%
Statistic	Average Value	Average Value	Average Value	95 <sup>th</sup> Percentile
Project Emissions <sup>a</sup> Incorporating CO <sub>2</sub> Sequestered	-\$1,732,998,409	-\$6,556,134,123	-\$9,886,092,612	-\$20,056,804,163

<sup>a</sup> Project Emissions are represented by construction emissions, operational emissions, and the first year of monitoring emissions. Upstream emissions have not been incorporated into this analysis.

<sup>b</sup> Assumed 30-year lifespan assumed to be 2026-2056

As presented above, the SC-GHG was calculated to save approximately \$1.8 billion, \$7.2 billion, and \$10.8 billion in climate damages (high to low discount rates) if the Project is constructed and operated compared to the no build scenario. The 95th percentile 3 percent discount rate has an SC-GHG value of more than \$21 billion. Due to nature of the proposed Project, the amount of CO<sub>2</sub> emitted because of the construction and operation of the pipeline and subsequent wells is greatly surpassed by the ultimate amount of CO<sub>2</sub> stored (Table 3-8). As such, the Project would ultimately have a social benefit of GHG.

The scenarios presented in the previously discussed BLM MCFO SEIS were identified as reasonably foreseeable land uses for the RMP area. This document has been referenced as a reasonable representation of the no-action alternative to the proposed Project. Within the SEIS, projected GHG emissions associated with each scenario are presented, in addition to the SC-GHG from each scenario. See Section 3.2.2 for more information regarding the SEIS.

### 3.3 Resource Issue 2 – Cultural Resources

#### 3.3.1 Affected Environment

The physical-APE for the Project is approximately 110,100 acres and corresponds to the Project area. Within the physical-APE, previously conducted cultural resources inventories cover approximately 4,002 acres. Initial BLM MCFO modeling of the cultural environment to assess

the potential of 93,153 acres of un-inventoried lands within the APE found that the Project APE has the potential to have 355 unrecorded sites. Further identification effort lead to the development of the Cultural Resource Surface Disturbance Classification (CRSDC) geospatial dataset. The dataset and its initial truthing strategy can be relied upon as a primary base dataset for the proposed action and all types of future undertakings within the physical-APE. See Bender et al. (2023) for specifics to each category, truthing details, and data quality information.

Bender et al. (2023) also conducted and reported identification efforts central to the proposed action’s infrastructure which included Tribal Cultural Surveyors from the Standing Rock Sioux Tribe (Standing Rock), Rosebud Sioux Tribe (Rosebud), and Crow Nation (Crow). This inventory consisted of 2,185 acres within the physical-APE. There were sixteen cultural sites identified, recorded, and 21 isolated finds documented within the Class III survey corridor. In addition to the infrastructure inventory 37 of 41 previously recorded cultural resources present in the physical-APE were visited and either rerecorded or updated. There were also 151 new sites recorded including small- and large-scale historic BLM range improvement projects, a historic agricultural research facility, and a historic district. These were known historic aged resources within the physical-APE requiring recording.

The physical-APE also includes inventory, recording, and evaluation from Ferguson & McElroy (2022). The report covers 3,680 acres and includes locations with proposed infrastructure as well as general APE locations. The report also contributes 12 additional cultural sites to information of the physical-APE.

Overall, between the Bender et.al (2023) and the Ferguson & McElroy (2022) reports there are 218 sites within the physical-APE; all the sites were evaluated for their inclusion in the National Register of Historic Places (NRHP). BLM’s review agreed with the recommendations in all cases except for three of the sites 24CT0025, 24CT0060, and 24CT0058. The Montana State Historic Preservation Office’s (SHPO) review of the Project warranted that two additional sites remain unevaluated for the NRHP, 24CT0061 and 24CT1391. Of the remaining 213 sites, 192 are determined not eligible for the NRHP. The remaining 21 are determined eligible for the NRHP. The 21 eligible properties within the physical APE are listed in Table 3-11, as follows:

**Table 3-11  
Eligible Properties within the Physical Area of Potential Effects**

Site Number	Site Number	Site Number
24CT1571	24CT1613	24CT1688
24CT1607	24CT1614	24CT1689
24CT1608	24CT1622	24CT1690
24CT1609	24CT1632	24CT1691
24CT1610	24CT1643	24CT1692
24CT1611	24CT1671	24CT1718
24CT1612	24CT1687	24CT1719

There was also an Audio-Visual-APE (AV-APE) defined for the Project that covers 114,181 acres; 19,007 acres are outside the Project area. The AV-APE is based on 5.5 Minutes-Of-Angle (MOA) from each of the proposed injection well locations and is based on the maximum height of the proposed structures.

The AV-APE was developed to determine if the Project and its proposed infrastructure would have a significant impact to the viewshed of the Chalk Buttes TCP. The results of the analysis indicated that the structures to be placed at the proposed well locations would be visible. They are within 1-MOA distance from the TCP. The location of the proposed structures would not be placed within the threshold of significance, 5.5-MOA, where a detailed visual impact analysis related to the TCP would be warranted.

### *3.3.2 Environmental Effects—No Action Alternative*

Under the no action alternative, the proposed action would not proceed. Therefore, there would be no effects to historic properties from the proposed action.

### **Cumulative Effects**

Under the no action alternative, the proposed action would not be constructed; therefore, no cumulative impacts cultural resources or historic properties would occur. Existing activities in the area (i.e. livestock grazing, dispersed recreation, prescribed burns, noxious weed management, and agriculture) are expected to continue.

### *3.3.3 Environmental Effects—Alternative 2 (Proposed Action)*

The proposed infrastructure would impact 19 sites within the physical-APE; all but one are determined not eligible for the NRHP. The five unevaluated sites - 24CT0025, 24CT0060, 24CT0058, 24CT0061, and 24CT1391- would not be impacted by the proposed infrastructure. There is one eligible property that would be impacted.

The one historic property that would be impacted is 24CT1718, the Lone Tree Road, the site would be impacted along a 6.7-mile-long segment. The use that is proposed along these portions is a continuation of an existing cycle of ROW access and routine maintenance. There are no proposed changes to the alignment of the road. The portions of the Lone Tree Road that would be issued a ROW for the proposed action would not result in an adverse effect. These impacts and use of the road would not change the historical character of the road.

Specific details related to the impacts and findings of the physical-APE are found in cultural resources project number and analysis document MT-020-22-38C, Truesdale (2023). Specific details related to the impacts and finding of the physical-APE are found in cultural resources project number and analysis document MT-020-22-38B, Truesdale (2023). The findings of the physical-APE resulted in BLM's determination of no adverse effect to Historic Properties. The Project's AV-APE was also determined to have no adverse effect to the viewshed of the Chalk Buttes TCP. The distance beyond the 5.5-MOA and within the 1-MOA lends itself to the application of normal visual contrast considerations that are commonly applied, and committed to and detailed in Denbury's POD. The SHPO concurred with the BLM's Determination of No Adverse Effect to historic properties for Alternative 2 (Proposed Action), Montana SHPO numbers: 20233102609 (Physical-APE), 2023092715 (AV-APE).

**Cumulative Effects**

Authorization of the proposed action would have no effect on Historic Properties; therefore, the Project would not contribute to cumulative effects to Historic Properties. There would be 18 cultural sites evaluated for and determined not eligible for the NRHP. An UDP is included in POD Appendix X to provide for unanticipated discoveries.

**3.4 Resource Issue 3 – Socioeconomics**

*3.4.1 Affected Environment*

This section describes the existing social and economic characteristics of Carter County, Montana, encompassing the proposed Project. In addition, even though the Project is proposed in Carter County, Fallon County is included in the analysis because it is anticipated to provide most of the workers and housing needed during Project construction and operations. Data for the State of Montana is provided for reference.

**Population and Housing**

The affected environment is considered all of Carter County and Fallon County, Montana, both described as picturesque and known for ranching and farming. Carter County covers an area of 3,341 square miles with a population density of 0.4 people per square mile and Fallon County covers an area of 1,621 square miles with a population density of 1.8 people per square mile (U.S. Census Bureau 2023). Table 3-12 presents the demographic composition of Carter County in comparison to the State of Montana based on U.S. Census data.

**Table 3-12  
Demographic Profile of Carter and Fallon Counties, Montana**

Area	Total Population (2022)	Total Population (2020)	Total Population (2010)	Percent Minority (non-White) Population (2020)	Percent Hispanic Population (2020)	Percent Population Below Poverty Level (2020)	Median Household Income (2022 dollars)	Percent Population Unemployed (4 <sup>th</sup> QTR 2023)
Carter County	1,382	1,415	1,160	3.9%	1.3%	13.1%	\$46,486	1.8%
Fallon County	3,011	3,049	2,889	4.9%	2.0%	10.0%	\$79,750	1.9%
State of Montana	1,122,867	1,084,197	989,415	14.9%	4.5%	12.1%	\$72,980	2.3%

Carter County, Montana, Fallon County, Montana, and State of Montana - U.S. Census Bureau, 2010, 2020, 2022, and 2023; accessed January 2024.  
BLM Socioeconomic Profiles, Carter County, Montana and Fallon County, Montana; Headwaters Economics; December 11, 2023

Most housing in the counties are clustered in small towns and cities (e.g., Ekalaka and Baker) along major roadways with isolated residences scattered across the counties. Table 3-13 summarizes the housing characteristics of each county.

**Table 3-13  
Housing Characteristics of Carter and Fallon Counties, Montana**

Area	Total Housing Units (2022 <sup>1</sup> )	Median Value Owner-Occupied Housing (2022 <sup>1</sup> )	Owner-Occupied (2022 <sup>1</sup> )	Renter Occupied (2022)	Total Vacant Housing Units (2022 <sup>2</sup> )	Homeowner Vacancy Rate (2022)	Rental Vacancy Rate (2020)
Carter County	823	\$140,900	522 (63.5%)	195 (23.7%)	188 (22.9%)	0.5	2.5
Fallon County	1,572	\$231,300	1,133 (72.1%)	Information Not Available	313 (19.9%)	1.6	16.5
State of Montana	529,152	\$305,700	365,114 (69.0%)	144,458 (27.3%)	65,085 (12.3%)	0.7	4.8

1 - U.S. Census Bureau, 2022; accessed January 2024.

2 - BLM Socioeconomic Profiles for Carter County, Montana and Fallon County, Montana; Headwaters Economics; December 11, 2023.

### **Community Facilities and Public Services**

The Carter County Sheriff’s Office, volunteer fire department, and EMS serve the county from Ekalaka, the county seat of Carter County, approximately 12 miles north of the Project area. Fallon County is served by ambulance/EMS and the Fallon County Sheriff out of Baker, approximately 37 miles north of Ekalaka. The Ekalaka Municipal Airport in Carter County and the Baker Municipal Airport in Fallon County, both general aviation airports serving the surrounding areas, support emergency response, recreational and business travel, agricultural and economic support, and critical community access. The Dahl Memorial Healthcare hospital, Carter County Public Health, several places of worship, a library, and the Ekalaka Public Schools are all in Ekalaka. Additional fire support services are available from Plevna and Baker (Fallon County, Montana), Camp Crook, South Dakota, and Marmarth, North Dakota ranging from 21 to 52 miles away. The Fallon Medical Complex in Baker provides critical and emergency care and health and social services across Fallon, Carter, Wibaux, and Custer counties in Montana, and Slope Golden Valley, and Bowman counties in North Dakota. No community facilities or public services are within the Project area.

### **Economy and Employment**

Within Carter County, 27.8 percent of the land is owned by the federal government with 65.4 percent of the land held in private ownership. The BLM controls 84.9 percent of the federally owned lands with the U.S. Forest Service controlling the remaining 15.1 percent. Approximately 6.8 percent of the land is owned by the state, county, city, or other public jurisdiction. The economy of Carter County revolves around farming and ranching along with service-related jobs

farming, mining, construction, and manufacturing) comprise approximately 45 percent of the total jobs (401 out of 892) in the county compared to 18 percent in the State. Service-related jobs (e.g., retail; transportation and warehousing; finance and insurance; arts, entertainment, and recreation; and accommodations [lodging/hotels] and food services) comprise approximately 21 percent of the total jobs (186 out of 892) in the county compared to 68.5 percent in the State, with government jobs (federal, military and civil service, state, county, and local) comprising approximately 14 percent of the total jobs (127 out of 892) in the county compared to 13.5 percent in the State.<sup>5</sup>

Farming, ranching, and recreational uses (hunting) comprise the majority of the jobs in Carter County. Within the proposed ROWs for surface elements, there are 17 grazing allotments comprised of approximately 14,000 permitted BLM AUMs. Five hunting outfitters maintain special recreation permits on BLM lands within the Project area.

As noted in Table 3-12, the median household income in Carter County in 2022 was \$46,486 compared to \$72,980 in the State of Montana. In the fourth quarter of 2023, 1.8 percent of the county population was unemployed compared to 2.3 percent of the state's population.

Because workers to support construction and operation of the Project would also likely come from Fallon County, the following socioeconomic overview of Fallon County is provided. Within Fallon County 11.2 percent of the land is owned by the federal government (all federally owned land is controlled by the BLM), 7.0 percent of the is owned by the state, city, or county, with 81.8 percent of the land held in private ownership. The economy of Fallon County revolves around farming/ranching, mining (specifically oil and gas resources), and construction along with service-related jobs (e.g., retail trade, transportation/warehousing, real estate, and health care/social services). Non-service-related jobs (e.g., farming/ranching, mining, construction, and manufacturing) comprise approximately 35 percent of the total jobs (810 out of 2,293) in the county compared to 18 percent in the State. Service-related jobs (e.g., retail trade, transportation/warehousing, real estate, healthcare/social assistance, etc.) comprise approximately 42.4 percent of the total jobs (973 out of 2,293) in the county compared to 68.5 percent in the State.<sup>6</sup>

As noted in Table 3-12, the median household income in Fallon County in 2022 was \$79,750 compared to \$72,980 in the State of Montana. In the fourth quarter of 2023, 1.9 percent of the county's population was unemployed compared to 2.3 percent of the state's population.

### **Environmental Justice Community**

The Project is within a census block group in the southern portion of the county classified as low-income. The 2022 median income for a family of four in Carter County was \$46,486, lower than that of the State of Montana (the reference area) of \$72,980 and that of Fallon County of \$79,750. BLM uses a low-income threshold at or below 200 percent of the federal poverty rate (\$30,000 in 2023; 200 percent would equal \$55,500). With Carter County's median income being less than 200 percent of the federal poverty rate, Carter County is considered as a low-

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<sup>5</sup> BLM Socioeconomic Profile, State of Montana; Headwaters Economics, March 31, 2023; and BLM Socioeconomic Profiles of Carter County, Montana and Fallon County, Montana; Headwaters Economics; December 11, 2023.

<sup>6</sup> BLM Socioeconomic Profile of Fallon County, Montana; Headwaters Economics; December 11, 2023.

income environmental justice community of concern. Fallon County is not considered a low-income environmental justice community of concern.

A minority community of concern is present if the percentage of the population identified as belonging to a minority group in a study area is equal to or greater than 50 percent, or it is more than 10 percentage points higher than that of the reference area. As presented in Table 3-12, Carter County has a minority population of 3.9 percent and Fallon County has a minority population of 4.9 percent compared to that of the State at 14.9 percent; therefore, neither Carter County nor Fallon County are considered to have a minority environmental justice community of concern.

### 3.4.2 Environmental Effects—No Action Alternative

Under the no action alternative, the proposed action would not proceed. Land uses, employment, and economic conditions would likely continue following current trends with farming, ranching, and recreation as the primary economic and employment sectors in Carter County, with service-related jobs also contributing to the economy of Fallon County. None of the long-term ROW rental fees or employment generated by the proposed action would occur. Grazing leases and hunting activities would continue without interruption.

#### Cumulative Effects

Under the no action alternative, the Project would not be constructed; therefore, the actions would not contribute to cumulative effects in the future.

### 3.4.3 Environmental Effects—Alternative 2 (Proposed Action)

#### Population and Housing

No substantial changes in the resident population or types and numbers of residential units within Carter or Fallon County are anticipated with construction and operation of the Project. The Project would be developed over a 20-year time period with development cycles occurring every 1-2 years. Table 3-14 summarizes the anticipated workforce needed for construction and operation of the Project. Denbury estimates that 25 percent of the employees hired for construction (annual full-time equivalents [FTE]s) would come from Carter County, with the remaining 75 percent of FTEs coming from outside of the county.

**Table 3-14  
Project Workforce**

Construction Group	Worker Type	Work Duration	Annual FTE
Group 1	Engineering/Planning	18 months	4
Group 1	Well Pad Construction	5 months	35
Group 1	Well Drilling	5 months	20
Groups 2-8	Well Pad Construction	5 months each year for 8 years	35
Groups 2-8	Well Drilling	5 months each year for 8 years	20
Groups 2-8	Flowline Construction	5 months each year for 8 years	35
Groups 2-8	Bulkline Construction	5 months in Year 2 and Year 5	35
Groups 2-8	Facilities Construction	5 months in Year 2 and Year 5	35

<b>Construction Group</b>	<b>Worker Type</b>	<b>Work Duration</b>	<b>Annual FTE</b>
Groups 2-8	Electric Transmission Line Construction (by Southeastern Electric Cooperative)	5 months in Year 2	35
Groups 2-8	Access Road Construction	5 months each year for 8 years	35
Group 9	Well Pad Construction	5 months	35
Group 9	Well Drilling	5 months	20
<b>Operation</b>	<b>Worker Type</b>	<b>Work Duration</b>	<b>Annual FTE</b>
Injection Phase	Engineering/Planning	20 years	4
Injection Phase	O&M Staff	20 years	3
Post- Injection/Closeout	Engineering/Planning	50 years	1
Post- Injection/Closeout	O&M Staff	50 years	1

***Annual FTEs are estimated to include 25% local workers***

The influx of temporary workers during construction periods would result in increased demands on temporary housing, most likely in Ekalaka and Baker. Denbury anticipates that temporary construction workers would occupy local hotels, motels, and RV camps, primarily in Ekalaka (approximately 12 miles to the north) and Baker (approximately 49 miles to the north). The existing housing supply in Ekalaka and Baker is anticipated to be sufficient to support local permanent worker housing. The rental vacancy rate in Fallon County (16.5 percent) is higher than that of Carter County (2.5 percent), so more temporary and rental housing may be available in Fallon County.

Construction would occur within the Project boundary. Based on the proposed development plan for the Project, the proximity of residences to the primary site features were assessed. The closest residence to Project components (e.g., planned roads, well pads) is approximately 1.8 miles away. No homes or businesses would be displaced by the Project.

Given the short duration of construction periods spread across 20 years, the impacts of the Project on population and employment would be temporary and minor.

### **Community Facilities and Public Services**

The community facilities and public services that serve the Project area are within Ekalaka, approximately 12 miles north of the Project and Baker approximately 49 miles north of the Project. No community facilities would be directly affected or displaced by the Project. The temporary influx of construction workers during the timeframes noted in Table 3-14, may create minor and temporary increased demands on law enforcement, volunteer fire departments, and health care services.

An estimated 25 miles of existing developed roads (14 miles on BLM land), including Lone Tree Road, Ridge Road, and Hammond Road, would be used to access the Project. Approximately 27



miles of existing two-track roads (25 miles on BLM land) and 5 miles of new two-track roads (4 miles on BLM land) would be used to construct and operate the Project. Existing developed roads across BLM, State, and privately owned lands may require surface grading and the installation of new surface aggregate to provide a safe roadway for truck and equipment travel, but no widening or realignment of the existing, developed roads would occur. An agreement with Carter County would be completed for county roads. Existing and proposed two-track roads would be maintained as two track roads, and weed-free mats would be used to facilitate access for construction equipment and drill rigs during wet conditions. One new access road to the Pump Station North would be graded and surfaced with aggregate. Temporary erosion and sediment control devices would be installed and maintained during Project construction to prevent sediment-laden stormwater from leaving existing and new ROW. No aggregate or other materials containing detectable levels of erionite would be used to improve roads. No changes to emergency response times or changes in routes would be caused by road maintenance activities or road use during Project construction or operation. Bonding would be completed for surface disturbing activities throughout the life of the Project. No new road construction, repair, or maintenance would occur in Fallon County as part the Project.

Denbury would obtain required authorizations for county road use and crossing permits from Carter County prior to Project construction. Denbury would coordinate with the county to maintain hard-surfaced roads in an operable condition to continue to allow access by the public and landowners during construction. A traffic plan would be implemented to address access during construction and reclamation. If any temporary closures or detours are required, they would only be used after authorization is obtained from the appropriate agency (BLM, Carter County, Montana Department of Transportation, etc.). Denbury would present alternate routes to residents, contractors, and emergency responders for review and approval prior to implementing them. Proper signage would be provided, and signage locations would be approved prior to making changes in traffic flow. Denbury would notify the appropriate agencies, emergency response personnel, operators, and contractors working onsite prior to initiating road closures, route detours, or the reopening of previously closed roads. In addition, Denbury would develop, implement, and adjust as appropriate, the Project's Emergency Response Plan that outlines coordination with emergency responders and law enforcement in the event of an incident, severe weather, or natural disaster.

### **Economy and Employment**

The Project would provide economic contributions to Carter and Fallon counties and surrounding communities through increased expenditures on local goods and services during construction periods and increases in corresponding sales taxes and use tax revenues generated by temporary construction employees. As described in Table 3-14, between 4 and 35 construction employees would be hired during the staggered construction timeframes for the Project. Denbury estimates that approximately 25 percent of the construction workforce would be hired locally, contributing up to 8 short-term and temporary jobs over the 20-year Project development timeline. Denbury also estimates that 7 permanent employees would be hired over the initial 20 years of Project operation, and 2 permanent employees over the remainder of the overall 50-year Project operating timeframe. The permanent positions may be filled by local appropriately skilled persons or through skilled hires from outside of the Project area.

The Project is a FLPMA ROW, which generates rentals and fees payable to the BLM that are deposited into the federal treasury. Additional economic contributions to the county level would result from the use of State lands with funds payable to the Montana School Trust Fund.

The proposed action would result in no changes to permitted AUMs to existing livestock grazing permits. Areas of temporary disturbance would be restored in accordance with Denbury's Reclamation, Mitigation, and Monitoring Plan, which meets or exceeds RMP requirements for vegetation. Denbury would seed disturbed areas with a BLM-recommended seed mix for grouped ecological sites to mitigate wind and water erosion and would treat and monitor invasive/noxious weeds.

Construction of the proposed Project is projected to occur outside of the prime hunting season for the special recreation permits that the BLM has issued for the Project area, resulting in minimal disruption for the five hunting outfitters with special recreation permits within the Project area. Denbury would coordinate with BLM before implementing temporary road closures and/or implement detours that may affect recreationalists.

### **Environmental Justice**

The Project, located in a low-income environmental justice community (Carter County), would provide opportunities for additional jobs to residents and contributing funds to the State of Montana. Temporary increases in retail sales and lodging fees would be contributed by the construction workforce during construction timeframes across the 20-year development of the Project. No residences would be displaced, no changes to existing ambient sound levels would occur at the residences closest to noise generating facilities, and traffic impacts would be mitigated as described in Section 1.7.1 and the POD. The Project would have no disproportionate or adverse human health or environmental effects on low-income or minority populations.

### **Cumulative Effects**

No disproportionate or adverse human health or environmental effects are generated from the Project. The generation of revenue and local jobs is often viewed as a contribution to a county with lower income levels.

## **3.5 Resource Issue 4 – Wildlife (Sage-Grouse and Sage-Grouse Habitat)**

### ***3.5.1 Affected Environment***

This section describes the existing habitat in the Project area, details sage-grouse habitat requirements, provides current and historic lek information within and surrounding the Project area, and discusses factors that may contribute to population declines that have been documented in the region.

### **General Habitat Description**

The predominant wildlife habitat types occurring within the Project area include grassland (53 percent of the Project area) and sagebrush shrubland (46 percent) (USGS 2021). Limited areas of riparian and wetland vegetation, conifer forest, and barren land account for about 1 percent of the

Project area. These areas, scattered throughout the Project area, also provide wildlife habitat. Topographic relief varies from flat to rolling with occasional sections of steep terrain.

The Project area is mostly rangeland and is located within the Central Grassland ecoregion where natural vegetation is mixed grass prairie with small percentages of shrubs and forbs. Dominant grass species in the Project area include crested wheatgrass (*Agropyron cristatum*), Japanese brome (*Bromus japonicus*), western wheatgrass (*Elymus smithii*), and junegrass (*Koeleria macrantha*). Dominant forbs include prairie clovers (*Dalea* spp.), American vetch (*Vicia americana*), wild onion (*Allium* spp.), and western yarrow (*Achillea millefolium*). The shrubland vegetation cover type is primarily composed of big sagebrush shrubland communities. Common shrub species in this habitat type also include Wyoming big sagebrush, silver sagebrush (*Artemisia cana*), fewflower buckwheat (*Eriogonum pauciflorus*), broom snakeweed (*Gutierrezia sarothrae*), Rocky Mountain juniper (*Juniperus scopulorum*), prickly wild rose (*Rosa acicularis*), and greasewood (*Sarcobatus vermiculatus*).

Agricultural lands surrounding the Project area are predominantly hay fields consisting of alfalfa (*Medicago sativa*) or a mixture of cultivated grass species (e.g., crested wheatgrass, intermediate wheatgrass [*Thinopyrum intermedium*], and tall wheatgrass [*Thinopyrum ponticum*]). Hay fields on privately owned lands are harvested one or multiple times per year. Other common crops grown in the area include barley (*Hordeum vulgare*) and spring wheat (*Triticum aestivum*). Development of vegetation and soil for agriculture using clearing, tillage, and irrigation (among other practices including seeding, application of fertilizers, pesticides, and herbicides) results in long-term conversion of potential sage-grouse habitats to sustained human uses. The conversion of sagebrush to agriculture can influence the ability of sagebrush-dominated landscapes to support sage-grouse through habitat loss and fragmentation; however, the agricultural lands surrounding the Project area are predominantly hay fields, which may provide foraging habitat during the spring and summer nesting and brood-rearing seasons.

In the summer of 2019, the MCFO identified the invasive North African ventenata (*Ventenata dubia*), or wiregrass, in the Project area. Ventenata replaces perennial grasses and forbs, has no use to livestock or wildlife, and is a threat to sage-grouse habitat. During field surveys in the summer of 2022 and 2023, multiple areas in the Project area totaling approximately 800 acres and 1200 acres, respectively, were found to be infested with ventenata. The extent of infestation likely exceeds the acres that have been mapped.

Stagnant, shallow, surface water features are prominent throughout the Project area, which create potential habitat for mosquitos that may be infected with West Nile Virus (WNV). The area has a deep water table, making traditional water wells uneconomic. Instead, flow through pits and water retention pits are and have historically been used to provide water for livestock. These pits have a 10-to-15-year life span until they are silted-in and no longer functional to livestock or wildlife. The area also contains numerous old spreader dikes, a commonly used method of irrigation that collects and stores runoff. These spreader dikes are no longer functional but still pool water for long periods of time. Mosquito larvae are dependent on water during their egg, larva, and pupa stages. Even a small amount of pooled water can attract female mosquitos.

Soils in the area also play a role in creating potential habitat for mosquitos infected with WNV. Saturated hydraulic conductivity (Ksat) is the ease with which a saturated soil can transmit water through the pore space and is based on physical soil properties. Over 94 percent of the soils within the Project area have a Ksat permeability of less than 0.2 inch of moisture per hour, while

over 58 percent have a Ksat of less than 0.1 inch per hour. Percolation occurs slowly in these soils. It would take 5 hours for 1 inch of rain to percolate into soils with a Ksat of 0.2 and 10 hours for 1 inch of rain to percolate into soils with a Ksat of 0.1. Precipitation events with rainfall amounts exceeding the Ksat value would result in standing water on the surface, subsequently increasing potential for mosquito habitat.

Soils in the Project area are also prone to standing water when the interstitial pore space between soil particles becomes clogged with finer sediments. Sodium Adsorption Ratio (SAR) is a measure of the amount of sodium relative to calcium and magnesium in water extract from saturated soil paste. Soils that have SAR values of 13 or more may be characterized by an increased dispersion (i.e. movement) of clay particles. Almost 20 percent of the soils within the proposed Project area have an SAR ratio of 13 or greater. In soils with an SAR ratio greater than or equal to 13, percolation essentially ceases once clay particles fill the soil pore spaces, resulting in standing water. The standing water can remain on the surface for days to weeks at a time, depending on total amount of precipitation, additional moisture, and evaporation. The inundated areas provide suitable habitat and timeframes for mosquito eggs to hatch and mature into adult mosquitos. Additional discussion on how WNV affects sage-grouse is provided below.

### **Sage-Grouse Habitat Description**

Sage-grouse is a sagebrush-obligate species that requires continuous sagebrush-dominated habitats. Sage-grouse also forage in riparian, wet meadow, and hay fields during the spring and summer nesting and brood-rearing seasons and are dependent on mature sagebrush stands for forage and shelter in winter. Occupied habitat in Montana includes the sagebrush steppe of western North America, and sage-grouse distribution closely follows that of sagebrush, primarily big sagebrush (Montana Sage Grouse Work Group 2005). In addition to mature sagebrush, sage-grouse require an understory of grasses and forbs. In eastern Montana, where close interspersions of wintering, nesting, breeding, and brood-rearing habitats exist, sage-grouse are essentially nonmigratory (BLM 2015).

The entire Project area is designated as a PHMA for greater sage-grouse by the 2015 MCFO approved RMP. PHMA is defined as lands that have the highest value for sustaining sage-grouse populations. The State of Montana designated the area as Core Habitat which is defined as Montana's highest densities of sage-grouse (25 percent quartile), based on male counts and/or sage-grouse lek complexes and associated habitat important to sage-grouse distribution.

Montana Fish, Wildlife and Parks (MTFWP) conducted aerial telemetry flights to locate radio-collared hens from October to March 2010 to 2012 and delineated winter-use areas using data supplemented with the MTFWP sage-grouse winter database. Areas were subjectively designated into three categories: Critical winter range, Important winter range, and General winter range. Critical winter range consisted of large, wintered flocks ( $\geq 50$ ) of sage-grouse where hens often were localized for the entire winter. The proposed Project area contains 30,176 acres of what the MTFWP report designated as Critical winter range. Injection Wells 01, 02, 05, 10, and 11, the Pump Station South, and 24.7 miles of road would be located within these areas (3.53 miles of new roads). Important winter range consisted of medium wintered flocks ( $< 50$ ) that were used for most of the winter. The proposed Project area contains 7,366 acres of this habitat designation. General winter range consisted of small flock sizes ( $< 20$ ). These areas are either minor wintering grounds or require more data to characterize their importance. The

proposed Project area consists of 956 acres of General winter range (Foster et al. 2014). No wells, pumps stations, or roads would be in Important or General winter range.

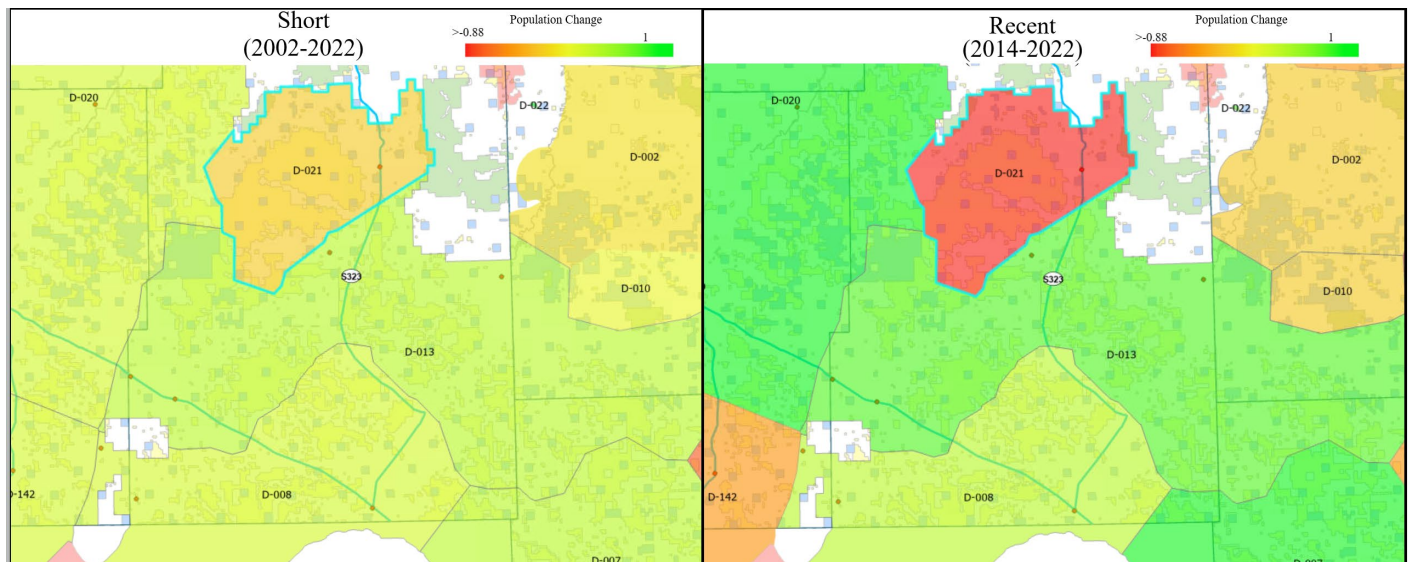
The Density Disturbance Calculation Tool (DDCT) is a tool that the Montana Sage Grouse Oversight Team uses to estimate the percent of disturbed sage-grouse habitat, relative to sage-grouse leks, that exists within an area larger than the proposed Project area. It models the density of development and level of disturbance that would result if a project was implemented in the DDCT area. The DDCT analysis area of 286,470 acres, larger than the Project area (110,100 acres), resulted in 9.52 percent existing disturbance, of which 9.29 percent is a result of cropland disturbance on privately owned lands. When cropland is excluded from the DDCT, existing disturbance would be at 0.23 percent of the available sage-grouse habitat within the DDCT area. The DDCT results related to the proposed action are discussed in Section 3.5.3.

### **Sage Grouse Populations**

Sage-grouse population declines are primarily due to habitat loss, habitat fragmentation, and reduced habitat quality resulting from energy development, urban expansion, conversion of habitats to agriculture, and alteration of habitats by invasive species that reduce habitat quality by reducing herbaceous forage and/or increasing the frequency and intensity of ground fires (United States Fish and Wildlife Service [USFWS] 2013). Other threats include predation, WNV, and fences.

Leks are open areas where strutting male grouse congregate to compete for mating opportunities. Sage-grouse leks are typically in the same location every year, with some leks persisting for over 85 years. Leks often occur in complexes, with one or more primary leks occurring near other lek locations that support fewer males (Connelly et al 2011). Some shifting of lek locations has been observed, potentially caused by persistent disturbance and/or alteration of vegetative cover (Connelly et al. 2011; Holloran 2005; Walker et al. 2007). It is surmised that the most important factor affecting a lek location is the proximity to and configuration and abundance of nesting habitat (Connelly et al. 2011; Connelly et al. 2000). Lek habitat is not considered limited to sage-grouse populations (Connelly et al. 2011) but is rather indicative of the location of high-quality nesting habitat and may change if the quality of that particular nesting habitat declines. It is thought that the most important factors for increasing sage-grouse populations are nest success, chick survival, and female survival (Taylor et al. 2012). Therefore, maintaining high-quality nesting and brood-rearing habitats is the more essential component of maintaining or increasing populations.

The USGS created a hierarchical monitoring model known as the Targeted Annual Warning System (TAWS) which monitors sage-grouse population trends across their range. All the leks in this area are part of the same neighborhood cluster (D-021), which are clusters of leks found in similar habitat with geographic barriers, or a local population. The cluster of sage-grouse leks found within the Project area have consistently shown a negative average annual population rate of change over six temporal scales (or timeframes). The most dramatic decline occurred on the short (2004-2022) and recent (2014-2022) timescale, with 0.91 and 0.88, respectively (<1 indicates a decline, 1 stable, >1 increase) (Figure 3-3). In the most recent temporal scale, this negative population growth contrasts with the surrounding clusters of sage-grouse which have had stable or increasing population growth rates of 0.97, 1.03, and 0.97. Unlike many other clusters showing this type of decline, there is not one leading cause that can be identified (Coates et al. 2023).



**Figure 3-3 Population Changes from the USGS’s TAWS Report for Sage-Grouse Cluster D-021 Compared to Neighboring Clusters on Short (using data from 2002 to 2022) and Recent (using only data from 2014-2022) Temporal Scales (Coates et al. 2023)**

MTFWP and BLM conducted a population viability analysis for sage-grouse in what the state considers the Southeastern Montana Sage-Grouse Core Area, in the region the Project is located, using local population data. Several scenarios were modeled including various environmental conditions from normal conditions to severe weather events, flooding, and potential WNV outbreaks. The study found that the mean population growth rates in normal circumstances were stable, and catastrophic, severe weather events did not substantially affect population growth rates (Foster et al. 2014). Lek survey data collected since the 1980’s suggest that the downward trend of sage-grouse population occurring elsewhere are not occurring within the Southeastern Montana Sage-Grouse Core Area in Carter County. The study area included three USGS TAWS clusters, which, as discussed above, have not seen the same decline. However, the study was completed in 2012, and the most recent timescale analysis with the most significant decline occurred from 2014 to 2022 (Coates et al. 2023).

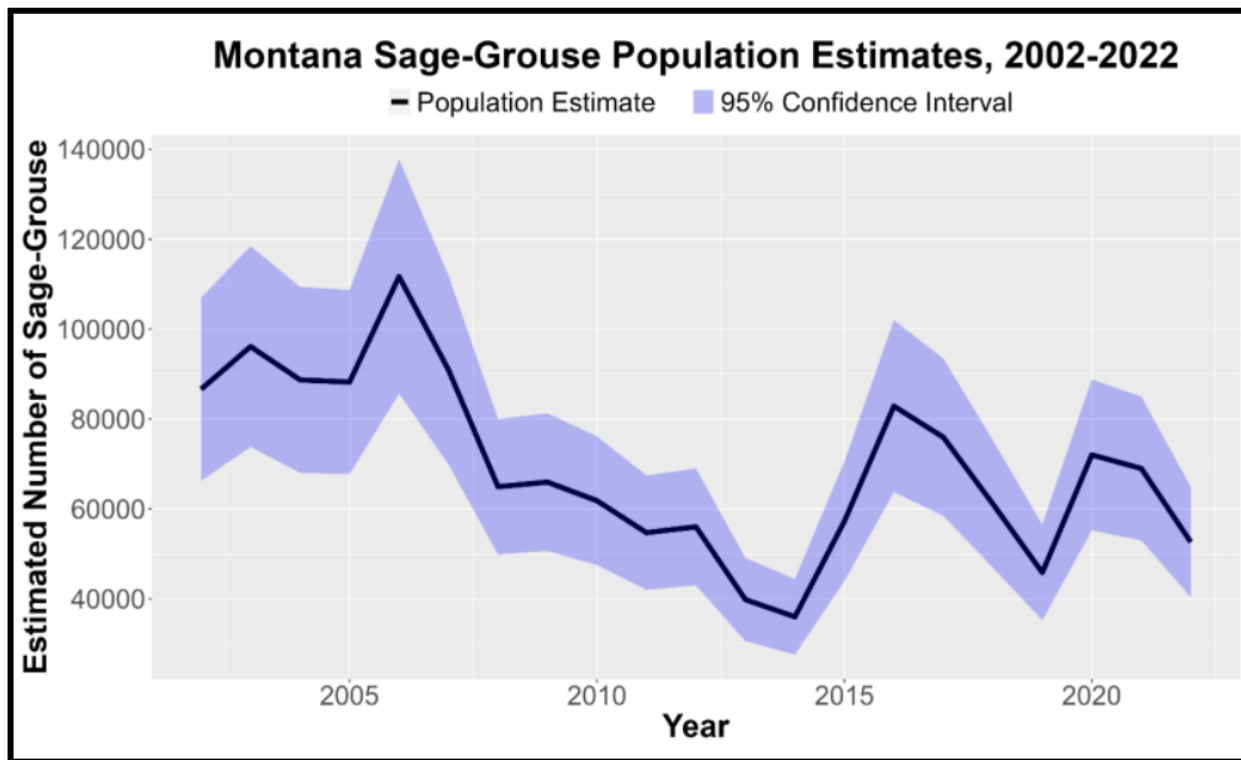
There are 17 Confirmed Active (CA) leks within the Project area and within a 3.1-mile buffer surrounding the Project. The MTFWP defines a CA lek as a lek with 2 or more males lekking on site in one year followed by evidence of lekking (e.g., presence of birds, or signs thereof such as vegetation trampling, feathers, or droppings) within 10 years of that observation. These 17 leks have been surveyed periodically since 1990, and at least 10 leks were visited in 10 years since 2005. As reported in Table 3-15, the average number of males observed during those surveys ranged from 1 to 21 males, which is similar to the averages from the MTFWP and BLM study discussed above.

**Table 3-15**  
**Average Sage-Grouse Male Attendance at CA Leks**

<b>MTFWP Lek ID</b>	<b>2005</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2022</b>	<b>2023</b>
CA-001	7	0	0	0	0	0	0	0	-	0	-	0	0
CA-005A	38	0	0	0	0	0	10	0	0	0	0	0	0
CA-006	50	7	18	15	-	-	5	-	-	0	-	0	0
CA-009B	0	0	0	0	0	0	0	0	-	6	11	11	10
CA-055	45	26	0	-	8	0	21	3	-	0	-	5	2
CA-056	44	19	24	-	-	26	29	-	-	19	-	16	12
CA-057	10	5	10	-	2	14	1	-	-	3	-	1	0
CA-058	22	0	7	0	3	8	0	0	0	4	22	0	0
CA-059	5	0	0	0	-	0	6	-	-	0	-	14	7
CA-060	29	11	42	-	4	10	4	1	0	1	0	0	0
CA-061	4	0	1	4	17	-	0	-	-	1	-	16	8
CA-062	3	0	0	0	-	17	11	3	3	1	0	0	0
CA-066	24	0	0	0	-	3	-	-	2	0	9	3	0
CA-143	-	-	3	3	0	-	-	0	1	0	0	0	0
CA-148	-	-	-	2	4	-	1	0	0	0	0	0	0
CA-152	-	-	-	-	-	-	-	2	2	4	15	0	6
CA-154	-	-	-	-	-	-	-	11	3	0	0	0	0
<b>Average Per Lek</b>	<b>21</b>	<b>6</b>	<b>7</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>7</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>6</b>	<b>4</b>	<b>3</b>

Only years where 10 or more leks were visited are included in this table. A dash (“-”) indicates the lek was not visited during that year. Lek CA-005A was visited in 2006, 2007, 2008, 2012, 2013, and 2021, CA-146 was surveyed in 2021, and lek CA-164 was surveyed in 2007. Due to the small sample size these years were not include

Male attendance at these leks have been on a downward trend since the early 2000’s reaching a record low in 2018 and then rebounding slightly. At a landscape-scale, sage-grouse population numbers generally oscillate over a period of 8 to 10 years (Fedy and Doherty 2011). The observed trend for the area is consistent with population fluctuations for the overall state of Montana (MTFWP 2022) (Figure 3-4).



**Figure 3-4 Overall Montana Sage-Grouse Population Estimates from 2002 to 2022 (MTFWP 2022)**

In addition to the 17 CA leks there are 16 additional leks with other statuses. These include five Confirmed Inactive (CI) leks, five Unconfirmed (UC) leks, and six Never Confirmed Active (NCA) leks. UC and NCA leks are leks that do not have evidence that they are a permanent lek used on a yearly basis. In many cases these are satellite leks, relatively small leks (usually less than 15 males) near larger leks. These satellite leks can occur for several reasons including when the main lek is not suitable for a given day or days due to weather conditions, predators, disturbance, etc., and when the male count at the main lek is very high. Because there is not enough data to prove these are active leks they were not included in this analysis, but they can help explain some of the fluctuations in sage-grouse numbers in the surveyed CA leks in Table 3-15 above.

Agricultural lands are considered one of the major threats to sage-grouse from habitat loss. While agriculture fields can provide some habitat during brood-rearing, they are generally avoided by sage-grouse. This is particularly true in the fall and winter when their diet consists



nearly entirely of big sagebrush. In central Montana, 96 percent of sage-grouse leks were located in a landscape where less than 15 percent consisted of cropland. Each 10 percent increase after led to a 54 percent decrease in lek density (Smith et al. 2018). It has also been found that the density of ravens (*Corvus corax*), birds that predate sage-grouse nests, is strongly positively correlated with agriculture (O’Neil et al. 2018). Agriculture was calculated at 9.29 percent for the DDCT area (286,470 acres) according to the state’s DDCT.

WNV is a contributor to the declining sage-grouse populations throughout their range. WNV, a mosquito-borne arbovirus first found in the West Nile sub-region of Uganda in 1927. It is now found in 48 states after it was first detected in the United States in 1999. WNV can infect many species including over 250 bird species, and infected birds can transmit the virus (Cornell Wildlife Health Lab n.d.). The first documented sage-grouse mortalities from WNV occurred in 2003 (Naugle et al 2004, Moynahan et al. 2006). As discussed in the *General Habitat* section above, the types of soils in the area and abundance of shallow water pits and spreader dikes provide mosquito larval habitat, increasing the potential for the spread of WNV. No testing of birds, mosquitos, or water sources have been completed for WNV in the area, but it is likely present.

While not documented in the Project area, WNV is likely present and a factor in the declining sage-grouse population in the Project area. In the six counties that border Carter County, the Center for Disease Control (CDC) (2023) reported an uptake in human and equine cases in 2018, mostly in Campbell County, Wyoming southwest of Carter County (Table 3-16).

**Table 3-16  
Reports of WNV in Carter County and Surrounding Counties using CDC (2023) Reports**

County, State	2016	2017	2018	2019	2020	2021	2022	2023	Incidence per 100,000 Population (1999-2022)
Carter, MT	0	0	0	0	0	0	0	1 (E)	unknown
Custer, MT	0	1 (M)	2 (H)	1 (H)	0	0	0	1 (E) < 5 (H)	3.19
Fallon, MT	0	0	0	0	0	0	0	0	7.11
Powder River, MT	0	0	1 (E)	0	0	0	0	1 (E)	2.4
Campbell, WY	1 (E)	1 (E)	1 (A) 4 (E)	1 (H)	0	0	0	1 (A) 1 (E)	2.24
Cook, WY	0	0	2 (H)	1 (H)	0	0	0	1 (E)	2.34
Hardin, SD	1 (M)	0	0	0	0	0	0	1 (Unk)	>1.10
<b>Total</b>	<b>2</b>	<b>2</b>	<b>10</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>&lt;12</b>	<b>-</b>

(E) indicates equine, (A) avian, (M) mosquito, (H) human, (Unk) unknown

WNV was first found in sage-grouse in the Powder River Basin of Wyoming and Montana in 2003 and was estimated to cause a 25 percent decrease in survival (Naugle et al. 2004). These populations have only recently (2013 onward) started to show a stabilization in some the population clusters, while other populations continue to show a continued negative decline (Coates et al. 2023). Current sage grouse populations have lower counts than before the WNV outbreak, which is likely partially due to factors other than WNV.

On the fringe of the sage-grouse range in South Dakota, a 44 percent decline in numbers occurred from 2006 to 2008, and an overall 80 percent decline occurred from 2006 to 2014 (Robinson 2014). WNV was documented as a source of mortality for sage-grouse during this period although to what extent is not known (Kaczor 2008, Swanson 2009). Sage-grouse chick mortality attributed to WNV ranged from 6.5 to 71 percent in 2006 and from 20.8 to 62.5 percent in 2007 (Kaczor 2008). In the “non-outbreak” years of 2016 and 2017, it was found that 3.3 and 15 percent, respectively, of mosquito pools (vials) tested positive for WNV, and WNV only contributed to 5 percent of sage-grouse mortality (Parsons 2019). The South Dakota population has rebounded slightly since the record lows counts in 2014 but still remains over 50 percent lower than prior to the 2006 outbreak (South Dakota Department of Game, Fish and Parks, Division of Wildlife 2022). WNV antibodies have been shown to last at least 5 months in sage-grouse (Walker et al. 2007). It is unknown if or how fast WNV antibodies decrease to undetectable levels in sage-grouse. In South Dakota less than 2 percent of the 158 sage-grouse tested had antibodies, suggesting that the population had not encountered WNV or that it was lethal to the population (Parsons 2019).

The decline in sage-grouse may also be related to recent weather conditions. The winters of 2018 and 2019 saw much colder than average temperatures, particularly in the months of February through April, prior to and at the start of lekking season (Table 3-17). Out of the past six years, four years experienced colder than average annual temperatures at the Ridgeway weather station, located 1.3 miles east the Project area (National Oceanic and Atmospheric Administration [NOAA] n.d.a).

**Table 3-17**  
**Temperature Departure from Normal by Month from 2017 to 2022 in Fahrenheit Using NOAA (n.d.a) Historical Data**

Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
2017	-8.1	4	4.7	1.7	0.7	2.6	4.9	-2.2	-1	-0.1	1.9	-1.4	0.6
2018	-2.4	-15.6	-7.1	-5	4.3	1	-0.2	-1.9	0.2	-3.1	-0.6	2	-2.3
2019	4.3	-18.1	-10.5	1.7	-5.4	-1	-1.9	-1.8	1.4	-7.1	-1.6	-3.1	-3.6
2020	-0.8	1.2	2.1	-3.6	-0.4	2.5	-0.3	1.8	-0.6	-4.8	4.3	7.2	0.7
2021	6.6	-11.8	4.9	-0.8	-1.6	8.2	6.3	*	*	*	5.9	2.4	-2.3
2022	2.8	-0.8	0.3	-6.6	-1.3	-1	2.1	3.1	4.5	1.7	-6.6	-7.3	-0.7

\*indicates missing data. Colors based on degrees below normal (>10, 5 to 9.9, and 2 to 4.9)

The severe winter weather conditions of 2018 and 2019 were followed by a prolonged drought. Drought conditions began in May of 2020 when the US Drought Monitor (NOAA n.d.b) categorized the area as “abnormally dry” and upgraded it to “moderately dry” in June. The drought continued to worsen, and it was categorized as an “extreme drought” in July of 2021. Conditions improved to “severe” that winter, but the drought persisted until June 2022. Departure from normal precipitation at the Ridgeway weather station showed significantly less precipitation than average during 2020 and 2021 (Table 3-18). In addition to the drought, 2021 also experienced another severe winter (NOAA n.d.a).

**Table 3-18**  
**Precipitation Departure from Normal by Month from 2017 to 2022 in Inches using NOAA**  
**(n.d.a) Historical Data**

Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
2017	-0.09	-0.2	0.02	1.48	-1.49	-1.34	-1.1	-1.13	2.47	-1.21	-0.02	0.23	-2.38
2018	-0.23	0.92	0.48	0.16	-0.64	0.26	0.49	-0.28	-0.2	-0.31	-0.47	0.34	0.53
2019	0.16	0.42	0.39	-0.49	1.17	-0.29	3.11	0.86	2.82	0.56	0.28	-0.14	8.85
2020	-0.32	0.23	-0.27	-1.25	-0.36	-0.75	0.42	-1.32	-0.55	0.2	-0.57	-0.49	-5.03
2021	-0.28	-0.17	-0.38	-0.68	0.7	-1.93	-0.44	-0.13	-0.98	0.19	-0.44	-0.21	-4.75
2022	-0.26	0.16	-0.28	5.24	-0.73	0.45	-0.65	-0.29	-0.86	0.33	-0.07	1.01	4.05

## Noise

Noise pollution has the potential to affect sage-grouse populations. Ambrose et al. (2021), conducted a study that evaluated the effects of gas-field sounds on sage-grouse. The study found a significant relationship between trends in grouse numbers and sound levels. The study also found that a common practice to limit anthropogenic sounds to no more than 10 A-weighted decibels (dBA) above the existing sound level is appropriate (Ambrose et al. 2021). The 10 dBA threshold is consistent with EO 12-2015, which states that new project noise levels, either individual or cumulative, should not exceed 10 dBA (as measured by L<sub>50</sub>, which is the sound pressure level exceeded 50 percent of the time) above baseline noise at the perimeter of an active lek from 6:00 p.m. to 8:00 a.m. during the breeding season (March 1 – July 15).

Existing sound levels for the area surrounding the proposed Project are not available; however, the National Park Service (NPS) conducted geospatial sound modeling based on long term measurement data and how it relates to climate, topography, human activity, and time of day/year. Using these relationships, NPS developed a model for expected L<sub>50</sub> sound levels for all areas throughout the United States (Mennitt et al. 2014). The natural L<sub>50</sub> sound level in the area is the expected sound level of the area without human influence.

In absence of measured ambient data within the Project area, the NPS-predicted natural L<sub>50</sub> sound level of 29 dBA is the assumed ambient noise level. This assumed sound level was used in the Project’s noise analysis (POD Appendix V).

### 3.5.2 Environmental Effects —No Action Alternative

Under this alternative, ROWs would not be approved; therefore, no construction or reclamation activities would be conducted for the proposed action, and no new impacts to sage-grouse habitat would occur. As discussed in the *Affected Environment* section above, the sage-grouse populations in the area are declining at a faster rate than their neighboring populations. While an exact cause is unknown, it is likely a combination of factors including drought, severe winter, WNV, invasive/noxious weed infestations, and the relatively high percentage of agriculture surrounding the Project area. Under the no action alternative these factors, would continue to cause fluctuations and a general decline in the population. The area would continue to provide habitat to support sage-grouse during all of their seasonal uses. Existing and established land uses would continue.

## **Cumulative Effects**

No additional cumulative impacts from the proposed action would occur. Existing land management activities would continue, and the noxious weed monitoring and treatments that Denbury has initiated would cease. Treatment of the invasive ventenata and other invasive species that degrade sage-grouse habitat would not occur or would occur on a much smaller scale. Specifically, a lack of weed management on the aggressive infestation of ventenata within the Project area may lead to an increased prevalence of noxious weeds, leading to poor quality of sage-grouse habitat and potential displacement of sage-grouse.

Under the no-action alternative, the compensatory mitigation that Denbury proposes would not be applied to the Project. As further described in Section 3.5.3, Denbury proposes to secure mitigation credits through the implementation of conservation easements at three locations in Carter County: the LO Ranch, Ringling Ranch II, and Ringling Ranch III. These ranches are part of different sage-grouse clusters or populations in the TAWS, which include south Carter County and northeast Wyoming; therefore, the easements are not anticipated to provide use directly to the sage-grouse population found in the Project area. Although the sage-grouse population has declined for the populations at the LO Ranch, Ringling Ranch II, and Ringling Ranch III, they are not as severe as the population declines in the Project area. The population at the Ringling Ranch sites belongs to cluster D-005 which has seen a -0.95 and -0.97 decline at the short and recent temporal scales. The LO Ranch contains cluster D-008 which has seen a decline of -0.95 and -0.97 at the short and recent temporal scale. The conservation easement at the LO Ranch would ensure development on private lands does not occur between the two large tracts of undisturbed BLM land, thereby reducing habitat fragmentation and, at a landscape level, providing contiguous quality habitat for the sage-grouse population in southern Carter County and northeastern Wyoming. The conservation easements at Ringling Ranch II and Ringling Ranch III will provide protection of quality habitat in northern Carter County.

### *3.5.3 Environmental Effects—Alternative 2 (Proposed Action)*

Under Alternative 2, the BLM would approve the SF-299 application and would issue Denbury short- and long-term ROW grants for elements listed in Table 2-1 to construct and operate the Project. Construction and reclamation activities would be conducted for the proposed action. Impacts to sage-grouse and habitat are analyzed below. The proposed powerline corridor is not a proposed ROW; therefore, it would not be approved but is being analyzed in this document.

## **Sage-Grouse Habitat Impacts**

To assess sage-grouse habitat within the analysis area, a GIS-based habitat quantification tool (HQT) developed by the Montana Sage Grouse Habitat Conservation Program was used, which consists of a three-level assessment (Johnson 1980). The tool includes state designated Core Habitat (which largely overlaps with BLM identified PHMAs to account for buffers from leks). The HQT models direct and indirect impacts from a project and overlays those impacts on the HQT Basemap to calculate the total amount of functional acres lost due to the project. The model was calculated with a 9-year construction phase, 20-year operational phase, and a 50-year reclamation phase. The Raw HQT Score is 84,900.47 functional acres lost.

The baseline habitat services that exist prior to the proposed Project activities include considerable disturbances to the landscape. The DDCT was used to quantify the existing

conditions and the net proposed difference as a result of the Project including co-location and phased construction and operations as detailed in POD. The DDCT draft analysis presents a net loss of 475.57 acres, or 0.16 percent, of suitable habitat within the 286,470.53 acres evaluated.

Existing disturbance within the DDCT area, with cropland included, is 9.52 percent. When cropland is excluded, because cropland is inherently disturbed, this is reduced to 0.23 percent of the available sage-grouse habitat within the DDCT area. The Project would increase the overall disturbance by 0.16 percent, for a total overall disturbance of 9.68 percent with cropland included, or 0.39 percent without cropland. The existing level of disturbance from cropland would result in sage-grouse continuing to avoid these lands. Moreover, the DDCT area would continue to have reduced availability of quality habitat for sage-grouse because the cropland largely encircles the intact sage-brush steppe in the Project area.

Impacts to nesting, wintering, and brood-rearing habitats through construction activities and habitat loss of approximately 475 acres would be mitigated through the committed protection measures listed below. Large portions of the proposed action would occur along existing roads and ROWs, thus minimizing habitat fragmentation. Eighty-nine percent (35 miles) of the bulklines and flowlines would be co-located with existing or proposed permanent access roads. The Project would use approximately 14 miles of existing developed roads (Lone Tree Road and Ridge Road) and 25 miles of existing two-track roads on BLM-administered lands. Approximately 5 miles of new two-track roads (4 miles on BLM lands) would be created throughout the Project area to access well pads and pump stations. Where the proposed action would be constructed in new areas, temporary habitat fragmentation and degradation would occur. Reclamation activities would occur at the completion of construction and would minimize habitat impacts within the ROW. Treatment of invasive and noxious weeds, specifically *ventenata*, in and around the ROW, would further ensure containment of weeds to facilitate maintaining quality sage-grouse habitat. Habitat conversion would occur in small portions scattered throughout shrubland areas, as reclamation would reclaim these areas to the grassland habitat type in the short-term, with shrublands expected in the long-term.

Because the existing impacts from croplands would be ongoing, the small amount of habitat loss (0.16 percent) would be scattered throughout suitable habitat, and Denbury would implement committed measures to mitigate impacts, long-term impacts to sage-grouse habitat from the proposed action are not anticipated.

### **Sage-Grouse Population Impacts**

The USGS completed a literature review to provide potential ranges for conservation buffers around sage-grouse leks for various activities/structures. A 3.1-mile buffer is recommended for surface disturbances (human activities that alter or remove natural vegetation), linear features (roads), and energy development (oil, gas, wind, and solar) to limit disturbance to seasonal movements and general habitat use, reduce habitat fragmentation, and deter increased predation (Maier et al. 2014). Thirteen leks are inside one or more of the recommended conservation buffers (Table 3-19).

**Table 3-19**  
**Distances (in miles) from a Lek to the Closest Structure/Activity Type**

Lek ID	North or South?	Existing Disturbance	New Permanent Surface Disruption (Roads, Wellpads)	New Temporary Surface Disturbance (Flowlines)	New Low Structure (Wells)	New Tall Structure (Transmission Line)
CA-001	North	2.3	<b>2.3</b>	3.2	2.3	6.9
CA-005A	North	5	<b>5.1</b>	14.4	5.1	20.7
CA-009B	North	3.1	<b>2.8</b>	<b>3</b>	2.8	6.2
CA-056	North	2.5	<b>2.5</b>	<b>2.5</b>	2.5	9.5
CA-057	North	4	<b>4</b>	4.9	4	8.3
CA-058	North	1.4	<b>2.1</b>	<b>2.1</b>	2.4	4.4
CA-060	North	1.5	<b>1.1</b>	<b>2.9</b>	1.5	4
CA-061	North	2.5	<b>2.5</b>	4.3	2.4	5.3
CA-062	North	1.6	<b>1.4</b>	4.8	1.4	2
CA-148	North	1.7	<b>1.1</b>	4.1	<b>1.1</b>	2.9
CA-152	North	1.3	<b>2.3</b>	6.7	<b>1.2</b>	2.8
CA-006	South	1.3	<b>3</b>	9.2	<b>1.2</b>	14.1
CA-055	South	1.7	<b>1</b>	6.4	<b>0.9</b>	13.5
CA-059	South	2	<b>2.6</b>	<b>2.8</b>	2.7	8.9
CA-066	South	4	4	14.4	4	18.6
CA-143	South	4.6	4.6	13.7	4.6	20.1
CA-154	South	0.8	<b>0.8</b>	10.8	1.8	10.8
<b>USGS Conservation Buffer</b>		N/A	3.1	3.1	1.2	2

Highlighted cells indicate Project elements within the USGS recommended lek buffer.

Thirteen leks would be within 3.1 miles of the proposed surface disturbance, road use, and aboveground infrastructure. There are 3.5 miles of the new two-track roads in what MTFWP identified Critical sage-grouse winter habitat. These new roads spur off existing publicly accessible roads and end at wells or pump stations. Of these, three miles would be scattered throughout the middle of the 27,000 acres identified as Critical winter range. The construction of these roads would not occur in the winter months, but their use in the winter for well maintenance and monitoring would likely result in avoidance behavior by sage-grouse. Timing restrictions described in the *Mitigation* section below would be implemented to minimize potential impacts associated with road use.

To reduce the risk of predation on sage-grouse, the USGS recommends a lek conservation buffer of 2 miles for tall structures such as electrical, communication, and meteorological towers (Maier et al. 2014). Under this alternative, Denbury proposes a corridor for an aboveground powerline, a tall structure associated with the upgrade and extension of an existing distribution line to the

northern pump station. The powerline would be submitted by Southeastern Electric under a separate ROW application to undergo a separate review and decision. For analysis purposes, this document analyzes the proposed corridor for the future above ground powerline. One confirmed active lek (Lek ID CA-062) would be located approximately 2 miles from the proposed power line extension corridor. The power line design, including pole placement, is not detailed; however, the POD states that 30-foot power poles will be installed to a depth of 6 feet, so the structures would be 24 feet tall. Design features associated with constructing and operating the transmission line would be addressed in Southeastern Electric Cooperative's ROW application and review process.

Sage-grouse avoid structures that are correlated with higher avian predation such as power lines. The appearance of tall structures on the landscape regardless of actual use by raptors makes the surrounding habitat considered to be "risky" for sage-grouse and is therefore avoided (Dinkins et al. 2012). Seasonal movements for male sage-grouse have found 76 percent occur within 0.6 miles of a lek, and 90 percent within 0.8 miles (Wallestad and Schladweiler 1974). Distances of nests from leks were more variable. In Wyoming it was found that 64 percent of nests occur within 3.1 miles of the lek (Holloran and Anderson 2005). Even though the powerline is 2 miles from the active, lek, it is anticipated that sage-grouse would avoid the area around the power line during other seasonal uses such as nesting and winter due to the mere presence of a tall structure on the landscape.

However, if the powerline was buried, the habitat would be available for all seasonal uses by sage-grouse. This would make it a surface disruption and it would be mitigated with the same stipulations as other surface disturbance. After reclamation, there would be no anticipated impacts except when maintenance or repairs are needed. In such cases, sage-grouse would temporarily avoid the area while workers are present but return to their normal behavior once the activities are complete.

### **Well Density**

The 2015 MCFO approved RMP incorporates a cap on the density of energy and mining facilities at an average of one facility (e.g. injection well) per 640 acres in PHMA. A well pad density analysis was completed within the DDCT assessment area. The well density calculation for the Project is 0.04 wells per 640 acres, which is below the cap.

### **Mitigation Measures**

The Project would be located in a PHMA with above ground facilities and therefore cannot entirely avoid impacts to sage-grouse habitat. However, the applicant-committed resource protections, as outlined in the POD, POD Appendix I, and summarized below, would greatly minimize local and regional long-term impacts to sage-grouse habitat and leks by maintaining the functionality of lekking habitats and lek sites.

In addition to the applicant-committed resource protections, the BLM would require the following additional mitigation measures as stipulations to ROW grants, if approved:

- Restricting operational activities within 3.1 miles of sage-grouse leks (the entire Project area) to 10:00 a.m. to 6:00 p.m. during the lekking season (March 15 to July 15), unless there is a safety concern or emergency situation.

- Restricting routine maintenance activities and monitoring of Injection Wells 01, 02, 04, 05, 06, 07, and 11 and access roads leading to those wells when snow cover is four inches or greater, and/or there is a daily and/or overnight low temperature of zero degrees Fahrenheit (with wind chill) that occurs for three consecutive days or any three days in a five-day period. This restriction would not apply if a safety concern must be addressed or an emergency response is required.
- Anti-perch bird deterrents must be installed at each injection well to reduce perch sites for potential sage-grouse predators.

Denbury would implement a mitigation and conservation hierarchy to avoid and minimize impacts to sage-grouse and reclaim its habitat, as well as compensate for residual impacts that cannot be mitigated. Design modifications were made to minimize impacts through Project siting, construction and operational phasing over multiple years, and the adherence to seasonal timing stipulations for sage-grouse during the construction, drilling, operations, and reclamation schedule (which minimizes impacts during sage-grouse lekking and nesting periods). Denbury minimized impacts by co-locating approximately 35.1 miles (89 percent) of the bulklines and flowlines along existing or proposed permanent access roads. Denbury designed and scheduled the construction activities for the Project to be consistent with Montana EO 12-2015 to the extent practicable. Denbury would utilize equipment best suited to the Project terrain to minimize disturbance and impacts to vegetation and soils. Denbury would also avoid operations in riparian areas, streams, and springs to the greatest extent possible to minimize impacts to aquatic resources. Denbury would avoid unnecessary surface disturbance created by movement of equipment on saturated or wet soils.

The Project would be developed in stages with the first group of activities involving construction of one stratigraphic test well, followed by a sequential build-out of 15 injection wells, associated infrastructure, and CO<sub>2</sub> injection over a 20-year period; subsequently, impacts to sage-grouse and associated habitat as a result of construction would only be associated with the ongoing activity group.

Denbury would conduct construction, drilling, routine maintenance, and reclamation activities, including vegetation clearing, between July 16 and November 30 in any given year to minimize potential Project effects on nesting and habitats associated with sage-grouse (limiting the construction duration each year and staging construction over multiple years would substantially reduce disturbances). To limit the amount of new roads that would be created for the Project, existing two-track roads and existing developed roads would be used to the extent practicable; however, some new two-track roads would be created.

Denbury would avoid contributing to the spread of WNV to sage-grouse and other bird species by implementing design features that would reduce the potential to create mosquito habitat in shallow standing water. During grading, Denbury would retain gaps between rows of topsoil and subsoil to prevent accumulation of water on the land. Temporary erosion controls would be installed to prevent sediment-laden water from being transported into wetlands and streams. Reserve pits would be fenced to prevent livestock and wildlife from trampling the perimeter, avoiding hoof print pockets of water that could serve as habitat for breeding mosquitos.



Extending into the operations phase, Denbury would treat standing water in reserve pits with larvicides to reduce mosquito production.

Denbury would control invasive and noxious weeds throughout Project construction, operation, and reclamation phases, which would aid in the restoration of disturbed areas and protect adjacent undisturbed sage-grouse habitat. Noxious weed populations within the ROW, the Project disturbance footprints, and along access roads would be pre-treated. Noxious weed occurrences would be documented and monitored throughout all Project phases, and Denbury would continue to treat and eradicate noxious weed populations over the life of the Project. During construction, vehicles and equipment entering the site would be inspected to verify that they are free of soil and debris capable of transporting noxious weed seeds, roots, and rhizomes. Materials such as straw bales, mulch, matting, gravel, fill, and seed would be certified noxious weed-free before being used on the Project.

During the reclamation phase of the proposed Project, areas disturbed by construction would be reseeded. With the exception of permanent aboveground facility footprints, temporary disturbance areas would be reseeded with an approved seed mixture within the proper growing season to ensure appropriate vegetative cover/species and further reduce the establishment of noxious weeds. Denbury would use site-specific seed mixes for ecosites that have been identified for the Project. BLM-recommended seed mixes that facilitate the re-establishment of native vegetation and promote the succession of sagebrush establishment and recovery would be used. The seed mixes would include Wyoming big sagebrush, western wheatgrass, and other native grasses and forbs to enhance grouse habitat. Monitoring would be conducted in accordance with the methods described in Denbury's Reclamation, Mitigation, and Monitoring Plan.

The applicant would provide compensatory mitigation as required by the State of Montana Sage Grouse Habitat Conservation Program (<https://sagegrouse.mt.gov/>). The mitigation measures would meet state requirements to offset impacts to sage-grouse habitat using perpetual conservation easements.

### **Cumulative Effects**

The Project area is publicly accessible and existing land use activities are expected to continue. Consistent with state-wide trends, the sage-grouse population in this area has experienced fluctuations and an overall decline due to multiple, existing factors, which is expected to continue. While the Project would only contribute a 0.16 percent decrease in availability of sage-grouse habitat, it would add potential stressors to specific leks in the area by potentially modifying behavior and seasonal use by sage-grouse. In addition, sage-grouse would also avoid short-structures during all seasonal use. If the above ground powerline is pursued, avoidance would occur at a larger scale.

However, with the mitigation and committed measures, the magnitude of these stressors from the proposed action would be negligible. This is due to the stressors being present but at an extended spatial and temporal scale, while being minimized as discussed above. More specifically, limiting disruption or disturbance during lekking season in the construction, drilling, operational, and restoration stages, and from routine maintenance and monitoring of Injection Wells 01, 02, 04, 05, 06, 07, and 11 during harsh winters, and potentially burying the future proposed

powerline, these stressors would drastically minimize avoidance by sage-grouse in the Project area.

At a landscape level, there would be a net conservation gain of sage-grouse habitat as a result of the conservation easements and treatment of invasive and noxious weeds in the area. Treatment of the invasive *ventenata* and other invasive species would contribute to maintaining sage-grouse habitat quality. As discussed in Section 3.5.2, even though the LO Ranch and Ringling Ranch conservation easements have different sage-grouse clusters or populations in the TAWS and are not anticipated to provide use directly to the sage-grouse population found in the Project area, the conservation easements would eliminate development on private lands, reduce habitat fragmentation, and provide contiguous quality habitat for sage-grouse populations in Carter County and northeastern Wyoming.

## **4 Consultation and Coordination**

### **4.1 Summary of Public Involvement and Coordination**

#### **Scoping**

On September 26, 2023, the proposed action was posted on the BLM ePlanning website<sup>7</sup> with NEPA number DOI-BLM-MT-C020-2023-0070-EA. A 30-day public scoping period was initiated on September 27, 2023, with the posting of the proposed action POD and associated maps to the BLM ePlanning website. Letters were mailed to stakeholders on September 25, 2023 to notify them of the scoping period and to seek comments on the proposed action. A post was published on September 27, 2023 on the BLM – Montana/Dakotas Facebook page announcing the scoping period and public meeting. On September 27, 2023 a newspaper article announcing the scoping period and public meeting was also sent to news outlets in Montana, North Dakota, South Dakota, and Wyoming. A public meeting was held in Ekalaka, Montana on October 12, 2023. On October 13, 2024, the BLM received a letter requesting the comment period be extended to allow further review of the scoping materials. On October 17, 2023, the BLM extended the public comment period an additional 30 days, announcing that the scoping period would end on November 27, 2023. On January 30, 2024, a scoping report was posted on the BLM ePlanning website, and on February 16, 2024, this EA was posted on the BLM ePlanning website for public review and comment. Comments received on this EA and the BLM’s responses to these comments will be provided as an appendix to the updated EA.

### **4.2 Summary of Interagency and Native American Tribe Coordination**

This section summarizes coordination that the BLM MCFO has conducted with federal, state, and local government agencies, and Native American Tribes. In addition to the coordination described below, each agency and tribe received a letter on September 25, 2023, informing them of the 30-day public comment period for this EA and soliciting comments, and a follow up letter on October 17, 2023, notifying them of the 30-day comment period extension.

#### **State Historic Preservation Office Consultation**

The proposed action is considered a federal undertaking, as defined in Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations found in 36 CFR Part 800. The BLM’s Cultural Resource Program in Montana operates under a National Programmatic Agreement with an implementing protocol with the Montana SHPO. The BLM coordinated with the Montana SHPO throughout 2022 and 2023 to develop cultural analysis approach and to facilitate consultation efforts for field surveys and visual setting. This included a field visit on September 12, 2022 to the project area. The BLM consulted with the Montana SHPO under provision Section VIII.8D of its state protocol on September 22, 2023. BLM received a response about its finding of effect on October 27, 2023.

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<sup>7</sup> Available at <https://eplanning.blm.gov/eplanning-ui/project/2026556/510>

## **Tribal Consultation**

The BLM consults with Native Americans under various statutes, regulations, and EOs, including the American Indian Religious Freedom Act (42 U.S.C. §1996), Section 106 of the NHPA (36 CFR Part 800), the Native American Graves Protection and Repatriation Act (25 U.S.C. §§ 3001-3013), National Environmental Policy Act ([NEPA], 42 U.S.C. §§ 4321 *et seq.*), and EO 13175 - Consultation and Coordination with Indian Tribal Governments (65 FR 67249). On March 30, 2022, a letter was sent initiating government-to-government consultation on the Project. On August 5, 2022, BLM invited the 17 Tribes to participate in field surveys of the project area. Tribal Historic Preservation Officers from the Standing Rock, Rosebud, and Crow responded to the invitation participation in and the field surveys.

On September 12, 2022, Traditional Cultural Specialists (TCSs) from Rosebud, Standing Rock, and Crow, representatives from the BLM, Burns & McDonnell, and Denbury participated in a Project kickoff meeting in Baker, Montana to discuss the Project and associated field surveys. From September 12 to 23, 2022, the Rosebud, Standing Rock, and Crow TCS and archaeologists from Burns & McDonnell completed Class III intensive survey of 2,185 acres centric to the submitted plan infrastructure of the POD. On September 25, 2023, a letter sharing the results of the Class III cultural inventory, including the POD, was sent to all 17 Tribes. No concerns were presented by the Tribes.

## **U.S. Fish and Wildlife Service Consultation**

Under the provisions of Section 7(a)(2) of the Endangered Species Act of 1973 ([ESA], 16 U.S.C. §§ 1531-1544), a federal agency that carries out, permits, licenses, funds, or otherwise authorizes an activity must consult with the USFWS, as appropriate, to ensure that the proposed action is not likely to jeopardize the continued existence of any species listed under the ESA or result in the destruction or adverse modification of designated critical habitat. Burns and McDonnell contacted the regarding species to consider in the analysis. In a May 4, 2022 letter, the USFWS indicated that additional efforts for protected butterfly species (e.g., Dakota skipper [*Hesperia dacotae*]) would not be needed for the Project in conjunction with ESA Section 7 informal consultation. The USFWS also provided recommendations for habitat assessments and acoustic surveys that could be conducted to characterize the potential bat population in the Project area. Acoustic surveys and habitat assessments were completed, and although no NLEBs were identified during these survey efforts, the surveys were not designed to determine the presence or probable absence of NLEBs in the Project area. In accordance with USFWS interim guidance and survey guidelines released in March 2023, even though NLEB was not identified through surveys or assessments in the project area, the BLM assumed NLEB was present as survey efforts did not meet the requirements to assume probable absence.

During the initial coordination with the USFWS, the NLEB was listed as Threatened under the ESA; however, on March 31, 2023, the NLEB was reclassified as a federally Endangered species. The BLM determined that the activities that are under the jurisdiction of the BLM, as detailed in this EA, would have *no effect* on the NLEB. However, because the proposed action would be constructed in stages over a 20-year period, permitting agencies would be required to revisit and determine if ongoing or future construction *may affect* the NLEB, other listed species, and/or any newly listed species based on new information and listing decisions and initiate consultation if needed to comply with ESA. See Section 1.7.5 above for additional information.

## **U.S. Environmental Protection Agency Region 8**

The EPA is the permitting agency for Class VI injection wells. Under the Safe Drinking Water Act of 1974, The UIC Class VI permitting process is a reiterative process that includes an extensive review of site-specific data and modeling for two different permits, the construction (drilling) permit and the injection permit. The BLM MCFO and Denbury have been in close coordination with EPA Region 8 staff throughout 2022 and 2023 regarding the Project, UIC permit requirements, and the UIC permit review process. The BLM would continue to coordinate with the EPA throughout the UIC permit review process and would provide comments on measures to protect federal minerals for each proposed Class VI injection well. See POD Appendix A for further details on the EPA permitting process and regulatory requirements.

## **U.S. Army Corps of Engineers**

The USACE regulates the placement of dredged and fill material in Waters of the U.S., including jurisdictional wetlands under the Clean Water Act Section 404 (33 U.S.C § 1344). The BLM MCFO and Denbury met with USACE representatives on June 5, 2023 to introduce the Project and discuss potential permit requirements. A follow up meeting was held on November 2, 2023. The USACE confirmed that anticipated wetland and stream impacts would likely be eligible for verification under a NWP. See POD Section 5.4 for details on water, wetland, and riparian crossings and POD Appendix R for associated maps. Prior to construction, Denbury would be responsible for submitting a pre-construction notification, if required by the applicable NWP conditions or its regional condition, to the USACE for eligibility verification.

## **Pipeline and Hazardous Materials Safety Administration**

PHMSA regulates the construction, operation, and maintenance of CO<sub>2</sub> pipelines (49 CFR §§ 190 and 195-199). These regulations cover all phases of a pipeline or facility's lifecycle, including materials, design, construction, operation, maintenance, integrity management, and abandonment. See POD Sections 4.2 and 7.1 for additional information on pipeline construction and safety standards. The BLM MCFO met with PHMSA on November 13, 2023 for a Project introduction and to discuss pipeline safety standards and regulations.

## **Montana Sage Grouse Habitat Conservation Program**

The Montana Greater Sage Grouse Stewardship Act (87-5-901 – 97-5-918, MCA) and Montana EO 12-2015 together comprise the Montana Sage Grouse Conservation Strategy, which is implemented through the Montana Sage Grouse Habitat Conservation Program (Program). Since 2021, the Program and BLM MCFO have worked with Denbury to achieve more effective conservation across affected lands to ensure compliance with the 2015 MCFO RMP and the State's EO 12-2015. In its letter dated September 11, 2023, the Program concluded that the proposed activities that are presented in Denbury's Greater Sage-Grouse Mitigation Plan are consistent with the Montana Sage Grouse Conservation Strategy. See POD Appendix I for a copy of the approved mitigation plan.

## **Montana Department of Natural Resources and Conservation**

The Montana Department of Natural Resources & Conservation (DNRC) would be responsible for reviewing and issuing agreements for activities on State lands which may include leases, ROWs, and/or temporary use permits. The Montana Board of Oil and Gas Conservation (BOGC) is responsible for issuing drilling permits. The BLM MCFO and Denbury have been in close coordination with Montana DNRC and BOGC staff throughout 2022 and 2023 regarding the

Project. The BLM would continue to coordinate with the Montana DNRC and BOGC during the permitting and execution of the stratigraphic test well.

### **Carter County**

The BLM met with Carter County officials regarding the proposed action during the initial planning stages on April 19, 2022 and again on September 18, 2023, in advance of the scoping period. Denbury also met independently with Carter County Commissioners on March 14, 2022, and with the Missouri River Basin Grazing Association on August 23, 2022. Denbury would continue to coordinate with Carter County throughout the life of the Project. Emergency response officials would be provided with training on how to respond to Project-related emergencies and would be invited to participate in annual table-top drills with Denbury's operations personnel. See POD Section 7.1 and POD Appendix W for information about Denbury's public outreach program and emergency response plan that would follow the guidelines included in the *CO<sub>2</sub> Emergency Response Tactical Guidance Document: Best Practice Guidelines for Preparedness and initial Response to a Pipeline Release of Carbon Dioxide (CO<sub>2</sub>)* (API, 2023).

## **5 List of Appendices**

Appendix A—List of Preparers

Appendix B—Acronyms and Abbreviations

Appendix C—List of References

Appendix D—Sound Level Contours Figure

Appendix E—Air Quality Analysis Calculations

## Appendix A: List of Document Preparers / Reviewers

<b>Name</b>	<b>Affiliation</b>	<b>Title</b>	<b>Resource Area</b>
<b>Irma Nansel</b>	BLM	Planning and Environmental Coordinator	Project Lead/NEPA
<b>Beth Klempel</b>	BLM	Assistant Field Manager	Lands and Realty
<b>Mark Peterson</b>	BLM	Physical Scientist (Air Quality)	Air Resources
<b>CJ Truesdale</b>	BLM	Archaeologist	Paleontology, Cultural Resources, Tribal Consultation
<b>Amy Stillings</b>	BLM	Socioeconomic Specialist	Social, environmental justice, and economic conditions
<b>Fiona Petersen</b>	BLM	Wildlife Biologist	Wildlife; Greater Sage-Grouse
	BLM		
<b>Josh Buckmaster</b>	BLM	Soil Scientist	Soils/Reclamation
<b>Christopher Morris</b>	BLM	Hydrologist	Water Resources
<b>Christina Stuart</b>	BLM	Fisheries Biologist	Aquatics/Fisheries
<b>Dena Sprandel-Lang</b>	BLM	Outdoor Recreation Planner	VRM, Recreation
<b>Brenda Witkowski</b>	BLM	Weed Supervisor	Noxious/Invasives
<b>Matt Lewin</b>	BLM	Range Management Specialist	Vegetation, Livestock Grazing
<b>Carissa Shilling</b>	BLM	Geologist	Solid Minerals
<b>Paul Helland</b>	BLM	Petroleum Engineer	Fluid Minerals
<b>Sarah Binckley</b>	Contractor	NEPA Specialist	NEPA



<b>Name</b>	<b>Affiliation</b>	<b>Title</b>	<b>Resource Area</b>
<b>Taylor Volkens</b>	Contractor	Air Quality Specialist	Air Quality
<b>Tess Fuller</b>	Contractor	Air Quality Specialist	Air Quality
<b>Mary Hauner-Davis</b>	Contractor	Air Quality Specialist	Air Quality
<b>Marcia Bender</b>	Contractor	Archaeologist	Archaeology, Tribal Consultation
<b>Shari Cannon-Mackey</b>	Contractor	Socioeconomic Specialist	Social, environmental justice, and economic conditions
<b>Gabriel Weger</b>	Contractor	Noise Specialist	Noise Quality
<b>Bryan Gasper</b>	Contractor	Wildlife Biologist	Wildlife; Greater Sage-Grouse

Contractor is Burns & McDonnell

## Appendix B: Acronyms and Abbreviations

APE	Area of Potential Effects
AQRV	Air Quality Related Value(s)
AUM	Animal Unit Months
AV-APE	Audio Visual - Area of Potential Effects
BLM	Bureau of Land Management
BMPs	best management practices
BOGC	Board of Oil and Gas Conservation
CA	Confirmed Active
CAA	Clean Air Act
CCA	Cedar Creek Anticline
CDC	Center for Disease Control
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH <sub>4</sub>	methane
CI	Confirmed Inactive
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalent
Crow	Crow Nation
CRSDC	Cultural Resource Surface Disturbance Classification
dBA	A-weighted decibel
DDCT	Density Disturbance Calculation Tool
Denbury	Denbury Carbon Solutions, LLC, a wholly owned subsidiary of Denbury Inc.
DNRC	Department of Natural Resources & Conservation
dv	deciview
EA	Environmental Assessment
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973
FLPMA	Federal Land Policy and Management Act of 1976
FR	Federal Register
FTE	full-time equivalent(s)
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GWP	global warming potential
HAP	hazardous air pollutants
HQT	habitat quantification tool
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change

IWG	Interagency Working Group on the Social Cost of Greenhouse Gas Emissions
L <sub>50</sub>	sound pressure level exceeded 50 percent of the time
km	kilometers
K <sub>sat</sub>	Saturated Hydraulic Capacity
MAAQs	Montana Ambient Air Quality Standards
MCFO	Miles City Field Office
MDEQ	Montana Department of Environmental Quality
MOA	Minutes-Of-Angle
MTFWP	Montana Fish, Wildlife, and Parks
N <sub>2</sub> O	nitrous oxides
NAAQS	National Ambient Air Quality Standards
NCA	Never Confirmed Active
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NETL	National Energy Technology Laboratory
NHPA	National Historic Preservation Act
NLCD	National Land Cover Dataset
NLEB	northern long-eared bat
NO <sub>2</sub>	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NO <sub>x</sub>	nitrogen oxides
NPS	National Park Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NWP	Nationwide Permit
O <sub>3</sub>	ozone
PGM	Photochemical Grid Modeling
PHMA	Priority Habitat Management Area
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM	particulate matter
PM <sub>10</sub>	particulate matter with a diameter of less than 10 microns
PM <sub>2.5</sub>	particulate matter with a diameter of less than 2.5 microns
POD	Plan of Development
Project	Snowy River Carbon Dioxide (CO <sub>2</sub> ) Sequestration Project
PSD	Prevention of Significant Deterioration
RMP	Resource Management Plan
ROD	Record of Decision
Rosebud	Rosebud Sioux Tribe
ROW	right(s)-of-way
SAR	sodium absorption ratio

SC-GHG	social cost of greenhouse gases
SEIS	Draft Supplemental Environmental Impact Statement and Potential Resource Management Plan Amendment
SF-299	SF-299 Application for Transportation and Utility Systems and Facilities on Federal Lands
SF6	sulfur hexafluoride
SHPO	State Historic Preservation Office
SO2	sulfur dioxide
Standing Rock	Standing Rock Sioux Tribe
TAWS	Targeted Annual Warning System
TCP	Traditional Cultural Property
TCS	Traditional Cultural Specialists
UDP	Unanticipated Discoveries Plan
UIC	Underground Injection Control
UNFCC	United Nations Framework Convention on Climate Change
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDW	underground sources of drinking water
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compounds
VRM	visual resource management
WNS	West Nile virus

## Appendix C: List of References

40 Code of Federal Regulations (CFR) Part 98. Mandatory Greenhouse Gas Reporting.

Adams A., R. Byron, B. Maxwell, S. Higgins, M. Eggers, L. Byron, and C. Whitlock. Climate change and human health in Montana: a special report of the Montana Climate Assessment. Montana State University, Institute on Ecosystems, Center for American Indian and Rural Health Equity, Bozeman. 2021.

Alcalde J, Flude S, Wilkinson M, Johnson G, Edlmann K, Bond CE, Scott V, Gilfillan SMV, Ogaya X, Haszeldine RS. Estimating geological CO<sub>2</sub> storage security to deliver on climate mitigation. *Nat Commun.* 2018.

Almberg, E., M. Becker, J. Ramsey, and K. Smucker. Montana's 2022 Annual White-nose Syndrome Surveillance Report. 2022.

Ambrose, Skip, C. Florian, J. Olnes, J. MacDonald, T. Hartman. Sagebrush Soundscapes and the Effects of Gas-Field Sounds on Greater Sage-Grouse. *Western Birds* 52(1): 23-46. 2021.

American Petroleum Institute. Carbon Dioxide (CO<sub>2</sub> Emergency Response Tactical Guidance Document: Best Practice Guidelines for Preparedness and initial Response to a Pipeline Release of Carbon Dioxide (CO<sub>2</sub>). Washington, DC: API Publishing Services. November 2023.

Beaucham, C., King, B., Feldmann, K., Harper, M., & Dozier, A. (2018). Assessing occupational erionite and respirable crystalline silica exposure among outdoor workers in Wyoming, South Dakota, and Montana. *Journal of Occupational and Environmental Hygiene.* Abingdon-on-Thames, Oxfordshire, United Kingdom: Taylor & Francis Group.

Bender, Marcia, Christina Huling, Melinda McCarthy, Stuart Postiglione, Jacob Schaffer, and Shannon Spurgeon. Cultural Resource Inventory of the Snowy River CO<sub>2</sub> Sequestration Project, Carter County, MT. MT-020-22-38. Manuscript on file at BLM Miles City Field Office, Miles City, MT. 2023.

Bureau of Land Management (BLM). Miles City Field Office Draft Supplemental Environmental Impact Statement and Potential resource Management Plan Amendment. 2023.

Bureau of Land Management (BLM). BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate. 2022.

Bureau of Land Management (BLM). Montana/Dakotas State Office PGM Modeling Study Air Resource Impact Assessment Report. 2016.

- Bureau of Land Management (BLM). Miles City Field Office Resource Management Plan, RMP Revision (2023) - Environmental Impact Statement. 2015.
- Center for Disease Control. Historic Data (1999-2022) Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Division of Vector-Borne Diseases (DVBD). Atlanta, GA. 2023
- Coates, Peter S., et al. *Range-wide population trend analysis for greater sage-grouse (Centrocercus urophasianus)—Updated 1960–2022*. No. 1175. US Geological Survey, 2023.
- Connelly J.W., C.A. Hagen, and M.A. Schroeder. Characteristics and dynamics of greater sage-grouse populations. In *Greater Sage-Grouse: Ecology and Conservation of a Landscape Species and Its Habitats*, pp. 53–67, edited by S.T. Knick and J.W. Connelly. Studies in Avian Biology No. 38. Berkeley: University of California Press and Norman, Oklahoma: Cooper Ornithological Society. 2011
- Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. Guidelines to Manage Sage Grouse Populations and Their Habitats. *Wildlife Society Bulletin* 28 (4):967–985. 2000.
- Cornell Wildlife Health Lab. West Nile Virus. Retrieved from <https://cwhl.vet.cornell.edu/disease/west-nile-virus>. n.d.
- Council on Environmental Quality (CEQ). National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. 88 Federal Register (FR) 1196. 2023.
- Council on Environmental Quality (CEQ). National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions. 84 Federal Register (FR) 30097. 2021.
- Council on Environmental Quality (CEQ). Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews. 81 Federal Register (FR) 51866. 2016.
- Denbury. Plan of Development Snowy River CO<sub>2</sub> Sequestration Project. Denbury Carbon Solutions, LLC. 2023.
- Dinkins, Jonathan B., Michael R. Conover, Christopher P. Kirol and Jefferey Beck. Greater Sage-Grouse (*Centrocercus urophasianus*) select nest sites and brood sites away from avian predators. *The Auk*. 2012 Oct; 129(4);600-610.
- Executive Order 13990. Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. 2021.
- Executive Order 14008. Tackling the Climate Crisis at Home and Abroad. 2021.

Federal Land Manager Environmental Database. Available at <https://views.cira.colostate.edu/fed/>. Accessed January 2024.

Fedy BC, Doherty KE. Population cycles are highly correlated over long time series and large spatial scales in two unrelated species: greater sage-grouse and cottontail rabbits. *Oecologia*. 2011 Apr;165:915-24.

Foster, Melissa A., John T. Ensign, Windy N. Davis, and Dale C. Tribby. Greater Sage-Grouse in the Southeast Montana Sage-Grouse Core Area. Available at <https://bloximages.chicago2.vip.townnews.com/billingsgazette.com/content/tncms/assets/v3/editorial/2/84/284e0542-de2a-53a6-a7b4-4a2fcfaf434e/536dc4f181448.pdf>. Accessed on November 16, 2023.

Grid United. North Plains Connector. Available at <https://northplainsconnector.com/>. Accessed on September 26, 2023.

Headwaters Economics. Bureau of Land Management Socioeconomic Profile Tool. Available at <https://headwaterseconomics.org/tools/blm-profiles/>. Accessed December 2023.

Holloran, M.J. Greater Sage-Grouse (*Centrocercus urophasianus*) Population Response to Natural Gas Development in Western Wyoming. Ph.D. dissertation, Department of Zoology and Physiology, University of Wyoming, Laramie. 2005.

Holloran MJ, Anderson SH. Spatial distribution of greater sage-grouse nests in relatively contiguous sagebrush habitats. *The Condor*. 2005 Nov 1;107(4):742-52.

Intergovernmental Panel on Climate Change (IPCC). Guidelines for National Greenhouse Gas Inventories Chapter 5: Carbon Dioxide Transport, Injection, and Geological Storage. 2006.

Intergovernmental Panel on Climate Change (IPCC). AR4 Climate Change 2007: Synthesis Report. 2007.

Intergovernmental Panel on Climate Change (IPCC). AR5 Climate Change 2013: Synthesis Report. 2013.

Interagency Working Group on Social Cost of Greenhouse Gases (IWG). Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990. 2021.

Johnson, D.H. The Comparison of Usage and Availability Measurements for Evaluating Resource Preference. *Ecology* 61:65–71. 1980.

Kaczor NW, Jensen KC, Klaver RW, Rumble MA, Herman-Brunson KM, Swanson CC. Nesting success and resource selection of greater sage-grouse. *Studies in Avian Biology*.

2011;39:107-18.

- Manier, D.J., Z. Bowen, M. Brooks, M. Casazza, P. Coates, P. Deibert, S. Hanser, and D. Johnson. Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review. U.S. Geological Survey Open-File Report 2014-1329. 2014.
- Mennitt, Daniel, Kirk Sherrill, and Kurt Frstrup. A geospatial model of ambient sound pressure levels in the contiguous United States. *Journal of the Acoustical Society of America*. 135: 2746-2764. 2014.
- Montana Fish, Wildlife, and Parks. Montana Greater Sage-grouse Population Report. 2022.
- Montana Sage Grouse Work Group. Management Plan and Conservation Strategies for Sage Grouse in Montana – Final. Available at: <https://fwp.mt.gov/binaries/content/assets/fwp/conservation/wildlife-reports/sage-grouse/sgfinalplan.pdf/>. 2005.
- Moynahan BJ, Lindberg MS, Thomas JW. Factors contributing to process variance in annual survival of female greater sage-grouse in Montana. *Ecological Applications*. 2006 Aug;16(4):1529-38.
- National Energy Technology Laboratory (NETL). Gate-to-Gate Life Cycle Analysis Model of Saline Aquifer Sequestration of Carbon Dioxide. 2013.
- National Oceanic and Atmospheric Agency. Date snapshot details: NOWData. National Weather Service. Department of the Interior. Billings, MT. Retrieved from <https://www.weather.gov/wrh/Climate?wfo=byz>. n.d.a
- National Oceanic and Atmospheric Agency. Date snapshot details: Drought Monitor. Department of the Interior. Washington, DC. Retrieved from <https://www.climate.gov/maps-data/data-snapshots/data-source-drought-monitor>. n.d.b
- Naugle DE, Aldridge CL, Walker BL, Cornish TE, Moynahan BJ, Holloran MJ, Brown K, Johnson GD, Schmidtman ET, Mayer RT, Kato CY. West Nile virus: Pending crisis for greater sage-grouse. *Ecology Letters*. 2004 Aug;7(8):704-13.
- O'Neil, Shawn T., et al. "Broad-scale occurrence of a subsidized avian predator: Reducing impacts of ravens on sage-grouse and other sensitive prey." *Journal of Applied Ecology* 55.6 (2018): 2641-2652.
- Parsons LA. Greater Sage-Grouse survival, breeding ecology, resource selection, and West Nile virus prevalence on the eastern fringe of their range. South Dakota State University; 2019.
- Robinson AC. Management plan and conservation strategies for greater sage-grouse in North Dakota. North Dakota Game and Fish Department; 2014.



- South Dakota Department of Game, Fish and Parks, Division of Wildlife. 2022. South Dakota greater sage-grouse action plan 2022–2026. Wildlife Division Report Number 2022-01. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota, USA. 2022.
- Smith, Joseph T., et al. "Effects of livestock grazing on nesting sage-grouse in central Montana." *The Journal of Wildlife Management* 82.7 (2018): 1503-1515.
- Swanson CC. Ecology of greater sage-grouse in the Dakotas. South Dakota State University; 2009.
- Taylor, R. L., B. L. Walker, D. W. Naugle, and S. Mills. Managing Multiple Vital Rates to Maximize Greater Sage-Grouse Population Growth. *Journal of Wildlife Management* 76(2):336–347. 2012.
- Truesdale, CJ. Snowy River Carbon Capture and Storage Project: BLM report on NHPA responsibilities, impacts analysis, and cultural environment, BLM Project Number: MT-020-22-38C, MT-SHPO Project Number: 2023102609. October 2023.
- Truesdale, CJ. Minutes of Angle – A Visual Analysis of a Proposed Carbon Sequestration Project and the Viewshed of the Chalk Buttes TCP, BLM Project Number: MT-020-22-38B, MT-SHPO Project Number: 2023092715. October 2023.
- United Nations Framework Convention on Climate Change (UNFCCC). The United States of America National Determined Contribution, Reducing Greenhouse Gases in the United States: A 2030 Emissions Target. 2021.
- U.S. Department of Commerce, Bureau of the Census. 2020. 2016-2021 American Community Survey 5-Year Estimates (DP02, Selected Social Characteristics; DP03, Economic Characteristics; DP04, Housing Characteristics; and DP05, Demographics and Housing). Available at: <https://www.census.gov/data.html>. Accessed September 2023.
- U.S. Environmental Protection Agency (EPA). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021. 2023a.
- U.S. Environmental Protection Agency (EPA). U.S. Environmental Protection Agency. Greenhouse Gas Inventory Data Explorer. Online at: <https://cfpub.epa.gov/ghgdata/inventoryexplorer/#iallsectors/allsectors/allgas/gas/all>. 2023b.
- U.S. Environmental Protection Agency (EPA). Clean Air Act Section 112 List of Hazardous Air Pollutants: Amendments to the list of Hazardous Air Pollutants (HAP). 2022.
- U.S. Fish and Wildlife Service (USFWS). 2013. Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report. Denver, Colorado: U.S. Fish and Wildlife Service. 2013.

U.S. Geological Survey. National Land Cover Database (NLCD) 2019 Land Cover Science Product version 2.0. 2021.

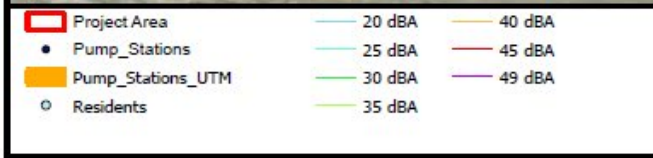
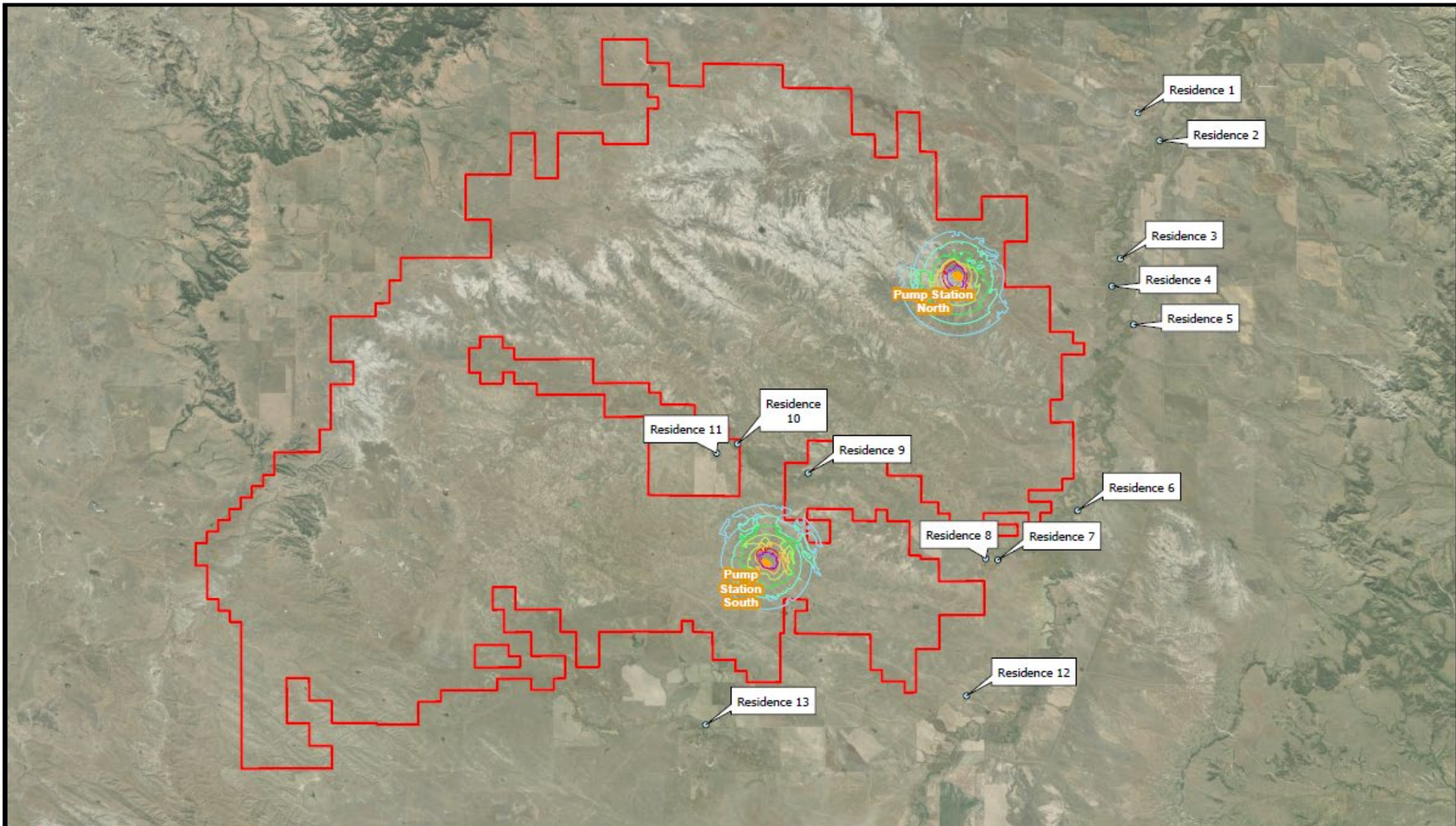
U.S. Global Change Research Program (USGCRP). Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D. R., C. W. Avery, D. R. Easterling, K. E. Kunkel, K. L. M. Lewis, T. K. Maycock, and B. C. Stewart (eds.)]. 2018.

Walker, B. L., D. E. Naugle, and K. E. Doherty. Greater Sage-Grouse Population Response to Energy Development and Habitat Loss. *Journal of Wildlife Management* 71(8):2644–2654. 2007

Wallestad, R. O., and Schladweiler, P. Breeding season movements and habitat selection of male sage grouse: *Journal of Wildlife Management*, v.38, p. 634–637.1974

## **Appendix D: Sound Level Contours Figure**

Path: Z:\Client\ENR\Orebury\137286\_Montana\CCU\GIS\Studies\Geospatial\MapData\FishAndWildlife\FigureA-1 Project Location New\Figure A-1 Project Location.aprx browser 12/25/2024



There are no Residential Receptors within one mile of Pump Stations

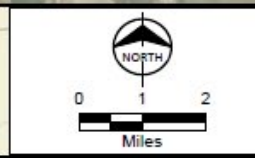


Figure A-2  
Residential Sound Level Contours  
Snowy River CO2  
Sequestration Project  
Carter County, MT

## **Appendix E: Air Quality Analysis Calculations**