# Haynach Solar Hybrid Project

*Final 1041 Application*

Prepared for
Alamosa County
Land Use & Building Department

Prepared on behalf of Adapture Solar Development, Inc. by
Barr Engineering Co.

August 2025

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# Final 1041 Application

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(1)(a) The health, welfare, and safety of the citizens of this County will be protected and served; ..... 2

(1)(b) The natural and socio-economic environment of this County will be protected and enhanced; ..... 2

(1)(c) All reasonable alternatives to the proposed action, including use of existing rights-of-way and joint use of rights-of-way wherever uses are compatible, have been adequately assessed, and the proposed action represents the best interests of the people of this County and represents the best utilization of resources in the impact area; ..... 2

(1)(d) A satisfactory program to mitigate and minimize adverse impacts has been presented; 3

(1)(e) The nature and location or expansion of the facility complies with all applicable provisions of the master plan of this County, and other applicable regional, metropolitan, state, and national plans; ..... 3

(1)(f) The nature and location or expansion of the facility complements the existing and reasonably foreseeable needs of the service area and of the area immediately affected by the facility; ..... 3

(1)(g) The nature and location or expansion of the facility does not unduly or unreasonably impact existing community services; ..... 3

(1)(h) The nature and location or expansion of the facility will not create an expansion of the demand for government services beyond the reasonable capacity of the community or region to provide such services, as determined by the Permit Authority; ..... 3

(1)(i) The facility site or expansion area is not in an area with general meteorological and climatological conditions which would unreasonably interfere with or obstruct normal operations and maintenance; ..... 3

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# Abbreviations

| | |
|---|---|
| Adapture or Applicant | Adapture Solar Development, Inc. |
| ADT | Average Daily Traffic |
| AF | acre feet |
| AFY | acre-feet per year |
| Barr | Barr Engineering Co. |
| BESS | battery energy storage system |
| BOCC | Board of County Commissioners |
| CDA | Colorado Department of Agriculture |
| CDOT | Colorado Department of Transportation |
| CDPHE | Colorado Department of Public Health and Environment |
| CGP | Construction General Permit |
| cm | centimeter |
| CMP | County Master Plan |
| CODEX | Colorado's Conservation Data Explorer |
| CPCN | Certificate of Public Convenience and Necessity |
| CPW | Colorado Parks and Wildlife |
| CRP | Conservation Resource Program |
| CRSP | Colorado River Storage Project |
| CWA | Clean Water Act |
| dBA-Leq | A-weighted equivalent continuous sound level |
| DOLA | Colorado Department of Local Affairs |
| EMS | emergency medical services |
| EOP | Emergency Operations Plan |
| EPA | U.S. Environmental Protection Agency |
| ES | Executive Summary |
| EVT | Expected Vegetation Type |
| gen-tie | generation-tie |
| Ifs | isolated finds |
| IMPLAN | Impacts analysis for planning |
| IPaC | Information for Planning and Consultation |
| kV | kilovolt |
| LOS | level of service |
| LUDC | Land Use and Development Code |
| mph | miles per hour |
| MRIO | multi-region input-output |
| MWh | megawatt hours |
| NLCD | National Land Cover Dataset |
| NPS | nonpoint source |
| NRHP | National Register of Historic Places |
| OTIS | Online Transportation Information System |
| Project | Haynach Solar Hybrid Project |
| PSCo | Public Service Company of Colorado |

| | |
|---|---|
| PUC | Public Utilities Commission |
| SAM | Species Activity Mapping |
| SHE | Short Elliot Hendrickson Inc. |
| SHPO | Colorado State Historic Preservation Office |
| SWMP | Stormwater Management Plan |
| Tri-State | Tri-State Generation and Transmission Association |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |
| WQCD | Water Quality Control Commission and Water Quality Control Division |

# 1 Executive Summary

This Final 1041 Application is submitted to support the Haynach Solar Hybrid Project (Project) proposed by Adapture Solar Development, Inc. (Adapture or Applicant). It has been prepared in accordance with the content requirements outlined in the Alamosa County 1041 Regulations, as amended. Specifically, this application follows the content and procedures outlined in Chapter 6, Regulations for Site Selection and Construction of Major Facilities of a Public Utility. Barr Engineering Co. (Barr) prepared this final application package and completed most of the special studies and assessments included as attachments to this application. Studies completed by other entities are also identified and included within this submittal.

Provided in this Executive Summary (ES) is a description of the Project that has been previously submitted to the county as part of the Preliminary Application package submitted in April 2024 and as part of a Final Application variance request reviewed and approved by the county Land Use & Building Department and the Board of County Commissioners (BOCC) on April 9, 2025. The granted waiver request is included in this application as Attachment 1. Provided as Attachment 2 of this application is a comment response matrix addressing questions and deficiencies identified in the Project Preliminary Application by Land Use & Building Department staff/consultants.

Lastly, this ES includes a detailed summary regarding Project compliance with permit application criteria outlined in Section 6.304 of the county's 1041 regulations. Compliance with these criteria is a prerequisite for permit approval. This application package demonstrates compliance with all evaluation criteria and concludes that the proposed Project site minimizes natural and social resource adverse impacts, including on county services, and would have substantial economic benefit to the county from construction and operational tax revenues over the 40-year life of the Project.

## 1.1 Project Description

The proposed Project is a 110 megawatt (MW) solar photovoltaic and 110 MW, 4-hour battery energy storage system (BESS) and substation that would be installed on an approximately 1,109-acre site. The proposed facility would be located north of the existing San Luis Valley Substation, jointly owned and operated by Tri-State Generation and Transmission Association (Tri-State) and Public Service Company of Colorado (PSCo). This substation is located on the northwest corner of Eightmile Lane and East County Road 102 N. An existing solar facility, Hooper Solar, is immediately adjacent and south of the proposed project. This location is approximately 5.5 miles southwest of the community of Hooper, Colorado. The Project would produce approximately 330,039 megawatt hours (MWh) annually of emissions-free electricity and store and provide approximately 440 MWh of energy storage capabilities to the grid. The facility would require construction of an onsite collector substation and a new 230 kilovolt (kV) generation-tie (gen-tie) line to connect with the existing Tri-State and PSCo San Luis Valley Substation. The project construction schedule will be determined by final development approvals, but we anticipate construction starting between 2026 and 2030. The Project is expected to remain operational for 40 years. A detailed description of the Project is provided in Attachment 3.

## 1.2 Preliminary Application Deficiencies Addressed

Provided as Attachment 2 of this application is a comment response matrix addressing questions and deficiencies identified in the Project Preliminary Application by Land Use & Building Department staff/consultants. The Preliminary Application was submitted to the county by Adapture in April 2024. A

copy of the county's Preliminary Application Technical Review Memorandum is also included in Attachment 2.

## 1.3 Action on Permit Application

This section includes a detailed summary of Project compliance with permit application criteria outlined in Section 6.304 of the county's 1041 regulations. Compliance with these criteria is a prerequisite for permit approval.

**(1) The Permit Authority shall approve an application for a permit for site selection and construction of a major facility of a public utility (with reasonable conditions, if any, in the discretion of the Permit Authority) only if the proposed site selection and construction complies with all of the following criteria:**

**(1)(a) The health, welfare, and safety of the citizens of this County will be protected and served;**

The Project includes a Hazardous Materials, Waste Management and Emergency Response Plan (Attachment 12) and a Transportation Impact Study and Level 2 Auxiliary Turn Lane Assessment (Attachment 5) to address community health and safety issues.

The Hazardous Materials, Waste Management, and Emergency Response Plan has been developed to be consistent with the Alamosa County Emergency Operations Plan (EOP) and the San Luis Valley Hazard Mitigation Plan 2023-2028 and to ensure compliance with federal, state, and local regulatory requirements on generating and managing hazardous materials and solid waste.

After receiving the Transportation Impact Study, the Colorado Department of Transportation (CDOT) will complete a crash data analysis to consider, if necessary, additional recommended mitigation safety measures.

**(1)(b) The natural and socio-economic environment of this County will be protected and enhanced;**

The Project site selected and the proposed construction avoid impacting sensitive natural resources such as wildlife, wetlands, and/or cultural resources (refer to Attachment 8 and Attachment 9 and Section (2)(a)(ix)F1. - 2. Description of historic and archaeological resources in the Final 1041 Application.)

There will be significant socio-economic benefits to Alamosa County, to adjacent counties, and the state and federal government from temporary and permanent job creation, sales of goods and services, and construction and operational tax revenues (refer to the Economic Impact Analysis in Attachment 4)

**(1)(c) All reasonable alternatives to the proposed action, including use of existing rights-of-way and joint use of rights-of-way wherever uses are compatible, have been adequately assessed, and the proposed action represents the best interests of the people of this County and represents the best utilization of resources in the impact area;**

Section (2)(e)(xi)A1-5. (B) 1.- 2 addresses alternative sites and technologies, and joint use of rights-of-way. The Project design is consistent with other PV energy storage sites in the county and co-locates the proposed gen-tie interconnection facilities on the existing San Luis Valley Substation property. Additionally, no new roads are proposed to access the Project site; rather, the Project would utilize existing county road rights-of-way.

**(1)(d) A satisfactory program to mitigate and minimize adverse impacts has been presented;**

To mitigate potential impacts to the natural and social environment, and/or to comply with existing laws or ordinances, each Project technical report or resource study (attached to this application) includes recommended mitigation measures to minimize potential adverse impacts.

**(1)(e) The nature and location or expansion of the facility complies with all applicable provisions of the master plan of this County, and other applicable regional, metropolitan, state, and national plans;**

The Project is in conformance with the Alamosa County Master Plan and state and federal plans (refer to Section (2)(a)(iii)A).

**(1)(f) The nature and location or expansion of the facility complements the existing and reasonably foreseeable needs of the service area and of the area immediately affected by the facility;**

The Project would be adjacent to the existing Hooper Solar Project facility and the San Luis Valley Substation. In addition to the Project and the Hooper Solar Facility, three other existing solar facilities are located off Eightmile Lane (LN 8 N) within 5 miles east of the proposed site (refer to Map 2-8 Energy Resources). The Project's close proximity to the substation eliminates the need for a lengthy overhead transmission line, which is compatible with the Alamosa County Master Plan.

**(1)(g) The nature and location or expansion of the facility does not unduly or unreasonably impact existing community services;**

The nature and location of the Project do not unduly or unreasonably impact existing community services. In fact, the Project has substantial tax benefits to Alamosa County and to special districts during construction ($743,000) and operation ($1,988,776 annually) of the Project (refer to the Economic Impact Assessment Section 8.2 and 8.3 in Attachment 4).

**(1)(h) The nature and location or expansion of the facility will not create an expansion of the demand for government services beyond the reasonable capacity of the community or region to provide such services, as determined by the Permit Authority;**

The Project will not require an unreasonable expansion of community services, although the Project would generate tax benefits over the life of the Project that far exceed those currently generated by the property. Refer to Section 11 of the Project Economic Impact Assessment in Attachment 4 – Economic Impact Assessment.

**(1)(i) The facility site or expansion area is not in an area with general meteorological and climatological conditions which would unreasonably interfere with or obstruct normal operations and maintenance;**

Resource issue waived by the County (refer to Attachment 1).

**(1)(j) The nature and location of the facility or expansion will not adversely affect the water rights of any upstream, downstream, or adjacent communities or other water users;**

The Project would not adversely affect the water rights of any other up or downstream users (refer to Attachment 10 – Water Rights Summary). Project water use would be sourced from DWR Permit Numbers 29660-F (WDID 2014189) and 10334-F (WDID 2009110) within Parcel Number Parcel No. 500922100171 and Permit Numbers 17513-F (WDID 2009113) and 17514-F-R (WDID 2009114), respectively, within Parcel No. 5009163000040. These are water rights currently owned by Mr. Lee Welch that would be transferred to Adapture upon final execution of the Project site lease. Any excess water not needed for commercial or industrial use could be transferred or sold by the owner to other water users within the area or placed in the U.S. Department of Agriculture Conservation Resource Program for later use.

**(1)(k) Adequate water supplies are available for facility needs;**

Project water needs are approximately 200-300 acre-feet (AF) during the 16-month construction period for dust suppression and 10 AF annually during Project operations for O&M building water use and periodic panel washing. The permits described in Section (j) above each have a permitted use of approximately 246-480 AF annually, subject to the Rules Governing the Withdrawal of Groundwater in Water Division No. 3 (The Rio Grande Basin) and Establishing Criteria for the Beginning and End of the Irrigation Season in Water Division No. 3 for All Irrigation Water Rights (Rules) (refer to Attachment 11 – Hydrology Study and associated supporting information).

**(1)(l) The nature and location of the facility or expansion will not unduly interfere with any existing easements for or rights-of-way, for other utilities, canals, mineral claims, or roads;**

The Project will not unduly interfere with any existing easements or rights-of-way. A Project site (property) warranty deed is available upon request. On the Project site, there are several electric distribution and transmission easements. The Project is designed to avoid these easements. Mineral rights beneath the Project site are owned by the federal government, the State of Colorado, Dan Glaxner, Bonnie and Gerald Ritter, Lee Welch, and Robert and Linda Glaxner. There are no documented occurrences of locatable mineral deposits on or in the immediate area of the Project. Most of the locatable mineral deposits in the region come from the Sangre de Cristo Mountains to the northeast. There are no known coal resources within the immediate region of the Project site, and no history of coal production in Alamosa County. The Bureau of Land Management San Luis Valley Resource Management Plan describes the San Luis Basin as having a low potential for oil and gas development. There are no active oil or gas leases within the Project site.

**(1)(m) The applicant is able to obtain needed easements for drainage, disposal, utilities, access, etc.;**

At this time, there are no known encumbrances for needed easements. Access to the site would be via a driveway permit from the Alamosa County Road and Bridge Department. Adapture is in negotiation with PSCo regarding an easement across their property to the south for a Project gen-tie interconnection to the San Luis Valley Substation.

**(1)(n) Adequate electric, gas, telephone, water, sewage, and other utilities exist or shall be developed to service the site;**

No new utilities are needed to support the Project site.

**(1)(o) The nature and location for expansion of the facility will not interfere with any significant wildlife habitat or adversely affect any endangered wildlife species, unique natural resource or historic landmark within the impact area;**

The Project site, consistent with the solar siting considerations in the draft Comprehensive Plan (July 2025), will not be near or interfere with any Colorado Natural Heritage Program Potential Conservation Areas and Network of Conservation Areas, including National Wildlife Refuges, State Wildlife Areas, and other areas of high habitat value and management (refer to the Biological Resources Review in Attachment 8).

**(1)(p) The nature and location or expansion of the facility, including expected growth and development related to the operation and provision of service, will not significantly deteriorate air quality in the impact area;**

Resource issue waived by the county (refer to Attachment 1).

**(1)(q) The geological and topographic features of the site are adequate for all construction, clearing, grading, drainage, vegetation, and other needs of the facility construction or expansion;**

Resource issue waived by the county (refer to Attachment 1).

**(1)(r) The existing water quality of affected state waters will not be degraded below state and federal standards or established baseline levels;**

There are no wetlands or waters of the U.S. or of the state of Colorado within the Project site, nor will any be impacted by the Project (refer to Attachment 9).

**(1)(s) The benefits of the proposed developments outweigh the losses of any natural resources or reduction of productivity of agricultural lands as a result of the proposed development.**

The socio-economic benefits of the Project, in the form of temporary and permanent employment, generation of sales of goods and services, and local, state, and federal tax revenues over the life of the Project, are significantly higher than are currently generated from the property and land use (refer to the Economic Impact Analysis in Attachment 4).

# 2 Final 1041 Application

This section provides all Project details as required by Chapter 6 of the county 1041 regulations. It has been arranged to mirror the submittal requirements of Chapter 6 and is organized to coincide with each code requirement. Where waivers have been granted by the county, they are also identified by code citation and included as Attachment 2 to this application.

**(2) Final Application**

**(2)(a) At the time of making final application, all applicants shall submit five (5) copies of the following documents and information:**

**(2)(a)(i) Delineation of base area (that area likely to be subject to land use changes as a result of the project).**

**(2)(a)(i)A Map showing base area: describe how the determination was made.**

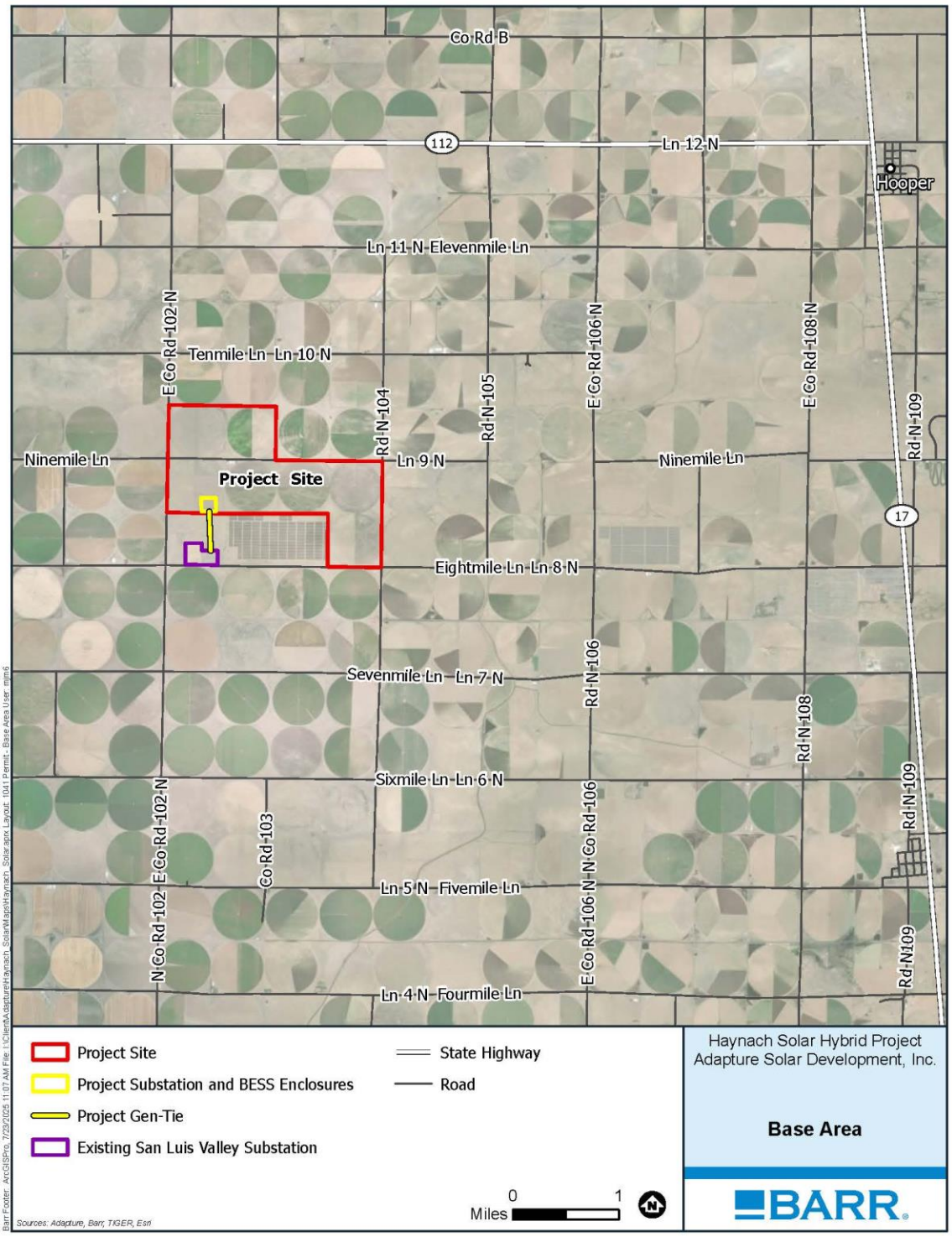
Map 2-1. Project Base Area depicts the Project's base area. It shows all proposed facilities and the boundaries of the Project where land use changes will occur.

**(2)(a)(i)B Map showing all special districts (school, fire, water sanitation, etc.) affected by the proposal.**

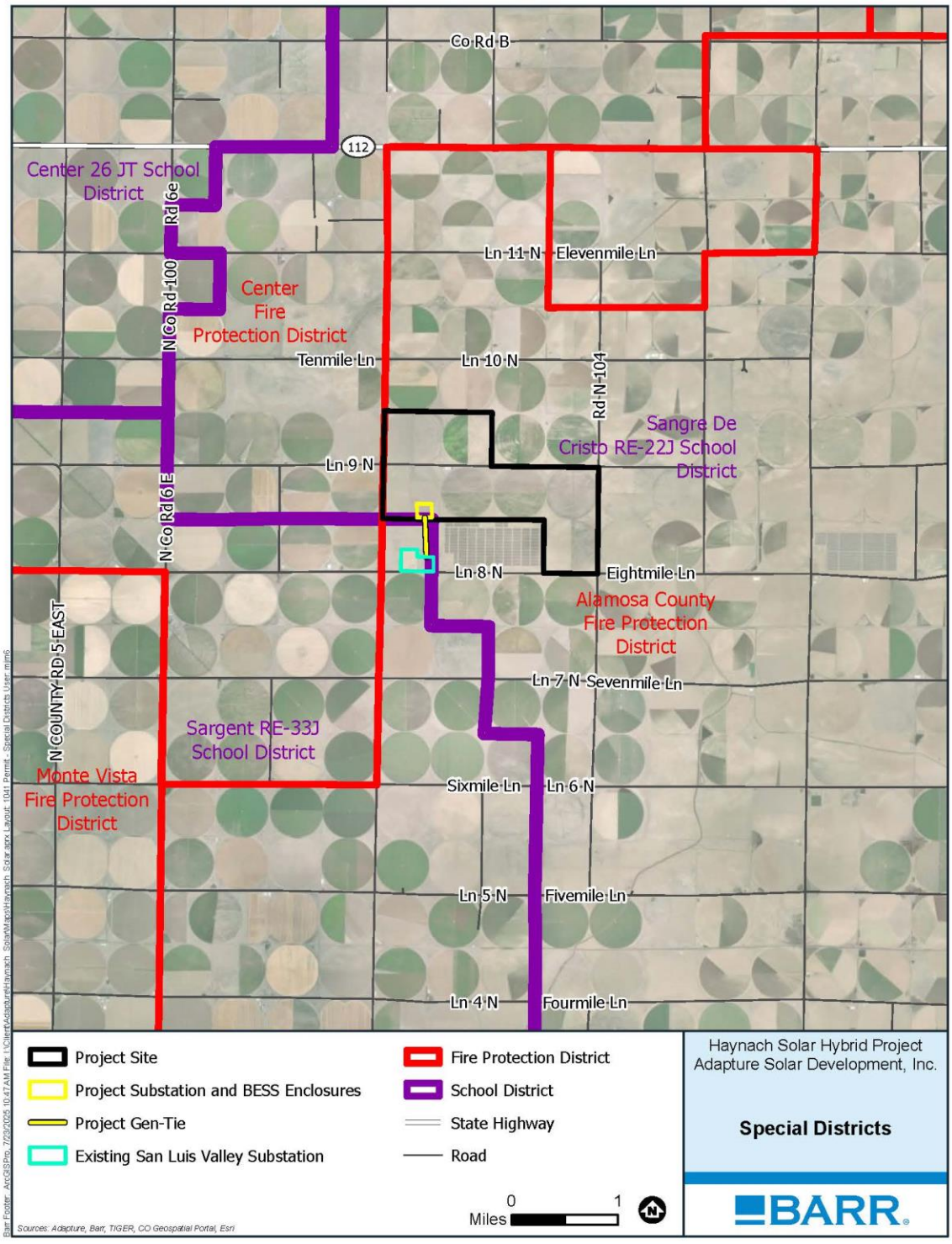
Map 2-2. Alamosa County Affect Special Districts depicts all Alamosa County special districts affected by the Project. The nature of each district's impacts is defined in other sections of the application.

**(2)(a)(ii) Delineation of impact area (that area whose physical and socio-economic environment is likely to be impacted, beneficially and adversely, by the site selection and construction of the proposed facility).**

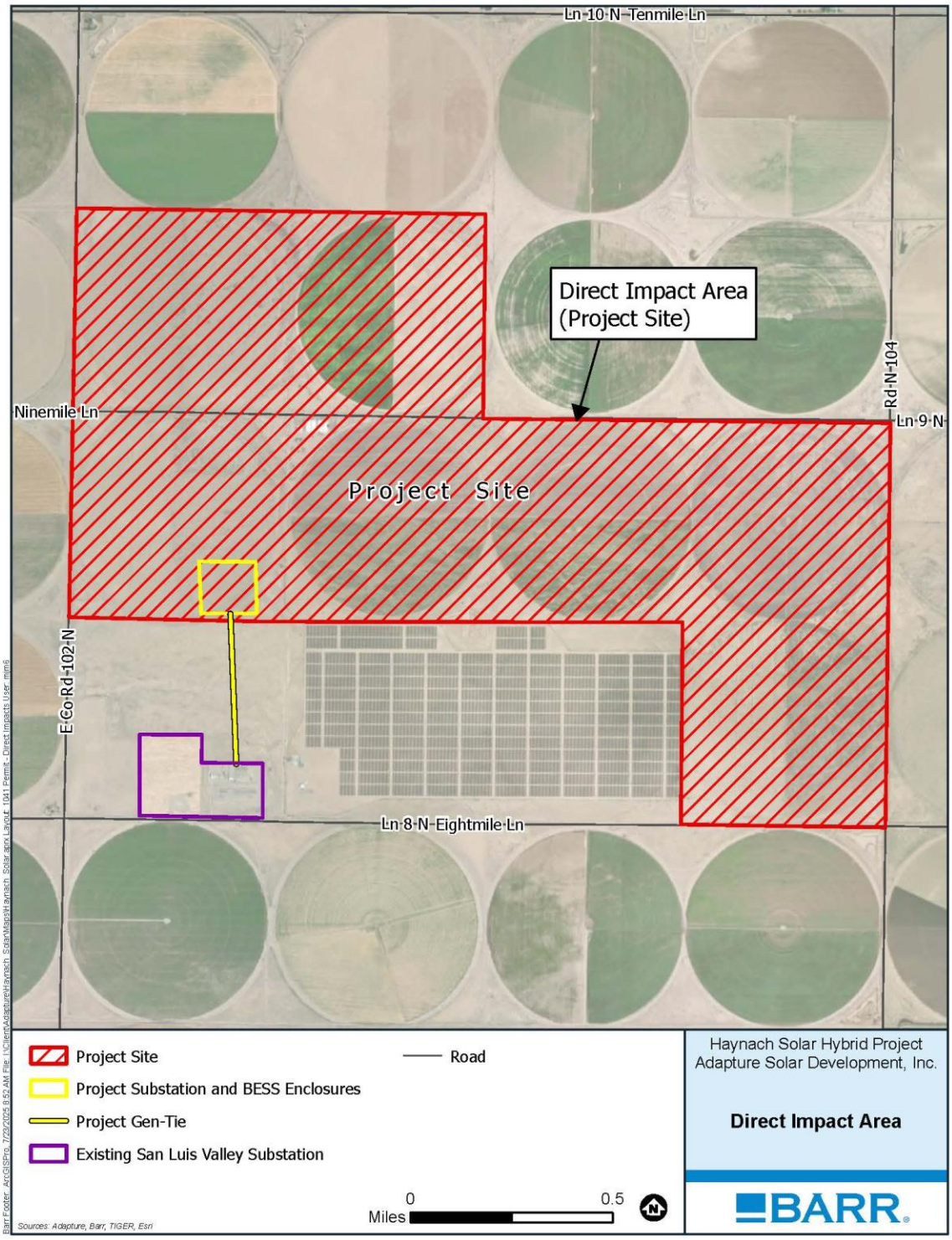
The Project area of impact, as depicted in Map 2-3, includes the areas of direct physical ground disturbance where construction activities will alter the landscape to accommodate Project facilities. Map 2-4 delineates indirect impact areas where resource issues such as noise, visual character, and traffic may be impacted by the Project construction and operation. These impact areas are further discussed in Sections (vii) Description of visual conditions (base area), (viii) Description of noise conditions (base area), and in (ix) Description of socio-economic environment (impact area), subsection (E) Existing Transportation Network of this application. Lastly, the Project socio-economic impact area, including Alamosa County, adjoining counties, the state of Colorado, and the federal government, is described in Sections (vi) Description of employment and economic opportunities, and (ix) Description of socio-economic environment (impact area). These are areas where goods and services, employment, and taxes generated by the Project will benefit these economies.



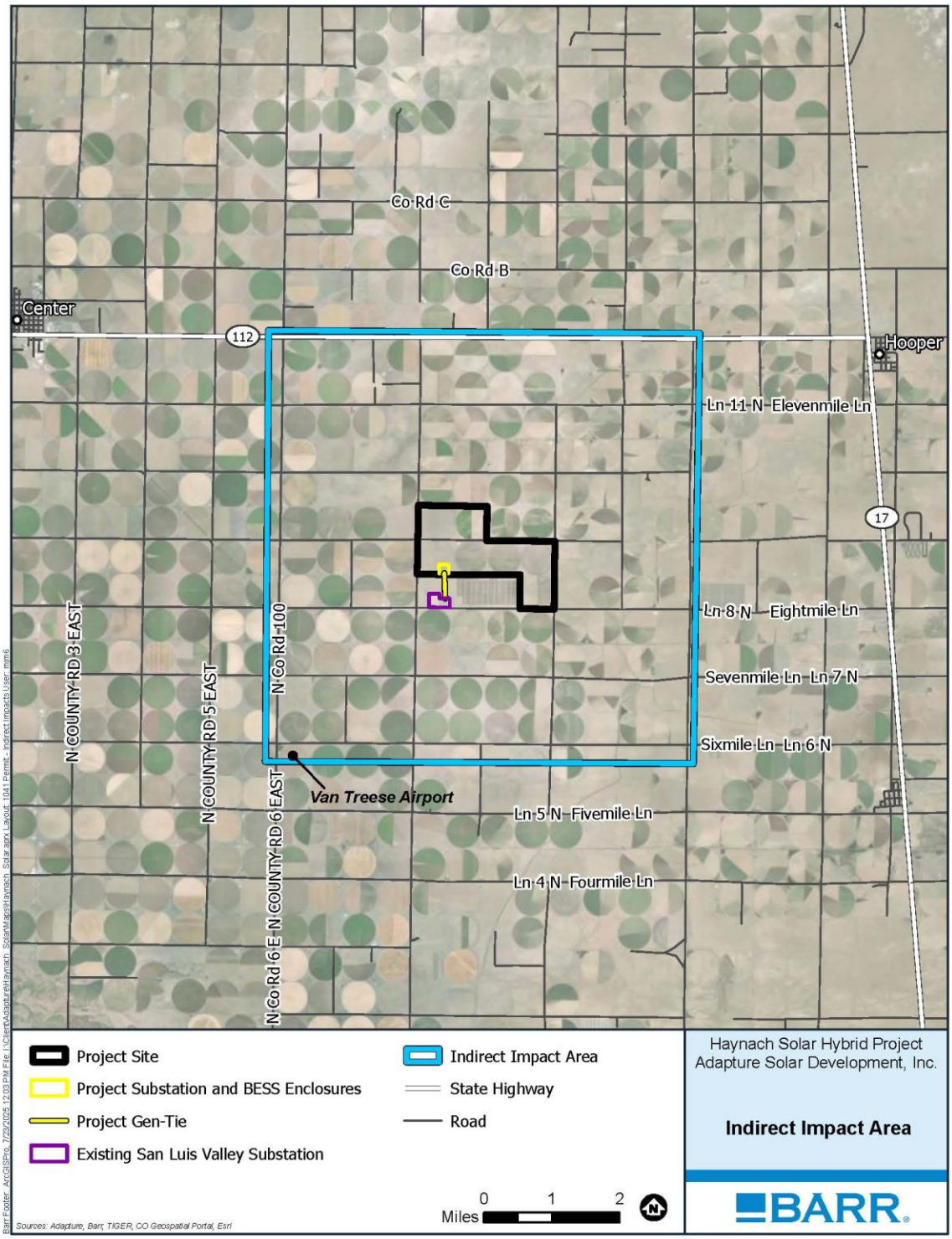

**Map 2-1. Project Base Area**




**Map 2-2. Alamosa County Affect Special Districts**




**Map 2-3. Project Direct Impact Area**




**Map 2-4. Project Indirect Impact Area**

**(2)(a)(iii) Objectives of the proposed site selection and facility.**

Solar, battery hybrid systems can produce emissions-free electricity while assisting utility operators in more effectively integrating intermittent renewable resources into the electrical grid. That is, construction and operation of the hybrid facility will allow the operator to charge the BESS during periods of solar energy generation (day) and shift output to the regional transmission system to peak (evening) hours when it is most valuable in deferring use of other non-renewable resources elsewhere.

The objectives of the Project are to:

- Improve energy reliability for Alamosa County.
- Increase the reliability and flexibility of the electrical grid by storing energy.
- Locate a solar hybrid project nearby to an existing electrical substation to minimize the length of transmission interconnection.
- Help to integrate renewable generation on the electric grid and avoid unreliability from renewable generation that has plagued other parts of the country, by installing battery energy storage capacity that can be called upon in periods of peak demand or varying sunlight conditions.

**(2)(a)(iii)A Describe the relationship of project to local land use policies and comprehensive plans and to policies and plans adopted or under preparation by federal, state and other affected local governmental agencies.**

Land use and development planning in Alamosa County is guided by the County Master Plan (CMP) and the Land Use and Development Code (LUDC) adopted in 2009. The proposed Project is consistent with the LUDC definition of a “solar panel field” as defined in the LUDC. As described in Section 2.4.3.B Utility, major: Alamosa County considers applications for Utility Scale Solar and Battery Storage developments under the county’s 1041 Regulations. According to the CMP, “Alamosa County is already pursuing and would very much like to augment its focus as a national center for the exploration and production of alternative energies like geothermal, solar, wind, biodiesel, and other renewable and alternative energy industries.” The Project is consistent with the land use and policy goals of the Town of Hooper and the Community of Mosca. Specifically, Goal 6.7, Policy 6.7.4, aims to attract commercial development and to build upon the alternative energy industry already in the San Luis Valley.

While the CMP encourages the expansion of renewable energy development in the county, it also recognizes that solar energy development can be considered a natural resource extractive industry and can impact the environment. Consistent with multiple CMP goals, Adapture has proposed a Project site that minimizes impacts to scenic resources (Goal 8.4), natural hazards (Goal 8.5), and natural resources, including wildlife (Goals 8.6, 8.8, and 8.9). Other Project resource protection measures, such as water and air quality pollution prevention (Goals 8.10, 8.11, and 8.12), are described in other sections of this application.

At the state level, the Colorado legislature recently passed a series of bills that build upon the state’s commitment to transition to a low-carbon economy. This package of new laws, among other objectives, supports the increased development of renewable energy with the goal of transitioning to 100% clean electricity generation by 2040. The policies have empowered the Public Utilities Commission (PUC) to facilitate a rapid transition to renewable energy across the state, which includes working with the state’s largest utility, Xcel Energy (Xcel), to invest in renewable energy and meet a goal of reducing greenhouse gas pollution by 80% by 2030. Xcel, of which PSCo is a subsidiary, expects to add 10,000 MW of

renewables to its portfolio in the next decade. The proposed Adapture Project is consistent with these state energy policy goals.

As there is no Project federal regulatory nexus, land use decisions on private property are made at the local level by Alamosa County.

**(2)(a)(iii)B Describe the relationship of the project to other existing and planned utility facilities of similar nature, other communication or energy generation and transmission facilities, local government capital improvement programs, and special district expansion programs.**

The proposed Project is located partially within the original footprint of the Hooper Solar Site, which was permitted under Resolution 2012-G-5—an HB1041 permit granted by Alamosa County in 2012 for a 150 MW solar project issued to San Luis Valley Solar Farm LLC (Meridian subsidiary) and transferred to Solar Star Colorado III, LLC (SunPower subsidiary) and amended by Resolution 2014-G-7.

In 2012, the entire area, including both the existing Hooper Solar Site and the land now associated with the proposed Project, was planned as a single-phase development. In 2014, the then-owner of the Hooper Solar Site requested and received approval to split the project into multiple phases. Phase 1 has since been constructed, while Phases 2 and 3 were intended to occupy the land now proposed for the Adapture Project.

Phases 2 and 3 received multiple permit extensions over the years; however, in 2024, the permit authority concluded that the project no longer met the conditions of Permit Resolution 2014-G-7 and did not grant further extensions. As a result, any previous approvals from Alamosa County for development on the Haynach Solar Hybrid Project site have expired.

**(2)(a)(iv) Description of need for project**

**(2)(a)(iv)A Describe briefly why the public convenience and necessity require the facility of the size and nature proposed be constructed on the site proposed.**

A Colorado Public Utilities Commission (PUC) issued Certificate of Public Convenience and Necessity (CPCN) is required for electric utilities constructing and operating facilities in Colorado. Issuing CPCNs increases public confidence in the companies authorized to provide electric services in the state. It promotes financially healthy companies that will stay in business and provide a high level of service to their customers. The PUC provides oversight over entry and exit from the Colorado market with the goal of protecting customers and assuring that companies provide service to customers on a non-discriminatory basis. The CPCN serves the public interest by balancing the needs of customers and utility service providers in terms of rates, service, infrastructure, and reliability. The proposed Project site is immediately adjacent to the existing San Luis Valley Substation and to the Hooper Solar Project. This close proximity enables lower-cost solar power generation, system reliability, and public safety. Additionally, the location as sited minimizes environmental impacts; another factor that the PUC considers when issuing a CPCN.

**(2)(a)(iv)B Sources of demographic and economic data and methods of analysis.**

To assess Alamosa County's socioeconomic characteristics and local public services, various documents and publications from local, state, federal, academic, nonprofit, and other private organizations were reviewed. A list of primary organizations is shown below, with specific citations provided throughout the report.

- Colorado State Demography Office
- Colorado Department of Local Affairs (DOLA)
- "Impacts analysis for planning" (IMPLAN) (refer to: https://implan.com/history/)
- Alamosa County
- U.S. Census Bureau

Economic impacts were modeled using the IMPLAN system, which is described in Section 7, along with the specific methodology adopted for this analysis. Fiscal impacts are estimated using the state-assessed property tax template provided by the Colorado DOLA.

Unless otherwise noted in the Project Economic Impact Assessment (Attachment 4), the information presented throughout the assessment and in this application is based on 2023 Census data (the most current data available), including dollar figures in 2023 dollars. Projected project costs, budgets, and impact estimates are presented in 2025 dollars.

**(2)(a)(iv)C Market function (i.e. what user needs and patterns will project fulfill).**

The Project's market function would fulfill user needs by increasing the supply of electric energy, supporting and creating skilled jobs, and generating public revenues (refer to Section 12 of the Project Economic Impact Assessment in Attachment 4). The regional energy demand is driven by residential and agricultural users, particularly during peak summer months. It supports the shift toward renewable energy mandated by Colorado's clean energy goals and aligns with the growing daytime load from electrification and irrigation systems.

Aggressive emissions-reduction requirements put in place by the 2019 legislation require Colorado to reduce $CO_2$ equivalent emissions by 80% in the power sector and 50% across all sectors against 2005 levels by 2030. Related to the emissions reduction in the state is the shift in energy generation. According to the Common Sense Institute of Colorado, as of 2023, coal accounted for 32.9% of Colorado's power generation, while natural gas accounted for 30%, wind accounted for 28%, and solar for 6.3%. This large segment of coal-fired power generation is important to understand in the context of Colorado policy focused on $CO_2$-emission reduction that plans to retire all coal generation between 2025 and 2031; this means that one-third of Colorado's power generation is planned to be removed in the next few years. The Project will contribute to replacing this reduction in coal-generated power and to reducing $CO_2$ emissions in the power sector.

**(2)(a)(v) Description of support facilities needed**

**(2)(a)(v)A Type of water quality control.**

**(2)(a)(v)A1 Describe proposed sewage treatment facilities and nonpoint source controls.**

The Project will require a septic tank and leach/drain field for sewage treatment onsite. The size and design specifications are dictated by the Alamosa County code. The Water Quality Control Commission and Water Quality Control Division (WQCD) of the Colorado Department of Public Health and Environment (CDPHE), under the authority of federal and Colorado statutes, administer state programs implementing the Clean Water Act (CWA). Section 319 of the CWA was created to establish a national program to control nonpoint source (NPS) water pollution and to develop NPS management programs that maintain and improve water quality in the state. The Nonpoint Source Program of the WQCD has delegated authority to implement a U.S. Environmental Protection Agency (EPA) approved state NPS management program under the CWA. Because the Project will disturb more than one acre or more of land during construction, the Project will prepare a Stormwater Management Plan (SWMP) that complies with the Construction General Permit (CGP #COR400000). This permit is required 14 calendar days prior to commencing construction activities. No Project site discharge permit (COR900000) is required during Project operations as there are no receiving surface waters in proximity to the Project site.

**(2)(a)(v)A2 Describe pollutant loads (point and nonpoint sources) expected directly from development. Specify seasonal variations.**

The SWMP is prepared to commit to and implement pollutant control measures to meet CGP effluent limitations, including the following:

- Control measures to prevent the discharge of sediment in stormwater.
- Control measures to minimize dust, consistent with EPA's 2022 CGP for dry climates.
- A requirement to minimize erosion at stormwater discharge locations. Control measures to meet this requirement may include the use of erosion controls and/or velocity dissipation devices (e.g., check dams, sediment traps) at the outfall to slow down stormwater flow.
- A specific requirement that spills and leaks must be contained and mitigated immediately upon identification.
- Added specific requirement that washout for paint, form release oils, curing compounds, or other similar construction materials must go to a leak-proof container or a lined pit.
- Minimize exposure to fertilizers, pesticides, and herbicides. Specifically, the permit requires that the permittee store, use, and dispose of the fertilizer, pesticide, or herbicide in accordance with the manufacturer's directions to minimize the potential discharge of excess or improperly applied product.

**(2)(a)(v)B Public services and facilities.**

This section describes public services that would be impacted by the Project construction and operations. Given the Project's location in unincorporated Alamosa County, law enforcement would fall under the sheriff's office, fire protection under the Alamosa County Fire Protection District, and emergency medical services (EMS) under the County Ambulance District. The location is also within the Sangre de Cristo School District and the Rio Grande Water Conservation District.

**(2)(a)(v)B1 Estimate police and fire protection requirements.**

Refer to Sections 11.3 and 11.4 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(v)B2 Estimate public road maintenance requirements.**

According to CDOT Access Code requirements for auxiliary lanes on R-A and R-B roadways, an acceleration lane for the eastbound to southbound direction at the intersection of CO 17 / Lane 8 N is warranted. According to Section 4 of the Access Code, the acceleration lane for a 65 mph R-A roadway shall be 1,380 feet with a 25:1 transition taper. The taper is included within the acceleration length. A temporary acceleration lane may be constructed if required by CDOT. Additional details regarding road classifications and required upgrades are included in the Transportation Impact Study and Level 2 Auxiliary Turn Lane Assessment provided in Attachment 5.

Following review of the Alamosa County Land Use & Development Code, no reference to required Project impact fees, which would cover public road maintenance near the Project, was found. Rather, tax revenues derived from oil and gas production, commercial, industrial, agricultural, and other commercial activities in the County cover the cost of public road maintenance. All of the public roads that border the Project site are currently maintained by the county.

**(2)(a)(v)B3 Estimate educational and health service requirements.**

Refer to Sections 11.5, 11.6, and 11-7 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(v)B4 Estimate facilities and services required to provide adequate water supply and sewage treatment.**

Constructing the Project would require an estimated 200 to 300 acre-feet of water over the entire construction period, or 133 to 200 acre-feet per year (AFY). This water would be used primarily for compaction, dust suppression (including truck wheel washing), and concrete mixing. At this rate, the Project would account for no more than 0.3% of annual county water use. No county sewage treatment facilities would be required to support the Project.

Water demand for panel washing is not expected to exceed 10 AFY. Water is anticipated to be obtained from on-site wells or delivered via truck from an off-site source (or sources) in the project vicinity. If water is trucked to the site, it is anticipated that an available local water source would be selected to minimize truck trips/lengths in transporting water to/from the site.

Refer to Sections 11.9 and 11.10 of the Project Economic Impact Assessment in Attachment 4 for fiscal water supply service estimates.

**(2)(a)(vi) Description of employment and economic opportunities.**

IMPLAN assumes construction “supports” or hires existing job holders rather than creating new jobs. However, the ability of a local workforce to support a construction project depends on the size of the workforce and the employment required to construct the project. Further, specific skills or specialized trades may need to be recruited from outside a region, again depending on the nature of the local workforce and project construction requirements.

**(2)(a)(vi)A Describe capital investment in facility.**

The total estimated capital investment to construct the Project is $331,120,170. Refer to Section 7.1.1 of the Project Economic Impact Assessment in Attachment 4 for a detailed description and breakdown of expenditures.

**(2)(a)(vi)B Estimate anticipated revenues to local, state and federal governments, special districts.**

## Local Revenues

The tax impact of construction would be approximately $743,000 received at the local level (sub-county, special districts, and county combined). Refer to Section 8.2.5 of the Project Economic Impact Assessment in Attachment 4 for an explanation of the total county tax revenue impacts of construction.

The Project's total annual impact on the county would be $2.0 million, which would increase the size of Alamosa County's economy by 0.1 percent, as measured by total output. Refer to Section 8.3.5 of the Project Economic Impact Assessment in Attachment 4 for an explanation of the annual economic impact by industry in Alamosa County.

Total annual tax impacts resulting from the Project's operations and maintenance would be $79,000 received at the local level (sub-county, special districts, and county combined). Refer to Section 8.3.6 of the Project Economic Impact Assessment in Attachment 4 for an explanation of the annual county tax revenue impact of operations.

Total tax revenues are estimated to be $3.2 million at the local level. Refer to Section 8.3.7 of the Project Economic Impact Assessment in Attachment 4 for an explanation of the total accumulated county tax revenue impact of operations.

The Project would be located in Tax Area 22-6. At the end of the 40-year lifetime, total lifetime payment of $19,312,634 would be allocated to various tax area jurisdictions. Refer to Section 9, Table 9-2 of the Project Economic Impact Assessment in Attachment 4 for an explanation of estimates of tax area 22-6, property tax per special district.

## State and Federal Revenues

The state of Colorado will receive tax revenues from construction in the amount of $3,210,415, and the federal government will receive $12,275,958. Refer to Sections 8.4.6 and 8.4.7 and Table 8-19 of the Project Economic Impact Assessment in Attachment 4 for an explanation of the total state tax revenue impacts of construction.

The state of Colorado will receive tax revenues from operations in the amount of $120,906, and the federal government will receive $222,442. Refer to Section 8.5.6 of the Project Economic Impact Assessment in Attachment 4 for an explanation of the total annual state and federal tax revenue impact of operations.

The state of Colorado will receive total accumulated tax revenues from operations in the amount of $4,836,232, and the federal government will receive $8,897,664. Refer to Section 8.5.7 of the Project Economic Impact Assessment in Attachment 4 for an explanation of the total accumulated state and federal tax revenue impact of operations.

The state of Colorado would receive an estimated annual tax revenue of $161,208 from operations. Refer to Section 8.5.8, Table 8-26 of the Project Economic Impact Assessment in Attachment 4 for the total state tax revenue impact of operations.

The state of Colorado will receive an estimated $19,320 in total property taxes. Refer to Section 9, Table 9-1 of the Project Economic Impact Assessment in Attachment 4 for estimates of state-assessed property tax.

**(2)(a)(vi)C Describe employment opportunities.**

**(2)(a)(vi)C1 Types of jobs and number of positions anticipated; employment; wage and salary schedules.**

Refer to Sections 8.2.3, 8.3.4, 8.4.3, and 8.5.4 of the Project Economic Impact Assessment in Attachment 4 for tabulated estimates of employment opportunities during the Project construction and operation.

**(2)(a)(vi)C2 Opportunities for employment of local citizens.**

Refer to Section 7.2.3.1 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(vi)C3 Employment opportunities for low income and minority population in impact area.**

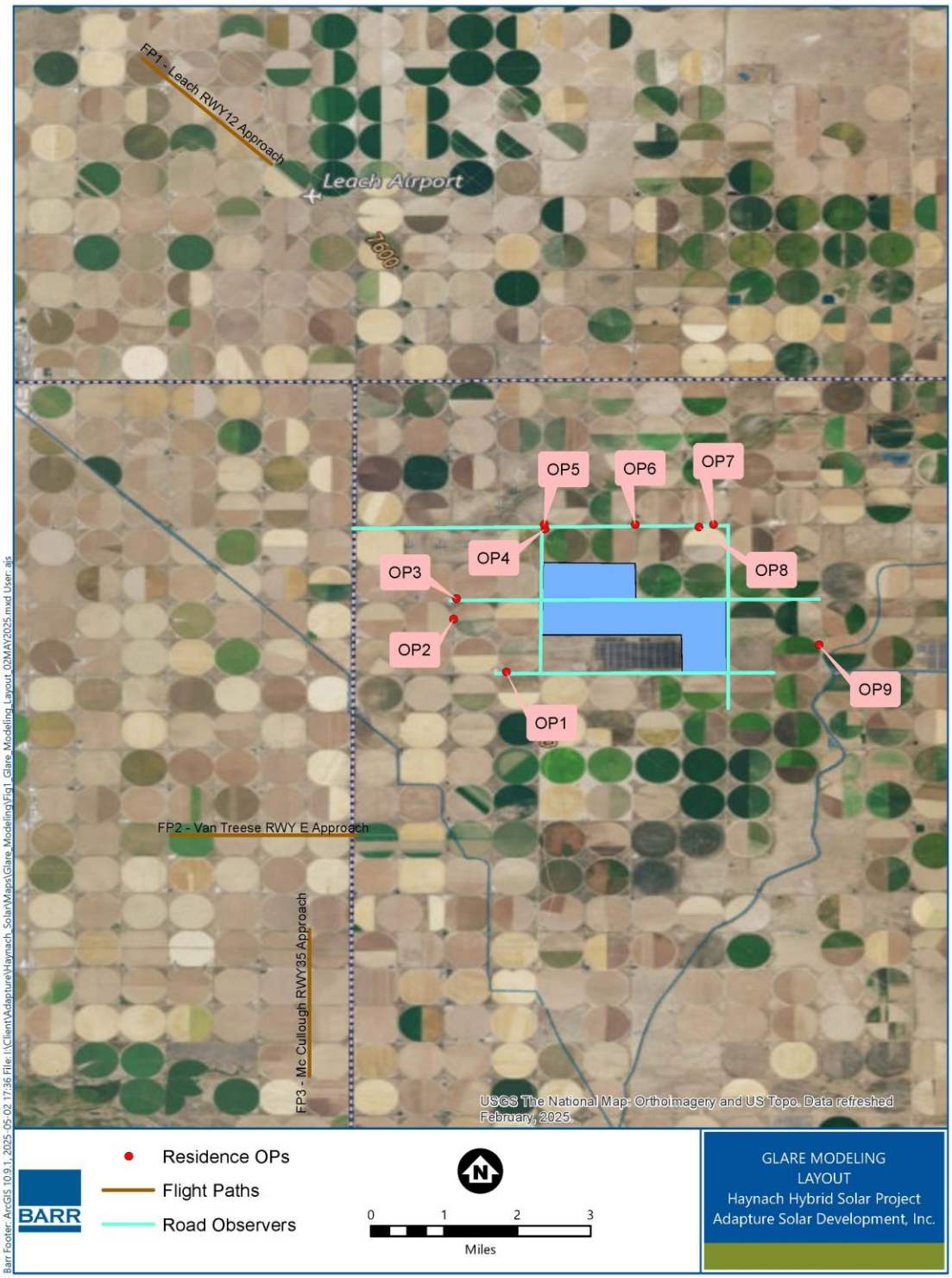
Refer to Section 7.2.3.2 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(vii) Description of visual conditions (base area).**

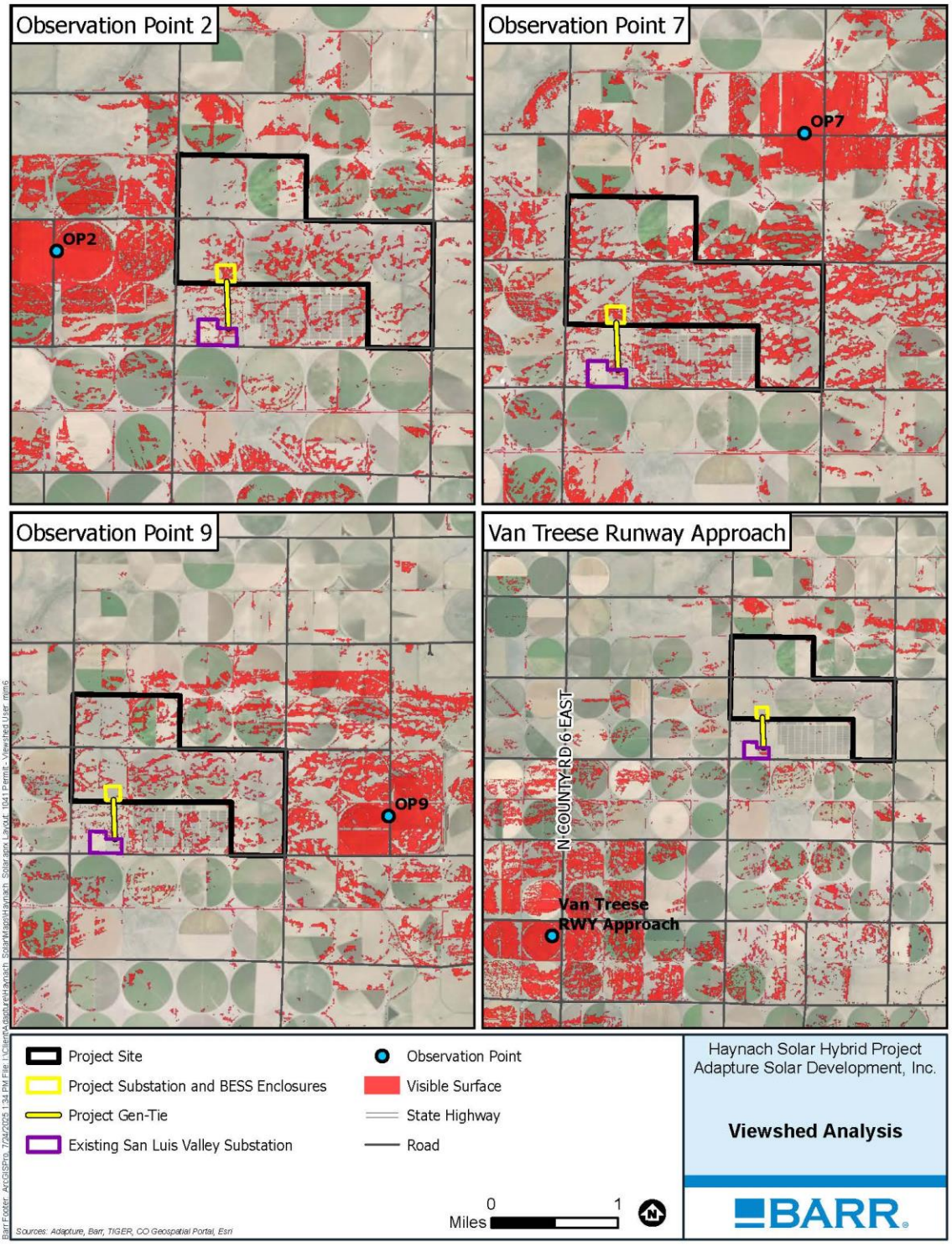
The visual conditions of the study area consist mainly of disturbed rangeland and both fallow and active agriculture. Agricultural cultivation in the area is completed within center-pivot irrigated crop circles, with apparent used and unused irrigation drainage ditches and depressions scattered across the landscape. The terrain is generally flat with minor areas of gradual undulation. There are a few residences within the visual base area (refer to maps below) and no commercial businesses. The existing Hooper Solar Project and associated interconnection infrastructure to the San Luis Valley Substation are the most notable visual baseline features in the assessment area.

**(2)(a)(vii)A Map area within view of project.**

A Glare Analysis was performed by Barr and is included in Attachment 6. The modeled layout of the analysis is shown on Map 2-6, depicting the projected panel areas as derived for input to the model. Receptors were placed on several roads in the vicinity of the Project. Selected route-based receptors included Eightmile Ln (Ln 8 N), Ln 9 N, Ln 10 N, E County Rd 102 N, and Rd N 104. Receptors were also placed on 2-mile approach paths for Leach Airport Runway 12, Van Treese Airport Runway E, and McCullough Airport Runway 35. Additionally, nine fixed observation points were modeled for potential surrounding residences within 1 mile, identified from aerial photo review, as shown in Map 2-6.




**Map 2-5. Glare Analysis Layout**




**Map 2-6. Viewshed Analysis**

Barr completed a desktop elevation model viewshed analysis. Depicted on Map 2-7. Project Topography are areas within 1 mile of the Project where it can be seen from the receptors. As with the glare analysis, receptors included public roads, residences, and approach paths to three area airstrips.

**(2)(a)(vii)B Map access and travel routes, public areas, residential areas that will have a view of the project**

Detailed Project public travel routes and access roads are mapped in the Project Transportation Impact Study and Level 2 Auxiliary Lane Assessment provided in Attachment 5 – Transportation Impact Study and Level 2 Auxiliary Turn Lane Assessment. Residences with a view of the Project are visible on aerial image figures provided in the study, and on Map 2-6 and Map 2-7. There are no nearby public areas.

**(2)(a)(viii) Description of noise conditions (base area)**

A Project Noise Analysis was completed by Barr and is included in Attachment 7. Provided as follows is a summary of the noise baseline conditions at and near the Project site.

The Project is in a rural, agricultural area with dispersed farmhouses near the site. Existing noise sources include vehicular traffic on local roads, noise from agricultural operations, activities at the existing Hooper Solar Project facility and the San Luis Valley Substation electric substation and solar facility, and incidental background noise from nearby residences, wildlife, weather, or other environmental sources.

To assess existing background noise levels, noise measurements were conducted at the approximate center of the Project site (refer to Map 2-1 for reference) from 4:20 p.m. to 10:30 p.m., May 13, 2025. The sound levels measured during this period were:

- 45.6 dBA (Leq) from 4:20 p.m. to 10:30 p.m. (overall)
- 48.4 dBA (Leq) from 4:20 p.m. to 7:00 p.m. (daytime)
- 41.0 dBA (Leq) from 7:00 p.m. to 10:00 p.m. (evening)
- 28.4 dBA (Leq) from 10:00 p.m. to 10:30 p.m. (nighttime)

These levels are typical of a sparsely developed, rural area with little exposure to highway traffic or other urban or industrial noise sources. Based on the measurements and published estimates of ambient sound levels for various land uses provided in the analysis, it is reasonable to assume that background noise levels near the Project area are 30 A-weighted equivalent continuous sound level (dBA-Leq) or less in the late-night hours and 45 to 50 dBA-Leq during the day when daily activities are ongoing in the surrounding area. During the noise measurements, Barr observed that activity in the area was low; little traffic was observed, and no active agricultural operations were ongoing. It is likely that ambient noise levels are higher during times when more active agricultural operations are ongoing, for example, irrigation sprinklers or harvesting operations.

**(2)(a)(ix) Description of socio-economic environment (impact area).**

Given the rural nature of the county economy, a multi-region input-output (MRIO) model framework is adopted to show portions of labor and materials flowing from other regions of the state, including the urban centers, which would also be impacted by the Project construction and operations. See Appendix A of the Economic Impact Assessment (Attachment 4) for a further description of the MRIO model structure. Within each region, construction and operations events were modeled using IMPLAN's Industry Impact

Analysis (IIA) event type, which allows each region to have a unique production function, realistically capturing likely sourcing of labor and materials as well as sales tax rates. Economic impact model results are estimated averages across each of these two regions (Alamosa County and the entire state of Colorado).

**(2)(a)(ix)A Characteristics of the existing population.**

This section describes the demographic profile and trends of Alamosa County, a rural county in southern Colorado covering 723 square miles. The description of the local demographic and community trends focuses on several measures of population, household composition, race, age, and education. Every attempt has been made to provide the most current data available; however, much of the data presented is sourced from the Colorado SDO and the U.S. Census, which is generally available through 2023.

**(2)(a)(ix)A1 Age, income level and distribution, education, social background, family size, etc.**

Refer to Section 3 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)A2 Neighborhood and distinct socio-economic groups.**

Refer to Sections 3.5 and 3.7 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)A3 Migrational trends and seasonal fluctuations.**

Refer to Section 3.4 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)A4 Anticipated population changes.**

Refer to Section 11.1 of the Project Economic Impact Assessment in Attachment 4. Given the size of the construction workforce (Table 8-14 in assessment) and considering the intention to hire locally, along with ongoing operations employment (Table 8-22 in assessment), including indirect and induced impacts relative to the size of the county, any changes to the county's population and social characteristics would be negligible.

**(2)(a)(ix)B Current employment.**

Refer to Sections 5.1, 5.2, and 5.3 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)B1 Principal employers, type, number of employees.**

Refer to Section 4.2 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)B2 Unemployment and underemployment.**

Refer to Sections 5.4 and 5.5 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)B3 Characteristics of local labor pool.**

Refer to Section 5.6 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)B4 Manpower training and retraining potential.**

Refer to Section 7.2.3.2 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)C Inventory local governments and special districts providing services in base areas.**

This section reviews public services that would be impacted by the Project construction and operations. Given the Project's location in unincorporated Alamosa County, law enforcement would fall under the sheriff's office, fire protection under the Alamosa County Fire Protection District, and emergency medical services (EMS) under the County Ambulance District. The location is also within the Sangre de Cristo School District and the Rio Grande Water Conservation District.

**(2)(a)(ix)C1 Map jurisdiction and type of service.**

Map 2-2 above delineates special districts serving the Project site.

**(2)(a)(ix)C2 Capacity and utilization of services.**

Refer to Section 11 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)C3 Operating revenue and expenditures.**

Refer to Section 11 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)C4 Tax base.**

Refer to Section 10 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)C5 Current level of taxation.**

Refer to Section 10 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)C6 Estimate revenue-generating capacity and identify potential new sources of revenue.**

Refer to Section 11 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)D Housing.**

Although Adapture would strive to hire as many local workers for construction as possible, the share of local hiring would depend on the availability of skilled labor in the region at the time of construction. A portion of the construction workforce would most likely require temporary housing during all or part of construction. This section evaluates the supply of currently available local housing and the demand for housing from workers who would reside in the county temporarily during construction. Actual rental market conditions at the time of construction may vary.

**(2)(a)(ix)D1 Current housing inventory (including numbers, types, (owner or rental), sales or rental prices, year-round or seasonal, dormitories, mobile homes, and locations).**

Refer to Sections 6.2, 6.3, and 6.4 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)D2 Projected housing requirements (including numbers, types (owner or rental), sales or rental prices, year-round or seasonal, dormitories, mobile homes, and locations).**

Refer to Sections 6.1, 6.5, and 6.6 of the Project Economic Impact Assessment in Attachment 4.

**(2)(a)(ix)E Existing Transportation Network.**

The existing transportation network consists of CO 17, CO 112, CR 102 N, and LN 8 N. Each is described in the Transportation Impact Study in Attachment 5 and summarized below.

CO 17 is a two-lane, principal arterial roadway with a CDOT highway classification of RA: Regional Highway. The roadway has a posted speed limit of 65 miles per hour (mph) within the study area.

CO 112 is a two-lane, minor arterial roadway with a CDOT highway classification of R-B: Rural Highway. The roadway has a posted speed limit of 65 mph within the study area.

CR 102 N is an unpaved county road that serves the surrounding rural Alamosa County. No posted speed limit was detected.

Similar to CR 102 N, Lane 8 N is an unpaved county road that serves the surrounding rural Alamosa County. No posted speed limit was detected.

**(2)(a)(ix)E1 Access to site.**

Site access will be provided off CR 102 N and LN 8 N. Vehicles will access from the surrounding communities via State Highway (CO) 17 and CO 112. Refer to the Vicinity Map in the Transportation Impact Study in Attachment 5.

**(2)(a)(ix)E2 Circulation within base area and commuting patterns in impact area.**

Existing traffic counts were collected at the intersections of CO 17 / LN 8 N and CO 112 / CR 102 N on Wednesday, June 4, 2025. Appendix A of the Transportation Impact Study and Level 2 Auxiliary Turn Lane Assessment contains the turning movement count data, and Figure 3 displays the existing traffic volumes. Average Daily Traffic (ADT) for CO 17 is approximately 2,400 vehicles per day (vpd), and ADT for CO 112 is 870 vpd as displayed in CDOT's Online Transportation Information System (OTIS).

**(2)(a)(ix)E3 Capacities of arterial streets within impact area.**

Section 3.3 of the Transportation Impact Study, Level 2 Auxiliary Turn Lane Assessment (Attachment 5) summarizes the existing baseline conditions level of service (LOS). LOS is a measure used to describe operational conditions at an intersection. LOS categories ranging from A to F are assigned based on the predicted delay in seconds per vehicle for the intersection overall and for individual turning movements. LOS A indicates very good operations, while LOS F indicates poor, congested operations. Overall, intersection LOS D is considered acceptable by CDOT and most municipalities.

The analysis indicates that the intersections at CO 17 / LN 8 N and CO 112 / CR 102 N currently operate at LOS A, with all movements also operating at LOS B or better.

**(2)(a)(ix)E4 Maintenance provisions and costs.**

There are no statutory impact fees, other than permit fees, associated with land development applications in Alamosa County. Maintenance of county roads in proximity to the Project site is currently completed by the county Road and Bridge Department. Project construction activities and facility operations will generate tax revenues for Alamosa County that will be used, in part, for county road maintenance costs.

**(2)(a)(ix)F Description of historical and archaeological resources.**

To comply with historical preservation laws and 1041 regulations, an archaeological resources literature review and an intensive pedestrian survey (e.g., Class III) were conducted, focused on the Project site.

Barr archaeologists inventoried the 1,109 acres entirely on private land under Colorado State Permit No. 85539. The inventory resulted in documenting six new sites and five isolated finds (IFs). None of the six sites is recommended to be eligible for listing in the National Register of Historic Places (NRHP). Provided below are brief descriptions of the sites and IFs found. A report has been submitted to the Colorado State Historic Preservation Office (SHPO) for review and concurrence.

**(2)(a)(ix)F1 Describe historical and archaeological sites by means of completing state inventory forms and submit these to the State Historical Society for evaluation.**

Six newly recorded sites (Site Numbers 5AL900.3, 5AL901.3, 5AL1247, 5AL1248, 5AL1249, and 5AL1250) were documented during the survey, including three linear historic sites consisting of two road segments and a segment of a historic transmission line. The remaining three sites consist of historic dumps. None of the identified resources is recommended as eligible for listing in the NRHP.

The five IFs consisted of three precontact and two historic artifact isolates. The IF number and description of each are provided below:

- 5AL1251: One tertiary obsidian biface thinning flake. Cultural affiliation: Precontact.
- 5AL1252: Five coffee cans, possibly 1960s. Some text remains ‘electric percolator’. Cultural affiliation: Historic.
- 5AL1253: One tertiary quartzite biface thinning flake. Cultural affiliation: Precontact.
- 5AL1254: Broken Corner Tang Knife Late archaic. Length 4 centimeters (cm), Width: 2.5 cm, Thickness: 0.2 cm, side notch depths: 0.4 and 0.7 cm. Cultural affiliation: Precontact Late Archaic 650 B.C.- 450 A.D.(1).
- 5AL1255: Five fragments of clear glass, one church key opened can, one broken Owens Illinois seltzer clear glass bottle. Cultural affiliation: Historic.

None of the recorded IFs retain sufficient significance and integrity beyond indicating that people have been in the area, and all of them are recommended as not eligible for inclusion in the NRHP. No further archaeological work is recommended for the IFs.

**(2)(a)(ix)F2 Describe resources individually and as they relate to the community; include photos wherever possible.**

Brief summary descriptions of each site and IF are provided as follows. Detailed descriptions of each site are included in the Class III Cultural Resources Inventory on file with the SHPO. Isolates are described above. The photo below is of the IF 5AL1254.

Site 5AL900.3 Eight Mile Lane – HDR, EOC Inc. previously recorded a segment of Eight Mile Lane 5AL900.1 in 2013. The newly recorded segment begins at the intersection of County Road 104 and runs east to west. This segment of Eight Mile Road is a heavily used, crowned-and-ditched gravel road that provides access to adjacent agricultural fields.

Site 5AL901.3 Poncha Transmission Line – The site is a newly recorded segment of the Poncha Transmission Line that runs north–south through the project area. The Poncha 230 kV transmission line was part of the Fryingpan–Arkansas Project, a participating project under the broader Colorado River Storage Project (CRSP) authorized by Congress in 1956.

5AL1247 Road to Dickey's Wind Mill – Site HAY-RLC-01 is a newly recorded historical road identified during the literature review as the Road to Dickey's Windmill. The 1881 BLM-GLO plat map depicts a historic road labeled "Road to Dickey's Wind Mill" crossing project Sections 16, 21, and 22. The road was likely part of a failed homestead effort in the 1880s.




**Photograph 2-1. Detail of Broken Corner-Tang Knife (IF 5AL 1254)**

5AL1248 Historical Dump – Site HAY-RLC-02 is a newly recorded historical artifact scatter, consisting of an estimated 75 to 100 artifacts dispersed across the area. The assemblage includes various glass fragments—clear, purple, milk glass, aqua, and cobalt blue, dating from approximately 1800 to the present.

5AL1249 Historical Dump – Site HAY-RLC-03 is a newly recorded historic artifact scatter consisting of an estimated 100 artifacts, dispersed and clustered throughout the area. The assemblage includes a variety of glass fragments—clear, aqua, and purple—as well as scattered galvanized metal, unidentified can fragments, stoneware, and whiteware dishes. Several whiteware fragments include handles and plate sherds resembling teacups and saucers. A notable artifact concentration, designated AC-1, is near the center of the site and contains approximately 25 artifacts. This concentration includes one Hazel-Atlas cold cream jar, a logo used between 1920 and 1964, multiple porcelain plates marked "Made in Japan," and ceramics featuring transfer prints and polychrome floral designs.

5AL1250 Historical Dump – Site HAY-RLC-04 is a newly recorded historical artifact scatter consisting of an estimated 100 to 150 historic artifacts dispersed and clustered throughout the area. The assemblage includes a variety of glass fragments: clear, amethyst, aqua, and milk glass dating from approximately 1800 to the present. One Hazel-Atlas milk jar, bearing the company's maker's mark, was identified, which

was in use between 1920 and 1964. Sanitary cans and various galvanized steel fragments are scattered across the site.

None of the sites or IFs relate to the community, with the exception of Eight Mile Lane and the Poncha Transmission Line, which are both currently still in use by the community and Xcel. The Project will not adversely impact or change the use of either site.

**(2)(a)(x) Description of atmospheric conditions (impact area).**

Waiver granted, refer to Attachment 1.

**(2)(a)(x)A Meteorology**

Waiver granted, refer to Attachment 1.

**(2)(a)(x)B Topography**

Waiver granted, refer to Attachment 1.

**(2)(a)(x)C Background ambient air quality (TSP, S02, HC, CO, NOx, 03, etc.).**

Waiver granted, refer to Attachment 1.

**(2)(b) At the time of final application, applicants seeking a permit for the site selection and construction of transmission lines or substations shall submit, in addition to those requirements set forth in Subsection (a) of this Section, five (5) copies of the following documents and information:**

**(2)(b)(v) Description of geologic and pedologic conditions of base area.**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)A Map bedrock and surficial geology.**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)B Map and describe areas of:**

**(2)(b)(v)B1 Avalanches**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)B2 Mud flows and debris fans**

Waiver granted, refer to Attachment 1

**(2)(b)(v)B3 All types of unstable or potentially unstable slope**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)B4 Special seismic considerations**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)B5 Areas of high radioactivity**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)B6 Ground subsidence**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)B7 Expansive soil and rock**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)B8 Other geologic conditions which are pertinent**

Waiver granted, refer to Attachment 1.

**(2)(b)(v)C Map extent of 100-year floodplain if present.**

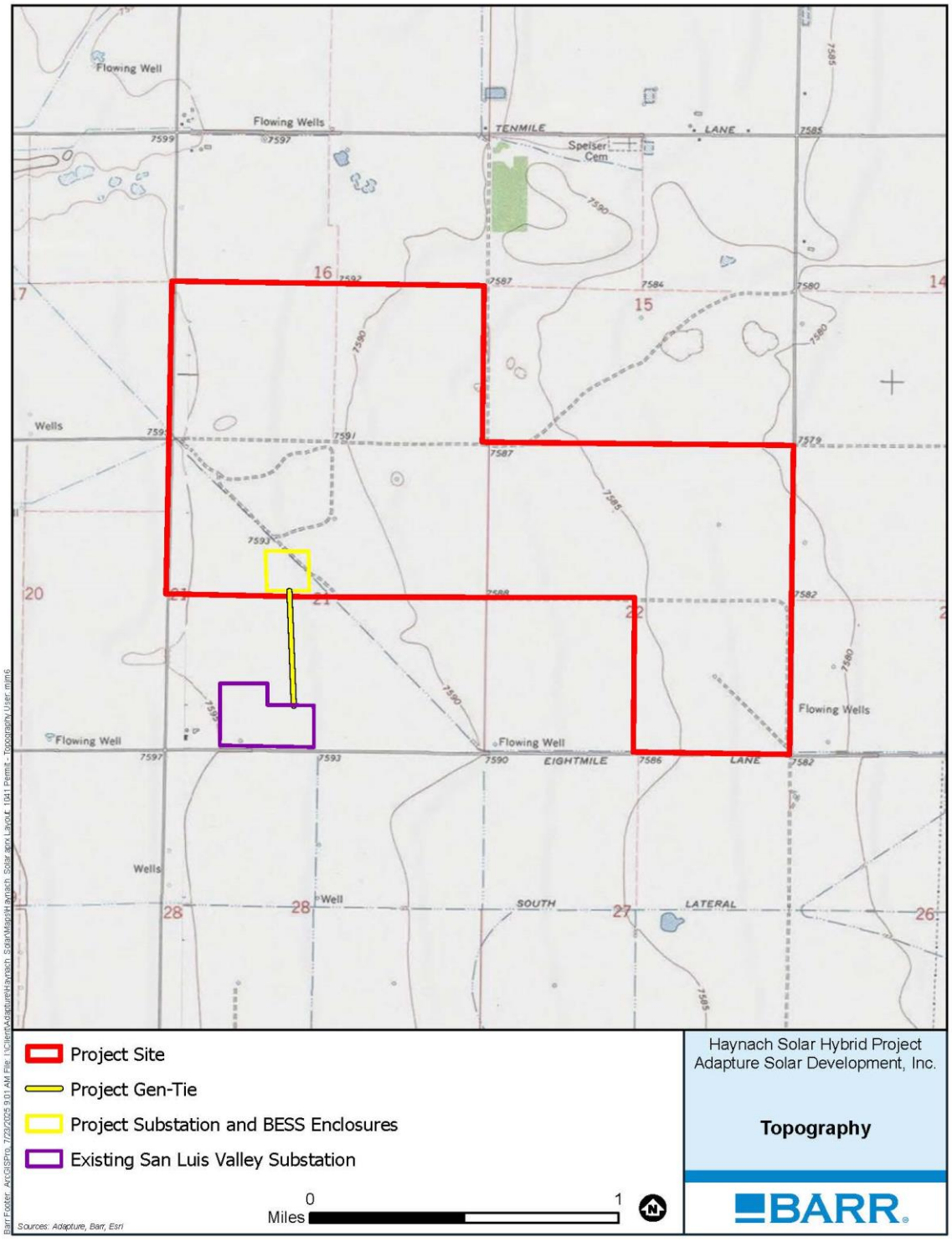
N/A. No floodplain present.

**(2)(b)(v)D Map topography in adequate detail to determine adequacy of facility design.**

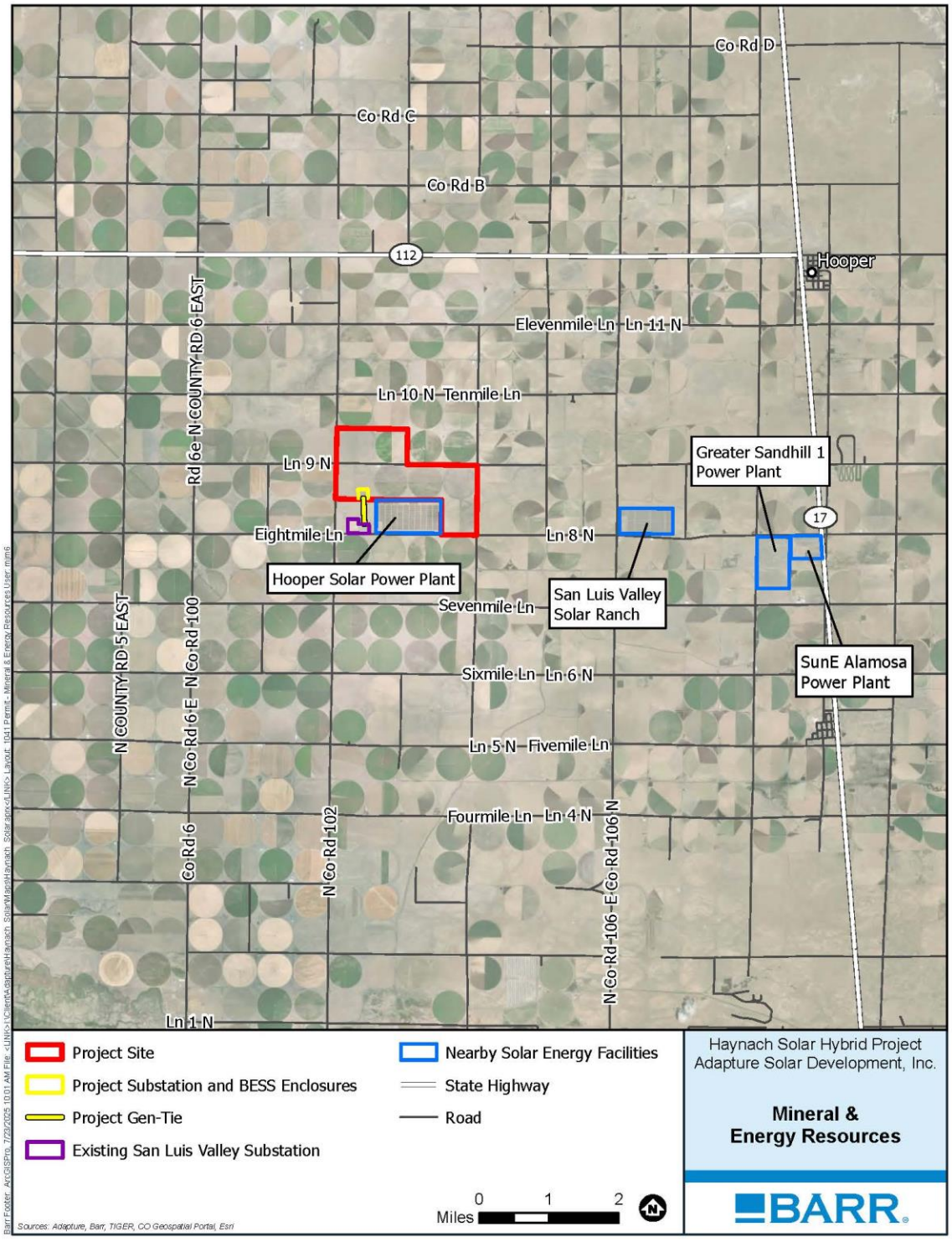
Map 2-7 shows Project site topography based on the Hooper West and Center South 7.5' U. S. Geologic Survey Topographic Quadrangle

**(2)(b)(v)E Map and evaluate mineral and energy resources.**

There are no active mines or oil and gas mineral resources present to map in the indirect impact area. Map 2-8 depicts energy resources in the form of solar farms near the Project site. Four other existing solar farms are within 5 miles of the site, all along Eightmile Lane east of the Project site.




**Map 2-7. Project Topography**




**Map 2-8. Mineral & Energy Resources**

**(2)(b)(v)F Map and evaluate agricultural resources.**

Map 2-9 shows agricultural resources on and adjacent to the Project site as mapped by CropScape. Potatoes are the predominant crop grown on the site and on adjacent farms.

**(2)(b)(vi) Description of biotic conditions (impact area).**

A Biological Resources Review of the Project site and a 1-mile radius was completed in 2023 and is included as Attachment 8 – Biological Resources Review. An initial site visit was completed on April 17 and 18, 2023, with the objective of identifying biological resources on/near the Project site. Field reconnaissance was conducted via windshield and pedestrian surveys within the project limits, and assessing raptor habitat within a 1-mile radius using binocular/spotting scopes.

The biological resources assessment was completed using a combination of existing information obtained from publicly available sources, including reports, published literature, online databases, GIS data, and site reconnaissance. Biological resource protection measures to be adopted by Adapture, including Colorado Parks and Wildlife(CPW) Solar Energy Best Management Practices (BMPs) are included in Table 2-1 and in Attachment 8.

**(2)(b)(vi)A Map plant communities.**

Included in the Biological Resources Review is a vegetation map (Figure 6 in Attachment 8 – Biological Resources Review) that was based on the National Land Cover Dataset (NLCD). Map 2-10, a site plant communities map, is based on the Landfire Expected Vegetation Type (EVT) dataset.

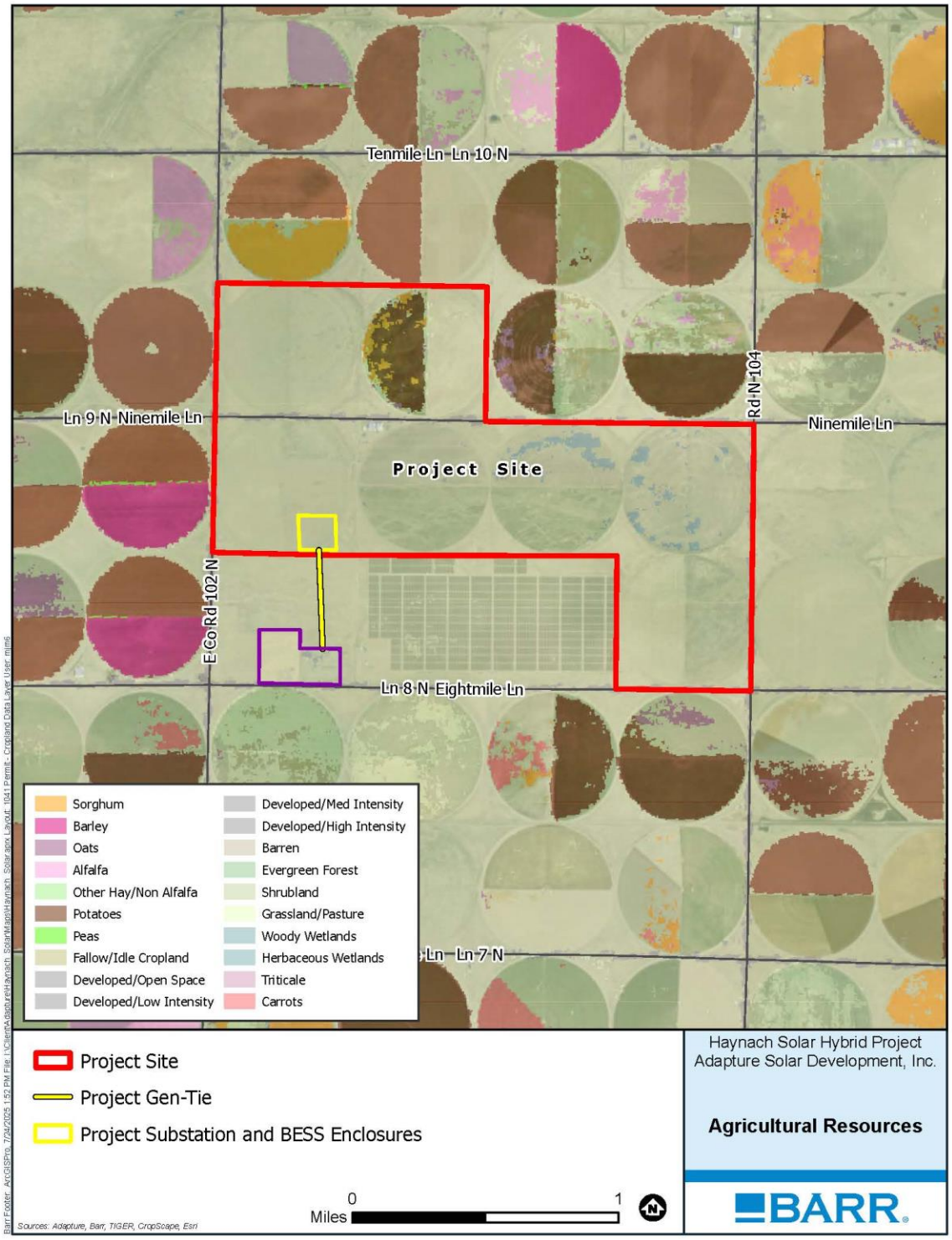
**(2)(b)(vi)A1 Characteristics, quantity, productivity of plant types.**

The field survey documented plant community types within the study area. Vegetation on the property was dominated by both native and invasive species commonly observed in the arid West. Community types on the property are as follows:

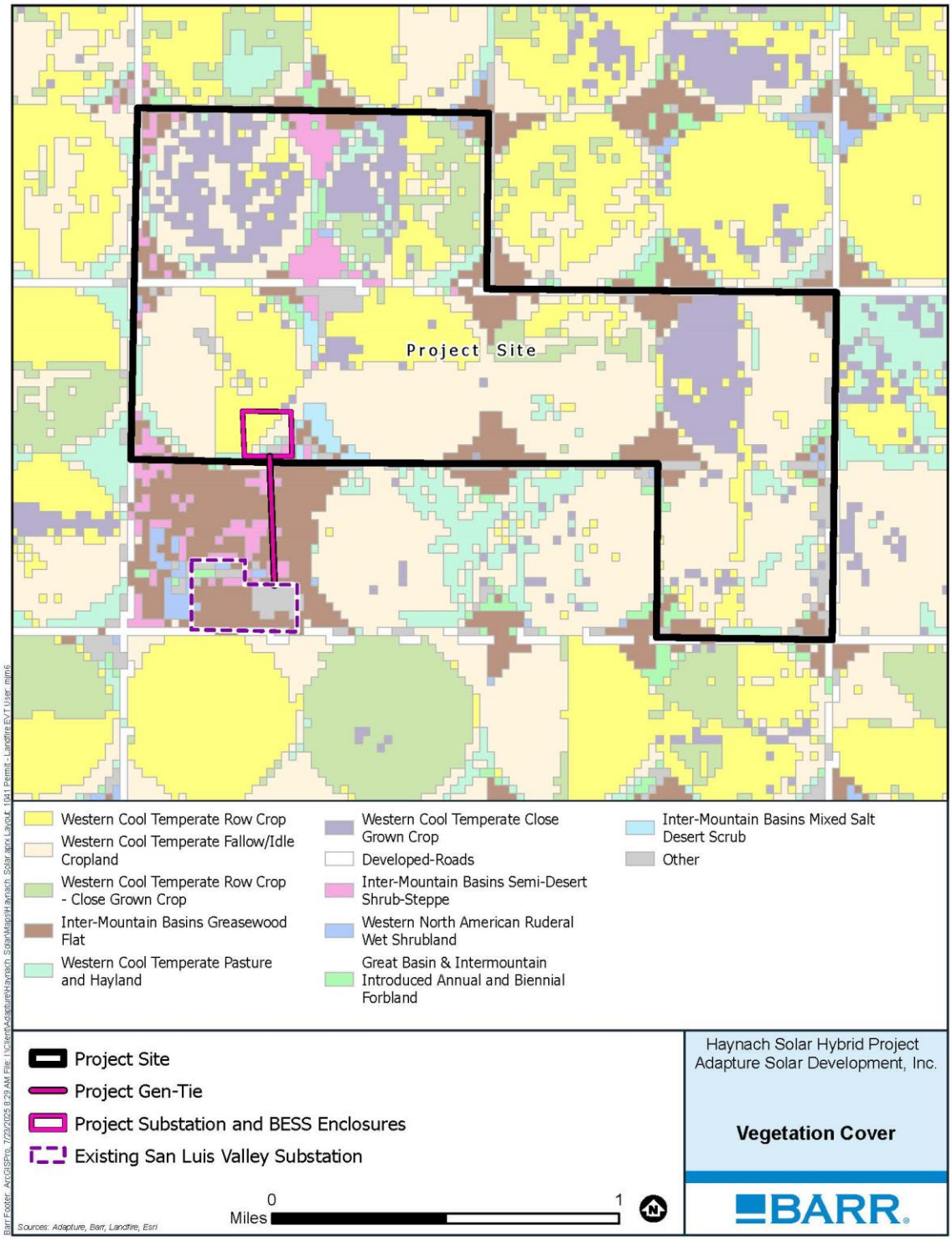
- 66% (736 acres) - fallow agriculture dominated by Russian thistle, kochia (*Bassia scoparia*), and bare ground areas.
- 21% (235 acres) -disturbed rangeland dominated by big sagebrush (*Artemisia tridentata*), Russian thistle (*Salsola tragus*), and bare ground areas
- 11% (126 acres) - active agriculture dominated by common wheat (*Triticum aestivum*).

Based on the NLCD, the study area consists mostly of cultivated crop lands with small portions of shrub/scrub and hay/pasture land cover types (refer to Figure 6 in Attachment 8 – Biological Resources Review). The site visit determined that NLCD land cover type locations were generally accurate compared to field observations.

The Colorado Department of Agriculture (CDA) listed noxious weed species and other invasive plant species that were observed on-site, including Kochia (*Bassia scoparia*) and Russian Thistle (*Salsola tragus*). Both species are considered nuisance species with eradication requirements. Noxious weeds were found primarily within the disturbed rangeland and fallow agriculture communities, accounting for approximately 52% (579 acres) of vegetation surface cover.




**Map 2-9. Agricultural Resources**




**Map 2-10. Plant Communities**

**(2)(b)(vi)A2 Endangered or threatened plant species.**

The Biological Resources Review, completed in 2023 is provided in Attachment 8 – Biological Resources Review. Based on the U.S. Fish and Wildlife Service (USFWS), Information for Planning and Consultation (IPaC), and the Colorado Parks and Wildlife (CPW), Colorado's Conservation Data Explorer (CODEX), and Species Activity Mapping (SAM), there are no endangered and threatened plant species with the potential to occur on the site. An updated the IPaC and CODEX report was obtained in July 2025. There are two state-sensitive plants with the potential to occur in the San Luis Valley, but neither is endangered or threatened. *Cleome multicaulis* is restricted to saline or alkaline soils, around alkali sinks, ponds, alkaline meadows, or old lake beds, which are not present on the Project site. *Delphinium robustum* grows in broad canyon bottoms, along edges of meadows, or in open woods, which are also not present at or near the Project site.

**(2)(b)(vi)A3 Evidence of past disturbance and current indications of stages in ecological succession.**

Agriculture, rural development, electrical infrastructure, and an existing commercially operational solar generation facility have extensively disturbed the study.

**(2)(b)(vi)B Wildlife (Terrestrial)**

**(2)(b)(vi)B1 Determine species present, seasonal occurrence, status and relative importance.**

The Biological Resources Review in Attachment 8 listed and assessed terrestrial wildlife with potential to occur in the Project area according to the USFWS IPaC (Section 4.3), CODEX, and CPW SAM species (Section 4.4) occurrence lists. Other terrestrial wildlife assessed included migratory birds (Section 4.5), raptors (Section 4.6), and bald and golden eagles (Section 4.7).

Direct observation of wildlife utilization or signs of wildlife (sightings, burrows, tracks, scat, etc.) included horned larks (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), red-tailed hawk (*Buteo jamaicensis*), ground squirrel burrows (*Urocitellus* sp. or *Ictidomys* sp.), and coyote (*Canis latrans*) scat.

**(2)(b)(vi)B2 Map distribution of species.**

There are no species of concern, general wildlife of interest, or populations worth mapping. The CPW SAM, which maps species occurrence data, only identifies the Project site within the "range" (breeding, winter, or summer) of various species. There is no occurrence data or mapping specific to the Project site.

**(2)(b)(vi)B3 Map biological features (migration routes, breeding grounds, etc.).**

There are no unique or high-value biological habitat features in the Project impact assessment areas for wildlife. The Biological Resources Review in Attachment 8 includes various maps, but none that show important migration routes or breeding grounds.

**(2)(b)(vi)B4 Identify species included on official federal or state list of endangered or threatened species.**

Refer to Sections 4.3 and 4.4 in the Biological Resources Review in Attachment 8 for lists of USFWS IPaC, CODEX, and CPW SAM-listed endangered species with the potential to occur in the Project vicinity. The IPaC and CODEX reviews were updated in July 2025 and are included in Attachment 8. There were the same number of federally listed species with potential to occur on or near the site, five, though the threatened Mexican spotted owl is no longer listed as having potential, and the proposed endangered Suckley's cuckoo bumble bee has been added. The Suckley's cuckoo bumble bee is considered by the USFWS to be extirpated in Colorado.

Based on the updated search, the state species of concern, Greater Sandhill Crane (*Antigone canadensis tabida*), is known to occur within 1 mile of the Project site. While sandhill cranes are known to periodically utilize croplands and grasslands as terrestrial habitats for foraging, most concentrations in the San Luis Valley are more commonly in closer proximity to aquatic habitats. The Burrowing owl (*Athene cunicularia*), a state-threatened species, was also added to the occurrence list in the updated search. Burrowing owls are most commonly associated with prairie-dog towns that have not been documented on the Project site.

**(2)(b)(vi)B5 Identify species that are unique in their Colorado distribution.**

According to the CODEX, the Greater Sandhill Crane has been documented within 1 mile of the Project site and is a species considered uniquely concentrated within the San Luis Valley, Colorado, on a seasonal basis. Based on the impact area, this crane sighting was likely one or more cranes in an agricultural field.

According to the Alamosa Visitor Guide, the end of February marks the start of the Greater Sandhill Crane migration into the San Luis Valley. By mid-April, an estimated 20,000 cranes have come and gone from the valley. While concentrated at the Alamosa, Monte Vista, and Baca National Wildlife Refuges due to the expansive wetland habitats present, the cranes can be found anywhere, including pastures, crop circles, and along roadsides.

**(2)(b)(vi)C Wildlife (Aquatic)**

No aquatic resources are present in the Project impact assessment areas. Attachment 9 provides the Wetlands Resources Delineation Report and a copy of the jurisdictional determination request submitted to the U.S. Army Corps of Engineers, Albuquerque District.

**(2)(b)(vi)C1 Identify species present.**

None, not applicable (N/A).

**(2)(b)(vi)C2 Map streams, lakes and reservoirs which provide or have potential for habitat.**

N/A, none present within the impact assessment areas.

**(2)(b)(vi)C3 Map biological features (spawning runs, spawning beds, etc.)**

N/A, none present within the impact assessment areas.

**(2)(b)(vi)C4 Identify any endangered species (federal or state) or any which are unique in their Colorado distribution.**

Refer to Sections 4.3 and 4.4 in the Biological Resources Review in Attachment 8 for lists of USFWS IPaC, CODEX, and CPW SAM-listed endangered species with the potential to occur in the Project vicinity. No federal or state-listed species are expected to be present, or if incidentally present, impacted by the project.

**(2)(c) At the time of final application, applicants seeking a permit for the site selection and construction of pipelines or storage areas shall submit, in addition to those requirements set forth in subsection (a) and (b) of this Section, five (5) copies of the following documents and information:**

**(2)(c)(v) Description of hydrologic conditions – surface (impact area).**

There are no surface water resources present on the Project site (refer to Attachment 9). The project site is located on FEMA FIRM Panel 0800090005A, dated January 19, 1978. That panel is not printed, and there is no digital data available. Waiver granted, refer to Attachment 1.

**(2)(c)(v)A Provide map of all surface water.**

There are no surface water resources present on the Project site (refer to Attachment 9). Waiver granted, refer to Attachment 1.

**(2)(c)(v)B Describe expected monthly stream flows for typical year, wet year, dry year (include 7 day -10 year low flows where sufficient data exists).**

Waiver granted, refer to Attachment 1.

**(2)(c)(v)C Describe physical stream features (gradient, velocity, depth, etc.).**

Waiver granted, refer to Attachment 1.

**(2)(c)(v)D Provide data on chemical and biological quality, including BOD, dissolved O2, free CO2, PH, TDS, ph-th alkalinity, MO alkalinity, NH4, heavy metals and other toxic or deleterious substances.**

**(2)(c)(vi) Description of hydrologic conditions - subsurface (impact area).**

Waiver granted, refer to Attachment 1.

**(2)(c)(vi)A Map all aquifers that may be affected by project.**

Waiver granted, refer to Attachment 1.

**(2)(c)(vi)B Provide tables, graphs, map showing permeability, transmissibility, thickness, volume, depth of aquifers.**

Waiver granted, refer to Attachment 1.

**(2)(c)(vi)C Describe geology of strata overlying aquifers including percolation rates, travel time to groundwater surface.**

Waiver granted, refer to Attachment 1.

**(2)(c)(vi)D Map of all wells using aquifers including diameter and flow rates.**

Waiver granted, refer to Attachment 1.

**(2)(d) At the time of final application, applicants seeking a permit for the site selection and construction of a power plant shall submit, in addition to those requirements set forth in subsections (a), (b) and(c) of this Section, five (5) copies of the following documents and information:**

**(2)(d)(v) Map locating and describing resource areas to be utilized as sources of energy.**

Waiver granted, refer to Attachment 1.

**(2)(d)(vi) Description of water system proposed:**

**(2)(d)(vi)A Source of supply, volume, and rate of flow at full development.**

Water would be sourced from water wells on Parcel No. 5009163000040 and piped to the O&M Facility. Potable water use in the O&M Facility is expected to be less than 100 gallons per day (gpd). The county building code would dictate how much the septic system would need to be designed for by the number of personnel using the building and the number of sanitary fixtures required. But the anticipated gpd is a very low number. During construction, up to 20,000 gpd may be necessary for dust suppression. The existing water wells to be used each produce up to 1,000 gallons per minute (gpm), or 1,440,000 gpd. Adpature will need to apply for a change in use State of Colorado State Engineer to convert those water wells to commercial wells. Based on the gpd specified, there is more than adequate volume to support both phases of the Project.

**(2)(d)(vi)B Water rights owned or utilized.**

A water rights review was completed and is included in Attachment 10. Lee A. Welch owns water rights and permits associated with the NE1/4 of Section 22, Township 40N R9E under DWR Permit Numbers 29660-F (WDID 2014189) and 10334-F (WDID 2009110) within Parcel Number Parcel No. 500922100171. He also owns water rights and permits associated with the SW1/4 and SE1/4 under Permit Numbers 17513-F (WDID 2009113) and 17514-F-R (WDID 2009114), respectively, within Parcel No. 5009163000040.

**(2)(d)(vi)C Proposed points of diversion and changes of points of diversion.**

There are no points of diversion proposed from any area streams or reservoirs. Water would be sourced from water wells on Parcel No. 5009163000040 and piped to the O&M Facility. This would be a change in the point of diversion from center pivot to O&M Building and would require a change in use application with the State Engineer (refer to Attachment 10, the Water Rights Summary).

**(2)(d)(vi)D Volume of stream flow to remain unused between points of diversion.**

Any excess water not needed for commercial or industrial use could be transferred or sold by the owner to other water users within the area or placed in the U.S. Department of Agriculture (USDA) Conservation Resource Program (CRP) for later use.

**(2)(d)(vi)E Dependability of supply (physical and legal).**

The dependability of the water rights supply is expected to be reliable based on the minimal use of water required for the Project relative to the available water supply from existing parcel wells. Project water needs are approximately 200-300 AF during the 16-month construction period for dust suppression and 10 AF annually during Project operations for O&M building water use and periodic panel washing. The water rights and permits described in Section (B) have permitted uses of approximately 246-480 AF annually per well, subject to the Rules Governing the Withdrawal of Groundwater in Water Division No. 3

(The Rio Grande Basin) and Establishing Criteria for the Beginning and End of the Irrigation Season in Water Division No. 3 for All Irrigation Water Rights (Rules) (refer to Attachment 10 – Water Rights Summary and associated supporting information).

**(2)(d)(vi)F Effects on downstream users.**

Area agricultural water users should benefit from the reduction in water used and placed into the CRP. Refer to (2)(d)(vi)D above.

**(2)(d)(vii) Description of air pollution control measures.**

The only planned air pollution control measures are associated with those required as part of the Project SWMP. Specifically, the Project will implement air pollution control measures to minimize dust, consistent with EPA's 2022 CGP for dry climates. These measures will be detailed in the Project SWMP and are required 14 days prior to construction.

**(2)(e) At the time of final application, all applicants shall submit an analysis of impacts as follows:**

Impact analyses for each of the resources considered in this section were completed by Adapture consultants and are referenced and attached to this application.

**(2)(e)(v) Summarize the major natural and socio-economic environmental constraints as they affect the site selection and construction of the facility as proposed.**

Socio-economic impacts and constraints are detailed in the Project Economic Impact Assessment provided in Attachment 4. Potential constraints are limited to a housing market shortage to support the temporary construction workforce.

No natural resource constraints have been identified for the selected site. The following sections of this application discuss various natural resources investigations.

**(2)(e)(vi) Describe present utilization of land, water, air, biotic, geologic and socio-economic resources within impact area as applicable to submission requirements.**

The Proposed project area is zoned as "R-Rural," which is defined by the Alamosa County Land Use and Development Code (Code) as a "district primarily intended to provide for the protection and continuation of agriculture and forestry operations and the preservation of environmentally sensitive lands. This district is established for the vast majority of the County. It allows for the uses, services, and industry that are compatible with agricultural practices and that do not cause adverse impacts to agricultural and/or ranching operations." A solar facility should not cause adverse impacts to agriculture and/or ranching operations in the area and should be considered compatible with agricultural practices and a temporary use.

Current land use on the Project parcels is agricultural use, with several center-pivot fields apparently fallow for several years and several other currently active. The Project area includes a mix of undeveloped land, existing agricultural operations, overhead transmission lines, existing photovoltaic solar energy uses, and the San Luis Valley substation. The Project site consists primarily of cultivated crop land with small portions of the site composed of a combination of inter-mountain basins greasewood flat, inter-mountain basins semi-desert shrub steppe, and developed areas with agricultural structures present. There are no wetlands or streams on the Project site. There are no unique or valuable geologic features or mineral resources associated with the site. Wildlife use of the site is typical of other

agricultural fields that are devoid of wetlands or water resources in the valley. These drier agricultural fields are less biologically diverse than sites with aquatic resources present. Overall, the site is unremarkable from a natural resource standpoint.

**(2)(e)(vii) Describe alternative uses for these resources.**

As evidenced along Lane 8 N, utility-scale solar development is an ideal alternative land use in this portion of the county and the San Luis Valley. Three other solar power plants are within 5 miles of the proposed Project site, which is strategically located immediately adjacent to the existing San Luis Valley Substation.

**(2)(e)(viii) Analyze the effects of the proposed site selection and construction upon the natural and socio-economic environment of the impact area as applicable to submission requirements.**

The following sections summarize the effects of the Project site selection and construction upon the natural and socio-economic environment. Resource-specific studies and assessments have been provided as attachments for more detailed analyses.

**(2)(e)(viii)A Provide analysis of hydrologic, atmospheric, geologic, pedologic, biotic, visual, and impacts.**

Alamosa County waived requirements for hydrologic, atmospheric, geologic, and pedologic studies. Refer to the waiver list in Attachment 1.

The Project Biological Resources Report is provided in Attachment 8. The report summarizes the absence of any federal or state-listed species of concern associated with the site. No raptor nests were identified within a 1-mile radius of the site during the 2023 baseline survey, nor were any nests detected during 2025 follow-up biological surveys. There is suitable habitat for migratory birds on the Project site, and pre-construction migratory bird nest surveys are recommended if disturbance activities are to occur during the nesting season (April 1 – August 31).

The Project Glare Analysis Memorandum and modeling results are provided in Attachment 6. Modeled impacts indicate there is minimal potential for glare to impact nearby receptors. Projected glare impacts are limited to drivers passing through the Project area on Lane 9 N. No glare impacts are modeled to affect nearby residences or pilots approaching nearby airports. A viewshed analysis using a digital elevation model was completed. The results of the viewshed analysis are displayed in Map 2-6. Viewshed Analysis. Based on terrain elevations near the Project site, the facility will be most visible from observation points (residences) within 1 mile of the site to the north. Views from the east and west will only see small portions of the facility. Virtually none of the Project site is visible from the ground at the Van Treese airstrip.

The Project Noise Analysis Report is provided in Attachment 7. Predicted construction equipment noise will slightly exceed the State of Colorado's standards near the Project boundary when construction occurs near the edges of the site. However, there are no sensitive receivers in these areas, so temporary construction noise should not constitute a nuisance. When construction moves toward the interior of the site, noise levels will meet the state's standards. Noise levels at the nearby residential receivers will meet the state's noise criteria during construction. Construction-related noise increases will not occur at night, and construction noise will be temporary. Worker commuter traffic and materials delivery vehicles will generate short-term increases in noise during construction. Predicted noise levels from the PCS units and substation/BESS facility are below the 55/50 dBA standards for the residential zone at all residential

receivers and below the 80/75 dBA standards for the adjacent agricultural and industrial lands. Corona noise (defined in the report) from the Gen-tie Line is expected to be minor.

**(2)(e)(viii)B Provide surface and subsurface drainage analysis.**

A Hydrology Study evaluating the hydrologic and hydraulic characteristics of the proposed Project site was completed. The purpose of the study was to understand the flood depths, flow velocities, and scour depths associated with the 100-year, 24-hour storm event under existing conditions. The existing topography is relatively flat, draining from west to east. The site is tributary to San Luis Creek, approximately 14 miles to the east. The elevation ranges from 2311 to 2318 feet. The Hydrology Study is included in Attachment 11 of this application.

The limits of anticipated 100-year inundation for depths greater than 0.25 feet within the Project vicinity are shown on Figure 8 in Attachment 11. The watershed experiences a minimal amount of inundation, as it is mostly agricultural land with no natural channels. One depression, near the southwest edge of the site, reaches a depth of almost 7 feet. Other areas within manmade channels can reach depths of 4 feet. Inundation depths outside of channelized areas and areas of depression typically do not exceed 1.5 feet within the project site. Expected flooding depth for a 100-year rainfall event was calculated for existing terrain conditions using the 2D modeling simulation option in HEC-RAS v. 6.2. Flooding depths and scour are limited throughout the Project site (generally less than 1.5 feet of inundation and less than 0.5 feet of scour). Flow velocities are generally less than 1.5 feet/second.

**(2)(e)(viii)C Provide socio-economic impact analysis.**

Socio-economic impacts are detailed in the Project Economic Impact Assessment provided in Attachment 4 Socio-economic impacts are detailed in Sections 8, 9, 11, and 12.

**(2)(e)(viii)D Provide transportation impact analysis.**

Attachment 5 provides the Project Transportation Impact Study and Level 2 Auxiliary Turn Lane Assessment. The study concluded that the anticipated traffic volume generated by Project development is not expected to significantly impact the surrounding roadway network. Short-term construction-related traffic will be the largest generator of traffic for the site. Travel time delay and LOS impacts from short-term, construction-related traffic and long-term, site-related traffic are projected to be minimal.

A right turn acceleration lane is warranted for the eastbound to southbound movement at CO 17 / LN 8 N. If CDOT requires the auxiliary lane, a temporary lane may be constructed. The sight distance evaluation indicates that each access has sufficient entering sight distance for a 65 mph roadway. There are no known safety issues in the existing study area, and the site-generated traffic is not expected to present any additional safety issues.

**(2)(e)(viii)E Provide analysis of impacts upon agricultural productivity and agricultural resources.**

According to the landowner, Mr. Welch, he has only been irrigating the parcels he owns in Section 16 (APN ended in 40) by using Central Pivot Irrigation. Out of the total 1,109 acres, Mr. Welch is currently farming only 160 acres and producing Sudan grass. He produces approximately 3 tons per acre, which is bailed for sale. The market value of his production is estimated at $20,000/annually. In addition, Mr. Welch also receives approximately $24,000/annually under a Conservation Reserve Program to *not* farm to preserve area soils from eroding. Based on the U.S. Department of Agriculture's 2022 agricultural census of Alamosa County, there are 141,342 acres in farmland in the county. The portion that Mr. Welch

has been farming (160 acres) is less than 1 percent (0.001 percent) of the county's farmland. If you include all of the Project site acres, the Project will still only reduce agricultural productivity, in terms of acres in production, by less than 1 percent (0.007). The Project would generate greater tax and induced revenues for the county (refer to Attachment 4) compared to the small tonnage of Sudan grass being taken out of production.

**(2)(e)(ix) Analyze the long-term effects of the proposed site selection and construction upon the physical and socio-economic development of the impact area.**

As described throughout this application and in the multiple attached special studies and assessments, the Project site selection will have minimal long-term adverse effects on physical developments in the impact area. There are no existing developments, such as businesses or public parks, in the impact area, but several residences and an existing industrial solar development are nearby. The impact area of the site selected appears to be compatible with the proposed Project, as the Project would be the fifth solar farm along Eightmile Lane.

The Economic Impact Assessment in Attachment 4 describes substantial socio-economic benefit, both in the short- and long-term within the socio-economic impact area (refer also to Section 2(e)(iv)C of this application).

**(2)(e)(x) Justify the proposed site selection and construction against the present and alternative uses of the resources in the impact area.**

As described in Section(2)(e)(iv)E, nearly 90 percent of the proposed site has been fallow, non-productive agricultural land for years. Mr. Welch has made a personal decision to sell the land due to the value of the land parcels in close proximity to the San Luis Valley Substation and to other solar energy facilities in the county. It is Mr. Welch's decision and choice to stop farming and to sell his land for a greater financial return than its current use.

**(2)(e)(xi) Describe a program to minimize and mitigate adverse impacts and to maximize the positive impacts of the proposed site selection and construction.**

**(2)(e)(xi)A Most of the special studies and resource assessments completed by Adapture for the Project include recommendations to eliminate or reduce social and environmental impacts. Analyze alternatives**

**(2)(e)(xi)A1 Alternative locations and routes**

Because the existing San Luis Valley Substation, jointly owned by PSCo and Tri-State, has available capacity to supplement the grid, and because the proposed Project is located immediately adjacent to the substation property, no alternative facility locations were considered by Adapture once the Project site was leased. There are basically two alternative access routes to the Project site, from the north and from the south, both existing routes into the San Luis Valley. Project-related traffic, from the construction and operation of the facility, will be proportional to where workers/employees reside and from the location where the Project equipment originates. There are no other access route alternatives to the site.

**(2)(e)(xi)A2 Alternative types of facilities**

According to the San Luis Valley Ecosystem Council, the valley has several attributes that make it an ideal location for solar energy development. These attributes include the following:

- High Altitude: As the highest mountain valley in the United States, the San Luis Valley benefits from clear skies and ample sunlight due to its elevation. This results in high levels of solar radiation, making it an excellent location for solar energy production.
- Abundant Solar Resources: The region receives a significant amount of sunlight throughout the year, with an abundance of sunny days. This makes it highly suitable for solar power generation technologies.
- Large Land Availability: The valley offers vast expanses of land, which is crucial for large-scale solar energy projects. This land availability allows for the development of utility-scale solar installations, including solar farms.
- Government Support and Incentives: There is a growing interest and push to develop the San Luis Valley for solar energy. Local governments, as well as state and federal agencies, may offer incentives, tax credits, and other support to encourage solar energy development in the region.
- Economic Opportunities: Solar energy development in the San Luis Valley can bring economic benefits to the local communities, including job creation, investment opportunities, and increased revenue through taxes and land leases.

Table 2-1 below summarizes the mitigation measures to be implemented by Adapture should the Project be approved by Alamosa County.

**(2)(e)(xi)B Analyze alternatives**

**(2)(e)(xi)B1 Alternative locations and routes**

Because the existing San Luis Valley Substation, jointly owned by PSCo and Tri-State, has available capacity to supplement the grid, and because the proposed Project is located immediately adjacent to the substation property, no alternative facility locations were considered by Adapture once the Project site was leased. There are basically two alternative access routes to the Project site, from the north and from the south, both existing routes into the San Luis Valley. Project-related traffic, from the construction and operation of the facility, will be proportional to where workers/employees reside and from the location where the Project equipment originates. There are no other access route alternatives to the site.

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- Economic Opportunities: Solar energy development in the San Luis Valley can bring economic benefits to the local communities, including job creation, investment opportunities, and increased revenue through taxes and land leases.

**Table 2-1 Haynach Solar Hybrid Project Mitigation Measures***

| Resource | Mitigation Measure | Purpose |
|---|---|---|
| Biological Resources | A pre-construction avian nest survey is recommended if disturbance activities are to occur during the nesting season (April 1 - August 31). | MBTA compliance. Impact minimization |
| | If disturbance activities are to occur during the nesting season (November 15 – October 31), a pre-construction raptor nest survey is recommended. | Impact minimization |
| | Security and wildlife-friendly (where possible) fencing | CPW solar development BMP (refer to Attachment 8), public health, and safety |
| | During construction and operations, limiting vehicle speeds to 25 mph on project roads. Minimize the amount of exposed or open trenches. Install wildlife escape ramps as necessary. | CPW solar development BMP |
| | Development of a Revegetation and Weed Management Plan. | CPW solar development BMP and county request |
| | Night sky facility lighting | CPW solar development BMP |
| | The Project gen-tie will be designed in accordance with *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 and Reducing Avian Collisions with Power Lines: The State of the Art in 2012.* | CPW solar development BMP |
| | Reclamation and Decommission Plans were prepared in coordination with CPW and county planning and resource agencies. | CPW solar development BMP |
| | Compliance with CPUC Rule 3668, including pre-construction wildlife surveys and consultation with CPW. | CPW solar development BMP |
| Water/Soil Resources | A SWMP will be prepared. | Soil stabilization, water quality protection |
| | A Hazardous Materials, Waste Management, and Emergency Response Plan has been prepared. | Water and soil protection, as well as public health and safety planning |
| Cultural Resources | Any unanticipated discovery of archaeological resources will be immediately communicated to the SHPO to direct treatment and further action (if any). | Cultural resource impact minimization. |
| Traffic | A right turn acceleration lane is warranted for the eastbound to southbound movement at CO 17 / Lane 8 N. If CDOT requires the auxiliary lane, a temporary lane may be constructed. | Public health and safety. |
| Visual | Night sky facility lighting. | Reduce nighttime visual impacts. |

* Additional mitigation measures may be added during the 1041 review process.

Alternative solar facility types include PV and concentrating and/or solar thermal projects. The proposed Project, a PV facility with added BESS, represents a more cost-effective and higher rate of investment return compared to other solar technologies. Additionally, PV facilities already exist in the valley, whereas at least two previously proposed solar thermal projects in Saguache County were either never permitted or built by the developer.

Alternative fuel facilities include coal-burning or natural gas combustion power plants. The San Luis Valley has low potential for coal, oil, and gas resource development, as evidenced by the absence of such energy facilities in the valley. Building a power plant utilizing these natural resources would require significant infrastructure development, such as rail lines and pipelines to bring coal, oil, or natural gas into the valley in sufficient volumes to generate 100 MW of power. Because of these constraints and associated costs, these alternative fuel facility types are not viable alternatives.

**(2)(e)(xi)B3 Use of existing rights-of-way**

The Project utilizes the existing county road transportation network and associated rights-of-way for Project site access. The gen-tie transmission easement is described in 4. below.

**(2)(e)(xi)B4 Joint use of rights-of-way with other utilities**

The Project design co-locates the proposed gen-tie interconnection facilities on the existing San Luis Valley Substation property. Additionally, no new roads are proposed to access the Project site; rather, the Project would utilize existing county road rights-of-way.

**(2)(e)(xi)B5 Upgrading of existing facilities**

N/A. The Project will interconnect to the existing San Luis Valley Substation. Precise facility upgrades are not known at this time.

**(2)(e)(xi)C Analyze non-structural alternatives as applicable.**

Non-structural alternatives include conservation of energy use and no new development. Neither alternative addresses the rapid expansion of energy consumption in Colorado. According to the U.S. Energy Information Administration, before 2030, Colorado's demand for electricity is expected to surge from 10 gigawatts to 14 gigawatts, with the potential to double to 20 gigawatts. For perspective, a continuous power supply of 1 gigawatt could potentially power around 700,000 homes (https://pknergypower.com/what-is-megawatt-and-how-many-homes-can-it-power/). Some estimates suggest a gigawatt could power 1,000,000 depending upon the consumption rate (https://teacherscollegesj.org/how-many-homes-can-a-gigawatt-power-for-a-year/). This amount of electricity cannot be produced in Alamosa County or in the state of Colorado by conservation alone. Further, because of the projected increase in electric energy demand, no new development is not a sustainable alternative to meet anticipated demand.

**(2)(e)(xi)C1 Conservation of energy use**

Energy conservation is not a viable alternative to new energy development in Colorado. The state is committed to transitioning to 100% clean electricity generation by 2040 and rapidly expanding vehicle electrification. This transition is part of Colorado's broader strategy to reduce greenhouse gas emissions and protect the health of communities and the natural environment (refer to Section (2)(a)(iii)A. The state's roadmap and legislative actions are designed to ensure a clean energy future, which includes reducing GHG emissions and increasing investment in renewable energy sources.

**(2)(e)(xi)C2 No development**

No development would not meet the Project's purpose and need, nor would it necessarily conform to local, state, and federal programs and policies to expand renewable energy development outlined in Section 2(a)(iii)A.

**(2)(e)(xii) Analyze management alternatives (i.e. development scheduling, training programs, facility design, land trades, etc.).**

The location of the Project is dependent on the ability of the existing transmission infrastructure to accept additional generation into the grid at the San Luis Valley Substation. Consequently, there are no management alternative locations to the proposed Project location. The San Luis Valley Substation is co-owned by PSCo and Tri-State and has been identified by both utilities as having available capacity to allow the Project to connect into the grid with minimal upgrade cost. The proposed Project site is located a short distance from the San Luis Valley Substation, and the proposed interconnection route to connect our project to the substation extends across tilled agricultural land with no nearby homes or related development. Short transmission lines and interconnection at a substation with minimum upgrade cost help the Project reduce construction costs and minimize generation costs for the electricity to be produced for the grid.

The Project is located adjacent to an existing solar project (50 MW Hooper Solar). Though the Project is an independent facility, its proximity to the existing project will make it appear to be an expansion of a similar use and will, therefore, minimize the visual impact on surrounding areas. The existing project has also helped neighbors adapt to a new type of land use in the area, reducing the potential of the proposed Project creating new concerns about land use changes.

The Project is located on tilled agricultural land with minimal presence of natural habitat. Natural resource surveys completed by the project and reviewed by state and federal agencies have confirmed avoidance of impacts to sensitive natural resources. As a result, the Project supports Alamosa County's goals for sustainable development.

The Project is located on flat terrain and requires minimal site grading or improvements prior to site construction. The open terrain allows for optimized panel layout and minimizes unused space within the project area. Minimal site preparation and unused space help maintain lower project costs and generation pricing.

**(2)(e)(xiii) Analyze air and water pollution control alternatives.**

The only planned air and water pollution control measures are associated with those required as part of the Project SWMP. Specifically, the Project will implement soil erosion control measures consistent with those in the CGP and air pollution control measures consistent with EPA’s 2022 CGP for dry climates. These measures, including erosion control BMPs (i.e., silt fencing, vegetation retention, wind fencing, sediment traps, seeding, etc.), will be detailed in the Project SWMP and are required 14 days prior to construction. No alternative measures to those to be approved by CDPHE are considered.

**(2)(e)(xiii)A Analyze design alternatives (access, landscaping, architectural controls, etc.).**

The Project is using a combination of single-axis tracking photovoltaic solar panels and battery energy storage technology to meet interconnection suitability needs. The combination of solar panels coupled with battery energy storage allows the facility to generate electricity throughout the day and store excess energy in the battery system. During periods of lower solar generation, the battery system can discharge

energy into the system, providing a stable and reliable power supply across a wider period of time. Using solar panels to generate electricity provides a long-term energy source with no greenhouse gas emissions and provides a long-term stable tax income for the county.

**(2)(e)(xiii)B Submit a program to meet "front end" costs of providing necessary services and facilities.**

Based on communications with the Alamosa Planning Department (Richard Hubler), the “front end” costs in this section refer to upfront costs to mitigate Project impacts. Provided in Section (2)(e)(vii) is a tabular listing of mitigation measures and the rationale for providing such services and design features to the facility.

# Attachment 1 – Waiver Request

## Permitting Process and Requirements the a Solar PV Project

HB1041 Regulations Chapter 6: Regulations for Site Selection and Construction of Major Facilities of a Public Utility

### SUBMISSION REQUIREMENT WAIVER CHECKLIST FOR SOLAR PV GENERATING FACILITIES.

| Note to Applicant | For your Solar PV Generating Facility, the submission requirements marked as YES in Column A will be waived by the Board of County Commissioners on a consent agenda at a regular meeting. Your attendance at this meeting is not required. | | | |
|---|---|---|---|---|
| | If you wish to request that other submission requirements be waived, note those requirements in Column B. The Board of County Commissioners will rule on your request at a regular meeting and your attendance is required. | A | B | C |

| Code Citation | | | | | Submission Requirement | WAIVER TO BE APPROVED (by County) | Waiver Requested (by Applicant) | Waiver Granted (by County) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| (1) | | | | | STEP 1: Preliminary Application | | | | |
| | (a) | | | | Application Form | | | | |
| | | (i) | | | A completed application form | | | | |
| | | (ii) | | | Description of proposed facility and site | | | | |
| | | (iii) | | | Description of present use and zoning | | | | |
| | | | A | | Location Map showing proposed site and clearly indicating the relationship of the site to the surrounding area within 50 miles from site | | | | |
| | | | B | | Type of facility: - specify where applicable | | | | |
| | | | | 1 | approximate floor space of office building | | | | |
| | | | | 2 | voltage and length of transmission line | | | | |
| | | | | 3 | power source and generating capacity | | | | |
| | | | | 4 | function and size of substation | | | | |
| | | | | 5 | diameter and length of pipeline | YES | | | |
| | | | | 6 | capacity of storage tanks, and type of petroleum derivative to be storyed | YES | | | |
| | | | | 7 | service area | | | | |
| | | | | 8 | resource area (e.g. source of power being generated or transmitted, source of petroleum derivative being transported) | YES | | | |
| | | | C | | Proposed Development Schedule | | | | |
| | | | | 1 | Estimate max number of employees, number of shifts and employees per shift during the following phases: construction, operation and maintenance | | | | |
| | | | | 2 | Specify any future phases or extensions of the facility and relationship of the factility to larger programs and plans. | | | | |
| | | | | 3 | Specify timetable for planning (e.g. federal permits, state permits, local zoning, etc.) | | | | |
| | | | | 4 | Estimate beginning and completion of construction and beginning of operation of facility. | | | | |
| | | | | 5 | Describe support facilities (eg pollution control, parking areas, landscaping, etc.) to be provided | | | | |
| | | | | 6 | Describe any feasible "non-structural" alternatives to meet the objectives of the proposed site selection and construction | | | | |
| | | | D | | Hazards and emergency procedures | | | | |
| | | | | 1 | describe hazards, if any, of fire, explosion and other dangers to the health, safety and welfare of employees and the general public | | | | |
| | | | | 2 | describe hazards, if any, of environmental damage and contamination due to materials used at or activities taking place at the proposed facility. | | | | |
| | | | | 3 | Describe emergency procedures to be used in the event of fire, explosion or other event which may endanger the public health, safety and welfare | | | | |
| | | | | 4 | Describe any prevalent natural hazards that will affect or be affected by development, and describe mitigating measures to be taken to reduce danger due to such natural hazards | | | | |
| (2) | | | | | STEP 2: Final Application | | | | |
| | (a) | | | | At the time of making final application, all applicants shall submit 5 copies of the following documents and information: | | | | |
| | | (i) | | | Delineation of Base Area (that area likely to be subject to land use changes as a result of the project) | | | | |
| | | | A | | Map of Base Area; describe how the determination was made. | | | | |
| | | | B | | Map of Special Districts (schools, fire, water sanitation, etc.) affected by the proposal. | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | (ii) | | | Delineation of impact area (that areas whose physical and socio-economic environment is likely to be impacted, beneficially and adversely, by the site selection and construction of the proposed facility) | | | | |
| | | (iii) | | | Objectives of the proposed site selection and facility | | | | |
| | | | A | | Describe the relationship of project to local land use policies and comprehensive plans and to policies and plans adopted or under preparation by federal, state and other affected local government agencies. | | | | |
| | | | B | | Describe the relationship of the project to other existing and planned utility facilities of similar nature, other communication or energy generation and transmission facilities, local government capital improvement programs, and special district expansion programs. | | | | |
| | | (iv) | | | Description of need for project | | | | |
| | | | A | | briefly describe why the public convenience and necessity require the facility of the size and nature proposed be constructed on the site proposed. | | | | |
| | | | B | | sources of demographic and economic data and method of anlysis | | | | |
| | | | C | | market function (ie. What user needs and patterns will project fulfill.) | | | | |
| | | (v) | | | Description of support facilities needed | | | | |
| | | | A | | Type of water quality control | | | | |
| | | | | 1 | Describe proposed sewage treatment facilities and nonpoint source controls. | | | | |
| | | | | 2 | describe pollutant loads (point and non-point sources) expected directly from development. Specify seasonal variations. | | | | |
| | | | B | | Public services and facilities | | | | |
| | | | | 1 | Estimate police and fire protection requirements | | | | |
| | | | | 2 | Estimate public road maintenance requirements | | | | |
| | | | | 3 | Estimate educational and health services requirements | | | | |
| | | | | 4 | Estimate facilities and service required to provide adequate water supply and sewage treatment | | | | |
| | | (vi) | | | Description of employment and economic opportunities | | | | |
| | | | A | | Describe Capital Investment in facility | | | | |
| | | | B | | Estimate anticipated revenues to local, state and federal governments, special districts | | | | |
| | | | C | | Describe employment opportunities | | | | |
| | | | | 1 | Types of jobs and number of positions, wage, salary schedule | | | | |
| | | | | 2 | Opportunities for employment of local citizens | | | | |
| | | | | 3 | Employment opportunities for low income and minority populations | | | | |
| | | (vii) | | | Description of visual conditions (base area) | | | | |
| | | | A | | Map area within view of project | | | | |
| | | | B | | Map access and travel routes, public areas, residential areas that will have a view of the project | | | | |
| | | (viii) | | | Description of noise conditions(base area) | | | | |
| | | | A | | Desribe and map possible expected noise levels by immediate and future facility operations | YES | | | |
| | | (ix) | | | Description of socio-economic environment (impact area) | | | | |
| | | | A | | Characteristics of the existing population | | | | |
| | | | | 1 | Age, income level and distribution, education, social background, family size, etc | | | | |
| | | | | 2 | Neighborhood and distinct socio-economic groups | | | | |
| | | | | 3 | Migrational trends and seasonal fluctuations | | | | |
| | | | | 4 | Anticipated population changes | | | | |
| | | | B | | Current employment | | | | |
| | | | | 1 | Principal employers, type, number of employees | | | | |
| | | | | 2 | Unemployment and under employment | | | | |
| | | | | 3 | Characteristics of local labor pool | | | | |
| | | | | 4 | Manpower training and retraining potential | | | | |
| | | | C | | Inventory local governments and special districts providing services in base area | | | | |
| | | | | 1 | Map jurisdiction and type of service | | | | |
| | | | | 2 | Capacity and utilization of services | | | | |
| | | | | 3 | Operating revenue and expenditures | | | | |
| | | | | 4 | Tax Base | | | | |
| | | | | 5 | Current level of taxation | | | | |
| | | | | 6 | Estimate revenue generating capacity and identify potential new sources of revenue | | | | |
| | | | D | | Housing | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | Current housing inventory | | | | |
| | | | | 2 | Projected housing requirements | | | | |
| | | | E | | Existing Transportation Network | | | | |
| | | | | 1 | Access to site | | | | |
| | | | | 2 | Circulation within base area and commuting patterns in impact area | | | | |
| | | | | 3 | Capacities of arterial streets within impact area | | | | |
| | | | | 4 | Maintenance provisions and costs | | | | |
| | | | F | | Description of historical and archaeological resources | | | | |
| | | | | 1 | Describe historical and archeological sites by means of completing state inventory forms and sumbit these to the State Historical Society for Evaluation | | | | |
| | | | | 2 | Describe resources individually and as the relate to the community, include photos wherever possible | | | | |
| | | (x) | | | Description of atmospheric conditions (impact area) | YES | | | |
| | | | A | | Meteorology (based on worst-case winter conditions) | YES | | | |
| | | | | 1 | Wind speed and direction | YES | | | |
| | | | | 2 | Inversion height | YES | | | |
| | | | | 3 | Atmospheric stability | YES | | | |
| | | | B | | Topography | YES | | | |
| | | | | 1 | Desribe general and outstanding topographic feature in project area (maps and aerials) | YES | | | |
| | | | C | | Background ambient air quality (TSP, SO2, HC, CO, Nox, O3, etc.) | YES | | | |
| | (b) | | | | At the time of final application, applicants seeking a permit for the site selection and construction of transmission lines or substations shall submit, in addition to those requirements set forth in Subsection (a) of this Section, 5 copies of the following documents and information: | | | | |
| | | (i) | | | Description of geologic and pedologic conditions of base area | | | | |
| | | | A | | Map of Bedrock and surficial geology | YES | | | |
| | | | B | | Map and describe areas of: | | | | |
| | | | | 1 | Avalanches | YES | | | |
| | | | | 2 | Mud flows and debris fans | YES | | | |
| | | | | 3 | All types of unstable or potentially unstable slope | YES | | | |
| | | | | 4 | Special seismic considerations | YES | | | |
| | | | | 5 | Areas of high radioactivity | YES | | | |
| | | | | 6 | Ground subsidence | YES | | | |
| | | | | 7 | Expansive soil and rock | YES | | | |
| | | | | 8 | Other geologic conditions which are pertinent | YES | | | |
| | | | C | | Map extent of 100-year flood plain if present | | | | |
| | | | D | | Map topography in adequate detail to determine adequacy of design | | | | |
| | | | E | | Map and evaluate mineral and energy resources | | | | |
| | | | F | | Map and evaluate agricultural resources | | | | |
| | | (ii) | | | Description of biotic conditions (impact area) | | | | |
| | | | A | | Map plant communities | | | | |
| | | | | 1 | Characteristics, quantity, productivity of plant types | | | | |
| | | | | 2 | Endangered or threatened plant species | | | | |
| | | | | 3 | Evidence of past disturbances and current indications of stages in ecological succession | | | | |
| | | | B | | Wildlife (terrestial) | | | | |
| | | | | 1 | Determine species present, seasonal occurrence, status and relative importance | | | | |
| | | | | 2 | Map distribution of species | | | | |
| | | | | 3 | Map biological features (migration routes, breeding grounds, etc.) | | | | |
| | | | | 4 | Identify species included on official federal or state list of endangered or threatened species | | | | |
| | | | | 5 | Identify species that are unique in their Colorado distribution | | | | |
| | | | C | | Wildlife (acquatic) | | | | |
| | | | | 1 | Identify species present | | | | |
| | | | | 2 | Map streams, lakes and reservoirs which provide or have potential for habitat | | | | |
| | | | | 3 | Map biological features (spawning runs, spawning beds, etc.) | | | | |
| | | | | 4 | Identify any endangered species (federal or state) or any which are unique in their Colorado distribution. | | | | |
| | c | | | | At the time of final application, applicants seeking a permit for pipelines or storage areas shall submit, in addition to those requirements set forth in subsection (a) and (b) of this Section, 5 copies of the following documents and information: | YES | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | (i) | | | Description of hydrologic conditions - surface (impact area) | YES | | | |
| | | | A | | Provide map of all surface water | YES | | | |
| | | | B | | Describe expected monthly streamflows for typical year, wet year, dry year (include 7 day-10 year low flows where sufficient data exists) | YES | | | |
| | | | C | | Describe physical stream features (gradiant, velocity, depth, etc.) | YES | | | |
| | | | D | | Provide data on chemical and biological quality, including BOD, dissoved O2, free CO2, PH, TDS, ph-th alkalinity, MO alkalinity, NH4, heavy metals and other toxic or deleterious substances. | YES | | | |
| | | (ii) | | | Description of hydrologic conditions - subsurface (impact area) | YES | | | |
| | | | A | | Map all aquifers that may be affected by project | YES | | | |
| | | | B | | Provide tables, graphs, map showing permeability, transmissibility, thickness, volume, depth of aquifers. | YES | | | |
| | | | C | | Describe geology of strata overlying aquifers including percolation rates, travel time to groundwater surface. | YES | | | |
| | | | D | | Map of all wells using aquifers including diameter, flow rates. | YES | | | |
| | (d) | | | | At the time of final application, applicants seeking a permit for the site selection and construction of a power plant shall submit, in addition to those requirements set forth in subsections (a), (b), and c of this Section, 5 copies of the following documents and information: | | | | |
| | | (i) | | | map locating and describing resource areas to be utilized as sources of energy | YES | | | |
| | | (ii) | | | description of water system proposed: | | | | |
| | | | A | | Source of supply, volume and rate of flow at full development | | | | |
| | | | B | | Water rights owned or utilized | | | | |
| | | | C | | Proposed points of diversion and changes of points of diversion | | | | |
| | | | D | | Volume of stream flow to remain unused between points of diversion | | | | |
| | | | E | | Dependability of supply (physical and legal) | | | | |
| | | | F | | Effects on downstream users | | | | |
| | | (iii) | | | Description of air pollution control measures | | | | |
| | (e) | | | | At the time of final application, all applicants shall submit an analysis of impacts as follows: | | | | |
| | | (i) | | | Summarize the major natural and socio-economic environmental constraints as they affect the site selection and construction of the facility as proposed. | | | | |
| | | (ii) | | | Describe present utilization of land, water, air, biotic, geologic and socio-economic resources within impact area as applicable to submission requirements. | | | | |
| | | (iii) | | | describe alternative uses for these resources | | | | |
| | | (iv) | | | Analyze effects of proposed site selection and construction upon the natural and socio-economic environment of the impact area as applicable to submission requirements. | | | | |
| | | | A | | Provided analysis of hydrologic, atmospheric, geologic, pedologic, biotic, visual and noise impacts | | | | |
| | | | B | | Provide surface and subsurface drainage analyis | | | | |
| | | | C | | Provide socio-economic impact analysis | | | | |
| | | | D | | Provide transportation impact anlysis | | | | |
| | | | E | | Provide analysis of impacts upon agricultureal productivity and ag resources | | | | |
| | | (v) | | | Analyze long-term effects of the proposed site selection and construction upon the physical and socio-economic development of the impact area | | | | |
| | | (vi) | | | Justify the proposed site selection and construction against the present and alternative uses of the resources in the impact area | | | | |
| | | (vii) | | | Describe a program to minimize and mitigate adverse impacts and to maximize the positive impacts of the proposed site selection and construction. | | | | |
| | | | A | | Analyze alternatives | | | | |
| | | | | 1 | Alternative locations and routes | | | | |
| | | | | 2 | Alternative types of facilities | | | | |
| | | | | 3 | Use of existing rights-of-way | | | | |
| | | | | 4 | Joint use of rights of way with other utilities | | | | |
| | | | | 5 | Upgrading of existing facilities | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | B | | Analyze non-structural alternatives as applicable | | | | |
| | | | | 1 | Conservation of energy use | | | | |
| | | | | 2 | No development | | | | |
| | | | C | | Analyze management alternatives (ie development scheduling, training programs, facility design, land trades, etc.) | | | | |
| | | | D | | Analyze air and water pollution control alternatives | | | | |
| | | | E | | Analyze design alternatives (access, landscaping, architectural controls) | | | | |
| | | | F | | Submit a program to meet "front end" costs of providing necessary services and facilities | | | | |
| | | | | | | | | | |
| | | | | | Other Requirements or Permits prior to Construction | | | | |
| | | | | 1 | National Pollutant Disharge Elimination System (NPDES) Permit for storm water management from the CO. Dept. of Health and Environment | | | | |
| | | | | 2 | Alamosa County Culvert and Access Permit | | | | |
| | | | | 3 | Alamosa County Building Permit | | | | |
| | | | | 4 | Alamosa County ROW License for Transmission Lines | | | | |

# Attachment 2 – Preliminary Application Comment Response

**Haynach Solar Hybrid Project Preliminary Application Comment-Response Matrix**

| Code Reference | Comment | Response |
|---|---|---|
| Non-specific to code | Consistent spelling of the Project name | Corrected in Final Application to “Haynach” |
| 1(a)(ii) | Section 2.1.1.1 – What is meant by “A light-colored ground cover or palliative may be used to increase electricity production?” | A light-colored ground cover or palliative was referenced as a potential design element to illustrate one of several methods that can support increased electricity production in certain photovoltaic systems, such as those utilizing bifacial modules. This could include materials such as white-tinted palliative (dust suppressant), white gravel, or other reflective treatments placed beneath the modules to increase albedo (a measure of how well a surface reflects solar energy). However, its inclusion is not a confirmed aspect of the project design at this time and would depend on a range of factors, including final technology selection and site-specific considerations. |
| 1(a)(ii) | Section 2.1.1.1 – Add specifics on fencing type for perimeter, substation, and BESS. | The Project will follow CPW's fencing recommendations in their solar energy BMP recommendations and “Fencing with Wildlife in Mind.” Refer to Recommendation 9, Security Fencing and Lighting, in the attached CPW solar siting BMPs. |
| 1(a)(ii) | Section 2.1.1.1 – Application is inconsistent as to whether a BESS will be included. | Section 1.1 and Attachment 3 (Section 2.1.1.5) of the Final Application clearly state that the Project includes a 4-hour BESS that will store and provide approximately 440 megawatt hours (MWh) of energy storage capabilities to the grid. |
| 1(a)(ii) | Section 2.1.1.1 – Improve and expand description of fire containment and safety for BESS. | BESS fire containment and safety are summarized in Section 2.1.1.5 Battery Storage Component of Attachment 3 in the Final Application.<br>Additional Project fire safety is described in Section 2.1.5 of the same attachment and in the Hazardous Materials, Waste Management, and Emergency Response Plan provided in Attachment 13 of the Final Application. |
| 1(a)(ii)A | Figure 1 map needs to show the relationship of the site to the surrounding area. | The referenced map has been revised and is included as an attachment to this comment response matrix. |
| 1(a)(ii)B5 | Waiver requests | See Attachment 1 of the Final Application for approved waiver requests. |
| 1(a)(ii)B6 | Describe whether petroleum derivatives will be associated with the onsite substation. | The onsite substation will use petroleum derivatives to insulate and cool the transformer. Final volumes will be determined by equipment specifications but will exceed 10,000 gallons. The substation design will house the transformers inside an oil containment area, which will prevent spills from leaving the substation footprint or entering the ground. Containment design will follow federal and state Spill Prevention, Control, and Countermeasure rules and regulations. |

| Code Reference | Comment | Response |
|---|---|---|
| 1(a)(ii)C2 | Please state in the application if there are any future phases or extensions of the Project (such as a BESS). | The Project, including the BESS component, would be constructed in 16 months. Refer to the Project Description in Attachment 3 of the Final Application. |
| 1(a)(ii)C5 | Elaboration on landscaping and revegetation, if that is to occur. Consider the preparation of a Vegetation Management Plan for the Project. | A Project Revegetation and Weed Management Plan has been prepared and included as Attachment 14 of the Final Application. Adapture anticipates possible revisions to the plan in coordination with Madeline Wilson, with the local SLV Extension office. |
| 1(a)(ii)C6 | Provide feasible "non-structural" alternatives to meet the objectives of the proposed site selection and construction. If there are none, state so and explain why. | See Section 2(e)(vii B1.-2. of the Final Application. |
| Non-specific to code | Explain how the Project will comply with requirements, not just say that they will. This could be prepared as a separate exhibit with a compliance matrix. | Provided as an attachment to this comment response matrix is a Project Permit Matrix that describes all known or possible permit requirements and actions needed to comply with the permitting requirements. |
| Non-specific to code | Update Table 3 in Exhibit E to reflect that the silverspot is now listed as threatened under the ESA. | Table 3 in Exhibit E (now Attachment 9) has been updated. Barr also updated federal and state species lists in July 2025. The updated lists are included in Attachment 9 of the Final Application. Barr addressed species potential and impact considerations for newly listed species in Section 2(b)(ii)B-C. |
| Non-specific to code | Section 4.5 in Appendix E: Recommend preconstruction nest surveys to occur no more than 5 days prior to disturbance (not 7 days). | Changed to 5 days from 7. Refer to Section 4.5 in Attachment 9 of the Final Application. |
| Non-specific to code | Section 4.7 of Exhibit E: Why is a preconstruction bald eagle survey recommended? If so, why not a golden eagle survey also? | Based on the Kimley-Horn conclusion that “No suitable nesting, winter night roosting, or communal roosting sites were observed. No bald eagle nests, bald eagle winter night roosts, or communal roosts were mapped within a 1.0-mile radius of the study area. In addition, no golden eagle nests are mapped within a 1.0-mile radius of the study area.” We have removed the recommendation and the last sentence of Section 4.7, as an eagle cannot build a nest where no suitable habitat is present (a tree or rock outcrop). |

| Code Reference | Comment | Response |
|---|---|---|
| Non-specific to code | Exhibit E: What is meant by "SAM species"? Are these species SGCN? Species of Concern? Need to clarify the status of the species discussed in the report. | From Section 3.1 of the Biological Resource Review (Attachment 9 of the Final Application), Kimley-Horn reviewed the Colorado Conservation Data Center (CODEX) to identify CPW-sensitive species. The CODEX includes species from the CPW Species Activity Mapping (SAM). The report states that 19 species potentially intersect the project site as a result of the review of the SAM database. Table 4 lists 20 species. We agree that the report is unclear.<br>Barr completed an updated CODEX review in July 2025. The updated CODEX is provided in Attachment 9 of the Final Application. The CODEX includes state and federally listed threatened and endangered species, state species of concern, and Tier 1 and 2 priority species from Colorado's State Wildlife Action Plan, which includes species of greatest conservation need (SGCN). According to the updated list obtained by Barr, there are 5 Tier 1 species with the potential to occur in the Project area, and 22 Tier 2 species. Those SGCNs that updated the Kimley-Horn review are addressed with Final Application in Sections 2B(ii)A and B. |
| Non-specific to code | A CODEX report is referenced in Exhibit E but is not included in the list of references. Suggest citing and referencing the report. Suggest including the CODEX report. | Barr downloaded a current (2025) Project CODEX report, which is included in Attachment 9 of the Final Application. |
| Non-specific to code | Please include a discussion of water rights in the final application, including a demonstration of the benefits/losses associated with the transition from farmland to solar. | Barr completed a Water Rights Review that is included in Attachment 11 of the Final Application. The benefits of converting the water rights to commercial use are included in Section 2(d)(ii)F and include greater water availability to "downstream" users as Project water demands are less than those of agricultural use on the property. Project economic benefits to the county are detailed in the Economic Impact Assessment, Attachment 4 of the Final Application. |
| Non-specific to code | Please include a discussion of recent legislation (SB24-212) regarding CPW coordination and recommended Best Management Practices (BMPs). | Adapture has reviewed the referenced CPW BMPs and provides the following documentation regarding compliance with and/or adoption of CPW solar BMPs:<br>1. Pre- and post-Project assessment of potential adverse effects. Refer to 2(e)(viii)F of the final application.<br>2. Compliance with Colorado Public Utilities Commission Rule 3668-Environmental Impacts. Project completed pre-development wildlife surveys and has proposed a site that minimizes impacts to wildlife. Refer to Attachment 9 of the Final Application.<br>3. Impact minimization – Adapture would complete pre-construction MBTA surveys 5 days prior to ground or vegetation disturbance between April 1-August 31. |

| Code Reference | Comment | Response |
|---|---|---|
| | | 4. The Project site avoids CPW high priority habitats (HPH).<br>5. During construction and operations, Adapture will limit vehicle speeds to 25 mph on project roads. Adapture will minimize the amount of exposed or open trenches during construction and install earthen ramps to minimize trapping wildlife.<br>6. Weed management is planned. Refer to the Revegetation and Weed Management Plan in Attachment 14.<br>7. Project fencing would require security fencing. Care will be taken to avoid trapping wildlife within the Project site. Facility lighting will be night skies compliance downward facing to minimize light pollution.<br>8. The gen-tie design will follow Avian Power Line Interaction Committee, BMPs to minimize impacts to avian species.<br>9. An annual wildlife monitoring report will be completed during the first 3 years of operation to assess wildlife presence/absence and associated impacts.<br>10. Adapture has developed a Revegetation Plan (Attachment 14 of the Final Application) and has a conceptual decommission plan described in Attachment 3. A Final Decommissioning Plan would be developed closer to the end of the life of the facility and will be coordinated with the county. |

# Attachment 3 – Project Description

# HAYNACH SOLAR HYBRID PROJECT
# PROPOSED BY ADAPTURE SOLAR DEVELOPMENT, INC.

## PROJECT DESCRIPTION
**April 1st, 2025**

## 1. Introduction

Adapture Solar Development, Inc. (Adapture or Applicant) is proposing to construct and operate a 110 megawatt (MW) solar photovoltaic and 110 MW, 4-hour, battery energy storage system (BESS) and substation that would be installed on an approximately 1,109 acre site, known as the Haynach Solar Hybrid Project (Project). The proposed facility would be located north of the existing San Luis Valley Substation, jointly owned and operated by Tri-State Generation and Transmission Association (Tri-State) and Public Service Company of Colorado (PSCo). This substation is located on the northwest corner of Eightmile Lane and East County Road 102 N. There is an existing solar facility, Hooper Solar, that is immediately adjacent and south of the proposed project. This location is approximately 5.5 miles southwest of the community of Hooper, Colorado. The Project would produce approximately 330,039 megawatt hours (MWh) annually of emissions free electricity and store and provide approximately 440 megawatt hours (MWh) of energy storage capabilities to the grid. The facility would require construction of an onsite collector substation and a new 230 kilovolt (kV) generation-tie (gen-tie) line to connect with the existing Tri-State and PSCo San Luis Valley Substation.

### 1.1. Project Objectives

Solar, battery hybrid systems can produce emissions free electricity while assisting utility operators in more effectively integrating intermittent renewable resources into the electrical grid. That is, construction and operation of the hybrid facility will allow the operator to charge the BESS during times of solar energy generation (day) and shift output to the regional transmission system to peak (evening) hours when it is most valuable in deferring use of other non-renewable resources elsewhere. The objectives of the Haynach Solar Hybrid Project are to:

- Improve energy reliability for Alamosa County.
- Locate a solar hybrid project nearby to an existing electrical substation to minimize the length of transmission interconnection.
- Help to integrate renewable generation on the electric grid and avoid unreliability from renewable generation, by installing battery energy storage capacity that can be called upon in periods of peak demand or varying sunlight conditions.

### 1.2. Project Location and Surrounding Land Uses

The proposed Haynach Solar Hybrid Project would be located on the parcels 500921200173, 500921100172, 500922100171, and 500916300040), north of Eightmile Lane and East of East County Road 102 N, approximately 17 miles north west of Alamosa, Colorado, in unincorporated Alamosa County, Colorado.

The project parcels and surrounding area are zoned “Rural” The proposed project is located immediately adjacent to and North/Northeast of the Hooper Solar Project. Immediately south of the proposed project is a substation jointly owned by the Public Service Company of Colorado and Tri-State Generation Services.

The images below show the project parcel boundaries and its immediate adjacent infrastructures and the project location within San Luis Valley:

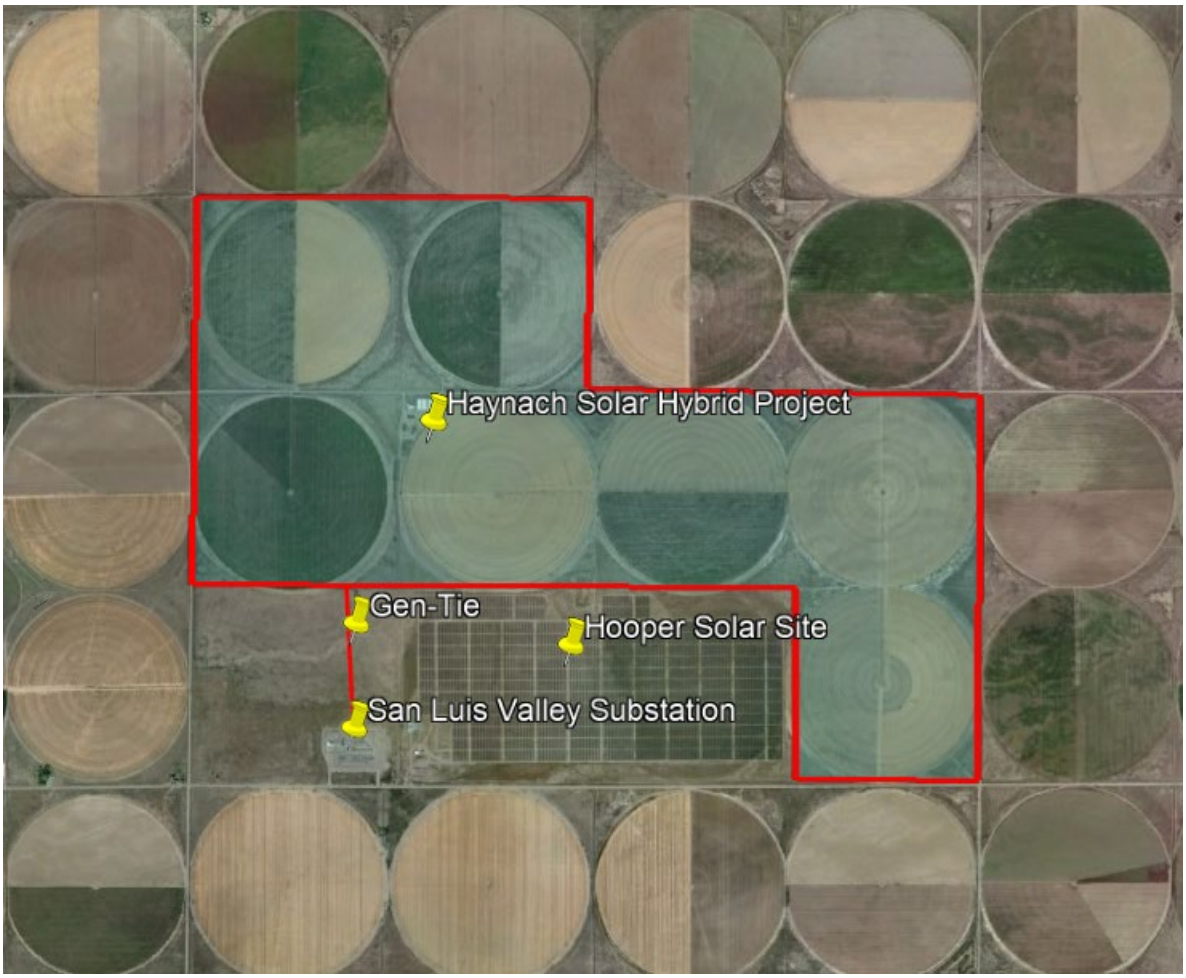



Image 1 - Haynach solar hybrid project and adjacent parcels.




Image 2 - Haynach solar hybrid project within San Luis Valley

## 1.3. Project Timeline

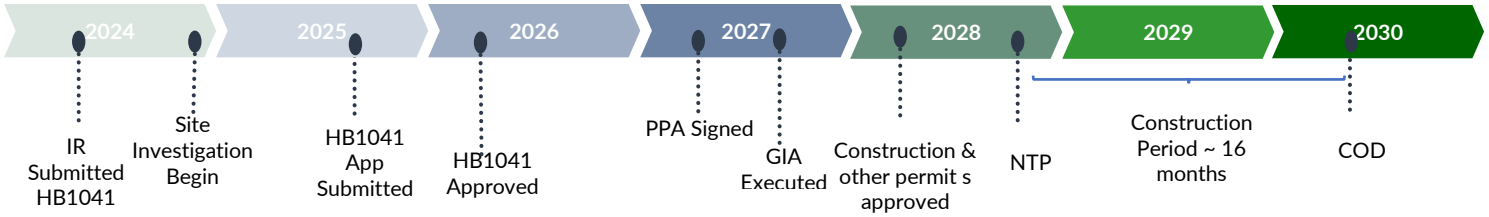



Figure 1 - Haynach Solar Hybrid Project timeline

The timeline above outlines the key milestones necessary to advance the project from early-stage development to construction and ultimately commercial operations. Each stage builds upon the progress of the previous one, reflecting how various aspects of development—interconnection, permitting, and securing power purchase agreements (PPAs)—must align to ensure the project can move forward.

This timeline captures the multi-year development process starting in 2024, with PSCo's interconnection request filings and site investigations. The submission of an Interconnection Request (IR) marks the project's formal entry into the planning process. HB1041 approval, targeted for 2026, is a critical prerequisite for local permitting and construction.

In parallel, the project advances through utility interconnection and commercial contracting steps. By 2027, the project aims to have signed a PPA and executed a Generator Interconnection Agreement (GIA), both essential components to secure financing. These agreements signal that the project has firm commitments to deliver power to the grid and is on track to meet utility requirements.

Permitting also progresses during this time, with additional approvals—such as development agreements or construction permits—targeted for 2028. Once these and other ancillary permits and agreements are in place, and the Notice to Proceed (NTP) is issued, the project can formally enter the construction phase.

Construction is estimated to take approximately 16 months, beginning in late 2028. The timeline culminates with the project achieving Commercial Operations Date (COD) in 2030, at which point it will begin delivering clean energy to the grid.

Each of these milestones is interdependent. For example, financing for the project cannot be secured without the HB1041 approval, executed GIA, and a signed PPA. Similarly, construction cannot begin until all major permits are in place and interconnection agreements are finalized. This interconnected process ensures that all regulatory, technical, and commercial components align, allowing the project to be successfully built and operated.

While this timeline provides a high-level view of the expected development process, actual timelines may vary. Adapture will make every effort to maintain or even accelerate this schedule when market conditions, permitting timelines, interconnection progress, and other key elements allow. However, renewable energy development is complex and subject to factors beyond Adapture's control, such as long lead equipment procurement, delays in interconnection studies, or changes in regulatory processes. These can impact project timelines despite best efforts. Transparency and collaboration with all stakeholders will remain central as the project advances.

## 1.4. PROJECT BACKGRAOUND

The area where the project is planned was previously included in the footprint of an adjacent project (referred to here as the Hooper Solar Site), which was originally permitted under Resolution 2012-G-5 — an HB1041 permit granted by Alamosa County in 2012 for a 150 MW solar project issued to San Luis Valley Solar Farm LLC (Meridian subsidiary) and transferred to Solar Star Colorado III, LLC (SunPower subsidiary) and amended by Resolution 2014-G-7.

At the time of permitting, the entire area—including both the existing Hooper Solar Site and the land now associated with the Haynach Solar Hybrid Project—was planned as a single-phase development. In 2014, the then-owner of the Hooper Solar Site requested and received approval to split the project into multiple phases. Phase 1 has since been constructed, while Phases 2 and 3 were intended to occupy the land now proposed for the Haynach Solar Hybrid Project.

Phases 2 and 3 received multiple permit extensions over the years; however, in 2024, the permit authority concluded that the project no longer met the conditions of Permit Resolution 2014-G-7 and did not grant further extensions. As a result, any previous approvals from Alamosa County for development on the Haynach Solar Hybrid Project site have expired.

The Haynach Solar Hybrid Project is a separate acquisition, and our team is pursuing an independent development path, including all new permitting, interconnection, and commercial arrangements.

# 2. Description of the Project

## 2.1. Overview

The proposed Haynach Solar Hybrid Project would be built and operated by Adapture to provide PSCo additional local area electrical generation and capacity for electrical system reliability and flexibility. The Project would have a rated power capacity of 110 MW for both the solar and BESS portions and the ability to discharge the battery over a 4-hour duration, for up to 440 MWh of energy. Photovoltaic electrical generators provide emissions free electrical generation and are not subject to varying fuel costs. Battery-based energy storage provides flexibility in the delivery of power to the electrical grid by storing energy during periods of oversupply and discharging it to the electrical grid during periods of high demand. A battery system can provide instantaneous response, as compared to a slower ramping rate of a traditional coal or gas-fired generation resource. Energy storage speed-of-response reduces the total amount of reserve power needed to manage the grid effectively, providing savings and reliability benefits. By building the proposed Project, a clean, reliable resource would be gained to help integrate renewables, reduce dependence on coal and gas-fired generation, and reduce GHG and criteria air pollutant emissions.

The Applicant will contract with a Colorado electrical utility or other large electrical load customer for energy purchases and renewable energy credits from the solar generator and for energy charging and discharging from the battery. These may be utilities, such as PSCo, Tri-State or other local Co-operatives or large load customer operating large energy facility such as a datacenter operator who purchase wholesale electricity from the generator and has contractual arrangements to do so with the electrical utility. The contract will pay the facility a fixed energy and renewable energy credit amount at a per MWh rate and a fixed monthly kW-month rate for the ability to schedule and dispatch the battery. The energy, renewable energy credits and the battery capacity may be contracted with different entities. In general, the solar panels would generate electricity during daylight hours and the batteries would store electricity by charging during periods of excess supply or lower electricity demand and the batteries would discharge the stored energy to the electrical grid during periods of high electrical demand. The ability to store energy would improve the utilities ability to integrate renewable resources efficiently and reliably.

### 2.1.1. Project Facilities

The project facilities (refer to Preliminary Site Plan) would include the following main components, each of which are described in greater detail thereafter:

- Photovoltaic (PV) modules and trackers
- Inverter and medium voltage transformers
- Electrical collection and distribution system
- Project substation
- Battery storage
- Generation-Tie
- Site access road(s)
- Operations and maintenance (O&M) facilities

#### 2.1.1.1. Photovoltaic (PV) modules and trackers

The proposed project would utilize photovoltaic (PV) panels which may or may not use bi-facial technology on mounting frameworks to convert sunlight directly into electricity. Individual panels would be installed on tracker mount systems (single- or dual-axis, using galvanized steel or aluminum). The panels would rotate to follow the sun over the course of the day. The panels would be deployed in proximity to the

power conditioning stations (PCS) where the DC produced by the panels is converted to alternating current (AC) and transferred to the on-site substation and eventual delivery to the electrical grid.

Each PV module would be placed on a tracker mounting structure. The foundations depths for the mounting structures may varyv depending on the structure, soil conditions, and wind loads, and may be encased in concrete or utilize small concrete footings. A light-colored ground cover or palliative may be used to increase electricity production. Final solar panel layout and spacing would be optimized for project area characteristics and the desired energy production profile.

#### 2.1.1.2. Inverter and Medium Voltage Transformers

Photovoltaic energy generated by the panels would be delivered via cable to the PCS generally located within the solar array field. The PCS are comprised of inverters, transformers, and other electrical equipment to reach the needed collection level voltage. The footprint of each PCS, which is generally mounted on a concrete pad. All PCS would be located within the project footprint. The inverter converts the DC electricity to AC electricity, which then flows to a transformer where it is stepped up to the appropriate collection level voltage. The proposed project would use Sungrow SG4400 Central inverters or equivalent and one medium voltage transformers per inverter. Each inverter and transformer would be installed as per manufacturer's requirements.

#### 2.1.1.3. Electric Collection and Distribution System

The DC output of multiple rows of PV modules connected in series would be collected through one or more combiner boxes and associated electrical wiring located throughout the Project site. The power would be delivered via an underground cable network to the inverters in the electrical equipment enclosures at the PCS, described above. Multiple transformers electrically connected in parallel would deliver AC power to the Project Substation located on-site.

#### 2.1.1.4. Project Substation

Output from the PCS would be transferred via electrical conduits and electrical conductor wires to an onsite substation in the southwest quadrant of the site. The proposed substation would include transformers, breakers, switches, meters, and related equipment. Interconnection equipment, including the control house, would be installed aboveground and underground within the footprint of the substation. The substation would also contain a control house. The substation would be surrounded by a barbed wire chain-link fence and would comply with electrical codes.

#### 2.1.1.5. Battery Storage Component

The battery system would consist of commercially available lithium-ion batteries housed in enclosures. The battery storage component would have a footprint of approximately 2.5 acres. Site preparation required for the battery storage enclosures requires leveling the area for a flat concrete foundation.

The proposed lithium-ion batteries would principally comply with the UL 9450 standard for outdoor energy storage enclosures. The project will be subject to compliance with existing federal, state, and local regulations for health and safety, and local Fire Code. The Applicant would select Battery Energy Storage System (BESS) providers that comply with the application-specific codes, standards, and regulations for the siting, construction, and operation of lithium-ion stationary BESS.

The project would include current best practices for fire safety. The BESS would contain a safety system as required by NFPA 855 and tested under the UL 9540A Test Method for Evaluating Thermal Runaway

Fire Propagation in Battery Energy Storage Systems. The enclosure wall is designed to contain the fire and prevent propagation.

#### 2.1.1.6. The Generation-Tie

The 230 kV gen-tie would interconnect the Project Substation to the existing jointly owned Tri-State and PSCo San Luis Valley Substation. The gen-tie is proposed to extend to the south from the Project Substation for approximately 0.4 miles. The gen-tie right-of way would be from 25 to 75-feet-wide.

#### 2.1.1.7. Site Access and Roads

The project would be accessed directly from either East County Road 102 N or Eightmile Lane. The access road would be constructed as part of the proposed project. Additional access roads would be constructed between the rows of PV panels within the project site. Access roads would be approximately 20 feet wide and would be accessed via multiple gates to allow access to the internal access roads. The access points and interior driveways would be constructed in accordance with Alamosa County and Local Fire Protection requirements and maintained to ensure on-site circulation for emergency vehicles during all weather conditions.

The rows of PV panels would be enclosed within the project site fencing. Fencing would be a six- foot tall wire fence topped by one foot-tall three-strands of barbed wire.

#### 2.1.1.8. Operations and Maintenance Facilities

The project would include the construction of an O&M building with associated on-site parking (unpaved) within the project site. The O&M building may be co-located with the substation. Roads, driveways, and parking lot entrances would be constructed in accordance with Alamosa County improvement standards and Colorado regulations.

### 2.1.2. Project Construction Activities

The construction period for the proposed project from site preparation through construction and testing is expected to commence in the fall of 2028 and would extend for approximately 16 months.

Construction of the proposed project would include the following activities:

- Site preparation
- Construction of access and internal circulation roads
- Grading and earthwork
- Dust control
- Panel installation
- Concrete foundations
- Structural steel work
- Electrical/instrumentation work
- Collector line installation
- Stormwater management facilities
- Architecture and landscaping Construction Schedule

For the construction phase of the project, resource protection measures will be implemented to minimize environmental impacts. These measures will include but not be limited to dust suppression techniques, erosion control practices, and health and safety protocols. All activities will be carried out in accordance

with the project's mitigation and permitting plan to ensure compliance with environmental regulations and to protect surrounding resources. The goal is to minimize any disruptions to the local environment during construction. These efforts will also prioritize the safety and well-being of the workforce and the community.

### 2.1.3. Operation and Maintenance Activities

Once the proposed project is constructed, maintenance would generally be limited to the following:

- Cleaning of PV panels
- Monitoring electricity generation
- Providing site security
- Facility maintenance – replacing or repairing inverters, wiring, and PV modules

### 2.1.4. Decommissioning

Solar equipment has a typical lifespan of over 30 years. The proposed project expects to sell the renewable energy produced by the project under the terms of a long-term Power Purchase Agreement (PPA) with a utility or other power off taker. Upon completion of the PPA term, the project operator may, at its discretion, choose to enter into a subsequent PPA or decommission and remove the system and its components. Upon decommissioning, the solar facility could be converted to other uses in accordance with applicable land use regulations in effect at that time.

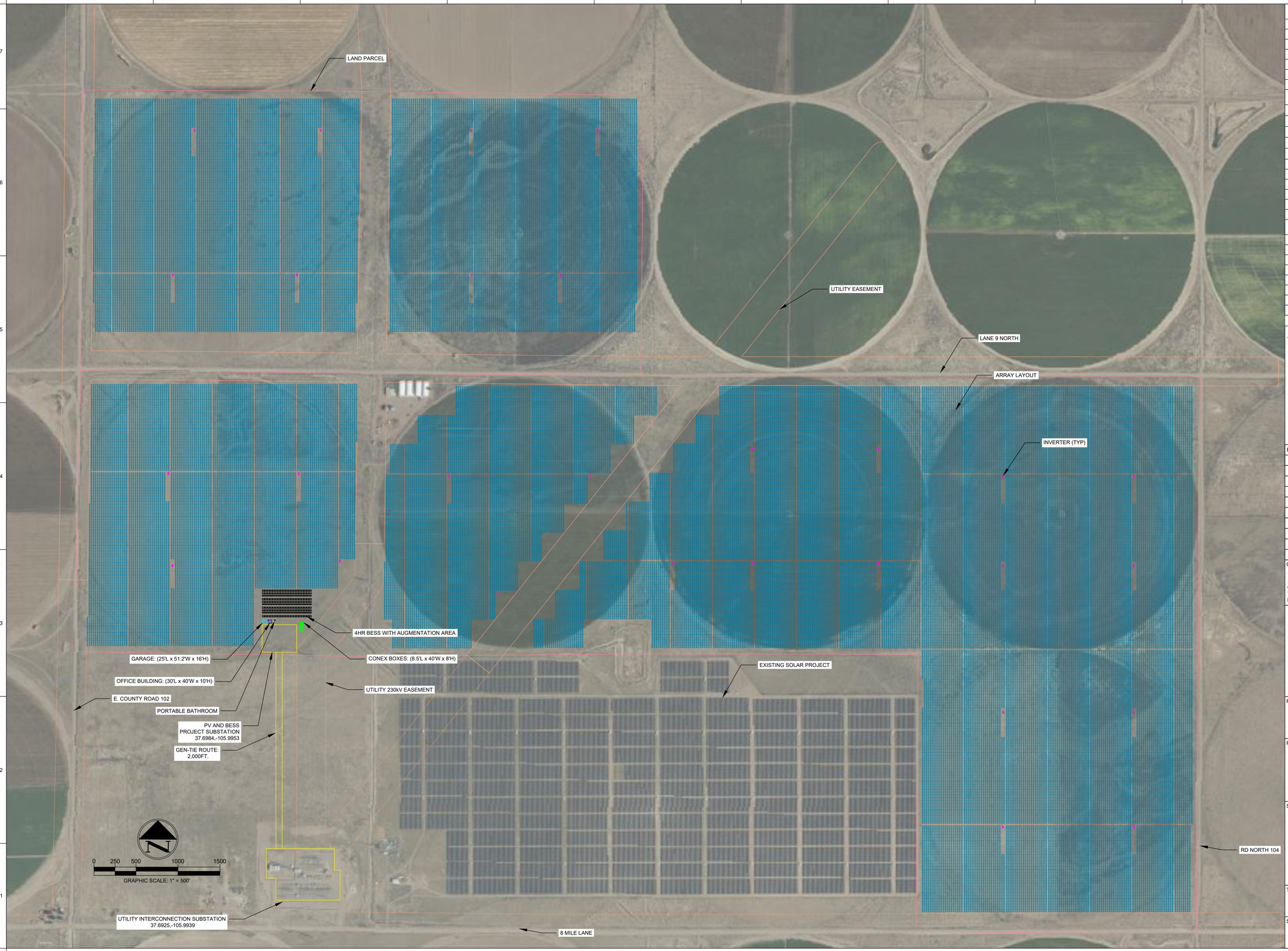
It is anticipated that, during project decommissioning, project structures that would not be needed for subsequent use would be removed from the project site. The site would revert to undeveloped land that supports agricultural production and wildlife habitat. The decommissioning and restoration process involves removing aboveground and belowground structures, restoring topsoil, revegetation, and seeding. Temporary erosion and sedimentation control BMPs would be used during the decommissioning phase.

Equipment would be de-energized prior to removal, salvaged (where possible), and shipped off-site to be recycled or disposed of at an appropriately licensed disposal facility. Once the solar modules are removed, the racks would be disassembled, and the structures supporting the racks would be removed. Site infrastructure would be removed, including fences, and concrete pads that may support the inverters, transformers and related equipment. The demolition debris and removed equipment may be cut or dismantled into pieces that can be safely lifted or carried by standard construction equipment. The fencing and gates would be removed, and all materials would be recycled to the extent practical. Project roads would be restored to their pre-construction condition unless they may be used for subsequent land use. The area would be thoroughly cleaned and all debris removed. Materials would be recycled to the extent feasible, with the remainder disposed of in landfills in compliance with all applicable laws.

### 2.1.5. Fire Safety

As part of the Haynach Solar Hybrid Project, outreach and coordination will be conducted with the Mosca Hooper Fire Department to ensure compliance with all local, state, and national fire safety standards and regulations. This collaboration will ensure the implementation of appropriate safety measures throughout the construction and operational phases, focusing on minimizing fire risks and maintaining safety for personnel and the surrounding community. Fire protection during construction will include the provision of fire extinguishers and portable firefighting equipment, regularly inspected and maintained according to local and federal standards. For the operational phase, the project will adhere to the current international fire code (IFC) and relevant fire safety standards, including fire suppression systems for the Battery Energy Storage System (BESS), and will be designed to minimize fire hazards while ensuring the

safety of the facility and emergency responders. Additionally, an Emergency Response Plan is being developed in collaboration with local consultants from Colorado, and it will be shared with the county as part of the final application.




## SITE BUFFERS

| | |
|---|---|
| PUBLIC ROADS | 100 FT (50 FT EACH SIDE) |
| WETLANDS | 50 FT |
| PIPELINES | 100 FT (50 FT EACH SIDE) |
| NON-PARTICIPATING PROPERTY | 50 FT |
| RESIDENCES | 250 FT |
| FENCE (FROM PROPERTY LINE) | 2 FT MIN |
| SOLAR SETBACK FROM FENCE | 20 FT |

## SOLAR

| | |
|---|---|
| MODULES | CS6W-575TB-AG |
| DISPLAYED DC CAPACITY | 193 MW DC |
| PROPOSED PROJECT CAPACITY | 154 MW DC |
| TOTAL AC CAPACITY | 110 MW AC |
| MODULES | 575 W |
| PROPOSED MODULE QTY | 268,200 |
| MODULE/STRING | 25 |
| PROPOSED # OF STRINGS | 3,572 |
| INVERTER | SUNGROW SG4400 |
| INVERTER COUNT | 28 |
| GCR | 38% |

## BESS

| | |
|---|---|
| BESS | POWER TITAN 2.0 |
| BESS AC POWER | 110MW |
| BESS NAMEPLATE CAPACITY | 440MWHR |
| TRANSFORMER QTY | 38 |
| TRANSFORMER SIZE | 5MVA |
| BESS CONTAINER | ST5015U |
| BESS CONTAINER QTY | 152 |
| SHOWN OVERBUILD | 1.732 |

**NOTE:**

1. RED SHADED AREA REPRESENTS A NO BUILDING ZONE

NOT FOR CONSTRUCTION. FOR BIDDING PURPOSES ONLY.

| REV | DESCRIPTION | DATE |
|---|---|---|
| A | PRELIMINARY LAYOUT | 4/4/2024 |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |

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ADAPTURE RENEWABLES®

1901 Harrison St, Suite 1630
Oakland, CA 94612, USA

PROJECT NAME:

HAYNACH

PROJECT ADDRESS:

MOSCA, CO
37.703°,-105.983°

SEAL:

DATE: 4/4/24

PROJECT #: -

DRAWN BY: TS

CHECKED BY: ZZ

TITLE: PRELIMINARY LAYOUT

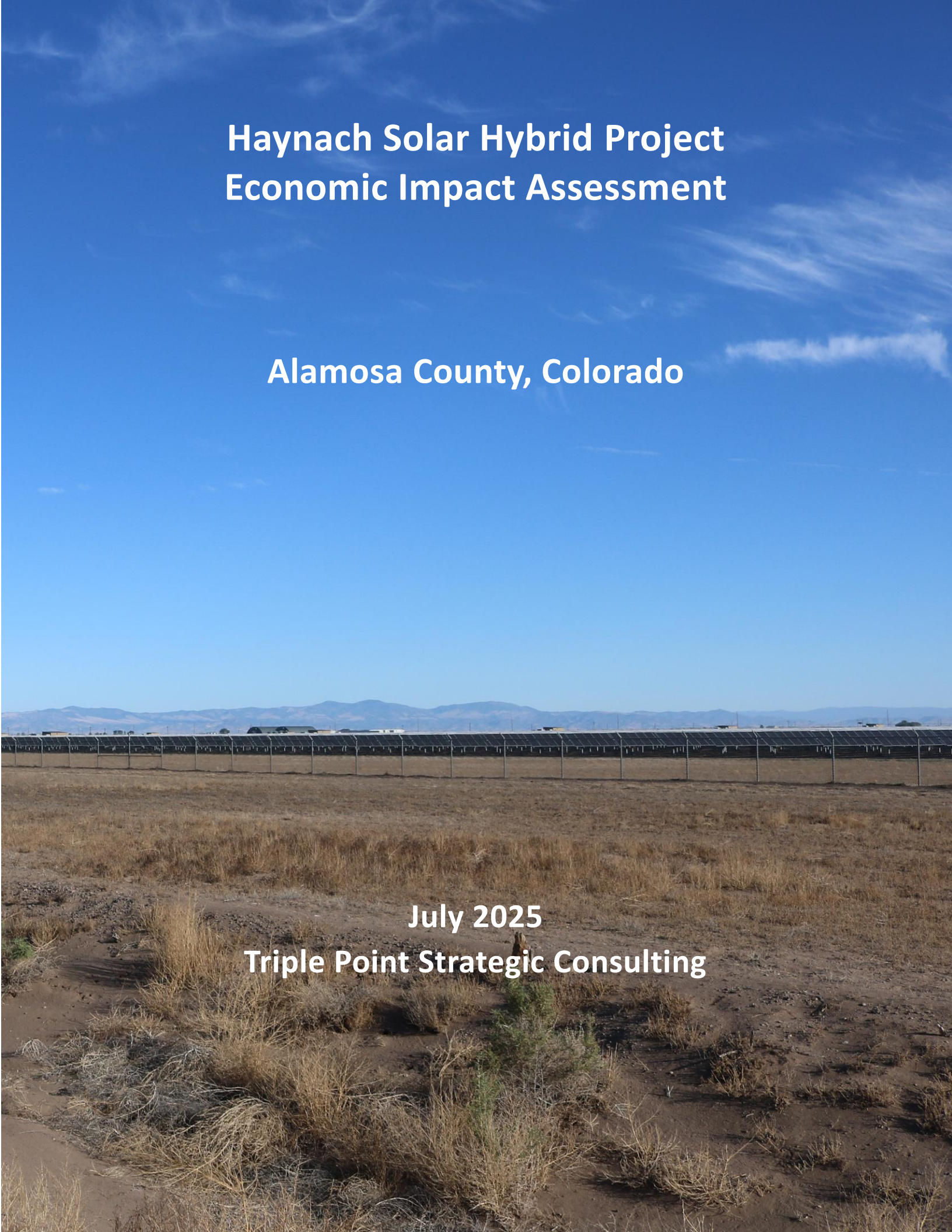
SHEET: E-200

PLOT DATE: Monday, July 07, 2025

# Attachment 4 – Economic Impact Assessment

# Haynach Solar Hybrid Project
# Economic Impact Assessment

## Alamosa County, Colorado



**July 2025**

**Triple Point Strategic Consulting**

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# Haynach Solar Hybrid Project
# Economic Impact Assessment

## Alamosa County, Colorado

**Prepared for:**

**Haynach Solar, LLC**
**1901 Harrison Street**
**Oakland, CA 94612**

**Prepared by:**

**Triple Point Strategic Consulting**
**PO Box 985**
**Crested Butte, Colorado 81224**

**July 2025**

Cover photo credit: Jeffrey Beall

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# Acronyms and Abbreviations

| | |
|---|---|
| ACAD | Alamosa County Ambulance District |
| ACFPD | Alamosa County Fire Protection District |
| ACS | American Community Survey |
| AFY | acre-feet per year |
| BEA | Bureau of Economic Analysis |
| BESS | battery energy storage system |
| BLS | Bureau of Labor Statistics |
| CRS | Colorado Revised Statutes |
| DOLA | Department of Local Affairs |
| EIA | Energy Information Administration |
| EMS | emergency medical services |
| EPC | engineering, procurement, and construction |
| EZ | Enterprise Zone |
| FTE | full-time equivalent |
| gen-tie | generation tie |
| GDP | gross domestic product |
| HUTF | Highway Users Tax Fund |
| IIA | Industry Impact Analysis |
| IMPLAN | impact analysis for planning |
| I-O | Input-Output |
| IRC | Internal Revenue Code |
| kWh | kilowatt-hour |
| kV | kilovolt |
| LPF | Leontief Production Function |
| LQ | location quotient |
| Mgal | million gallons |
| MHVFD | Mosca-Hooper Volunteer Fire Department |
| MRIO | multi-region input-output |
| MW | megawatt |
| MWac | megawatts of alternating current |
| MWh | megawatt hour |
| OPI | Other Property Income |
| PPA | Power Purchase Agreement |
| Project | Haynach Solar Project |
| PSCo | Public Service Company of Colorado |
| PV | photovoltaic |
| REA | Regional Economic Accounts |
| RGWCD | Rio Grande Water Conservation District |
| RV | recreational vehicle |
| SAIPE | Small Area Income and Poverty Estimates |
| SDO | State Demography Office |
| SLVHC | San Luis Valley Housing Coalition |

| | |
|---|---|
| SOC | Standard Occupational Classification |
| TOPI | Taxes on Production and Imports, Net of Subsidies |
| Tri-State | Tri-State Generation and Transmission Association |
| Wac | watt alternating current |
| Wdc | watt direct current |

# Executive Summary

The Haynach Solar Hybrid Project (Project) is a proposed 110-megawatt alternating current (MWac) solar project with an adjoining 110 MWac battery energy storage system (BESS) located in Alamosa County, Colorado. The Project would be developed on approximately 1,109 acres of private land. Barr Engineering Co. subcontracted Triple Point Strategic Consulting LLC to prepare this socioeconomic assessment for the Project. We assume the Project would be constructed over 16 months beginning in the fourth quarter of 2028, followed by 40 years of operations. The first full year of operations is projected to be 2031.

The economy of Alamosa County is driven by agriculture, higher education, and healthcare which have been growing along with the population. Real median household income just over half of the state level and has not grown over the past 10 years. Affordable housing is in short supply, though developments are being constructed. Total housing inventory has grown at a consistent one percent average annual growth rate for more than 30 years. Given the estimated size of the workforce needed to construct this project relative to the local and regional workforce, we anticipate the majority of workers already live in proximity to the Project and would not require temporary housing.

The outlook for utility-scale solar electricity generation in Colorado is very positive. The state currently ranks 13th in utility-scale generation. Production costs have declined significantly, supporting further growth with many new projects in the planning stages throughout the state. Alamosa County is home to several utility-scale solar energy plants. The Project would have a positive impact on the county economy during construction and would continue to generate economic activity over the planned lifetime of the Project.

**Capital Construction Budget**

The total projected capital budget for construction is $331 million, of which $194 million would be used to purchase and import specialized equipment and $99.8 million would be injected into the Colorado economy in the form of construction spending (direct investment).

**Economic Benefits of Construction to Alamosa County**

The portion of direct investment estimated to be spent in Alamosa County is $39.5 million. The economic impacts to Alamosa County during the 16 months of construction include the following:

- A total beneficial economic impact of $50.4 million (direct spending plus multiplier impacts)
- A total of $743,000 in local and county tax revenues from construction activities received within Alamosa County

**Table ES-1. Construction Employment Impacts to Alamosa County**

| Employment Impact During Construction | Average Annual Employment | Total Annual Labor Income |
|---|---|---|
| Direct employment | 119.5 | $11,981,865 |
| Supply chain and induced employment | 45.0 | $2,197,327 |

Note: The average annual job estimates are approximately full-time equivalent (FTE).

**Economic Benefits of Construction to Colorado, Including Alamosa County**

The entire amount of direct investment projected to be spent in Colorado is $99.8 million, including the portion spent in Alamosa County. The total beneficial economic impacts to Colorado, including Alamosa County, during the 16 months of construction include the following:

- A total beneficial economic impact of $172.5 million (direct spending plus multiplier impacts)
- A total of $3.5 million in local and county tax revenues from construction activities received within Colorado

**Table ES-2. Construction Employment Impacts to Colorado, Including Alamosa County**

| Employment Benefits During Construction | Average Annual Employment | Total Annual Labor Income |
|---|---|---|
| Direct employment | 209.1 | $20,968,264 |
| Supply chain and induced employment | 237.8 | $17,782,456 |

Note: The average annual job estimates are approximately full-time equivalent (FTE).

**Operations Budget**

The total annual amount of spending in Colorado for operations is projected to be $2.0 million, excluding off-site, capital, and property tax expenses. The planned operating lifetime is up to 40 years. The facility is expected to be fully operational in 2030 and the first full year of operations would be 2031.

**Economic Benefits of Operations to Alamosa County**

The portion of the annual budget spent directly within Alamosa County is projected to be $1.3 million. The annual economic impacts to Alamosa County during operations include the following:

- A total annual economic impact of $2.0 million
- A total of $79,000 annually in local and county tax revenues from operations activities received within Alamosa County

**Table ES-3. Operations Employment Impacts to Alamosa County**

| Employment Benefits During Operations | Average Annual Employment | Total Annual Labor Income |
|---|---|---|
| Direct employment | 5.8 | $569,129 |
| Supply chain and induced employment | 2.3 | $133,903 |

Note: The average annual job estimates are approximately full-time equivalent (FTE).

**Economic Benefits of Operations to Colorado, Including Alamosa County**

The portion of the annual budget spent directly within Alamosa County is projected to be $2.0 million. The annual economic impacts to Colorado, including Alamosa County, from operations include the following:

- A total annual economic impact of $3.6 million
- A total of $178,000 annually in local and county tax revenues from operations activities received within Colorado

**Table ES-4. Operations Employment Impacts to Colorado, including Alamosa County**

| Employment Benefits During Operations | Average Annual Jobs | Annual Labor Income |
|---|---|---|
| Direct jobs | 5.8 | $569,129 |
| Supply chain and induced jobs | 5.5 | $423,920 |

Note: at statewide effective average, local tax rates are higher than within Alamosa County.

Note: The average annual job estimates are approximately full-time equivalent (FTE).

Special equipment would be imported into Alamosa County and subject to taxation having fiscal benefits. State-assessed property tax payments are estimated to total $19.3 million over the Project's lifetime, including $9.5 million payable to the Sangre De Cristo School District and $6.7 million to Alamosa County. All of the beneficiaries of that would receive tax revenues are described. Population and housing growth, in Alamosa County and across Colorado, combined with new electricity-driven new technology will increase demand for electricity going forward. Alamosa County is in a strong position to further grow a skilled solar energy workforce and means for exporting locally produced, renewable energy.

## About Triple Point Strategic Consulting LLC (Project Lead) and Consulting Team

Triple Point specializes in developing custom economic and financial models. We deliver results for our clients with high-value and accurate information, as demonstrated by our many repeat clients. Triple Point is active across the western United States and Canada, modeling for scenario planning, financial forecasting, permitting and approvals, optimal resource allocation, and improved decision-making. Economic impact studies are conducted using the IMPLAN model.

Jeff Moffett, Ph.D. founded Triple Point Strategic Consulting in 2013 to provide marketing, strategic planning, and economic analysis services. Focus areas are renewable energy, affordable housing, health assessments, resource management, and economic development. Jeff has served as an expert witness before the Idaho Department of Water Resources Court and was recently appointed to the nonpartisan Committee for a Responsible Federal Budget's Advisory Board. Jeff earned his master's degree in Econometrics and a doctorate in Applied Statistics at the University of Washington, Seattle. For more information visit www.tpsconsulting.net.

Nathan Perry, Ph.D. is a Professor of Economics at Colorado Mesa University and principal of Alvarium Economics. He has conducted many regional economic studies in Colorado, including economic impact studies, public land studies, and energy studies, and has published academic work on deficits and debt, inflation, and the Great Depression. Dr. Perry regularly presents on the economic conditions in western Colorado and the national economy, and serves on the Governor's Revenue Estimating Advisory Committee (GREAC).

Cirrus is a trusted business advisor providing state and local consulting services to renewable energy developers and owner-operators. The Cirrus team helps companies manage state and local tax liabilities, maximize public funding opportunities for investments, and enhance public-private partnerships in local communities. Cirrus leadership has worked together for over two decades and has extensive experience in the renewable energy industry, having rendered advisory services for over 900 development- and operational-stage projects totaling more than 115 gigawatts. They have negotiated incentives for renewables projects in more than 30 states.

As shown in the following table, this report directly addresses multiple socioeconomic issues as required in the Alamosa County 1041 regulations.

**Table ES-5. List of 1041 Regulations and Socioeconomic Report Sections**

| 1041 Permit Requirement | Description | Section (s) |
|---|---|---|
| (2) (a) (ii) | Delineation of impact area (that area whose physical and socio-economic environment is likely to be impacted, beneficially and adversely, by the site selection and construction of the proposed facility). | 1.3, 7.2.2 |
| (2) (a) (iv) (B) | Sources of demographic and economic data and methods of analysis. | 1.4 |
| (2) (a) (iv) (C) | Market function (i.e. what user needs and patterns will project fulfill). | 12 |
| (2) (a) (v) (B) | Public services and facilities. | 11 |
| (2) (a) (v) (B) (1) | Estimate police and fire protection requirements | 11.3, 11.4 |
| (2) (a) (v) (B) (3) | Estimate educational and health services requirements | 11.5 - 11.7 |
| (2) (a) (v) (B) (4) | Estimate facilities and services required to provide adequate water supply and sewage treatment. | 11.9 - 11.10 |
| (2) (a) (vi) | Description of employment and economic opportunities | 7.2.3 |
| (2) (a) (vi) (A) | Describe Capital Investment in facility | 7.2.1 |
| (2) (a) (vi) (B) | Estimate anticipated revenues to local, state and federal governments, special districts. | 8.2.5, 8.3.5 - 8.3.7, 8.4.6, 8.4.7, 8.5.6 - 8.5.8, 9 |
| (2) (a) (vi) (C) | Description of employment opportunities | 8.2.3, 8.3.4, 8.4.3, 8.5.4 |

| 1041 Permit Requirement | Description | Section (s) |
|---|---|---|
| (2) (a) (vi) (C) (1) | Types of jobs and number of positions anticipated; employment; wage and salary schedules. | 8.2.3, 8.3.4, 8.4.3, 8.5.4 |
| (2) (a) (vi) (C) (2) | Opportunities for employment of local citizens. | 7.2.3 |
| (2) (a) (vi) (C) (3) | Employment opportunities for low income and minority population in impact area. | 7.2.3.3 |
| (2) (a) (ix) | Description of socio-economic environment (impact area). | 1.3 |
| (2) (a) (ix) (A) | Characteristics of the existing population. | 3 |
| (2) (a) (ix) (A) (1) | Age, income level and distribution, education, social background, family size, etc. | 3 |
| (2) (a) (ix) (A) (2) | Neighborhood and distinct socio-economic groups. | 3.5, 3.7 |
| (2) (a) (ix) (A) (3) | Migrational trends and seasonal fluctuations. | 3.4 |
| (2) (a) (ix) (A) (4) | Anticipated population changes. | 11.1 |
| (2) (a) (ix) (B) | Current employment. | 5.1 - 5.3 |
| (2) (a) (ix) (B) (1) | Principal employers, type, number of employees. | 4.2 |
| (2) (a) (ix) (B) (2) | Unemployment and underemployment. | 5.4 - 5.5 |
| (2) (a) (ix) (B) (3) | Characteristics of local labor pool. | 5.6 |
| (2) (a) (ix) (B) (4) | Manpower training and retraining potential. | 7.2.3.2 |
| (2) (a) (ix) (C) | Inventory local governments and special districts providing services in base areas. | 11 |
| (2) (a) (ix) (C) (2) | Capacity and utilization of services. | 11 |
| (2) (a) (ix) (C) (3) | Operating revenue and expenditures. | 11 |
| (2) (a) (ix) (C) (4) | Tax base. | 10 |
| (2) (a) (ix) (C) (5) | Current level of taxation. | 10 |
| (2) (a) (ix) (C) (6) | Estimate revenue generating capacity and identify potential new sources of revenue. | 11 |
| (2) (a) (ix) (D) | Housing | 6 |
| (2) (a) (ix) (D) (1) | Current housing inventory (including numbers, types, (owner or rental), sales or rental prices, year-round or seasonal, dormitories, mobile homes and locations). | 6.2 - 6.4 |
| (2) (a) (ix) (D) (2) | Projected housing requirements (including numbers, types (owner or rental), sales or rental prices, year-round or seasonal, dormitories, mobile homes and locations). | 6.1, 6.5, 6.6 |
| (2) (e) (i) | Summarize the major natural and socio-economic environmental constraints as they affect the site selection and construction of the facility as proposed. | 7, 12, 13 |
| (2) (e) (ii) | Describe present utilization of land, water, air, biotic, geologic and socio-economic resources within impact area as applicable to submission requirements. | 3, 4, 5, 7 |

| 1041 Permit Requirement | Description | Section (s) |
|---|---|---|
| (2) (e) (iv) | Analyze the effects of the proposed site selection and construction upon the natural and socio-economic environment of the impact area as applicable to submission requirements. | 8, 9, 11, 12 |
| (2) (e) (iv) (C) | Provide socio-economic impact analysis. | 8, 9, 11, 12 |
| (2) (e) (v) | Analyze the long-term effects of the proposed site selection and construction upon the physical and socioeconomic development of the impact area. | 12 |
| (2) (e) (vii) (F) | Submit a program to meet "front end" costs of providing necessary services and facilities. | 7, 9 |

# Key Terminology

**Direct Effects:** The initial economic activity that occurs as a result of the project. This would include labor and materials spending in Alamosa County and Colorado.

**Direct Investment:** The initial expenditure or funding allocated to undertake a project within a defined region, such as a county or state. Direct investment, also referred to as total direct impact, includes labor, materials, taxes, and other business costs for the construction phase and the operations and maintenance phases that are spent locally.

**Dollar Year:** The year represented by the values in an impact event being modeled. This is usually (but not always) the same as the year in which the event occurred or is expected to occur.

**Economic Benefit:** The benefits that accrue to the defined region resulting from this project including direct, indirect, and induced economic impacts. These benefits are broken down by economic output, employment, labor income, industry growth, and tax revenues in this report.

**Indirect Effects:** The economic activity generated in the supply chain resulting from the direct effects. This can include construction supplies (concrete, steel, wiring); equipment rental; future landscaping services for the site; legal, environmental, or safety services; and other goods and services that result from the direct spending.

**Induced Effects:** The economic activity created when workers from both the direct and indirect effects spend their wages on goods and services.

**Intermediate Inputs:** Repeating everyday materials required to make a final product. Intermediate inputs are purchases of nondurable goods and services such as energy, materials, and purchased services that are used for the production of other goods and services, rather than for final consumption. They do not include any capital-account purchases or labor.

**Jobs:** The job impact counts are supported in the case of construction and created in the case of operations within the region that would result from this Project. Direct jobs are a model input. IMPLAN calculates indirect and induced job impact estimates resulting from the Project. See Appendix A for an explanation of direct, indirect, and induced impacts.

Note that IMPLAN jobs are not equivalent to full-time employment. In IMPLAN, one job lasting 12 months = two jobs lasting 6 months each = three jobs lasting 4 months each. A job can be either full time or part time. Although IMPLAN jobs are not technically equivalent to full-time employment, they are effectively full-time equivalent for the industries modeled in this report.

**Labor Income:** The total value of all forms of employment income paid throughout a defined economy during a specified period of time. It reflects the combined cost of total payroll paid to employees (e.g., wages and salaries, benefits, payroll taxes) and payments received by self-employed individuals and/or unincorporated business owners (e.g., capital consumption allowance) across the defined economy. Note that IMPLAN's estimated Employee Compensation and Proprietor Income fields represent the average payroll values for all employees that work in a firm, across all industries that report in the Project area's region.

**Other Property Income (OPI):** All money collected by an industry that is not paid into the operations of the company. This would include profits, capital consumption allowance, payments for rent, royalties, and interest income. This is also known as Gross Operational Surplus.

**Output:** The value of production by industry in a calendar year. Total output is the sum of labor income, OPI, TOPI, and intermediate inputs.

**Taxes on Production and Imports, Net of Subsidies (TOPI):** This impact category includes sales tax, property tax, motor vehicle taxes, severance, excise, assessments, custom duties, and other taxes and fees, less government subsidies. Because TOPI is net of subsidies, it can be negative for a given industry in a given year if that industry received more subsidies from the government than it paid out in these specific taxes in that year. *TOPI does not include all taxes paid by an industry.* For example, social insurance taxes are a part of employee compensation, and profits taxes are part of OPI.

**Total Output:** The gross total value of all sales and production. Total output is a broader measure than gross domestic product (GDP). Output is the value of an industry's production, and includes GDP and intermediate inputs that are associated with it.

# 1 Introduction

## 1.1 Purpose

Adapture Solar Development, Inc./Haynach Solar, LLC (Applicant) is proposing to construct and operate a 110 megawatt (MW) solar photovoltaic and 110 MW, 4-hour, battery energy storage system (BESS) and substation known as the Haynach Solar Hybrid Project (Project). The solar energy facility would be installed on approximately 1,109 acres of private land in Alamosa County, Colorado. The county requires a 1041 permit for site selection and construction of major facilities of a public utility.

The purpose of the report is to show how the economy and culture of the county and region would be impacted by constructing and operating the Project. This report characterizes the demographic and socioeconomic conditions of Alamosa County and estimates the economic impacts of construction and operations activities. Developing the facility would produce new sources of revenue and fiscal benefits for Alamosa County and applicable special districts. Estimates of the revenue generating capacity are provided. Assessments of public services are also provided including fire and emergency response, law enforcement, medical facilities, and school district. Barr Engineering Co (Barr), Haynach Solar, LLC's project lead consultant, contracted Triple Point Strategic Consulting LLC to prepare this socioeconomic assessment for the Project.

## 1.2 Project Overview

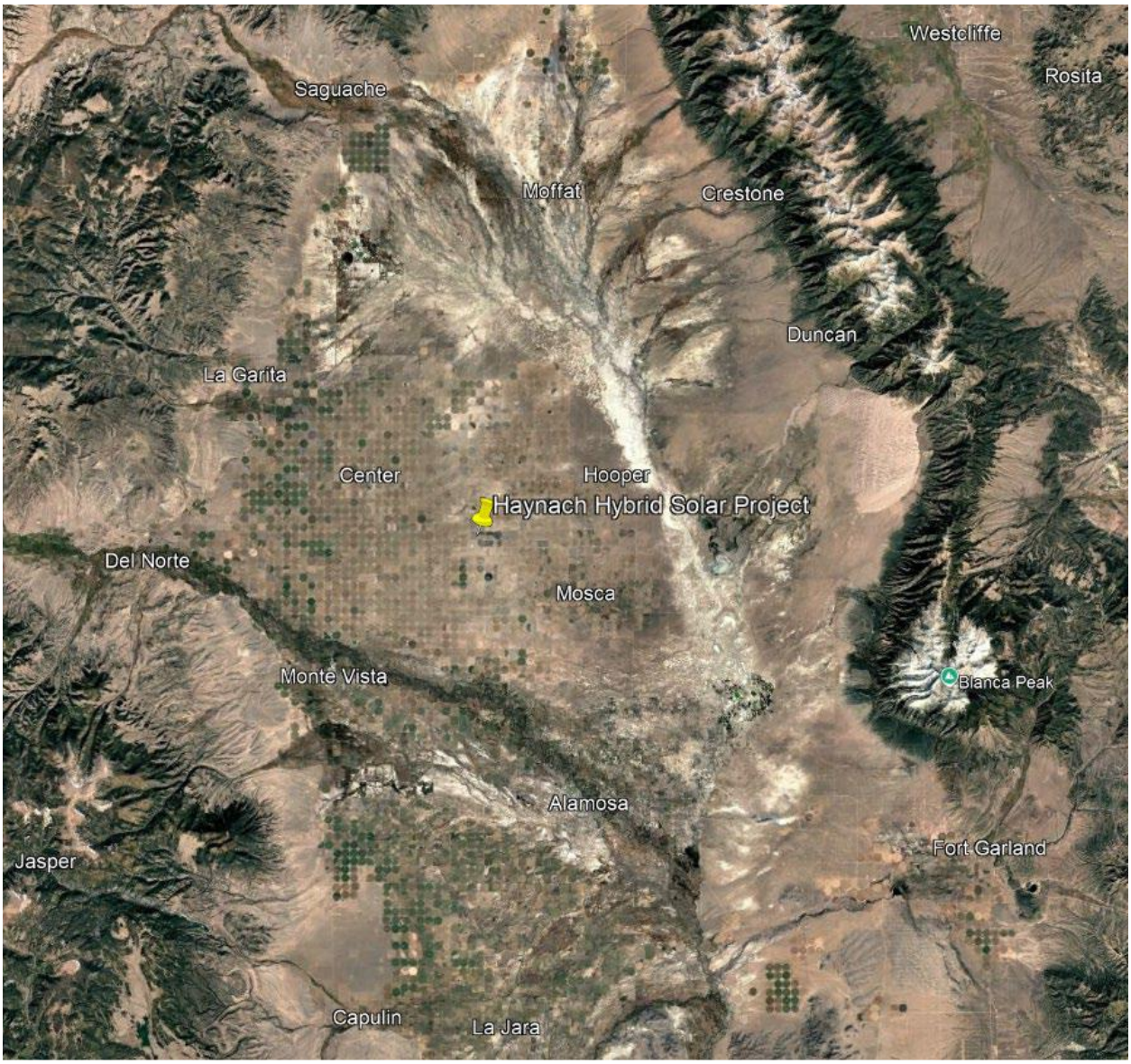
We assume the Project would be constructed over 16 months beginning in the fourth quarter of 2028, followed by 40 years of operations. The first full year of operations is projected to be 2031.

The Project would produce approximately 330,039 megawatt hours (MWh) annually of emissions-free electricity and would store and provide approximately 440 MWh of energy storage capabilities to the grid. The facility would require construction of an on-site collector substation and a new 230 kilovolt (kV) generation-tie (gen-tie) line to connect with the existing Tri-State Generation and Transmission Association (Tri-State) and Public Service Company of Colorado (PSCo) San Luis Valley Substation.

## 1.3 Project Location

The Project would be located in unincorporated Alamosa County, approximately 17 miles northwest of Alamosa, Colorado (Figure 1-1). This report delineates Alamosa County as the primary impact area (socioeconomic environment). Impacts to surrounding counties and the state are provided secondarily.

The proposed facility would be located 0.4 mile north of the existing San Luis Valley Substation, jointly owned and operated by Tri-State and PSCo. The Project would be interconnected to the San Luis Valley Substation via an approximately 0.4-mile-long, 230 kV gen-tie transmission line. This substation is located on the northwest corner of Eightmile Lane and East County Road 102 N. An existing solar facility, Hooper Solar, is immediately adjacent and south of the proposed project approximately 5.5 miles southwest of the community of Hooper, Colorado.




Source: Adapture Renewables/Haynach Solar, LLC

**Figure 1-1. Haynach Solar Hybrid Project in the San Luis Valley**

## 1.4 Data Sources and Methodology

In order to assess the socioeconomic characteristics of Alamosa County and local public services, a variety of documents and publications have been reviewed from local, state, federal, academic, nonprofit, and other private organizations. A list of primary organizations is shown below, with specific citations provided throughout the report.

- Colorado State Demography Office (SDO)
- Colorado Department of Local Affairs (DOLA)
- IMPLAN
- Alamosa County
- U.S. Census Bureau

Economic impacts are modeled using the IMPLAN system, which is described in Section 7 along with specific methodology adopted for this analysis. The fiscal impacts analysis includes results estimated using the state-assessed property tax template provided by the Colorado DOLA.

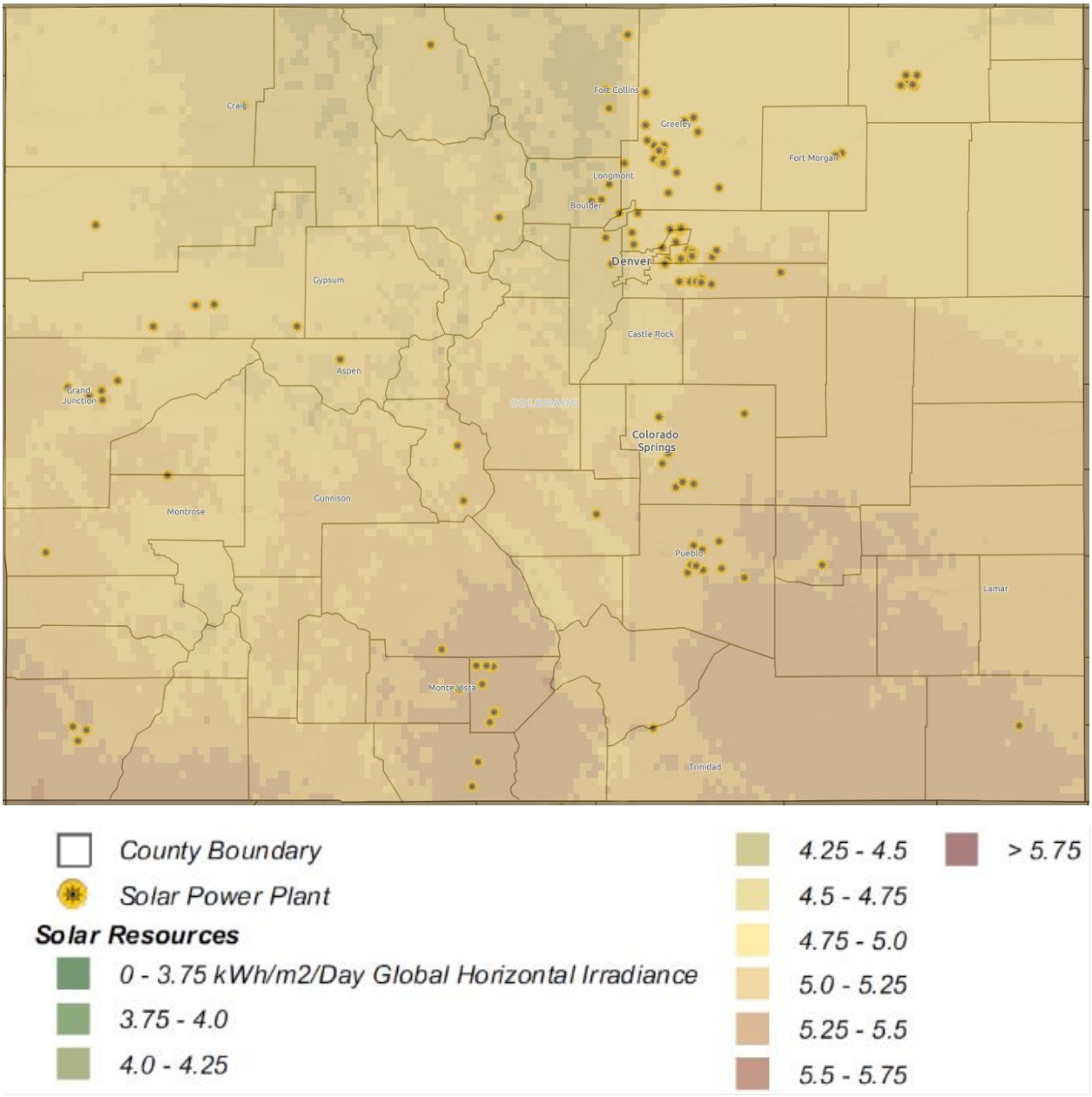
Unless otherwise noted, the information presented throughout this report is based on 2023 Census data (the most current data available), including dollar figures in 2023 dollars. Projected project costs, budgets, and impact estimates are presented in 2025 dollars.

# 2 Solar Energy in Colorado

Colorado has become a leader in utility scale solar photovoltaic (PV) development, leveraging its high levels of solar irradiance with supportive state policies to encourage solar PV growth (Figure 2-1). According to the U.S. Energy Information Administration (EIA) (2024), Colorado ranked 11th in the United States for utility-scale solar power generating capacity in 2023, with 1,294 MW installed. An estimated 1,722 additional MW are expected to be installed by the end of 2024. A significant portion of Colorado's solar resources is concentrated in southern Colorado, near the New Mexico border. Nationally, over 50 percent of new U.S. grid capacity installations in 2023 came from solar energy (Gilbert, Hoen and Gagarin 2024).

According to the Solar Energy Industries Association (2024), 10.8 percent of Colorado's electricity is produced from solar power. Prices for solar have fallen by 43 percent in the last 10 years, while solar investment has reached $8 billion. Colorado's 414 solar companies, which include 40 manufacturers, 195 installers, and 179 "other" companies, employ 8,177 people. Note that this includes utility, commercial, and residential.

Since 2010, the installed costs for utility-scale PV have decreased by approximately 75 percent, an average 10 percent annual reduction. In 2023, the capacity-weighted average cost was $1.43 per watt alternating current (Wac), down from $1.56 per Wac in 2022 (Gilbert, Hoen and Gagarin 2024) (Energy Technologies Area, Berkeley Lab 2024). These cost reductions are accurate despite correcting for strong inflationary pressures. For larger solar projects ranging from 100 MW to 700 MW, the cost is approximately $1.05 per watt direct current (Wdc) for the nation.




Source: EIA.

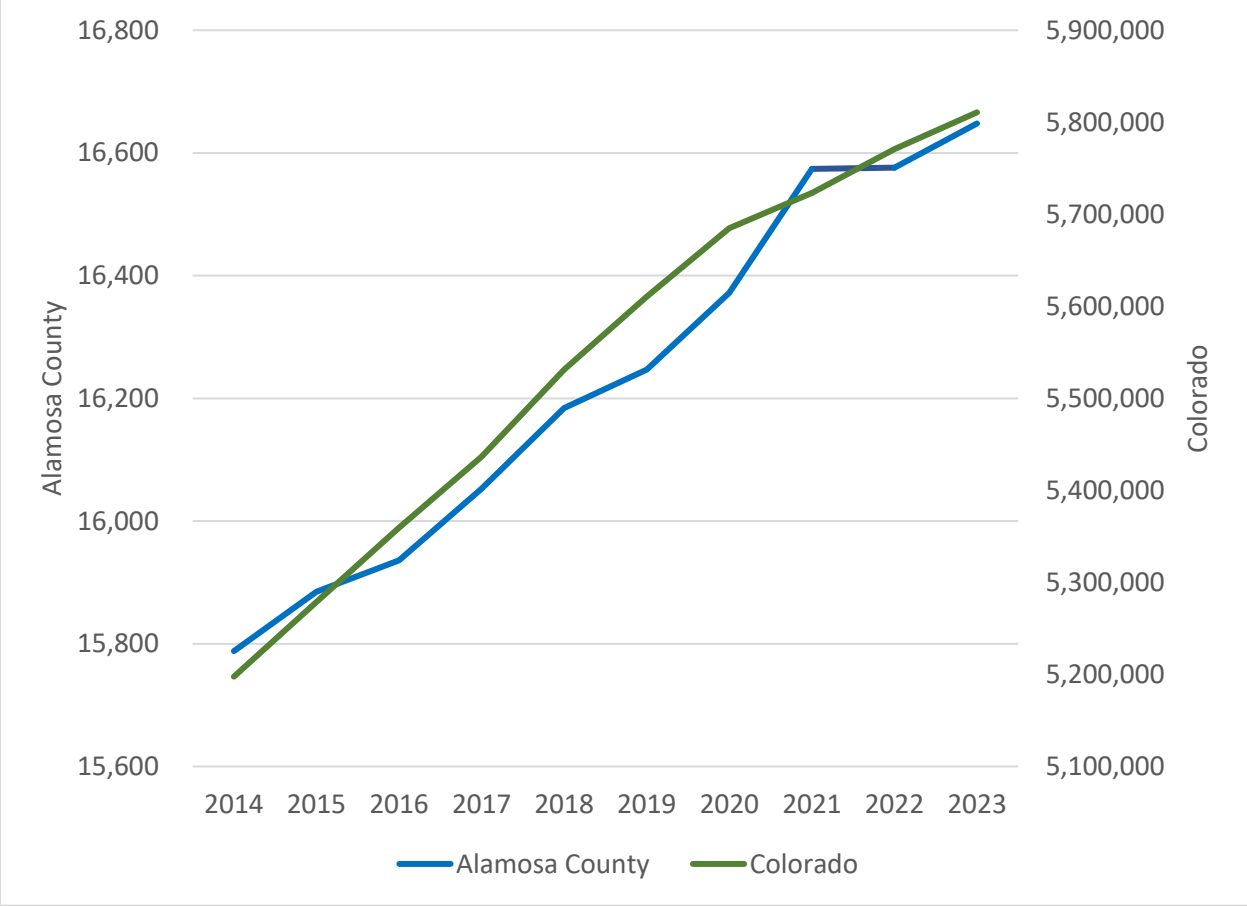
**Figure 2-1. Colorado Solar Power Plants and Irradiance**

# 3 Demographics

This section describes the demographic profile and trends of Alamosa County, a rural county in southern Colorado covering 723 square miles. The description of the local demographic and community trends focuses on several measures of population, household composition, race, age, and education. Every attempt has been made to provide the most current data available, however, much of the data presented is sourced from the Colorado SDO and the U.S. Census, which is generally available through 2023.

## 3.1 Population

The population of Alamosa County was 16,648 in 2023, or about 23 residents per square mile. Figure 3-1 shows the county's population has grown consistently for the past 10 years (U.S. Census Bureau 2024). From 2014 through 2023, the county's population grew at an average annual rate of 0.6 percent (Colorado Department of Local Affairs 2024).



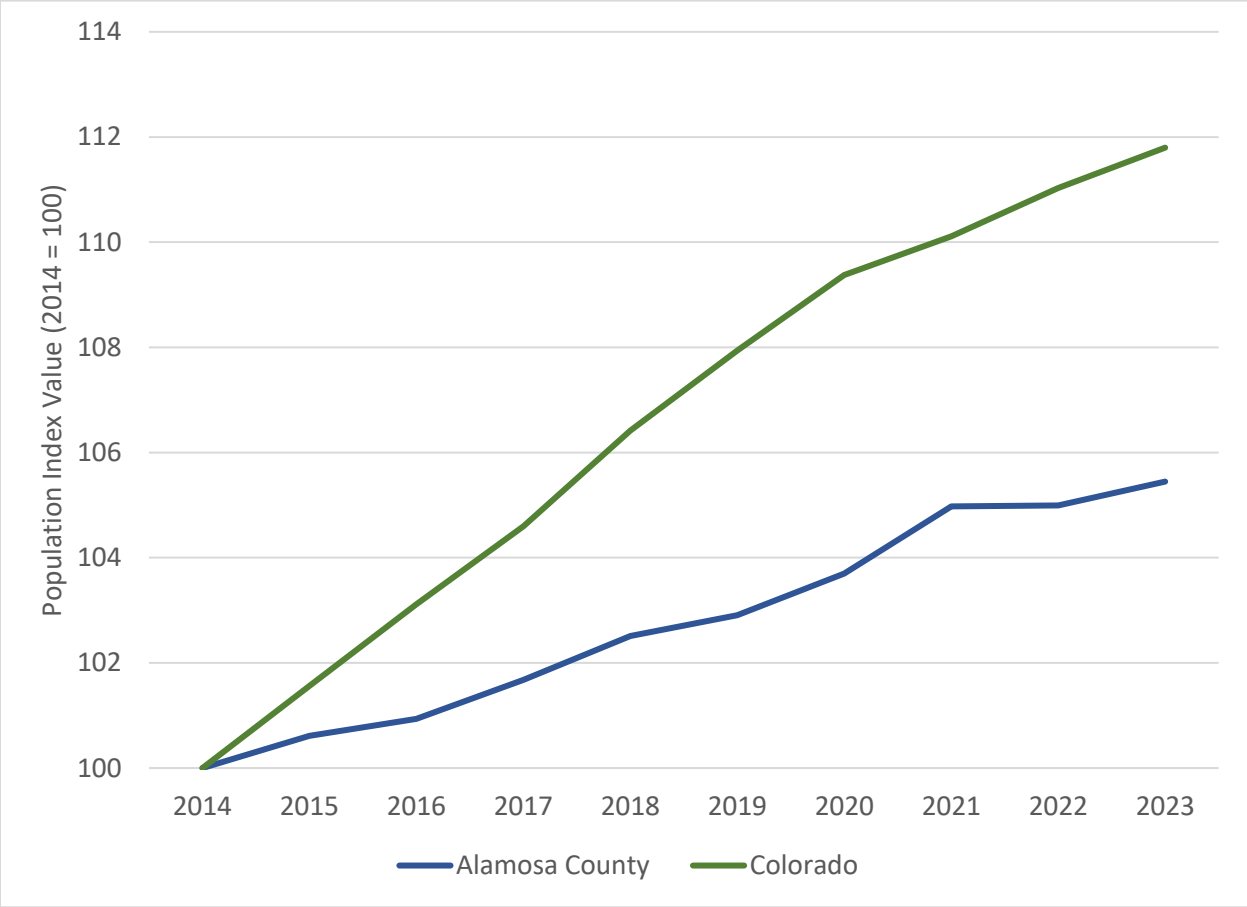

Source: American Community Survey (ACS), Colorado SDO.

**Figure 3-1. Alamosa County and Colorado Population Growth, 2014 - 2023**

## 3.2 Population Growth Rates

Figure 3-2 illustrates population trends for both Colorado and Alamosa County, with the data indexed to the year 2014 to highlight relative trends between the two regions more clearly. The graph reveals a steady increase in Colorado's population over time at an annual average growth rate of 1.2 percent. Alamosa County's population has grown, but at half the rate of the state. The SDO forecasts the population growth rate to gradually decline from 0.3 percent in 2024 to 0.1 percent by 2050, when the county population is estimated to be 17,652.

Indexing numerical data allows for quick comparison and is common in economic and financial analysis. By normalizing data to a common starting point, the relative rate of change of variables over time is easily observed. Indexing enhances perspective of economic trends.

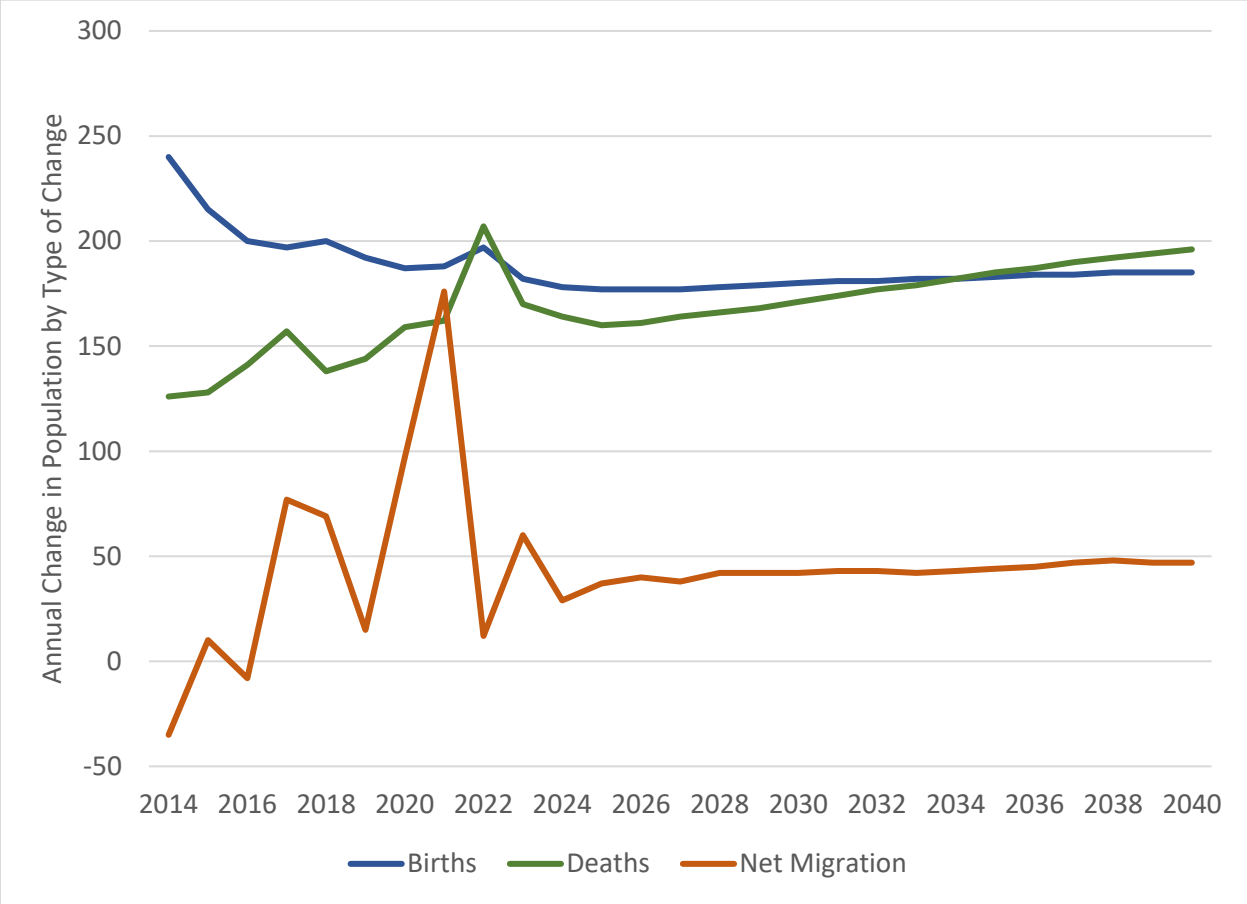



Source: ACS, Colorado SDO.

**Figure 3-2. Alamosa County and Colorado Population Growth, 2014 - 2023**

## 3.3 Population Components of Change

Population change is a function of births, deaths, and net migration. The rate of natural increase is calculated as births minus deaths and rises when births outpace deaths. Net migration increases population when the number of people moving into an area exceeds the number moving away. Since 2017, Alamosa County's population has grown on the basis of natural increase and net migration (Figure 3-3).




Source: Colorado SDO.

**Figure 3-3. Components of Alamosa County Population Change, 2014 - 2050**

Table 3-1 shows the counties having the greatest effect of population growth from 2016 to 2020 (U.S. Census Bureau 2023). Much of the increase was from people migrating from other rural, southern Colorado counties.

**Table 3-1. Top 10 Positive Net Migration Origins**

| County | State | In-Migration | Out-Migration | Net |
|---|---|---|---|---|
| Colorado | Rio Grande County | 251 | 83 | 168 |
| Colorado | Custer County | 99 | 0 | 99 |
| Florida | Miami-Dade County | 93 | 0 | 93 |
| Utah | Weber County | 85 | 0 | 85 |
| Colorado | El Paso County | 75 | 11 | 64 |
| Colorado | Las Animas County | 61 | 0 | 61 |
| Colorado | Jefferson County | 78 | 18 | 60 |
| Ohio | Jefferson County | 59 | 0 | 59 |
| Colorado | Boulder County | 53 | 0 | 53 |
| Colorado | Garfield County | 81 | 29 | 52 |

Source: U.S. Census.

Table 3-2 shows the counties having the greatest effect of population decline from 2016 to 2020 (U.S. Census Bureau 2023). While Saguache County, adjacent to the north, received the most out-migration from Alamosa County, many people migrated out of Colorado.

**Table 3-2. Top 10 Negative Net Migration Destinations**

| County | State | In-Migration | Out-Migration | Net |
|---|---|---|---|---|
| Colorado | Larimer County | 52 | 79 | −27 |
| Wisconsin | Rock County | 0 | 28 | −28 |
| Florida | Lee County | 0 | 33 | −33 |
| Missouri | Greene County | 0 | 34 | −34 |
| California | Orange County | 0 | 35 | −35 |
| Colorado | Mesa County | 0 | 38 | −38 |
| Missouri | Cape Girardeau County | 0 | 57 | −57 |
| Colorado | Denver County | 24 | 87 | −63 |
| Texas | Galveston County | 0 | 98 | −98 |
| Colorado | Saguache County | 49 | 219 | −170 |

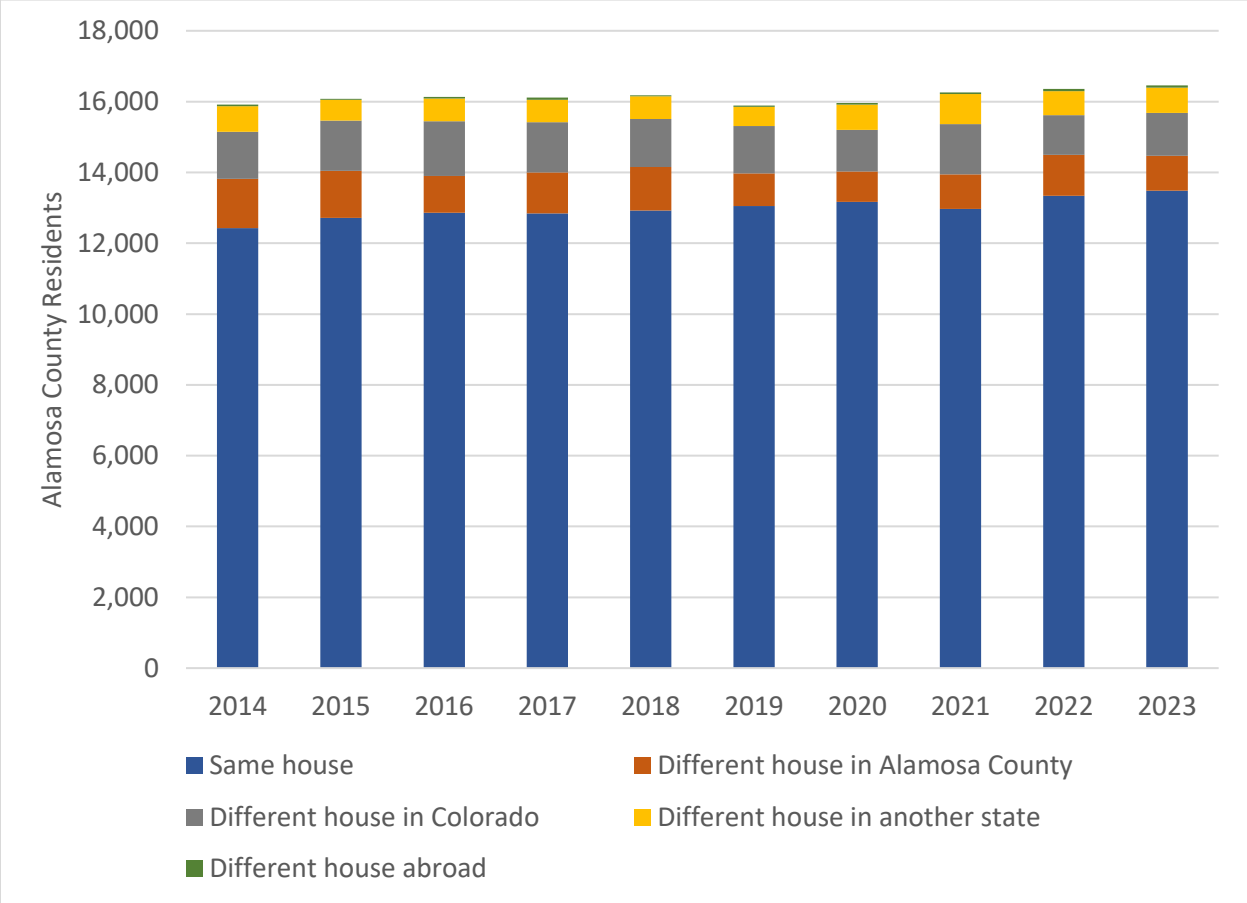
Source: U.S. Census.

## 3.4 Population Mobility

Figure 3-4 shows the mobility of the county's population from one year to the next, based on surveying the location of residents' residence in the previous year. Increased mobility is an indication of economic activity and opportunity, as well as an indication of population change.

In 2023, 12 percent of Alamosa County's population had lived outside the county in the previous year—almost unchanged from 2014. Thirty-nine percent of the in-migration came from outside Colorado in 2023.

Figure 3-4 also shows Alamosa County residents are now moving less within the county than a decade prior, indicating a tight housing market. In 2014, almost 9 percent of county residents moved within the county; by 2023, the share had fallen to 6 percent. Greater mobility corresponds to and supports more economic diversity and growth.

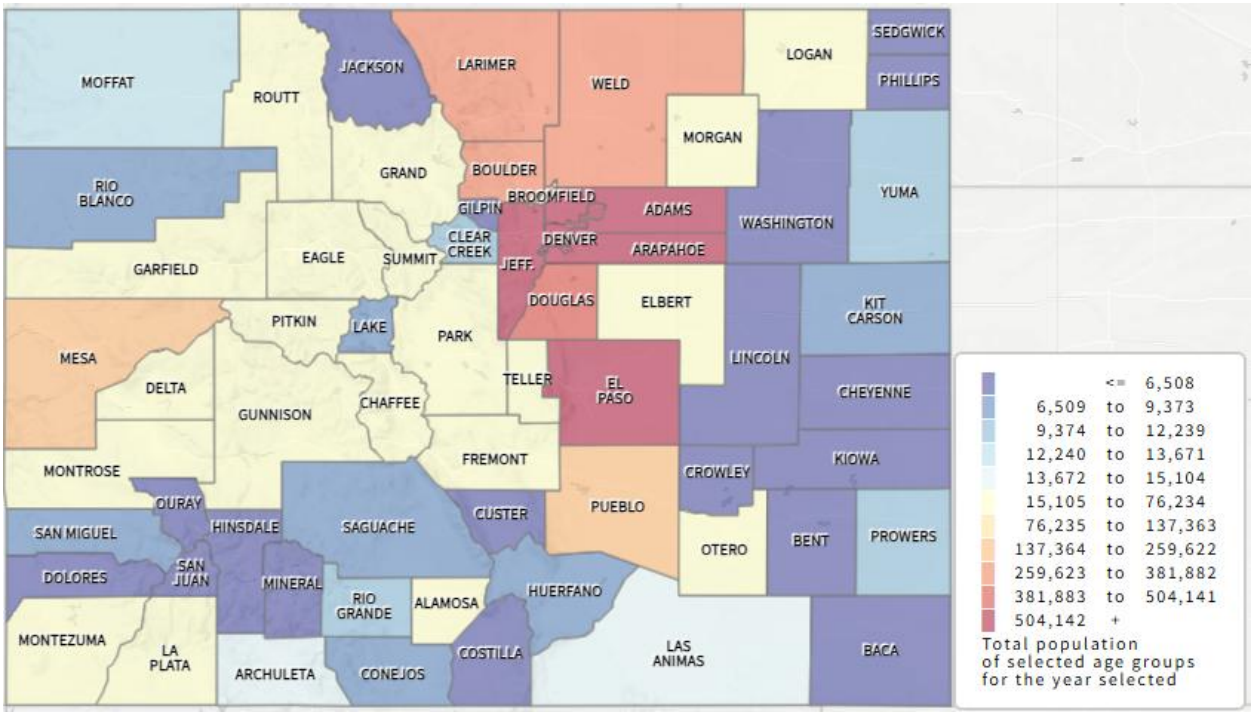



Source: U.S. Census.

**Figure 3-4. Residence of Alamosa County's Population "One Year Ago," 2014 to 2023**

## 3.5 Population Density

Figure 3-5 shows that Alamosa County is surrounded by sparsely populated counties. In addition to the local workforce in Alamosa and the neighboring San Luis Valley counties, the Project could draw workers from the urban Front Range who would live in the area temporarily and commute home on weekends, as well as workers from farther distances who would reside in the area temporarily.




Source: Colorado SDO.

**Figure 3-5. Colorado Total Population Heat Map**

## 3.6 Household Composition

Table 3-3 shows Alamosa County's evolving household composition trends from 2013 to 2023. The share of single male householder families increased from 3 to 8 percent, while the share of married couple families fell by 6 percentage points.

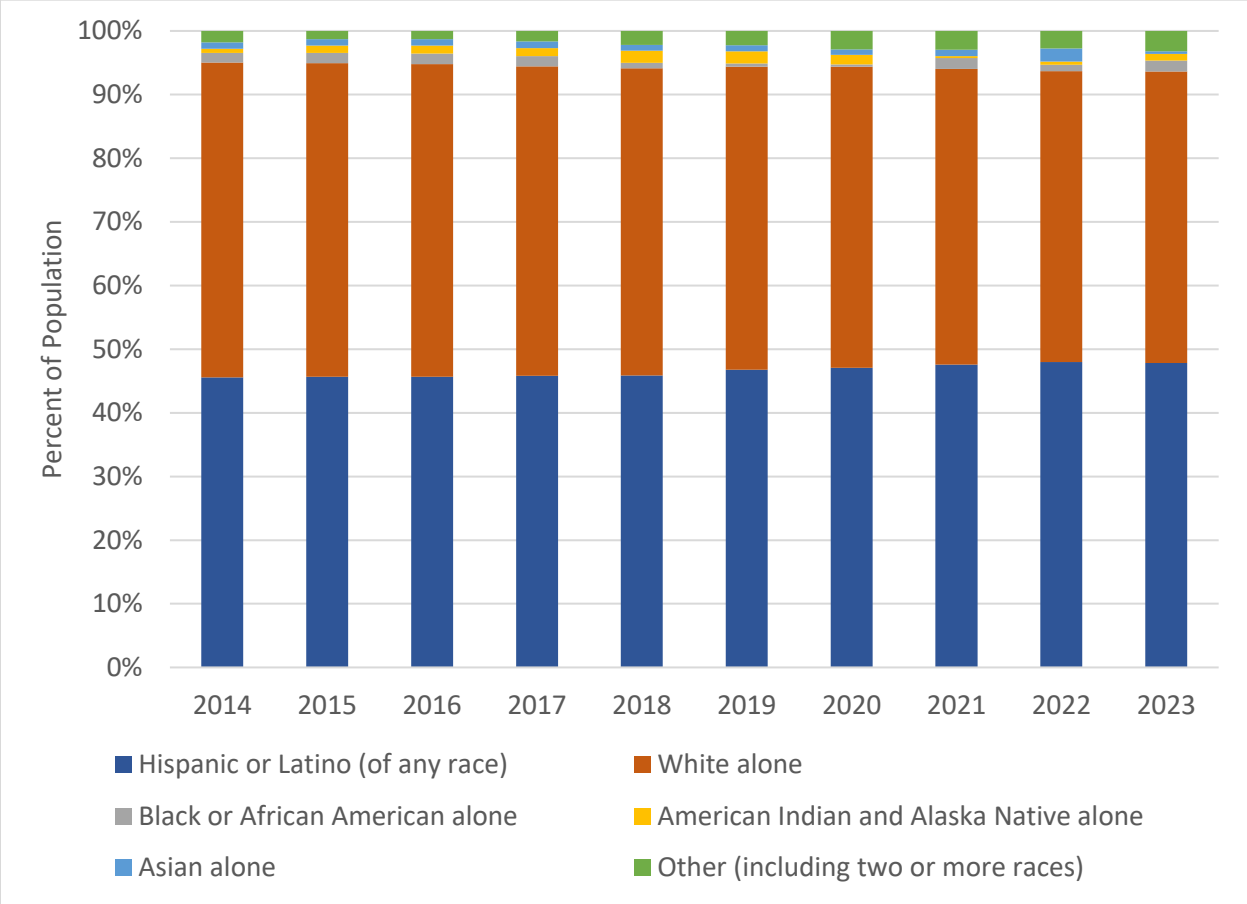
**Table 3-3. Alamosa County Household Composition, 2013, 2018, and 2023**

| Household Type | 2013 | Percent | 2018 | Percent | 2023 | Percent |
|---|---|---|---|---|---|---|
| Family married couples | 2,668 | 45% | 2,701 | 44% | 2,592 | 39% |
| Family single male householder | 206 | 3% | 309 | 5% | 538 | 8% |
| Family single female householder | 718 | 12% | 464 | 8% | 856 | 13% |
| Nonfamily, alone | 1,941 | 32% | 2,032 | 33% | 2,059 | 31% |
| Nonfamily, not alone (roommates, etc.) | 460 | 8% | 647 | 11% | 525 | 8% |
| **Total** | **5,993** | **100%** | **6,153** | **100%** | **6,570** | **100%** |

Source: U.S. Census.

## 3.7 Race and Ethnicity

Figure 3-6 shows the region's population growth by race and ethnicity categories. Over the past 10 years, the population slowly transitioned from majority white to majority Hispanic or Latino. In 2014, the population was 49 percent white and 46 percent Hispanic or Latino. By 2023, the population was 48 percent Hispanic or Latino and 46 percent white. Other races combined increased from 5 to 6 percent over the time period.

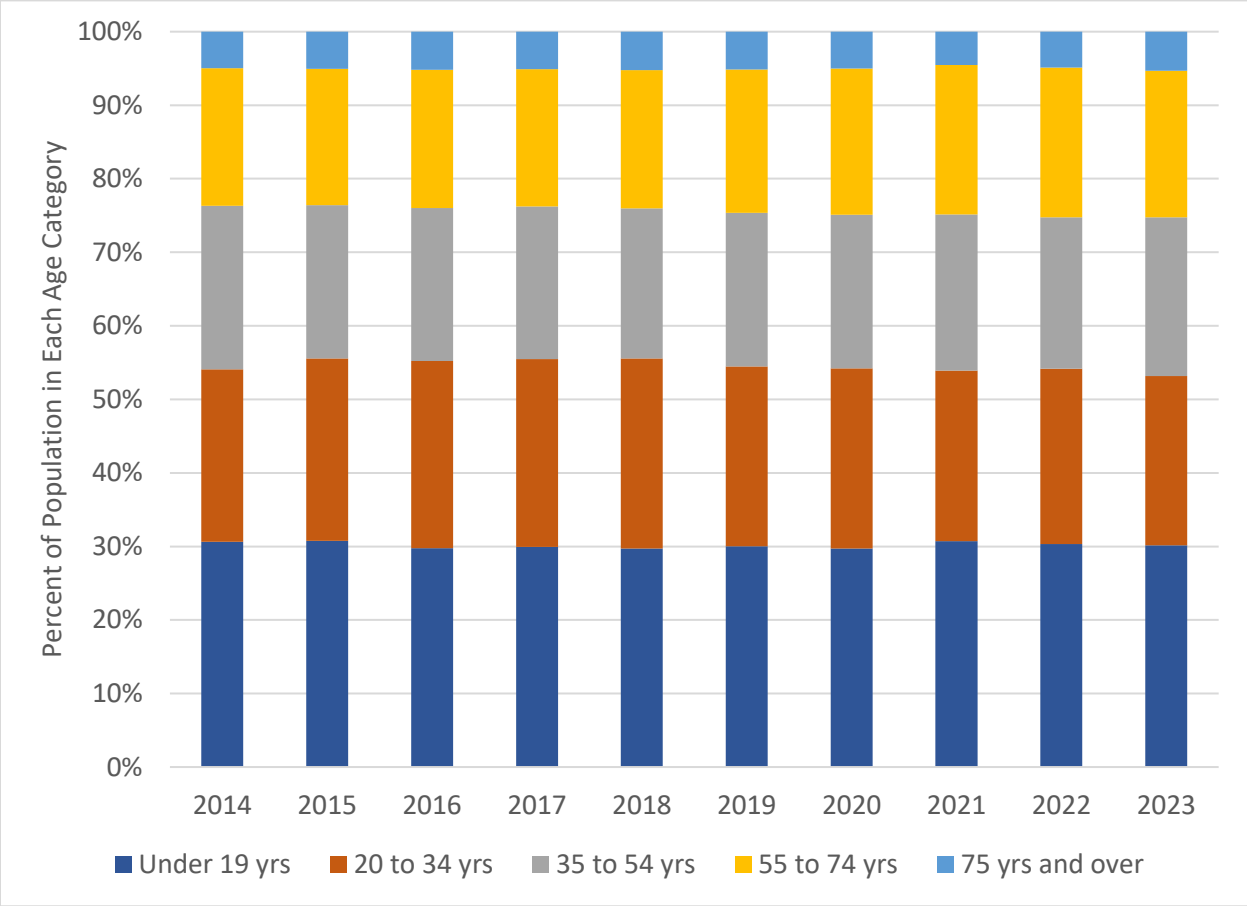



Source: U.S. Census.

**Figure 3-6. Alamosa County Population by Race and Ethnicity, 2014 to 2023**

## 3.8 Age Distribution

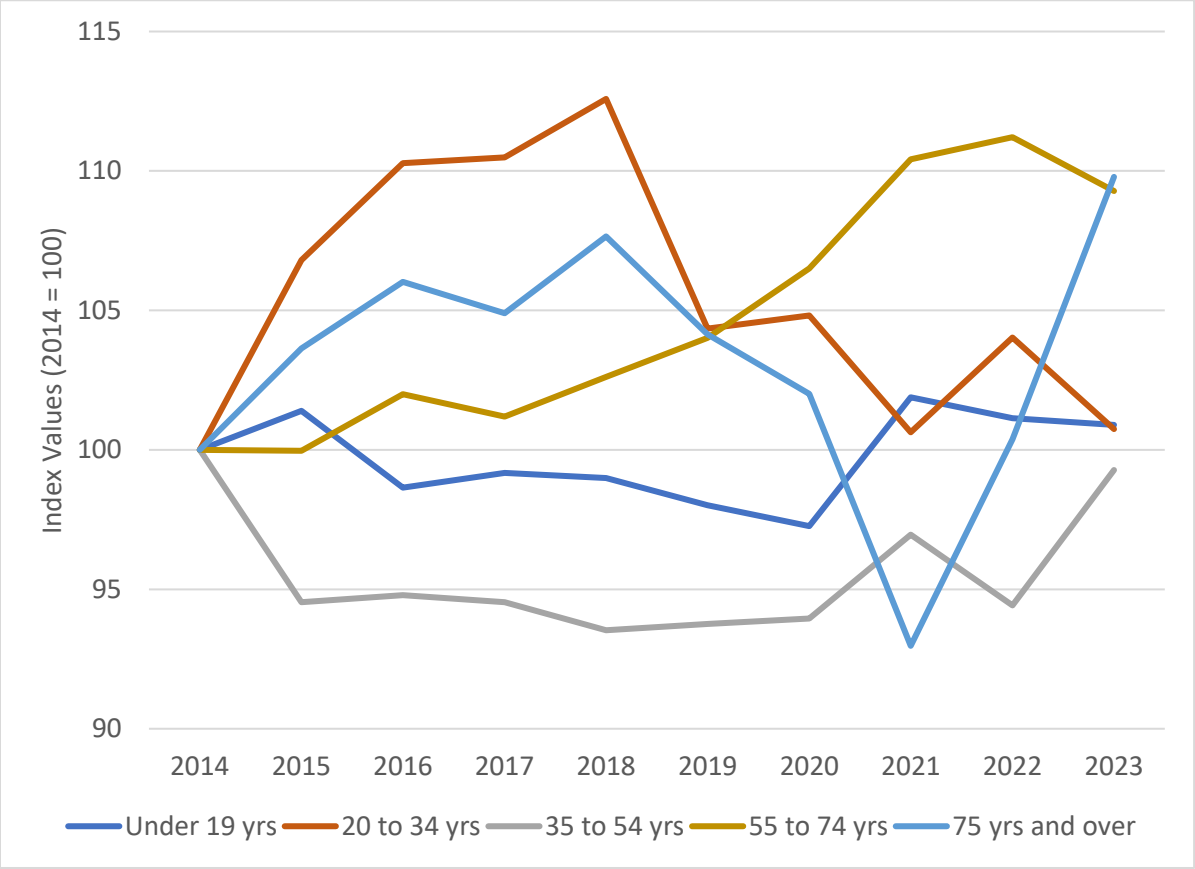
Figure 3-7 shows the age class distribution of Alamosa County from 2014 to 2023. The county's population is an aging population; the median age increased from 30.8 to 33.1 over this period. From 2014 to 2023, the share of the population 55 years and older increased from 23.7 to 25.2 percent.




Source: U.S. Census.

**Figure 3-7. Alamosa County Age Distributions, 2014 - 2023**

Figure 3-8 show the aging trends as an index chart. By 2023, the populations of the two oldest age categories had increased by about 10 percent. The number of people in the younger categories remained unchanged.




Source: U.S. Census.

**Figure 3-8. Alamosa County Age Distribution Trends, 2014 - 2023**

## 3.9 Education Levels

Table 3-4 compares the educational characteristics of Alamosa County to Colorado as of 2023. Almost 90 percent of the county's population 25 years and older have a high school degree or higher. The share of households with a broadband internet subscription was 90 percent, two percentage point greater than the state, and an increase from 75 percent prior to the pandemic in 2019.

**Table 3-4. Alamosa County Educational Attainment and Internet Access**

| Education Characteristics | Colorado | Alamosa County |
|---|---|---|
| Percent with High School or Higher Degree | 92% | 89% |
| Percent with Bachelor's or Higher Degree | 41% | 29% |
| Percent with broadband internet subscription | 88% | 90% |

Source: U.S. Census.

# 4 Alamosa County Economy

According to the economic impact analysis for planning (IMPLAN) data, the total gross domestic product (GDP) of Alamosa County was just over $1 billion and total economic output was $1.8 billion in 2023 (IMPLAN Group LLC 2024). There are 181 industries operating in the county.

## 4.1 Primary Industries

Table 4-1 lists the top 15 industries in Alamosa County (IMPLAN Group LLC 2024) as measured by total economic output. The top 2 industries are Hospitals and Vegetable Farming. The Other Real Estate category includes the value of operations for residential property managers, lessors of nonresidential buildings, and offices of real estate agents and brokers (offering services other than residential leasing) (Lucas 2020).

**Table 4-1. Top 15 Alamosa County Industries by Total Economic Output**

| Industry | Total Output | Employment | Labor Income | Avg Labor Income/ Employment |
|---|---|---|---|---|
| Hospitals | $148,813,300 | 759.2 | $67,176,606 | $88,480 |
| Vegetable and melon farming | $110,472,346 | 532.1 | $7,584,753 | $14,256 |
| Insurance carriers | $106,668,857 | 220.4 | $21,150,332 | $95,968 |
| Electric power transmission | $84,720,539 | 63.7 | $8,626,770 | $135,407 |
| Monetary authorities | $52,650,595 | 158.3 | $11,543,842 | $72,933 |
| Other real estate | $48,209,860 | 319.0 | $7,688,188 | $24,098 |
| State government - education | $44,811,655 | 820.3 | $39,048,308 | $47,602 |
| Limited-service restaurants | $43,892,431 | 405.4 | $10,533,582 | $25,981 |
| Full-service restaurants | $34,142,517 | 390.9 | $9,879,449 | $25,275 |
| Tenant-occupied housing | $32,133,513 | 192.1 | $5,098,687 | $26,543 |
| Insurance agencies and brokerages | $31,050,872 | 116.0 | $7,938,592 | $68,442 |
| Local government - other services | $30,199,918 | 499.1 | $25,823,146 | $51,744 |
| General merchandise stores | $30,071,870 | 315.2 | $12,794,155 | $40,597 |
| Local government - education | $28,135,764 | 409.1 | $24,130,316 | $58,990 |
| State government - other services | $26,745,202 | 304.7 | $23,090,468 | $75,793 |

Source: IMPLAN.

## 4.2 Principal Employers by Type and Size

Table 4-2 lists principal employers by type and number of employees operating within Alamosa County.

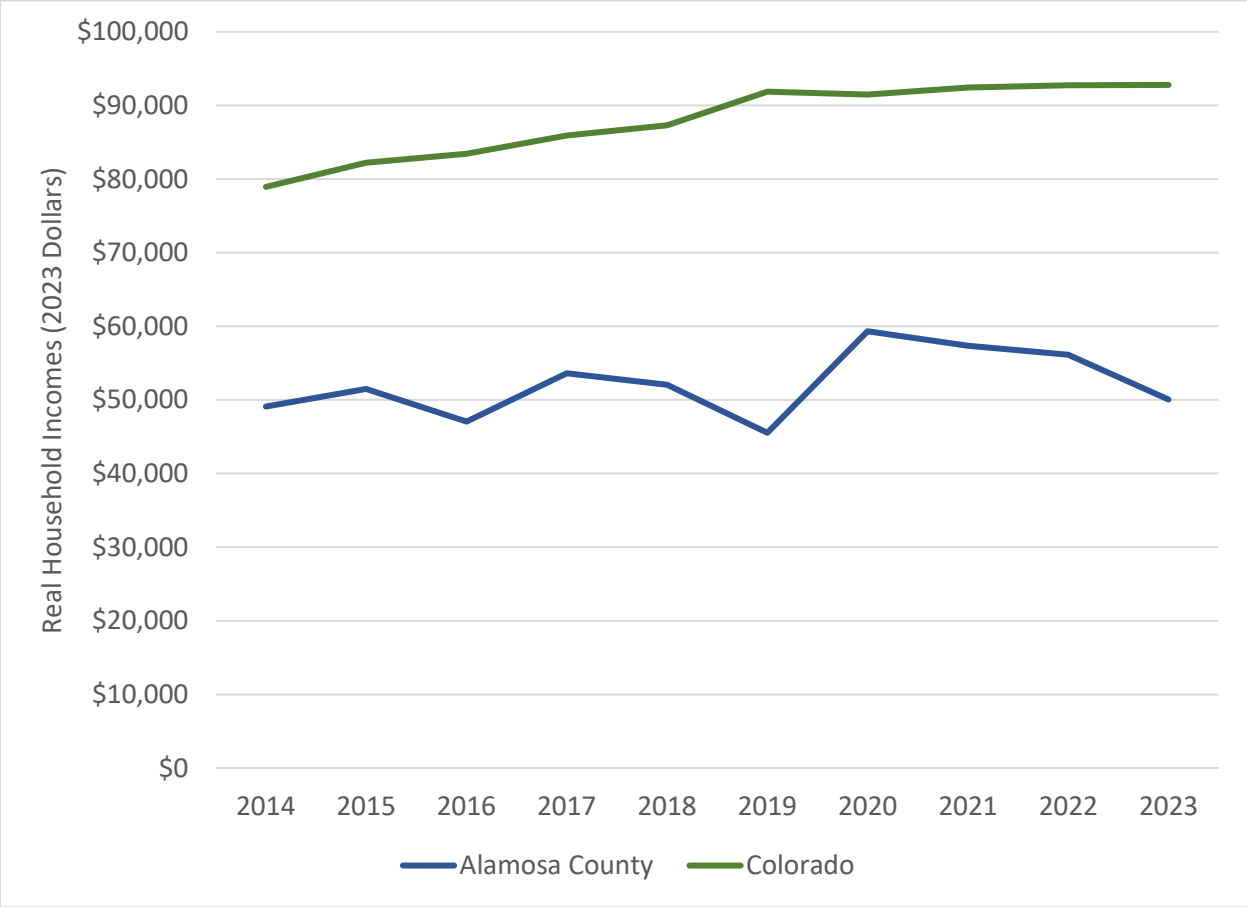
**Table 4-2. Select Employers by Type and Employment**

| Type of Industry | Approximate Industry Employment | Name of Select Businesses |
|---|---|---|
| Health Care & Social Assistance | 1,275 | San Luis Valley Health |
| | | Valley-Wide Health Systems |
| Educational Services | 1,229 | Adams State University |
| | | Alamosa County School District |
| Retail Trade | 1,167 | Walmart |
| | | Alamosa Home |
| | | Treasure Alley |
| | | Big Valley Hobby Town |
| Public Administration | 804 | City of Alamosa |
| | | Alamosa County Government |
| Agriculture | 838 | Proximity Malt |
| | | The Spud Company LLC |
| | | Farm Service Center Co |
| Construction | 659 | Alcon Construction, Inc. |
| | | Van Gieson and Company, Inc. |
| | | SLV Builders, Inc. |
| Accommodation & Food Services | 1,207 | Hampton Inn Alamosa |
| | | Best Western Alamosa Inn |
| | | San Luis Valley Brewing Company |
| | | McDonald's |

## 4.3 Household Income

The U.S. Census Bureau provides annual estimates of income and poverty statistics for all school districts, counties, and states through the Small Area Income and Poverty Estimates (SAIPE) program. SAIPE generally has lower variance for small areas like counties, especially those with populations below 65,000, because it combines ACS data with other sources. For counties, SAIPE typically provides the best single-year estimates of median household income (U.S. Census Bureau 2024).

The median household income in Alamosa County in 2023 was $50,056, significantly below the state median of $92,790. Figure 4-1 compares the county and state median income trends adjusted for inflation. In real 2023 dollars, Alamosa County's median household income only increased by $1,000 from 2014 to 2023.




Source: U.S. Census.

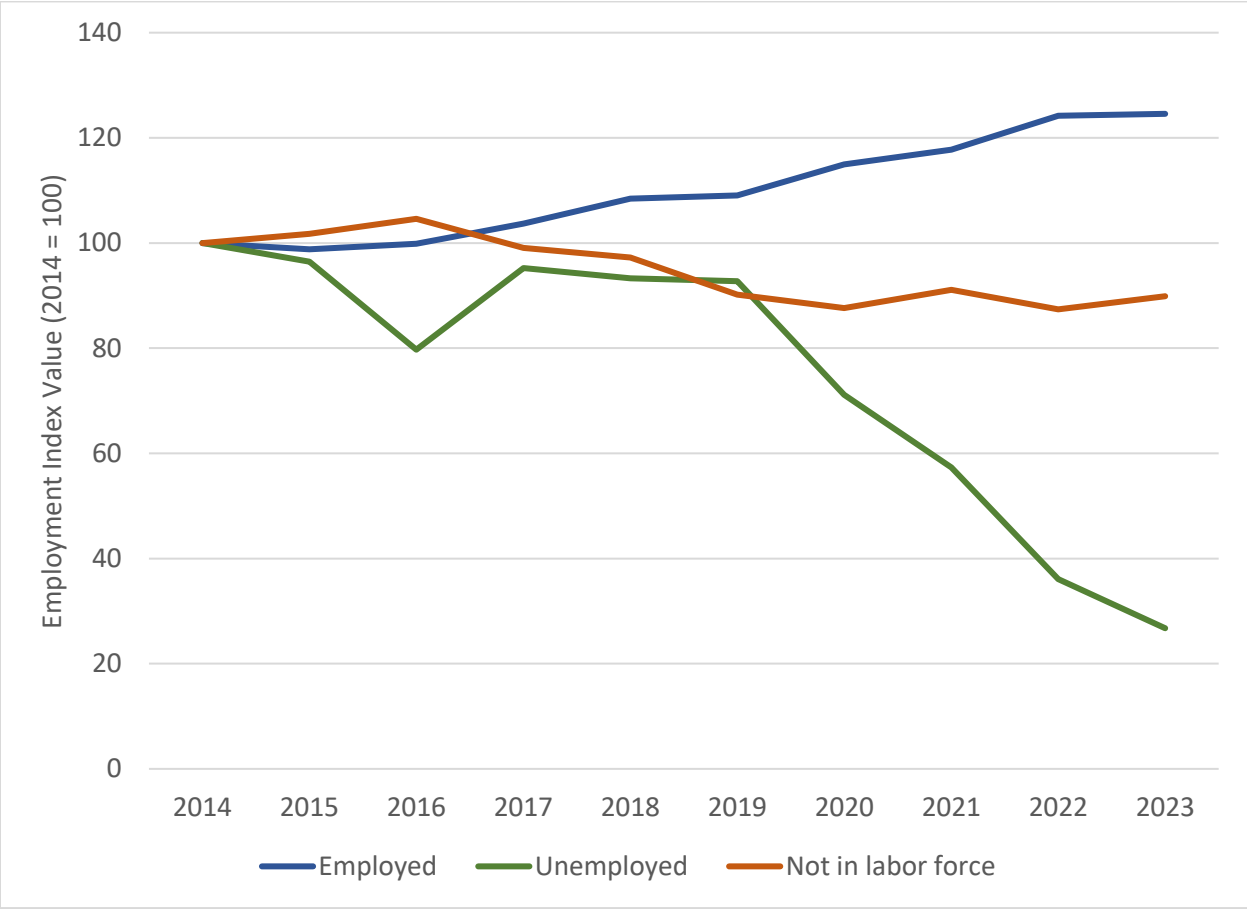
**Figure 4-1. Alamosa County and Colorado Median Household Incomes**

# 5 Employment

This section describes the workforce and current employment within Alamosa County.

## 5.1 Labor Force Trends

The labor force includes individuals who are either employed or actively seeking work. Those without a job but actively seeking employment are classified as unemployed, whereas individuals not seeking work are excluded from the labor force. Over the last decade (from 2014 to 2023), the number of civilian employed persons 16 years and older in Alamosa County increased at an average annual rate of 2.5 percent (Figure 5-1). The number of persons not in the labor force decreased at a rate of 1.1 percent.

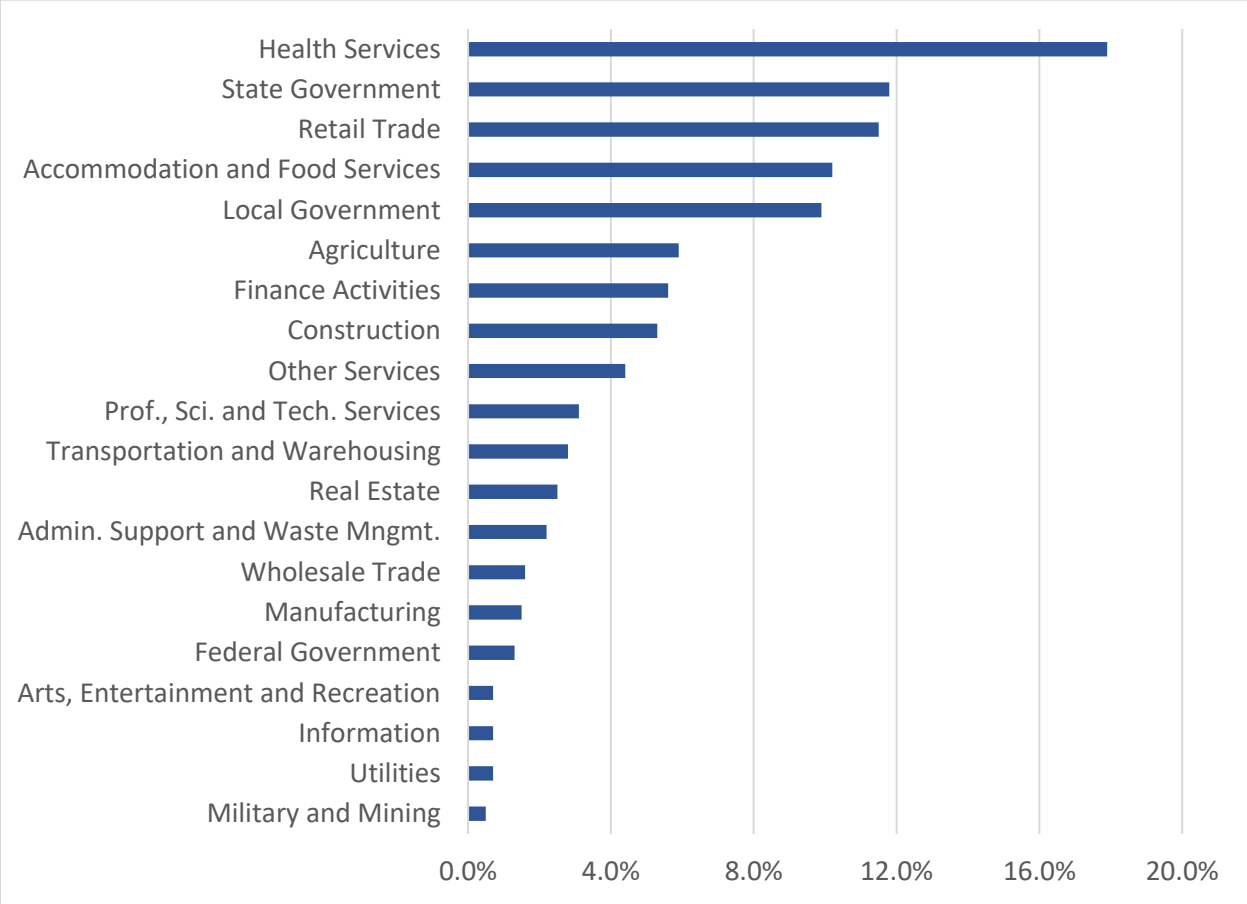



Source: U.S. Census.

**Figure 5-1. Alamosa County Labor Force and Employment**

## 5.2 Employment by Industry

Alamosa County is a regional center for medical services. The Alamosa County population is aging; thus, health services account for the largest share of county jobs. The county is home to Adams State University, which is categorized as State Government employment in Figure 5-2. Hospitality, local government, and agriculture also account for significant shares of county employment (Colorado Department of Local Affairs 2023).



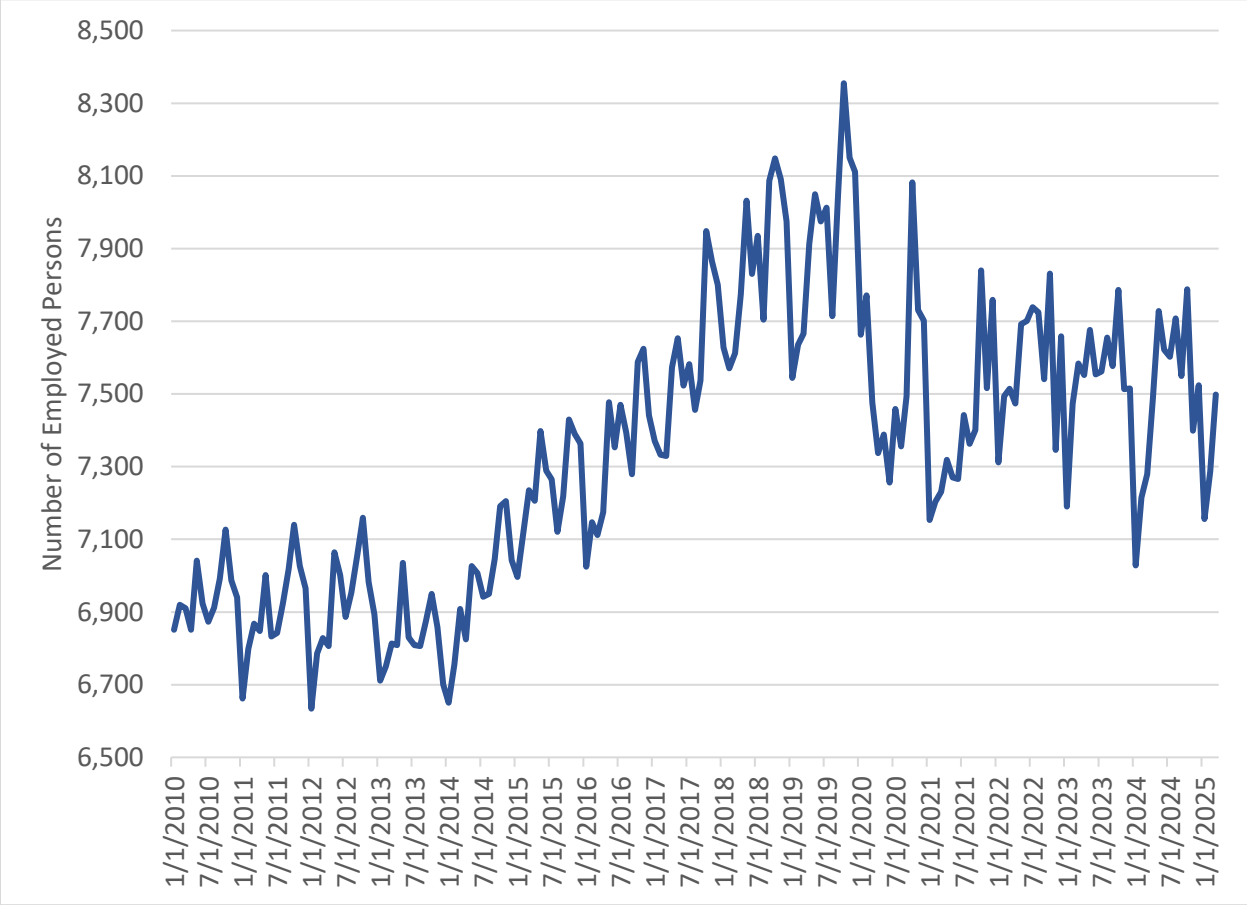

Source: Bureau of Labor Statistics (BLS).

**Figure 5-2. Alamosa County Share of Jobs by Industry**

## 5.3 Current Employment

As of March 2025, there were 7,498 employed persons in Alamosa County (Figure 5-3). Since the pandemic, employment peaked in March 2023 and has declined steadily for the past 2 years. In January 2025, employment dropped by 2.6 percent (U.S. Bureau of Labor Statistics 2025).

In terms of seasonality, employment shows a consistent pattern of peaking in October, falling to a bottom in January, peaking again in May (though not as high as in October), and reaching another bottom in August (though not as low as in January), before peaking again in October. This pattern is consistent with an agricultural economy.




Source: BLS.

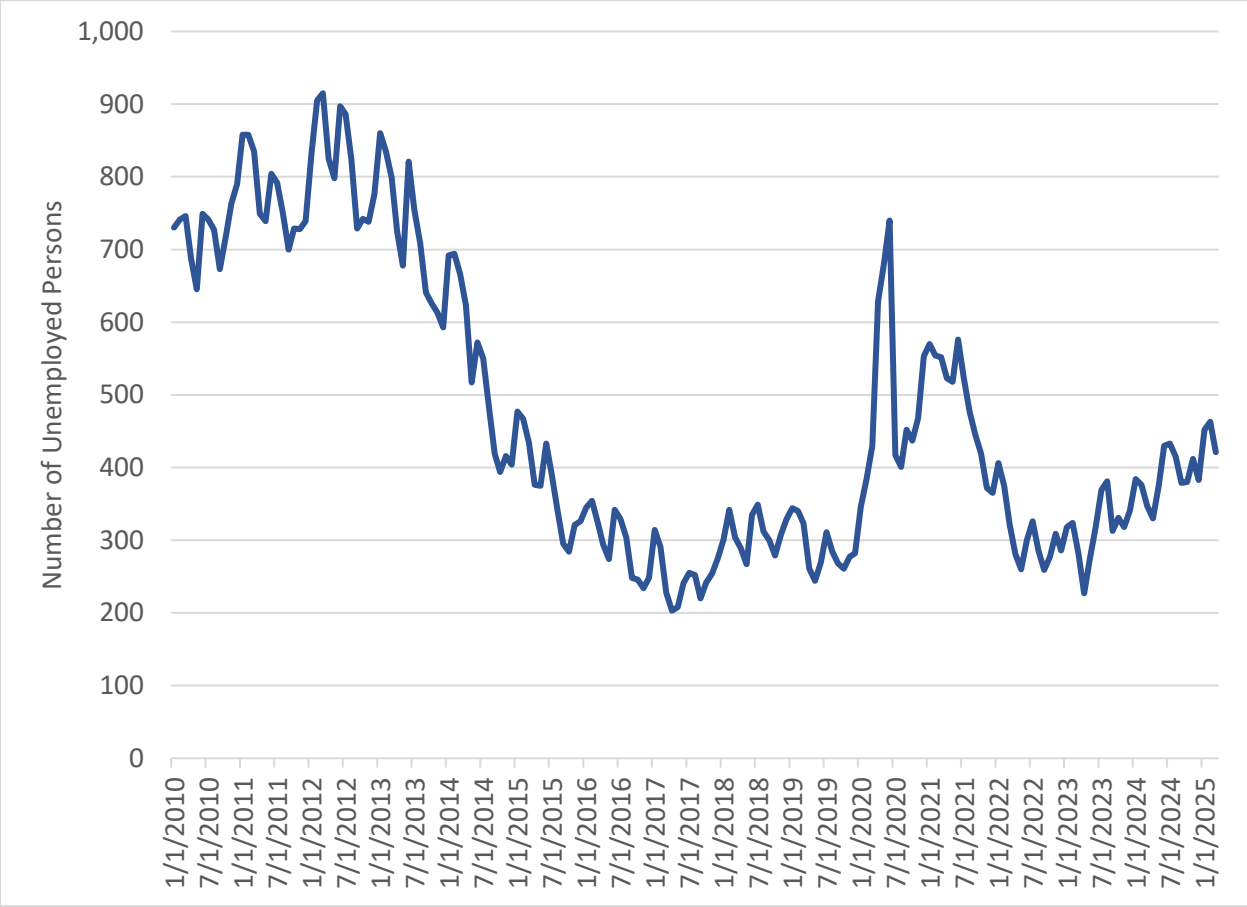
**Figure 5-3. Monthly Employed Persons in Alamosa County**

## 5.4 Current Unemployment

As of March 2025, there were 421 unemployed persons in Alamosa County (Figure 5-4) (U.S. Bureau of Labor Statistics 2025), representing a 5.3 percent unemployment rate (U.S. Bureau of Labor Statistics 2025). After peaking during the pandemic, unemployment fell to a low in April 2023 with only 227 unemployed people. Since then, unemployment has trended upward.

Although the unemployment rate is low, the number of unemployed people is significantly greater than the workforce required to construct the Project, which would offer work opportunities to unemployed persons with specific skills in addition to supporting currently employed persons. Project operations would also provide employment opportunities for some unemployed persons.

Project construction would have a positive impact on employment in Alamosa County and put some downward pressure on the unemployment rate. The Project's operations would not have a significant impact on the unemployment rate.




Source: BLS

**Figure 5-4. Monthly Unemployed Persons in Alamosa County**

## 5.5 Underemployment

Underemployment is defined as a situation where a person is working, but their job does not fully use their skills, education, availability, or earnings potential. Underemployment can take the form of involuntary part-time work, overqualification, or low-wage/unstable work. The Bureau of Labor Statistics (BLS) calculates underemployment at the state level, but no official calculation exists at the county level.

The broadest measure of underemployment is the BLS's U-6 designation, which includes the unemployed, workers employed part-time for economic reasons, and those marginally attached to the labor force (U.S. Bureau of Labor Statistics 2025). The Colorado U-6 unemployment rate for 2024 was 8.1 percent, slightly higher than the nation's 7.5 percent. This number is generally compared to the standard unemployment rate (U-3), which was 4.4 percent in Colorado and 4 percent in the nation in 2024.

In Alamosa County, the U-3 unemployment rate in 2024 was 4.9 percent, with 387 individuals unemployed and 7,494 employed (Colorado Department of Labor and Employment 2025). While U-6 is not calculated at the county level, proxy indicators derived from Census data can provide insights into underemployment.

One method is to calculate involuntary part-time employment by taking those who work less than 35 hours per week and dividing by the total employed population. In 2021, 65.8 percent of Alamosa's workforce was employed part-time according to Census data. However, this likely reflects a combination of voluntary and involuntary part-time work, and may overstate true underemployment.

A second indicator is the percentage of workers earning less than two-thirds of the median wage. In 2021, 27.4 percent of workers in Alamosa County met this threshold, down from 30.2 percent in 2017.

A third proxy for underemployment is overqualification, calculated as the percentage of workers with a bachelor's degree working in low-skilled occupations. This proxy calculation shows that 0.7 percent meet this qualification in Alamosa County in 2021.

A simple unweighted average of these three proxies equates to 31.4 percent, which can be considered a rough proxy for underemployment in the county.

## 5.6 Characteristics of Labor Pool

Location quotients (LQs) are a useful means for describing the characteristics of a local labor pool. The LQ measures an industry's share of its regional economy relative to the industry's share of the national economy. When a regional industry's LQ is greater than 1.0, the region will have a high concentration of firms and/or employees in that industry, and the region will likely export that industry's products or services. Likewise, an LQ less than 1.0 indicates a low concentration of that industry, and net imports are likely.

An industry's LQ is often considered along with the number of people it employs in that region. Local economies are particularly sensitive to the changes and trends of their industries that have high LQs and many employees. Perhaps the best example of this is Puget Sound's dependence on Boeing in the 1970s.

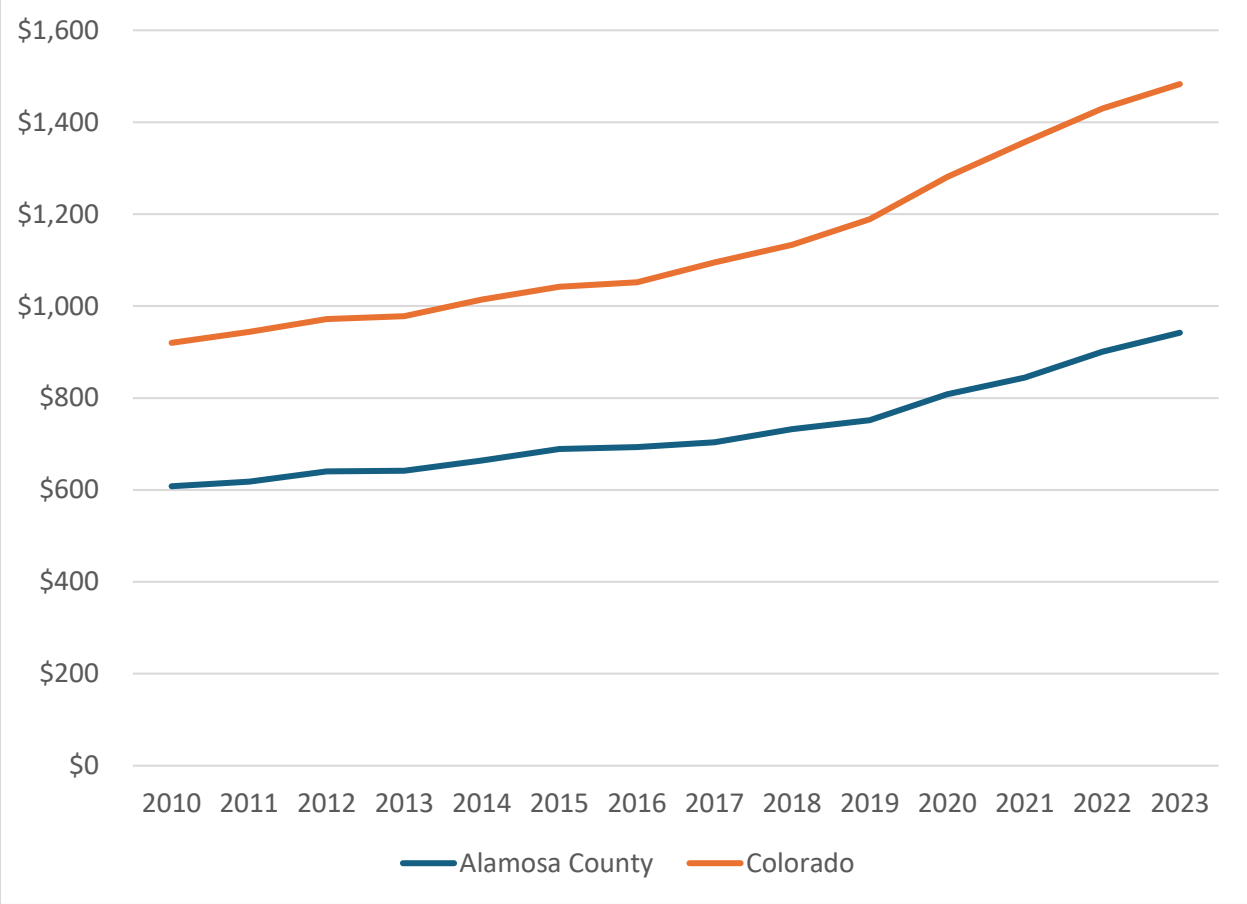
Table 5-1 presents LQs for Alamosa County and the other four San Luis Valley counties combined as of 2023 based on the BLS Standard Occupational Classification (SOC) codes at the two-digit level. Not surprisingly, the region's farming industries have exceedingly high LQs.

**Table 5-1. Location Quotients for Alamosa County and the Other Four San Luis Valley Counties**

| Occupation Code | Occupation | Alamosa County's LQ | San Luis Valley's Other Four Counties' LQ |
|---|---|---|---|
| 11-0000 | Management | 0.88 | 0.81 |
| 13-0000 | Business and Financial Operations | 0.88 | 0.64 |
| 15-0000 | Computer and Mathematical | 0.6 | 0.39 |
| 17-0000 | Architecture and Engineering | 0.57 | 0.44 |
| 19-0000 | Life, Physical, and Social Science | 1.14 | 0.95 |
| 21-0000 | Community and Social Service | 1.38 | 1.13 |
| 23-0000 | Legal | 0.94 | 0.49 |
| 25-0000 | Educational Instruction and Library | 1.4 | 1.46 |
| 27-0000 | Arts, Design, Entertainment, Sports, and Media | 0.66 | 0.6 |
| 29-0000 | Health Care Practitioners and Technical | 1.42 | 0.79 |
| 31-0000 | Health Care Support | 1.23 | 0.62 |
| 33-0000 | Protective Service | 1.21 | 1.4 |
| 35-0000 | Food Preparation and Serving | 1.16 | 0.78 |
| 37-0000 | Building and Grounds Cleaning and Maintenance | 0.95 | 0.99 |
| 39-0000 | Personal Care and Service | 0.82 | 1.05 |
| 41-0000 | Sales and Related | 1.01 | 0.77 |
| 43-0000 | Office and Administrative Support | 0.99 | 0.87 |
| 45-0000 | Farming, Fishing, and Forestry | 5.7 | 21.44 |
| 47-0000 | Construction and Extraction | 0.93 | 0.97 |
| 49-0000 | Installation, Maintenance, and Repair | 0.95 | 1.08 |
| 51-0000 | Production | 0.39 | 0.69 |
| 53-0000 | Transportation and Material Moving | 0.72 | 1.04 |
| 99-0000 | Military | 0.37 | 0.62 |

## 5.7 Wages

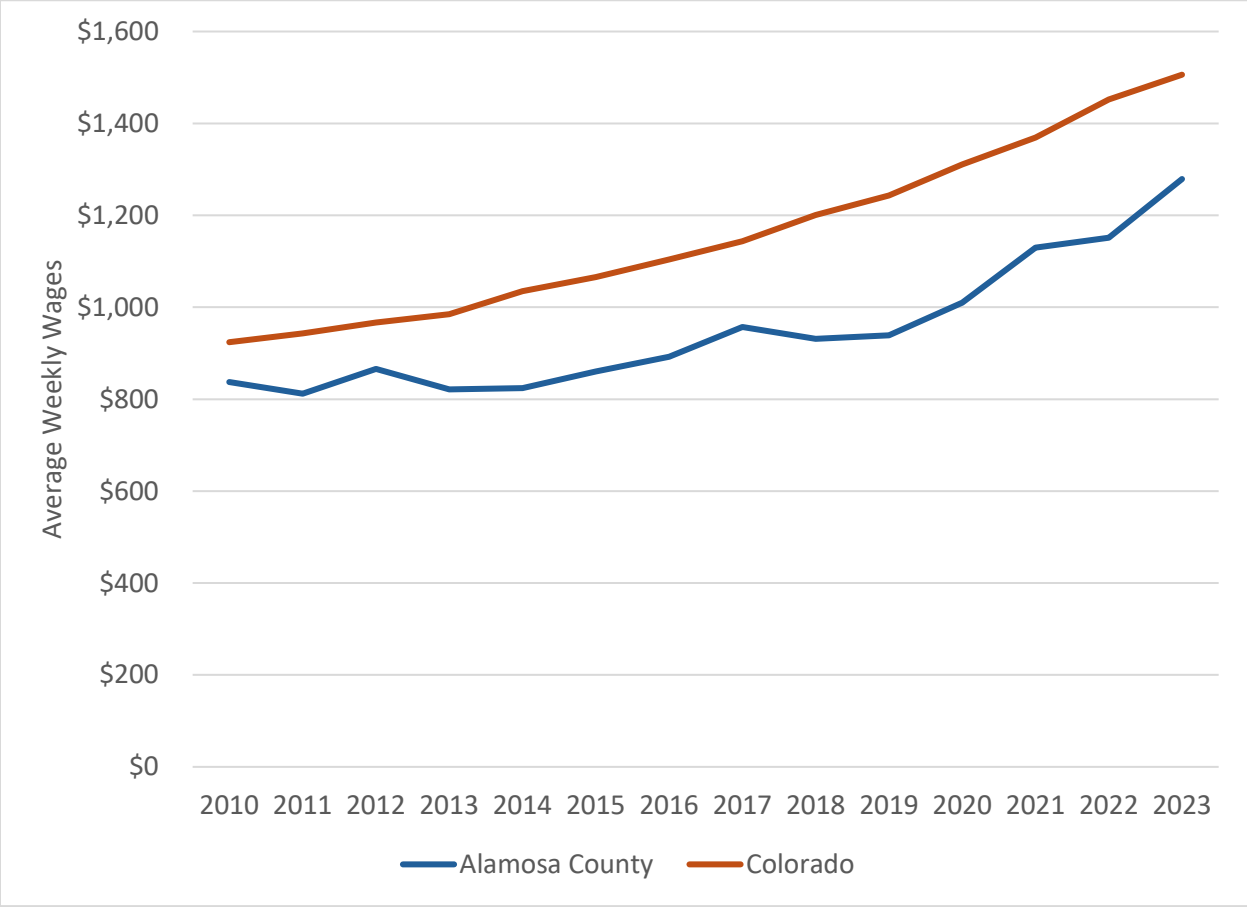
Figure 5-5 illustrates average weekly wages for Alamosa County and Colorado. This averages all industries to show the difference in wages between the state and the county. Colorado's average weekly wages in 2023 were $1,483, while Alamosa County's was $942. Alamosa County's average weekly wages are 36 percent below the state average.




Source: Colorado SDO.

**Figure 5-5. Average Weekly Wages in Alamosa County and Colorado**

Figure 5-6 shows average weekly wages just for the construction industry. In 2023, the construction average weekly wage in Colorado was $1,506, while in Alamosa County it was $1,279. Alamosa County's construction average weekly wages are 15 percent below the state average.




Source: Colorado SDO.

**Figure 5-6. Average Weekly Construction Wages in Alamosa County and Colorado**

Table 5-2 shows the number of businesses operating in each industry in Alamosa County along with average annual employment and average annual wage, which does not include supplements (benefits) to wages.

**Table 5-2. Alamosa County Employment and Average Wage by Industry**

| Alamosa County 2023 Industry | Establishments | Average Employment | Average Annual Total Wage |
|---|---|---|---|
| Agriculture, Forestry, Fishing & Hunting | 34 | 248 | $45,131 |
| Mining | 3 | 15 | $73,253 |
| Utilities | 6 | 76 | $103,117 |
| Construction | 49 | 433 | $66,440 |
| Manufacturing | 20 | 143 | $38,356 |
| Wholesale Trade | 21 | 144 | $75,480 |
| Retail Trade | 77 | 1,083 | $37,951 |
| Transportation and Warehousing | 22 | 219 | $68,953 |
| Information | 6 | 62 | $38,687 |
| Finance and Insurance | 25 | 478 | $72,341 |
| Real Estate and Rental and Leasing | 25 | 104 | $39,316 |
| Professional and Technical Services | 52 | 190 | $68,189 |
| Management of Companies | 3 | N/A | N/A |
| Administrative and Waste Services | 16 | 113 | $30,655 |
| Educational Services | 6 | 1,059 | $47,060 |
| Health Care and Social Assistance | 119 | 1,709 | $55,467 |
| Arts, Entertainment, and Recreation | 10 | 47 | $53,406 |
| Accommodation and Food Services | 63 | 998 | $22,959 |
| Other Services, Ex. Public Admin | 40 | 179 | $35,365 |
| Public Administration | 32 | 790 | $50,352 |
| Unclassified | 2 | 1 | $17,458 |

Source: Colorado Quarterly Census of Employment and Wages.

# 6 Housing

Although the Applicant would strive to hire as many local workers for construction as possible, the share of local hiring would depend on the availability of skilled labor in the region at the time of construction. A portion of the construction workforce would most likely require temporary housing during all or part of construction. This section evaluates the supply of currently available local housing and the demand for housing from workers who would reside in the county temporarily during construction. Actual rental market conditions at the time of construction may vary.

## 6.1 Projected Housing Requirements

Constructing the Project would require a direct workforce of 209.1 per year on average for 16 months. Residents working on Project construction presumably already have housing. Workers residing in the region temporarily would need to find housing. As shown in Table 7-2 and Table 7-3 (Section 7.2.3) the regional electric power and construction work force exceeds the needs of the Project. However, many factors will determine the share of the Project's construction employment that would be filled by local residents including, but not limited to, selection of an engineering, procurement, and construction (or EPC) contractor, demand from other projects at the time of construction, specific skills required, scheduling, and competitiveness of compensation. For those workers relocating temporarily, some may live on the Front Range and return home on the weekends, while others may reside temporarily for the duration of construction. Indirect and induced employment impacts would support existing jobs, such as adding grocery store shifts or extra hours for a mechanic.

## 6.2 Housing Unit Inventory

Table 6-1 shows Colorado SDO data for housing units. In 2023, there were 7,280 total housing units and 758 of the total units were vacant at the time of the census. Occupied units grew at an average annual rate of 0.7 percent from 2016, while vacant units averaged 2.4 percent annual growth.

**Table 6-1. Alamosa County Housing Unit Inventory**

| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|
| Total Housing Units | 6,835 | 6,908 | 6,990 | 7,026 | 7,082 | 7,140 | 7,204 | 7,280 |
| Occupied Housing Units | 6,192 | 6,247 | 6,310 | 6,343 | 6,377 | 6,439 | 6,471 | 6,522 |
| Vacant Housing Units | 643 | 661 | 680 | 683 | 705 | 701 | 733 | 758 |
| Vacancy Percent | 9.4% | 9.6% | 9.7% | 9.7% | 10.0% | 9.8% | 10.2% | 10.4% |
| Household Population to Total Housing Units Ratio | 2.20 | 2.20 | 2.19 | 2.19 | 2.18 | 2.18 | 2.17 | 2.16 |

Source: Colorado State Demography Office.

Additional inventory continues to be constructed. In March, the Tierra Azul housing development broke ground. Phase One will create 130 new units and at buildout there will be more than 400 new units (Alamosa Citizen 2025).

Not all empty units may be available for rent for various reasons. In the San Luis Valley, many units are abandoned due to poor condition (San Luis Valley Coalition 2021). According to the U.S. Census Bureau definition, adopted by the SDO, a housing unit is vacant if no one is living in it at the time of the interview unless its occupants are only temporarily absent. In addition, a vacant unit may be one that is entirely occupied by persons who have a usual residence elsewhere.

## 6.3 Housing Tenure

Approximately 43 percent or 2,865 of the occupied housing units in Alamosa County are rented. This ratio has remained constant from 2016 to 2023. The average household size of rented units decreased from 2.42 in 2016 to 2.23 in 2023.

**Table 6-2. Housing Tenure, 2016 and 2023**

| Tenure and Household Size by Tenure | 2016 | 2023 |
|---|---|---|
| Occupied housing units | 5,946 | 6,570 |
| Owner-occupied | 3,384 | 3,705 |
| Renter-occupied | 2,562 | 2,865 |
| Average household size of owner-occupied unit | 2.68 | 2.48 |
| Average household size of renter-occupied unit | 2.42 | 2.23 |

Source: U.S. Census.

## 6.4 Housing Needs Assessments

According to the 2021 Alamosa Housing Needs Assessment (City of Alamosa 2021), the rental market in Alamosa has been experiencing low vacancy rates, contributing to increased rental prices. For the decade prior to 2021, new residential development has averaged only 1.2 percent annually, insufficient to meet the growing demand driven by population and job growth, both of which increase demand for electricity as well.

The San Luis Valley Housing Coalition (SLVHC) conducted a comprehensive housing study to assess current housing conditions and needs across the six counties of the San Luis Valley: Alamosa, Conejos, Costilla, Mineral, Rio Grande, and Saguache (San Luis Valley Housing Coalition n.d.). SLVHC is actively working to rehabilitate abandoned homes and schools to increase the availability of affordable housing. For instance, the coalition is purchasing and renovating Boyd Elementary School in Alamosa to convert it into affordable housing units, and the region is also experiencing some new affordable housing development (The Colorado Sun 2022).

## 6.5 Current Rental Market

Average monthly rental rates corresponding to 10 listed units in Alamosa County in April 2025 range from $1,100 for a one-bedroom unit to $2,200 for a four-bedroom (Table 6-3). The overall average rent for all unit sizes is $1,400. Median rental prices and fair market rent prices are published by RentData and are also shown in Table 6-3 (RentData.org 2025). These estimates are lower than the actual listings found for this report, with the exception of three-bedroom units. According to rental data from RentData.org, the median rental price of a one-bedroom rental in Alamosa County is $844 (RentData.org

2025). In addition, to the 10 units listed in Alamosa County, an online search conducted for this found 10 additional listings in Saguache and Rio Grande Counties.

**Table 6-3. Alamosa County Average Asking Rent by Unit Size, April 2025**

| Unit Size | Studio | 1 Bedroom | 2 Bedroom | 3 Bedroom | 4+ Bedroom | All Unit Sizes |
|---|---|---|---|---|---|---|
| Current Listings | N/A | $1,100 | $1,217 | $1,410 | $2,200 | $1,400 |
| Median Rent | $839 | $844 | $1,036 | $1,402 | $1,720 | N/A |
| Fair Market Rent | $787 | $792 | $972 | $1,315 | $1,613 | N/A |

Source: Zillow, Trulia, Apartments.com, RentData, other classified sites.

In reading this and similar studies, there is a difference between a vacant unit and a rental vacancy, with the term "vacancy" often vague. An owned unit that is only occasionally occupied by the owner is considered a vacant unit, whereas an apartment available for rent is considered a rental vacancy.

## 6.6 Temporary Workforce Housing

Hotels, motels, and lodges may consider renting on a long-term basis. Some lodging operators may not want to consider long-term lodging while others may see it as an opportunity. Table 6-4 lists the primary hotels and motels in Alamosa County, which include over 670 rooms. In addition to the properties listed in Table 6-4, in April 2025 ground was broken for a new 90-room SpringHill Suites by Marriott (Valley Courier 2025).

**Table 6-4. Primary Commercial Lodging Properties in Alamosa County**

| Property | Rooms |
|---|---|
| Best Western Alamosa Inn | 53 |
| Comfort Inn & Suites Alamosa | 68 |
| Days Inn by Wyndham Alamosa | 32 |
| Dunes Inn Downtown | N/A |
| Fairfield Inn & Suites Alamosa | 57 |
| Hampton Inn Alamosa | 80 |
| Holiday Inn Express & Suites Alamosa | 74 |
| Quality Inn & Suites Alamosa | 125 |
| Riverside Inn of Alamosa | N/A |
| Rodeway Inn Alamosa | 125 |
| Super 8 by Wyndham Alamosa | 57 |
| The Sunset Inn | N/A |
| Valley Motel | N/A |

Long-term rental of transient lodging and short-term rental units are additional housing options. Alamosa County also features other lodging options such as short-term rentals, recreational vehicle (RV)

parks, and campgrounds, further increasing the total number of transient accommodations available to visitors.

The construction of temporary housing has become more prevalent in the oil and gas industry and has roots in military logistics (examples include Target Hospitality and Eagle Ford Village). RV lodging is another temporary solution.

# 7 Modeling Economic Impacts

This and the following sections estimate the economic activity and benefits that would occur in Alamosa County and Colorado as a result of constructing and operating the Project. All costs are presented in 2025 dollars unless otherwise noted. Fiscal benefits arising from the purchase and importation of specialized equipment are presented in Section 9.

## 7.1 Methodology

An Input-Output (I-O) approach is used to model the economic impacts from constructing, operating, and maintaining the Project over its planned lifetime in the context of county-level data representing Alamosa County's economy and data representing the rest of Colorado's economy. This assessment estimates the direct impacts resulting from development of the Project, as well as the indirect (supply chain spending) and induced (labor income spending) impacts. Employment, labor income, intermediate expenses, and tax revenues are provided. The IMPLAN I-O model is used to estimate Project impacts (IMPLAN Group LLC 2024). IMPLAN's methods are described in Appendix A.

## 7.2 IMPLAN Model Inputs

Developing an IMPLAN model for constructing the Project requires summary development plans, capital and operating expenditure budgets, the duration of construction in years, the starting year of construction, and a defined region of influence. In this case, the Project consists of a PV capacity of 110 megawatts of alternating current (MWac), BESS capacity of 110 MWac, and a substation. We assume the Project would be constructed over 16 months beginning in the fourth quarter of 2028, followed by 40 years of operations beginning in 2031. The BESS augmentation plan includes a 20 percent initial overbuild, followed by the addition of 50 MWh in Year 8 and 300 MWh in Year 15.

### 7.2.1 Capital Construction Budget

A summary projected capital budget is used as the basis for deriving the direct economic impacts resulting from construction. The proposed Project would include the following activities:

- Site preparation
- Grading and earthwork
- Dust control
- Panel installation
- Concrete foundations
- Structural steel work
- Electrical/instrumentation work
- Collector line installation
- Stormwater management facilities
- Architecture and landscaping

Table 7-1 shows a breakout of the three capital expenditure categories—PV generation, BESS, and substation—separating basic construction and assembly expenses from specialized equipment to be purchased from vendors outside Alamosa County.

Specialized equipment is manufactured outside the region and imported to the site. The importation of equipment has fiscal impacts, presented in Section 9, but not local economic impacts. Examples of specialized equipment items include the following:

- PV modules
- BESS
- Interconnection and substation equipment

Basic construction materials, such as concrete, are generally produced locally and thus have local economic impact. A workforce spending its labor income within the region would also have local economic impact as the spending ripples through the economy. Therefore, basic materials and labor to assemble the solar facility represent the direct investment or impact to the economy that is modeled using IMPLAN. Examples include the following:

- Site preparation
- Construction of access and internal circulation roads
- Grading and earthwork
- Dust control
- Panel installation
- Concrete foundations
- Structural steel work
- Electrical/instrumentation work
- Collector line installation
- Stormwater management facilities
- Architecture and landscaping

**Table 7-1. Haynach Solar Capital Construction Budget Summary**

| Capital Expenditure Category | Construction Expenses [(1)] | Specialized Equipment [(2)] | Transaction Taxes on Specialized Equipment [(3)] | Total Capital Budget to Construct |
|---|---|---|---|---|
| PV | $75,778,459 | $86,973,680 | $2,609,210 | $165,361,349 |
| BESS | $46,029,694 | $101,700,000 | $6,000,300 | $153,729,994 |
| Substation | $6,440,000 | $5,277,457 | $311,370 | $12,028,827 |
| **Total** | **$128,248,153** | **$193,951,137** | **$8,920,880** | **$331,120,170** |

Source: Adapture Solar Development, Inc.

(1) Labor and basic materials. Includes transaction taxes.

(2) PV panels, BESS, inverters, etc. Does not include transaction taxes.

(3) The Project would be liable for sales and use taxes at the unincorporated county rate, assuming possession is taken in Alamosa County. Purchase of solar electric generation equipment is exempt from state sales tax (see Section 9.5 for details).

## 7.2.2 Delineation of Impact Area

Given the rural nature of the county economy, a multi-region input-output (MRIO) model framework is adopted to show portions of labor and materials flowing between regions of the state, including the urban centers, which would also be impacted by Project construction and operations. See Appendix A for a further description of the MRIO model structure. Within each region, construction and operations events were modeled using IMPLAN's Industry Impact Analysis (IIA) event type, which allows each region to have a unique production function realistically capturing likely sourcing of labor and materials as well as sales tax rates. Economic impact model results are estimated averages across each of these two regions (Alamosa County and entire state of Colorado).

## 7.2.3 Local Employment Opportunities

IMPLAN assumes construction "supports" or hires existing job holders rather than creating new jobs. However, the ability of a local workforce to support a construction project depends on the size of the workforce and the employment required to construct the project. Further, specific skills or specialized trades may need to be recruited from outside a region, again depending on the nature of the local workforce and project construction requirements.

### 7.2.3.1 Opportunities for Employment of Local Citizens

Table 7-2 shows there were almost 500 electric power and construction wage and salary employees in Alamosa County in 2023 and almost half that number of proprietors, for a total annual average of 737.8.

**Table 7-2. Alamosa County Electric Power and Construction Employment**

| Employment Occupation Description | Wage & Salary | Proprietor | Total |
|---|---|---|---|
| Electric power generation - Solar | 14.1 | 0.7 | 14.8 |
| Electric power transmission and distribution | 56.6 | 7.1 | 63.7 |
| Construction of new health care structures | 15.3 | 8.3 | 23.6 |
| Construction of new manufacturing structures | 16.6 | 9.7 | 26.2 |
| Construction of new power and communication structures | 30.1 | 16.6 | 46.6 |
| Construction of new educational and vocational structures | 29.6 | 13.2 | 42.9 |
| Construction of new highways and streets | 36.4 | 17.6 | 54.0 |
| Construction of new commercial structures, including farm | 42.2 | 22.9 | 65.1 |
| Construction of other new nonresidential structures | 31.0 | 15.0 | 46.0 |
| Construction of new single-family residential structures | 90.9 | 58.8 | 149.6 |
| Construction of new multifamily residential structures | 19.0 | 12.6 | 31.6 |
| Construction of other new residential structures | 43.8 | 25.2 | 69.0 |
| Repair construction of nonresidential structures | 37.0 | 22.0 | 59.0 |
| Repair construction of residential structures | 23.8 | 11.8 | 35.6 |
| Repair construction of highways, streets, bridges | 6.3 | 3.8 | 10.1 |
| **Total** | **492.6** | **245.3** | **737.8** |

Source: IMPLAN.

Construction of the Project would create opportunities for these industries specifically and support their workforces. Actual employment would depend on construction phase scheduling, individual worker availability, and skills-matching.

Table 7-3 shows a similar list of employment for the four neighboring San Luis Valley counties combined, with a total annual average of 1,371.0 in these industries. Project construction would most likely support these workforces as well.

**Table 7-3. Four Neighboring San Luis Valley Counties Electric Power and Construction Employment**

| Employment Occupation Description | Wage & Salary | Proprietor | Total |
|---|---|---|---|
| Electric power generation - hydroelectric | 4.4 | 0.6 | 4.9 |
| Electric power transmission and distribution | 61.9 | 10.1 | 72.0 |
| Construction of new health care structures | 16.2 | 28.9 | 45.1 |
| Construction of new manufacturing structures | 19.4 | 33.9 | 53.3 |
| Construction of new power and communication structures | 34.5 | 60.1 | 94.6 |
| Construction of new educational and vocational structures | 31.3 | 46.2 | 77.6 |
| Construction of new highways and streets | 41.1 | 61.5 | 102.6 |
| Construction of new commercial structures, including farm | 45.2 | 79.2 | 124.4 |
| Construction of other new nonresidential structures | 52.1 | 53.2 | 105.3 |
| Construction of new single-family residential structures | 102.1 | 188.4 | 290.5 |
| Construction of new multifamily residential structures | 21.3 | 39.3 | 60.6 |
| Construction of other new residential structures | 49.1 | 88.2 | 137.4 |
| Repair construction of nonresidential structures | 42.1 | 77.0 | 119.1 |
| Repair construction of residential structures | 24.5 | 39.0 | 63.5 |
| Repair construction of highways, streets, bridges | 7.2 | 13.2 | 20.4 |
| **Total** | **552.3** | **818.7** | **1,371.0** |

Source: IMPLAN.

### 7.2.3.2 Training and Retraining Potential

The Project presents a strategic opportunity to advance workforce development and create opportunities for low-income and minority populations in Alamosa County. The solar project would create construction and operational roles that require minimal prior experience, creating opportunities for individuals transitioning from agriculture, service-sector, or other backgrounds, especially those characterized by frequent underemployment.

Trinidad State College and Adams State University, as well as the San Luis Valley Workforce Center, have opportunities for retraining for the solar construction and operations industry. Trinidad State College has a construction technology program that prepares students for construction jobs. Trinidad State College also offers online courses in solar design training and solar panel installer training (Trinidad State 2025). Adams State offers several trades programs certificates that transfer well to both solar construction and operations, including electrical technician, maintenance technician, and other certificates (Adams State University 2025).

#### 7.2.3.3 Employment Opportunities for Low-Income and Minority Populations

Programs offered through Trinidad State College, Adams State University, and the San Luis Valley Workforce Center are especially valuable in a county where a large portion of workers earn below two-thirds of the median wage, and part-time work is a high percentage of total work. Alamosa County is 48 percent Hispanic or Latino with a 21.7 percent poverty rate (U.S. Census Bureau 2024). The project is in a rural location, which makes it ideal to serve workforce needs of nearby low-income and Hispanic populations.

### 7.2.4 Construction Model Inputs

To accurately model the local economic activity that would result from Project construction, the budget for construction expenses ($128,248,153) is reduced to exclude off-site expenses such as engineering, design, permitting, and other corporate expenses, which are estimated to be 22 percent of the total. Table 7-4 shows the total amount of investment in Colorado would be $99,848,876 or 78 percent of the $128 million construction expenses budget, roughly a third of the total capital budget.

IMPLAN's IIA modeling option using IMPLAN Industry 47 (Construction of New Power and Communication Structures) was adopted. The equipment purchased outside the county would have fiscal impacts; however, these purchases would not have other economic impacts in the region and thus are not included in the IMPLAN model. These equipment purchases do generate local fiscal impacts (see Section 9).

**Table 7-4. Construction Phase Inputs for IMPLAN Model**

| Capital Expenditure Category | Construction Expenses [1] |
|---|---|
| PV | $58,998,074 |
| BESS | $35,836,876 |
| Substation | $5,013,926 |
| **Total** | **$99,848,876** |

(1) Labor and basic materials. Includes sales and use taxes.

Economically, Alamosa is a relatively small county. In 2023, full-time equivalent (FTE) employment in Alamosa County's Industry 47 was approximately 46.63. The MRIO model framework captures the distribution of economic impacts across the county and the rest of Colorado. The nature of the impacts varies as well; thus, a unique production function was constructed for each region. Table 7-5 shows the employment and total output (direct construction spending) allocated to each region.

**Table 7-5. Distribution of Construction Employment and Direct Expenses**

| Capital Expenditure Category | Employment | Construction Expenses [1] |
|---|---|---|
| Alamosa County | 159.32 | $39,476,469 |
| Rest of Colorado | 119.49 | $60,372,407 |
| **Total** | **278.81** | **$99,848,876** |

(1) Labor and basic materials. Includes sales and use taxes.

### 7.2.5 Annual Operations Budget

The first full year of operations is assumed to be 2031. Once the proposed project is constructed, maintenance would generally be limited to the following:

- Cleaning of PV panels
- Monitoring electricity generation
- Providing site security
- Facility maintenance – replacing or repairing inverters, wiring, and PV modules

The total annual operating budget, less property taxes and other off-site corporate expenses, is estimated to be $2,631,486 (Table 7-6).

**Table 7-6. Haynach Solar Annual Operations Budget**

| Operations Expenditure Category | Operations Expenses | Specialized Replacement Equipment [(1)] | Transaction Taxes on Specialized Equipment [(2)] | Total Operations Budget, Less Property Tax |
|---|---|---|---|---|
| Total | $1,962,513 | $640,039 | $28,934 | $2,631,486 |

(1) Specialized replacement equipment, excluding BESS augmentation equipment.

(2) The Project would be liable for sales and use taxes at the unincorporated county rate, assuming possession is taken in Alamosa County. Purchase of solar electric generation equipment is exempt from state sales tax (see Section 9.5 for details).

### 7.2.6 Operations Model Inputs

The economic impact resulting from operations and maintenance of the Project is best represented by Industry 37 (Operations of Electric Power Generation – Solar). The total amount of local spending (investment) would be $1,962,513 per year. As with construction, unique production functions were developed for each region (Table 7-7).

**Table 7-7. Distribution of Operations Employment and Direct Expenses**

| Region | Employment (FTE) [(1)] | Operations Expenses [(2)] |
|---|---|---|
| Alamosa County | 5.8 | $1,345,036 |
| Rest of Colorado | 0.0 | $617,477 |
| **Total** | **5.8** | **$1,962,513** |

(1) Approximately full-time equivalent (FTE).

(2) Labor and basic materials. Includes sales and use taxes.

## 7.3 Assumptions and Uncertainties

Estimating the direct, indirect, and induced impacts of the future in a regional economy is extremely complicated. IMPLAN averages labor compensation, production value, and other metrics for 528 different industries of the economy by region. For example, this study models the construction of the Project by assuming Industry 47 (Construction of New Power and Communication Structures). Actual future economic impacts depend on specific operating plans and may evolve over time as the result of

technological innovation and alternating management strategies. Actual impacts also depend on final Project specifications and approvals.

For local construction purchases (e.g., concrete, fencing, fuel, small tools, office supplies), IMPLAN's data shows a 26.3 percent leakage rate for Alamosa County. In other words, these are the portions of the modeled construction and operations expenditures that represent spending outside the region.

Actual tax revenues depend on final purchase prices, assessor appraisals, inflation, and other factors. The fiscal impacts in Section 9 are not estimated with IMPLAN.

Finally, forecasts of future events are inherently uncertain, as the coronavirus pandemic demonstrated.

# 8 Economic Benefits Results

## 8.1 Overview

This section estimates the economic activity and benefits that would occur in Alamosa County and Colorado as a result of constructing and operating the Project, giving particular attention to total economic output, employment, labor income, industry growth, and tax revenues. All costs are presented in 2025 dollars unless otherwise noted.

IMPLAN models the multiplier spending that occurs as spending on construction and operations "ripples" through the economy. Direct impacts occur in the sector being modeled, while indirect and induced impacts occur in many sectors. For each category, each level of impact (direct, indirect, and induced) is estimated. Employment impacts are estimated at the occupation level. Indirect and induced impacts in other industries are presented, along with the growth of each industry in Alamosa County. Total tax revenue impacts are summarized by type of impact and level of jurisdiction.

## 8.2 Economic Benefits to Alamosa County from Construction

IMPLAN estimates economic impacts based on the total planned capital expenditure, construction plans, and the underlying model data. Table 8-1 shows the direct local capital expenditure of $39.5 million.

### 8.2.1 Total Output from Construction

IMPLAN defines the total production value of an industry as output. In this case, the industry is new power and communication construction (Industry Code 47) and the hybrid solar facility is the product. Table 8-1 shows a total economic impact to Alamosa County of $50.4 million that would result from construction.

**Table 8-1. Total Construction Impact to Alamosa County by Impact Type and Category**

| Type Impact | Labor Income | Intermediate Expenditures | Other Property Income | Taxes on Production | Total Output |
|---|---|---|---|---|---|
| Direct | $15,975,820 | $11,981,865 | $11,055,702 | $463,082 | $39,476,469 |
| Indirect | $1,082,804 | $1,999,872 | $690,149 | $367,208 | $4,140,033 |
| Induced | $1,846,966 | $2,612,261 | $1,790,238 | $512,062 | $6,761,528 |
| **Total** | **$18,905,590** | **$16,593,999** | **$13,536,089** | **$1,342,352** | **$50,378,029** |

The indirect and induced labor income impacts would be 5.7 and 9.8 percent of total labor income impacts, respectively. The total output indirect and induced impacts would be 8.2 and 13.4 percent of total output, respectively.

Labor Income represents the total value of all forms of employment income, including benefits, payroll taxes, and payments received by self-employed individuals and/or unincorporated business owners across Alamosa County's economy. Intermediate Expenditures are purchases of nondurable goods and

services such as energy, materials, and purchased services that are used for the production of other goods and services, rather than for final consumption. Other Property Income (OPI) represents Gross Operating Surplus minus Proprietor Income.

Taxes on Production and Imports, Net of Subsidies (TOPI) include transaction taxes, excise taxes, customs duties, property taxes, motor vehicle licenses, severance taxes, other taxes, and special assessments, less government subsidies. In other words, *TOPI does not include all taxes paid by an industry*. TOPI tax impacts are split into subcategories based on each region's contribution of the collected tax. TOPI are tax revenues, but not inclusive of all tax revenues, paid by an industry. For example, social insurance taxes are a part of employee compensation and profits taxes are part of OPI. In the case of TOPI direct impacts, property taxes on construction impacts are not property taxes on a built structure itself but rather on the construction companies' properties (refer to Appendix A for further explanation of IMPLAN's tax estimates).

### 8.2.2 Supported Employment

Table 8-2 shows the estimates of average annual employment during the 16 months of Project construction. The estimated average annual number of direct jobs held by those residing in the county permanently or temporarily and supported by construction is 119.5. This number is approximately FTE for the solar construction and operations industries; hence two half-time workers would be counted as one full-time worker. The number of indirect and induced jobs held by county residents and supported by construction is estimated to be 45.0. IMPLAN estimates the indirect and induced jobs. The average annual labor income per direct FTE would be $100,267 and the average annual labor income for all FTE would be $86,196.

**Table 8-2. Construction Phase Employment Impacts to Alamosa County**

| Type Impact | Average Annual Employment (FTE) | Average Annual Labor Income/FTE |
|---|---|---|
| Direct | 119.5 | $100,267 |
| Indirect | 14.2 | $57,190 |
| Induced | 30.8 | $44,975 |
| **Total** | **164.5** | **$86,196** |

Note: The average annual job estimates are approximately full-time equivalent (FTE).

### 8.2.3 Occupation Detail

Table 8-3 shows the top 10 direct construction occupations supported by the Project based on the BLS SOC codes at the five-digit level and converted to FTE, which does not include proprietors. A total of 138 occupations would experience some impact. Total compensation includes benefits supplementing wages and salaries.

**Table 8-3. Construction Phase Occupation Impacts to Alamosa County for the Top 10 Occupations**

| Occupation | Average Annual Employment (FTE) | Average Annual Total Employee Compensation |
|---|---|---|
| Solar Photovoltaic Technicians | 18.8 | $83,363 |
| Electrical Power-Line Technicians | 17.8 | $106,928 |
| First-Line Supervisors of Construction Workers | 9.1 | $119,633 |
| Operating Engineers and Equipment Operators | 8.5 | $91,112 |
| Telecommunications Line Technicians | 7.2 | $76,212 |
| First-Line Supervisors of Technicians | 6.6 | $129,976 |
| Electricians | 4.6 | $104,800 |
| Construction Managers | 3.8 | $170,569 |
| General and Operations Managers | 3.1 | $207,879 |
| Project Management Specialists | 2.9 | $132,386 |

## 8.2.4 Economic Impact by Industry Growth Percentage

Table 8-4 shows the size of the impact relative to the size of the industry in Alamosa County by estimating the growth percentage for each of the top 10 industries impacted. Constructing this Project would have a very large impact on Industry 47 (Construction of New Power and Communication Structures). Overall, the total economic impact of the Project's construction investment of $39.5 million in Alamosa County would increase the size of the county's economy by 2.2 percent during construction to $1.8 billion, as measured by total output.

**Table 8-4. Impact to Alamosa County by Industry Growth Percentage for the Top 10 Industries**

| Industry Description | County Output | Project Impact | Estimated Growth |
|---|---|---|---|
| Construction of new power structures | $6,336,875 | $39,476,469 | 623.0% |
| Commercial equipment leasing | $847,735 | $108,871 | 12.8% |
| Ready-mix concrete manufacturing | $4,365,960 | $344,073 | 7.9% |
| Durable goods merchant wholesalers | $4,780,711 | $323,098 | 6.8% |
| Stone mining and quarrying | $2,459,842 | $112,352 | 4.6% |
| Building material supplies stores | $10,248,853 | $422,072 | 4.1% |
| Architectural and engineering services | $8,210,218 | $232,473 | 2.8% |
| Wholesale electronic goods | $2,172,784 | $61,307 | 2.8% |
| Commercial equipment repair | $839,366 | $22,096 | 2.6% |
| Management of companies | $6,761,598 | $173,562 | 2.6% |

### 8.2.5 Total Tax Revenue Impacts of Construction

As a result of Project construction, both direct and indirect tax revenues would accrue to Alamosa County, local municipalities, and special districts, in addition to the state and federal governments. IMPLAN estimates these tax revenue impacts resulting from construction investment, capturing all tax revenue across all levels of government for the specific industries and institutions affected by an event or group of events.

Taxes are levied at different levels of government. IMPLAN estimates tax impacts at the following levels: Federal, State + Local, State, County, Sub-County General, and Sub-County Special Districts. IMPLAN's tax impact estimates are based on collected and reported taxes in the region for the given data year. Sub-County General includes city and township governments. Sub-County Special Districts include fire and public school districts.

IMPLAN estimates of tax impacts are based on collected and reported revenues averaged across industries and households. For example, in the case of sales taxes IMPLAN estimates are not calculated as the explicit products of rates and sale prices, but rather reported revenues averaged across industries to give unit values per dollar of output (refer to Appendix A for further explanation of IMPLAN's tax estimates).

Table 8-5 shows the total tax impacts occurring within Alamosa County that would result from Project construction, essentially assembling the special equipment on the Project site. The fiscal impacts arising from the purchase and importation of special equipment are separate and presented in Section 9. Total tax revenues are estimated to be $6.0 million, of which approximately $743,000 would be received at the local level (sub-county, special districts, and county combined). Note that the taxes on production (Table 8-1) are a subset of the total amount of tax revenue generated (refer to Appendix A for further explanation of IMPLAN's tax estimates).

**Table 8-5. Tax Impact of Construction within Alamosa County by Impact Type and Tax Category**

| Impact Type | Sub-County | Special Districts | County | State | Federal | Total Tax |
|---|---|---|---|---|---|---|
| Direct | $73,317 | $95,052 | $91,739 | $580,138 | $3,546,411 | $4,386,657 |
| Indirect | $58,316 | $73,136 | $71,797 | $175,408 | $254,435 | $633,092 |
| Induced | $80,265 | $100,744 | $98,858 | $259,014 | $453,544 | $992,424 |
| **Total Impact** | **$211,898** | **$268,932** | **$262,394** | **$1,014,560** | **$4,254,390** | **$6,012,173** |

## 8.3 Economic Benefits to Alamosa County from Operations

In this section, the portion of the annual operating budget (see Table 7-7) spent within Alamosa County and the resulting impacts are presented as well as 40-year accumulative impacts. The first full year of operations would be 2031.

### 8.3.1 Total Annual Output from Operations

Table 8-6 shows an estimate of the economic impact to Alamosa County that would result from operating the Project. Annually, the direct investment (portion of annual operating budget spent within

Alamosa County) is estimated to be $1.3 million. Indirect and induced total outputs are estimated to generate $392,000 and $253,000 annually, respectively. Thus, the total annual economic output impacting Alamosa County would be $2.0 million. Refer to the Key Terminology section for a further description of terms.

**Table 8-6. Haynach Solar Total Annual Operations Impact to Alamosa County**

| Type Impact | Labor Income | Intermediate Expenditures | Other Property Income | Taxes on Production | Total Output |
|---|---|---|---|---|---|
| Direct | $569,129 | $440,584 | $237,645 | $97,678 | $1,345,036 |
| Indirect | $64,775 | $237,015 | $65,201 | $25,253 | $392,245 |
| Induced | $69,127 | $97,780 | $67,013 | $19,164 | $253,084 |
| **Total** | **$703,031** | **$775,380** | **$369,859** | **$142,095** | **$1,990,365** |

The indirect and induced labor income impacts are significant, accounting for 9.2 percent and 9.8 percent of total labor income impacts, respectively. The total output indirect and induced impacts are also significant, accounting for 19.7 percent and 12.7 percent of total output, respectively.

At these levels, the Project is not expected to negatively impact water or energy prices in Alamosa County. In fact, solar PV is second only to wind for using the least amount of water per megawatt hour of electricity produced (Cutler and Louf 2024).

### 8.3.2 Total Accumulative Output from Operations

IMPLAN is a linear model. Thus, we can extrapolate the 40-year accumulative operating impact by multiplying the annual impact by the number of years. Table 8-7 shows the total output over the 40-year planned lifetime to be $79.6 million.

**Table 8-7. Total Accumulative Operations Impact to Alamosa County**

| Type Impact | Labor Income | Intermediate Expenditures | Other Property Income | Taxes on Production | Total Output |
|---|---|---|---|---|---|
| Direct | $22,765,156 | $17,623,370 | $9,505,781 | $3,907,133 | $53,801,440 |
| Indirect | $2,591,006 | $9,480,604 | $2,608,055 | $1,010,136 | $15,689,801 |
| Induced | $2,765,096 | $3,911,209 | $2,680,513 | $766,546 | $10,123,365 |
| **Total** | **$28,121,258** | **$31,015,183** | **$14,794,349** | **$5,683,814** | **$79,614,605** |

### 8.3.3 Employment Created

Table 8-8 shows estimates of annual employment during the operations phase. The estimated average annual number of direct jobs created in Alamosa County is 5.8. This number is approximately FTE for the solar construction and operations industries; hence two half-time workers would be counted as one full-time worker. The number of indirect and induced jobs created by operations is estimated to be 2.3.

IMPLAN estimates the indirect and induced jobs. The average annual labor income per direct FTE would be $98,295 and the average annual labor income for all FTE would be $86,262.

**Table 8-8. Operating Phase Employment Impacts to Alamosa County**

| Type Impact | Average Annual Employment (FTE) | Average Annual Labor Income/FTE |
|---|---|---|
| Direct | 5.8 | $98,295 |
| Indirect | 0.8 | $78,994 |
| Induced | 1.5 | $44,888 |
| **Total** | **8.1** | **$86,262** |

Note: The average annual job estimates are approximately full-time equivalent (FTE).

## 8.3.4 Occupation Detail

Table 8-9 shows the top 10 direct operating occupations created by the Project based on the BLS SOC codes at the three-digit level and converted to FTE, which does not include proprietors. Total compensation includes benefits supplementing wages and salaries.

**Table 8-9. Annual Operating Phase Occupation Impacts in Alamosa County for the Top 10 Occupations**

| Occupation | Average Annual Employment (FTE) | Average Annual Total Employee Compensation |
|---|---|---|
| Construction Trades Workers | 1.6 | $64,039 |
| Business Operations Specialists | 0.7 | $111,825 |
| Top Executives | 0.3 | $174,066 |
| Engineers | 0.3 | $125,945 |
| Financial Specialists | 0.3 | $112,240 |
| Plant and System Operators | 0.3 | $73,879 |
| Other Management Occupations | 0.2 | $181,821 |
| Supervisors of Construction Workers | 0.2 | $80,374 |
| Helpers, Construction Trades | 0.2 | $48,448 |
| Sales Representatives, Services | 0.2 | $100,194 |

## 8.3.5 Annual Economic Impact by Industry Growth Percentage

Table 8-10 shows the size of the impact relative to the size of the industry in Alamosa County by estimating the growth percentage for each of the top 10 industries impacted. Overall, the county's total annual economic output from all industries combined is $1.8 billion. The Project's total annual impact to the county would be $2.0 million, which would increase the size of Alamosa County's economy by 0.1 percent, as measured by total output.

**Table 8-10. Impact to Alamosa County by Industry Growth Percentage for the Top 10 Industries**

| Industry Description | County Output | Project Impact | Estimated Growth |
|---|---|---|---|
| Solar electric power generation | $9,330,953 | $1,374,923 | 14.7% |
| Electric power transmission | $84,720,539 | $271,382 | 0.3% |
| Support activities for transportation | $2,252,931 | $6,358 | 0.3% |
| Professional, scientific, and technical services | $286,064 | $631 | 0.2% |
| Pipeline transportation | $83,613 | $176 | 0.2% |
| Maintenance and repair of roads | $1,856,846 | $3,742 | 0.2% |
| Employment services | $4,159,557 | $4,568 | 0.1% |
| Maintenance of nonresidential structures | $10,848,782 | $9,044 | 0.1% |
| Retail gasoline stores | $6,032,351 | $4,556 | 0.1% |
| Data processing and hosting | $1,287,145 | $899 | 0.1% |

### 8.3.6 Total Annual Tax Revenue Impact of Operations

As a result of Project operations, both direct and indirect tax revenues would accrue to Alamosa County, local municipalities, and special districts, in addition to the state and federal governments. IMPLAN estimates these tax revenue impacts resulting from operational spending, capturing all tax revenue across all levels of government for the specific industries and institutions affected by an event or group of events.

Taxes are levied at different levels of government. IMPLAN estimates tax impacts at the following levels: Federal, State + Local, State, County, Sub-County General, and Sub-County Special Districts. IMPLAN's tax impact estimates are based on collected and reported taxes in the region for the given data year. Sub-County General includes city and township governments. Sub-County Special Districts include fire and public school districts.

IMPLAN estimates of tax impacts are based on collected and reported revenues averaged across industries and households. Thus, in the case of sales taxes, IMPLAN estimates are not calculated as the explicit products of rates and sale prices (refer to Appendix A for further explanation of IMPLAN's tax estimates).

Table 8-11 shows the total annual tax impacts resulting from the Project's operations and maintenance. Total direct tax revenues are estimated to be $231,000 annually, with another $80,000 generated through indirect and induced spending. The total annual tax impact would be $311,000, of which $79,000 would be received at the local level (sub-county, special districts, and county combined). Note that the taxes on production (Table 8-6) are a subset of the total amount of tax revenue generated (refer to Appendix A for further explanation of IMPLAN's tax estimates).

**Table 8-11. Annual Tax Impact within Alamosa County from Operations by Type and Category**

| Impact Type | Sub-County | Special Districts | County | State | Federal | Total Tax |
|---|---|---|---|---|---|---|
| Direct | $15,636 | $19,668 | $19,278 | $51,781 | $124,892 | $231,254 |
| Indirect | $4,034 | $5,057 | $4,965 | $12,250 | $16,597 | $42,902 |
| Induced | $3,004 | $3,770 | $3,700 | $9,694 | $16,975 | $37,143 |
| **Total Impact** | **$22,673** | **$28,495** | **$27,943** | **$73,724** | **$158,464** | **$311,298** |

### 8.3.7 Total Accumulative Tax Revenue Impact of Operations

Table 8-12 shows the accumulative tax impacts resulting from lifetime operations of the Project, simply 40-year multiples of the estimates shown in Table 8-12. Total tax revenues are estimated to be $12.5 million, of which $3.2 million would be received at the local level (refer to Appendix A for further explanation of IMPLAN's tax estimates).

**Table 8-12. Accumulative Tax Impact of Operations by Type and Category**

| Impact Type | Sub-County | Special Districts | County | State | Federal | Total Tax |
|---|---|---|---|---|---|---|
| Direct | $625,424 | $786,713 | $771,114 | $2,071,220 | $4,995,673 | $9,250,145 |
| Indirect | $161,352 | $202,262 | $198,605 | $489,981 | $663,862 | $1,716,062 |
| Induced | $120,155 | $150,811 | $147,987 | $387,748 | $679,013 | $1,485,714 |
| **Total Impact** | **$906,931** | **$1,139,786** | **$1,117,707** | **$2,948,950** | **$6,338,548** | **$12,451,921** |

## 8.4 Total Combined Economic Benefits to Colorado from Construction

This section shows the total impact to Colorado, including Alamosa County. Table 8-13 shows the direct capital expenditure of $99.8 million that would occur within the state.

### 8.4.1 Total Output from Construction

Table 8-13 shows a total economic impact to Colorado of $172.5 million that would result from Project construction.

**Table 8-13. Total Construction Impact to Colorado by Impact Type and Category**

| Type Impact | Labor Income | Intermediate Expenditures | Other Property Income | Taxes on Production | Total Output |
|---|---|---|---|---|---|
| Direct | $27,957,685 | $47,927,460 | $22,111,404 | $1,852,327 | $99,848,876 |
| Indirect | $13,422,591 | $18,800,889 | $6,390,960 | $1,664,957 | $40,279,397 |
| Induced | $10,287,350 | $12,188,014 | $8,049,826 | $1,864,879 | $32,390,069 |
| **Total** | **$51,667,626** | **$78,916,363** | **$36,552,190** | **$5,382,162** | **$172,518,341** |

The indirect and induced labor income impacts would be 26.0 and 19.9 percent of total labor income impacts, respectively. The total output indirect and induced impacts would be 23.3 and 18.8 percent of total output, respectively.

## 8.4.2 Supported Employment

Table 8-14 shows the estimates of annual employment during the 16 months of Project construction. The estimated average annual number of direct jobs held by those residing in the state permanently or temporarily and supported by construction is 209.1. This number is approximately FTE for the solar construction and operations industries; hence two half-time workers would be counted as one full-time worker. The number of indirect and induced jobs held by county residents and supported by construction is estimated to be 237.8. IMPLAN estimates the indirect and induced jobs. The average annual labor income per direct FTE would be $100,279 and the average annual labor income for all FTE would be $86,710.

**Table 8-14. Construction Phase Employment Impacts to Colorado**

| Type Impact | Average Annual Employment (FTE) | Average Annual Labor Income/FTE |
|---|---|---|
| Direct | 209.1 | $100,279 |
| Indirect | 111.6 | $90,206 |
| Induced | 126.2 | $61,137 |
| **Total** | **446.9** | **$86,710** |

Note: The average annual job estimates are approximately full-time equivalent (FTE).

## 8.4.3 Occupation Detail

Table 8-15 shows the top 10 direct construction occupations supported by the Project based on the BLS SOC codes at the five-digit level and converted to FTE, which does not include proprietors. A total of 138 occupations would experience some impact. Total compensation includes benefits supplementing wages and salaries.

**Table 8-15. Construction Phase Occupation Impacts to Colorado for the Top 10 Occupations**

| Occupation | Average Annual Employment (FTE) | Average Annual Total Employee Compensation |
|---|---|---|
| Solar Photovoltaic Technicians | 32.8 | $83,363 |
| Electrical Power-Line Technicians | 31.1 | $106,928 |
| First-Line Supervisors of Construction Workers | 15.9 | $119,633 |
| Operating Engineers and Equipment Operators | 14.8 | $91,112 |
| Telecommunications Line Technicians | 12.6 | $76,212 |
| First-Line Supervisors of Technicians | 11.5 | $129,976 |

| Occupation | Average Annual Employment (FTE) | Average Annual Total Employee Compensation |
|---|---|---|
| Electricians | 8.0 | $104,800 |
| Construction Managers | 6.6 | $170,569 |
| General and Operations Managers | 5.4 | $207,879 |
| Project Management Specialists | 5.1 | $132,386 |

### 8.4.4 Economic Impact by Type and Industry

The $99.8 million of total economic output would have ripple effects throughout Alamosa County's economy and would impact many other industries. Table 8-16 shows the distribution of output by type of impact for the top 10 industries most impacted as measured by the dollar value of total output. A total of 460 industries would be impacted. Industry 47 (Construction of New Power and Communication Structures) would experience the most impact since that is the industry in which the direct capital investment would occur.

**Table 8-16. Impact by Type and Industry for the Top 10 Industries**

| Total Output Impact by Industry | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Construction of new power structures | $99,848,876 | $0 | $0 | $99,848,876 |
| Durable goods merchant wholesalers | $0 | $4,198,644 | $179,293 | $4,377,937 |
| Owner-occupied housing | $0 | $0 | $4,080,448 | $4,080,448 |
| Management of companies | $0 | $2,744,843 | $396,066 | $3,140,909 |
| Commercial equipment leasing | $0 | $2,433,097 | $45,077 | $2,478,175 |
| Other real estate | $0 | $1,567,450 | $813,694 | $2,381,144 |
| Architectural and engineering services | $0 | $2,216,141 | $50,556 | $2,266,697 |
| Monetary authorities | $0 | $1,079,330 | $705,830 | $1,785,161 |
| Building material and supplies stores | $0 | $1,401,381 | $156,027 | $1,557,408 |
| Truck transportation | $0 | $1,084,970 | $262,800 | $1,347,770 |

### 8.4.5 Economic Impact by Industry Growth Percentage

Table 8-17 shows the size of the impact relative to the size of the industry in Colorado by estimating the growth percentage for each of the top 10 industries impacted. Constructing this Project would have a very large impact on Industry 47 (Construction of New Power and Communication Structures). Overall, the total economic impact of the Project's construction investment of $99.8 million in Colorado would increase the size of the state's economy by 0.01 percent during construction to $894.3 billion, as measured by total output.

**Table 8-17. Impact to Colorado by Industry Growth Percentage for the Top 10 Industries**

| Industry Description | State Output | Project Impact | Estimated Growth |
|---|---|---|---|
| Construction of new power structures | $3,847,763,796 | $99,848,876 | 2.6% |
| Prefab metal components manufacturing | $144,151,760 | $877,934 | 0.6% |
| Turned product and screw manufacturing | $175,519,125 | $273,841 | 0.2% |
| Stone mining and quarrying | $177,876,993 | $239,873 | 0.1% |
| Ready-mix concrete manufacturing | $1,264,187,971 | $1,331,360 | 0.1% |
| Cut stock, resawing lumber, and planing | $27,774,747 | $26,149 | 0.1% |
| Commercial equipment leasing | $2,657,146,678 | $2,478,175 | 0.1% |
| Cement manufacturing | $307,415,973 | $240,581 | 0.1% |
| Sand and gravel mining | $245,709,017 | $190,147 | 0.1% |
| Fabricated structural metal manufacturing | $849,017,232 | $612,084 | 0.1% |

## 8.4.6 Total Tax Revenue Impacts of Construction

Table 8-18 shows the total tax impacts to Colorado that would result from Project construction, essentially assembling the special equipment on the Project site. The fiscal impacts arising from the purchase and importation of special equipment are separate and presented in Section 9. Total tax revenues are estimated to be $19.0 million, of which approximately $3.5 million would be received at the local level (sub-county, special districts, and county combined). Note that the taxes on production (Table 8-13) are a subset of the total amount of tax revenue generated (refer to Appendix A for further explanation of IMPLAN's tax estimates).

**Table 8-18. Total tax Impact of Construction within Colorado by Impact Type and Tax Category**

| Impact Type | Sub-County | Special Districts | County | State | Federal | Total Tax |
|---|---|---|---|---|---|---|
| Direct | $382,514 | $590,212 | $240,695 | $1,396,871 | $6,645,433 | $9,255,725 |
| Indirect | $349,356 | $539,552 | $212,103 | $899,689 | $3,111,922 | $5,112,623 |
| Induced | $379,112 | $578,400 | $242,543 | $913,855 | $2,518,603 | $4,632,513 |
| **Total** | **$1,110,982** | **$1,708,164** | **$695,341** | **$3,210,415** | **$12,275,958** | **$19,000,861** |

### 8.4.7 State Tax Revenue Impacts of Construction

The state of Colorado receives tax revenues in the amount of $3,210,415, which are detailed in Table 8-19.

**Table 8-19. Total State Construction Tax Impact Detail**

| Description | Employee Compensation | TOPI | Corporations | Households | Total |
|---|---|---|---|---|---|
| Social Insurance Tax-Employee Contribution | $42,323 | $0 | $0 | $0 | $42,323 |
| Social Insurance Tax-Employer Contribution | $49,765 | $0 | $0 | $0 | $49,765 |
| TOPI: Sales Tax | $0 | $1,574,778 | $0 | $0 | $1,574,778 |
| TOPI: Motor Vehicle License | $0 | $24,743 | $0 | $0 | $24,743 |
| TOPI: Severance Tax | $0 | $50,936 | $0 | $0 | $50,936 |
| TOPI: Other Taxes | $0 | $19,892 | $0 | $0 | $19,892 |
| OPI: Corporate Profits Tax | $0 | $0 | $550,847 | $0 | $550,847 |
| Personal Tax: Income Tax | $0 | $0 | $0 | $814,855 | $814,855 |
| Personal Tax: Motor Vehicle License | $0 | $0 | $0 | $19,620 | $19,620 |
| Personal Tax: Other Tax (Fish/Hunt) | $0 | $0 | $0 | $62,655 | $62,655 |
| **Total** | **$92,089** | **$1,670,350** | **$550,847** | **$897,130** | **$3,210,415** |

## 8.5 Total Combined Economic Benefits to Colorado from Operations

In this section, the portion of the annual operating budget (see Table 7-7) spent within Colorado and the resulting impacts are presented as well as 40-year accumulative impacts. The first full year of operations would be 2031.

### 8.5.1 Total Annual Output from Operations

Table 8-20 shows an estimate of the economic impact to Colorado that would result from operating the Project. Annually, the direct investment (portion of annual operating budget spent within Colorado) is estimated to be $2.0 million. Indirect and induced total outputs are estimated to generate $1.0 million and $604,000 annually, respectively. Thus, the total annual economic output impacting Colorado would be $3.6 million. Refer to the Key Terminology section for a further description of terms.

**Table 8-20. Haynach Solar Total Annual Operations Impact to Colorado**

| Type Impact | Labor Income | Intermediate Expenditures | Other Property Income | Taxes on Production | Total Output |
|---|---|---|---|---|---|
| Direct | $569,129 | $881,169 | $316,859 | $195,357 | $1,962,513 |
| Indirect | $239,321 | $558,242 | $171,607 | $53,047 | $1,022,217 |
| Induced | $184,599 | $228,799 | $152,621 | $37,667 | $603,686 |
| **Total** | **$993,049** | **$1,668,210** | **$641,087** | **$286,071** | **$3,588,417** |

The indirect and induced labor income impacts are significant, accounting for 24.1 percent and 18.6 percent of total labor income impacts, respectively. The total output indirect and induced impacts are also significant, accounting for 28.5 percent and 16.8 percent of total output, respectively.

## 8.5.2 Total Accumulative Output from Operations

IMPLAN is a linear model. Thus, we can extrapolate the 40-year accumulative operating impact by multiplying the annual impact by the number of years. Table 8-21 shows the total output over the 40-year planned lifetime to be $143.5 million.

**Table 8-21. Total Accumulative Operations Impact to Colorado**

| Type Impact | Labor Income | Intermediate Expenditures | Other Property Income | Taxes on Production | Total Output |
|---|---|---|---|---|---|
| Direct | $22,765,156 | $35,246,741 | $12,674,375 | $7,814,266 | $78,500,537 |
| Indirect | $9,572,843 | $22,329,692 | $6,864,271 | $2,121,889 | $40,888,694 |
| Induced | $7,383,954 | $9,151,970 | $6,104,835 | $1,506,682 | $24,147,440 |
| **Total** | **$39,721,952** | **$66,728,402** | **$25,643,481** | **$11,442,837** | **$143,536,671** |

## 8.5.3 Employment Created

Table 8-22 shows estimates of average annual employment within Colorado during the operations phase. The estimated average annual number of direct jobs created is the same for Colorado as Alamosa County (Table 8-8) based on the assumption that all direct employment would reside in the county. The number of indirect and induced jobs created by operations within Colorado is estimated to be 5.5. The average annual labor income for all FTE would be $87,958. Notice more employment is indirectly created and induced at the state level than the county level because the state's economy is larger. Furthermore, the wage levels of the indirect and induced employment occurring across the state are higher than in Alamosa County.

**Table 8-22. Operating Phase Employment Impacts to Colorado**

| Type Impact | Average Annual Employment (FTE) | Average Annual Labor Income/FTE |
|---|---|---|
| Direct | 5.8 | $98,295 |
| Indirect | 2.2 | $107,802 |
| Induced | 3.3 | $56,280 |
| **Total** | **11.3** | **$87,958** |

Note: The average annual job estimates are approximately full-time equivalent (FTE).

## 8.5.4 Occupation Detail

Since the direct operations employment is assumed to occur within Alamosa County, the direct operations occupations created at the state level are equivalent to those at the county level shown in Table 8-9.

## 8.5.5 Annual Economic Impact by Type and Industry

The $2.0 million of total direct economic output would have ripple effects throughout Colorado's economy and would impact many other industries. Table 8-23 shows the distribution of output by type of impact for the top 10 industries most impacted as measured by the dollar value of total output. A total of 456 industries would be impacted. Sector 37 would experience the most impact since that is the sector in which the direct investment would occur.

**Table 8-23. Impact to Colorado by Type and Industry for the Top 10 Industries**

| Total Output Impact by Industry | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Electric power generation - solar | $1,962,513 | $37,127 | $674 | $2,000,314 |
| Electric power transmission and distribution | $0 | $500,039 | $8,742 | $508,781 |
| Owner-occupied housing | $0 | $0 | $93,701 | $93,701 |
| Local government electric utilities | $0 | $50,913 | $779 | $51,692 |
| Other real estate | $0 | $25,747 | $16,612 | $42,359 |
| Monetary authorities | $0 | $21,376 | $18,072 | $39,447 |
| Hospitals | $0 | $0 | $29,817 | $29,817 |
| Scientific research and development services | $0 | $26,478 | $2,101 | $28,579 |
| Full-service restaurants | $0 | $7,089 | $20,748 | $27,837 |
| Data processing, hosting, and related services | $0 | $21,940 | $5,378 | $27,317 |

## 8.5.6 Total Annual Tax Revenue Impact of Operations

Table 8-24 shows the total annual tax impacts resulting from the Project's operations and maintenance. Total direct tax revenues are estimated to be $335,000 annually, with another $204,000 generated

through indirect and induced spending. The total annual tax impact would be $539,000, of which $178,000 would be received at the local level (sub-county, special districts, and county combined) across the region and state. Note that the taxes on production (Table 8-20) are a subset of the total amount of tax revenue generated (refer to Appendix A for further explanation of IMPLAN's tax estimates).

**Table 8-24. Annual Tax Impact within Colorado from Operations by Type and Category**

| Impact Type | Sub-County | Special Districts | County | State | Federal | Total Tax |
|---|---|---|---|---|---|---|
| Direct | $37,568 | $54,541 | $29,768 | $80,819 | $132,640 | $335,335 |
| Indirect | $10,297 | $15,066 | $7,976 | $25,663 | $57,651 | $116,653 |
| Induced | $7,091 | $10,303 | $5,665 | $18,651 | $45,225 | $86,936 |
| **Total Impact** | **$54,956** | **$79,911** | **$43,409** | **$125,133** | **$235,516** | **$538,924** |

## 8.5.7 Total Accumulative Tax Revenue Impact of Operations

Table 8-25 shows the accumulative tax impacts resulting from lifetime operations of the Project, simply 40-year multiples of the estimates shown in Table 8-24. Total tax revenues are estimated to be $21.6 million, of which $7.1 million would be received at the local level across the region and state (refer to Appendix A for further explanation of IMPLAN's tax estimates).

**Table 8-25. Accumulative Tax Impact of Operations by Type and Category**

| Impact Type | Sub-County | Special Districts | County | State | Federal | Total Tax |
|---|---|---|---|---|---|---|
| Direct | $1,502,718 | $2,181,632 | $1,190,712 | $3,232,762 | $5,305,596 | $13,413,419 |
| Indirect | $411,862 | $602,658 | $319,048 | $1,026,514 | $2,306,021 | $4,666,102 |
| Induced | $283,655 | $412,139 | $226,598 | $746,030 | $1,809,018 | $3,477,440 |
| **Total Impact** | **$2,198,234** | **$3,196,428** | **$1,736,359** | **$5,005,306** | **$9,420,634** | **$21,556,961** |

## 8.5.8 State Tax Revenue Impacts of Operations

The state of Colorado would receive an estimated annual tax revenue amount of $125,133, which are detailed in Table 8-26.

**Table 8-26. Total State Operations Tax Impact Detail**

| Description | Employee Compensation | TOPI | Corporations | Households | Total |
|---|---|---|---|---|---|
| Social Insurance Tax-Employee Contribution | $795 | $0 | $0 | $0 | $795 |
| Social Insurance Tax-Employer Contribution | $934 | $0 | $0 | $0 | $934 |
| TOPI: Sales Tax | $0 | $94,042 | $0 | $0 | $94,042 |

| Description | Employee Compensation | TOPI | Corporations | Households | Total |
|---|---|---|---|---|---|
| TOPI: Motor Vehicle License | $0 | $1,228 | $0 | $0 | $1,228 |
| TOPI: Severance Tax | $0 | $2,528 | $0 | $0 | $2,528 |
| TOPI: Other Taxes | $0 | $987 | $0 | $0 | $987 |
| OPI: Corporate Profits Tax | $0 | $0 | $9,672 | $0 | $9,672 |
| Personal Tax: Income Tax | $0 | $0 | $0 | $13,632 | $13,632 |
| Personal Tax: Motor Vehicle License | $0 | $0 | $0 | $303 | $303 |
| Personal Tax: Other Tax (Fish/Hunt) | $0 | $0 | $0 | $1,011 | $1,011 |
| **Total** | **$1,729** | **$98,786** | **$9,672** | **$14,945** | **$125,133** |

## 8.6 Decommissioning Impacts

Solar equipment has a typical lifespan of over 40 years. The proposed project expects to sell the renewable energy produced by the project under the terms of a long-term Power Purchase Agreement (PPA) with a utility or other power offtaker. Upon completion of the PPA term, the project operator may, at its discretion, choose to enter into a subsequent PPA or decommission and remove the system and its components. Upon decommissioning, the solar facility could be converted to other uses in accordance with applicable land use regulations in effect at that time.

During Project decommissioning, structures that would not be needed for subsequent use would be removed. The site would revert to undeveloped land that supports agricultural production and wildlife habitat. The decommissioning and restoration process involves removing aboveground and belowground structures, restoring topsoil, revegetation, and seeding. Temporary erosion and sedimentation control best management practices would be used during the decommissioning phase.

Equipment would be de-energized prior to removal, salvaged (where possible), and shipped off-site to be recycled or disposed of at an appropriately licensed disposal facility. Once the solar modules are removed, the racks would be disassembled, and the structures supporting the racks would be removed. Other site infrastructure would also be removed, including fences, and concrete pads that may support the inverters, transformers and related equipment. The demolition debris and removed equipment may be cut or dismantled into pieces that can be safely lifted or carried by standard construction equipment. The fencing and gates would be removed, and all materials would be recycled to the extent practical. Project roads would be restored to their pre-construction condition unless they may be used for subsequent land use. The area would be thoroughly cleaned and all debris removed. Materials would be recycled to the extent feasible, with the remainder disposed of in landfills in compliance with all applicable laws.

Decommissioning would also require expenditures with economic impacts. Given that utility-scale solar power generation facilities are based on new technology, there is little precedent for their

decommissioning, and the technology that would be used to dispose of solar panels three decades or more in the future may not yet have been developed.

A 2019 study by Swift Current estimated the cost of decommissioning a 100 MW solar facility in Maine in 50 years to be $2.2 million (Swift Current 2019). A 2020 study by the Commercial Solar Guy estimated the cost of decommissioning a 5 MW solar facility in Massachusetts in 20 years to be $287,798 (Weaver 2020). A June 2022 study by the Center for Rural Affairs cites a low estimate of $9,090 per MW from South Dakota and a high estimate of $56,300 per MW from Minnesota (Kolbeck-Urlacher 2022). The cost to decommission a 99 MW BESS in Wisconsin was estimated to be $10.7 million (Wisconsin Power and Light Company 2023). Based on scaling this limited information, the estimated cost of decommissioning this Project's 110 MW generation facility and 110 MW BESS could be $13 million to $18 million.

# 9 Fiscal Impacts

## 9.1 Overview

As previously mentioned, the Project would require the purchase of large equipment, including solar panels and inverters, from outside Alamosa County. The production of this equipment would impact the region(s) in which the equipment is produced but would not impact Alamosa County's economy. Therefore, these anticipated expenses were not included as inputs to the IMPLAN economic impact model. However, property, sales, and use taxes apply to the transaction and ownership of this equipment for both the construction and operational phases of the Project. This section provides estimates of these tax revenues.

## 9.2 Colorado Renewable Energy Tax Incentives

According to Colorado Revised Statutes (CRS) § 39-26-724(1)(a), the components used in the production of alternating current electricity from a renewable energy source are exempt from sales and use tax (Colorado Office of the State Auditor 2022). See Section 9.5 for further description. Components include—but are not limited to—solar modules, trackers, supporting structures/racks, inverters, towers, and foundations. Components not directly used in the creation of renewable energy, such as energy storage devices and remote monitoring systems, are not eligible (Colorado Department of Revenue 2021).

Regarding property tax, all renewable energy systems with greater than 2 MWac electricity generation capacity are valued as public utility property by the Colorado Division of Property Taxation and subject to state assessment (Colorado Department of Local Affairs 2021). Effectively, this incentivizes the development of renewable energy by "leveling" the annual payments over time rather than applying a depreciation schedule in which a greater share of the total taxes is paid in the initial operating years. It also helps to ensure that renewable energy projects are not subject to higher property taxes than their non-renewable counterparts.

## 9.3 State-Assessed Property Tax

The Colorado Department of Local Affairs Division of Property Taxation publishes a template used to calculate property taxes for renewable energy projects placed in service on or after January 1, 2021 (Colorado Department of Local Affairs 2024). The template first determines a depreciated value based on a capital cost threshold rate per kilowatt, taxpayer-specific inputs including nameplate capacity and power purchase agreement details, and an assumed deprecation over a 20-year period. Second, the total depreciated value is then levelized by using the template to estimate the levelized annual payment of property taxes over the life of the Project. Following the state template, our calculation uses a flat millage rate over the life of the Project. Pursuant to CRS § 39-4-102, our model follows the prescribed formula for the 30-year period. For tax years beyond 30, we follow state guidance that the Project would be assessed and taxed at a 20 percent floor, although the state has indicated that income or market approaches may be considered at that time. The Applicant intends to purchase the land. In that case, the tax liability associated with the land value is incorporated in the template-derived tax payment calculation, and there would be not be an additional real property tax liability.

The template is the basis for estimating the total annual property tax payments shown in Table 9-1. This method levels the payments as mentioned in Section 9.2. By basing the calculations on energy production, this approach factors in the replacement equipment that would be purchased occasionally throughout the lifetime of the Project in the course of normal operations and maintenance.

For reference, the Division of Property Taxation provides a benchmark estimate of annual property tax payments based on the depreciating nonrenewable cost basis. The benchmark payments are also shown in Table 9-1 and Figure 9-1 shows a graphical comparison. The estimated annual payments assume no change in the mill levy rates over time.

**Table 9-1. Annual Property Tax Payments**

| Year | Total Levelized Property Tax Payment | Total Benchmark Property Tax Payment | Year | Total Levelized Property Tax Payment | Total Benchmark Property Tax Payment |
|---|---|---|---|---|---|
| 2031 | $552 | $1,311 | 2051 | $552 | $276 |
| 2032 | $552 | $1,242 | 2052 | $552 | $276 |
| 2033 | $552 | $1,173 | 2053 | $552 | $276 |
| 2034 | $552 | $1,104 | 2054 | $552 | $276 |
| 2035 | $552 | $1,035 | 2055 | $552 | $276 |
| 2036 | $552 | $966 | 2056 | $552 | $276 |
| 2037 | $552 | $897 | 2057 | $552 | $276 |
| 2038 | $552 | $828 | 2058 | $552 | $276 |
| 2039 | $552 | $759 | 2059 | $552 | $276 |
| 2040 | $552 | $690 | 2060 | $552 | $276 |
| 2041 | $552 | $621 | 2061 | $276 | $276 |
| 2042 | $552 | $552 | 2062 | $276 | $276 |
| 2043 | $552 | $483 | 2063 | $276 | $276 |
| 2044 | $552 | $414 | 2064 | $276 | $276 |
| 2045 | $552 | $345 | 2065 | $276 | $276 |
| 2046 | $552 | $276 | 2066 | $276 | $276 |
| 2047 | $552 | $276 | 2067 | $276 | $276 |
| 2048 | $552 | $276 | 2068 | $276 | $276 |
| 2049 | $552 | $276 | 2069 | $276 | $276 |
| 2050 | $552 | $276 | 2070 | $276 | $276 |
| | | | **Total** | **$19,320** | **$19,320** |

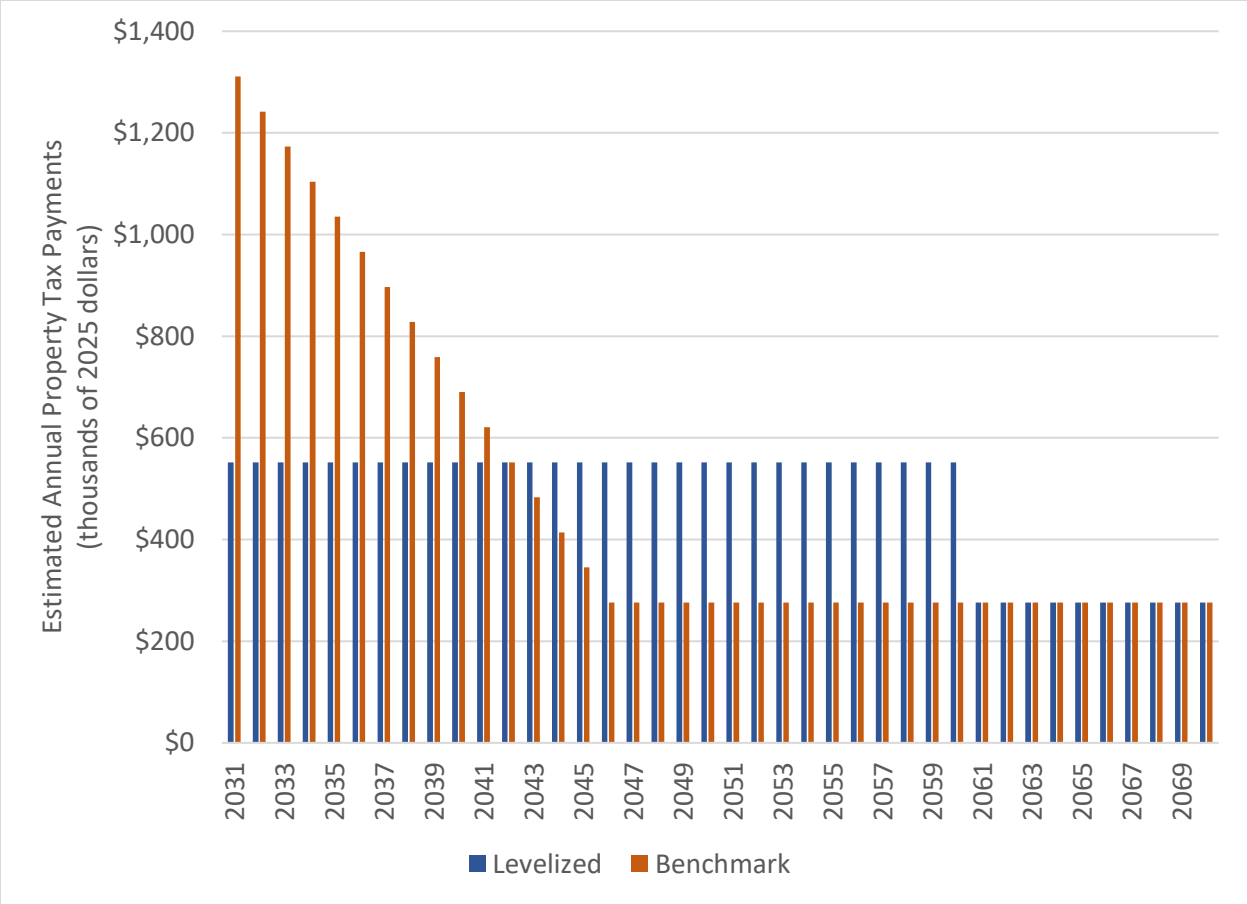



**Figure 9-1. Comparison of State Assessed (Levelized) vs. Benchmark Property Tax over the Project Lifetime**

At the end of the 40-year lifetime, both tax calculation methods give a total lifetime payment of $19,312,634. Further, the land classification remains agricultural, so the property tax payments for the land would not increase. This method is developed in accordance with Colo. Rev. Stat. § 39-4-102, as well the land classification for renewable energy projects.

Although renewable energy generation systems are state assessed in the manner described in this section, the tax revenue would be returned to the applicable taxing authorities in the tax district where the Project is located. The Project would be located in Tax Area 22-6. We have not assumed an escalation any tax in future years. Table 9-2 shows the estimated tax revenue to be received by each jurisdiction.

**Table 9-2. Estimated Property Tax over Project Lifetime by Tax Jurisdiction**

| Tax Area 22-6 Jurisdictions | Tax Rate | Tax Revenue |
|---|---|---|
| Alamosa County | 2.52% | $6,747,405 |
| Sangre De Cristo School District | 3.57% | $9,535,875 |
| Alamosa County Fire Protection | 0.54% | $1,451,716 |

| Tax Area 22-6 Jurisdictions | Tax Rate | Tax Revenue |
|---|---|---|
| Rio Grande Water Conservation | 0.16% | $427,762 |
| San Luis Valley Water Conservation | 0.04% | $109,881 |
| Alamosa Weed and Pest | 0.10% | $268,420 |
| Alamosa County Ambulance | 0.29% | $771,575 |
| **Total** | **7.2237%** | **$19,312,634** |

## 9.4 Impact on Neighboring Property Values

The development of the Project is not expected to impact neighboring property values. Nationally, several studies have been conducted on the impact of utility-scale solar facilities on surrounding property values. A 2018 study conducted at the University of Texas found that large solar facilities have very little impact on nearby residential home values (Al-Hamoodah, et al. 2018). Another study in 2018, found "no consistent negative impact" occurring to properties adjacent to solar farms in Illinois and Indiana (McGarr and Lines 2018). A 2019 report from the Solar Energy Industries Association cited McGarr and Line's study, as well as another Illinois study, and an appraisal study in North Carolina and Tennessee that determined there was a less than 1 percent change in property values surrounding solar farms (Solar Energy Industries Association 2019). A 2020 study from the University of Rhode Island found no associated impact on property values for solar farms located in rural areas (Gaur and Lang 2020). In Chisago County, Minnesota the assessor found no adverse impacts on nearby property values resulting from the 1,000-acre "North Star" solar project (Chisago County Press 2017). Further, there have been some examples of positive impacts on surrounding property values as the additional demand for solar production increases overall demand for land (American Society of Farm Managers & Rural Appraisers 2021).

More recently, a study conducted at Lawrence Berkeley National Laboratory found that residential home values within a mile of a large-scale solar facility declined by 2.3 percent on average and that homes more than a mile away were not affected (Elmallah, et al. 2023). A study specific to agricultural land values found no effect on land values near utility-scale solar farms. This study further points out that the adjacent land could be positively impacted if also converted to solar production and that transmission line construction may also have a positive impact for a similar reason (Abashidze and Taylor 2023). A 2022 undergraduate thesis conducted at Duke University found a similar result for low-income homes, which decreased in value 1.4 percent within 3 miles of solar farms in North Carolina (Wang 2022).

Basic research conducted by Triple Point Strategic Consulting in western Nebraska in 2021 found that agricultural property values were primarily dependent on irrigation rather than other factors, such as neighboring use.

## 9.5 Sales and Use Tax

In Colorado, all sales of components used in the production of alternating current electricity from renewable energy sources are exempt from the taxes imposed by the State of Colorado, Regional Transportation District, and Scientific and Cultural Facilities District under a Renewable Energy

Exemption. However, the exemption does not apply to any city or county sales tax administered by the Colorado Department of Revenue, unless the city or county has adopted the exemption by ordinance or resolution. Components that qualify for exemption include wind turbines, rotors/blades, solar modules, trackers, generating equipment, supporting structures or racks, inverters, towers and foundations, balance of system components (e.g., wiring, control systems, switchgears, generator step-up transformers), and concentrating solar power components (e.g., mirrors, plumbing, heat exchangers). Components that qualify for exemption do not include any item used beyond the point of generator step-up transformers located at the production site, labor, energy storage devices, or remote monitoring systems (Colorado Office of the State Auditor 2022) (Colorado Department of Revenue 2021).

Alamosa County imposes a county sale and use tax across the county. While many counties and cities have the authority to either honor or deny the renewable energy sales and use tax exemption with respect to county and local taxes, Alamosa County does not honor the exemption. Therefore, the sales and use tax exemption would apply only to state sales and use taxes for qualifying purchases at the proposed site. The county sales tax rate in unincorporated Alamosa County is 3 percent.

Although the energy generation components are exempt from state sales tax, the BESS and interconnection equipment purchased at the time of construction would be subject to the state and county sales taxes applicable in unincorporated Alamosa County. The estimated equipment cost and resulting sales tax amount is shown in Table 9-3.

**Table 9-3. Estimated Sales Tax Revenue from Initial Equipment Purchase**

| Equipment | Equipment Cost | State Sales Tax (2.9%) | County Sales Tax (3.0%) | Total Tax |
|---|---|---|---|---|
| PV | $86,973,680 | Exempt | $2,609,210 | $2,609,210 |
| BESS | $101,700,000 | $2,949,300 | $3,051,000 | $6,000,300 |
| Interconnection | $5,277,457 | $153,046 | $158,324 | $311,370 |
| **Total** | **$193,951,137** | **$3,102,346** | **$5,818,534** | **$8,920,880** |

The estimated total accumulative replacement equipment costs and resulting sales tax amounts are shown in Table 9-4.

**Table 9-4. Estimated Annual Sales Tax Revenue from Replacement Equipment Purchase**

| Equipment | Replacement Equipment Cost | State Sales Tax (2.9%) | County Sales Tax (2.0%) | Total Tax |
|---|---|---|---|---|
| PV | $287,013 | Exempt | $344,416 | $344,416 |
| BESS and Interconnection | $335,610 | $389,308 | $402,732 | $792,040 |
| BESS augmentation (Yrs 8 and 15) | $29,917,937 | $867,620 | $897,538 | $1,765,158 |
| **Total** | **$30,540,561** | **$1,256,928** | **$1,644,686** | **$2,901,614** |

## 9.6 Colorado Tax Incentives

Colorado legislature created the Enterprise Zone (EZ) program to encourage development in economically distressed areas of the state. In designated EZs, businesses are eligible for various incentives. EZ areas in rural counties that meet additional economic distress criteria receive enhanced rural EZ status. The Project is located in an EZ in the North-East-Central EZ. This section describes EZ opportunities and other incentives the Project may be eligible to receive.

### 9.6.1 Property Tax Incentive

The valuation of renewable property using the capital cost threshold rate is intended to be a form of statutory incentive since the threshold rate is based on comparable nonrenewable cost to construct (gas turbines), which historically are lower than the cost to construct a renewable facility of equal capacity. As a result, local discretionary property tax incentives are not typically granted for renewable facilities and we have not contemplated a discretionary incentive in our calculation. However, any city, county, or special district within an EZ is authorized to consider entering into a property tax incentive agreement with individual taxpayers who have qualifying new business facilities, provided that the incentive is limited to the incremental property tax liability over pre-EZ levels.

### 9.6.2 Sales and Use Tax Incentive

Any city, county, or special district within an EZ is authorized to negotiate with individual taxpayers who have qualifying new business facilities for a refund of local sales taxes on purchases of equipment, machinery, machine tools, or supplies used in the taxpayer's business in the EZ.

### 9.6.3 Non-Tax Local Incentives

Local government and community organizations can offer incentives such as fee waivers, expedited land use review and approval, actual cash payments, and grant sponsorship. These incentives are highly discretionary and further discussion would need to occur in order to determine the level of support. Note that the Colorado Investment Tax Credit specifically applies to state income taxes and is separate from the federal Investment Tax Credit.

### 9.6.4 Colorado Investment Tax Credit

A taxpayer operating a business facility in an EZ may take a Colorado income tax credit of 3 percent on qualified investments made during the tax year for property used solely and exclusively in an EZ for at least 1 year. The credit is based on provisions of the federal Internal Revenue Code (IRC) as it existed immediately prior to the enactment of the federal Revenue Reconciliation Act of 1990. Qualified property is defined as “section 38 property” in section 48 of the IRC. Section 38 property generally includes tangible personal property that is depreciable under section 168 of the IRC. Renewable energy investment qualifies, but the option to receive a refund expired in 2020. The amount of credit that can be used in a given year is the lesser of the taxpayer’s net tax liability or $750,000. The remaining credit can be carried forward for 14 years.

### 9.6.5 New Employee Tax Credits

A taxpayer who operates a business facility in an EZ is allowed a credit for the net increase of employees working at the facility during the tax year. In order to meet the definition of a qualified facility, a renewable project must have an operations and maintenance building or temporary trailer or office space within the EZ in order to qualify the employees. The number of employees is calculated by adding the number of employees on the last business day of each month of the tax year and dividing the total by 12 or by the number of months the business was operating in Year 1. In an enhanced EZ, the credit is $3,100 per net new employee. Any unused credit can be carried forward for up to 7 years.

### 9.6.6 Employer-Sponsored Health Insurance Tax Credits

If a business in an EZ offers a qualified health insurance plan and it contributes at least 50 percent of the total cost of the health plan, the business can earn a tax credit of $1,000 per employee. The number of employees is calculated by adding the number of employees on the last business day of each month of the tax year and dividing the total by 12. The credit amount is available for all employees covered by a qualified health plan for 2 years only.

### 9.6.7 Job Training Tax Credits

If a business in an EZ provides job training, it may claim a state income tax credit equal to 12 percent of the eligible job training costs. To qualify, the training program must be a structured training or basic education program to improve the job skills of the taxpayer's employees who work predominantly within an EZ. Nonqualifying expenses include regular operations of a business, on-the-job training that is not part of a qualified job-training program, wages paid to employees being trained, or training employees who work outside the EZ. The combined amount of investment tax credit and job training investment tax credit a taxpayer applies to offset tax for a given tax year cannot exceed the limits on credit use. Any excess credit that cannot be used to offset tax can be carried forward for 14 years.

## 9.7 Federal Investment Tax Credits

The Inflation Reduction Act, enacted in August 2022, extends federal renewable energy tax credits. Beginning January 1, 2025, the traditional Investment Tax Credit under Section 48 and the Production Tax Credit under Section 45 were replaced by technology-neutral credits: the Clean Electricity Investment Tax Credit (Section 48E) and the Clean Electricity Production Tax Credit (Section 45Y), respectively. Federal policy continues to evolve and further changes are possible. The Project would likely qualify for the Section 48E Investment Tax Credit, subject to meeting eligibility criteria and final guidance from the Internal Revenue Service. The Applicant anticipates qualifying for a 40-percent Investment Tax Credit, reflecting bonus credits for meeting prevailing wage and apprenticeship requirements, and potentially for domestic content or energy community siting. Additional eligibility conditions, such as workforce development and apprenticeship standards, appear applicable, and the Project is expected to meet those requirements.

# 10 Existing Tax Base and Current Levels of Taxation

The Project is located in unincorporated Alamosa County and is subject to Alamosa County tax code.

## 10.1 Sales Tax

Alamosa County imposes 3 percent sales and use tax county-wide and Alamosa County residents are also subject to the Colorado sales tax of 2.9 percent. The Colorado Department of Revenue collects both the county and state sales tax. In fiscal year (FY) 2023, the county received over $3 million in sales tax revenue (see Table 11-1).

## 10.2 Local Marketing District and Lodging Taxes

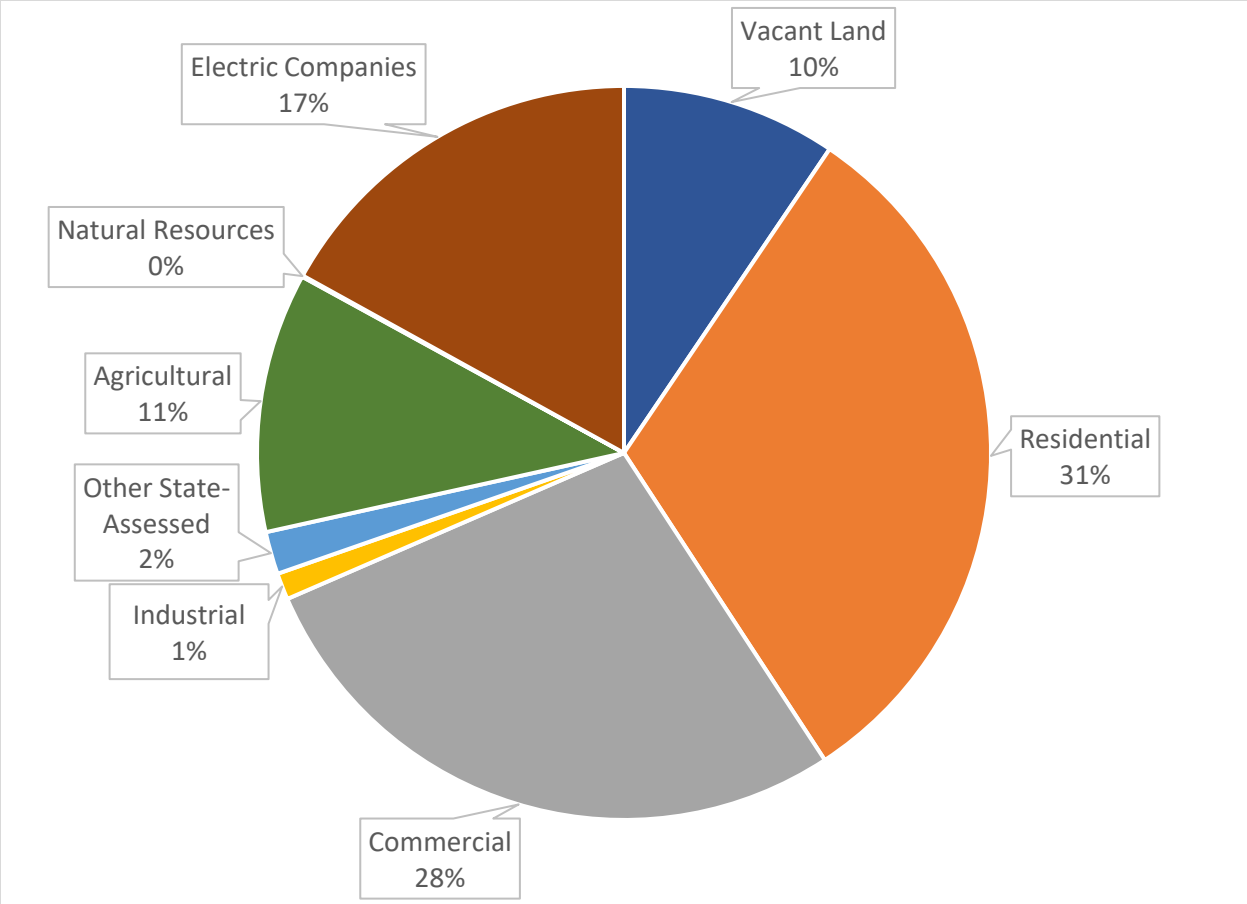
The Alamosa County Local Marketing District oversees a 4 percent marketing and promotion tax within the district and a 2 percent tax within the county. Both taxes are levied on the sale of rooms and accommodations. In 2024, approximately $1.3 million was collected by both taxes combined. The 2025 Operating Plan outlines intentions for allocating funds (Visit Alamosa Colorado 2024).

## 10.3 Highway User's Tax

The Highway Users Tax Fund (HUTF) is the primary source of transportation funding in Colorado. The HUTF revenues come from state motor fuel taxes (22 cents per gallon for gasoline and 20.5 cents per gallon for diesel), vehicle registration fees, and smaller sources including driver's license fees and fines (Bernard, et al. 2022). Approximately $1.5 million was remitted to Alamosa County in 2023 (Colorado Department of the Treasury 2024).

## 10.4 Property Tax

Residential and commercial property comprise the majority of property value in Alamosa County (Figure 10-1). The 2024 county abstract shows a total of $213 million to be assessed with an anticipated $5.8 million to be received by the county government (Alamosa County Assessor 2024). Cities, schools, and various special districts receive the balance of property tax revenue collected.




Source: Alamosa County Assessor.

**Figure 10-1. Alamosa County Taxable Property Distribution by Class, 2024**

# 11 Local Governments and Special Districts

This section reviews public services that would be impacted by Project construction and operations. Given the Project's location in unincorporated Alamosa County, law enforcement would fall under the sheriff's office, fire protection under the Alamosa County Fire Protection District, and emergency medical services (EMS) under the County Ambulance District. The location is also within the Sangre de Cristo School District and Rio Grande Water Conservation District.

## 11.1 Anticipated Population Changes

Given the size of the construction workforce (Table 8-14) and considering the intention to hire locally, along with ongoing operations employment (Table 8-22), including indirect and induced impacts relative to the size of the county, any changes to the county's population and social characteristics would be negligible.

## 11.2 Alamosa County

Alamosa County's fiscal year ends December 31. The FY 2025 total revenue budget is $15.5 million, as shown in Table 11-1 (Alamosa County 2024). FY 2025 is budgeted to reduce the general fund balance. Roughly 30 percent of the revenue comes from property tax, about 20 percent from sales tax, and the balance from permits, fees, fines, grants, other taxes, and state allocations.

**Table 11-1. Alamosa County Budget Summary**

| Alamosa County | FY23 Actual | FY24 Projected | FY25 Budgeted |
|---|---|---|---|
| Property Tax Revenue | $4,265,936 | $4,304,126 | $4,529,344 |
| Sales and Use Tax Revenue | $3,007,256 | $3,036,444 | $3,174,078 |
| Other Revenue | $7,943,228 | $8,436,498 | $7,794,556 |
| Subtotal Revenue | $15,216,420 | $15,777,068 | $15,497,978 |
| Expenses Total | $11,611,537 | $14,321,941 | $15,702,721 |
| Net | $3,604,883 | $1,455,127 | ($204,743) |
| Ending General Fund Balance | $13,997,233 | $15,452,360 | $15,247,617 |

Source: Alamosa County.

Table 11-2 shows the total tax revenue impact to Alamosa County for comparison to the county budget. Over the lifetime of the Project the county would receive $12.6 million in tax revenue, not quite equivalent to a year of county operations.

**Table 11-2. Total Tax Impact to Alamosa County Government**

| Tax | County Tax Revenue |
|---|---|
| Personal property tax (lifetime) | $5,783,490 |
| Sales tax (initial equipment purchase) | $5,308,534 |
| Construction spending | $249,634 |
| Operations spending (lifetime) | $837,584 |
| Sales tax (replacement equipment) | $405,000 |
| **Total County Tax Revenue** | **$12,584,242** |

Ostensibly, these tax revenues would be available for increasing funding for social services, providing job training, mitigating negative impacts, and many other potential local governmental functions.

## 11.3 Alamosa County Sheriff

The Project's proposed location in unincorporated Alamosa County falls under the jurisdiction of the Alamosa County Sheriff's Office. The FY 2025 sheriff's departments budgets are $4.4 million for the county sheriff's office, and $1.5 million for sheriff deputies (Alamosa County 2024). The Alamosa County Sheriff's Office has approximately 18 law enforcement officers and 21 support personnel (Alamosa County n.d.). The closest sheriff station is in the City of Alamosa, approximately 20 miles south of the Project, which would be a 20- to 25-minute response time.

**Table 11-3. Alamosa County Sheriff's Office Budgets**

| Sheriff's Office Expenses | FY23 Actual | FY24 Projected | FY25 Budgeted |
|---|---|---|---|
| County Sheriff | $3,896,426 | $4,054,409 | $4,428,732 |
| Sheriff Deputies | $1,162,979 | $1,442,457 | $1,508,250 |
| **Total** | **$5,059,405** | **$5,496,866** | **$5,936,982** |

Source: Alamosa County.

Based on the 2023 population of 16,648, the per capita Sheriff expense was $303.90. One way to put the Project's impact into perspective is to extrapolate on a per-worker basis. As shown in Table 8-14, an average of 209.1 direct workers would be directly employed per year during the 16 months of construction. However, most of the workforce already resides in the county. Therefore, the actual incremental impact would be minimal.

## 11.4 Alamosa County Fire Protection District

The Project's location falls under the jurisdiction of the Alamosa County Fire Protection District (ACFPD) for fire protection and emergency services. The ACFPD is responsible for providing these services to 99 percent of the county. The ACFPD funding goes to both the City of Alamosa and the Mosca-Hooper Volunteer Fire Department (MHVFD). The Project would fall under the fire jurisdiction of the MHVFD.

The closest fire station is MHVFD Station 1, located at 5235 State Highway 17, Mosca, Colorado, 81146. The fire station is about 9.8 miles from the Project site and response time would be approximately 10 minutes.

The MHVFD receives nearly all of its funding from the ACFPD mill levy. Detailed budget data is not available because the department functions on an "as needed" basis for most of its purchasing. They also raise funds through miscellaneous fundraising efforts. Over its lifetime, the Project would generate an estimated $1.2 million for the ACFPD in property tax revenue.

The City of Alamosa has 35 volunteer firefighter positions and a budget of $795,145. It is estimated that the MHVFD employs between 5 and 15 volunteers, in addition to a fire chief, assistant chiefs, and lieutenants at each of the two stations.

As part of the Project, outreach and coordination would be conducted with the MHVFD to ensure compliance with all local, state, and national fire safety standards and regulations. This collaboration would ensure the implementation of appropriate safety measures throughout the construction and operational phases, focusing on minimizing fire risks and maintaining safety for personnel and the surrounding community. Fire protection during construction would include the provision of fire extinguishers and portable firefighting equipment, regularly inspected and maintained according to local and federal standards. For the operational phase, the project would adhere to the current International Fire Code and relevant fire safety standards, including fire suppression systems for the BESS, and would be designed to minimize fire hazards while ensuring the safety of the facility and emergency responders. Additionally, an Emergency Response Plan is being developed in collaboration with local consultants from Colorado, and it will be shared with the county as part of the final application.

## 11.5 Alamosa County Ambulance District

The purpose of Alamosa County Ambulance District (ACAD) is to provide for the treatment and transportation of the sick, injured, or otherwise incapacitated or helpless (Alamosa County Ambulance District 2025). The ACAD was created in 1991 in order to provide the only advanced life support ambulance service in the area. ACAD contracts with San Luis Valley Health to provide paramedics to operate the ambulances and is based out of San Luis Valley Health (the only licensed trauma center in the area) and is credentialed by the state at the paramedic level. EMS in Alamosa County are primarily funded by the ACAD. The organizational structure of the ACAD is similar to the ACFPD, but they collect a mill levy across the entirety of the county.

The service operates ambulances on 12-hour shifts and is estimated to complete approximately 4,500 calls a year. Using a dual paramedic model, the number of ambulances in service at any given time can vary from day to day. The MHVFD tends to respond to all medical calls within the MHVFD response area.

In 2020, there were 2,740 runs and an ambulance cost $221,000. Over its lifetime, the Project would generate an estimated $661,350 for the ACFPD in property tax revenue.

## 11.6 Medical Facilities

The San Luis Valley Health system is the main regional health care provider for Alamosa County and surrounding rural communities. Its mission is to improve community health by delivering high-quality,

accessible care through a network of inpatient, outpatient, and emergency services. The system is guided by data-informed planning and aims to address rural health disparities across the San Luis Valley, including those related to poverty, chronic illness, and limited health care access in remote areas (San Luis Valley Health 2025).

There are two major medical centers in the area. The San Luis Valley Health Regional Medical Center is located in the City of Alamosa, has 49 beds, and is a level 3 trauma center. The medical center is approximately 20 to 25 minutes from the Project and has trauma-certified physicians and nurses and air transport (Guardian Flight).

A second facility, Conejos County Hospital, is a 17-bed critical access hospital located in La Jara, Colorado, approximately 35 miles southwest of the Project site. It provides basic emergency and outpatient services and functions as a secondary care option for rural patients across the region (Conejos County Hospital 2025).

## 11.7 Sangre de Cristo School District

Sangre de Cristo School District RE-22J is a small, rural public school district located in Mosca, Colorado, serving students from pre-kindergarten through 12th grade (Sangre de Cristo School District 2025). The district comprises two schools: Sangre de Cristo Elementary School and Sangre de Cristo Undivided High School. Total enrollment for the 2023-24 school year was 277 with 26 FTE teachers in the classroom and 48 FTE staff (Institute of Education Sciences 2025).

Table 11-4 shows the district's budget for the 2023-2024 school year (i.e., FY24). Over its lifetime, the Project would generate an estimated $8.2 million for the district in property tax revenue.

**Table 11-4. Sangre de Cristo School District Budget**

| FY24 School Year | Budget |
|---|---|
| State Funding | $2,267,000 |
| Local Funding | $2,041,000 |
| Federal Funding | $579,000 |
| **Total Revenue** | **$4,887,000** |
| | |
| Instructional Expenditures | $2,157,000 |
| Other Expenditures | $2,762,000 |
| **Total Expenditures** | **$4,919,000** |
| | |
| Net | ($32,000) |
| | |
| **Ending Fund Balance** | **$3,342,576** |

## 11.8 Alamosa County Weed Control District

The Alamosa County Weed Control District manages and mitigates noxious weeds across Alamosa County, ensuring the preservation of native ecosystems and agricultural lands. Over its lifetime, the Project would generate an estimated $230,075 for the district in property tax revenue.

## 11.9 Rio Grande Water Conservation District

The Project site is located within Subdistrict Number 1, known as the Closed Basin Project, of the Rio Grande Water Conservation District (RGWCD). For local water management, the RGWCD oversees several subdistricts that manage groundwater use and sustainability. The subdistrict was recognized as a legal entity in 2006 and formed in order to take action to help restore a balance between available water supplies and current levels of water use, so the San Luis Valley can continue to remain a sustainable agricultural community.

The Subdistrict Number 1 preliminary budget for 2025 lists planned expenditures totaling $7,890,470, including $661,600 of administrative expenditures and the majority allocated to water management and conservation (Rio Grand Water Conservation District n.d.). Over its lifetime, the Project would generate an estimated $366,653 for the district in property tax revenue.

## 11.10 San Luis Valley Water Conservation District

The Project would generate an estimated $94,184 for the San Luis Valley Water Conservation District in property tax revenue over its lifetime. The San Luis Valley Water Conservation District provides a water augmentation program in which water rights are used to augment, or replace, the injury to water users caused by the pumping of small wells. Because the District provides this service, there is an opportunity for towns, businesses, and homeowners to obtain new non-exempt wells, allowing for growth in the local economy (San Luis Valley Water Conservancy District 2024).

### 11.10.1 Alamosa County Water Use

In 2017, the U.S. Geological Survey published estimates of water use in the United States at the county level (U.S. Geological Survey 2017).

**Table 11-5. Alamosa County Water Withdrawal and Consumptive Use, 2017**

| Water Type | Withdrawal (Mgal/day) | Consumption Rate | Consumptive Use (Mgal/day) | Consumptive Use (AFY) |
|---|---|---|---|---|
| Total water, fresh | 140.74 | 46.4% | 65.24 | 73,126 |

Source: U.S. Geological Survey.
Notes: AFY = acre-feet per year; Mgal = million gallons

### 11.10.2 Project Water Use

Constructing the Project would require an estimated 200 to 300 acre-feet of water over the entire construction period, or 133 to 200 acre-feet per year (AFY). This water would be used primarily for

compaction, dust suppression (including truck wheel washing), and concrete mixing. At this rate, the Project would account for no more than 0.3 percent of annual county water use.

Water demand for panel washing is not expected to exceed 10 AFY. Water is anticipated to be obtained from on-site wells or delivered via truck from an off-site source (or sources) in the project vicinity. If water is trucked to the site, it is anticipated that an available local water source would be selected to minimize truck trips/lengths in transporting water to/from the site.

# 12 Socioeconomic Assessment

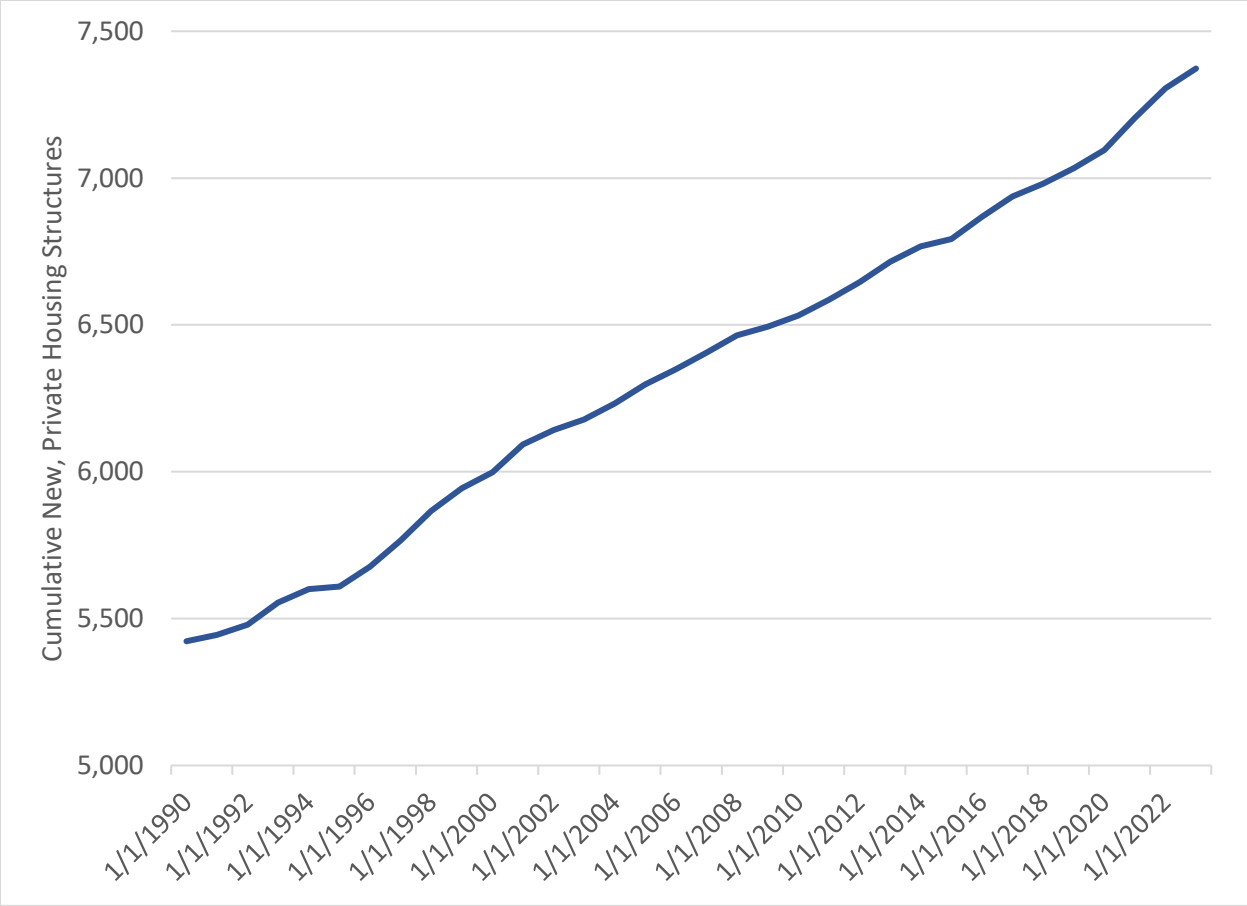
The Project's market function would fulfill user needs by increasing the supply of electric energy, supporting and creating skilled jobs, and generating public revenues. The regional energy demand is driven by residential and agricultural users, particularly during peak summer months. It supports the shift toward renewable energy mandated by Colorado's clean energy goals and aligns with growing daytime load from electrification and irrigation systems. Alamosa County already produces 256,880 MWh of energy per year from renewable sources, 97 percent of the county's total production. Most of these power plants are solar, including the neighboring project, Hooper Solar, which produces 118,275 MWh per year (Find Energy LLC 2025).

The Project's output is expected to feed into the Xcel Energy distribution system, reducing strain on long-distance transmission and helping stabilize regional electricity prices. Previously, the Climate and Economic Justic Screening Tool categorized northern Alamosa County as disadvantaged on the basis of high energy costs, specifically average annual energy cost as a share of household income based on 2019 U.S. Census data.

Alamosa has both workforce needs and population growth needs that make electricity production important. A housing study conducted in 2021 showed that the City of Alamosa has a housing unit deficit of over 500 housing units (City of Alamosa 2021). The report also found that Alamosa imports workers from surrounding areas who cannot find housing locally. To keep pace with expected population growth and economic development, the county will need to add 400-600 housing units over the next 5-10 years. Using an average of 7,944 kilowatt hour (kWh)/year per housing unit, that equates to 3.972 gigawatt hours/year in electricity demand for the county[1] (U.S. Energy Information Administration n.d.). In addition to workforce needs, the natural population growth of Alamosa is expected to increase from 16,673 in 2024 to 17,354 in 2034, or a 4 percent increase. The majority of this population growth will be due to the birth rate.

Figure 12-1 shows the cumulative number of county building permits issued over the past three decades (U.S. Census Bureau 2025). As a proxy for housing development, this data corresponds to an annual average growth rate of almost 1 percent a year. The trajectory of housing unit growth points to continued and sustained demand for electricity well into the future.

[1] Calculation is made using EIA's estimate of 662 kWh/month (7,944 kWh/year) per household.




Source: U.S. Census.

**Figure 12-1. New Private Housing Structures Authorized by Building Permits for Alamosa County**

# 13 Conclusion

Construction of the Haynach Solar Hybrid Project would help achieve state and utility company goals for increasing the generating capacity of non-hydroelectric renewable energy. The federal government continues to support renewable energy through established goals and financial incentives, however the evolving political environment introduces some uncertainty about the future trajectory of these programs. Economically, the region is dependent on agriculture, higher education, and health care, which have been growing along with the population. Although housing is being built, supply is not keeping up with demand, increasing prices and dropping rental vacancy to near zero. Construction would support a large number of local workers during the 16-month construction phase.

The economic benefits—including good operations jobs, ongoing tax revenues, and increased availability of energy—would last for the 40-year lifespan of the Project. Renewable energy generation would also be a welcome step toward greater economic diversification.

In the short-term, for the 16-month duration of the construction phase, the Project would bring a substantial amount of economic activity to the region and support many workers. This would place some incremental demands on socioeconomic sectors of the region including housing, law enforcement, transportation, and health care, depending on how many workers would relocate temporarily. Advanced planning of Project construction would mitigate and reduce negative impacts, and incremental tax revenues would help fund additional services.

The Project is a unique opportunity to achieve both a clean energy supply and economic development, which may offset temporary strains on public and community services and housing from construction. Advanced planning would help mitigate environmental impacts. Over the long-term, Project operations would provide many ongoing positive benefits. Solar power generation is a growing industry that would further diversify the economy and create new, skilled jobs along with a steady flow of tax revenues and clean energy.

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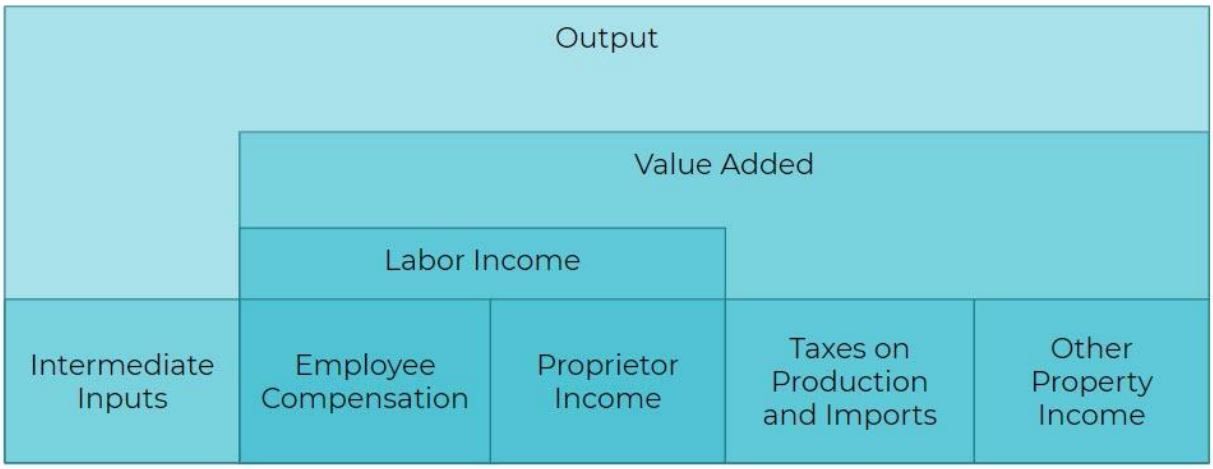
# Appendix A – The IMPLAN Economic Impact Model

Input-Output (I-O) modeling is based on the foundational concept that all industries, households, and governments in an economy are connected through buy-sell relationships; therefore, a given economic activity supports a ripple of additional economic activity throughout the economy. IMPLAN is an I-O modeling system that uses annual, regional data to map these buy-sell relationships so users can predict how specific economic changes would impact a given regional economy or estimate the effect of past or existing economic activity.

Output is the value of products and services produced by an industry in a calendar year. Total output is broken down into the following four categories (see the Key Terminology section for definitions):

- Intermediate expenditures
- Labor income
- Taxes on production and imports, less subsidies (TOPI)
- Other Property Income (OPI)

The allocation of output into these categories is determined by a Leontief Production Function (LPF). IMPLAN derives a unique LPF for each industry in each region and for each year. Graphically, the LPF is shown in Figure A-1.




Source: IMPLAN.

**Figure A-1. Diagram of a Leontief Production Function**

IMPLAN incorporates all available economic data for each county in the country. Employment and labor income data are sourced from the Bureau of Labor Statistics (BLS) Census of Employment and Wages, Census Bureau's County Business Patterns Reports, and Bureau of Economic Analysis' (BEA's) Regional Economic Accounts information, which also provides information on annual gross domestic product. Data regarding industry inputs, byproducts, margins, and industry spending patterns are also sourced from the BEA's Input-Output Benchmark Table and other sources.

For estimating economic output, IMPLAN sources information from several federal surveys, such as the Census' Annual Survey of Manufacturers and the BEA's Output Series. Other sources include the National Agricultural Statistical Service, National Bureau of Economic Research, Internal Revenue Service, and Energy Information Administration.

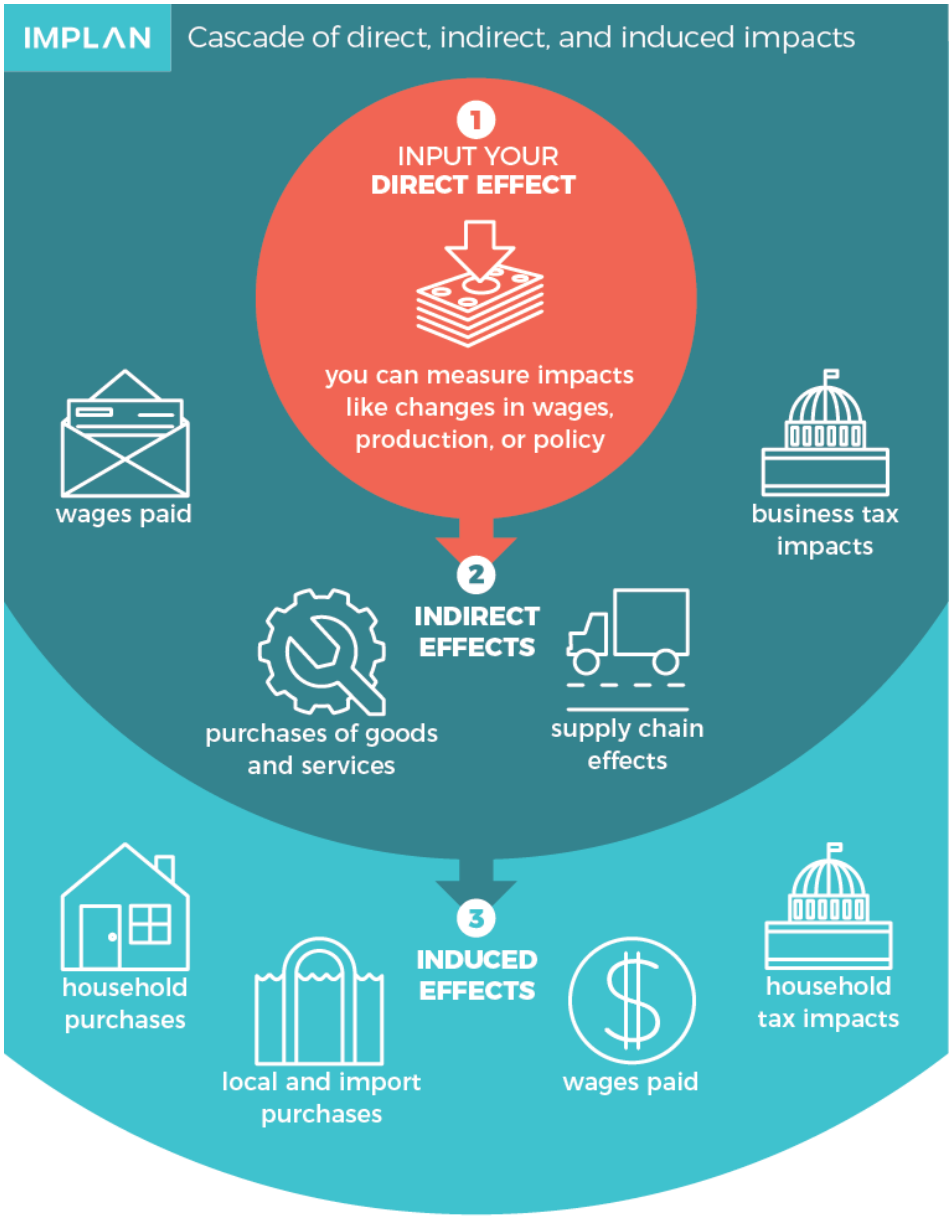
IMPLAN was originally conceived in 1972 as part of the Rural Development Act of 1972. After initial development by the U.S. Forest Service, IMPLAN was further developed by the University of Minnesota during the 1980s. In the 1990s, IMPLAN was privatized, and the Minnesota IMPLAN Group began taking commercial orders. IMPLAN is now widely used for modeling economic impacts across many business sectors.

This analysis uses the latest version of IMPLAN, which currently incorporates 528 industry sectors as defined by the BEA and the latest datasets from 2024.

For a particular producing industry, multipliers estimate three components of total change within the local area (see Figure A-2):

- *Direct effects* represent the initial change in the industry in question. For example, building a new transmission line will directly expand the size of that industry within the region it is located.
- *Indirect effects* are changes in inter-industry transactions as supplying industries respond to increased demands from the directly affected industries. Supply-chain purchases are indirect economic impacts.
- *Induced effects* reflect local spending changes resulting from income changes in the directly and indirectly affected industries. Spending of both direct and indirect labor income generates induced economic impacts. Workers purchasing groceries is an example of an induced impact.

The economic impacts derived in this analysis are presented in 2025 dollars.




Source: IMPLAN.

**Figure A-2. Diagram of Economic Multiplier Impacts**

## Estimating Tax Revenue Impacts Using the IMPLAN Model

Taxes are levied at different levels of government. IMPLAN estimates tax impacts at the following levels: Federal, State + Local, State, County, Sub-County General, and Sub-County Special Districts. IMPLAN's tax impact estimates are based on collected and reported taxes in the region for the given data year. Sub-County General includes city and township governments. Sub-County Special Districts include fire and public school districts.

TOPI, less subsidies, include sales and excise taxes, customs duties, property taxes, motor vehicle licenses, severance taxes, other taxes, and special assessments. TOPI tax impacts are split into

subcategories based on each region's contribution of the collected tax (IMPLAN 2023). TOPI are tax revenues, but not inclusive of all tax revenues, paid by an industry (refer to the Key Terminology section for definitions). For example, social insurance taxes are a part of employee compensation and profits taxes are part of OPI. In the case of TOPI direct impacts, property taxes on construction impacts are not property taxes on a built structure itself but rather on the construction companies' properties.

In IMPLAN, taxes are specific to the industry and geographic region. However, the breakout by tax category (e.g., sales tax, property tax) is not industry specific because of raw data limitations. Thus, the distribution for a given geographic region is an all-industry average. Also, in IMPLAN there is no way to know the breakout of the components of each subset of tax (e.g., sales tax) into additional detail, as the raw data does not have this level of detail. However, the ratios for TOPI:Output and OPI:Output are industry specific. I-O models by default treat TOPI as a leakage, meaning that any TOPI generated as part of an analysis will not generate any additional effects. OPI generally refers to profits and returns to capital and will be negative if the industry is operating at a deficit.

For detailed itemization of taxes modeled in IMPLAN by category, refer to Taxes: Where's the Tax? (Clouse 2020).

## Estimating Employment Using the IMPLAN Model

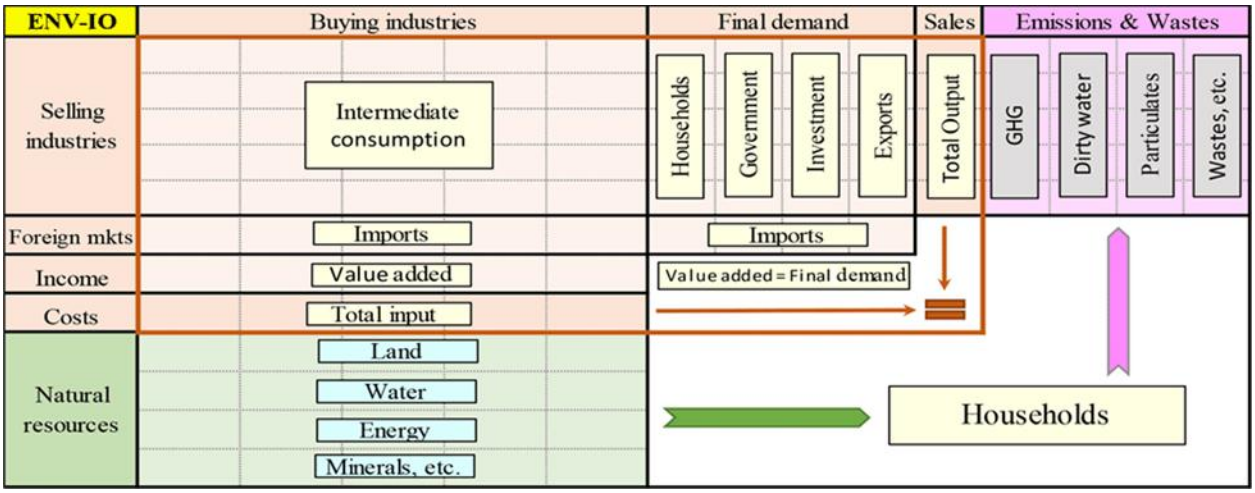
Employment data in IMPLAN follows the same definition used by the BEA and BLS, which is full-time/part-time annual average. Because a person can hold more than one job, a job count is not necessarily the same as a count of employed persons. However, for the electric power industries, the IMPLAN conversion factors are almost 1.0, therefore the IMPLAN employment estimates are approximately FTE whereby 1 job lasting 12 months = 2 jobs lasting 6 months each = 3 jobs lasting 4 months each. A job can be either full-time or part-time. Similarly, a job that lasts one quarter of the year would be 0.25 job. IMPLAN employment include workers that are not accounted for by a number of other data sources. This often means that IMPLAN jobs are larger than many other sources report.

Construction jobs are considered "supported" since the building of a facility requires or supports a region's workforce. In the case of this Project, the operations and maintenance jobs are considered "created" since they would not exist prior to construction of the Project.

## Estimating Environmental Impacts Using the IMPLAN Model

IMPLAN's environmental impact estimates rely on industry-specific coefficients representing physical emissions or resource use per dollar of industry output, with the physical unit depending on the particular pollutant or resource under consideration. IMPLAN's environmental coefficients are sourced from the U.S. Environmental Protection Agency's U.S. Environmentally-Extended Input-Output (USEEIO) model data (version 1.1).

Figure A-1 depicts the flow of goods and services between production and consumption along with the use of natural resources.

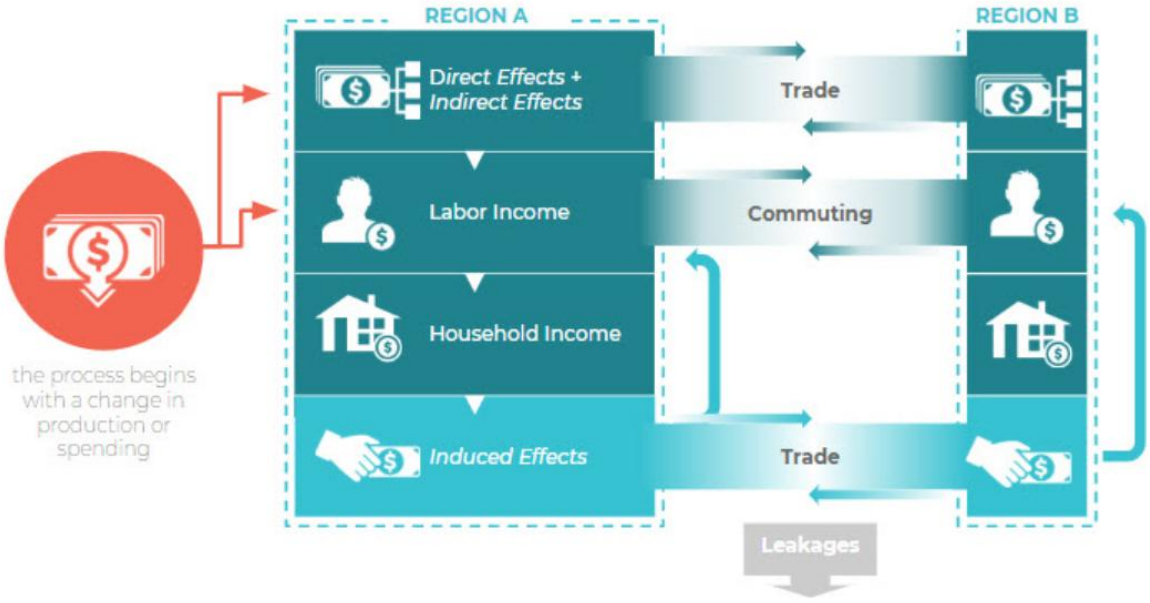



Source: IMPLAN.

**Figure A-3. Schematic Diagram of an Environmentally-Extended Input-Output Model**

## Multi-Regional Input-Output Models

Multi-Regional Input-Output (MRIO) analysis models how an impact on any of the 528 BEA Industries in a region affect the production of all 528 Industries and household spending in any other region, including zip code to zip code. MRIO analyses utilize interregional commodity trade and commuting flows to quantify the demand changes across many regions stemming from a change in production and/or income in another region (Figure A-4).




Source: IMPLAN.

**Figure A-4. Schematic Diagram of Multi-Region Input-Output Model**

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# HAYNACH SOLAR PROJECT

*Local Economic Benefits Analysis of the Haynach Solar Hybrid Project within Alamosa County*

## PROJECT DESCRIPTION

The Haynach Solar Hybrid Project is a proposed project that would generate 110 megawatts of electricity with an adjoining 110-megawatt battery energy storage system located in Alamosa County, Colorado. Haynach Solar would operate for 40 years and connect with the existing Tri-State Generation and Transmission Association (Tri-State) and Public Service Company of Colorado San Luis Valley Substation. Barr Engineering, the project's lead consultant, contracted Triple Point Strategic Consulting to prepare a socioeconomic assessment. This brief summarizes the local economic and fiscal benefits estimated to accrue within Alamosa County.

## PUBLIC REVENUE BENEFITS TOTAL $30.7 MILLION

**Tax Revenue from New Economic Activity (Income, Social Insurance, Sales, etc.)**

- Paying workers, purchasing basic materials, and operating business will generate incremental tax revenue at all levels

| JURISDICTION | CONSTRUCTION | OPERATIONS | TOTAL |
|---|---|---|---|
| Municipal | $211,899 | $906,931 | $1,118,830 |
| Special Districts | $268,932 | $1,139,786 | $1,408,718 |
| County | $262,393 | $1,117,707 | $1,380,100 |
| **TOTAL TAX** | **$743,224** | **$3,164,424** | **$3,907,647** |

| JURISDICTION | PURCHASE AND IMPORT OF SPECIAL EQUIPMENT FOR CONSTRUCTION | REPLACEMENT EQUIPMENT DURING OPERATIONS |
|---|---|---|
| Alamosa County | $5,818,534 | $1,644,686 |

**State Assessed Property Tax Revenue**

- Haynach Solar would generate approximately $19.3 million in property tax over the Project's planned lifetime. This table breaks down the revenue by property tax authority within unincorporated Alamosa County.

| PROPERTY TAX AUTHORITY | LIFETIME REVENUE |
|---|---|
| Alamosa County | $6,747,405 |
| Sangre De Cristo School District | $9,535,875 |
| Alamosa County Fire Protection | $1,451,716 |
| Rio Grande Water Conservation | $427,762 |
| San Luis Valley Water Conservation | $109,881 |
| Alamosa Weed and Pest | $268,420 |
| Alamosa County Ambulance | $771,575 |
| **TOTAL FOR TAX DISTRICT 22-6** | **$19,312,634** |

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## ECONOMIC BENEFITS OF CONSTRUCTION FOR ALAMOSA COUNTY

Construction and operations workers employed by the Project would spend their income within Alamosa County. A portion of the intermediate supplies would be purchased from county vendors for direct use and/or the result of indirect (supply chain) and induced (labor income) spending.

**Construction Activity**

- Construction anticipated to last 16 months from late 2028 into 2030
- Total direct investment is projected to be up to $39.5 million
- Total economic impact up to $50.4 million, including indirect and induced spending

| COLORADO EMPLOYMENT IMPACT DURING CONSTRUCTION (FTE) | AVG ANNUAL EMPLOYMENT (FTE) | TOTAL ANNUAL LABOR INCOME |
|---|---|---|
| Direct Employment | 119.5 | $11,981,865 |
| Supply Chain and Induced Employment | 45.0 | $2,197,327 |

## CONSTRUCTION OCCUPATIONS

Haynach Solar would support an annual average of 165 total jobs for workers in Alamosa County during construction including direct, indirect and induced. The table below shows the top five occupations.

| TOP 5 OCCUPATION CATEGORIES | AVG ANNUAL FTE | AVG ANNUAL TOTAL COMPENSATION |
|---|---|---|
| Solar Photovoltaic Technicians | 18.8 | $83,363 |
| Electrical Power-Line Technicians | 17.8 | $106,928 |
| First-Line Supervisors of Construction Workers | 9.1 | $119,633 |
| Operating Engineers and Equipment Operators | 8.5 | $91,112 |
| Telecommunications Line Technicians | 7.2 | $76,212 |

## ONGOING ECONOMIC BENEFITS

Operating and maintaining Haynach Solar would increase economic activity on an annual basis over the lifetime of the Project and would create lasting, skilled jobs for Alamosa County residents.

- Operations anticipated to begin in 2031
- Total direct spending for operations is projected to be up to $1.3 million per year
- Total economic impact up to $2.0 million per year, including indirect and induced spending



## METHODOLOGY

This analysis quantifies the direct, indirect (supply chain spending), and induced (labor income spending) impacts using an Input-Output (I-O) modeling approach with IMPLAN software, a highly regarded system that relies on extensive data sets. Haynach Solar was modeled by creating a multi-regional input-output structure using the most current underlying data sets. Note the estimates presented in this brief are based on the best available data and methods, yet subject to variability.

## ABOUT THE AUTHORS

Jeff Moffett, Ph.D. is the principal of Triple Point Strategic Consulting LLC specializing in developing custom economic and financial models. Focus areas are renewable energy, housing, water, and economic development. Jeff earned his M.S. in Econometrics and Ph.D. in Applied Statistics at the University of Washington, Seattle. Nathan Perry, Ph.D. Nathan is a Professor of Economics at Colorado Mesa University. Nathan earned his Ph.D. at the University of Utah. Cirrus is a trusted business advisor providing state and local tax consulting services to renewable energy developers and owner-operators. The Cirrus team helps companies negotiate incentives, maximize public funding opportunities for investments, and enhance public-private partnerships in local communities.

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## PUBLIC REVENUE BENEFITS TOTAL $49.6 MILLION

**Tax Revenue from New Economic Activity (Income, Social Insurance, Sales, etc.)**

- Paying workers, purchasing basic materials, and operating business will generate incremental tax revenue at all levels

| JURISDICTION | CONSTRUCTION | OPERATIONS | TOTAL |
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| State | $1,014,560 | $2,948,950 | $3,963,509 |
| Federal | $4,254,390 | $6,338,548 | $10,592,938 |
| **TOTAL TAX** | **$6,012,174** | **$12,451,921** | **$18,464,095** |

| JURISDICTION | PURCHASE AND IMPORT OF SPECIAL EQUIPMENT FOR CONSTRUCTION | REPLACEMENT EQUIPMENT DURING OPERATIONS |
|---|---|---|
| Alamosa County | $5,818,534 | $1,644,686 |
| State of Colorado | $3,102,346 | $1,256,928 |
| **TOTAL** | **$8,920,880** | **$2,901,614** |

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## PUBLIC REVENUE BENEFITS TOTAL $71.7 MILLION

**Tax Revenue from New Economic Activity (Income, Social Insurance, Sales, etc.)**

- Paying workers, purchasing basic materials, and operating business will generate incremental tax revenue at all levels

| JURISDICTION | CONSTRUCTION | OPERATIONS | TOTAL |
|---|---|---|---|
| Municipal | $1,110,982 | $2,198,234 | $3,309,216 |
| Special Districts | $1,708,164 | $3,196,428 | $4,904,592 |
| County | $695,341 | $1,736,359 | $2,431,700 |
| State | $3,210,415 | $5,005,306 | $8,215,721 |
| Federal | $12,275,958 | $9,420,634 | $21,696,592 |
| **TOTAL TAX** | **$19,000,860** | **$21,556,961** | **$40,557,821** |

| JURISDICTION | PURCHASE AND IMPORT OF SPECIAL EQUIPMENT FOR CONSTRUCTION | REPLACEMENT EQUIPMENT DURING OPERATIONS |
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| Sangre De Cristo School District | $9,535,875 |
| Alamosa County Fire Protection | $1,451,716 |
| Rio Grande Water Conservation | $427,762 |
| San Luis Valley Water Conservation | $109,881 |
| Alamosa Weed and Pest | $268,420 |
| Alamosa County Ambulance | $771,575 |
| **TOTAL FOR TAX DISTRICT 22-6** | **$19,312,634** |

Jeffrey L. Moffett, Ph.D. | www.tpsconsulting.net | jmoffett@tpsconsulting.net

## TOTAL ECONOMIC BENEFITS OF CONSTRUCTION WITHIN COLORADO

Construction and operations workers employed by the Project would spend their income within Colorado. Most of the intermediate supplies would be purchased from Colorado vendors for direct use and/or the result of indirect (supply chain) and induced (labor income) spending.

**Construction Activity**

- Construction anticipated to last 16 months from late 2028 into 2030
- Total direct investment is projected to be up to $99.8 million
- Total economic impact up to $172.5 million, including indirect and induced spending

| COLORADO EMPLOYMENT IMPACT DURING CONSTRUCTION (FTE) | AVG ANNUAL EMPLOYMENT (FTE) | TOTAL ANNUAL LABOR INCOME |
|---|---|---|
| Direct Employment | 209.1 | $20,968,264 |
| Supply Chain and Induced Employment | 237.8 | $17,782,456 |

## CONSTRUCTION OCCUPATIONS

Haynach Solar would support an annual average of 447 total jobs for workers in Colorado during construction including direct, indirect and induced. The table below shows the top five occupations.

| TOP 5 OCCUPATION CATEGORIES | AVG ANNUAL FTE | AVG ANNUAL TOTAL COMPENSATION |
|---|---|---|
| Solar Photovoltaic Technicians | 32.8 | $83,363 |
| Electrical Power-Line Technicians | 31.1 | $106,928 |
| First-Line Supervisors of Construction Workers | 15.9 | $119,633 |
| Operating Engineers and Equipment Operators | 14.8 | $91,112 |
| Telecommunications Line Technicians | 12.6 | $76,212 |

## ONGOING ECONOMIC BENEFITS

Operating and maintaining Haynach Solar would increase economic activity on an annual basis over the lifetime of the Project and would create lasting, skilled jobs for Colorado residents.

- Operations anticipated to begin in 2031
- Total direct spending for operations is projected to be up to $2.0 million per year
- Total economic impact up to $3.6 million per year, including indirect and induced spending



## METHODOLOGY

This analysis quantifies the direct, indirect (supply chain spending), and induced (labor income spending) impacts using an Input-Output (I-O) modeling approach with IMPLAN software, a highly regarded system that relies on extensive data sets. Haynach Solar was modeled by creating a multi-regional input-output structure using the most current underlying data sets. Note the estimates presented in this brief are based on the best available data and methods, yet subject to variability.

## ABOUT THE AUTHORS

Jeff Moffett, Ph.D. is the principal of Triple Point Strategic Consulting LLC specializing in developing custom economic and financial models. Focus areas are renewable energy, housing, water, and economic development. Jeff earned his M.S. in Econometrics and Ph.D. in Applied Statistics at the University of Washington, Seattle. Nathan Perry, Ph.D. Nathan is a Professor of Economics at Colorado Mesa University. Nathan earned his Ph.D. at the University of Utah. Cirrus is a trusted business advisor providing state and local tax consulting services to renewable energy developers and owner-operators. The Cirrus team helps companies negotiate incentives, maximize public funding opportunities for investments, and enhance public-private partnerships in local communities.

# Attachment 5 – Transportation Impact Study and Level 2 Auxiliary Turn Lane Assessment

COLORADO
Department of Transportation
Region 5

# Transportation Impact Study Methodology Form

Prior to starting a traffic impact study, a Methodology Form must be submitted for review and signed by the Region 5 Access Engineer. It shall be included as part of the study.

| CONTACT INFORMATION | |
|---|---|
| Consultant: | Name: Mitch Wagner |
| | Telephone: 303-586-5833 |
| | Email: mjwagner@sehinc.com |
| Developer/Owner Name: | Adapture Renewables Inc. |

| PROJECT INFORMATION | |
|---|---|
| Project Name | Haynach Solar Hybrid Project |
| Project Location | 5.5 southwest of Hooper, CO (Alamosa County) |
| Project Description *(Attached proposed site plan)* | The project consists of installing a 110 MW solar photovoltaic and 4-hour battery energy storage system. The site will contain a substation and generation-tie. |
| State Highway | CO 17 and CO 112 |
| County | Alamosa County |
| Mile Post | MP 21.25 along CO 112, and MP 84.10 along CO 17 |
| Posted Speed Limit | 65 mph |

| TIS ASSUMPTIONS | | | |
|---|---|---|---|
| Study Years | Current Year: 2025 | Buildout Year: 2029 | Long Term Year: 2049 |
| Traffic Assessment Level *(Provide justification)* | Level 2 Auxiliary Lane Assessment - peak construction force represents the majority of site generated traffic. Max workforce will be 175 workers. Assumption is 1.5 workers / vehicle = 116 vehicles per peak hour spread over two accesses. 15 delivery vehicles were identified as part of the project during peak construction. A PCE of 3 will be applied to the trucks and added to the trip generation. An 80% from the south and 20% from the north estimation was given by Adapture Renewables for truck traffic. This is short-term, temporary traffic. | | |
| Study Intersections | 1. CO 17 / Lane 8 N | 6. | |
| | 2. CO 112 / CR 102 N | 7. | |
| | 3. | 8. | |
| | 4. | 9. | |
| | 5. | 10. | |
| Future Growth Rate | ☒ OTIS | ☐ Regional TDM | ☐ Other |
| Seasonal Adjustment Factor | N/A | | |

COLORADO
Department of Transportation
Region 5

| ASSUMPTIONS CONTINUED | | | | |
|---|---|---|---|---|
| Project Trip Distribution *(State assumptions and attach sketch that shows individual movements.)* | Per correspondence with Adapture Renewables Inc, max workforce during construction will be 175 workers. Assumption is 1.5 workers / vehicle = 116 vehicles per peak hour spread over two accesses. 15 delivery trucks are also included with a PCE of 3 per Access Code applied (45 total equivalent vehicles) This is short-term, temporary traffic expected to start December 2029 and last 16 months. Long term traffic is projected to be 4 employees accessing the site per day. | | | |
| Trip Reduction Percentage | Internal Capture: | n/a | Pass By: | n/a |
| | Multi-Modal: | n/a | Other: | n/a |
| Study Time Periods<br><br>*(Check all that apply)* | ☒ AM (7-9) | ☒ PM (4-6) | ☐ Weekday | |
| | ☐ SAT (Midday) | ☐ Other - used peak | | |
| Existing and Proposed ITE Trip Generation Land Use | Developer provided trip generation for construction and site specific traffic once complete | | | |
| Analysis Methods *(Check all that apply)* | ☒ Synchro or ☐ HCS *(isolated intersections only)* | ☐ SimTraffic or ☐ Other *(closely spaced intersections or when known/expected queuing issue)* | | |
| | ☐ Signal Warrants | ☐ Pedestrian/Transit/Bicycle | | |
| | ☒ Safety/Sight Distance | ☐ Queuing and Storage | | |
| | ☐ Other | | | |
| Notes and Other Assumptions | | | | |
| Crash Data | CDOT will perform a crash data analysis for the highway in the vicinity of the proposed access and provide to the consultant. As a part of the study consultant shall recommend mitigation measures for any identified safety issues. | | | |
| Simulation Input Files | Consultant to provide computer files used for analysis with a signed and sealed copy of the study. | | | |

| CDOT INTERNAL USE ONLY | |
|---|---|
| Review Comments<br><br>☐ Revise and Resubmit | |
| Engineer Signature/Date | ☐ Approved |




# Level 2 Auxiliary Turn Lane Assessment

## Haynach Solar Hybrid Project

### Alamosa County, Colorado

July 17, 2025

SEH

Building a Better World for All of Us®

Engineers | Architects | Planners | Scientists

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Appendix B – LOS Calculation Worksheets

Appendix C – Adapture Renewables Correspondence

Appendix D – Sight Distance Photos

# Level 2 Auxiliary Turn Lane Assessment

Prepared for Barr Engineering Co.

## 1 Introduction

Short Elliott Hendrickson Inc. (SEH) is pleased to provide this level 2 auxiliary turn lane assessment for the proposed Haynach Solar Hybrid Project development in Alamosa County near the intersection of East County Road 102 N (CR 102) and Lane 8 N, approximately 5.5 miles southwest of Hooper, CO.

The purpose of this assessment is to document the project's trip generation, determine auxiliary turn lane requirements at the proposed access sites, and recommend mitigation measures associated with the proposed development of the site. This study examines intersection operations for existing, short-term (Year 2029), and long-term (Year 2049) traffic conditions. Typical weekday morning and evening peak periods were analyzed for site-specific impacts.

## 2 Project Description

### 2.1 Proposed Development

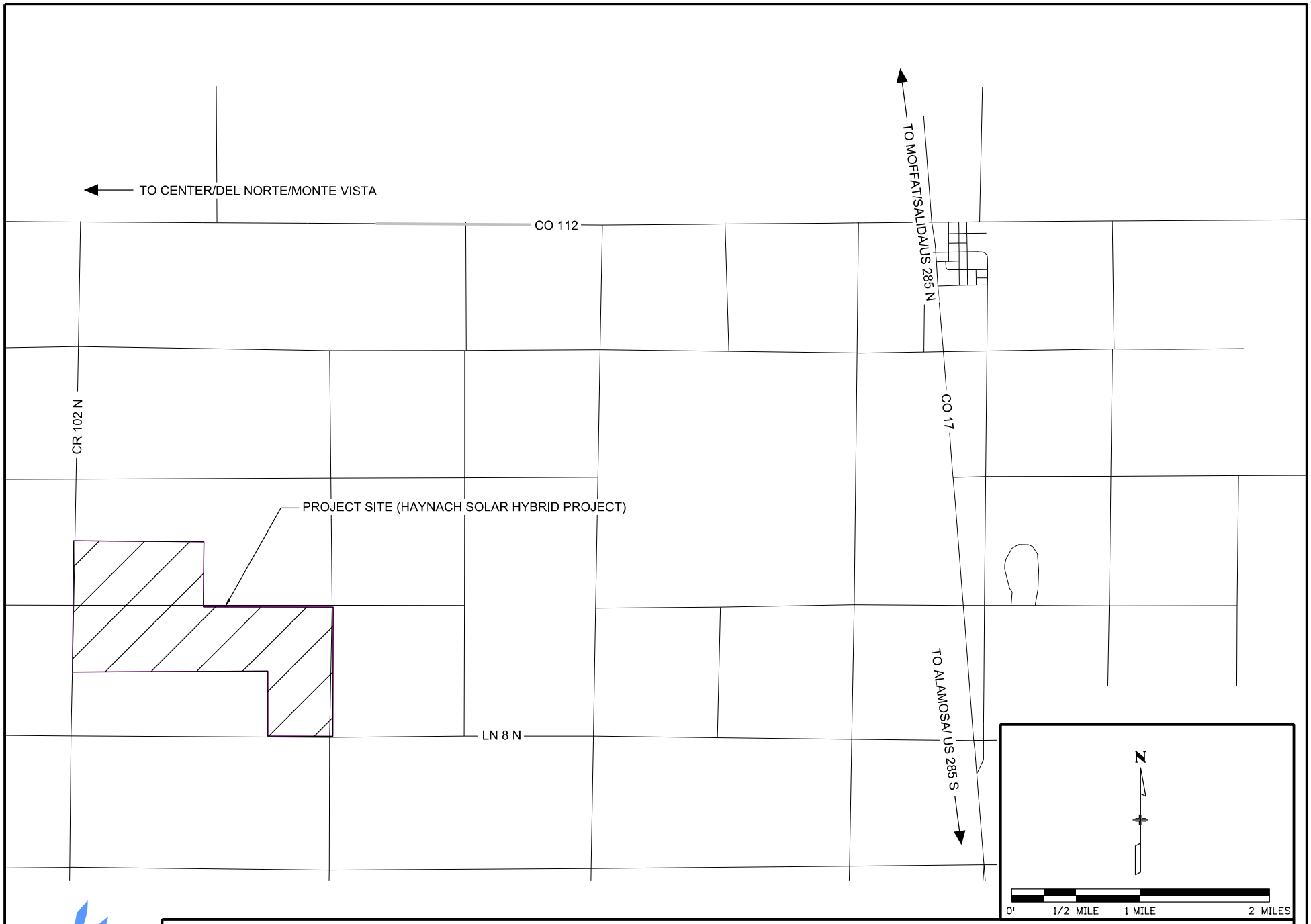
The project consists of a 110 megawatt (MW) solar photovoltaic and 110 MW, 4-hour battery storage system and substation that would be installed on a 1,109-acre parcel of private property. The solar system will be owned and operated by Adapture Renewables, Inc. The project requires the construction of an on-site collector substation and a new 23 kilovolt (kV) generation-tie (gen-tie) line to connect with the existing Tri-State and PSCo San Luis Valley Substation. Construction on the site is expected to start in December 2028 with a duration of 16 months. A vicinity map showing the site location in relation to the surrounding roadway network is provided in **Figure 1**. The existing site is adjacent to another solar plant. The preliminary site plan is outlined in **Figure 2**.

### 2.2 Site Access

Site access will be provided off CR 102 N and Lane 8 N. Vehicles will access from the surrounding communities via State Highway (CO) 17 and CO 112.

### 2.3 Study Area and Evaluation Parameters

The project study area includes the intersections at CO 17 / Lane 8 N, and CO 112 / CR 102 N. Average weekday morning and evening peak period existing year, short-term (Year 2029), and long-term (Year 2049) scenarios.

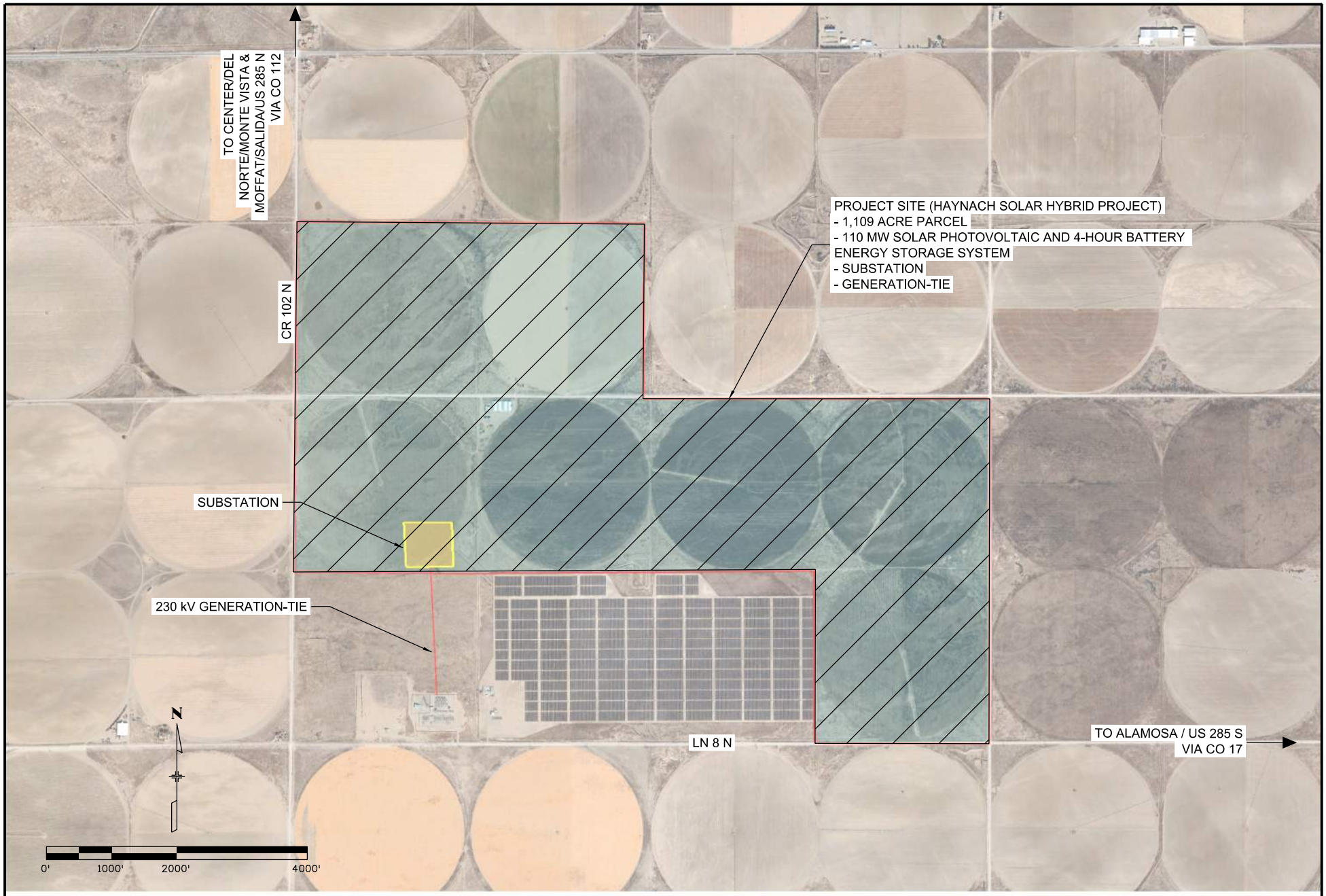



SEH

Level 2 Auxiliary Turn Lane Assessment - Haynach Solar Hybrid Project

# VICINITY MAP

| Scale | 1" = 1 MILE | Date | 07/17/2025 | Drawn By | MJW | Job # | BARRE-184218 | Figure | 1 |
|---|---|---|---|---|---|---|---|---|---|




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Level 2 Auxiliary Turn Lane Assessment - Haynach Solar Hybrid Project

# SITE PLAN

| Scale | 1" = 2,000' | Date | 07/17/2025 | Drawn By | MJW | Job # | BARRE-184218 | Figure | 2 |
|---|---|---|---|---|---|---|---|---|---|

# 3 Existing Background Conditions

## 3.1 Roadway Network

**CO 17**
CO 17 is a two-lane, principal arterial roadway with a CDOT highway classification of R-A: Regional Highway. The roadway has a posted speed limit of 65 miles per hour (mph) within the study area.

**CO 112**
CO 17 is a two-lane, minor arterial roadway with CDOT highway classification of R-B: Rural Highway. The roadway has a posted speed limit of 65 mph within the study area.

**CR 102 N**
CR 102 N is an unpaved county road that serves the surrounding rural Alamosa County. No posted speed limit was detected.

**Lane 8 N**
Similar to CR 102 N, Lane 8 N is an unpaved county road that serves the surrounding rural Alamosa County. No posted speed limit was detected.

## 3.2 Existing Background Traffic Volumes

Existing traffic counts were collected by SEH at the intersections of CO 17 / Lane 8 N, and CO 112 / CR 102 N on Wednesday, June 4, 2025. **Appendix A** contains the turning movement count data and **Figure 3** displays the existing traffic volumes. Average Daily Traffic (ADT) for CO 17 is approximately 2,400 vehicles per day (vpd), and ADT for CO 112 is 870 vpd as displayed in CDOT's Online Transportation Information System (OTIS).

## 3.3 Existing Background Conditions Level of Service

Level of Service (LOS) was calculated using Synchro 11 software to evaluate the performance of the intersections within the study area. This software package utilizes criteria described in the Highway Capacity Manual[1]. LOS is a measure used to describe operational conditions at an intersection. LOS categories ranging from A to F are assigned based on the predicted delay in seconds per vehicle for the intersection overall, as well as for individual turning movements. LOS A indicates very good operations, while LOS F indicates poor, congested operations. Overall intersection LOS D is considered acceptable by CDOT and most municipalities.

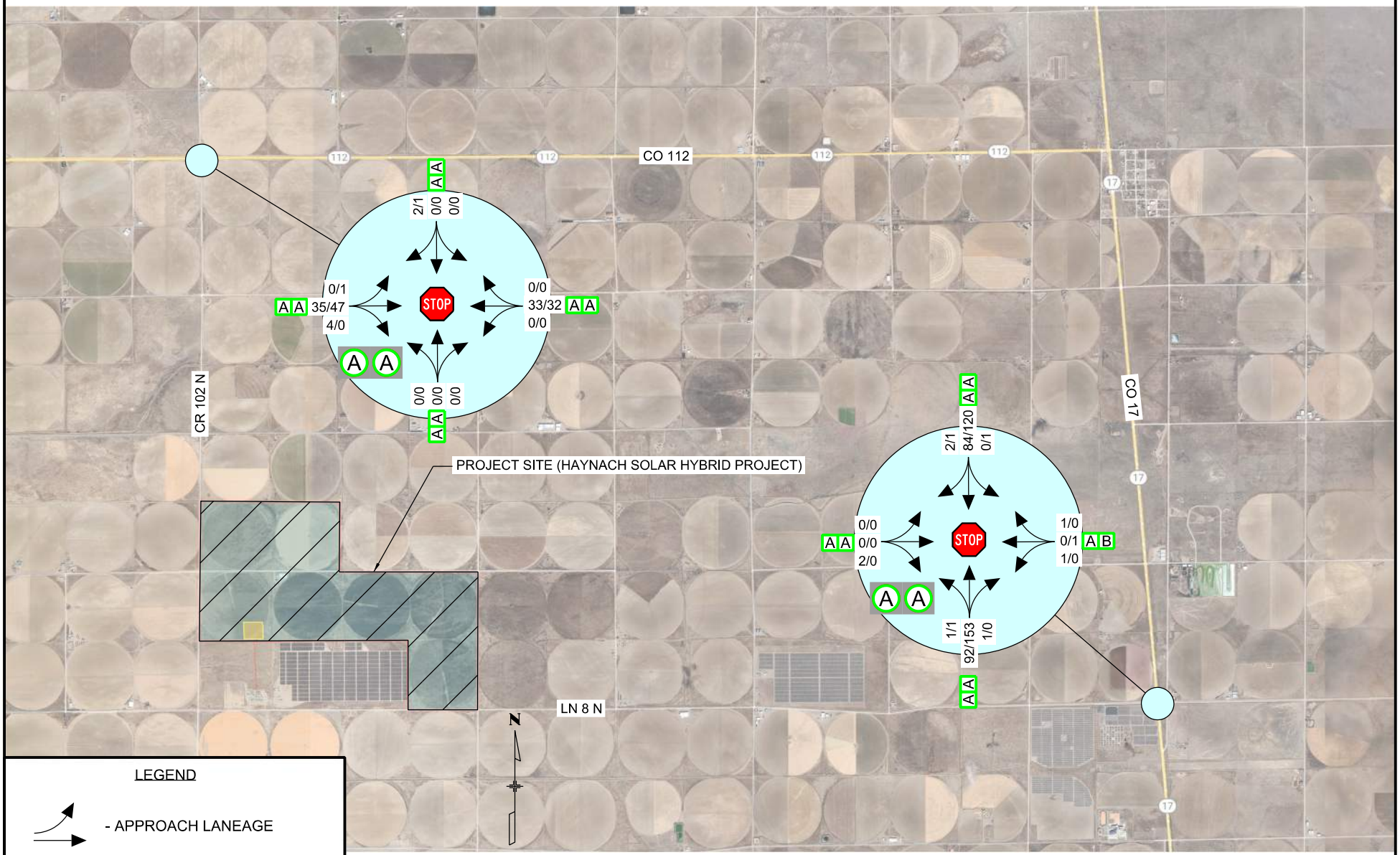
A summarization of the results of the intersection LOS calculations is displayed in **Table 1**. The analysis indicates that the intersections at CO 17 / Lane 8 N, and CO 112 / CR 102 N currently operate at LOS A with all movements also operating at LOS B or better. **Appendix B** contains the LOS analysis worksheets for reference.

---

1 *HCM 6th: Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis* Washington, D.C.: Transportation Research Board, 2016. Print.

Table 1. LOS Results - Haynach Solar

| Intersection and Critical Movements | Year 2025 Traffic | | | | Short-Term (Year 2029) Traffic | | | | | | | | Long-Term (Year 2049) Traffic | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS |
| **STOP CONTROL** | **Existing Background Traffic** | | | | **2029 Background Traffic** | | | | **2029 Background + Site Generated Traffic** | | | | **2049 Background Traffic** | | | | **2049 Background + Site Generated Traffic** | | | |
| **CO 17 / Lane 8 N** | **0.6** | **A** | **0.1** | **A** | **0.6** | **A** | **0.1** | **A** | **5.4** | **A** | **2.4** | **A** | **0.6** | **A** | **0.1** | **A** | **0.8** | **A** | **0.1** | **A** |
| Eastbound Left + Through + Right | *8.7* | A | *0.0* | A | *8.7* | A | *0.0* | A | *8.7* | A | *9.4* | A | *8.8* | A | *0.0* | A | *8.8* | A | *9.0* | A |
| Westbound Left + Through + Right | *9.3* | A | *10.9* | B | *9.4* | A | *11.0* | B | *16.8* | C | *11.0* | B | *9.5* | A | *11.0* | B | *9.6* | A | *11.2* | B |
| Northbound Left + Through + Right | *7.4* | A | *7.5* | A | *7.4* | A | *7.5* | A | *8.2* | A | *7.5* | A | *7.4* | A | *7.5* | A | *7.4* | A | *7.6* | A |
| Southbound Left + Through + Right | *0.0* | A | *7.6* | A | *0.0* | A | *7.6* | A | *0.0* | A | *7.6* | A | *0.0* | A | *7.6* | A | *0.0* | A | *0.0* | A |
| **CO 112 / CR 102 N** | **0.3** | **A** | **0.6** | **A** | **0.3** | **A** | **0.5** | **A** | **0.9** | **A** | **3.8** | **A** | **0.2** | **A** | **0.4** | **A** | **0.3** | **A** | **0.6** | **A** |
| Eastbound Left + Through + Right | *0.0* | A | *7.3* | A | *0.0* | A | *7.3* | A | *0.0* | A | *7.3* | A | *0.0* | A | *7.3* | A | *0.0* | A | *7.3* | A |
| Westbound Left + Through + Right | *0.0* | A | *0.0* | A | *0.0* | A | *0.0* | A | *7.8* | A | *0.0* | A | *0.0* | A | *0.0* | A | *7.4* | A | *0.0* | A |
| Northbound Left + Through + Right | *0.0* | A | *0.0* | A | *0.0* | A | *0.0* | A | *0.0* | A | *9.4* | A | *0.0* | A | *0.0* | A | *0.0* | A | *9.1* | A |
| Southbound Left + Through + Right | *8.5* | A | *8.5* | A | *8.5* | A | *8.5* | A | *8.5* | A | *8.5* | A | *8.5* | A | *8.5* | A | *8.5* | A | *8.5* | A |




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Level 2 Auxiliary Turn Lane Assessment - Haynach Solar Hybrid Project

# EXISTING CONDITIONS

| Scale | 1" = 1 MILE | Date | 07/17/2025 | Drawn By | MJW | Job # | BARRE-184218 | Figure | 3 |
|---|---|---|---|---|---|---|---|---|---|

## 3.4 Trip Generation

Trip generation of the site is projected from correspondence with Adapture Renewables, Inc. **Appendix C** contains email correspondence with the development manager for the project. The vast majority of vehicular trips will be generated in the construction phase starting in December, 2028 and continuing for 16 months. According to Adapture Renewables, Inc., peak construction force will be approximately 175 people.

Vehicles were estimated using a 1.5 person per vehicle ratio. To represent the worst case scenario of traffic, 100% of morning peak hour traffic was assumed to be entering the site and 100% of evening peak hour traffic was assumed to be exiting the site.

Long-term trip generation was estimated via correspondence with the developer of the site. They indicated that the site is expected to generate four (4) vpd.

ITE trip generation rates were not utilized as part of the proposed development. **Table 2** displays the projected trip generation for the short-term, and long-term site usage. **Figure 4** displays the projected trip generation and distribution of the site.

**Table 2 – Haynach Solar Trip Generation**

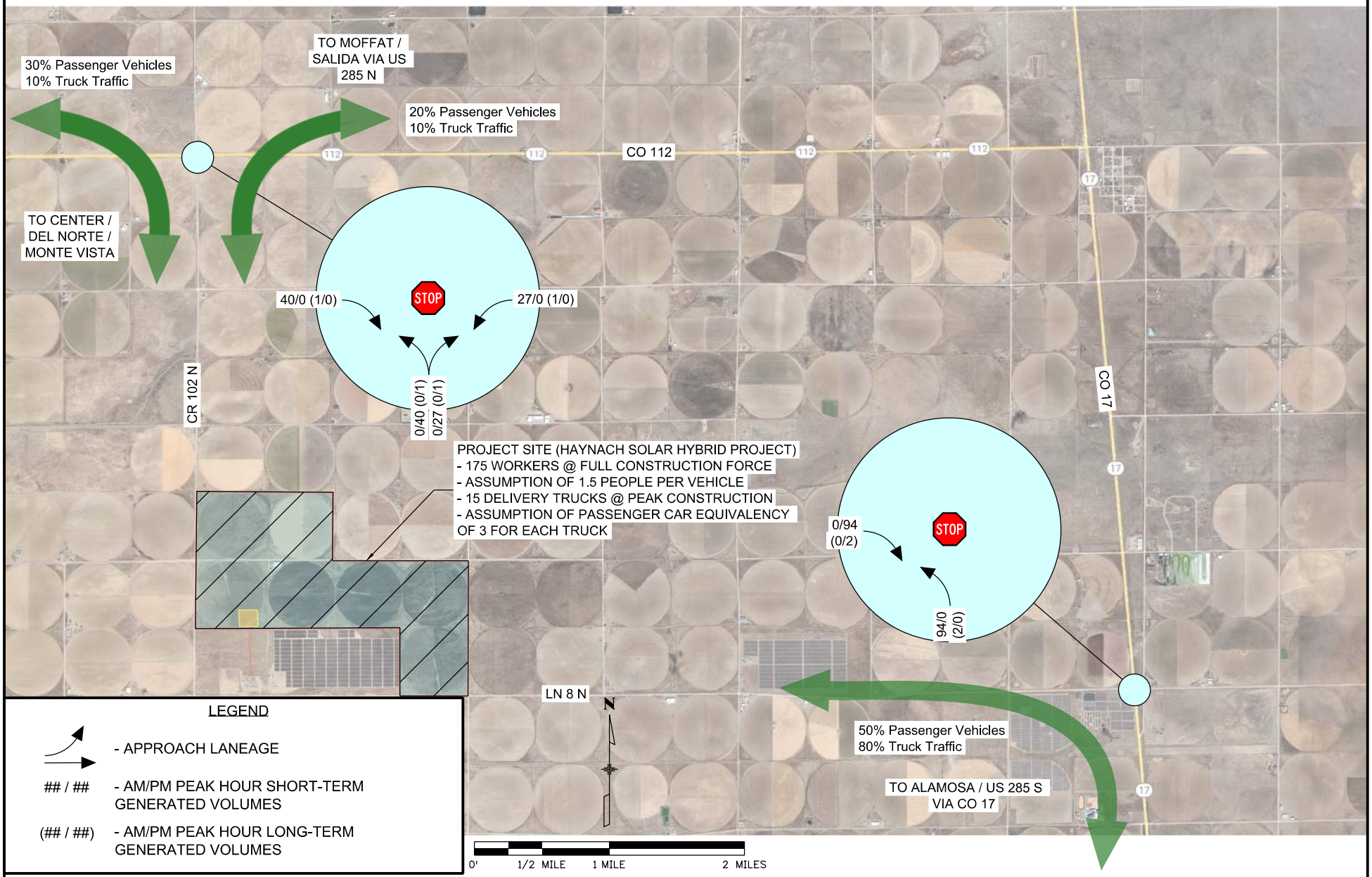
| Land Use | Size | Unit | AM Peak Hour Trips | | | | PM Peak Hour Trips | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Rate | Total | In | Out | Rate | Total | In | Out |
| Haynach Solar Construction | 116 | 175 Workers / 1.5 Vehicles per Worker | 1.00 | 116 | 116 | 0 | 1.00 | 116 | 0 | 116 |
| Haynach Solar Construction | 15 | Delivery Trucks | 3.00 | 45 | 45 | 0 | 1.00 | 45 | 0 | 45 |
| **Short-Term (Year 2029) Total Trips (Truck Traffic Included)** | | | | **161** | **161** | **0** | | **161** | **0** | **161** |
| Haynach Solar Fully Operational | 4 | Workers | 1.00 | 4 | 4 | 0 | 1.00 | 4 | 0 | 4 |
| **Long-Term (Year 2049) Total Trips** | | | | **4** | **4** | **0** | | **4** | **0** | **4** |

## 3.5 Trip Distribution and Assignment

Trip distribution percentages for site generated traffic are based on current traffic patterns in the study area and how traffic will access the site. 50% of the traffic is projected to access the site from the southeast towards Alamosa, 30% from the west to Center, Del Norte and Monte Vista, and 20% to the northeast towards Moffat and Salida. The overall distribution of trips to and from the site are illustrated in **Figure 4**.

## 3.6 Truck Traffic Considerations

According to Adapture Renewables, Inc., truck traffic for the site is estimated to be a maximum of 15 trucks per day accessing the site and are expected to be semi-trucks with 40 foot containers. Truck distribution is projected to be 80% from the south and 20% to the north. Time of day was not noted in correspondence but included in peak hour traffic as the worst case scenario. A passenger car equivalency of 3 was assumed to account for the semi-trucks per CDOT Access Code. **Table 2** includes the truck traffic estimate for the peak hour traffic.




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Level 2 Auxiliary Turn Lane Assessment - Haynach Solar Hybrid Project

# TRIP GENERATION & DISTRIBUTION

| Scale | 1" = 1 MILE | Date | 07/17/2025 | Drawn By | MJW | Job # | BARRE-184218 | Figure | 4 |
|---|---|---|---|---|---|---|---|---|---|

# 4 Short-Term (Year 2029) Analysis

## 4.1 Short-Term Background Traffic Volumes

As noted in Section 2.1, construction on the site is expected to start in December 2028 with a duration of 16 months. Year 2029 was identified as the year of peak construction traffic resulting from a peak construction work force of 175 workers.

Short-term background traffic volumes were developed using OTIS. OTIS lists a 20-year growth factor of 1.11 along CO 17 (0.55% per year) and 1.19 (0.95% per year) along CO 112. The projected short-term background traffic volumes are contained in **Figure 5**.

## 4.2 Short-Term Background Level of Service

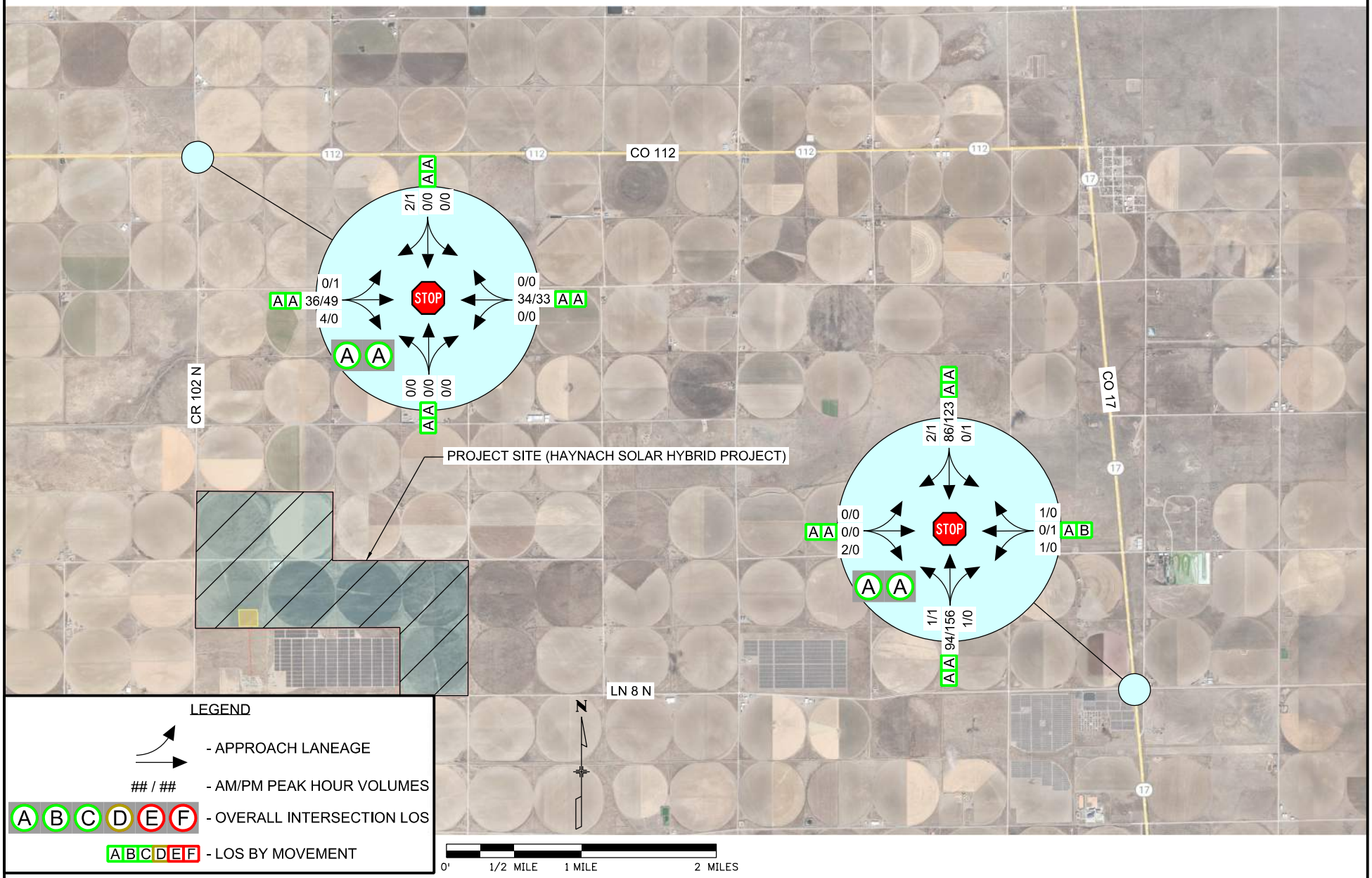
Year 2029 background traffic volumes were analyzed to determine future operations and capacity constraints. A summarization of the results of the intersection LOS calculations is displayed in **Table 1**. The intersections of CO 17 / Lane 8 N, and CO 112 / CR 102 N are projected to continue operating at LOS A with all movements also operating at LOS B or better. **Appendix B** contains the LOS analysis worksheets for reference.

## 4.3 Short-Term Background plus Site Generated Traffic Volumes

The construction related estimated vehicular volumes for the Haynach Solar development were combined with the short-term background volumes to produce the total short-term traffic volumes. The resulting total traffic volumes are presented in **Figure 6.**

## 4.4 Short-Term Background plus Site Generated Traffic Level of Service

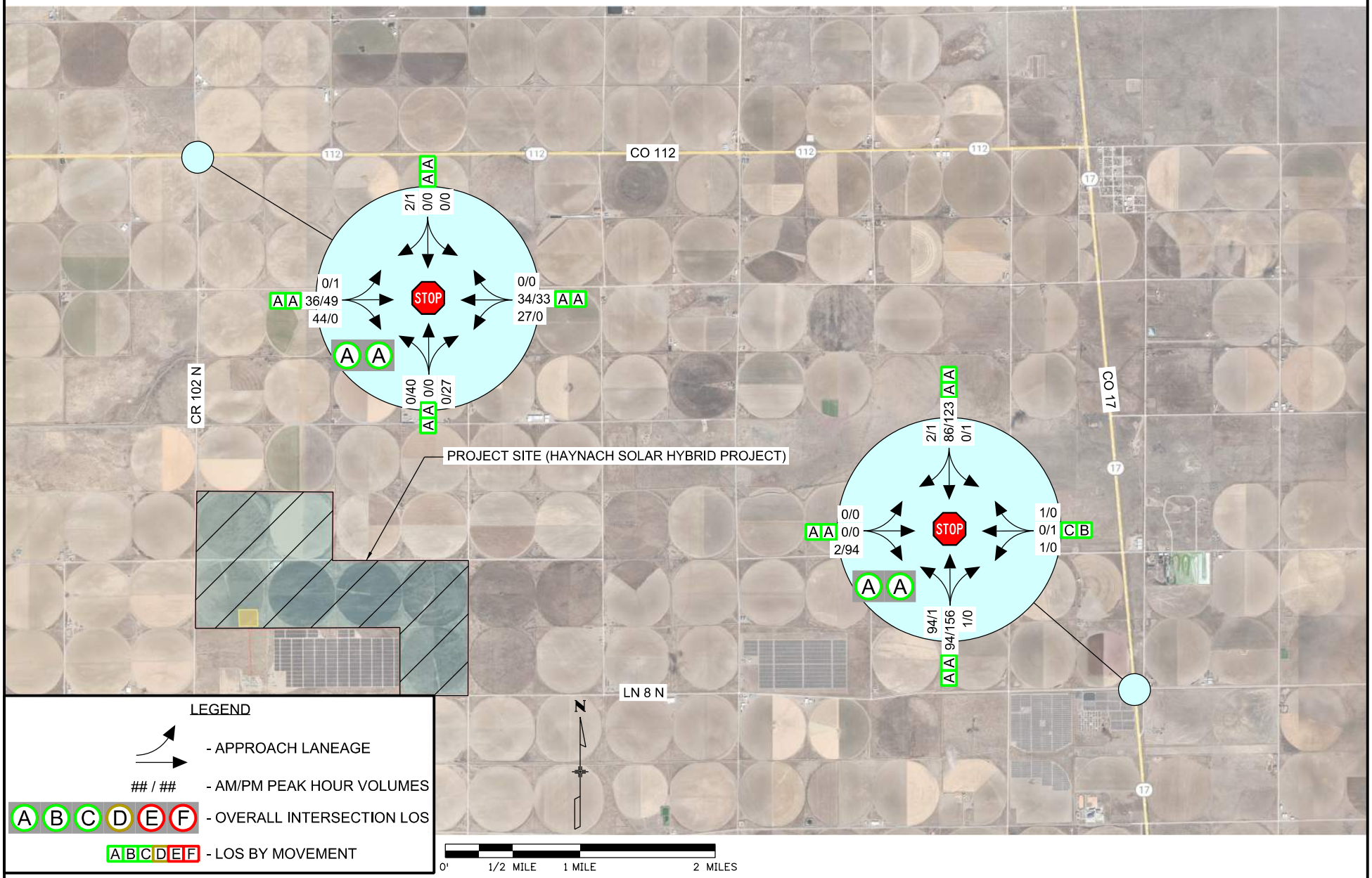
Year 2029 background plus site generated traffic volumes were analyzed to determine future operations and capacity constraints. A summarization of the results of the intersection LOS calculations is displayed in **Table 1**. The intersections of CO 17 / Lane 8 N, and CO 112 / CR 102 N are projected to continue operating at LOS A with all movements also operating at LOS C or better. Minor increases in delay are expected for the construction related traffic turning movements. **Appendix B** contains the LOS analysis worksheets for reference.




Level 2 Auxiliary Turn Lane Assessment - Haynach Solar Hybrid Project

# SHORT TERM (YEAR 2029) BACKGROUND CONDITIONS

| Scale | 1" = 1 MILE | Date | 07/17/2025 | Drawn By | MJW | Job # | BARRE-184218 | Figure | 5 |
|---|---|---|---|---|---|---|---|---|---|




Level 2 Auxiliary Turn Lane Assessment - Haynach Solar Hybrid Project

# SHORT TERM (YEAR 2029) BACKGROUND + SITE GENERATED TRAFFIC CONDITIONS

| Scale | 1" = 1 MILE | Date | 07/17/2025 | Drawn By | MJW | Job # | BARRE-184218 | Figure | 6 |
|---|---|---|---|---|---|---|---|---|---|

# 5 Long-Term (Year 2049) Background Analysis

## 5.1 Long-Term Background Traffic Volumes

Year 2049 is identified as the long-term horizon year for this study and is 20 years post peak construction. The 20-year growth factor of 1.11 along CO 17 (0.55% per year) and 1.19 (0.95% per year) along CO 112 were applied to the short-term background volumes to develop the long-term background volumes. The projected long-term background traffic volumes are contained in **Figure 7**.

## 5.2 Long-Term Background Level of Service

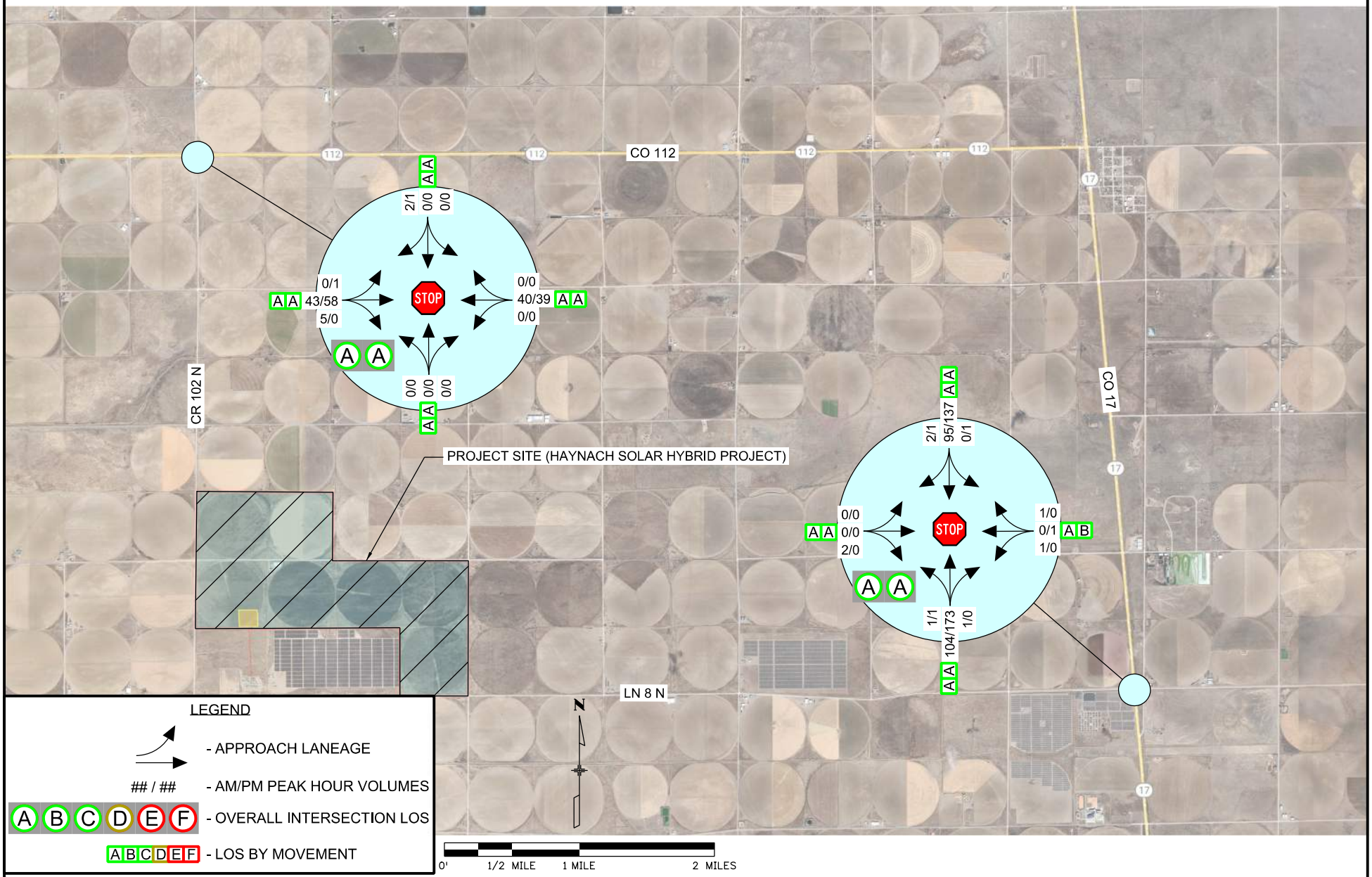
Year 2049 background traffic volumes were analyzed to determine future operations and capacity constraints. A summarization of the results of the intersection LOS calculations is displayed in **Table 1**. The intersections of CO 17 / Lane 8 N, and CO 112 / CR 102 N are projected to continue operating at LOS A with all movements also operating at LOS B or better. **Appendix B** contains the LOS analysis worksheets for reference.

## 5.3 Long-Term Background plus Site Generated Traffic Volumes

The long-term site vehicular volumes for the Haynach Solar development (as displayed in **Table 2** above) were combined with the long-term background volumes to produce the total short-term traffic volumes. The resulting total traffic volumes are presented in **Figure 8.**

## 5.4 Long-Term Background plus Site Generated Traffic Level of Service

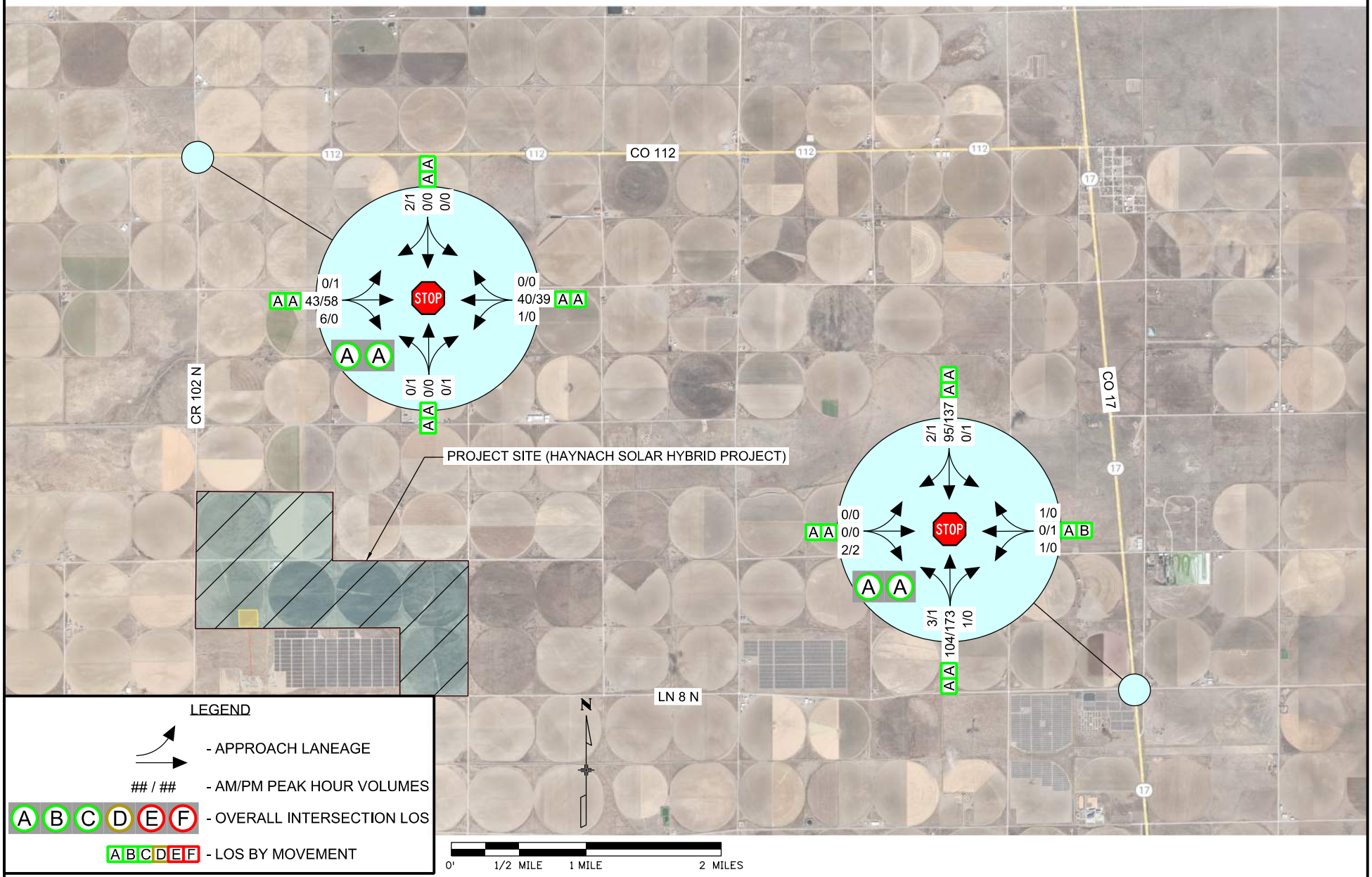
Year 2049 background plus site generated traffic volumes were analyzed to determine future operations and capacity constraints. A summarization of the results of the intersection LOS calculations is displayed in **Table 1**. The intersections of CO 17 / Lane 8 N, and CO 112 / CR 102 N are projected to continue operating at LOS A with all movements also operating at LOS B or better. Minimal to no impacts to delay are projected from the long-term site related traffic. **Appendix B** contains the LOS analysis worksheets for reference.




Level 2 Auxiliary Turn Lane Assessment - Haynach Solar Hybrid Project

# LONG TERM (YEAR 2049) BACKGROUND CONDITIONS

| Scale | 1" = 1 MILE | Date | 07/17/2025 | Drawn By | MJW | Job # | BARRE-184218 | Figure | 7 |
|---|---|---|---|---|---|---|---|---|---|




Level 2 Auxiliary Turn Lane Assessment - Haynach Solar Hybrid Project

# LONG TERM (YEAR 2049) BACKGROUND + SITE GENERATED TRAFFIC CONDITIONS

| Scale | 1" = 1 MILE | Date | 07/17/2025 | Drawn By | MJW | Job # | BARRE-184218 | Figure | 8 |
|---|---|---|---|---|---|---|---|---|---|

# 6 Additional Roadway Analysis

## 6.1 Auxiliary Lane Analysis

The short-term construction traffic associated with building the Haynach Solar facility represent the largest number of vehicles that will access the site. As noted in **Table 2**, 116 vehicles and 15 delivery trucks are projected to be generated in the AM and PM peak hour. **Figure 4** from Section 3.5 displays the trip generation.

CO 17 has a CDOT access category of R-A: Regional Highway, and CO 112 is classified as R-B. The posted speed limit is 65 mph for both roadways in the study area. According to State of Colorado State Highway Access Code, (Volume 2, March 2002). The following criteria require the construction of auxiliary lanes for both R-A and R-B roadway classifications:

- Right turn deceleration lane: 25 vehicles/hour
- Left turn deceleration lane: 10 vehicles/hour
- Right turn acceleration lane: 50 vehicles/hour when posted speed on the highway is 45 mph or greater and the highway has only one lane for through traffic.
- Left turn acceleration lane: as needed to benefit safety and operations.

According to the volume thresholds listed above, auxiliary lanes are required for:

- Northbound left deceleration lane at CO 17 / Lane 8 N
- Eastbound right acceleration lane at CO 17 / Lane 8 N
- Westbound left deceleration lane at CO 112 / CR 102 N
- Eastbound right deceleration lane at CO 112 / CR 102 N

However, per Section 3.5.5 of the Access Code, “The auxiliary lanes required in the category design standards may be waived when the 20th year predicted roadway volumes conflicting with the turning vehicle are below the following minimum volume thresholds. The right turn deceleration lane may be dropped if the volume in the travel lane is predicted to be below 150 DHV. The left turn deceleration lane may be dropped if the opposing traffic is predicted to be below 100 DHV. The right turn acceleration lane may be dropped if the adjacent traveled lane is predicted to be below 120 DHV. The left turn acceleration lane may be dropped if the volume in the inside lane in the direction of travel is predicted to be below 120 DHV.”

**Table 3** displays the auxiliary lane analysis results of the short-term construction related traffic. Long-term traffic does not warrant any auxiliary lanes.

**Table 3 – Auxiliary Lane Analysis**

| Intersection | Movement | Peak Hour Volume | Auxiliary Lane Type | Access Code Volume Threshold | Auxiliary Lane Required? |
|---|---|---|---|---|---|
| CO 17 / Lane 8 N | Northbound Left | 94 vph | Deceleration Lane | 10 vph / opposing volume below 100 vph | **No, opposing volume = 86 vph** |
| | Eastbound Right | 94 vph | Acceleration Lane | 50 vph / adjacent volume below 120 vph | **Yes, >50 vph and adjacent volume = 123 vph** |
| CO 112 / CR 102 N | Eastbound Right | 44 vph | Deceleration Lane | 25 vph / adjacent volume below 150 vph | **No, adjacent volume = 36 vph** |
| | Westbound Right | 27 vph | Deceleration Lane | 25 vph / adjacent volume below 150 vph | **No, adjacent volume = 34 vph** |
| | Northbound Left | 40 vph | Acceleration Lane | Safety concerns only | **No** |
| | Northbound Right | 27 vph | Acceleration Lane | 50 vph / adjacent volume below 150 vph | **No** |

According to the Access Code requirements for auxiliary lanes on R-A and R-B roadways, an acceleration lane for the eastbound to southbound direction at the intersection of CO 17 / Lane 8 N is warranted. According to Section 4 of the Access Code, the acceleration lane for a 65 mph R-A roadway shall be 1380 feet with a 25:1 transition taper. The taper is included within the acceleration length. A temporary acceleration lane may be constructed if required by CDOT. It should be noted that the adjacent volume is very nearly the 120 vph threshold and will fluctuate seasonally.

## 6.2 Sight Distance Evaluation

Entering sight distance photos were taken at the two study intersections at CO 17 / Lane 8 N, and CO 112 / CR 102 N. Additional photos were also taken at the project site. According to Section 4 of the Access Code, entering sight distance for a 65 mph roadway is 650 feet. Sight distance at all access points is well over 650 feet. **Appendix D** contains the photos for reference.

# 7 Conclusions and Mitigation Considerations

Based on the analysis described in the sections above, the following conclusions have been drawn regarding the traffic impacts resulting from the Haynach Solar development:

- The anticipated traffic volume generated by the Haynach Solar development is not expected to significantly impact the surrounding roadway network.
- Short-term, construction related traffic will be the largest generator of traffic for the site. Construction is anticipated to start in December, 2028 and last 16 months.
- Travel time delay and LOS impacts from short-term, construction related traffic and long-term, site related traffic is projected to be minimal.
- A right turn acceleration lane is warranted for the eastbound to southbound movement at CO 17 / Lane 8 N. If the auxiliary lane is required by CDOT, a temporary lane may be constructed. It should be noted that adjacent volume is nearly the 120 vph threshold and will fluctuate seasonally.
- Sight distance evaluation indicates that each access has sufficient entering sight distance for a 65 mph roadway.
- There are no known safety issues in the existing study area. The site generated traffic is not expected to present any additional safety issues.

MJW

# Appendix A

Traffic Count Data

# Highway 17 & Lane 8 N, Alamosa County, CO

**0 0**

## Wednesday, June 4, 2025

| Time | Southbound 0 | | | | | | Westbound 0 | | | | | | Northbound 0 | | | | | | Eastbound 0 | | | | | | VEHICLE TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | |
| 12:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 12:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 12:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 12:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 1:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 1:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 1:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 1:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 2:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 2:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 2:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 2:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 3:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 3:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 3:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 3:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 4:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 4:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 4:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 4:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 5:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 5:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 5:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 5:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 6:00 AM | 0 | 0 | 10 | 0 | 0 | *10* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 3 | 0 | 0 | *3* | 0 | 0 | 0 | 0 | 0 | *0* | **13** |
| 6:15 AM | 0 | 0 | 3 | 0 | 0 | *3* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 8 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | **12** |
| 6:30 AM | 0 | 0 | 4 | 0 | 0 | *4* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 9 | 0 | 0 | *10* | 0 | 0 | 0 | 0 | 0 | *0* | **14** |
| 6:45 AM | 0 | 0 | 11 | 0 | 0 | *11* | 0 | 0 | 2 | 0 | 0 | *2* | 0 | 1 | 8 | 0 | 0 | *9* | 0 | 0 | 1 | 0 | 0 | *1* | **23** |
| Hourly Total | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 2 | 0 | 0 | *2* | 0 | 3 | 28 | 0 | 0 | *31* | 0 | 0 | 1 | 0 | 0 | *1* | **62** |
| 7:00 AM | 0 | 0 | 6 | 1 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 2 | 10 | 0 | 0 | *12* | 0 | 0 | 0 | 5 | 0 | *5* | **24** |
| 7:15 AM | 0 | 0 | 12 | 0 | 0 | *12* | 0 | 1 | 0 | 0 | 0 | *1* | 0 | 4 | 13 | 0 | 0 | *17* | 0 | 0 | 0 | 0 | 0 | *0* | **30** |
| 7:30 AM | 0 | 0 | 13 | 0 | 0 | *13* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 19 | 0 | 0 | *19* | 0 | 0 | 0 | 0 | 0 | *0* | **32** |
| 7:45 AM | 0 | 0 | 15 | 0 | 0 | *15* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 28 | 0 | 0 | *29* | 0 | 0 | 1 | 1 | 0 | *2* | **46** |
| Hourly Total | 0 | 0 | 46 | 1 | 0 | *47* | 0 | 1 | 0 | 0 | 0 | *1* | 0 | 7 | 70 | 0 | 0 | *77* | 0 | 0 | 1 | 6 | 0 | *7* | **132** |

# Highway 17 & Lane 8 N, Alamosa County, CO
## 0 0
## Wednesday, June 4, 2025

| | Southbound 0 | | | | | | Westbound 0 | | | | | | Northbound 0 | | | | | | Eastbound 0 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | VEHICLE TOTAL |
| 8:00 AM | 0 | 0 | 12 | 0 | 0 | *12* | 0 | 1 | 1 | 0 | 0 | *2* | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 1 | 1 | 0 | *2* | **44** |
| 8:15 AM | 0 | 0 | 17 | 0 | 0 | *17* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 2 | 27 | 0 | 0 | *29* | 0 | 0 | 0 | 2 | 0 | *2* | **48** |
| 8:30 AM | 0 | 0 | 20 | 0 | 0 | *20* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 2 | 15 | 1 | 0 | *18* | 0 | 0 | 0 | 5 | 0 | *5* | **43** |
| 8:45 AM | 0 | 0 | 22 | 1 | 0 | *23* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 18 | 0 | 0 | *19* | 0 | 0 | 0 | 1 | 0 | *1* | **43** |
| | 0 | 0 | 71 | 1 | 0 | *72* | 0 | 1 | 1 | 0 | 0 | *2* | 0 | 5 | 88 | 1 | 0 | *94* | 0 | 0 | 1 | 9 | 0 | *10* | **178** |
| Hourly Total | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9:00 AM | 0 | 0 | 21 | 0 | 0 | *21* | 0 | 1 | 0 | 0 | 0 | *1* | 0 | 0 | 18 | 0 | 0 | *18* | 0 | 0 | 0 | 0 | 0 | *0* | **40** |
| 9:15 AM | 0 | 0 | 21 | 1 | 0 | *22* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 28 | 1 | 0 | *29* | 0 | 0 | 0 | 1 | 0 | *1* | **52** |
| 9:30 AM | 0 | 0 | 20 | 0 | 0 | *20* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 0 | 0 | 0 | *0* | **49** |
| 9:45 AM | 0 | 0 | 17 | 0 | 0 | *17* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 15 | 0 | 0 | *15* | 0 | 0 | 1 | 0 | 0 | *1* | **33** |
| | 0 | 0 | 79 | 1 | 0 | *80* | 0 | 1 | 0 | 1 | 0 | *2* | 0 | 0 | 89 | 1 | 0 | *90* | 0 | 0 | 1 | 1 | 0 | *2* | **174** |
| Hourly Total | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10:00 AM | 0 | 0 | 27 | 0 | 0 | *27* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 20 | 0 | 0 | *20* | 0 | 0 | 0 | 1 | 0 | *1* | **48** |
| 10:15 AM | 0 | 0 | 24 | 0 | 0 | *24* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 35 | 3 | 0 | *38* | 0 | 0 | 0 | 2 | 0 | *2* | **64** |
| 10:30 AM | 0 | 0 | 29 | 0 | 0 | *29* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 16 | 0 | 0 | *16* | 0 | 1 | 0 | 0 | 0 | *1* | **46** |
| 10:45 AM | 0 | 0 | 26 | 0 | 0 | *26* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 1 | 0 | 0 | 0 | *1* | **60** |
| | 0 | 0 | 106 | 0 | 0 | *106* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 103 | 3 | 0 | *106* | 0 | 2 | 0 | 3 | 0 | *5* | **218** |
| Hourly Total | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11:00 AM | 0 | 0 | 40 | 0 | 0 | *40* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 2 | 0 | 0 | *2* | **70** |
| 11:15 AM | 0 | 0 | 30 | 1 | 0 | *31* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 31 | 0 | 0 | *31* | 0 | 0 | 0 | 0 | 0 | *0* | **62** |
| 11:30 AM | 0 | 0 | 33 | 0 | 0 | *33* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 39 | 1 | 0 | *40* | 0 | 0 | 0 | 0 | 0 | *0* | **74** |
| 11:45 AM | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 1 | 33 | 0 | 0 | *34* | 0 | 1 | 0 | 0 | 0 | *1* | **64** |
| | 0 | 0 | 131 | 1 | 0 | *132* | 0 | 0 | 2 | 0 | 0 | *2* | 0 | 1 | 131 | 1 | 0 | *133* | 0 | 1 | 2 | 0 | 0 | *3* | **270** |
| Hourly Total | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12:00 PM | 0 | 0 | 23 | 0 | 0 | *23* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 41 | 0 | 0 | *41* | 0 | 1 | 0 | 0 | 0 | *1* | **65** |
| 12:15 PM | 0 | 0 | 27 | 0 | 0 | *27* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 53 | 0 | 0 | *53* | 0 | 1 | 0 | 0 | 0 | *1* | **81** |
| 12:30 PM | 0 | 0 | 29 | 0 | 0 | *29* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 25 | 0 | 0 | *25* | 0 | 0 | 0 | 0 | 0 | *0* | **54** |
| 12:45 PM | 0 | 1 | 24 | 0 | 0 | *25* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 37 | 0 | 0 | *37* | 0 | 0 | 0 | 0 | 0 | *0* | **63** |
| | 0 | 1 | 103 | 0 | 0 | *104* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 156 | 0 | 0 | *156* | 0 | 2 | 0 | 0 | 0 | *2* | **263** |
| Hourly Total | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1:00 PM | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 30 | 0 | 0 | *30* | 0 | 0 | 0 | 2 | 0 | *2* | **61** |
| 1:15 PM | 0 | 0 | 37 | 0 | 0 | *37* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 33 | 0 | 0 | *33* | 0 | 0 | 0 | 0 | 0 | *0* | **70** |
| 1:30 PM | 0 | 0 | 30 | 0 | 0 | *30* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 35 | 0 | 0 | *35* | 0 | 0 | 0 | 0 | 0 | *0* | **65** |
| 1:45 PM | 0 | 0 | 23 | 0 | 0 | *23* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 37 | 0 | 0 | *37* | 0 | 0 | 0 | 0 | 0 | *0* | **60** |
| | 0 | 0 | 118 | 0 | 0 | *118* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 135 | 0 | 0 | *135* | 0 | 0 | 0 | 2 | 0 | *2* | **256** |
| Hourly Total | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2:00 PM | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 36 | 0 | 0 | *36* | 0 | 0 | 0 | 0 | 0 | *0* | **68** |
| 2:15 PM | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 44 | 0 | 0 | *44* | 0 | 0 | 0 | 0 | 0 | *0* | **72** |
| 2:30 PM | 0 | 0 | 33 | 1 | 0 | *34* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 39 | 0 | 0 | *39* | 0 | 0 | 0 | 0 | 0 | *0* | **73** |
| 2:45 PM | 0 | 1 | 27 | 0 | 0 | *28* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 1 | 34 | 0 | 0 | *35* | 0 | 0 | 0 | 0 | 0 | *0* | **64** |
| | 0 | 1 | 120 | 1 | 0 | *122* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 1 | 153 | 0 | 0 | *154* | 0 | 0 | 0 | 0 | 0 | *0* | **277** |
| Hourly Total | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3:00 PM | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 0 | 0 | 0 | 0 | *0* | **64** |
| 3:15 PM | 0 | 0 | 34 | 0 | 0 | *34* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 27 | 0 | 0 | *27* | 0 | 0 | 0 | 0 | 0 | *0* | **61** |
| 3:30 PM | 0 | 0 | 37 | 0 | 0 | *37* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 30 | 0 | 0 | *30* | 0 | 0 | 0 | 0 | 0 | *0* | **67** |
| 3:45 PM | 0 | 0 | 38 | 0 | 0 | *38* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 35 | 0 | 0 | *35* | 0 | 0 | 0 | 1 | 0 | *1* | **74** |
| | 0 | 0 | 141 | 0 | 0 | *141* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 124 | 0 | 0 | *124* | 0 | 0 | 0 | 1 | 0 | *1* | **266** |
| Hourly Total | | | | | | | | | | | | | | | | | | | | | | | | | |

# Highway 17 & Lane 8 N, Alamosa County, CO
## 0 0
## Wednesday, June 4, 2025

| | Southbound 0 | | | | | | Westbound 0 | | | | | | Northbound 0 | | | | | | Eastbound 0 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | VEHICLE TOTAL |
| 4:00 PM | 0 | 0 | 34 | 0 | 0 | *34* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 0 | 0 | 0 | *0* | **62** |
| 4:15 PM | 0 | 0 | 41 | 0 | 0 | *41* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 21 | 0 | 0 | *21* | 0 | 0 | 0 | 0 | 0 | *0* | **62** |
| 4:30 PM | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 1 | 0 | 0 | 0 | *1* | 0 | 0 | 29 | 0 | 0 | *29* | 0 | 0 | 0 | 0 | 0 | *0* | **62** |
| 4:45 PM | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 21 | 0 | 0 | *21* | 0 | 0 | 0 | 1 | 0 | *1* | **50** |
| Hourly Total | 0 | 0 | 135 | 0 | 0 | *135* | 0 | 1 | 0 | 0 | 0 | *1* | 0 | 0 | 99 | 0 | 0 | *99* | 0 | 0 | 0 | 1 | 0 | *1* | **236** |
| 5:00 PM | 0 | 0 | 22 | 1 | 0 | *23* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 18 | 0 | 0 | *18* | 0 | 0 | 0 | 1 | 0 | *1* | **42** |
| 5:15 PM | 0 | 0 | 30 | 0 | 0 | *30* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 29 | 0 | 0 | *29* | 0 | 0 | 0 | 0 | 0 | *0* | **59** |
| 5:30 PM | 0 | 0 | 29 | 0 | 0 | *29* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 22 | 0 | 0 | *22* | 0 | 0 | 0 | 0 | 0 | *0* | **51** |
| 5:45 PM | 0 | 2 | 18 | 0 | 0 | *20* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 2 | 26 | 2 | 0 | *30* | 0 | 0 | 0 | 1 | 0 | *1* | **51** |
| Hourly Total | 0 | 2 | 99 | 1 | 0 | *102* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 2 | 95 | 2 | 0 | *99* | 0 | 0 | 0 | 2 | 0 | *2* | **203** |
| 6:00 PM | 0 | 0 | 25 | 0 | 0 | *25* | 0 | 2 | 0 | 0 | 0 | *2* | 0 | 0 | 20 | 0 | 0 | *20* | 0 | 0 | 0 | 0 | 0 | *0* | **47** |
| 6:15 PM | 0 | 0 | 24 | 0 | 0 | *24* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 0 | 0 | 3 | 0 | *3* | **59** |
| 6:30 PM | 0 | 0 | 15 | 0 | 0 | *15* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 18 | 0 | 0 | *18* | 0 | 0 | 0 | 0 | 0 | *0* | **34** |
| 6:45 PM | 0 | 0 | 13 | 0 | 0 | *13* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 15 | 0 | 0 | *16* | 0 | 0 | 0 | 0 | 0 | *0* | **29** |
| Hourly Total | 0 | 0 | 77 | 0 | 0 | *77* | 0 | 2 | 0 | 1 | 0 | *3* | 0 | 1 | 85 | 0 | 0 | *86* | 0 | 0 | 0 | 3 | 0 | *3* | **169** |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 8:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 9:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 9:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 9:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 9:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 10:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 10:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 10:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 10:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 11:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 11:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 11:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 11:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| **DAILY TOTAL** | **0** | **4** | **1254** | **6** | **0** | ***1264*** | **0** | **6** | **7** | **4** | **0** | ***17*** | **0** | **20** | **1356** | **8** | **0** | ***1384*** | **0** | **5** | **6** | **28** | **0** | ***39*** | **2704** |
| **Cars** | 0 | 4 | 1145 | 5 | 0 | *1154* | 0 | 6 | 6 | 4 | 0 | *16* | 0 | 17 | 1265 | 8 | 0 | *1290* | 0 | 4 | 4 | 24 | 0 | *32* | **2492** |
| **Heavy Vehicles** | 0 | 0 | 109 | 1 | 0 | *110* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 3 | 91 | 0 | 0 | *94* | 0 | 1 | 2 | 4 | 0 | *7* | **212** |
| **Heavy Vehicle %** | 0.00% | 0.00% | 8.69% | 16.67% | 0.00% | *8.70%* | 0.00% | 0.00% | 14.29% | 0.00% | 0.00% | *5.88%* | 0.00% | 15.00% | 6.71% | 0.00% | 0.00% | *6.79%* | 0.00% | 20.00% | 33.33% | 14.29% | 0.00% | *17.95%* | **7.84%** |

# Highway 17 & Lane 8 N, Alamosa County, CO

0 0

## Wednesday, June 4, 2025

### AM Peak Hour (00:00 to 10:00)

| Time | Southbound | | | | | | Westbound | | | | | | Northbound | | | | | | Eastbound | | | | | | VEHICLE TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | |
| 8:45 AM | 0 | 0 | 22 | 1 | 0 | *23* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 18 | 0 | 0 | *19* | 0 | 0 | 0 | 1 | 0 | *1* | **43** |
| 9:00 AM | 0 | 0 | 21 | 0 | 0 | *21* | 0 | 1 | 0 | 0 | 0 | *1* | 0 | 0 | 18 | 0 | 0 | *18* | 0 | 0 | 0 | 0 | 0 | *0* | **40** |
| 9:15 AM | 0 | 0 | 21 | 1 | 0 | *22* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 28 | 1 | 0 | *29* | 0 | 0 | 0 | 1 | 0 | *1* | **52** |
| 9:30 AM | 0 | 0 | 20 | 0 | 0 | *20* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 0 | 0 | 0 | *0* | **49** |
| Peak Hour Total | 0 | 0 | 84 | 2 | 0 | *86* | 0 | 1 | 0 | 1 | 0 | *2* | 0 | 1 | 92 | 1 | 0 | *94* | 0 | 0 | 0 | 2 | 0 | *2* | **184** |
| Peak Hour Heavy Vehicles | 0 | 0 | 4 | 0 | 0 | *4* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | **11** |
| Peak Hour Heavy Vehicles % | 0.00% | 0.00% | 4.76% | 0.00% | 0.00% | 4.65% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 7.61% | 0.00% | 0.00% | 7.45% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.98% |
| PHF | 0.000 | 0.000 | 0.955 | 0.500 | 0.000 | *0.935* | 0.000 | 0.250 | 0.000 | 0.250 | 0.000 | *0.500* | 0.000 | 0.250 | 0.821 | 0.250 | 0.000 | *0.810* | 0.000 | 0.000 | 0.000 | 0.500 | 0.000 | *0.500* | **0.885** |

### Mid Peak Hour (10:00 - 14:00)

| Time | Southbound | | | | | | Westbound | | | | | | Northbound | | | | | | Eastbound | | | | | | VEHICLE TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | |
| 11:30 AM | 0 | 0 | 33 | 0 | 0 | *33* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 39 | 1 | 0 | *40* | 0 | 0 | 0 | 0 | 0 | *0* | **74** |
| 11:45 AM | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 1 | 33 | 0 | 0 | *34* | 0 | 1 | 0 | 0 | 0 | *1* | **64** |
| 12:00 PM | 0 | 0 | 23 | 0 | 0 | *23* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 41 | 0 | 0 | *41* | 0 | 1 | 0 | 0 | 0 | *1* | **65** |
| 12:15 PM | 0 | 0 | 27 | 0 | 0 | *27* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 53 | 0 | 0 | *53* | 0 | 1 | 0 | 0 | 0 | *1* | **81** |
| Peak Hour Total | 0 | 0 | 111 | 0 | 0 | *111* | 0 | 0 | 2 | 0 | 0 | *2* | 0 | 1 | 166 | 1 | 0 | *168* | 0 | 3 | 0 | 0 | 0 | *3* | **284** |
| Peak Hour Heavy Vehicles | 0 | 0 | 5 | 0 | 0 | *5* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | 0 | 1 | 0 | 0 | 0 | *1* | **18** |
| Peak Hour Heavy Vehicles % | 0.00% | 0.00% | 4.50% | 0.00% | 0.00% | 4.50% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 7.23% | 0.00% | 0.00% | 7.14% | 0.00% | 33.33% | 0.00% | 0.00% | 0.00% | 33.33% | 6.34% |
| PHF | 0.000 | 0.000 | 0.841 | 0.000 | 0.000 | *0.841* | 0.000 | 0.000 | 0.500 | 0.000 | 0.000 | *0.500* | 0.000 | 0.250 | 0.783 | 0.250 | 0.000 | *0.792* | 0.000 | 0.750 | 0.000 | 0.000 | 0.000 | *0.750* | **0.877** |

### PM Peak Hour (14:00 - 24:00)

| Time | Southbound | | | | | | Westbound | | | | | | Northbound | | | | | | Eastbound | | | | | | VEHICLE TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | |
| 2:00 PM | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 36 | 0 | 0 | *36* | 0 | 0 | 0 | 0 | 0 | *0* | **68** |
| 2:15 PM | 0 | 0 | 28 | 0 | 0 | *28* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 44 | 0 | 0 | *44* | 0 | 0 | 0 | 0 | 0 | *0* | **72** |
| 2:30 PM | 0 | 0 | 33 | 1 | 0 | *34* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 39 | 0 | 0 | *39* | 0 | 0 | 0 | 0 | 0 | *0* | **73** |
| 2:45 PM | 0 | 1 | 27 | 0 | 0 | *28* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 1 | 34 | 0 | 0 | *35* | 0 | 0 | 0 | 0 | 0 | *0* | **64** |
| Peak Hour Total | 0 | 1 | 120 | 1 | 0 | *122* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 1 | 153 | 0 | 0 | *154* | 0 | 0 | 0 | 0 | 0 | *0* | **277** |
| Peak Hour Heavy Vehicles | 0 | 0 | 15 | 1 | 0 | *16* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 3 | 0 | 0 | *3* | 0 | 0 | 0 | 0 | 0 | *0* | **19** |
| Peak Hour Heavy Vehicles % | 0.00% | 0.00% | 12.50% | 100.00% | 0.00% | 13.11% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.96% | 0.00% | 0.00% | 1.95% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 6.86% |
| PHF | 0.000 | 0.250 | 0.909 | 0.250 | 0.000 | *0.897* | 0.000 | 0.000 | 0.250 | 0.000 | 0.000 | *0.250* | 0.000 | 0.250 | 0.869 | 0.000 | 0.000 | *0.875* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | *0.000* | **0.949** |

| Total Vehicles On Leg | | 2629 | | | |
|---|---|---|---|---|---|
| Vehicles Entering Intersection | 1264 | Vehicles Exiting Intersection | 1365 | | |
| **Southbound** | | | | | |
| Cars | 5 | 1145 | 4 | 0 | 0 |
| Heavy | 1 | 109 | 0 | 0 | 0 |
| **Total** | **6** | **1254** | **4** | **0** | **0** |

| Total Vehicles on Leg | Vehicles Entering Intersection | Vehicles Exiting Intersection | Eastbound | Cars | Heavy | Total |
|---|---|---|---|---|---|---|
| 72 | 39 | 33 | | 0 | 0 | **0** |
| | | | | 0 | 0 | **0** |
| | | | | 4 | 1 | **5** |
| | | | | 4 | 2 | **6** |
| | | | | 24 | 4 | **28** |

**Daily Volumes**

| Cars | Heavy | Total | Westbound | Vehicles Entering Intersection | Total Vehicles on Leg |
|---|---|---|---|---|---|
| 4 | 0 | **4** | | 17 | 35 |
| 6 | 1 | **7** | | | |
| 6 | 0 | **6** | | Vehicles Exiting Intersection 18 | |
| 0 | 0 | **0** | | | |
| 0 | 0 | **0** | | | |

| Cars | 0 | 0 | 17 | 1265 | 8 |
|---|---|---|---|---|---|
| Heavy | 0 | 0 | 3 | 91 | 0 |
| **Total** | **0** | **0** | **20** | **1356** | **8** |
| **Northbound** | | | | | |
| Vehicles Entering Intersection | 1384 | Vehicles Exiting Intersection | 1288 | | |
| Total Vehicles On Leg | | 2672 | | | |

# Highway 112 & County Road 102 N, Alamosa County, CO

0 0

## Wednesday, June 4, 2025

| Time | Southbound 0 | | | | | | Westbound 0 | | | | | | Northbound 0 | | | | | | Eastbound 0 | | | | | | VEHICLE TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | |
| 12:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 12:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 12:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 12:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 1:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 1:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 1:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 1:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 2:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 2:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 2:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 2:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 3:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 3:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 3:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 3:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 4:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 4:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 4:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 4:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 5:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 5:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 5:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 5:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **1** |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 2 | 0 | 0 | *2* | **6** |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | **10** |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | **11** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 15 | 0 | 0 | *15* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 13 | 0 | 0 | *13* | **28** |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 5 | 0 | 0 | *6* | **11** |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | **13** |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 10 | 0 | 0 | *10* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | **16** |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 4 | 0 | *11* | **20** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 23 | 4 | 0 | *28* | **60** |

# Highway 112 & County Road 102 N, Alamosa County, CO
## 0 0
## Wednesday, June 4, 2025

| | Southbound 0 | | | | | | Westbound 0 | | | | | | Northbound 0 | | | | | | Eastbound 0 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | VEHICLE TOTAL |
| 8:00 AM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 10 | 0 | 0 | *10* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | **15** |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 13 | 0 | 0 | *13* | **19** |
| 8:30 AM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 8 | 0 | 0 | *8* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | **20** |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 3 | 0 | 0 | *3* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 10 | 0 | 0 | *10* | **13** |
| Hourly Total | 0 | 0 | 0 | 2 | 0 | *2* | 0 | 0 | 27 | 0 | 0 | *27* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 38 | 0 | 0 | *38* | **67** |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 3 | 0 | 0 | *3* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | **12** |
| 9:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | **12** |
| 9:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | **13** |
| 9:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | **13** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 23 | 0 | 0 | *23* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 27 | 0 | 0 | *27* | **50** |
| 10:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | **12** |
| 10:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | **14** |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 10 | 0 | 0 | *10* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | **15** |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | **20** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 36 | 0 | 0 | *36* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 25 | 0 | 0 | *25* | **61** |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | **23** |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 3 | 0 | 0 | *3* | **15** |
| 11:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | **16** |
| 11:45 AM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | **16** |
| Hourly Total | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 38 | 0 | 0 | *38* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 31 | 0 | 0 | *31* | **70** |
| 12:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | **11** |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | **17** |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 13 | 0 | 0 | *13* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 12 | 0 | 0 | *13* | **26** |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 8 | 0 | 0 | *8* | **15** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 37 | 0 | 0 | *37* | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 1 | 30 | 0 | 0 | *31* | **69** |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | **15** |
| 1:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 10 | 1 | 0 | *11* | **18** |
| 1:30 PM | 0 | 0 | 0 | 2 | 0 | *2* | 0 | 0 | 3 | 0 | 0 | *3* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | **14** |
| 1:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | **19** |
| Hourly Total | 0 | 0 | 0 | 2 | 0 | *2* | 0 | 0 | 25 | 0 | 0 | *25* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 38 | 1 | 0 | *39* | **66** |
| 2:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 10 | 0 | 0 | *10* | **17** |
| 2:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 10 | 0 | 0 | *10* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | **17** |
| 2:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 8 | 0 | 0 | *9* | **14** |
| 2:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | **14** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 31 | 0 | 0 | *31* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 30 | 0 | 0 | *31* | **62** |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 1 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | **18** |
| 3:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 15 | 0 | 0 | *15* | **21** |
| 3:30 PM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 7 | 0 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | **19** |
| 3:45 PM | 0 | 2 | 0 | 0 | 0 | *2* | 0 | 0 | 5 | 0 | 0 | *5* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 6 | 0 | 0 | *6* | **14** |
| Hourly Total | 0 | 2 | 0 | 1 | 0 | *3* | 0 | 0 | 24 | 1 | 0 | *25* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 43 | 0 | 0 | *43* | **72** |

# Highway 112 & County Road 102 N, Alamosa County, CO
## 0 0
## Wednesday, June 4, 2025

| | Southbound 0 | | | | | | Westbound 0 | | | | | | Northbound 0 | | | | | | Eastbound 0 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | VEHICLE TOTAL |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 16 | 0 | 0 | *16* | **22** |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 10 | 0 | 0 | *10* | **23** |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | **15** |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | **19** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 33 | 0 | 0 | *33* | 0 | 0 | 1 | 0 | 0 | *1* | 0 | 0 | 45 | 0 | 0 | *45* | **79** |
| 5:00 PM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | **16** |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | **17** |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 19 | 0 | 0 | *20* | **29** |
| 5:45 PM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | **15** |
| Hourly Total | 0 | 0 | 0 | 2 | 0 | *2* | 0 | 0 | 30 | 0 | 0 | *30* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 44 | 0 | 0 | *45* | **77** |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | **20** |
| 6:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | **13** |
| 6:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 5 | 0 | 0 | *5* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | **9** |
| 6:45 PM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 4 | 0 | 0 | *5* | **12** |
| Hourly Total | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 26 | 0 | 0 | *26* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 26 | 0 | 0 | *27* | **54** |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 8:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 9:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 9:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 9:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 9:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 10:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 10:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 10:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 10:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 11:00 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 11:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 11:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| 11:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | *0* | **0** |
| **DAILY TOTAL** | **0** | **2** | **0** | **9** | **0** | ***11*** | **0** | **0** | **377** | **1** | **0** | ***378*** | **0** | **0** | **2** | **1** | **0** | ***3*** | **0** | **5** | **413** | **5** | **0** | ***423*** | **815** |
| **Cars** | 0 | 2 | 0 | 9 | 0 | *11* | 0 | 0 | 323 | 1 | 0 | *324* | 0 | 0 | 2 | 1 | 0 | *3* | 0 | 5 | 344 | 5 | 0 | *354* | **692** |
| **Heavy Vehicles** | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 54 | 0 | 0 | *54* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 69 | 0 | 0 | *69* | **123** |
| **Heavy Vehicle %** | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | *0.00%* | 0.00% | 0.00% | 14.32% | 0.00% | 0.00% | *14.29%* | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | *0.00%* | 0.00% | 0.00% | 16.71% | 0.00% | 0.00% | *16.31%* | **15.09%** |

# Highway 112 & County Road 102 N, Alamosa County, CO

0 0

## Wednesday, June 4, 2025

### AM Peak Hour (00:00 to 10:00)

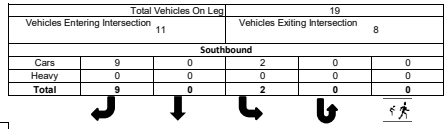
| Time | Southbound | | | | | | Westbound | | | | | | Northbound | | | | | | Eastbound | | | | | | VEHICLE TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 4 | 0 | *11* | **20** |
| 8:00 AM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 10 | 0 | 0 | *10* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | **15** |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 13 | 0 | 0 | *13* | **19** |
| 8:30 AM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 8 | 0 | 0 | *8* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | **20** |
| Peak Hour Total | 0 | 0 | 0 | 2 | 0 | *2* | 0 | 0 | 33 | 0 | 0 | *33* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 35 | 4 | 0 | *39* | **74** |
| Peak Hour Heavy Vehicles | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 6 | 0 | 0 | *6* | **10** |
| Peak Hour Heavy Vehicles % | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.12% | 0.00% | 0.00% | 12.12% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 17.14% | 0.00% | 0.00% | 15.38% | 13.51% |
| PHF | 0.000 | 0.000 | 0.000 | 0.500 | 0.000 | *0.500* | 0.000 | 0.000 | 0.825 | 0.000 | 0.000 | *0.825* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | *0.000* | 0.000 | 0.000 | 0.673 | 0.250 | 0.000 | *0.750* | **0.925** |

### Mid Peak Hour (10:00 - 14:00)

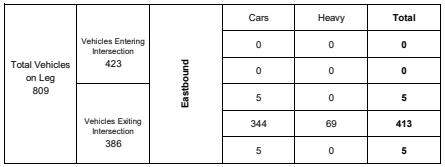
| Time | Southbound | | | | | | Westbound | | | | | | Northbound | | | | | | Eastbound | | | | | | VEHICLE TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | **20** |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | **23** |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 12 | 0 | 0 | *12* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 3 | 0 | 0 | *3* | **15** |
| 11:30 AM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | **16** |
| Peak Hour Total | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 44 | 0 | 0 | *44* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 30 | 0 | 0 | *30* | **74** |
| Peak Hour Heavy Vehicles | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 7 | 0 | 0 | *7* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 4 | 0 | 0 | *4* | **11** |
| Peak Hour Heavy Vehicles % | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 15.91% | 0.00% | 0.00% | 15.91% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 13.33% | 0.00% | 0.00% | 13.33% | 14.86% |
| PHF | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | *0.000* | 0.000 | 0.000 | 0.917 | 0.000 | 0.000 | *0.917* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | *0.000* | 0.000 | 0.000 | 0.625 | 0.000 | 0.000 | *0.625* | **0.804** |

### PM Peak Hour (14:00 - 24:00)

| Time | Southbound | | | | | | Westbound | | | | | | Northbound | | | | | | Eastbound | | | | | | VEHICLE TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | U Turns | Left Turns | Straight Through | Right Turns | Crosswalk Crossings | *Vehicle Approach Total* | |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 11 | 0 | 0 | *11* | **19** |
| 5:00 PM | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 6 | 0 | 0 | *6* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | **16** |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 8 | 0 | 0 | *8* | **17** |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 9 | 0 | 0 | *9* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 19 | 0 | 0 | *20* | **29** |
| Peak Hour Total | 0 | 0 | 0 | 1 | 0 | *1* | 0 | 0 | 32 | 0 | 0 | *32* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 1 | 47 | 0 | 0 | *48* | **81** |
| Peak Hour Heavy Vehicles | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 3 | 0 | 0 | *3* | 0 | 0 | 0 | 0 | 0 | *0* | 0 | 0 | 3 | 0 | 0 | *3* | **6** |
| Peak Hour Heavy Vehicles % | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 9.38% | 0.00% | 0.00% | 9.38% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 6.38% | 0.00% | 0.00% | 6.25% | 7.41% |
| PHF | 0.000 | 0.000 | 0.000 | 0.250 | 0.000 | *0.250* | 0.000 | 0.000 | 0.889 | 0.000 | 0.000 | *0.889* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | *0.000* | 0.000 | 0.250 | 0.618 | 0.000 | 0.000 | *0.600* | **0.698** |

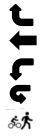


| Total Vehicles On Leg | | | | 19 |
|---|---|---|---|---|
| Vehicles Entering Intersection | 11 | Vehicles Exiting Intersection | 8 | |
| **Southbound** | | | | |
| Cars | 9 | 0 | 2 | 0 | 0 |
| Heavy | 0 | 0 | 0 | 0 | 0 |
| **Total** | **9** | **0** | **2** | **0** | **0** |



| Total Vehicles on Leg 809 | Vehicles Entering Intersection 423 | Eastbound | Cars | Heavy | Total |
|---|---|---|---|---|---|
| | | | 0 | 0 | **0** |
| | | | 0 | 0 | **0** |
| | Vehicles Exiting Intersection 386 | | 5 | 0 | **5** |
| | | | 344 | 69 | **413** |
| | | | 5 | 0 | **5** |

**Daily Volumes**



| Cars | Heavy | Total | Westbound | Vehicles Entering Intersection 378 | Total Vehicles on Leg 794 |
|---|---|---|---|---|---|
| 1 | 0 | **1** | | | |
| 323 | 54 | **377** | | | |
| 0 | 0 | **0** | | Vehicles Exiting Intersection 416 | |
| 0 | 0 | **0** | | | |
| 0 | 0 | **0** | | | |



| Cars | 0 | 0 | 0 | 2 | 1 |
|---|---|---|---|---|---|
| Heavy | 0 | 0 | 0 | 0 | 0 |
| **Total** | **0** | **0** | **0** | **2** | **1** |
| **Northbound** | | | | | |
| Vehicles Entering Intersection | 3 | Vehicles Exiting Intersection | 5 | | |
| Total Vehicles On Leg | | 8 | | | |

# Appendix B

LOS Calculation Worksheets

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 35 | 4 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Future Vol, veh/h | 0 | 35 | 4 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 67 | 25 | 92 | 82 | 92 | 92 | 92 | 92 | 92 | 92 | 50 |
| Heavy Vehicles, % | 2 | 17 | 0 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 0 | 52 | 16 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 40 | 0 | 0 | 68 | 0 | 0 | 102 | 100 | 60 | 100 | 108 | 40 |
| Stage 1 | - | - | - | - | - | - | 60 | 60 | - | 40 | 40 | - |
| Stage 2 | - | - | - | - | - | - | 42 | 40 | - | 60 | 68 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1570 | - | - | 1533 | - | - | 879 | 790 | 1005 | 881 | 782 | 1037 |
| Stage 1 | - | - | - | - | - | - | 951 | 845 | - | 975 | 862 | - |
| Stage 2 | - | - | - | - | - | - | 972 | 862 | - | 951 | 838 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1570 | - | - | 1533 | - | - | 875 | 790 | 1005 | 881 | 782 | 1037 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 875 | 790 | - | 881 | 782 | - |
| Stage 1 | - | - | - | - | - | - | 951 | 845 | - | 975 | 862 | - |
| Stage 2 | - | - | - | - | - | - | 968 | 862 | - | 951 | 838 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 0 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 1570 | - | - | 1533 | - | - | 1037 |
| HCM Lane V/C Ratio | - | - | - | - | - | - | - | 0.004 |
| HCM Control Delay (s) | 0 | 0 | - | - | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | - | - | A | - | - | A |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 92 | 1 | 0 | 84 | 2 |
| Future Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 92 | 1 | 0 | 84 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 50 | 25 | 92 | 25 | 25 | 82 | 25 | 92 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 8 | 0 | 2 | 5 | 2 |
| Mvmt Flow | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 112 | 4 | 0 | 88 | 2 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 213 | 213 | 89 | 213 | 212 | 114 | 90 | 0 | 0 | 116 | 0 | 0 |
| Stage 1 | 89 | 89 | - | 122 | 122 | - | - | - | - | - | - | - |
| Stage 2 | 124 | 124 | - | 91 | 90 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.2 | 7.1 | 6.52 | 6.2 | 4.1 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.3 | 3.5 | 4.018 | 3.3 | 2.2 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 744 | 684 | 975 | 748 | 685 | 944 | 1518 | - | - | 1473 | - | - |
| Stage 1 | 918 | 821 | - | 887 | 795 | - | - | - | - | - | - | - |
| Stage 2 | 880 | 793 | - | 921 | 820 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 739 | 682 | 975 | 744 | 683 | 944 | 1518 | - | - | 1473 | - | - |
| Mov Cap-2 Maneuver | 739 | 682 | - | 744 | 683 | - | - | - | - | - | - | - |
| Stage 1 | 915 | 821 | - | 884 | 793 | - | - | - | - | - | - | - |
| Stage 2 | 874 | 791 | - | 917 | 820 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 8.7 | 9.4 | 0.2 | 0 |
| HCM LOS | A | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1518 | - | - | 975 | 832 | 1473 | - | - |
| HCM Lane V/C Ratio | 0.003 | - | - | 0.004 | 0.01 | - | - | - |
| HCM Control Delay (s) | 7.4 | 0 | - | 8.7 | 9.4 | 0 | - | - |
| HCM Lane LOS | A | A | - | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 1 | 47 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Future Vol, veh/h | 1 | 47 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 62 | 92 | 92 | 89 | 92 | 92 | 92 | 92 | 92 | 92 | 25 |
| Heavy Vehicles, % | 2 | 6 | 0 | 2 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 4 | 76 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 36 | 0 | 0 | 76 | 0 | 0 | 122 | 120 | 76 | 120 | 120 | 36 |
| Stage 1 | - | - | - | - | - | - | 84 | 84 | - | 36 | 36 | - |
| Stage 2 | - | - | - | - | - | - | 38 | 36 | - | 84 | 84 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1575 | - | - | 1523 | - | - | 853 | 770 | 985 | 855 | 770 | 1042 |
| Stage 1 | - | - | - | - | - | - | 924 | 825 | - | 980 | 865 | - |
| Stage 2 | - | - | - | - | - | - | 977 | 865 | - | 924 | 825 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1575 | - | - | 1523 | - | - | 848 | 768 | 985 | 853 | 768 | 1042 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 848 | 768 | - | 853 | 768 | - |
| Stage 1 | - | - | - | - | - | - | 921 | 823 | - | 977 | 865 | - |
| Stage 2 | - | - | - | - | - | - | 973 | 865 | - | 921 | 823 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.4 | 0 | 0 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 1575 | - | - | 1523 | - | - | 1042 |
| HCM Lane V/C Ratio | - | 0.003 | - | - | - | - | - | 0.004 |
| HCM Control Delay (s) | 0 | 7.3 | 0 | - | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | A | - | A | - | - | A |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 153 | 0 | 1 | 120 | 1 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 153 | 0 | 1 | 120 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 166 | 0 | 1 | 130 | 1 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 302 | 301 | 131 | 301 | 301 | 166 | 131 | 0 | 0 | 166 | 0 | 0 |
| Stage 1 | 133 | 133 | - | 168 | 168 | - | - | - | - | - | - | - |
| Stage 2 | 169 | 168 | - | 133 | 133 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 650 | 612 | 919 | 651 | 612 | 878 | 1454 | - | - | 1412 | - | - |
| Stage 1 | 870 | 786 | - | 834 | 759 | - | - | - | - | - | - | - |
| Stage 2 | 833 | 759 | - | 870 | 786 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 648 | 611 | 919 | 650 | 611 | 878 | 1454 | - | - | 1412 | - | - |
| Mov Cap-2 Maneuver | 648 | 611 | - | 650 | 611 | - | - | - | - | - | - | - |
| Stage 1 | 869 | 785 | - | 833 | 758 | - | - | - | - | - | - | - |
| Stage 2 | 831 | 758 | - | 869 | 785 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 10.9 | 0 | 0.1 |
| HCM LOS | A | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1454 | - | - | - | 611 | 1412 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | - | 0.002 | 0.001 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 0 | 10.9 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | A | B | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 36 | 4 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Future Vol, veh/h | 0 | 36 | 4 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 67 | 25 | 92 | 82 | 92 | 92 | 92 | 92 | 92 | 92 | 50 |
| Heavy Vehicles, % | 2 | 17 | 0 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 0 | 54 | 16 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 41 | 0 | 0 | 70 | 0 | 0 | 105 | 103 | 62 | 103 | 111 | 41 |
| Stage 1 | - | - | - | - | - | - | 62 | 62 | - | 41 | 41 | - |
| Stage 2 | - | - | - | - | - | - | 43 | 41 | - | 62 | 70 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1568 | - | - | 1531 | - | - | 875 | 787 | 1003 | 877 | 779 | 1036 |
| Stage 1 | - | - | - | - | - | - | 949 | 843 | - | 974 | 861 | - |
| Stage 2 | - | - | - | - | - | - | 971 | 861 | - | 949 | 837 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1568 | - | - | 1531 | - | - | 872 | 787 | 1003 | 877 | 779 | 1036 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 872 | 787 | - | 877 | 779 | - |
| Stage 1 | - | - | - | - | - | - | 949 | 843 | - | 974 | 861 | - |
| Stage 2 | - | - | - | - | - | - | 967 | 861 | - | 949 | 837 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 0 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 1568 | - | - | 1531 | - | - | 1036 |
| HCM Lane V/C Ratio | - | - | - | - | - | - | - | 0.004 |
| HCM Control Delay (s) | 0 | 0 | - | - | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | - | - | A | - | - | A |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 94 | 1 | 0 | 86 | 2 |
| Future Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 94 | 1 | 0 | 86 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 50 | 25 | 92 | 25 | 25 | 82 | 25 | 92 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 8 | 0 | 2 | 5 | 2 |
| Mvmt Flow | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 115 | 4 | 0 | 91 | 2 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 219 | 219 | 92 | 219 | 218 | 117 | 93 | 0 | 0 | 119 | 0 | 0 |
| Stage 1 | 92 | 92 | - | 125 | 125 | - | - | - | - | - | - | - |
| Stage 2 | 127 | 127 | - | 94 | 93 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.2 | 7.1 | 6.52 | 6.2 | 4.1 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.3 | 3.5 | 4.018 | 3.3 | 2.2 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 737 | 679 | 971 | 741 | 680 | 941 | 1514 | - | - | 1469 | - | - |
| Stage 1 | 915 | 819 | - | 884 | 792 | - | - | - | - | - | - | - |
| Stage 2 | 877 | 791 | - | 918 | 818 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 732 | 677 | 971 | 737 | 678 | 941 | 1514 | - | - | 1469 | - | - |
| Mov Cap-2 Maneuver | 732 | 677 | - | 737 | 678 | - | - | - | - | - | - | - |
| Stage 1 | 912 | 819 | - | 881 | 790 | - | - | - | - | - | - | - |
| Stage 2 | 871 | 789 | - | 914 | 818 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 8.7 | 9.4 | 0.2 | 0 |
| HCM LOS | A | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1514 | - | - | 971 | 827 | 1469 | - | - |
| HCM Lane V/C Ratio | 0.003 | - | - | 0.004 | 0.01 | - | - | - |
| HCM Control Delay (s) | 7.4 | 0 | - | 8.7 | 9.4 | 0 | - | - |
| HCM Lane LOS | A | A | - | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 1 | 49 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Future Vol, veh/h | 1 | 49 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 62 | 92 | 92 | 89 | 92 | 92 | 92 | 92 | 92 | 92 | 25 |
| Heavy Vehicles, % | 2 | 6 | 0 | 2 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 4 | 79 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 37 | 0 | 0 | 79 | 0 | 0 | 126 | 124 | 79 | 124 | 124 | 37 |
| Stage 1 | - | - | - | - | - | - | 87 | 87 | - | 37 | 37 | - |
| Stage 2 | - | - | - | - | - | - | 39 | 37 | - | 87 | 87 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1574 | - | - | 1519 | - | - | 848 | 766 | 981 | 850 | 766 | 1041 |
| Stage 1 | - | - | - | - | - | - | 921 | 823 | - | 978 | 864 | - |
| Stage 2 | - | - | - | - | - | - | 976 | 864 | - | 921 | 823 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1574 | - | - | 1519 | - | - | 843 | 764 | 981 | 848 | 764 | 1041 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 843 | 764 | - | 848 | 764 | - |
| Stage 1 | - | - | - | - | - | - | 918 | 821 | - | 975 | 864 | - |
| Stage 2 | - | - | - | - | - | - | 972 | 864 | - | 918 | 821 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.4 | 0 | 0 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 1574 | - | - | 1519 | - | - | 1041 |
| HCM Lane V/C Ratio | - | 0.003 | - | - | - | - | - | 0.004 |
| HCM Control Delay (s) | 0 | 7.3 | 0 | - | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | A | - | A | - | - | A |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 156 | 0 | 1 | 123 | 1 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 156 | 0 | 1 | 123 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 170 | 0 | 1 | 134 | 1 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 310 | 309 | 135 | 309 | 309 | 170 | 135 | 0 | 0 | 170 | 0 | 0 |
| Stage 1 | 137 | 137 | - | 172 | 172 | - | - | - | - | - | - | - |
| Stage 2 | 173 | 172 | - | 137 | 137 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 642 | 605 | 914 | 643 | 605 | 874 | 1449 | - | - | 1407 | - | - |
| Stage 1 | 866 | 783 | - | 830 | 756 | - | - | - | - | - | - | - |
| Stage 2 | 829 | 756 | - | 866 | 783 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 640 | 604 | 914 | 642 | 604 | 874 | 1449 | - | - | 1407 | - | - |
| Mov Cap-2 Maneuver | 640 | 604 | - | 642 | 604 | - | - | - | - | - | - | - |
| Stage 1 | 865 | 782 | - | 829 | 755 | - | - | - | - | - | - | - |
| Stage 2 | 827 | 755 | - | 865 | 782 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 11 | 0 | 0.1 |
| HCM LOS | A | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1449 | - | - | - | 604 | 1407 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | - | 0.002 | 0.001 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 0 | 11 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | A | B | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 0 | 36 | 44 | 27 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Future Vol, veh/h | 0 | 36 | 44 | 27 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 67 | 25 | 92 | 82 | 92 | 92 | 92 | 92 | 92 | 92 | 50 |
| Heavy Vehicles, % | 2 | 17 | 0 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 0 | 54 | 176 | 29 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 41 | 0 | 0 | 230 | 0 | 0 | 243 | 241 | 142 | 241 | 329 | 41 |
| Stage 1 | - | - | - | - | - | - | 142 | 142 | - | 99 | 99 | - |
| Stage 2 | - | - | - | - | - | - | 101 | 99 | - | 142 | 230 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1568 | - | - | 1338 | - | - | 711 | 660 | 906 | 713 | 590 | 1036 |
| Stage 1 | - | - | - | - | - | - | 861 | 779 | - | 907 | 813 | - |
| Stage 2 | - | - | - | - | - | - | 905 | 813 | - | 861 | 714 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1568 | - | - | 1338 | - | - | 696 | 645 | 906 | 701 | 577 | 1036 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 696 | 645 | - | 701 | 577 | - |
| Stage 1 | - | - | - | - | - | - | 861 | 779 | - | 907 | 795 | - |
| Stage 2 | - | - | - | - | - | - | 882 | 795 | - | 861 | 714 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 3.2 | 0 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 1568 | - | - | 1338 | - | - | 1036 |
| HCM Lane V/C Ratio | - | - | - | - | 0.022 | - | - | 0.004 |
| HCM Control Delay (s) | 0 | 0 | - | - | 7.8 | 0 | - | 8.5 |
| HCM Lane LOS | A | A | - | - | A | A | - | A |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 0.1 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 5.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 94 | 94 | 1 | 0 | 86 | 2 |
| Future Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 94 | 94 | 1 | 0 | 86 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 50 | 25 | 92 | 25 | 25 | 82 | 25 | 92 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 8 | 0 | 2 | 5 | 2 |
| Mvmt Flow | 0 | 0 | 4 | 4 | 0 | 4 | 376 | 115 | 4 | 0 | 91 | 2 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 963 | 963 | 92 | 963 | 962 | 117 | 93 | 0 | 0 | 119 | 0 | 0 |
| Stage 1 | 92 | 92 | - | 869 | 869 | - | - | - | - | - | - | - |
| Stage 2 | 871 | 871 | - | 94 | 93 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.2 | 7.1 | 6.52 | 6.2 | 4.1 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.3 | 3.5 | 4.018 | 3.3 | 2.2 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 235 | 256 | 971 | 237 | 256 | 941 | 1514 | - | - | 1469 | - | - |
| Stage 1 | 915 | 819 | - | 349 | 369 | - | - | - | - | - | - | - |
| Stage 2 | 346 | 368 | - | 918 | 818 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 186 | 188 | 971 | 187 | 188 | 941 | 1514 | - | - | 1469 | - | - |
| Mov Cap-2 Maneuver | 186 | 188 | - | 187 | 188 | - | - | - | - | - | - | - |
| Stage 1 | 672 | 819 | - | 256 | 271 | - | - | - | - | - | - | - |
| Stage 2 | 253 | 270 | - | 914 | 818 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 8.7 | 16.8 | 6.2 | 0 |
| HCM LOS | A | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1514 | - | - | 971 | 312 | 1469 | - | - |
| HCM Lane V/C Ratio | 0.248 | - | - | 0.004 | 0.026 | - | - | - |
| HCM Control Delay (s) | 8.2 | 0 | - | 8.7 | 16.8 | 0 | - | - |
| HCM Lane LOS | A | A | - | A | C | A | - | - |
| HCM 95th %tile Q(veh) | 1 | - | - | 0 | 0.1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 1 | 49 | 0 | 0 | 33 | 0 | 40 | 0 | 27 | 0 | 0 | 1 |
| Future Vol, veh/h | 1 | 49 | 0 | 0 | 33 | 0 | 40 | 0 | 27 | 0 | 0 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 62 | 92 | 92 | 89 | 92 | 92 | 92 | 92 | 92 | 92 | 25 |
| Heavy Vehicles, % | 2 | 6 | 0 | 2 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 4 | 79 | 0 | 0 | 37 | 0 | 43 | 0 | 29 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 37 | 0 | 0 | 79 | 0 | 0 | 126 | 124 | 79 | 139 | 124 | 37 |
| Stage 1 | - | - | - | - | - | - | 87 | 87 | - | 37 | 37 | - |
| Stage 2 | - | - | - | - | - | - | 39 | 37 | - | 102 | 87 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1574 | - | - | 1519 | - | - | 848 | 766 | 981 | 831 | 766 | 1041 |
| Stage 1 | - | - | - | - | - | - | 921 | 823 | - | 978 | 864 | - |
| Stage 2 | - | - | - | - | - | - | 976 | 864 | - | 904 | 823 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1574 | - | - | 1519 | - | - | 843 | 764 | 981 | 804 | 764 | 1041 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 843 | 764 | - | 804 | 764 | - |
| Stage 1 | - | - | - | - | - | - | 918 | 821 | - | 975 | 864 | - |
| Stage 2 | - | - | - | - | - | - | 972 | 864 | - | 874 | 821 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.4 | 0 | 9.4 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 894 | 1574 | - | - | 1519 | - | - | 1041 |
| HCM Lane V/C Ratio | 0.081 | 0.003 | - | - | - | - | - | 0.004 |
| HCM Control Delay (s) | 9.4 | 7.3 | 0 | - | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | A | - | A | - | - | A |
| HCM 95th %tile Q(veh) | 0.3 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 94 | 0 | 1 | 0 | 1 | 156 | 0 | 1 | 123 | 1 |
| Future Vol, veh/h | 0 | 0 | 94 | 0 | 1 | 0 | 1 | 156 | 0 | 1 | 123 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 102 | 0 | 1 | 0 | 1 | 170 | 0 | 1 | 134 | 1 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 310 | 309 | 135 | 360 | 309 | 170 | 135 | 0 | 0 | 170 | 0 | 0 |
| Stage 1 | 137 | 137 | - | 172 | 172 | - | - | - | - | - | - | - |
| Stage 2 | 173 | 172 | - | 188 | 137 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 642 | 605 | 914 | 596 | 605 | 874 | 1449 | - | - | 1407 | - | - |
| Stage 1 | 866 | 783 | - | 830 | 756 | - | - | - | - | - | - | - |
| Stage 2 | 829 | 756 | - | 814 | 783 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 640 | 604 | 914 | 529 | 604 | 874 | 1449 | - | - | 1407 | - | - |
| Mov Cap-2 Maneuver | 640 | 604 | - | 529 | 604 | - | - | - | - | - | - | - |
| Stage 1 | 865 | 782 | - | 829 | 755 | - | - | - | - | - | - | - |
| Stage 2 | 827 | 755 | - | 722 | 782 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 9.4 | 11 | 0 | 0.1 |
| HCM LOS | A | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1449 | - | - | 914 | 604 | 1407 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | 0.112 | 0.002 | 0.001 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 9.4 | 11 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | A | B | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.4 | 0 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 0 | 43 | 5 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Future Vol, veh/h | 0 | 43 | 5 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 67 | 25 | 92 | 82 | 92 | 92 | 92 | 92 | 92 | 92 | 50 |
| Heavy Vehicles, % | 2 | 17 | 0 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 0 | 64 | 20 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 49 | 0 | 0 | 84 | 0 | 0 | 125 | 123 | 74 | 123 | 133 | 49 |
| Stage 1 | - | - | - | - | - | - | 74 | 74 | - | 49 | 49 | - |
| Stage 2 | - | - | - | - | - | - | 51 | 49 | - | 74 | 84 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1558 | - | - | 1513 | - | - | 849 | 767 | 988 | 852 | 758 | 1025 |
| Stage 1 | - | - | - | - | - | - | 935 | 833 | - | 964 | 854 | - |
| Stage 2 | - | - | - | - | - | - | 962 | 854 | - | 935 | 825 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1558 | - | - | 1513 | - | - | 846 | 767 | 988 | 852 | 758 | 1025 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 846 | 767 | - | 852 | 758 | - |
| Stage 1 | - | - | - | - | - | - | 935 | 833 | - | 964 | 854 | - |
| Stage 2 | - | - | - | - | - | - | 958 | 854 | - | 935 | 825 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 0 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 1558 | - | - | 1513 | - | - | 1025 |
| HCM Lane V/C Ratio | - | - | - | - | - | - | - | 0.004 |
| HCM Control Delay (s) | 0 | 0 | - | - | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | - | - | A | - | - | A |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 104 | 1 | 0 | 95 | 2 |
| Future Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 104 | 1 | 0 | 95 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 50 | 25 | 92 | 25 | 25 | 82 | 25 | 92 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 8 | 0 | 2 | 5 | 2 |
| Mvmt Flow | 0 | 0 | 4 | 4 | 0 | 4 | 4 | 127 | 4 | 0 | 100 | 2 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 240 | 240 | 101 | 240 | 239 | 129 | 102 | 0 | 0 | 131 | 0 | 0 |
| Stage 1 | 101 | 101 | - | 137 | 137 | - | - | - | - | - | - | - |
| Stage 2 | 139 | 139 | - | 103 | 102 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.2 | 7.1 | 6.52 | 6.2 | 4.1 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.3 | 3.5 | 4.018 | 3.3 | 2.2 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 714 | 661 | 960 | 718 | 662 | 926 | 1503 | - | - | 1454 | - | - |
| Stage 1 | 905 | 811 | - | 871 | 783 | - | - | - | - | - | - | - |
| Stage 2 | 864 | 782 | - | 908 | 811 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 709 | 659 | 960 | 714 | 660 | 926 | 1503 | - | - | 1454 | - | - |
| Mov Cap-2 Maneuver | 709 | 659 | - | 714 | 660 | - | - | - | - | - | - | - |
| Stage 1 | 902 | 811 | - | 868 | 781 | - | - | - | - | - | - | - |
| Stage 2 | 858 | 780 | - | 904 | 811 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 8.8 | 9.5 | 0.2 | 0 |
| HCM LOS | A | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1503 | - | - | 960 | 806 | 1454 | - | - |
| HCM Lane V/C Ratio | 0.003 | - | - | 0.004 | 0.01 | - | - | - |
| HCM Control Delay (s) | 7.4 | 0 | - | 8.8 | 9.5 | 0 | - | - |
| HCM Lane LOS | A | A | - | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 1 | 58 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Future Vol, veh/h | 1 | 58 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 62 | 92 | 92 | 89 | 92 | 92 | 92 | 92 | 92 | 92 | 25 |
| Heavy Vehicles, % | 2 | 6 | 0 | 2 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 4 | 94 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 44 | 0 | 0 | 94 | 0 | 0 | 148 | 146 | 94 | 146 | 146 | 44 |
| Stage 1 | - | - | - | - | - | - | 102 | 102 | - | 44 | 44 | - |
| Stage 2 | - | - | - | - | - | - | 46 | 44 | - | 102 | 102 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1564 | - | - | 1500 | - | - | 820 | 745 | 963 | 823 | 745 | 1032 |
| Stage 1 | - | - | - | - | - | - | 904 | 811 | - | 970 | 858 | - |
| Stage 2 | - | - | - | - | - | - | 968 | 858 | - | 904 | 811 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1564 | - | - | 1500 | - | - | 815 | 743 | 963 | 821 | 743 | 1032 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 815 | 743 | - | 821 | 743 | - |
| Stage 1 | - | - | - | - | - | - | 901 | 809 | - | 967 | 858 | - |
| Stage 2 | - | - | - | - | - | - | 964 | 858 | - | 901 | 809 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 0 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 1564 | - | - | 1500 | - | - | 1032 |
| HCM Lane V/C Ratio | - | 0.003 | - | - | - | - | - | 0.004 |
| HCM Control Delay (s) | 0 | 7.3 | 0 | - | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | A | - | A | - | - | A |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 173 | 0 | 1 | 137 | 1 |
| Future Vol, veh/h | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 173 | 0 | 1 | 137 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 188 | 0 | 1 | 149 | 1 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 343 | 342 | 150 | 342 | 342 | 188 | 150 | 0 | 0 | 188 | 0 | 0 |
| Stage 1 | 152 | 152 | - | 190 | 190 | - | - | - | - | - | - | - |
| Stage 2 | 191 | 190 | - | 152 | 152 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 611 | 580 | 896 | 612 | 580 | 854 | 1431 | - | - | 1386 | - | - |
| Stage 1 | 850 | 772 | - | 812 | 743 | - | - | - | - | - | - | - |
| Stage 2 | 811 | 743 | - | 850 | 772 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 609 | 579 | 896 | 611 | 579 | 854 | 1431 | - | - | 1386 | - | - |
| Mov Cap-2 Maneuver | 609 | 579 | - | 611 | 579 | - | - | - | - | - | - | - |
| Stage 1 | 849 | 771 | - | 811 | 742 | - | - | - | - | - | - | - |
| Stage 2 | 809 | 742 | - | 849 | 771 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 11.2 | 0 | 0.1 |
| HCM LOS | A | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1431 | - | - | - | 579 | 1386 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | - | 0.002 | 0.001 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 0 | 11.2 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | A | B | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 0 | 43 | 6 | 1 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Future Vol, veh/h | 0 | 43 | 6 | 1 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 67 | 25 | 92 | 82 | 92 | 92 | 92 | 92 | 92 | 92 | 50 |
| Heavy Vehicles, % | 2 | 17 | 0 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 0 | 64 | 24 | 1 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 49 | 0 | 0 | 88 | 0 | 0 | 129 | 127 | 76 | 127 | 139 | 49 |
| Stage 1 | - | - | - | - | - | - | 76 | 76 | - | 51 | 51 | - |
| Stage 2 | - | - | - | - | - | - | 53 | 51 | - | 76 | 88 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1558 | - | - | 1508 | - | - | 844 | 764 | 985 | 846 | 752 | 1025 |
| Stage 1 | - | - | - | - | - | - | 933 | 832 | - | 962 | 852 | - |
| Stage 2 | - | - | - | - | - | - | 960 | 852 | - | 933 | 822 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1558 | - | - | 1508 | - | - | 840 | 763 | 985 | 845 | 751 | 1025 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 840 | 763 | - | 845 | 751 | - |
| Stage 1 | - | - | - | - | - | - | 933 | 832 | - | 962 | 851 | - |
| Stage 2 | - | - | - | - | - | - | 955 | 851 | - | 933 | 822 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 0.2 | 0 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | - | 1558 | - | - | 1508 | - | - | 1025 |
| HCM Lane V/C Ratio | - | - | - | - | 0.001 | - | - | 0.004 |
| HCM Control Delay (s) | 0 | 0 | - | - | 7.4 | 0 | - | 8.5 |
| HCM Lane LOS | A | A | - | - | A | A | - | A |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 3 | 104 | 1 | 0 | 95 | 2 |
| Future Vol, veh/h | 0 | 0 | 2 | 1 | 0 | 1 | 3 | 104 | 1 | 0 | 95 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 50 | 25 | 92 | 25 | 25 | 82 | 25 | 92 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 8 | 0 | 2 | 5 | 2 |
| Mvmt Flow | 0 | 0 | 4 | 4 | 0 | 4 | 12 | 127 | 4 | 0 | 100 | 2 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 256 | 256 | 101 | 256 | 255 | 129 | 102 | 0 | 0 | 131 | 0 | 0 |
| Stage 1 | 101 | 101 | - | 153 | 153 | - | - | - | - | - | - | - |
| Stage 2 | 155 | 155 | - | 103 | 102 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.2 | 7.1 | 6.52 | 6.2 | 4.1 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.1 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.3 | 3.5 | 4.018 | 3.3 | 2.2 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 697 | 648 | 960 | 701 | 649 | 926 | 1503 | - | - | 1454 | - | - |
| Stage 1 | 905 | 811 | - | 854 | 771 | - | - | - | - | - | - | - |
| Stage 2 | 847 | 769 | - | 908 | 811 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 689 | 642 | 960 | 693 | 643 | 926 | 1503 | - | - | 1454 | - | - |
| Mov Cap-2 Maneuver | 689 | 642 | - | 693 | 643 | - | - | - | - | - | - | - |
| Stage 1 | 897 | 811 | - | 846 | 764 | - | - | - | - | - | - | - |
| Stage 2 | 836 | 762 | - | 904 | 811 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 8.8 | 9.6 | 0.6 | 0 |
| HCM LOS | A | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1503 | - | - | 960 | 793 | 1454 | - | - |
| HCM Lane V/C Ratio | 0.008 | - | - | 0.004 | 0.01 | - | - | - |
| HCM Control Delay (s) | 7.4 | 0 | - | 8.8 | 9.6 | 0 | - | - |
| HCM Lane LOS | A | A | - | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 1 | 58 | 0 | 0 | 39 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Future Vol, veh/h | 1 | 58 | 0 | 0 | 39 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 25 | 62 | 92 | 92 | 89 | 92 | 92 | 92 | 92 | 92 | 92 | 25 |
| Heavy Vehicles, % | 2 | 6 | 0 | 2 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| Mvmt Flow | 4 | 94 | 0 | 0 | 44 | 0 | 1 | 0 | 1 | 0 | 0 | 4 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 44 | 0 | 0 | 94 | 0 | 0 | 148 | 146 | 94 | 147 | 146 | 44 |
| Stage 1 | - | - | - | - | - | - | 102 | 102 | - | 44 | 44 | - |
| Stage 2 | - | - | - | - | - | - | 46 | 44 | - | 103 | 102 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.3 |
| Pot Cap-1 Maneuver | 1564 | - | - | 1500 | - | - | 820 | 745 | 963 | 821 | 745 | 1032 |
| Stage 1 | - | - | - | - | - | - | 904 | 811 | - | 970 | 858 | - |
| Stage 2 | - | - | - | - | - | - | 968 | 858 | - | 903 | 811 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1564 | - | - | 1500 | - | - | 815 | 743 | 963 | 819 | 743 | 1032 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 815 | 743 | - | 819 | 743 | - |
| Stage 1 | - | - | - | - | - | - | 901 | 809 | - | 967 | 858 | - |
| Stage 2 | - | - | - | - | - | - | 964 | 858 | - | 899 | 809 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.3 | 0 | 9.1 | 8.5 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 883 | 1564 | - | - | 1500 | - | - | 1032 |
| HCM Lane V/C Ratio | 0.002 | 0.003 | - | - | - | - | - | 0.004 |
| HCM Control Delay (s) | 9.1 | 7.3 | 0 | - | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | A | - | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 173 | 0 | 1 | 137 | 1 |
| Future Vol, veh/h | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 173 | 0 | 1 | 137 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 188 | 0 | 1 | 149 | 1 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 343 | 342 | 150 | 343 | 342 | 188 | 150 | 0 | 0 | 188 | 0 | 0 |
| Stage 1 | 152 | 152 | - | 190 | 190 | - | - | - | - | - | - | - |
| Stage 2 | 191 | 190 | - | 153 | 152 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | 4.12 | - | - | 4.12 | - | - |
| Critical Hdwy Stg 1 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.12 | 5.52 | - | 6.12 | 5.52 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | 2.218 | - | - | 2.218 | - | - |
| Pot Cap-1 Maneuver | 611 | 580 | 896 | 611 | 580 | 854 | 1431 | - | - | 1386 | - | - |
| Stage 1 | 850 | 772 | - | 812 | 743 | - | - | - | - | - | - | - |
| Stage 2 | 811 | 743 | - | 849 | 772 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 609 | 579 | 896 | 609 | 579 | 854 | 1431 | - | - | 1386 | - | - |
| Mov Cap-2 Maneuver | 609 | 579 | - | 609 | 579 | - | - | - | - | - | - | - |
| Stage 1 | 849 | 771 | - | 811 | 742 | - | - | - | - | - | - | - |
| Stage 2 | 809 | 742 | - | 846 | 771 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 9 | 11.2 | 0 | 0.1 |
| HCM LOS | A | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1431 | - | - | 896 | 579 | 1386 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | 0.002 | 0.002 | 0.001 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 9 | 11.2 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | A | B | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0 | 0 | - | - |

# Appendix C

Adapture Renewables Correspondence

## Mitch Wagner

**From:** Mitch Wagner
**Sent:** Friday, June 13, 2025 10:50 AM
**To:** Mitch Wagner
**Subject:** FW: Haynach Solar - Traffic Study

---

**From:** Paul O'Neil <poneil@sehinc.com>
**Sent:** Wednesday, May 21, 2025 3:20 PM
**To:** Mitch Wagner <mjwagner@sehinc.com>
**Cc:** Gabrielle Renner <grenner@sehinc.com>
**Subject:** Fw: Co - Haynach - Traffic Study

Mitch, got a few answers from Adapture on the solar project.

Thanks, Paul

---

**From:** Mike Fitzgerald <fitz@barr.com>
**Sent:** Wednesday, May 21, 2025 2:51 PM
**To:** Luis Meneses <lmeneses@adapturerenewables.com>
**Cc:** Paul O'Neil <poneil@sehinc.com>; Matt Press <mpress@adapturerenewables.com>
**Subject:** RE: Co - Haynach - Traffic Study

Thanks for these responses Luis!


### Mike Fitzgerald

Senior NEPA Consultant
fitz@barr.com | 970.488.3796 | Cell: 970.759.4830


---

**From:** Luis Meneses <lmeneses@adapturerenewables.com>
**Sent:** Wednesday, May 21, 2025 2:04 PM
**To:** Mike Fitzgerald <fitz@barr.com>
**Cc:** Paul O'Neil <poneil@sehinc.com>; Matt Press <mpress@adapturerenewables.com>
**Subject:** Co - Haynach - Traffic Study


**CAUTION: This email originated from outside of your organization.**


Hi Mike,

I am creating this new thread to not confuse what we are talking about as we have many tasks open.

Please, see the updated comments for traffic Study below:

What are the proposed work hours? Too early to answer. Please assume those ours that provide most flexibility in later stages according to your experience. The construction phase mentioned 500 workers a day. If there is a past solar project from a different site that has projections, we could use those. Typical workday as 8 hours, 10 hours, or 12 hours with Monday – Friday (Saturday) would be helpful to understand. I checked in with the construction team and they are saying peak construction force should be around 175 people

Where are most people coming from, what route are they taking to get to the site? Too early to answer. Please assume those routes that provide most flexibility in later stages according to your experience. Looking at this area most hotels are located in Alamosa and Monta Vista. Could we get a confirmation if these types of employees are traveler workers or planning on hiring local people to complete this work. These will largely being travelling employees. Local civil contractors laborers are typically used.

Are there vans/busses for the workers? Too early to answer. Please assume the scenario that provides most flexibility in later stages according to your experience. Personal vehicles would provide the most flexibility, does the site have room for 500 plus vehicles? There will be parking established for the (less than 500) workers

Are the crews coming out of Alamosa? Is there a construction camp? Please assume the scenario that provides most flexibility in later stages according to your experience. Typically work like this is out of town traveler employees that move from project to project. We can not assume construction camps unless they are known to be provided by the developer. No construction camp is planned currently.

When will the project start construction? What is the duration? It will start in December 2028. Expected duration is 18 months. OK

After construction what is the level of ongoing maintenance, # of employees needed per day/week? Personel will be on site 5 days a week. You can assume 4 ppl/day. OK

**Luis Meneses**
*Development Manager*
**Adapture Renewables, Inc.**
lmeneses@adapturerenewables.com
Direct: 310.425.5608
1901 Harrison Street, Suite 1630, Oakland, CA 94612

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## Mitch Wagner

**From:** Luis Meneses <lmeneses@adapturerenewables.com>
**Sent:** Thursday, July 10, 2025 12:58 PM
**To:** Mike Fitzgerald; Mitch Wagner; Jaime Hepner
**Cc:** Paul O'Neil
**Subject:** RE: Haynach Traffic Study

Hi,

Please see the responses from my team:

- Number of Truck trips = max 15 truck traveling to the site per day (At the peak of construction, usually for module deliveries)
- Size of the trucks = Semi truck with a 40ft container
- Where are the trucks coming from (i.e. 75% from the north/25% from the South) = 80% from the south / 20% from other directions (Note this may not be exact, but is my best estimate)

Let me know if further information is required.

Thanks,


**Luis Meneses**
*Development Manager*
**Adapture Renewables, Inc.**

lmeneses@adapturerenewables.com
Direct: 310.425.5608
1901 Harrison Street, Suite 1630, Oakland, CA 94612


---

**From:** Mike Fitzgerald <fitz@barr.com>
**Sent:** Tuesday, July 8, 2025 7:29 AM
**To:** Mitch Wagner <mjwagner@sehinc.com>; Jaime Hepner <jhepner@sehinc.com>; Luis Meneses <lmeneses@adapturerenewables.com>
**Cc:** Paul O'Neil <poneil@sehinc.com>
**Subject:** RE: Haynach Traffic Study

Mitch,

Thank you for the response. I've copied Luis Meneses so that he may address your trip volume and specifications questions.

I did check with Luis yesterday…there are no additional questions from Asset Management around the Traffic Study.

Luis,

Please see Mitch's assumption below. If you'd still like the equipment delivery volumes added, he will need an estimate of the # of truck trips, size of trucks, and generally where are the deliveries coming from (i.e. 75% from the north/25% from the South)

Fitz

## Mike Fitzgerald

Senior NEPA Consultant
fitz@barr.com | 970.488.3796 | Cell: 970.759.4830

---

**From:** Mitch Wagner <mjwagner@sehinc.com>
**Sent:** Tuesday, July 8, 2025 8:12 AM
**To:** Mike Fitzgerald <fitz@barr.com>; Jaime Hepner <jhepner@sehinc.com>
**Cc:** Paul O'Neil <poneil@sehinc.com>
**Subject:** RE: Haynach Traffic Study

**CAUTION: This email originated from outside of your organization.**

Hey Mike,

Sorry if someone already reached out but I just got back from vacation.

I'm more than happy to add in a discussion about it but my assumption is that the volume of deliveries will be acute and will not take place during either of the peak hours of construction traffic.

Do you or Luis have any information on deliveries and what that will look like? As in what sort of trucks and amount of equipment that will be coming in and the timeline of it? Any permits that the trucks carrying equipment will need?

I'll be on the lookout for any additional comments from asset management.

Thanks!

Mitchell Wagner, PE (CO)
Traffic Engineer
Short Elliott Hendrickson, Inc.
303.586.5833 direct | 920.639.7573 mobile

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## Mitch Wagner

**From:** Mike Fitzgerald <fitz@barr.com>
**Sent:** Thursday, July 17, 2025 2:19 PM
**To:** Mitch Wagner; Luis Meneses; Jaime Hepner; Paul O'Neil
**Subject:** RE: Haynach Traffic Study

Mitch,

As you finalize the revisions…please also change the duration of construction to 16 months…rather than 18.

Thanks!

Fitz


### Mike Fitzgerald

Senior NEPA Consultant
fitz@barr.com | 970.488.3796 | Cell: 970.759.4830


---

**From:** Mitch Wagner <mjwagner@sehinc.com>
**Sent:** Wednesday, July 16, 2025 12:50 PM
**To:** Mike Fitzgerald <fitz@barr.com>; Luis Meneses <lmeneses@adapturerenewables.com>; Jaime Hepner <jhepner@sehinc.com>; Paul O'Neil <poneil@sehinc.com>
**Subject:** RE: Haynach Traffic Study


**CAUTION: This email originated from outside of your organization.**


Hey Mike,

I am planning on finalizing the edits by end of week. I am unsure if there is any need for road maintenance. @Paul O'Neil might be able to answer that more definitively.

Thanks,


Mitchell Wagner, PE (CO)
Traffic Engineer
Short Elliott Hendrickson, Inc.
303.586.5833 direct | 920.639.7573 mobile

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**From:** Mike Fitzgerald <fitz@barr.com>
**Sent:** Monday, July 14, 2025 6:04 PM
**To:** Luis Meneses <lmeneses@adapturerenewables.com>; Mitch Wagner <mjwagner@sehinc.com>; Jaime Hepner <jhepner@sehinc.com>
**Cc:** Paul O'Neil <poneil@sehinc.com>
**Subject:** RE: Haynach Traffic Study

# Appendix D

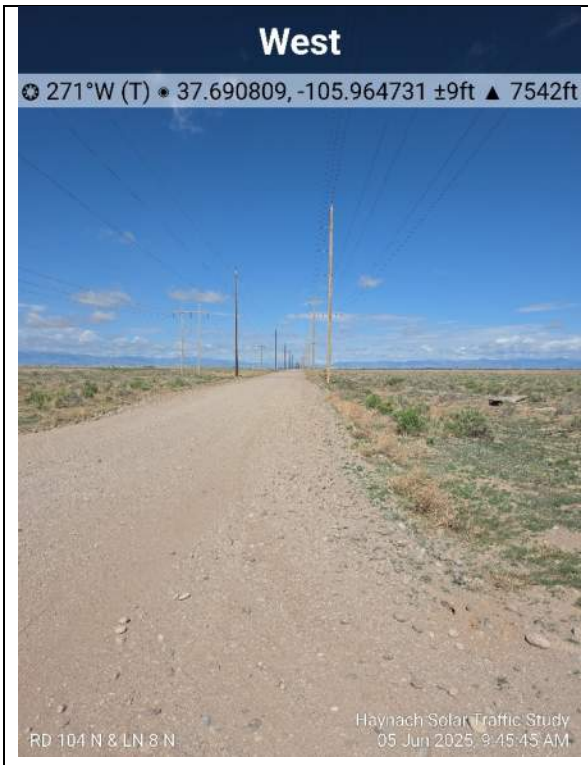
Sight Distance Photos


East
92°E (T) • 37.74857, -106.00146 ±9ft ▲ 7542ft
SH 112 & CR 102
Haynach Solar Traffic Study
05 Jun 2025, 9:28:34 AM


West
259°W (T) • 37.748567, -106.0015 ±9ft ▲ 7542ft
SH 112 & CR 102
Haynach Solar Traffic Study
05 Jun 2025, 9:29:11 AM


North
357°N (T) • 37.70542, -106.001523 ±9ft ▲ 7552ft
CR 102 & N 9 LN
Haynach Solar Traffic Study
05 Jun 2025, 9:39:06 AM


South
189°S (T) • 37.705435, -106.001536 ±9ft ▲ 7555ft
CR 102 & N 9 LN
Haynach Solar Traffic Study
05 Jun 2025, 9:40:30 AM


West
271°W (T) • 37.690809, -105.964731 ±9ft ▲ 7542ft
RD 104 N & LN 8 N
Haynach Solar Traffic Study
05 Jun 2025, 9:45:45 AM


East
93°E (T) • 37.690805, -105.964715 ±9ft ▲ 7542ft
RD 104 N & LN 8 N
Haynach Solar Traffic Study
05 Jun 2025, 9:46:33 AM


North
2°N (T) • 37.691544, -105.874595 ±9ft ▲ 7500ft
SH 17 & LN 8 N
Haynach Solar Traffic Study
05 Jun 2025, 9:54:18 AM


South
172°S (T) • 37.69153, -105.874574 ±9ft ▲ 7500ft
SH 17 & LN 8 N
Haynach Solar Traffic Study
05 Jun 2025, 9:55:34 AM

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# Attachment 6 – Glare Analysis

# Glare Analysis Memorandum

**To:** Luis Meneses, Development Manager
**From:** Andrew Skoglund
**Subject:** Haynach Solar Hybrid Project Glare Analysis
**Date:** 5/5/2025
**Project:** 06021002.00
**c:** Mike Fitzgerald

Barr Engineering Co. (Barr) was contracted by Adapture Solar Development, Inc. (Adapture) to complete a glare analysis for the Haynach Solar Hybrid Project (Project) in Alamosa County, Colorado. Adapture proposes to construct and operate a 110 megawatt (MW) solar photovoltaic and 110 MW, 4-hour, battery energy storage system (BESS) and substation that would be installed on an approximately 1,109-acre site. The proposed facility would be located north of the existing San Luis Valley Substation, jointly owned and operated by Tri-State Generation and Transmission Association and Public Service Company of Colorado. This memorandum summarizes the glare analysis of potential impacts to selected nearby roadway segments, observer locations, and airport approach paths near the Project site. Projected glare effects were limited to the roadway passing through the Project site and were limited to 'green' impacts with low potential to cause an after image.

***Modeling configuration:***

Modeling was performed using the ForgeSolar GlareGauge modeling tool. ForgeSolar incorporates the Solar Glare Hazard Analysis Tool (SGHAT) technology, licensed from Sandia National Laboratories. Glare analysis tools evaluate the occurrence of glare on a minute-by-minute basis; accordingly, they generally refer to solar hazards as 'glare'.

The ocular impact of solar glare is quantified into three categories:

- Green - low potential to cause after-image (flash blindness)
- Yellow - potential to cause temporary after-image
- Red - potential to cause retinal burn (permanent eye damage)

These categories assume a typical blink response in the observer. Note that retinal burn is typically not possible for PV glare since PV modules do not focus reflected sunlight.

Model simulation settings utilized default values:

- Time interval: 1 minute
- Peak DNI: 1000 W/m2
- Sun Subtended Angle: 9.3 mrad
- Enhanced subtended source angle calculations: Yes
- Ocular Transmission Coefficient: 0.5
- Pupil diameter: 0.002 m
- Eye focal length: 0.017 m

Facility details were based on the information provided by Adapture on March 13, 2025, via email. The modeled layout is shown in Figure 1, depicting the projected panel areas as derived for input to the model. Panel layout and operational details were modeled as follows:

- Single Axis Tracking
- Backtracking Method: Shade-Slope
- Tracking axis orientation: 180 degrees
- Maximum tracking angle: 60 degrees
- Resting angle: 60 degrees
- Panel Axis Height: 6.89 feet
- Ground Coverage Ratio: 0.45
- Panel surface: Smooth glass panels with Anti-reflective coating (ARC)

Receptors were placed on several roads in the vicinity of the Project. Selected route-based receptors included Eightmile Ln (Ln 8 N), Ln 9 N, Ln 10 N, E County Rd 102 N, and Rd N 104. Receptors were also placed on 2-mile approach paths for Leach Airport Runway 12, Van Treese Airport Runway E, and Mc Cullough Airport Runway 35. Additionally, nine fixed observation points were modeled for potential surrounding residences within 1 mile identified from aerial photo review as shown in Figure 1.

***Model Assumptions***

- Times associated with glare are denoted in standard time.
- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover, and geographic obstructions. While few of these elements are present in the Project area, where such features exist, they would screen views of the Project and minimize or eliminate glare from those locations.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards.
- Glare locations displayed on receptor plots are approximate. Actual glare spot locations may differ.
- Glare hazard determination relies on several approximations, including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.
- Actual ocular impact outcomes encompass a continuous, not discrete, spectrum. (e.g. ‘yellow’ vs ‘green’ impacts do not necessarily reflect a bright-line change in effect)
- The GlareGauge model assumes that the observation point receptor can view the entire PV array segment when predicting glare minutes; however, it may be that the receptor at the observation point may only be able to view a small portion (typically the nearest edge) of the PV array segment. Therefore, the predicted glare minutes and intensity from a specific PV array to a specific observation point are conservative because the observer will likely not experience glare from the entire PV array segment at once.
- The GlareGauge model does not consider the potential effect of shading from existing topography between the sun and the Project.

***Modeling Results***

Modeling was performed to assess potential for glare impacts to drivers on nearby roads as well as potential impacts to nearby residents. Additionally, 2-mile approach paths to nearby public and private airports with potential visibility toward the Project were assessed (Leach Airport, Van Treese Airport, and

Mc Cullough Airport). Modeled impacts indicate there is minimal potential for glare to impact nearby receptors. Projected glare impacts are limited to drivers passing through the Project area on Ln 9 N. Modeling shows potential for seeing “green” glare with low potential to cause an after-image on that route in mornings and evenings. No glare impacts are modeled to affect nearby residences or pilots approaching nearby airports.

It is important to note that a resting angle of 60-degrees (end of travel) was used for the panels in the analysis. If a resting angle of 0-degrees (flat) is instead selected, the model assumes panels transition to flat whenever the sun is below 60-degrees on either end of travel. This alternative approach results in flat panels during sunrise and sunset, for which the model projects ‘yellow’ glare impacts for drivers on Ln 8, 9, and 10, and ‘green’ glare impacts to most other modeled receptors. Accordingly, it is recommended that panels not be rested at or near 0-degrees (flat) when the sun is above the horizon.

**Table 1. Modeled Annual Glare Impacts**

| | Total "Green" Glare Hours/yr | % of year “Green” Glare |
|---|---|---|
| R1 – Ln 10 N | 0 | 0% |
| R2 – E County Rd 102 N | 0 | 0% |
| R3 – Eightmile Ln (Ln 8 N) | 0 | 0% |
| R4 – Rd N 104 | 0 | 0% |
| R5 – Ln 9 N | 3182 | 36% |
| FP1 – Leach approach to RWY12 | 0 | 0% |
| FP2 – Van Treese approach to RWY E | 0 | 0% |
| FP3 – Mc Cullough approach to RWY35 | 0 | 0% |
| OP1 | 0 | 0% |
| OP2 | 0 | 0% |
| OP3 | 0 | 0% |
| OP4 | 0 | 0% |
| OP5 | 0 | 0% |
| OP6 | 0 | 0% |
| OP7 | 0 | 0% |

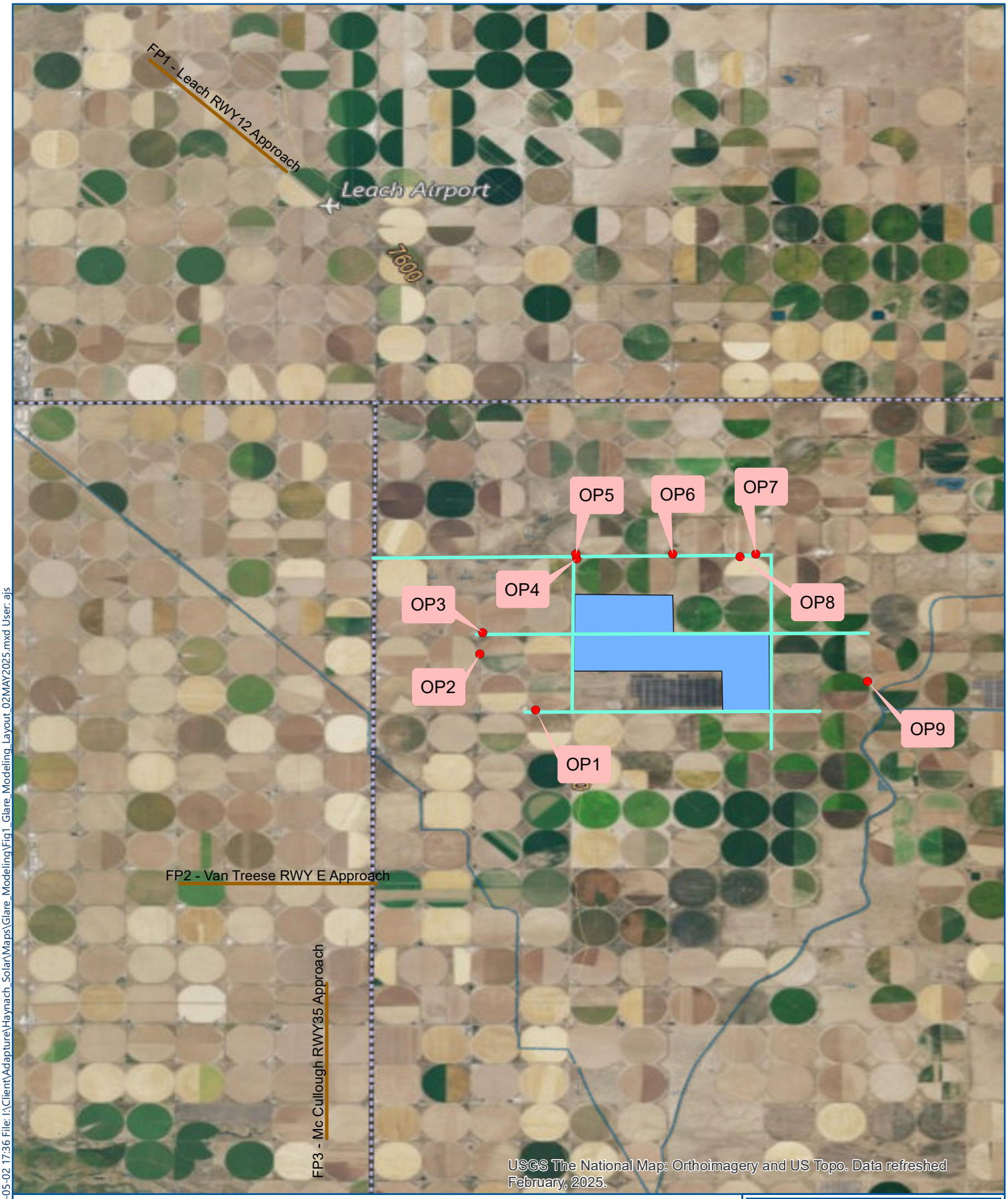
| | | |
|---|---|---|
| OP8 | 0 | 0% |
| OP9 | 0 | 0% |

***Summary***

Modeling results determined that glare effects from the Project potentially occur only for the road passing through the Project area (Ln 9 N), and only at 'green' levels. 'Green' levels of glare have low potential to cause an after-image. The Project is not located on airport property; therefore, no FAA flight path or control tower screening is explicitly required. Assessment of potential approach paths to nearby airports was included for completeness and indicates no expected glare. Modeled Project "green" glare impacts to drivers on Ln 9 N passing through the site are limited to potential "green" glare in the mornings and evenings. Given the limited receptor extent impacted paired with 'green' glare impacts only, the overall impact of panel reflected glare is expected to be minimal.

Attachments: Figure 1 - Glare Modeling Layout

Attachment 1 – ForgeSolar Model Output Summary




Residence OPs

Flight Paths

Road Observers

0 1 2 3

Miles

BARR

GLARE MODELING
LAYOUT
Haynach Hybrid Solar Project
Adapture Solar Development, Inc.

FIGURE 1

Barr Footer: ArcGIS 10.9.1, 2025-05-02 17:36 File: I:\Client\Adapture\Haynach_Solar\Maps\Glare_Modeling\Fig1_Glare_Modeling_Layout_02MAY2025.mxd User: ajs

# FORGESOLAR GLARE ANALYSIS

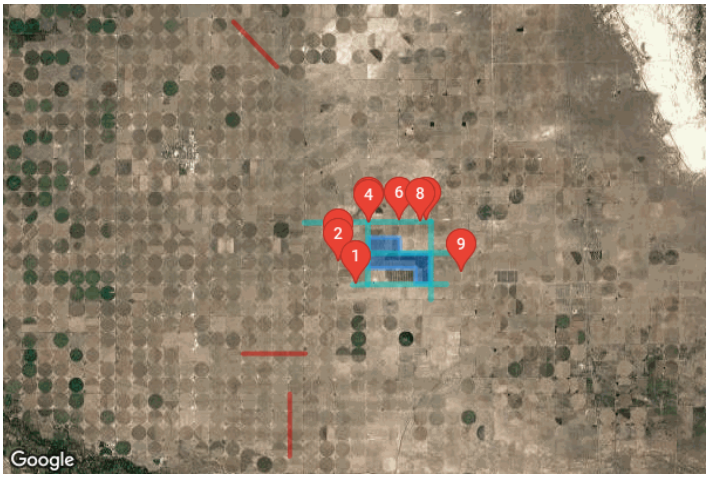
Project: **Haynach Solar**

Proposed 110MW Solar facility adjacent to the existing Hooper solar facility

Site configuration: **base_w_airstrips**

**Created** 01 May, 2025
**Updated** 01 May, 2025
**Time-step** 1 minute
**Timezone offset** UTC-7
**Minimum sun altitude** 0.0 deg
**DNI** peaks at 1,000.0 W/m$^2$
**Category** 100 MW to 1 GW
**Site ID** 148267.24889

**Ocular transmission coefficient** 0.5
**Pupil diameter** 0.002 m
**Eye focal length** 0.017 m
**Sun subtended angle** 9.3 mrad
**PV analysis methodology** V2




## Summary of Results

Glare with low potential for temporary after-image predicted

| PV Array | Tilt | Orient | Annual Green Glare | | Annual Yellow Glare | | Energy |
|---|---|---|---|---|---|---|---|
| | ° | ° | min | hr | min | hr | kWh |
| PV array 1 | SA tracking | SA tracking | 190,945 | 3,182.4 | 0 | 0.0 | - |

*Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.*

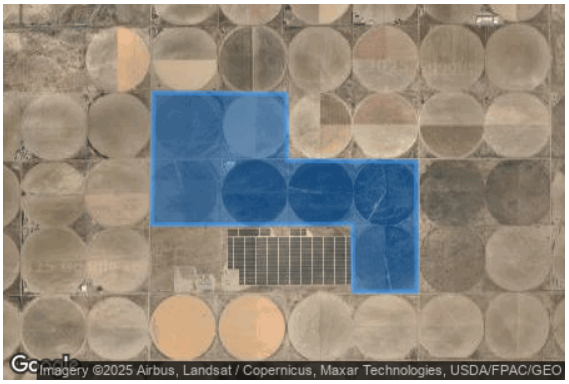
| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| Route 1 | 0 | 0.0 | 0 | 0.0 |
| Route 2 | 0 | 0.0 | 0 | 0.0 |
| Route 3 | 0 | 0.0 | 0 | 0.0 |
| Route 4 | 0 | 0.0 | 0 | 0.0 |
| Route 5 | 190,945 | 3,182.4 | 0 | 0.0 |
| FP 1 | 0 | 0.0 | 0 | 0.0 |
| FP 2 | 0 | 0.0 | 0 | 0.0 |
| FP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 1 | 0 | 0.0 | 0 | 0.0 |
| OP 2 | 0 | 0.0 | 0 | 0.0 |
| OP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 4 | 0 | 0.0 | 0 | 0.0 |
| OP 5 | 0 | 0.0 | 0 | 0.0 |
| OP 6 | 0 | 0.0 | 0 | 0.0 |

| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| OP 7 | 0 | 0.0 | 0 | 0.0 |
| OP 8 | 0 | 0.0 | 0 | 0.0 |
| OP 9 | 0 | 0.0 | 0 | 0.0 |

# Component Data

## PV Arrays

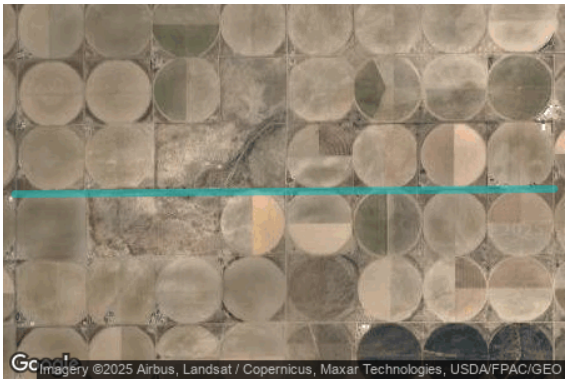
**Name**: PV array 1
**Axis tracking**: Single-axis rotation
**Backtracking**: Shade-slope
**Tracking axis orientation**: 180.0°
**Max tracking angle**: 60.0°
**Resting angle**: 60.0°
**Ground Coverage Ratio**: 0.45
**Rated power**: -
**Panel material**: Smooth glass with AR coating
**Reflectivity**: Vary with sun
**Slope error**: correlate with material




| Vertex | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| 1 | 37.691000 | -105.973763 | 2312.49 | 2.10 | 2314.59 |
| 2 | 37.698338 | -105.973935 | 2312.97 | 2.10 | 2315.07 |
| 3 | 37.698270 | -106.001487 | 2315.70 | 2.10 | 2317.80 |
| 4 | 37.712598 | -106.001229 | 2315.69 | 2.10 | 2317.79 |
| 5 | 37.712462 | -105.983033 | 2313.09 | 2.10 | 2315.19 |
| 6 | 37.705264 | -105.982861 | 2313.40 | 2.10 | 2315.50 |
| 7 | 37.705129 | -105.965095 | 2311.47 | 2.10 | 2313.57 |
| 8 | 37.691003 | -105.965009 | 2311.39 | 2.10 | 2313.49 |

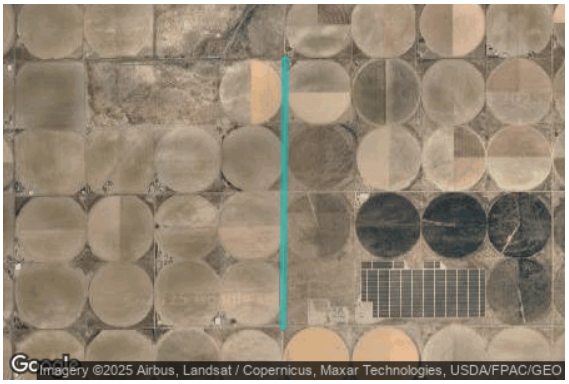
## Route Receptors

**Name**: Route 1
**Path type**: Two-way
**Observer view angle**: 50.0°



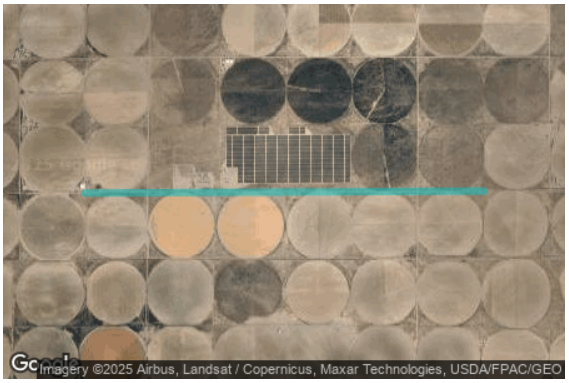

| Vertex | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| 1 | 37.719320 | -106.038823 | 2320.62 | 1.50 | 2322.12 |
| 2 | 37.719890 | -105.964700 | 2312.70 | 1.50 | 2314.20 |

**Name**: Route 2
**Path type**: Two-way
**Observer view angle**: 50.0°



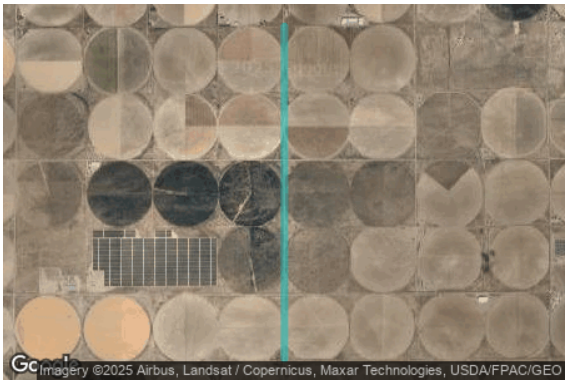

| Vertex | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| 1 | 37.690750 | -106.001800 | 2316.63 | 1.50 | 2318.13 |
| 2 | 37.719724 | -106.001500 | 2316.75 | 1.50 | 2318.25 |

**Name**: Route 3
**Path type**: Two-way
**Observer view angle**: 50.0°



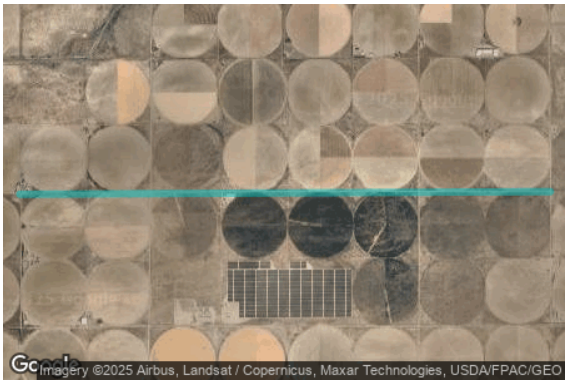

| Vertex | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| 1 | 37.690650 | -106.010490 | 2317.28 | 1.50 | 2318.78 |
| 2 | 37.690863 | -105.955644 | 2310.40 | 1.50 | 2311.90 |

**Name**: Route 4
**Path type**: Two-way
**Observer view angle**: 50.0°




| Vertex | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| 1 | 37.683860 | -105.964700 | 2312.30 | 1.50 | 2313.80 |
| 2 | 37.719890 | -105.964710 | 2311.26 | 1.50 | 2312.76 |

**Name**: Route 5
**Path type**: Two-way
**Observer view angle**: 50.0°




| Vertex | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| 1 | 37.705100 | -106.019607 | 2318.22 | 1.50 | 2319.72 |
| 2 | 37.705390 | -105.946700 | 2309.53 | 1.50 | 2311.03 |

## Flight Path Receptors

**Name**: FP 1
**Description**:
**Threshold height**: 15 m
**Direction**: 136.0°
**Glide slope**: 3.0°
**Pilot view restricted?** Yes
**Vertical view**: 30.0°
**Azimuthal view**: 50.0°




| Point | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| Threshold | 37.791298 | -106.054936 | 2316.65 | 15.24 | 2331.89 |
| Two-mile | 37.812096 | -106.080381 | 2318.58 | 181.99 | 2500.57 |

**Name**: FP 2
**Description**:
**Threshold height**: 15 m
**Direction**: 90.0°
**Glide slope**: 3.0°
**Pilot view restricted?** Yes
**Vertical view**: 30.0°
**Azimuthal view**: 50.0°




| Point | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| Threshold | 37.658750 | -106.038227 | 2320.76 | 15.24 | 2336.00 |
| Two-mile | 37.658750 | -106.074791 | 2326.36 | 178.33 | 2504.69 |

**Name**: FP 3
**Description**:
**Threshold height**: 15 m
**Direction**: 0.0°
**Glide slope**: 3.0°
**Pilot view restricted?** Yes
**Vertical view**: 30.0°
**Azimuthal view**: 50.0°




| Point | Latitude (°) | Longitude (°) | Ground elevation (m) | Height above ground (m) | Total elevation (m) |
|---|---|---|---|---|---|
| Threshold | 37.640178 | -106.047420 | 2321.69 | 15.24 | 2336.93 |
| Two-mile | 37.611265 | -106.047420 | 2321.28 | 184.34 | 2505.62 |

## Discrete Observation Point Receptors

| Name | ID | Latitude (°) | Longitude (°) | Elevation (m) | Height (m) |
|---|---|---|---|---|---|
| OP 1 | 1 | 37.691036 | -106.008542 | 2319.17 | 1.50 |
| OP 2 | 2 | 37.701432 | -106.018928 | 2320.09 | 1.50 |
| OP 3 | 3 | 37.705447 | -106.018411 | 2319.52 | 1.50 |
| OP 4 | 4 | 37.719184 | -106.000913 | 2317.84 | 1.50 |
| OP 5 | 5 | 37.720100 | -106.001106 | 2318.87 | 1.50 |
| OP 6 | 6 | 37.720055 | -105.983026 | 2315.99 | 1.50 |
| OP 7 | 7 | 37.720100 | -105.967526 | 2315.01 | 1.50 |
| OP 8 | 8 | 37.719583 | -105.970471 | 2314.99 | 1.50 |
| OP 9 | 9 | 37.696323 | -105.946766 | 2311.56 | 1.50 |

# Glare Analysis Results

## Summary of Results

Glare with low potential for temporary after-image predicted

| PV Array | Tilt | Orient | Annual Green Glare | | Annual Yellow Glare | | Energy |
|---|---|---|---|---|---|---|---|
| | ° | ° | min | hr | min | hr | kWh |
| PV array 1 | SA tracking | SA tracking | 190,945 | 3,182.4 | 0 | 0.0 | - |

*Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.*

| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| Route 1 | 0 | 0.0 | 0 | 0.0 |
| Route 2 | 0 | 0.0 | 0 | 0.0 |
| Route 3 | 0 | 0.0 | 0 | 0.0 |
| Route 4 | 0 | 0.0 | 0 | 0.0 |
| Route 5 | 190,945 | 3,182.4 | 0 | 0.0 |
| FP 1 | 0 | 0.0 | 0 | 0.0 |
| FP 2 | 0 | 0.0 | 0 | 0.0 |
| FP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 1 | 0 | 0.0 | 0 | 0.0 |
| OP 2 | 0 | 0.0 | 0 | 0.0 |
| OP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 4 | 0 | 0.0 | 0 | 0.0 |
| OP 5 | 0 | 0.0 | 0 | 0.0 |
| OP 6 | 0 | 0.0 | 0 | 0.0 |
| OP 7 | 0 | 0.0 | 0 | 0.0 |
| OP 8 | 0 | 0.0 | 0 | 0.0 |
| OP 9 | 0 | 0.0 | 0 | 0.0 |

## PV: PV array 1 low potential for temporary after-image

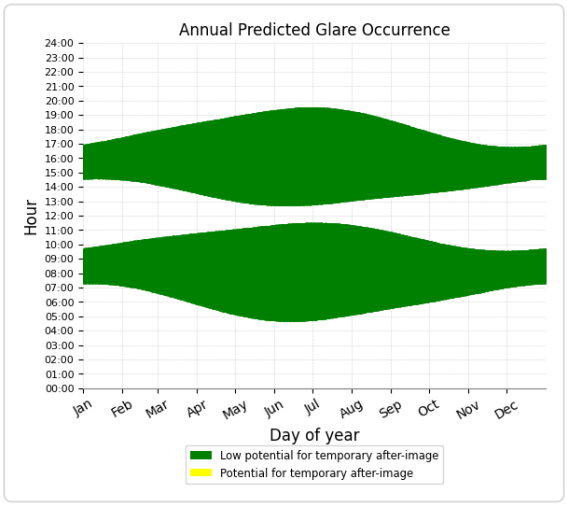
*Receptor results ordered by category of glare*

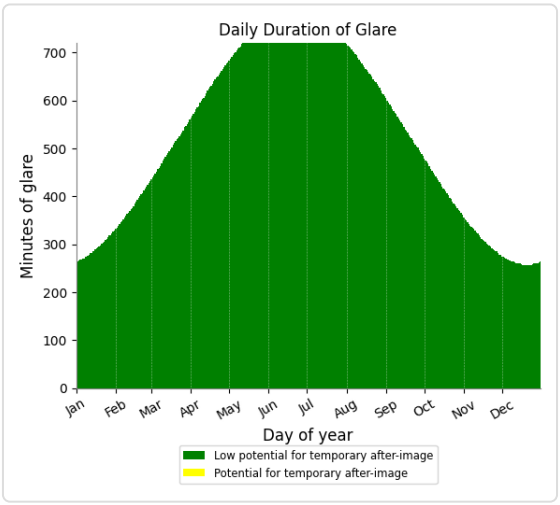
| Receptor | Annual Green Glare | | Annual Yellow Glare | |
|---|---|---|---|---|
| | min | hr | min | hr |
| Route 5 | 190,945 | 3,182.4 | 0 | 0.0 |
| Route 1 | 0 | 0.0 | 0 | 0.0 |
| Route 2 | 0 | 0.0 | 0 | 0.0 |
| Route 3 | 0 | 0.0 | 0 | 0.0 |
| Route 4 | 0 | 0.0 | 0 | 0.0 |
| FP 1 | 0 | 0.0 | 0 | 0.0 |
| FP 2 | 0 | 0.0 | 0 | 0.0 |
| FP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 1 | 0 | 0.0 | 0 | 0.0 |
| OP 2 | 0 | 0.0 | 0 | 0.0 |
| OP 3 | 0 | 0.0 | 0 | 0.0 |
| OP 4 | 0 | 0.0 | 0 | 0.0 |
| OP 5 | 0 | 0.0 | 0 | 0.0 |
| OP 6 | 0 | 0.0 | 0 | 0.0 |
| OP 7 | 0 | 0.0 | 0 | 0.0 |
| OP 8 | 0 | 0.0 | 0 | 0.0 |
| OP 9 | 0 | 0.0 | 0 | 0.0 |

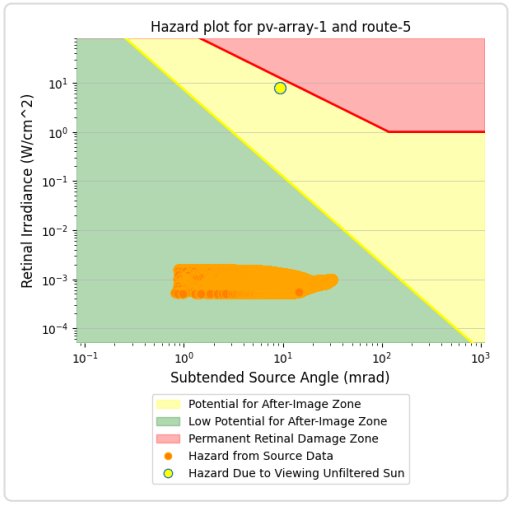
## PV array 1 and Route: Route 5

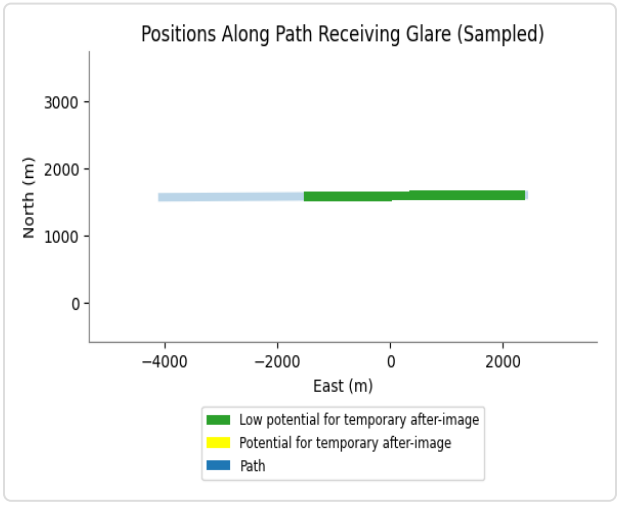
Yellow glare: none

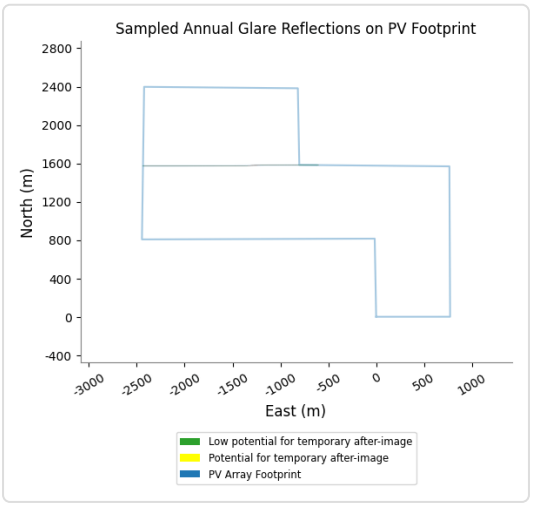
Green glare: 190,945 min.




## PV array 1 and Route: Route 1

No glare found

### PV array 1 and Route: Route 2

No glare found

### PV array 1 and Route: Route 3

No glare found

### PV array 1 and Route: Route 4

No glare found

### PV array 1 and FP: FP 1

No glare found

### PV array 1 and FP: FP 2

No glare found

### PV array 1 and FP: FP 3

No glare found

### PV array 1 and OP 1

No glare found

### PV array 1 and OP 2

No glare found

### PV array 1 and OP 3

No glare found

### PV array 1 and OP 4

No glare found

### PV array 1 and OP 5

No glare found

### PV array 1 and OP 6

No glare found

### PV array 1 and OP 7

No glare found

### PV array 1 and OP 8

No glare found

### PV array 1 and OP 9

No glare found

# Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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# Attachment 7 – Noise Study

# Noise Analysis

*Haynach Solar Hybrid Project*

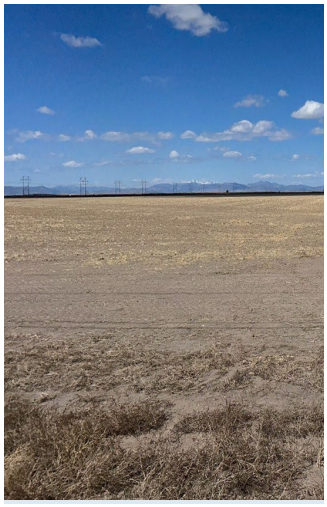
Prepared for
Adapture Solar Development, Inc.

Prepared by
Barr Engineering Co.

July 2025

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# Noise Analysis
# Haynach Solar Hybrid

July 2025

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Map 1 Noise Receiver Measurement, and Source Locations

# Abbreviations

| | |
|---|---|
| AC | alternating current |
| Adapture | Adapture Solar Development, Inc. |
| BESS | battery energy storage system |
| DC | direct current |
| dB | decibel |
| dBA | A-weighted decibel |
| dBA Ldn | day-night average decibel |
| dBA Leq | hourly average A-weighted decibel |
| E102N | East County Road 102 North |
| E104N | East County Road 104 North |
| FHWA | Federal Highway Administration |
| Gen-tie | generation-tie |
| HVAC | heating, ventilation, and air conditioning |
| kV | kilovolt |
| L9N | Lane Nine Mile North |
| Leq | equivalent noise level |
| Lmax | maximum noise level |
| MW | megawatt |
| MWh | megawatt hours |
| PCS | power conditioning station |
| Project | Haynach Solar Hybrid Project |
| PV | photovoltaic |
| RCNM | Road Construction Noise Model |
| Receiver | noise-sensitive land use |
| SH | Colorado State Highway |
| TNM | Traffic Noise Model |
| USEPA | U.S. Environmental Protection Agency |

# 1 Introduction

## 1.1 Project Overview

Adapture Solar Development, Inc.'s (Adapture) proposed Haynach Solar Hybrid Project (Project), located in Alamosa County, Colorado, consists of a 110-megawatt (MW) solar photovoltaic (PV) array with a substation and battery energy storage system (BESS) that would be installed on an approximately 1,109-acre site in the San Luis Valley. The Project is located along Lane Nine Mile North (L9N) between East County Road 102 North (E102N) and East County Road 104 North (E104N), about 5.5 miles southwest of the community of Hooper, Colorado (Map 1).

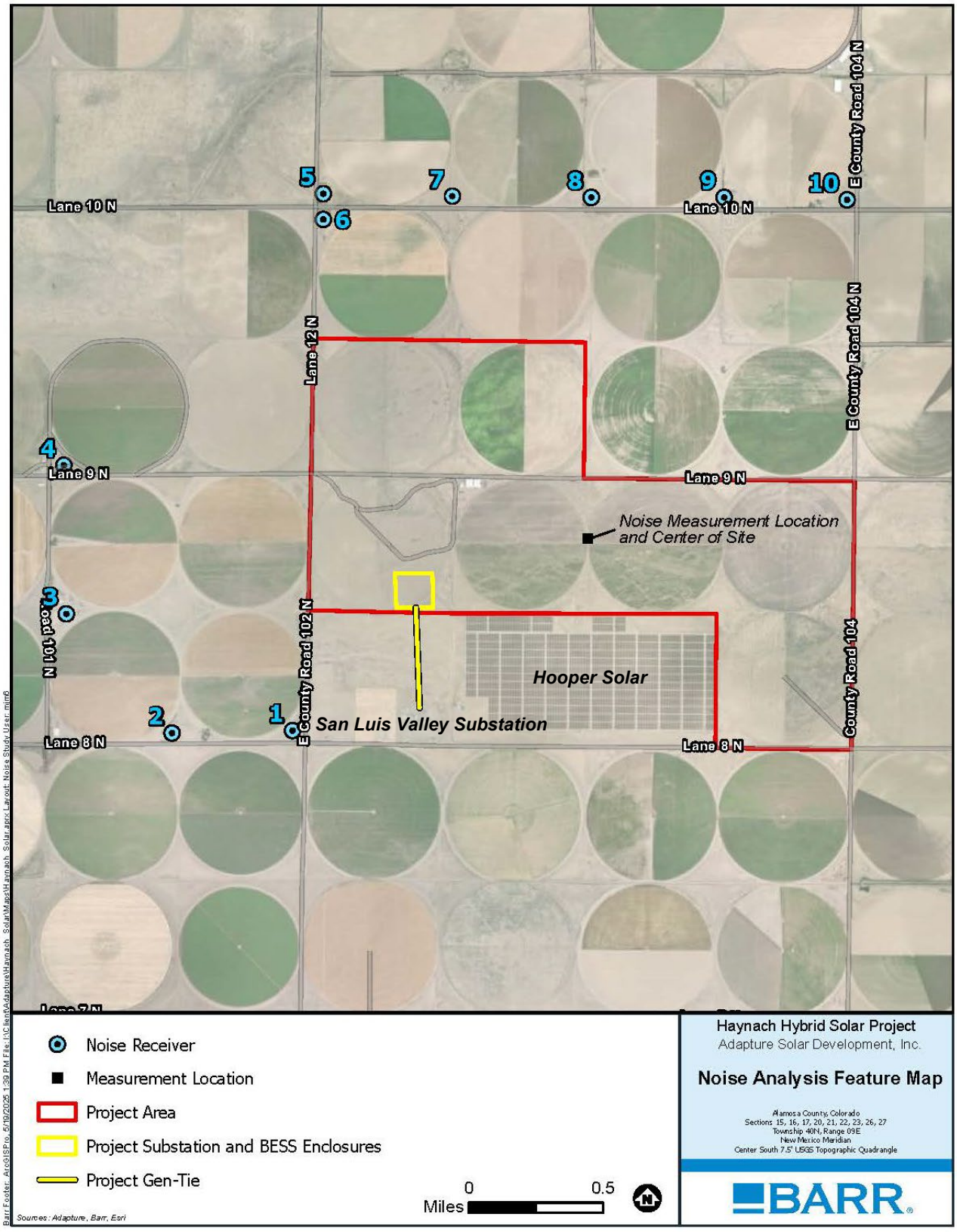
The proposed Project would be located immediately north of the existing San Luis Valley Substation, jointly owned and operated by Tri-State Generation and Transmission Association and Public Service Company of Colorado, and an existing solar facility, Hooper Solar, just south of the proposed Project. In addition to the PV arrays and associated power conditioning stations (PCS), BESS units, and onsite substation, the facility would include a new 230 kilovolt (kV) generation-tie (gen-tie) line to connect to the existing San Luis Valley Substation.

Barr Engineering Co. (Barr) prepared the following noise analysis to address potential noise levels that may occur during Project construction from heavy equipment and workforce traffic, and during Project operations from onsite equipment such as inverters, transformers, and the BESS units. Anticipated noise levels are evaluated under the County's definition of a noise-related nuisance, which is based on the State of Colorado's noise ordinance (Colorado Revised Statutes § 25-12-101-110 2024), and other generally accepted criteria that define environmental noise impacts.

## 1.2 Proposed Action

Barr assumed that the Project would include the following main components based on information from Adapture available at the time of this report:

- **PV modules and trackers**: The PV panels rotate to follow the sun throughout the day and convert sunlight into direct current (DC) electricity.
- **Inverter and medium voltage transformers**: DC energy generated by the PV panels would be delivered via cable to PCS units located within the solar field. The PCS units consist of inverters that convert DC electricity to alternating current (AC) and transformers that step up the AC to an appropriate voltage to transmit to the substation.
- **Electrical collection and distribution system:** The DC output of the PV modules would be collected throughout the Project site, delivered to the PCS units described above, and transmitted to the Project substation.
- **Project substation:** The on-site substation would be located in the southwest quadrant of the site. Based on available information, Barr assumed that the substation would include one 130-MW transformer and a single two-ton temperature control (HVAC) unit in a control building installed within the substation's footprint.




**Map 1** **Noise Receiver Measurement, and Source Locations**

- **BESS Units**: The BESS units would consist of commercially available lithium-ion batteries housed in enclosures. Barr assumed that the Project would utilize 152 Sungrow Power Titan 2.0 BESS units occupying an area immediately adjacent to the Project substation.

- **Gen-Tie**: A 230 kV gen-tie line would interconnect the substation to the existing San Luis Valley Substation. The gen-tie line would extend south from the Project substation for approximately 0.4 miles within a right-of-way from 25 to 75 feet wide.

- **Site access and roads**: The Project would be accessed directly from either E102N, which connects to Colorado State Highway (SH) 112, or L8N, which connects directly to SH 17. Additional access roads would be constructed within the Project site.

- **Other Facilities**: The Project site would be enclosed by a six-foot-tall fence topped with one-foot-tall three-strand barbed wire. The site would also include an operations and maintenance building and associated on-site parking, possibly co-located with the substation.

- **Construction**: The Project's construction period is expected to commence in the fall of 2028 and extend for approximately 16 months. Construction is expected to occur for up to 12 hours per day from 7:00 a.m. to 7:00 p.m.; little or no work will take place at night. Based on the Project traffic analysis (SEH 2025), Barr assumed that the construction workforce would include a maximum of 175 workers per day during the peak of construction.

# 2 Noise Background

## 2.1 Noise Metrics

Noise is generally defined as a loud, unpleasant, unexpected, or undesired sound typically associated with human activity and interfering with or disrupting normal activities. Chronic environmental noise causes a wide variety of adverse health effects, including sleep disturbance, annoyance, stress, hypertension, and more serious effects like hearing loss. Because noise impacts are related to noise exposure levels, the type of land use or activity affected, the change in noise over existing conditions, the time of day of exposure, and the characteristics of certain types of noise, a variety of exposure metrics and limits should be taken into consideration for minimizing noise from the proposed Project.

The relative loudness of sound is described in units of decibels (dB), a measure of the ratio of sound pressure energy on a logarithmic scale. A level of 0 dB is roughly equal to the threshold of human hearing, 55-65 dB is the range of normal conversation, levels above 65-70 dB are usually considered annoying, and a level of 120 dB is considered the threshold of pain. For community noise assessments, an A-weighted decibel (dBA) filter is used to correlate physical noise levels with the frequency sensitivity of human response. Community noise is typically averaged over a representative period and is expressed as an average noise level (Leq). Thus, community noise is discussed in terms of A-weighted average (over some period) noise levels in decibels (dBA Leq). Another relevant statistic includes the maximum noise level (Lmax), the momentary or instantaneous maximum sound, which is incorporated into the average level.

The difference in daytime and nighttime noise is also important to the degree of impact; noise is more disturbing at night than during the day. One noise metric to account for these varying disturbance levels is the day-night average sound level (Ldn), which represents the 24-hour Leq with a 10-dBA penalty added

to the “nighttime” levels from 10:00 p.m. to 7:00 a.m. Noise regulations may utilize the Ldn metric or apply a specific lower noise standard for nighttime versus daytime noise levels.

A person’s response to changes in sound over existing conditions is another factor in how noise impacts are defined. A 3-dBA change in sound is considered a barely noticeable difference; a 5-dBA change is noticeable; and a 10-dBA increase is typically perceived as a doubling in loudness. A noise increase of 10 dBA or more is considered a substantial noise impact under some regulations.

Certain noise sources also have distinctive acoustic features, including tonal elements, impulsivity, intermittency, and distinctiveness. These qualities may increase the level of impact or annoyance from noise. Some jurisdictions apply a penalty to Project-related noise levels if these qualities are present.

## 2.2 Regulatory Requirements

The Noise Control Act of 1972 established a national policy for noise research and noise control. Through this process, the U.S. Environmental Protection Agency (USEPA) identified noise levels for the protection of public health and welfare (USEPA 1974). The USEPA’s recommendations included a primary exposure limit of 55 dBA (Ldn) to protect the public from all adverse effects on health and welfare in residential areas and a second exposure limit of 70 dBA (Leq) averaged over 24 hours to prevent hearing loss. The Noise Control Act of 1972 did not have regulatory enforceability; rather, it provided guidance for local jurisdictions and deferred primary responsibility for noise control to state and local governments. Many federal agencies, such as the Federal Highway Administration (FHWA), as well as state and local agencies, have developed specific noise regulations to address their jurisdictions and responsibilities.

Alamosa County, Colorado, does not have a specific noise ordinance at the county level. Instead, the county relies on state statutes to address noise complaints. The county's land use office handles these complaints by considering whether a noise disturbance is a public nuisance based on state law.

The State of Colorado’s noise ordinance (Colorado Revised Statutes § 25-12-101-110 2024) stipulates that sound levels radiating from a property line at 25 feet or more constitute a public nuisance if they exceed the noise levels established for the time periods and zones shown in Table 1 (Subsection 25-12-103 [1]).

**Table 1 State of Colorado Noise Ordinance Standards**

| Zone/Time Period | 7:00 AM to 7:00 PM | 7:00 PM to 7:00 AM |
|---|---|---|
| Residential | 55 dBA | 50 dBA |
| Commercial | 60 dBA | 55 dBA |
| Light Industrial | 70 dBA | 65 dBA |
| Industrial | 80 dBA | 75 dBA |

Source: Colorado Revised Statutes § 25-12-101-110 2024

Other pertinent subsections of the Colorado noise ordinance include:

- In the hours between 7:00 a.m. and 7:00 p.m., the noise levels permitted in Subsection 25-12-103 (1) may be increased by 10 dBA for a period not to exceed fifteen minutes in any one-hour period (Subsection 25-12-103 [2]).

- Periodic, impulsive, or shrill noises shall be considered a public nuisance when such noises are at a sound level of five dBA less than those listed in Subsection 25-12-103 (1) (Subsection 25-12-103 [3]).

- Construction projects shall be subject to the maximum permissible noise levels specified for industrial zones for the period within which construction is to be completed pursuant to any applicable construction permit issued by proper authority or, if no time limitation is imposed, for a reasonable period for completion of the project (Subsection 25-12-103 [5]).

## 2.3 Baseline Conditions

The Project is in a rural, agricultural area with a few dispersed farmhouses near the site. Existing noise sources include vehicular traffic on local roads, noise from agricultural operations, activities at the existing electric substation and solar facility, and incidental background noise from nearby residences, wildlife, weather, or other environmental sources.

To assess existing background noise levels, noise measurements were conducted at the approximate center of the Project site (Map 1) from 4:20 p.m. to 10:30 p.m., May 13, 2025. Noise was measured using a Larson Davis SoundTrack LxT, Type I Integrating Sound Level Meter (serial number 6992), programmed in "slow" mode to record noise levels in "A" weighted form. The meter and microphone were mounted on a tripod, five feet above the ground, and equipped with a windscreen during the measurements. The sound level meter was calibrated before and after the monitoring. The sound levels measured during this period were:

- 45.6 dBA (Leq) from 4:20 p.m. to 10:30 p.m. (overall)
- 48.4 dBA (Leq) from 4:20 p.m. to 7:00 p.m. (daytime)
- 41.0 dBA (Leq) from 7:00 p.m. to 10:00 p.m. (evening)
- 28.4 dBA (Leq) from 10:00 p.m. to 10:30 p.m. (nighttime)

These levels are typical of a sparsely developed, rural area with little exposure to highway traffic or other urban or industrial noise sources. Based on the measurements and published estimates of ambient sound levels for various land uses (Acoustical Society of America 1993), it is reasonable to assume that background noise levels near the Project area are 30 dBA-Leq or less in the late-night hours and 45 to 50 dBA-Leq during the day when daily activities are ongoing in the surrounding area. During the noise measurements, Barr observed that activity in the area was low; little traffic was observed, and no active agricultural operations were ongoing. It is likely that ambient noise levels are higher during times when more active agricultural operations are ongoing, for example, irrigation sprinklers or harvesting operations.

## 2.4 Noise Sensitive Receivers

Potentially noise-sensitive locations in the Project area (receivers) include local residences. The residences nearest to the Project area include two residences 0.5 miles or more south and west of the site boundary along L8N, two residences about one mile west of the site along E101N, and approximately seven residences 0.5 miles or more north of the site along L10N (Map 1).

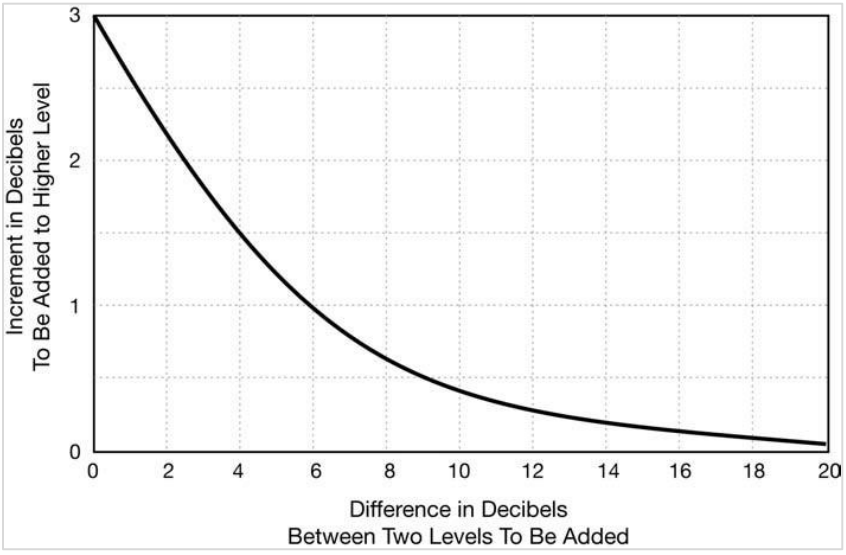
The land immediately surrounding the Project site is either industrial (solar facility and substation to the south) or vacant agricultural land, which is typically considered industrial for evaluation of noise impacts (FHWA 2011). The State of Colorado's noise ordinance establishes noise criteria for areas 25 feet and beyond outside the noise source's property line. For this study, Barr considered noise levels on industrial properties just outside the Project's property line and at potentially affected nearby residences.

# 3 Noise Impact Evaluation

Major sources of noise from the Project would include temporary construction activity from construction equipment, increased workforce traffic, and operational noise from equipment associated with the PCS units and substation/BESS facility. These are evaluated below.

## 3.1 Construction Equipment Noise

Construction equipment noise was estimated using the FHWA's Roadway Construction Noise Model (RCNM) (FHWA 2006), a national model for the prediction of construction noise. Although the Project is not a road project, the RCNM includes the same types of construction equipment used for the Project. The RCNM includes pre-programmed noise levels measured at 50 feet and typical usage rates for various types of equipment. Only the five loudest pieces of equipment were analyzed with the RCNM because, due to the logarithmic computations of noise, the addition of other equipment would make very little difference in cumulative sound levels. For example, the pile driver, the noisiest piece of equipment, is 16 to 20 dBA louder than any of the other pieces of equipment. As shown in Figure 1, adding two noise sources with a 16 dBA difference in noise results in the addition of about 0.2 dBA to the louder noise level; adding equipment with a 20 dBA difference results in almost no change. Alternatively, if two identical pile drivers were operated simultaneously, doubling the sound energy, the increase would amount to 3 dBA.




Source: Federal Transit Authority 2018.

**Figure 1 Approximate Decibel Addition**

Table 2 shows the results of the RCNM analysis for each piece of equipment as maximum noise levels (Lmax) that would occur over short periods of use and average levels (Leq) adjusted for usage percent that would occur over the daily work period. The cumulative total noise of all construction equipment is

also shown. The pile driver emits the loudest noise, but other equipment noise levels would prevail when the pile driver is not in use.

The RCNM calculates noise attenuation over the distance to the receiver. Typically, a noise point source diminishes by 6 dBA per doubling distance, with no intervening terrain or barriers. Thus, a noise source that registers 60 dBA at 50 feet will decline to 54 dBA at 100 feet, 48 dBA at 200 feet, and so on.

The Project construction equipment is anticipated to move around the site as the work progresses; consequently, the distance between the noise sources (pile driver and other equipment) and the receivers will vary. Table 2 shows short-term Lmax and average daily Leq noise levels for the construction equipment. Table 3 provides the receivers provides the short-term Lmax and average daily Leq noise levels at various distances from the source, assuming a worst-case condition in which work is being done at the edges of the Project site. The RCNM calculated noise levels are at 100 feet from the source near the property line, 200 and 500 feet from the source outside the property line in the agricultural/industrial area, and 2,500 and 5,000 feet from the source at representative residential receivers.

**Table 2 Construction Equipment Noise Emissions**

| Type of Equipment | Usage Percent | Maximum Noise (dBA-Lmax) | Average Noise Adjusted for Usage (dBA-Leq) |
|---|---|---|---|
| Impact Pile Driver @ 50 feet | 20 | 101.3 | 94.3 |
| Dozer @ 50 feet | 40 | 81.7 | 77.7 |
| Compactor@ 50 feet | 20 | 83.2 | 76.2 |
| Concrete Pump Truck @ 50 feet | 20 | 81.4 | 74.4 |
| All Other > 5 HP @ 50 feet | 50 | 85.0 | 82.0 |
| Cumulative Construction Noise @ 50 feet. | | 101.6 | 94.7 |

**Table 3 Construction Equipment Noise Emissions at Receivers**

| Receivers | Distance to Source (feet) | Maximum Noise (dBA-Lmax) | Average Noise Adjusted for Usage (dBA-Leq) |
|---|---|---|---|
| Property Line | 100 | 95.9 | 88.7 |
| Agricultural/Industrial Zone Outside Property Line | 200 | 89.6 | 82.7 |
| Agricultural/Industrial Zone Outside Property Line | 500 | 81.7 | 74.7 |
| Near Residential Receivers | 2,500 | 67.6 | 60.7 |
| Distant Residential Receivers | 5,000 | 61.6 | 54.7 |

The construction equipment noise levels in Table 2 are subject to the State of Colorado's noise ordinance, which establishes a limit of 80 dBA for construction (industrial zone levels) with an allowance for a 10 dBA increase for 15 minutes during any one-hour period between 7:00 a.m. and 7:00 p.m. The ordinance also states that impulsive noise will be regulated at a level of five dBA less than those listed for the designated zones. The pile driver will generate noise with impulsive characteristics (short bursts of

sound with a sharp rise and rapid decay and high peak sound pressure levels). With these conditions, the Project would be subject to a 75 dBA limit with the ability to exceed this level by 10 dBA for 15 minutes during any one-hour period.

The RCNM model shows that noise levels will slightly exceed these standards near the Project boundary when construction is being done at the edges of the site. Noise levels at the nearby residential receivers will meet the state's noise criteria during construction. When construction occurs toward the interior of the site, noise levels at the Project boundary will decline, and at a distance of about 500 feet from the Project boundary will meet the state's noise ordinance standards. Construction is expected to occur for up to 12 hours per day from 7:00 a.m. to 7:00 p.m.; little or no work will take place at night. Although construction may last 16 months, it will be temporary.

## 3.2 Construction Workforce Noise

Worker commuter traffic and material delivery vehicles would also generate noise during construction. The traffic analysis prepared for the Project (SEH 2025) showed that the construction workforce would generate a maximum of 116 additional trips per hour during the peak periods, assuming a workforce of 175 and a vehicle occupancy rate of 1.5. To evaluate worst-case conditions, Barr assumed that this traffic would include 15 percent medium trucks and 17 percent heavy trucks and that all the peak hour traffic would occur on a single local road. Background traffic on the local roads was assumed to be negligible.

To estimate the noise impacts of construction traffic, the FHWA's Traffic Noise Model (TNM) (FHWA 2004) was used to predict noise levels from construction-related traffic. The TNM model uses site-specific information on traffic volumes and speeds, vehicle classifications, roadway geometry, and site acoustic properties to predict hourly noise levels at selected locations. Table 4 shows the model's results during peak hours, with the construction workforce traffic, at various distances from the centerline of a local road such as L8N and E102N.

**Table 4 Construction Workforce and Materials-Related Traffic Noise (dBA-Leq)**

| Noise Level @ 50 feet | Noise Level @100 feet | Noise Level @ 200 feet | Noise Level @ 500 feet | Noise Level @ 1,000 |
|---|---|---|---|---|
| 60.3 | 56.6 | 50.1 | 41.6 | 33.7 |

The TNM analysis shows that worker commuter and materials delivery vehicles will generate short-term increases in noise during construction. Noise levels along local roads within 50 feet are shown to slightly exceed 60 dBA-Leq during peak traffic, and areas within 100 feet will exceed 56 dBA-Leq. These levels would not exceed the FHWA's criteria for highway noise in residential areas, which is 67 dBA-Leq during peak traffic (FHWA 2011). With greater distance from the highway (200 feet or more), traffic noise will diminish to ambient levels. Increased traffic and related noise would be limited to the construction period.

## 3.3 Operational Noise

To estimate noise generated by the operations of the Project after construction, sound levels were calculated for the proposed equipment to be used, including the PCS units and the substation/BESS facility. Barr assumed that the overall PV array site will contain approximately 30 PCS units distributed around the site, each with an inverter and transformer, and the co-located substation/BESS site with 152 BESS units and the substation transformer with one HVAC unit.

### 3.3.1 PCS Units

Based on information provided by Adapture, Barr assumed that each PCS unit would contain a medium voltage transformer (Sungrow MVS5140-LS-US or equivalent) and an inverter (Sungrow SG4400 Central or equivalent). Noise test reports for these Sungrow components were reviewed and used to calculate noise emissions for the PCS units. Table 5 provides noise calculations for a single PCS unit showing individual equipment noise emissions, combined noise levels of the equipment at the source, and Table 6 provides noise levels at receivers projected to various distances from the source. The precise locations of the PCS units are not currently defined. Barr assumed that the PCS units would be spaced throughout the site at a great enough distance apart that the cumulative noise of more than one unit would be negligible.

**Table 5 PCS Noise Emissions at Source**

| PCS Equipment Source | Number of Sources | Single Source Noise Level | Combined Source Noise Level* |
|---|---|---|---|
| Inverter | 1 | 87 dBA @ 3.3 feet | 87 dBA @ 3.3 feet |
| Transformer | 1 | 70.9 dBA @ 3.3 feet | 70.9 dBA @ 3.3 feet |
| Cumulative PCS Noise @ Source | | | 87.1 DBA @ 3.3 feet |

**Table 6 PCS Noise Emissions at Receivers**

| Receivers | Distance to Source | Noise Level |
|---|---|---|
| Property Line | 50 feet | 63.5 |
| Industrial/Agricultural Land Outside Property Line | 75 feet | 60.0 |
| Near Residential Receivers | 2,500 feet | 29.5 |
| Distant Residential Receivers | 5,000 feet | 23.5 |

Barr assumed that the PCS unit nearest to the Project boundary would be set back at least 50 feet. Table 5 shows that at a distance of 50 feet, noise from the PCS will be 63.5 dBA-Leq; at 75 feet (25 feet outside the property line as designated in the Colorado noise statute), it will be 60.0 dBA-Leq; and at the nearest residential receivers, it will be below 30 dBA-Leq. These levels comply with the State of Colorado noise statute.

### 3.3.2 BESS and Substation Facilities

Barr assumed that sound from the substation/BESS facility would emanate from the center of the co-occupied site in the southwest quadrant of the Project property. Adapture provided noise test data for the Sungrow Power Titan 2.0 BESS units anticipated for the Project, including sound pressure levels for varying loads and ambient temperatures. The highest tested noise levels for maximum power, temperature, and directional emissions were used in the analysis. Table 7 provides noise for the substation/BESS facility, showing individual equipment noise emissions and combined noise levels from all equipment at the source. Table 8 provides noise levels at the receiver at various distances from the source. As shown, the 152 BESS units generate the most noise and largely eclipse the other noise sources.

**Table 7 Operational Equipment Noise Emissions at Source**

| BESS/Substation Equipment Source | Number of Sources | Single Source Noise Level | Combined Source Noise Level* |
|---|---|---|---|
| BESS Units | 152 | 79.2 dBA @ 3.3 feet | 101.0 dBA @ 3.3 feet |
| Substation 130 MW Transformer | 1 | 87.0 dBA @ 3.3 feet | 87.0 dBA @ 3.3 feet |
| HVAC Equipment | 1 | 69.6 dBA @ 3.3 feet | 69.6 dBA @ 3.3 feet |
| Cumulative BESS/Substation Noise @ Source | | | 101.2 dBA @ 3.3 feet |

**Table 8 Operational Equipment Noise Emissions at Receivers**

| Receiver | Distance to Source | Noise Level** |
|---|---|---|
| Property Line | 900 feet | 52.5 dBA |
| Industrial/Agricultural Land Outside Property Line | 925 feet | 52.3 dBA |
| Near Residential Receivers | 4,000 feet | 39.5 dBA |
| Distant Residential Receivers | 8,000 feet | 33.5 dBA |

The property boundary nearest to the center of the substation/BESS facility is approximately 900 feet to the south at the San Luis Valley Substation. Table 7 shows that at a distance of 900 feet, at the property line, noise from the substation/BESS facility will be 52.5 dBA-Leq; at 975 feet, 25 feet outside the property line as designated in the Colorado noise statute, it will be 52.3 dBA-Leq; and at the representative residential receivers, it will be below 40 dBA-Leq. These levels are well within the State of Colorado noise ordinance standards. These noise levels would meet the daytime and nighttime requirements for the industrial zone at the Project site boundary and for the residential zone at the nearest farm residences. It is likely that increased noise from the substation/BESS facility will be noticeable near the Project property boundary. At the nearest residential receivers, increased noise will also be noticed or just barely perceptible, particularly during nighttime or other very quiet periods.

### 3.3.3 Gen-tie Line

The Project includes a gen-tie line from the on-site substation to the San Luis Valley Substation to the south. Noise can be generated by the corona effect from transmission lines, which is a phenomenon associated with the electrical ionization of the air that occurs due to very high electric field strength (Burns and McDonnell Engineering Company, Inc., 2019). Corona noise is usually experienced as a random crackling or hissing sound and can vary with voltage, altitude, and weather conditions. In relatively dry conditions, corona noise is typically about 40 to 50 dBA in the vicinity of the transmission line (Aspen Environmental Group, n.d.). Wet and high-humidity conditions may increase the corona noise to 50 to 60 dBA near the line. Relative to other noise sources in the vicinity of the gen-tie line, including the substation/BESS facility on the Project site, corona noise is expected to be a minor source of noise.

# 4 Summary of Project Related Impacts

The primary noise-sensitive receptors in the Project area include dispersed residences located 0.5 miles to one mile from the Project boundary. The land immediately adjacent to the site is industrial or

agricultural and less sensitive to Project-related noise. The applicable noise regulations are based on the State of Colorado's noise ordinance, which establishes the 55 dBA daytime and 50 dBA nighttime levels as acceptable for the residential zone and 80 dBA daytime and 75 dBA nighttime for the industrial zone.

Based on noise measurements and published estimates of ambient sound levels, background noise levels in the Project area are estimated to be about 30 dBA-Leq in the late-night hours and 45 to 50 dBA during the day. Noise levels in the Project area are expected to temporarily increase from construction activities, and once in operation, equipment associated with the PCS units and substation/BESS facility will be a permanent source of noise. The results of the analysis are as follows:

- Predicted construction equipment noise will slightly exceed the State of Colorado's standards near the Project boundary when construction occurs near the edges of the site. However, there are no sensitive receivers in these areas, so temporary construction noise should not constitute a nuisance. When construction moves toward the interior of the site, noise levels will meet the state's standards. Noise levels at the nearby residential receivers will meet the state's noise criteria during construction. Construction-related noise increases will not occur at night, and construction noise will be temporary.

- Worker commuter traffic and materials delivery vehicles will generate short-term increases in noise during construction. Peak hour noise levels along local access roads will exceed 55 dBA during AM and PM peak traffic at distances closer than about 200 feet to the roads. At greater distances from the highway, traffic noise will diminish to ambient levels.

- Predicted noise levels from the PCS units and substation/BESS facility are well below the 55/50 dBA standards for the residential zone at all residential receivers and below the 80/75 dBA standards for the adjacent agricultural and industrial lands. Noise level increases from the Project may be perceptible in the area, particularly near the site boundary.

- Corona noise from the Gen-tie Line is expected to be minor.

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# Attachment 8 – Biological Resources Review

# Biological Resources Review

## Haynach Hybrid Solar

Alamosa County, Colorado

April 26, 2023



***Prepared For:***

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5601 E. Slauson Ave, Suite 101
Commerce, CA 90040

Prepared By:

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**APPENDICES**

APPENDIX A: FIGURES

APPENDIX B: PHOTO LOCATION MAP AND SITE VISIT PHOTOGRAPHS

APPENDIX C: USFWS IPAC OFFICIAL SPECIES

**Biological Resources Review**
**Haynach Hybrid Solar**
**Approximately 1,105 Acres**
**Alamosa County, Colorado**
**April 26, 2023**

# 1.0 INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) was retained by Samsung Solar Energy 2 LLC. (Client) to perform a Biological Resources review for the proposed Haynach Hybrid Solar located on approximately 1,105 acres of undeveloped agricultural land located southwest of Hooper in Alamosa County, Colorado (study area). The site is generally located east of County Rd 102 N and north of Eightmile LN. A map of the general vicinity of the project is shown in **Figure 1, Appendix A**. The existing 320-acre, 49.5 mega-watt (MW) Hooper Solar project is located immediately adjacent to the south of the Project. The study area appears to consist mainly of disturbed rangeland and fallow agriculture. The study area can be seen in Figures 1-7 in Appendix A.

The proposed project consists of the development of a solar hybrid energy facility. The purpose of performing the biological resources was to characterize the existing site conditions and observe for the presence of potential biological resources of concern at the study area. An initial site observation to assess preliminary conditions was conducted on November 29 and 30, 2022. Kimley-Horn subsequently conducted a site visit at the study area on April 17 and 18, 2023 with the objective of delineating biological resources.

# 2.0 REGULATORY BACKGROUND

*Federally Listed Threatened and Endangered Species*

The purpose of the federal Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems upon which they depend. The United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) administer the ESA. The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife. Under the ESA, species may be listed as threatened or endangered. "Threatened" means a species is likely to become endangered within the foreseeable future. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. Under the ESA, individual species and their habitats are protected.

USFWS current policy makes it incumbent on the project proponent to ascertain the potential for impact to a T&E species for each project and then notify the USFWS for formal consultation if a proposed project "may affect" a listed species. The USFWS notes that "a qualified biologist should use the USFWS website and other current information to make this determination". For non-federally funded projects that "may affect" or are likely to adversely affect T&E species or their habitat, a Section 10(a)(1)(B) permit would be required. The USFWS also notes that for those projects with a federal (government) nexus, it is the responsibility of the federal action agency [under Section (7)(a)] to determine if a proposed project "may affect" T&E species or their habitat. Under Section 7, proposed endangered or threatened species must be considered in the effects analysis. This would apply if a federal nexus is identified for the project. Section 9 of the ESA prohibits the "take" of endangered species of fish or wildlife. Take is defined as, "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or an attempt to do the same". Under Section 9 of the ESA, proposed endangered or threatened species on private land without a federal nexus, are not required to be considered in the effects analysis.

*State-Listed Threatened and Endangered Species*

As directed by Colorado State Statute 33 (State Statute 33; CRS Ann. §§33-2 to 102-106), the Colorado Wildlife Commission issues regulations and develops management programs implemented by Colorado Parks and Wildlife (CPW) for wildlife species not federally listed as threatened or endangered. This includes maintaining a list of state threatened and endangered species. CPW also maintains a list of species of concern, but these species are not protected under State Statute 33. Although State Statute 33 prohibits the take, possession, and sale of a state-listed species, it does not include protection of their habitat.

*Migratory Birds*

The Migratory Bird Treaty Act (MBTA) makes it illegal for anyone to "take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations by the USFWS." Typically, if active nests of bird species protected by the MBTA are identified, the USFWS recommends avoiding tree clearing or nest removal until at least the peak of the nesting season (generally March through August) has passed or until the nest is abandoned.

The U.S. Department of the Interior, Office of the Solicitor, published a memorandum (M-37050) dated December 22, 2017 regarding the MBTA and how "incidental take" is viewed by the Department. The memorandum analyzes whether the MBTA prohibits the accidental or "incidental" taking or killing of migratory birds. "Incidental take" is take that results from an activity, but is not the purpose of that activity. In this memorandum, the Department of the Interior concluded that "*the MBTA's prohibition on pursuing, hunting, taking, capturing, killing, or attempting to do the same applies only to direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests, by killing or capturing, to human control*". Therefore, according to the Department of the Interior, the MBTA does not prohibit "incidental take". Courts have disagreed with respect to including or excluding "incidental take" when considering the prohibitions under the MBTA. In 2015, the Fifth Circuit in *United States v. Citgo Petroleum Corp.* issued an opinion that agreed with the Eighth and Ninth circuits that a taking is limited to deliberate acts done directly and intentionally to migratory birds. Therefore, the Fifth Circuit decided that the MBTA only prohibits intentional take and does not prohibit incidental take. This decision by the Fifth Circuit set precedent within the Fifth Circuit's jurisdiction, including Colorado.

On January 7, 2021, the USFWS published a final rule ("MBTA rule") defining the scope of the MBTA which excluded incidental take of migratory birds from being unlawful. This interpretation of the MBTA was effective as of March 8, 2021. On May 7, 2021, the USFWS proposed to revoke the January 7, 2021 final regulation and opened a public comment period which closed on June 7, 2021.

On September 29, 2021, the U.S. Department of Interior announced a series of actions to unwind the most recent rulemaking in an effort "to ensure that the MBTA conserves birds today and into the future." On October 4, 2021, the USFWS published a final rule revoking the most recent rule enacted by the Trump Administration that limited the scope of the MBTA. According to the Federal Register, the final MBTA revocation rule went into effect on December 3, 2021. It is our understanding that as of December 3, 2021, incidental take is enforceable under the MBTA.

In addition, on October 4, 2021, the USFWS published an Advanced Notice of Proposed Rulemaking announcing the intent to solicit public comments and information to help develop proposed regulations that would establish a permitting system to authorize the incidental take of migratory birds in certain circumstances. The USFWS issued a Director's Order establishing criteria for the types of conduct that will be a priority for enforcement activities with respect to incidental take of migratory birds.

It should be noted that the regulatory climate with respect to the MBTA is changing; however, it is our understanding that as of December 3, 2021, incidental take of migratory birds is enforceable under the MBTA.

*Bald and Golden Eagles*

According to the USFWS, the Bald and Golden Eagle Protection Act (BGEPA) prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. In addition to immediate impacts, this definition also covers “impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.”

*Noxious Weeds*

Noxious weeds are a major threat to the natural and agricultural resources of Colorado. In an effort to curb the spread of noxious weeds, the State of Colorado has included The Colorado Noxious Weed Act in Title 35 of the Colorado Revised Statues. The Colorado Noxious Weed Act states that the management of noxious weeds is the responsibility of local governing agencies, which has jurisdiction over both public and private lands.

The State of Colorado has developed a State Designated Noxious Weed list by rule of the Colorado Department of Agriculture (CDA). The state has identified 79 plants as Designated Noxious Weeds, effective as of 2020.

To meet the requirements of the Colorado Noxious Weed Act weed management goals, management techniques for noxious weeds will be implemented for species listed on the CDA Designated Noxious List:

- List A – designated for statewide eradication
- List B – managed to prevent further spread and, for selected species, designated for eradication in large areas
- List C – of more localized concern, but for which the State will provide education, research, and biological control assistance to jurisdictions that choose to manage the species

# 3.0 RESOURCE REVIEW AND FIELD ASSESSMENT

Kimley-Horn personnel conducted a site visit on April 17 and 18, 2023 with the objective of identifying potential biological resources. Field reconnaissance was conducted via windshield and pedestrian surveys within the project limits. In addition, representative photographs to document general conditions were also taken. During the field visit, the approximate temperature was 63° to 68° Fahrenheit, with partly sunny skies and winds 15 – 20 miles per hour. Vehicle access to the site was provided via Lane 8 North, Lane 9 North, North County Road 102, and North County Road 104. Access within the site was provided via unpaved dirt roads and driving overland with a 4x4 vehicle. Existing conditions as determined by field reconnaissance is provided in **Appendix A, Figure 7**.

## 3.1 BACKGROUND INFORMATION

The biological resources assessment was completed using a combination of existing information obtained from public readily available sources including reports, published literature, online databases, GIS data, and site reconnaissance.

The following data sources were used to complete this study:

- Colorado Conservation Data Center (CODEX)
    - CODEX database includes information from:

  - Bird Conservancy of the Rockies
  - Colorado Natural Heritage Program
  - CPW
  - National Land Cover Database (NLCD)
  - NatureServe
  - USFWS
- CPW Mapped Raptor Nest Database (Public Access Restricted)
- CPW Species Activity Mapping (SAM)
- USFWS Information for Planning and Consultation (IPaC)

## 3.2 MAPPING INFORMATION

Prior to performing the site visit, selected maps and background information were obtained and reviewed to assist with identifying potential biological resources in the study area. The selected resources are described below.

**Topographic Map**

Based on a review of the United States Geological Survey topographic map (Hooper West quadrangle), the study area is predominantly depicted as undeveloped, vacant land, as indicated by the lack of red shading, with areas of woodlands and shrublands, as indicated by green shading. Zero "blue-line" features and zero apparent ponds are depicted throughout the study area. The topographic map depicts the generally flat area with elevation ranging between 7566 and 7592 feet above mean sea level. The topographic map for the site can be seen as Figure 2 in Appendix A.

**Aerial Photographs**

Figures 3 in Appendix A provides current aerial photographs of the study area. Conditions within the study area appear to be generally consistent with the selected aerial photograph. The study area is generally depicted as largely agricultural with pockets of disturbed rangeland. Recent aerial photography (2023) is used as base data for many figures in Appendix A. **Figure 1 in Appendix B** provides the general location of site visit photographs. Ground level photographs are provided in **Appendix B, Figure 2.**

**National Wetlands Inventory (NWI) Map**

Based on review of NWI data, five potential wetland and/or waterbody features were identified within the study area, including three riverine features, one freshwater pond, and one freshwater emergent wetland feature. NWI data is published by the USFWS and depicts suspected wetland areas and waterbodies based on stereoscopic analysis of high-altitude aerial photographs. The published data is not regularly updated and has not been validated in the field. NWI data generally overlaps the riverine features. Figure 3 in Appendix A delineates the boundaries of potential wetlands and waters within the study area as recorded by the NWI data. These features can be utilized by species for habitat purposes.

**Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM)**

Figure 5 in Appendix A depicts the FEMA floodplain zone across the study area. According to the FEMA FIRM (Panel Number 0800090005A and 08105C0200C 1), there is minimal Flood Zone information for this project. The majority of the study area is located within Zone X: Area of Minimal Flood Hazard, which is outside of the FEMA designated 100-year and 500-year flood zones.

# 4.0 SUMMARY OF RESULTS

## 4.1 SOIL SURVEY

Alamosa County lies within the San Luis Alluvial Flats and Wetlands (22b) Sub-Region of the Arizona/New Mexico Plateau Ecoregion. There are six different Soil Map Units identified within the study area by the

National Resources Conservation Service (NRCS) Web Soil Survey. These soils are listed in **Table 1** and mapped in **Figure 4, Appendix A.**

**Table 1. Soil Map Units within the Study Area**

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI | Hydric Soil Components | Farmland |
|---|---|---|---|---|---|
| Gn | Gunbarrel loamy sand, 0 to 1 percent slopes | 387.0 | 35.0 | No | Farmland of unique importance |
| Gs | Gunbarrel loamy sand, saline | 285.1 | 25.8 | Yes | Not prime farmland |
| Mc | McGinty sandy loam | 38.7 | 3.5 | No | Not prime farmland |
| Mo | Mosca loamy sand | 147.8 | 13.4 | No | Farmland of unique importance |
| Ms | Mosca loamy sand, wet | 87.9 | 8.0 | Yes | Not prime farmland |
| Se | San Luis sandy loam, 0 to 1 percent slopes | 158.6 | 14.4 | No | Not prime farmland |

## 4.2 VEGETATION

The field survey documented plant community types within the study area. Vegetation on the property was dominated by both native and invasive species commonly observed in the arid West. Community types on the property are as follows:

- 66% (736 acres) - fallow agriculture dominated by Russian thistle, kochia (*Bassia scoparia*), and bareground areas.
- 21% (235 acres) -disturbed rangeland dominated by big sagebrush (*Artemisia tridentata*), Russian thistle (*Salsola tragus*), and bareground areas
- 11% (126 acres) - active agriculture dominated by common wheat (*Triticum aestivum*).

Based on the NLCD, the study area consists of mostly cultivated crops lands with small portions of shrub/scrug and hay/pasture land cover types (Figure 6, Appendix 1). The site visit determined that NLCD land cover type locations were generally accurate to field observations.

CDA-listed noxious weed species and other invasive plant species were observed on-site and are included in **Table 2**. Noxious weeds and invasive plants, which are found primarily within the disturbed rangeland and fallow agriculture communities, account for approximately 52% (579 acres) of vegetation surface cover.

**Table 2. CDA Noxious Weed and Other Invasive Plants within the Study Area**

| Species | CDA/Alamosa County Designation | Eradication Requirements |
|---|---|---|
| Kochia (*Bassia scoparia*) | Unlisted – Nuisance Species | None |
| Russian Thistle (*Salsola tragus*) | Unlisted – Nuisance Species | None |

Control of invasive species is a difficult task and requires on-going control measures. Care must be taken to avoid negatively impacting desirable plant communities and inviting infestation by other pioneer invaders.

Weed management is best achieved by employing aggressive control early on, and persistent control efforts over several growing seasons, including direct treatments, prevention through best management practices, monitoring of treatment efficacy, and subsequent detection efforts. Weed management is often limited to controlling existing infestations and prevention of further infestations, rather than total eradication.

## 4.3 FEDERALLY LISTED SPECIES

Kimley-Horn obtained an official species list from the USFWS IPaC system on April 12, 2023. The list includes nine (9) threatened, endangered or candidate species. A qualified biologist reviewed the list to determine species that may occur in the study area. Species included in the USFWS list but excluded from further evaluation are addressed in **Table 3**. This project will have no effect on the species listed in **Table 3**. Additionally, there is no federally designated Critical Habitat within the project vicinity.

**Table 3. Endangered Species Act Species Review**

| Species | Status | Habitat Requirements | Exclusion Justification | Likelihood of Presence |
|---|---|---|---|---|
| ***Mammals*** | | | | |
| Gray Wolf (*Canis lupus*) | ESA LE | Habitat generalist adapted to a variety of landscapes (USFWS 2022a). | The project does not include a predator management program component which automatically excludes this species as a potential constraint to development. | LOW |
| ***Birds*** | | | | |
| Mexican Spotted Owl (*Strix occidentalis lucida*) | ESA LT | Old growth and mature forests with complex structural components such as riparian or conifer communities (USFWS 2022b). | This species is not known to or is not believed to occur in Alamosa County, Colorado. Suitable habitat for this species is not present in the project area and this species is not a potential constraint to development. | LOW |
| Southwestern Willow Flycatcher (*Empidonax traillii extimus*) | ESA LE | Dense riparian areas with cottonwood, willow, and/or tamarisk. Saturated soils, standing water, or nearby streams, or pools, are important components of nesting habitat (USFWS 2022c). | This species is known to or is believed to occur in Alamosa County, Colorado. Suitable habitat for this species is not present in the project area and this species is not a potential constraint to development. | LOW |
| ***Insects*** | | | | |
| Monarch Butterfly (*Danaus plexippus*) | ESA C | Requires milkweed for survival. Adult monarchs feed on the nectar of flowering | Suitable habitat for this species is not present in the study area and this species is | LOW |

| Table 3. Endangered Species Act Species Review | | | | |
|---|---|---|---|---|
| **Species** | **Status** | **Habitat Requirements** | **Exclusion Justification** | **Likelihood of Presence** |
| | | milkweed, and larvae require milkweed as a host plant (USFWS 2022d). | currently not a potential constraint to development. | |
| Silverspot Great Basin *(Speyeria nokomis nokomis)* | ESA C | Requires permanent spring-fed meadows, seeps, marshes, and boggy streamside meadows associated with flowing water in arid country (USDA 2007). | Suitable habitat for this species is not present in the study area and this species is currently not a potential constraint to development. | LOW |
| Status Definitions: ESA = Endangered Species Act; LE = Listed Endangered, LT = Listed Threatened, C = Candidate | | | | |

## 4.4 STATE LISTED THREATENED AND ENDANGERED SPECIES

Kimley-Horn consulted the CPW SAM database on April 17, 2023. The list includes 19 species as potentially intersecting the study area. Of the 19 species listed as intersecting the study area, there are no species with a CPW recommendation for avoidance and minimization. A full list of CPW SAM species intersecting the project is available below in **Table 4.**

| Table 4. CPW SAM Species Seasonal Use and Restrictions | | |
|---|---|---|
| **Species** | **Seasonal Use** | **CPW Seasonal Restriction** |
| Bald Eagle *(Haliaeetus leucocephalus)* | Winter Forage | No |
| Big Brown Bat (*Eptesicus fuscus*) | Overall Range | No |
| Big Free-tailed Bat (*Nyctinomops macrotis*) | Overall Range | No |
| Brazilian Free-tailed Bat (*Taderia brasiliensis*) | Overall Range | No |
| Black Bear (*Ursus americanus*) | Overall Range | No |
| Elk (*Cervus canedensis*) | Overall Range | No |
| Greater Sandhill Crane (*Antigone canadensis*) | Foraging Area | No |
| Gunnison's Prairie Dog (*Cynomys gunnisoni*) | Overall Range | No |
| Bull Snake (*Pituphis catenifer sayi*) | Overall Range | No |
| Canada Geese (*Branta canadensis*) | Foraging Area<br>Winter Range | No |

| Table 4. CPW SAM Species Seasonal Use and Restrictions | | |
|---|---|---|
| **Species** | **Seasonal Use** | **CPW Seasonal Restriction** |
| Hernandez's Short-horned Lizard (*Phrynosoma hernadesi*) | Overall Range | No |
| Little Brown Myotis (*Myotis lucifungus*) | Overall Range | No |
| Mountain Lion (*Puma concolor*) | Overall Range | No |
| Mule Deer (*Odocoileus hemionus*) | Overall Range | No |
| Plateau Fence Lizard (*Sceloporus tristichus*) | Overall Range | No |
| Prairie Lizard (*Sceloporus undulatus*) | Overall Range | No |
| Prairie Rattlesnake (*Crotalus viridi*) | Overall Range | No |
| Southern Red-backed Vole (*Myodes califonius*) | Overall Range | No |
| Terrestrial Garter Snake (*Thamnophis elegans*) | Overall Range | No |
| White-tailed Jackrabbit (*Lepus townsendii*) | Overall Range | No |

## 4.5 MIGRATORY BIRDS

Kimley-Horn conducted a site visit to observe potential suitable migratory bird habitat on April 17 and 18, 2023. It was determined that the entirety of the site can be classified as suitable migratory bird nesting habitat. Bird surveys focused primarily on trees, shrubs, grassland vegetation, and structures suitable for nesting birds. Kimley-Horn also referenced the IPaC online planning tool (see IPaC Resource List in **Appendix C**). According to the IPaC, there are no USFWS birds of concern within the vicinity oif the study area. No migratory bird nests were observed. Since birds can build new nests from year to year, a pre-construction migratory bird nest survey is recommended to occur prior to, but no more than one week (7 days), before disturbance activities.

*Kimley-Horn Recommendations:*

- A pre-construction avian nest survey is recommended if disturbance activities are to occur during the nesting season (April 1 - August 31).

## 4.6 RAPTORS

All raptor species are protected in Colorado under the MBTA. There are various CPW development buffers for raptor nests depending on the type of raptor species and disturbance activity. CPW also publishes a mapped raptor nest geospatial database. There were no raptor nests observed within the study area or within a 1.0-mile radius. Since raptors can build new nests from year to year, a pre-construction raptor nest survey is recommended to occur prior to, but within the same nesting year as disturbance activities.

*Kimley-Horn Recommendations:*

- A pre-construction raptor nest survey is recommended if disturbance activities are to occur during the nesting season (November 15 – October 31).

## 4.7 BALD AND GOLDEN EAGLES

Kimley-Horn conducted a site visit to observe suitable eagle nesting and roosting habitat within the proposed study area or to be affected by the proposed project for the purposes of due diligence in complying with the BGEPA. No suitable nesting, winter night roosting, or communal roosting sites were observed. No bald eagle nests, bald eagle winter night roosts, or communal roosts were mapped within a 1.0-mile radius of the study area. In addition, no golden eagle nests are mapped within a 1.0-mile radius of the study area. Since eagles can build new nests from year to year, a pre-construction eagle survey is still recommended to occur prior to, but within the same nesting year as disturbance activities.

*Kimley-Horn Recommendations:*

- A pre-construction bald eagle survey is recommended if disturbance activities are to occur during the nesting season (November 15 - July 31).

## 4.8 WILDLIFE UTILIZATION

Direct observation of wildlife utilization or signs of wildlife (sightings, burrows, tracks, scat, etc.) included horned larks (*Eremophila alprestris*), western meadowlark (*Sturnella neglecta*), red-tailed hawk (*Buteo jamaicensis*), ground squirrel burrows *(Urocitellus sp.* or *Ictidomys sp*.), and coyote (*Canis latrans*) scat.

# 5.0 CONCLUSIONS

According to our site visit for biological resources within the study area for the Haynach Hybrid Solar resulted in the following key findings:

- The site does not have suitable habitat for USFWS ESA-listed species. These species are not a constraint to development.
- There are no federally designated critical habitats for ESA listed species within the study area.
- There are no CPW recommended avoidance or minimization measures required for SAM data species.
- No raptor nests were observed within 1.0-mile of the study area; however, pre-construction raptor nest surveys are still recommended if disturbance activities are to occur during the nesting season (November 15 – October 31) since raptors can build new nests from one year to the other.
- There is suitable habitat for migratory birds protected under the MBTA. Pre-construction migratory bird nest surveys are recommended if disturbance activities are to occur during the nesting season (April 1 – August 31).
- No CDA-listed or Alamosa County-listed noxious weed species were observed within the project area and there are no eradication requirements for invasive plants found within the study area.
- There are no conservation easements of areas of special biological concern on site.

This report has been prepared by:
**KIMLEY-HORN AND ASSOCIATES, INC.**
Please contact me at (720) 295-6923 or jesse.carlson@kimley-horn.com should you have any questions.

Sincerely,

Jesse Carlson
Senior Environmental Scientist

# 7.0 References

United States Depart of Agriculture. 2007. Great Basin Silverspot Butterfly (*Speyeria nokomis nokomis* [W.H. Edwards]): A Technical Conservation Assessment. Accessed at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5206805.pdf

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USFWS. 2022a. Gray Wolf (*Canis lupus*). Accessed at: https://ecos.fws.gov/ecp/species/4488

USFWS. 2022b. Mexican Spotted Owl (*Strix occidentalis lucida*). Accessed at: https://ecos.fws.gov/ecp/species/8196

USFWS. 2022c. Southwestern Willow Flycatcher (*Empidonax traillii extimus*). Accessed at: https://ecos.fws.gov/ecp/species/6749

USFWS. 2022d. Monarch Butterfly (*Danaus plexippus*). Accessed at: https://ecos.fws.gov/ecp/species/9743

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# Appendix A: Figures

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Aerial Source/Date: ESRI, 2022: Ownership Source/Date: BLM 2022

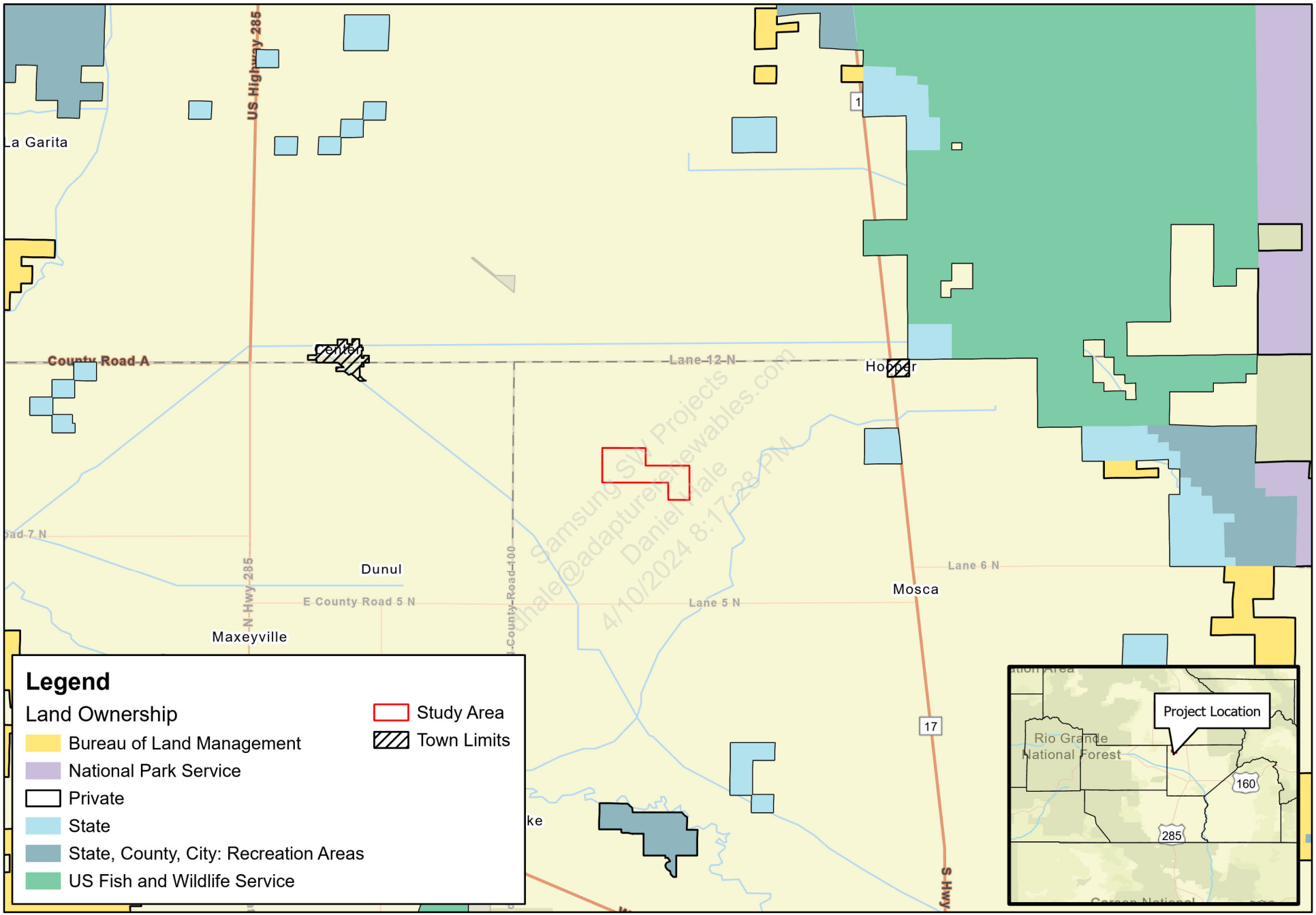



Figure 1: Vicinity Map
Biological Resources Report
Haynach Solar Project
Alamosa County, CO

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TOPO Source/Date: ESRI, 2022:

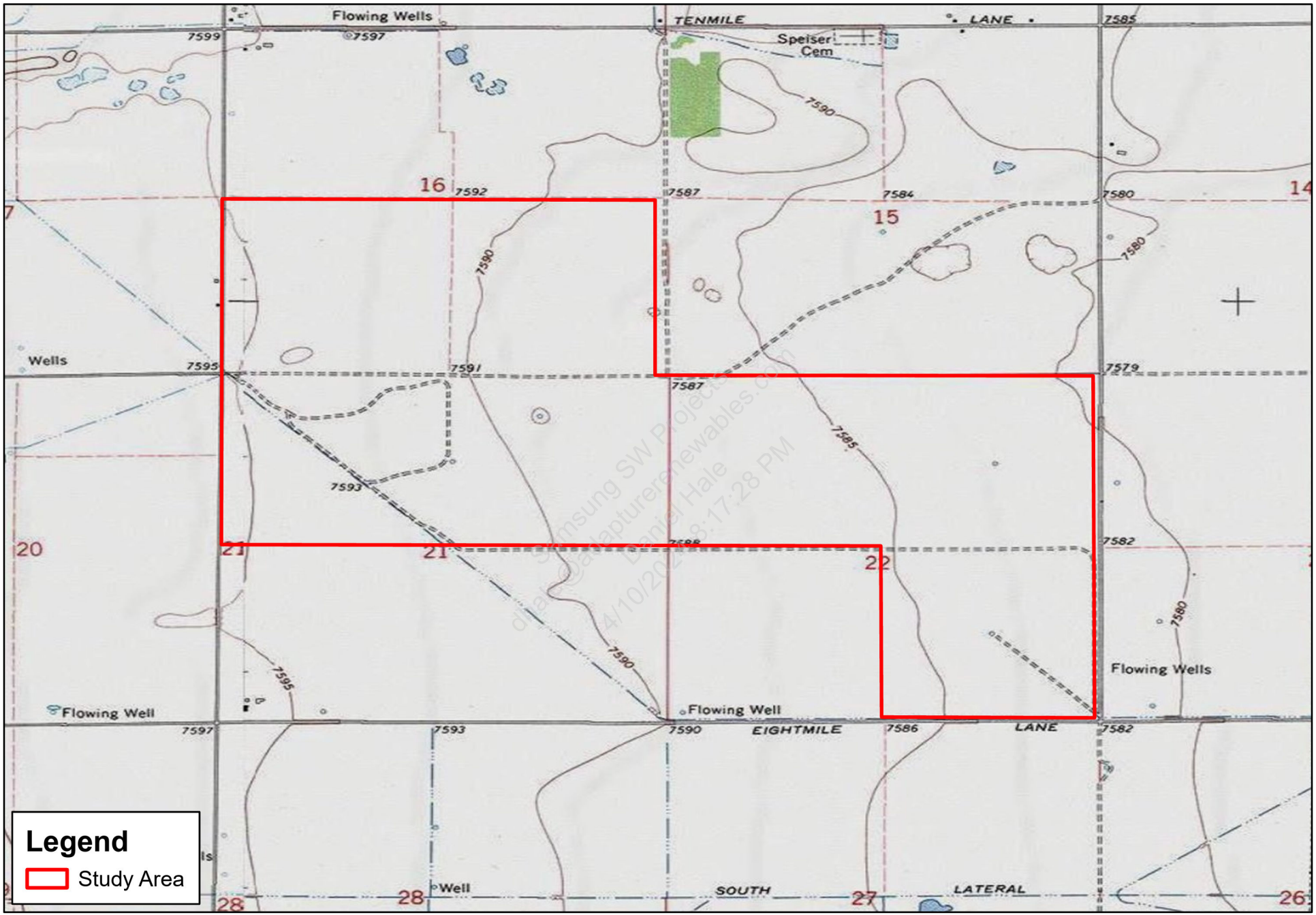



Figure 2: USGS Topo Map
Biological Resources Report
Haynach Solar Project
Alamosa County, CO

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0 1,000 2,000 4,000 Feet

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N W E S

Aerial Source/Date: ESRI, 2023: Hydrology/ NWI Source/Date: USFWS, 2023

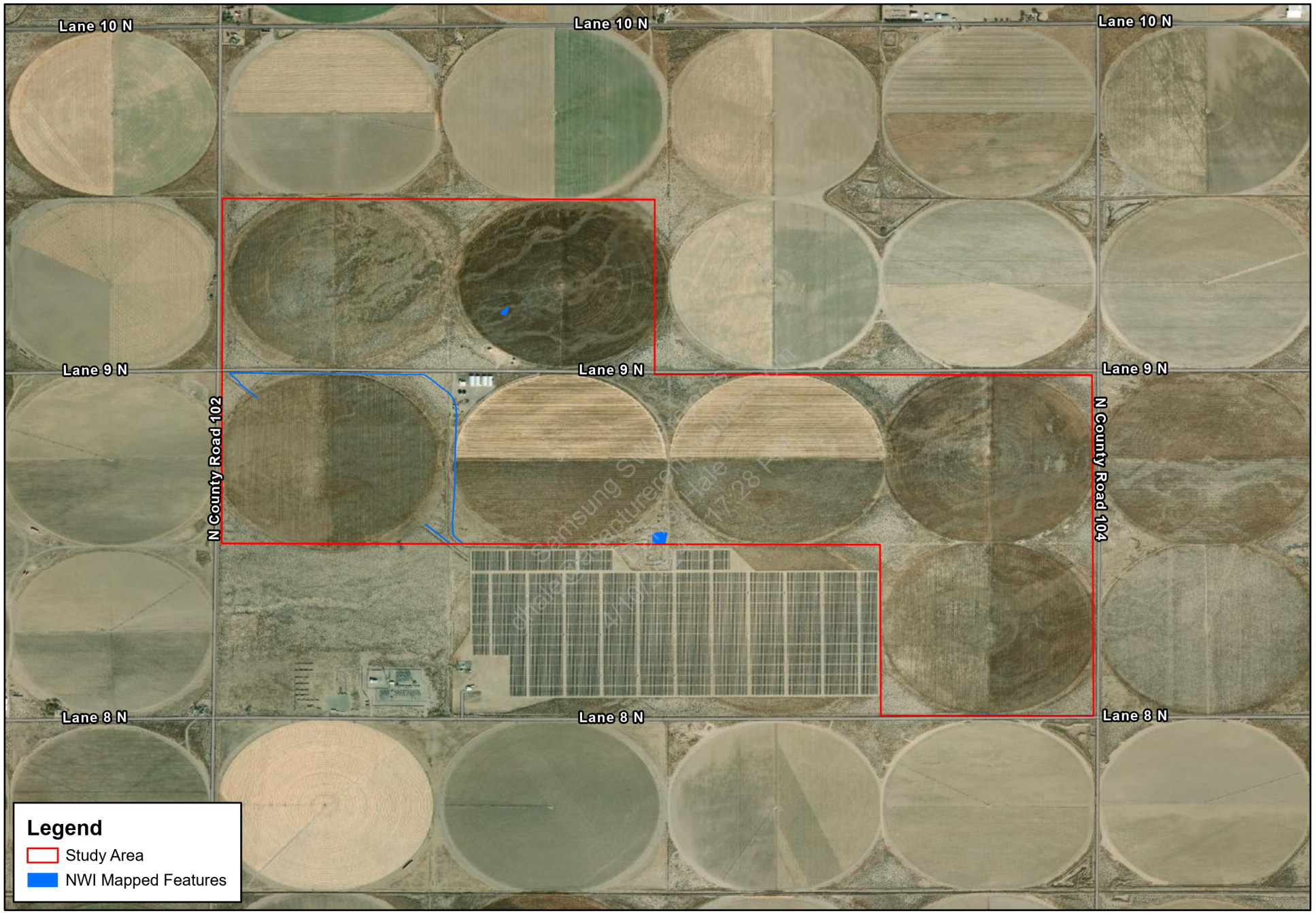



Figure 3: Aerial Map with NWI Hydrology Map
Biological Resources Report
Haynach Solar Project
Alamosa County, CO

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N W E S

Aerial Source/Date: ESRI, 2023: Soils Data Source/Date: NRCS 2023

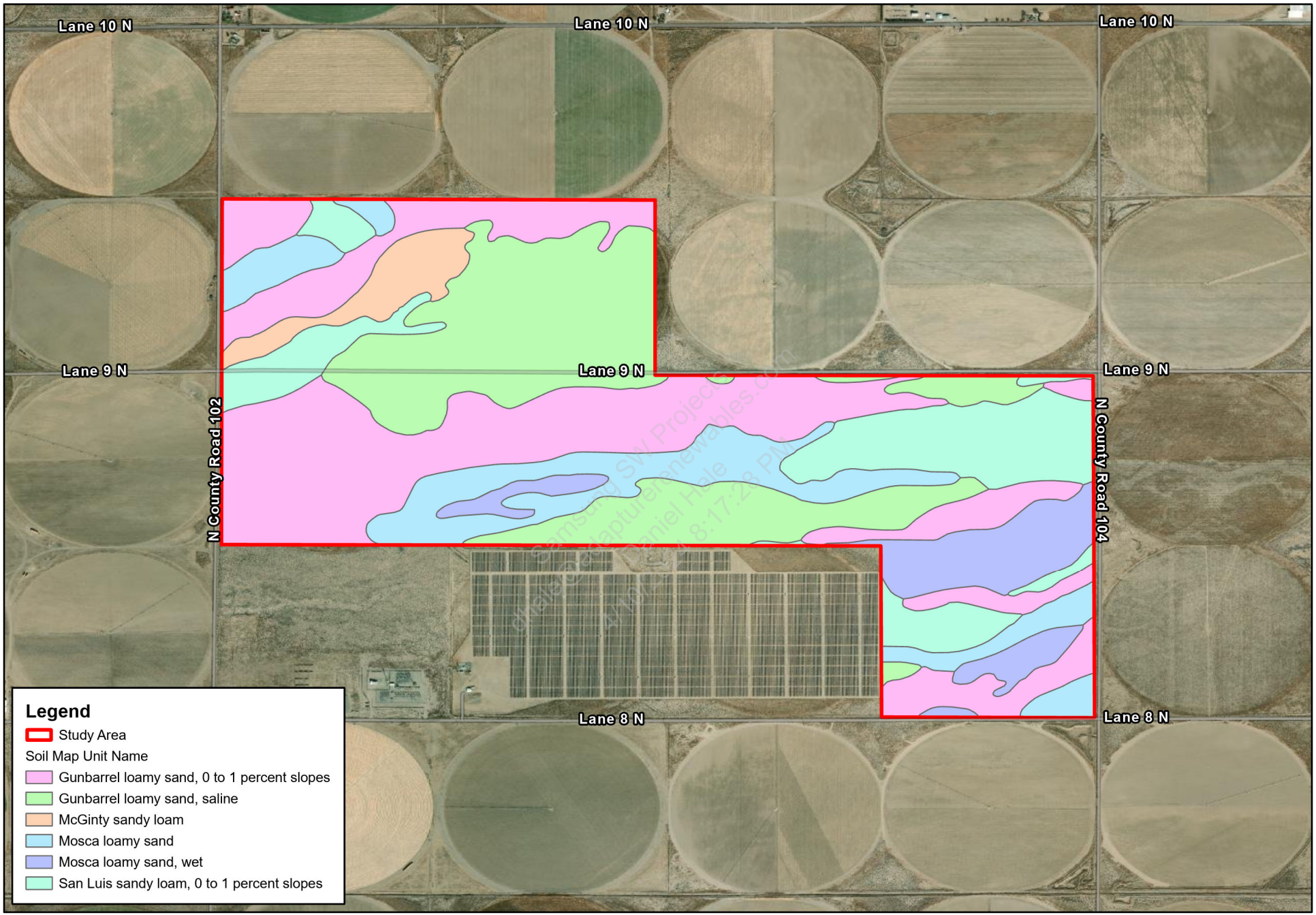



Figure 4: Soils Map
Biological Resources Report
Haynach Solar Project
Alamosa County, CO

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N W E S

Aerial Source/Date: ESRI, 2022: Flood Hazard Layer Source/Date: FEMA 2023

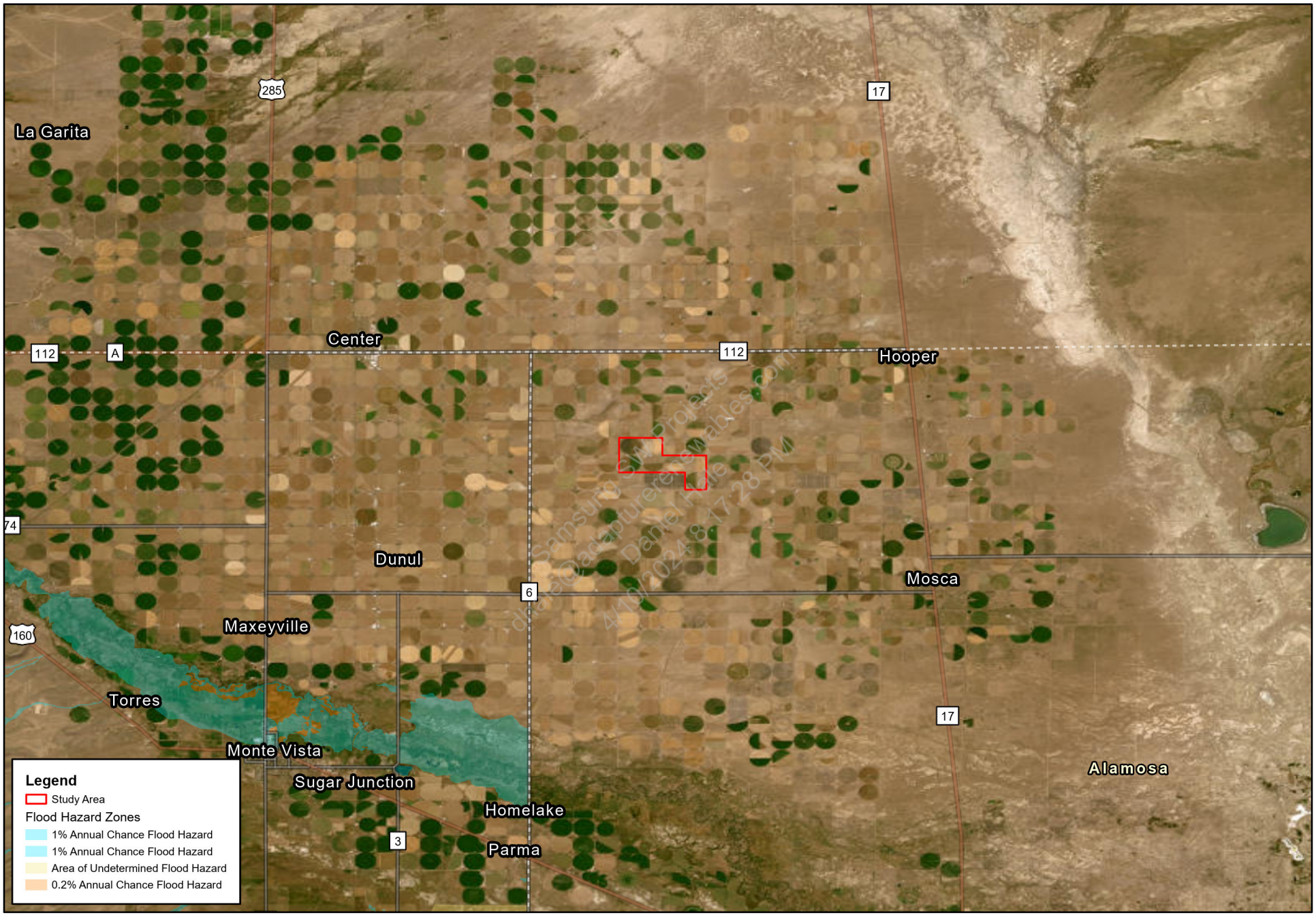



Figure 5: FEMA Flood Hazard Map
Biological Resources Report
Haynach Solar Project
Alamosa County, CO

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N W E S

Aerial Source/Date: ESRI, 2022:

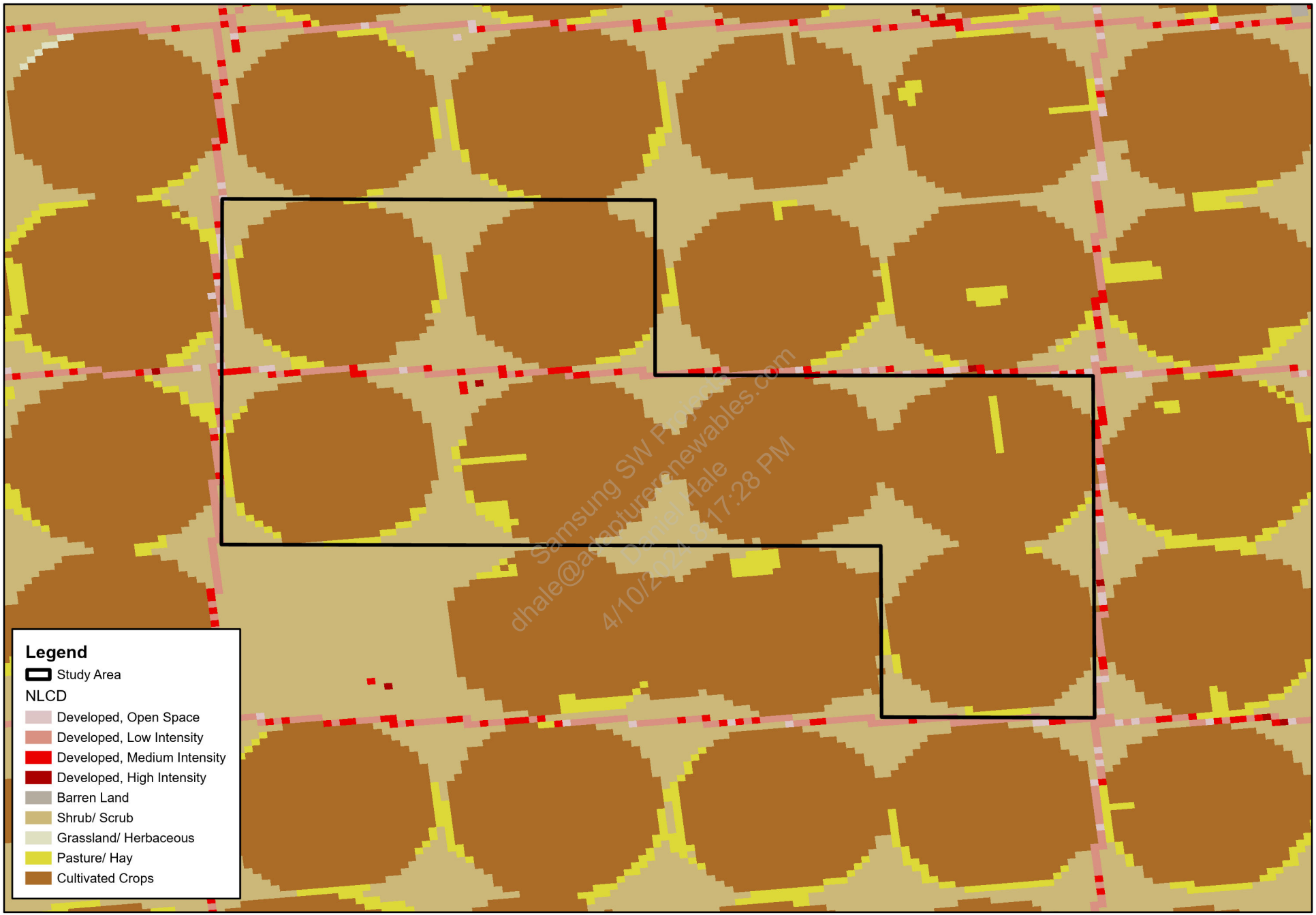



Figure 6: National Land Cover Dataset (NLCD) Map
Biological Resources Report
Haynach Solar Project
Alamosa County, CO

Aerial Source/Date: ESRI, 2023

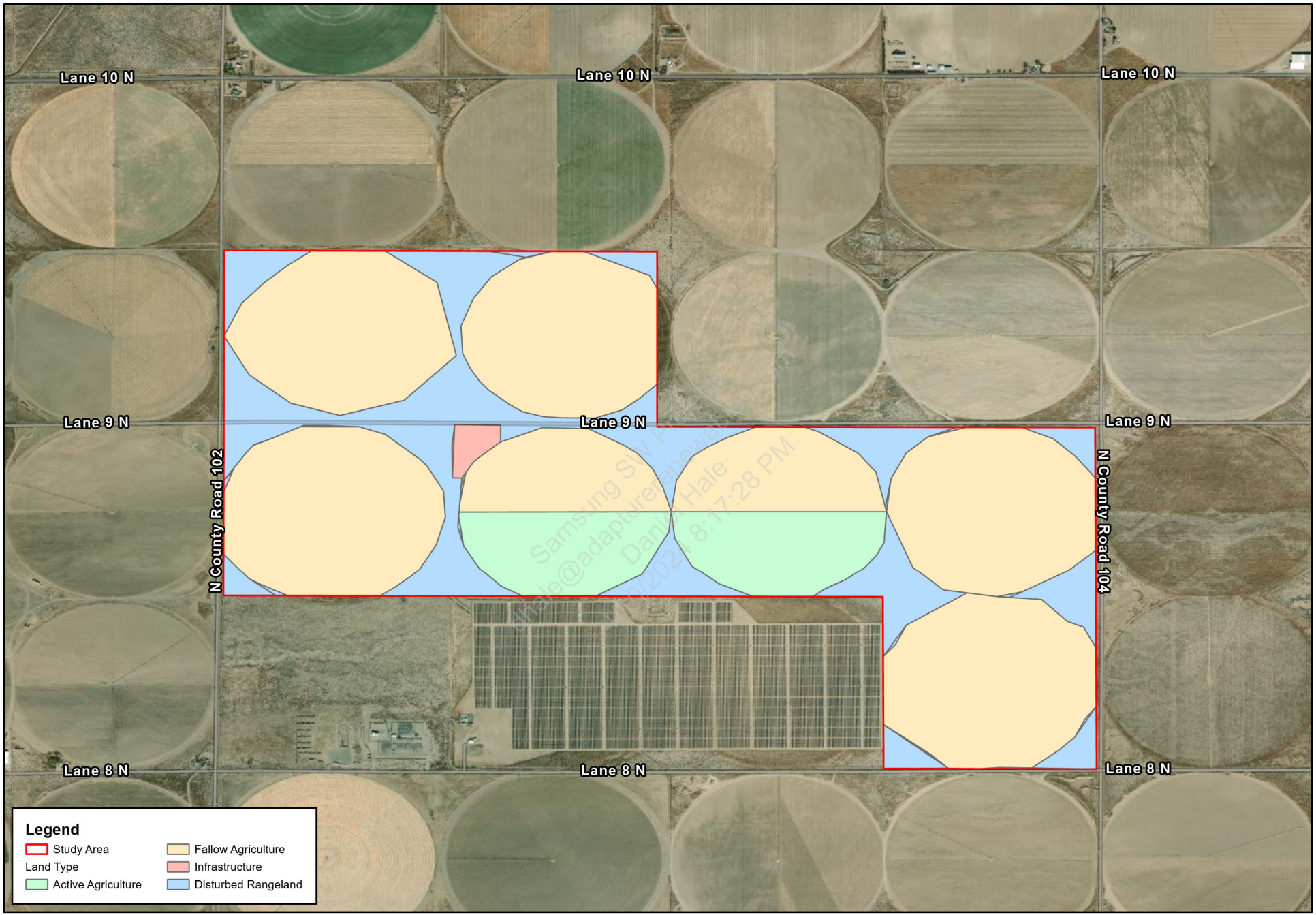



Figure 7: Field Resources Map
Biological Resources Report
Haynach Solar Project
Alamosa County, CO

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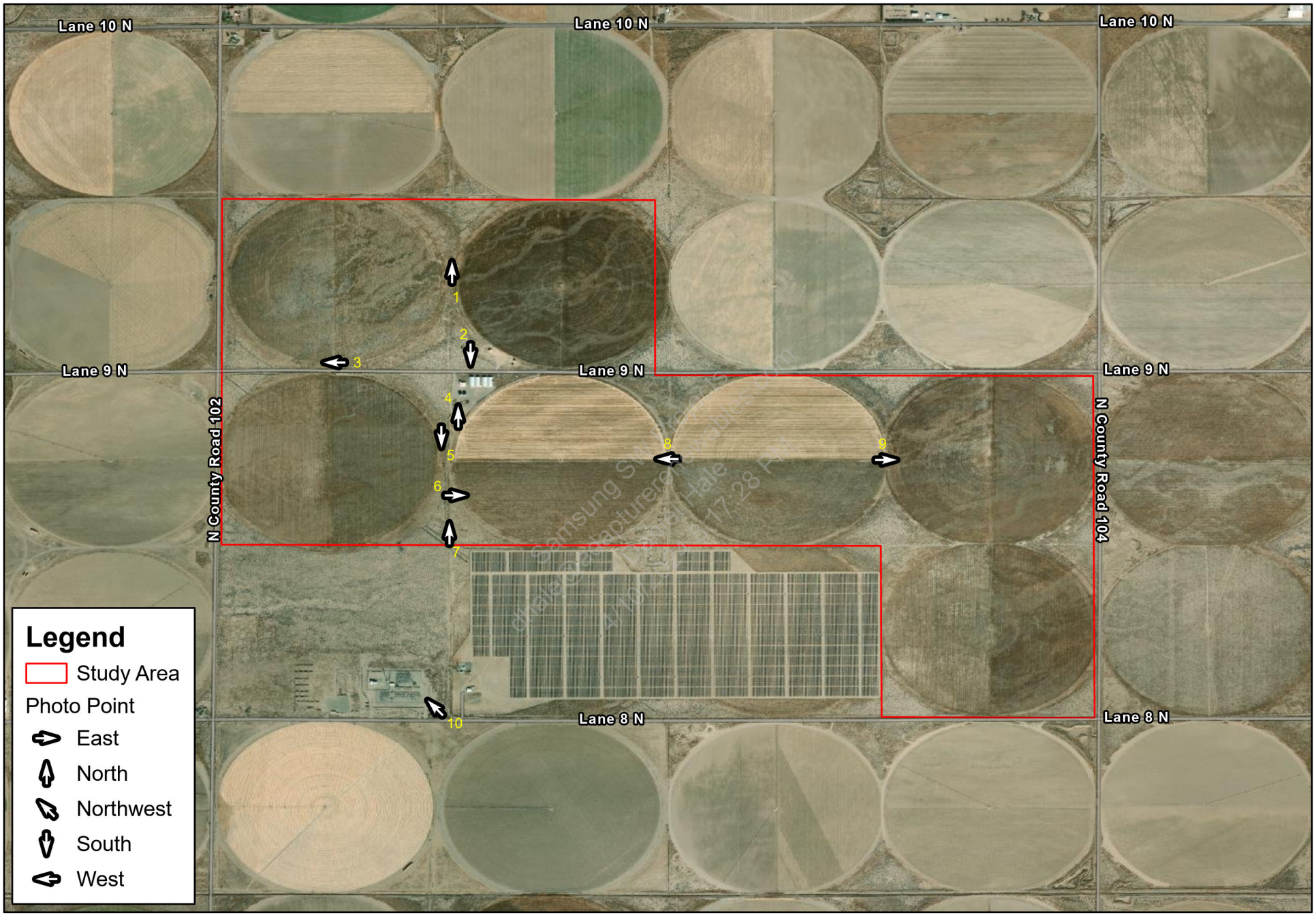
N W E S

# Appendix B: Photo Location Map and Site Visit Photographs

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Aerial Source/Date: ESRI, 2023




Biological Photo Location Map
Biological Resources Report
Haynach Solar Project
Alamosa County, CO

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N W E S

## Photo No. 1



View from the north-central portion of the study area looking north along 230kV TriState – PSCo Transmission Line (Hooper Solar Substation). Note disturbed rangeland (area between agriculture plots) in the foreground.

## Photo No. 2



View from the north-central portion of the study area looking south at typical disturbed rangeland (area between agriculture plots).

## Photo No. 3



View from the northwestern portion of the study area looking west at typical fallow agriculture.

## Photo No. 4



View from the western portion of the study area looking north at Lee Welch Farm structures.

## Photo No. 5



View from the central portion of the study area looking south along 230kV TriState – PSCo Transmission Line (Hooper Solar Substation).

## Photo No. 6



View from the central portion of the study area looking east towards typical active agriculture (wheat) field.

## Photo No. 7



View from the south-central portion of the study area looking north at typical disturbed rangeland (area between agriculture plots).

## Photo No. 8



View from the central portion of the study area looking west at typical active agriculture field (south) and typical fallow agriculture (north).

## Photo No. 9



View from east-central portion of the study area looking east at typical fallow agriculture.

## Photo No. 10



View from outside the study area looking northwest at Haynach point of interconnection (Hooper Solar Substation).

# Appendix C: USFWS IPAC Official Species List

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Western Colorado Ecological Services Field Office
445 West Gunnison Avenue, Suite 240
Grand Junction, CO 81501-5711
Phone: (970) 628-7180 Fax: (970) 245-6933

In Reply Refer To:
Project Code: 2023-0016156
Project Name: Haynach

April 12, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

**Migratory Birds**: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

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# OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

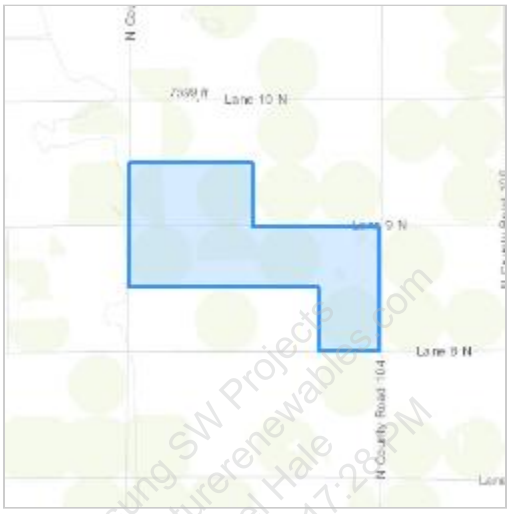
**Western Colorado Ecological Services Field Office**
445 West Gunnison Avenue, Suite 240
Grand Junction, CO 81501-5711
(970) 628-7180

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# PROJECT SUMMARY

Project Code: 2023-0016156
Project Name: Haynach
Project Type: New Constr - Above Ground
Project Description: Site Analysis
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.7016107,-105.9831691014503,14z




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Counties: Alamosa County, Colorado

# ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

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## MAMMALS

| NAME | STATUS |
|---|---|
| Gray Wolf *Canis lupus*<br>Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico.<br>There is **final** critical habitat for this species.<br>This species only needs to be considered under the following conditions:<br>▪ Lone, dispersing gray wolves may be present throughout the state of Colorado. If your activity includes a predator management program, please consider this species in your environmental review.<br>Species profile: https://ecos.fws.gov/ecp/species/4488 | Endangered |

## BIRDS

| NAME | STATUS |
|---|---|
| Mexican Spotted Owl *Strix occidentalis lucida*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/8196 | Threatened |
| Southwestern Willow Flycatcher *Empidonax traillii extimus*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/6749 | Endangered |

## INSECTS

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9743 | Candidate |
| Silverspot *Speyeria nokomis nokomis*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/2813 | Proposed Threatened |

## CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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# USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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# MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

THERE ARE NO FWS MIGRATORY BIRDS OF CONCERN WITHIN THE VICINITY OF YOUR PROJECT AREA.

## MIGRATORY BIRDS FAQ

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?**

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list

of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

**How do I know if a bird is breeding, wintering or migrating in my area?**
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

**What are the levels of concern for migratory birds?**
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

**Details about birds that are potentially affected by offshore projects**
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical

Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

**What if I have eagles on my list?**
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

**Proper Interpretation and Use of Your Migratory Bird Report**
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

# WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- Riverine

FRESHWATER EMERGENT WETLAND

- Palustrine

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# IPAC USER CONTACT INFORMATION

Agency: Kimley-Horn
Name: Jesse Carlson
Address: 380 Interlocken Crescent Suite 100
City: Broomfield
State: CO
Zip: 80021
Email jesse.carlson@kimley-horn.com
Phone: 2532982432

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Western Colorado Ecological Services Field Office
445 West Gunnison Avenue, Suite 240
Grand Junction, CO 81501-5711
Phone: (970) 628-7180 Fax: (970) 245-6933

In Reply Refer To: 07/22/2025 21:29:10 UTC
Project Code: 2025-0125405
Project Name: Haynach Hybrid Energy Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat (Colorado Ecological Services Field Office). Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the ESA is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR

402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf.

Projects and activities without a Federal nexus (e.g., without Federal funding, permit, or authorization) should be evaluated for the potential to “take” listed wildlife. Take does not apply to listed plants and to designated critical habitat. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (ESA Section 3, Definitions). Harm in the definition of “take” in the ESA means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering (50 CFR 17.3).

**Gray Wolf**: On November 8, 2023, the Service promulgated an ESA section 10(j) (i.e., experimental population) rule (10(j) rule) for gray wolf (*Canis lupus*) within the State of Colorado (88 FR 77014). For purposes of ESA section 7 consultation, we treat experimental populations as if they are proposed for listing, except on National Park Service and Service lands, where they are treated as threatened. Evaluations for proposed species are completed under the regulations for conferencing (50 CFR 402.10). Conferencing for species that are proposed for Federal listing, or for proposed critical habitat, is only required if a proposed action is likely to jeopardize the continued existence of a species or will result in destruction or adverse modification of proposed critical habitat. If an action agency determines that their action would not jeopardize the continued existence of the species, and/or would not result in the destruction or adverse modification of critical habitat, and the Service concurs, the conferencing requirement is fulfilled.

**Colorado River Fish/Depletions:** Formal interagency consultation under section 7 of the ESA is required for projects that may lead to depletions of water from any system that is a tributary to the Colorado River. Federal agency actions resulting in water depletions to the Colorado River system may affect the endangered bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), and the threatened humpback chub (*Gila cypha*), and their designated critical habitats.

Water depletions include evaporative losses and consumptive use of surface or groundwater within the affected basin, often characterized as diversion minus return flows. Project elements that could be associated with depletions include, but are not limited to: ponds, lakes, and reservoirs (e.g., detention, recreation, irrigation, storage, stock watering, municipal storage, and power generation); drilling, hydraulic fracturing and completion of oil and gas wells; hydrostatic testing of pipelines; water wells; dust abatement; diversion structures; and water treatment facilities. Any actions that may result in water depletions should be identified. An analysis of the water depletion should include: an estimate of the amount and timing of the average annual water use (both historic and new uses) and methods of arriving at such estimates; location of water use or where diversion occurs, as specifically as possible; if and when the water will be returned to the system; and the intended use of the water. Depending on Project details, the Service may have more specific questions regarding the potential consumptive use of the water.

The Service, in accordance with the Upper Colorado River Endangered Fish Recovery Program (https://coloradoriverrecovery.org/uc/), adopted a *de minimis* policy, which states that water-related activities in the Upper Colorado River Basin that result in less than 10 acre-foot per year of depletions in flow have no effect on the Colorado River endangered fish species and their critical habitat, and thus do not require consultation for potential effects on those species and critical habitat. While no section 7 consultation is needed, the Service requests Federal agencies notify the Upper Colorado Fishes Coordinator of depletions between 0.1 and 10 acre-feet per year with the approximate location of the project (e.g., reference to the most proximate surface water or tributary), the water use (e.g., agricultural, oil and gas, energy), and the timing of and depletion

amount. Detention basins designed to detain runoff for less than 72 hours, and temporary withdrawals of water outside of critical habitat (e.g., for hydrostatic pipeline testing) that return all the water to the same drainage basin within 30 days, are considered to have no effect and do not require consultation.

**Suckley's Cuckoo Bumble Bee**: On December 17, 2024, Suckley's cuckoo bumble bee (*Bombus suckleyi*) (Suckley's) was proposed for listing as an endangered species (89 FR 102074). Suckley's is an obligate social parasite of social bumble bees in the genus *Bombus*. Suckley's cannot successfully reproduce without the availability of suitable host colonies. It is a semi-specialist parasite and confirmed to usurp nests of Western bumble bee *(Bombus occiddentalis)* and Nevada bumble bees (*Bombus nevadensis*) (Service 2024).

Based on the best available information, no Suckley's have been observed in Colorado since 2014 despite ongoing surveys. The Species Status Assessment (SSA) shows observations since 2018 occur only in northern latitudes, primarily in Canada (Service 2024), but the species may persist in high quality upper elevation habitats in western States. While Suckley's is proposed for listing, there is no prohibition of "take" under Section 9 of the ESA; therefore, projects without a federal nexus, do not need to engage with the Service to exempt take under the ESA. However, we encourage including conservation measures benefiting pollinators and pollinator habitat into projects. Examples include retaining suitable foraging (diversity and abundance of native floral resources), nesting (suitable host colony above or below ground), and overwintering habitat (loose substrates such as leaf litter, duff, rotting logs); maintaining habitat for host bumble bees by avoiding impacts to abandoned underground holes (rodent burrows); and revegetation efforts that include native seed mixes to promote an abundance and diversity of native floral resources. Additionally, we recommend supporting and conducting general bumble bee and pollinator surveys.

While the species is not currently known to occur in Colorado, we encourage proactive conservation actions to protect and conserve pollinators and pollinator habitat. Examples include retaining suitable foraging (diversity and abundance of native floral resources), nesting (suitable host colony above or below ground), and overwintering habitat (loose substrates such as leaf litter, duff, rotting logs); maintaining habitat for host bumble bees by avoiding impacts to abandoned underground holes (rodent burrows); and revegetation efforts that include native seed mixes to promote an abundance and diversity of native floral resources. Additionally, we recommend supporting and conducting general bumble bee and pollinator surveys.

**Migratory Birds**: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

# OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Western Colorado Ecological Services Field Office**
445 West Gunnison Avenue, Suite 240
Grand Junction, CO 81501-5711
(970) 628-7180

# PROJECT SUMMARY

Project Code: 2025-0125405
Project Name: Haynach Hybrid Energy Project
Project Type: Distribution Line - New Construction - Above Ground
Project Description: Haynach Hybrid Energy development
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.7017379,-105.98314813703344,14z




Counties: Alamosa County, Colorado

# ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## MAMMALS

| NAME | STATUS |
|---|---|
| Gray Wolf *Canis lupus*<br>Population: CO<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/4488 | Experimental Population, Non-Essential |

## BIRDS

| NAME | STATUS |
|---|---|
| Southwestern Willow Flycatcher *Empidonax traillii extimus*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/6749 | Endangered |

## INSECTS

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus*<br>There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/9743 | Proposed Threatened |
| Silverspot *Speyeria nokomis nokomis*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/2813 | Threatened |
| Suckley's Cuckoo Bumble Bee *Bombus suckleyi*<br>Population:<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/10885 | Proposed Endangered |

## CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

# USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

# BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

# MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|---|
| Broad-tailed Hummingbird *Selasphorus platycercus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/11935 | Breeds May 25 to Aug 21 |

# PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

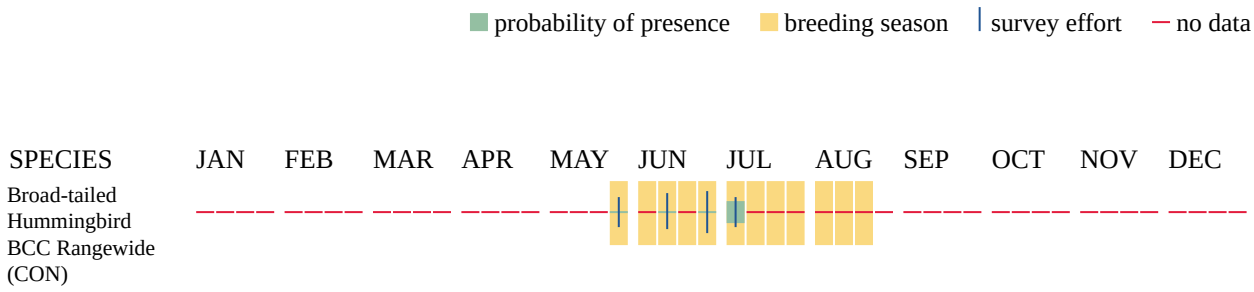
**Probability of Presence** (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

**Breeding Season** (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

**Survey Effort** (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

**No Data** (–)
A week is marked as having no data if there were no survey events for that week.




Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management

- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

# WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1C

FRESHWATER POND

- PUSAx

RIVERINE

- R4SBAx
- R5UBFx

# IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Alison Rohwer
Address: 2800 Cornerstone Drive B2-211
City: Pagosa Springs
State: CO
Zip: 81147
Email rohwer@ecosphere-services.com
Phone: 9704883794

CODEX

Colorado's Conservation Data Explorer

# Project Review Report

## Project Description

Potential utility-scale solar development

## Project Information

Report Generation Date: 7/15/2025 01:59:35 PM

Project Title: Haynach Solar

User Project Number(s):

System Generated ID: CODEX-5104

Project Type: Energy

Project Size: 1,143.79 (acres)

Latitude/Longitude: 37.702665 / -105.983845

County(s): ALAMOSA

Watershed(s) HUC 8: San Luis

Township/Range and/or Section(s): 040N009E - 17 - NM, 040N009E - 16 - NM, 040N009E - 15 - NM, 040N009E - 20 - NM, 040N009E - 21 - NM, 040N009E - 22 - NM

## Contact Information

Organization: Barr Engineering Co.

Contact Name: Alison Rohwer

Contact Phone: 970-759-2702

Contact Email: ARohwer@Barr.com

Contact Address: 2800 Cornerstone Drive B2-211 Suite E4, Pagosa Springs, CO 81147

Submitted On Behalf Of: PRIVATE

Prepared By:

# Project Report:

The information contained herein represents the results of a search of Colorado's Conservation Data Explorer (CODEX) and can be used as notice to anticipate possible impacts or identify areas of interest. This tool queries multiple conservation datasets and includes a synthesis of Colorado Natural Heritage Program (CNHP) and Colorado Parks and Wildlife (CPW) data for sensitive animal and plant species and natural communities. Care should be taken in interpreting these data.

Please note that the absence of data for a particular area, species, or habitat does not necessarily mean that these natural heritage resources do not occur on or adjacent to the project site, rather that our files do not currently contain information to document their presence. CODEX information should not replace field studies necessary for more localized planning efforts, especially if impacts to wildlife habitat are possible. Although every attempt is made to provide the most current and precise information possible, please be aware that some of our sources provide a higher level of accuracy than others, and some interpretation may be required. CODEX data is constantly updated and revised. Please contact CNHP, CPW and our partners for assistance with interpretation of this report or to obtain more information.

# Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. **This review does not constitute environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the review of site-specific projects by CNHP and CPW and our partners.**
2. This Project Report is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
3. The Conservation Data Explorer (CODEX) data is constantly changing and being updated and is not intended to be the final word on the potential distribution of special status species. Colorado is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. CODEX data contains information about species occurrences that have actually been reported to CNHP, CPW and our partners. Not all of Colorado has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.

# Location Accuracy Disclaimer:

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

# Contact for CODEX Support:

## Colorado Natural Heritage Program (CNHP)

CNHP
Colorado State University
1475 Campus Delivery
Fort Collins, CO 80523-1475

**Tel:** (970) 491-7331
**Email:** CNHP_codex_support@mail.colostate.edu
**CNHP Website:** cnhp.colostate.edu

## Colorado Parks and Wildlife

For support regarding project review of land use impacts to wildlife, please contact the regional office in which your project resides and visit https://cpw.state.co.us/conservation/Pages/CON-Energy-Land.aspx

**CPW Website :** cpw.state.co.us

### Northeast Region

**Denver Office**
6060 Broadway
Denver, CO 80216
**Tel:** (303) 291-7227

### Southeast Region

**Colorado Springs Office**
4255 Sinton Road
Colorado Springs, CO 80907
**Tel:** (719) 227-5200

### Northwest Region

**Grand Junction Office**
711 Independent Avenue
Grand Junction, CO 81505
**Tel:** (970) 255-6100

### Southwest Region

**Durango Office**
151 East 16th Street
Durango, CO 81301
**Tel:** (970) 247-0855

For questions regarding CPW data in CODEX please contact 303-291-7152 or matt.schulz@state.co.us

# Haynach Solar

## Aerial Image with Locator Map





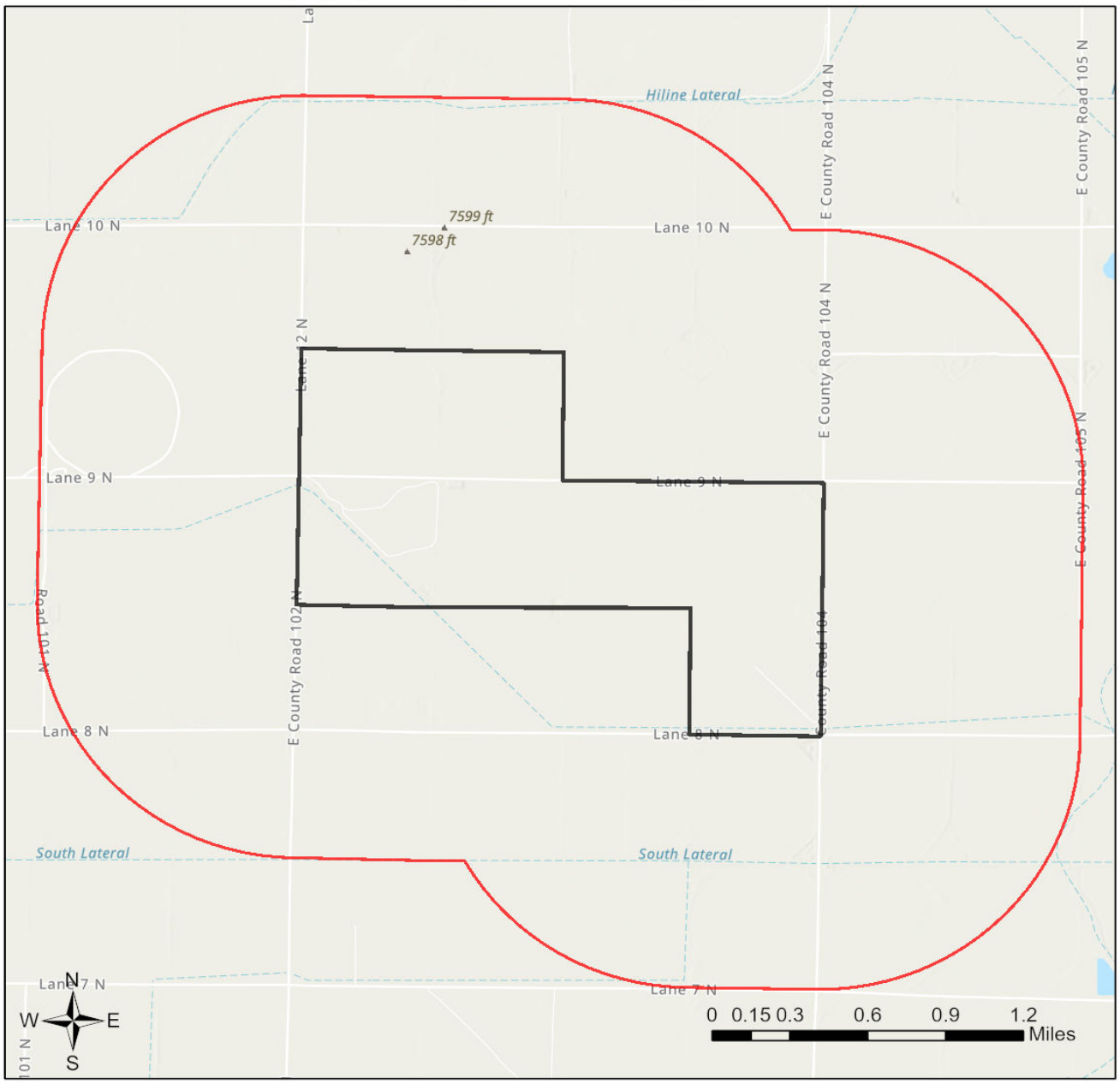


Buffered Search Area
Project Boundary

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Earthstar Geographics
Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau,

# Haynach Solar

## Topographic Map with Land Management Status

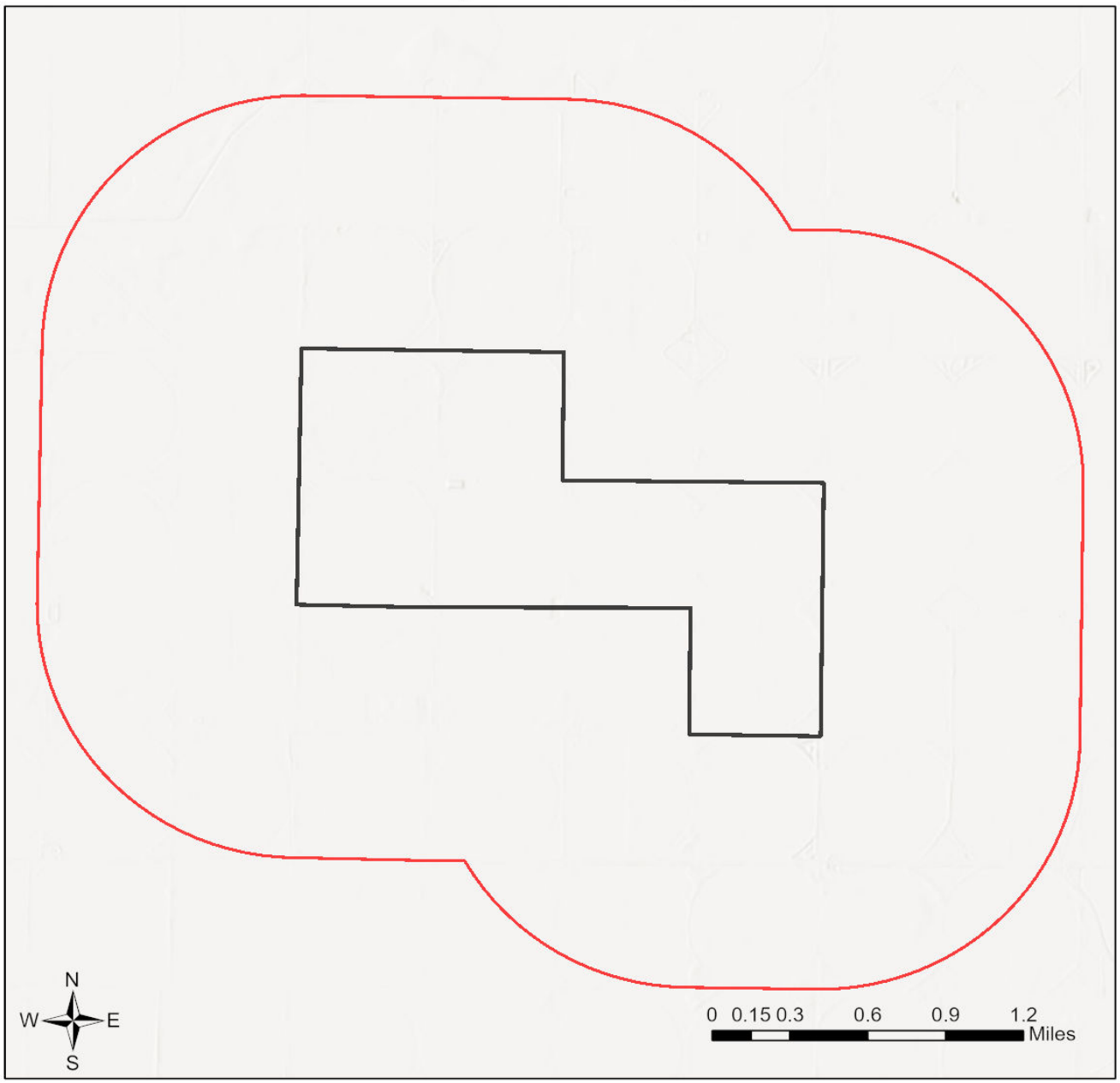



- Buffered Search Area
- Project Boundary
- Misc Federal (BOR, DOD, Misc)
- BLM
- NPS
- USFS
- USFWS
- Tribal
- State
- Local
- NGO/Land Trust
- Private Conservation
- Private

Esri, NASA, NGA, USGS, FEMA
Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS

# Haynach Solar

## Web Map As Submitted By User




Esri, NASA, NGA, USGS, FEMA

## Regulatory Species

### Table 1. Documented Occurrences Within 1 Miles Of Project Area

No results were found for this project area.

### Table 2. Potential Regulatory Species within Project Area: Models, Range Maps, or Records with Low Precision

| Major Group | Scientific Name | Common Name | Data Type | Global Rarity | State Rarity | ESA Status | CO Status | Other Status | Data Source |
|---|---|---|---|---|---|---|---|---|---|
| Birds | Aquila chrysaetos | Golden Eagle | CPW Breeding Range | G5 | S3S4B,S4N | | | BGEPA/BLM/SWAP Tier 1 | CPW 20231222 |
| Birds | Haliaeetus leucocephalus | Bald Eagle | CPW Winter Forage | G5 | S3B,S3N | | SC | BGEPA/BLM/SWAP Tier 2/USFS | CPW 20231222 |

### Table 3. Fish & Wildlife Service Critical Habitats within 1 Miles of Project Area

No results were found for this project area.

## Other Species of Concern

### Table 4. Documented Occurrences within 1 Miles of Project Area: Rare Species, Natural Communities, and Species of Economic, Recreational or Conservation Value

| Major Group | Scientific Name | Common Name | Data Type | Global Rarity | State Rarity | Viability Rank | Last Observation | ESA Status | CO Status | Other Status | CNHP Identifier | Data Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Birds | Antigone canadensis tabida | Greater Sandhill Crane | CPW Foraging Area | G5T5 | S2B,S4N | | | | SC | SWAP Tier 1 | | CPW 20231222 |

**Table 5. Potential Occurrences within Project Area: Models, Range Maps, or Records with Low Precision**

| Major Group | Scientific Name | Common Name | Data Type | Global Rarity | State Rarity | ESA Status | CO Status | Other Status | Data Source |
|---|---|---|---|---|---|---|---|---|---|
| Birds | Antigone canadensis tabida | Greater Sandhill Crane | CPW Overall Range | G5T5 | S2B,S4N | | SC | SWAP Tier 1 | CPW 20231222 |
| Birds | Athene cunicularia | Burrowing Owl | CPW Breeding Range | G4 | S4B | | ST | BLM/SWAP Tier 1/USFS | CPW 20231222 |
| Birds | Botaurus lentiginosus | American Bittern | CPW Breeding Range | G5 | S3S4B | | | SWAP Tier 2 | CPW 20231222 |
| Birds | Branta canadensis | Canada Goose | CPW Foraging Area | G5 | S5 | | | | CPW 20231222 |
| Birds | Branta canadensis | Canada Goose | CPW Winter Range | G5 | S5 | | | | CPW 20231222 |
| Birds | Buteo swainsoni | Swainson's Hawk | CPW Breeding Range | G5 | S5B | | | SWAP Tier 2 | CPW 20231222 |
| Birds | Circus hudsonius | Northern Harrier | CPW Breeding Range | G5 | S3B | | | SWAP Tier 2/USFS | CPW 20231222 |
| Birds | Columba fasciata (Patagioenas fasciata) | Band-tailed Pigeon | CPW Breeding Range | G4 | S4B | | | SWAP Tier 2 | CPW 20231222 |
| Birds | Falco mexicanus | Prairie Falcon | CPW Breeding Range | G5 | S4B,S4N | | | BLM/SWAP Tier 2 | CPW 20231222 |
| Birds | Leiothlypis virginiae | Virginia's Warbler | CPW Breeding Range | G5 | S5 | | | SWAP Tier 2/USFS | CPW 20231222 |
| Birds | Leucosticte atrata | Black Rosy-finch | CPW Winter Range | G4 | S4N | | | SWAP Tier 2 | CPW 20231222 |
| Birds | Leucosticte australis | Brown-capped Rosy-finch | CPW Overall Range | G4 | S3B,S4N | | | BLM/SWAP Tier 1 | CPW 20231222 |
| Birds | Peucaea cassinii | Cassin's Sparrow | CPW Breeding Range | G5 | S4B | | | SWAP Tier 2/USFS | CPW 20231222 |
| Birds | Plegadis chihi | White-faced Ibis | CPW Breeding Range | G5 | S2B | | | BLM/SWAP Tier 2 | CPW 20231222 |
| Birds | Selasphorus rufus | Rufous Hummingbird | CPW Migration Range | G4 | SNA | | | SWAP Tier 2 | CPW 20231222 |
| Birds | Spizella breweri | Brewer's Sparrow | CPW Breeding Range | G5 | S4B | | | BLM/SWAP Tier 2/USFS | CPW 20231222 |
| Insects | Agapema homogena | A Giant Silkmoth | Range Map - within range | G4 | S2 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Amblyderus triplehorni | Great Sand Dunes Anthicid Beetle | Range Map - within range | GNR | S1 | | | | CNHP 20210615 |
| Insects | Amblyderus werneri | Great Sand Dunes Anthicid Beetle | Range Map - within range | G1? | S1 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Bombus (Cullumanobombus) morrisoni (Bombus morrisoni) | Morrison's Bumble Bee | Range Map - within range | G3 | S2S4 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Bombus (Thoracobombus) pensylvanicus (Bombus pensylvanicus) | American Bumble Bee | Range Map - within range | G3G4 | S2S3 | | | BLM/SWAP Tier 2 | CNHP 20210615 |
| Insects | Bombus fervidus | Yellow Bumble Bee | Range Map - within range | GNR | S3S4 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Cicindela theatina | San Luis Dunes Tiger Beetle | Range Map - present | G1 | S1 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Coloradia luski | Lusk's Pinemoth | Range Map - within range | G4 | S3 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Copablepharon pictum | A Noctuid Moth | Range Map - present | GNR | S1 | | | | CNHP 20210615 |
| Insects | Daihinibaenetes giganteus | Giant Sand Treader Cricket | Range Map - present | GNR | S1 | | | | CNHP 20210615 |
| Insects | Eleodes hirtipennis | A Circus Beetle | Range Map - present | GNR | S1 | | | | CNHP 20210615 |
| Insects | Euphilotes rita coloradensis | Rita Dotted- Blue | Range Map - within range | G3G4T3 | S2 | | | SWAP Tier 2 | CNHP 20210615 |

**Table 5. Potential Occurrences within Project Area: Models, Range Maps, or Records with Low Precision**

| Major Group | Scientific Name | Common Name | Data Type | Global Rarity | State Rarity | ESA Status | CO Status | Other Status | Data Source |
|---|---|---|---|---|---|---|---|---|---|
| Insects | Libellula composita | Bleached Skimmer | Range Map - present | G3G4 | S2 | | | | CNHP 20210615 |
| Insects | Libellula nodisticta | Hoary Skimmer | Range Map - present | G4 | S1 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Polites rhesus | Rhesus Skipper | Range Map - within range | G3? | S2S3 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Pyrgus xanthus | Xanthus Skipper | Range Map - within range | G3 | S3 | | | SWAP Tier 2 | CNHP 20210615 |
| Insects | Schinia avemensis | Gold-edged Gem | Range Map - present | G1G3 | S2 | | | | CNHP 20210615 |
| Insects | Stinga morrisoni | Morrison's Skipper | Range Map - within range | G3G4 | S3S4 | | | | CNHP 20210615 |
| Insects | Sympetrum costiferum | Saffron-winged Meadowhawk | Range Map - present | G5 | S3 | | | | CNHP 20210615 |
| Mammals | Cervus canadensis (Cervus elaphus) | Elk | CPW Overall Range | G5 | S5 | | | | CPW 20231222 |
| Mammals | Cynomys gunnisoni | Gunnison's Prairie Dog | CPW Overall Range | G3? | S3 | | | BLM/SWAP Tier 1/USFS | CPW 20231222 |
| Mammals | Eptesicus fuscus | Big Brown Bat | CPW Overall Range | G5 | S5 | | | | CPW 20231222 |
| Mammals | Lepus townsendii | White-tailed Jackrabbit | CPW Overall Range | G5 | S4 | | | SWAP Tier 2 | CPW 20231222 |
| Mammals | Myodes gapperi gauti (Clethrionomys gapperi gauti) | Southern Red-backed Vole Subsp | CPW Overall Range | G5TNR | S4 | | | | CPW 20231222 |
| Mammals | Myotis lucifugus | Little Brown Myotis | CPW Overall Range | G3G4 | S4 | | | BLM/SWAP Tier 1 | CPW 20231222 |
| Mammals | Neotamias quadrivittatus | Colorado Chipmunk | Range Map - within range | G5 | S5 | | | | CNHP 20210615 |
| Mammals | Nyctinomops macrotis | Big Free-tailed Bat | CPW Overall Range | G5 | S1 | | | SWAP Tier 2 | CPW 20231222 |
| Mammals | Odocoileus hemionus | Mule Deer | CPW Overall Range | G5 | S4 | | | | CPW 20231222 |
| Mammals | Perognathus flavus sanluisi | Silky Pocket Mouse Subsp | CNHP General EO | G5T3 | S2 | | | | CNHP 20240711 |
| Mammals | Puma concolor | Mountain Lion | CPW Overall Range | G5 | S4 | | | | CPW 20231222 |
| Mammals | Tadarida brasiliensis | Brazilian Free-tailed Bat | CPW Overall Range | G5 | S1 | | | | CPW 20231222 |
| Mammals | Ursus americanus | Black Bear | CPW Overall Range | G5 | S5 | | | | CPW 20231222 |
| Reptiles | Crotalus oreganus | Western Rattlesnake | CPW Overall Range | G5 | SNR | | | | CPW 20231222 |
| Reptiles | Crotalus viridis | Western Rattlesnake | CPW Overall Range | G5 | S5 | | | | CPW 20231222 |
| Reptiles | Phrynosoma hernandesi | Greater Short-horned Lizard | CPW Overall Range | G5 | S5 | | | | CPW 20231222 |
| Reptiles | Pituophis catenifer sayi | Bullsnake | CPW Overall Range | G5T5 | S5 | | | | CPW 20231222 |
| Reptiles | Sceloporus consobrinus | Prairie Lizard | CPW Overall Range | G5 | S5 | | | | CPW 20231222 |
| Reptiles | Sceloporus tristichus | Southern Plateau Lizard | CPW Overall Range | G5 | S3 | | | | CPW 20231222 |
| Reptiles | Thamnophis elegans | Western Terrestrial Garter Snake | CPW Overall Range | G5 | S5 | | | | CPW 20231222 |
| Vascular Plants | Cleomella multicaulis (Cleome multicaulis) | Slender Spiderflower | CNHP Model | G2G3 | S2S3 | | | BLM/SWAP Tier 2 | CNHP 20210602 |
| Vascular Plants | Delphinium robustum | Wahatoya Creek Larkspur | CNHP Model | G2G3 | S2? | | | SWAP Tier 2 | CNHP 20210318 |

## Special Areas and Land Status

**Table 6. CNHP Potential Conservation Areas and Other Special Areas within 1 Miles of Project Area**

No results were found for this project area.

**Table 7. Managed Areas within Project Area**

| Name | Owner | Manager | Management Description | Public Access* | Protection Mechanism | Easement Holder | Data Source |
|---|---|---|---|---|---|---|---|
| | PRIVATE | PRIVATE | Private Land | No | NA | | COMaP 20240702 |

*It is the responsibility of the user to verify public access on any site as access can change over time. Entering an area that is not open to the public subjects an individual to possible sanctions for trespass under Colorado law.

## Water and Wetlands

**Table 8. National Wetland Inventory (NWI) Features within Project Area**

| NWI Code | Wetland Type | Total Acres | System | Class | Water Regime | Modifier | Data Source |
|---|---|---|---|---|---|---|---|
| PEM1C | Emergent | 0.18 | Palustrine | Emergent/Herbaceous | Seasonally Flooded | None | CNHP 20231001 |
| PUSAx | Other | 0.88 | Palustrine | Unconsolidated Shore | Temporarily Flooded | Excavated | CNHP 20231001 |
| R4SBAx | Rivers & Streams | 4.05 | Riverine | Stream Bed | Temporarily Flooded | Excavated | CNHP 20231001 |
| R5UBFx | Rivers & Streams | 0.04 | Riverine | Unconsolidated Bottom | Semipermanently Flooded | Excavated | CNHP 20231001 |

# Project Report Appendix

**Please visit the CNHP website for a more extensive collection of definitions for CODEX reports in addition to what is provided here below.**

# About CNHP Data

One of CNHP's core research activities is managing a statewide database that details the locations of rare and imperiled species and natural plant communities in Colorado. We gather data from CNHP surveys and monitoring projects, as well as from partners and other trusted sources like herbariums. All of our data are compiled and managed in the Biodiversity Information Management System (Biotics), a web-enabled database platform hosted by **NatureServe**. The species and natural plant communities we track are assigned global and state imperilment ranks based on rarity, threats, and trends, and their locations are mapped as element occurrences. Element occurrences include spatial data as well as details on condition, size, and landscape context. This information allows us to track both overall distribution and site-specific details describing how well elements are thriving at each location. We use element occurrences to delineate Potential Conservation Areas that represent the primary area needed to support the element occurrences, and often include additional suitable habitat or buffers from disturbance. **Please visit the** CNHP website **for more definitions and details related to CNHP data in CODEX.**

# CODEX Report Definitions

**CNHP Biodiversity Rank** – The significance of a potential conservation area in terms of its biological diversity ranging from B1 (Outstanding Biodiversity significance meaning protection of this potential conservation area can prevent a species from going extinct) to B5 (General interest or open space for more globally secure species).

**CNHP Edit Date**– The date the CNHP potential conservation area record was last updated.

**CNHP Identifier**– A unique identifier for each CNHP data type, applicable only to CNHP data records.

**CO Status** – State status per Colorado Parks & Wildlife: Endangered (SE), Threatened (ST), or State Special Concern (SC).

**Common Name** – The common name of the species or plant community.

**Managed Areas Name** – Name of the managed area.

**Manager** – The general land Manager.

**Management Description** - The general category of how the feature is managed.

**Other Species of Concern** – Other globally rare species and plant communities, BLM or USFS sensitive species, state listed species, or Tier 1 and Tier 2 priority species from Colorado's State Wildlife Action Plan, and species of economic and recreational value.

**Other Status** – Other status such as BLM sensitive species (BLM), U.S Forest Service sensitive species (USFS), and Tier 1 and Tier 2 priority species from Colorado's State Wildlife Action Plan (SWAP Tier 1, SWAP Tier 2).

**Critical Habitat Status** – Critical habitat status for federally listed species under the Endangered Species Act.

**Proposed** – Proposed critical habitat
**Final** – Final critical habitat

**Critical Habitat Federal Register**- The volume number and first page of the federal register publication describing the critical habitat.

**Critical Habitat Publication Date** - Federal Register publication date.

**Data Source** – The agency and date of the data provided.

**Data Type –**

**CNHP EO** – A location in which an element is, or was, present.

**CNHP General EO** – An element occurrence with imprecise directions; broadly mapped and typically historical or extirpated.

**CNHP Observation** – Sightings of species on CNHP's watchlist or sightings of tracked elements that do not meet the minimum criteria necessary to make an occurrence.

**CNHP PCA** – Areas in the state contributing to Colorado's biological diversity.

**CNHP Model** – Modeled presumed presence or habitat for a particular species.

**Owner** – The general land owner.

**Public Access** – Level of public access to the feature.

**Protection Mechanism** – Any mechanism of protection assigned to the managed area.

**Regulatory Species** – Species with federal protection under the Endangered Species Act or Bald and Golden Eagle Protection Act along with FWS designated critical habitat.

**Return on Investment Report** - Provides maps and the estimated annual benefit in dollars of conserved ecosystem services by ecosystem type within the project area in PDF format. Ecosystem types are derived from the 2016 National Land Cover Database (NLCD).

**Scientific Name** – The scientific name of the species or plant community

**Special Areas and Land Status** – CNHP Potential Conservation Areas (PCA), State Designated Natural Areas, Important Bird Areas, and managed lands from the Colorado Ownership, Management and Protection database (COMaP), SB181 High Priority Habitat

**Special Areas Name** – The name of the special area.

**State Rarity** - The rarity rank used by CNHP and The Natural Heritage Network to track how rare a species or plant community is in Colorado, ranging from S1 (rarest) to S5 (most common).

**CNHP PCA (Important Plant Area)** – B1 or B2 CNHP potential conservation area supporting globally rare plants.

**CNHP Range Map** – Overall range for a particular species by HUC 10 and HUC 12 for aquatics.

**Important Bird Area** – The most important places for birds as identified by the National Audubon Society.

**State Natural Area** - Areas that contain at least one unique or high-quality natural feature of statewide significance as designated by the Colorado Natural Areas Program.

**CPW <description>** - CPW data with a long list of data types: observations, nest sites, leks, etc.

**Easement Holder** – Organization or agency holding an easement (if present).

**ESA Status** – Federal status under the Endangered Species Act: Endangered (E), Threatened (T), or Federal Candidate (C) with qualifiers for Partial Status (PS) and experimental populations (XN).

**Global Rarity** – The rarity rank used by CNHP and The Natural Heritage Network to track how rare a species or plant community is globally, ranging from G1 (rarest) to G5 (most common).

**Last Observation** – The most recent field observation.

**Major group** – The major group in which the element falls: Amphibians,

**Viability Rank** – The estimated viability of the species or ecological integrity of the natural community based on condition, size, and landscape context, ranging from A (excellent) to D (poor).

**Water and Wetlands** – Wetland types from the National Wetland Inventory database.

**Class** - The general appearance of the habitat in terms of either the dominant life form of the vegetation, or the physiography and composition of the substrate.

**Modifier** - Modifier assigned to further describe wetlands and deepwater habitats within the classification hierarchy based on water chemistry or ph, wetland or deepwater alteration, or soil type.

**NWI Code** – An alpha-numeric code corresponding to the classification nomenclature that best describes a particular wetland habitat. For more information on NWI data values, visit https://www.fws.gov/wetlands/data/wetland-codes.html

**System** – A complex of wetlands and deepwater habitats that share the influence of similar hydrologic, geomorphologic, chemical or biological factors.

**Water Regime** - Description of water duration within a wetland habitat.

**Wetland Total Acres** - Total acres of the wetland type in the project area.

**Wetland Type** – The generalized Cowardin wetland type.

Birds, Crayfish, Fish, Insects, Mammals, Mollusks, Natural Communities, Nonvascular Plants, Reptiles, and Vascular Plants.

COLORADO
Parks and Wildlife
Department of Natural Resources

## Colorado Parks and Wildlife Best Management Practices for Solar Energy Development

Colorado Parks and Wildlife has a statutory responsibility to manage all wildlife species in Colorado. As such, we encourage protection for Colorado's wildlife species and habitats through responsible energy development and land use planning. Protection of core wildlife areas, quality fisheries and habitat, big game production and winter range, and other sensitive wildlife habitats are of highest importance. CPW is not a decision-maker with regard to energy development permitting. Instead, CPW provides recommendations to local, state, and federal regulatory agencies on ways to *avoid, minimize, and mitigate* impacts from development and land use changes, with the goal of providing for the long-term conservation of wildlife and wildlife habitats across the State of Colorado.

Impacts to wildlife will result from all forms of development. However, projects that are large in scale, expand development into remote or previously undisturbed areas, displace wildlife from crucial habitat, or cause a significant loss of habitat are of greater concern. Due to the large land requirements and the projected rate of development, utility-scale solar has the potential to significantly impact wildlife populations in Colorado. CPW encourages a scientific approach to siting decisions and careful consideration of the impacts to habitat necessary to sustain Colorado's wildlife populations. The recommendations in this document are intended to promote responsible development of large scale solar projects, upholding Colorado's responsibility to wildlife while supporting the renewable energy and climate change goals and standards set forth by the State of Colorado.

1. **Assessment of Potential Adverse Effects.** *The development of utility-scale solar energy facilities results in large-scale land use and potentially significant impacts to habitat and wildlife. The impacts to wildlife are influenced by the project size, location, and type of solar technology installed.* CPW takes a site-specific approach to assessing impacts of large-scale solar project development and presumes that habitat within the project footprint will become inaccessible to most wildlife and a functional loss within the larger landscape. In collecting information for a new solar project CPW recommends that the proponent conduct pre and post-development surveys that assess and measure wildlife utilization of the site in order to evaluate how the lost habitat may impact wildlife species.

2. **Alignment and Compliance with Colorado Public Utilities Commission (CPUC) Rule 3668-Environmental Impacts.** New renewable energy projects are required to follow CPUC Rule 3668 and conduct pre-development wildlife surveys, use these surveys to avoid, minimize and mitigate potential impacts to wildlife and their habitats, and work with CPW in the design of their project.

**3. Avoiding/Minimizing Impacts.** *In selecting sites for construction, focus on options that avoid high priority wildlife habitats over the use of mitigation strategies*. Impacts to wildlife will be lessened when solar development occurs on lands that have been previously disturbed and at locations within and adjacent to developed areas. Areas that exhibit high levels of wildlife use within the project area would benefit greatly by not placing facility infrastructure, including transmission lines, adjacent to or over such areas. Locally, micro-siting of infrastructure may be effective in minimizing losses to habitat and wildlife. If all measures for avoiding impacts are taken and prove insufficient to adequately protect wildlife and their habitat, then CPW recommends appropriate minimization and mitigation strategies be identified and implemented in consultation with CPW.

**4. Habitat Loss and Fragmentation.** *Habitat loss and fragmentation are significant concerns regarding solar development.* Minimizing the project footprint can help reduce the impacts to wildlife. CPW recommends that the developer consolidate facilities and roads to the extent possible to minimize the amount of land that is disturbed and fragmented. Perimeter fencing of the facility is of particular concern in addition to the extensive infrastructure of solar projects as a whole. Early consultation with CPW is recommended to identify high priority habitat that could be impacted by a project. CPW maintains a list of species-specific high priority habitats (HPH) in Colorado along with recommendations for management actions that may be implemented to avoid, minimize, and mitigate impacts to wildlife during land use development. CPW's recommendations were developed internally by a team of subject matter experts, are reviewed regularly, and are publicly available on CPW's website. High priority habitats include those that support state species of concern and Species of Greatest Conservation Need (SGCN) identified in Colorado's State Wildlife Action Plan and habitats that support wildlife during critical life stages. Because riparian areas are important habitats for a variety of wildlife and provide important wildlife movement corridors, a layout that maintains riparian access and connectivity for wildlife is preferred. Riparian areas within the proposed project area may be of particular concern given the limited availability of this habitat in some areas and the proportionally high use by many different species. Similarly, playas provide important habitat for waterfowl and other bird species, reptiles, bats, and amphibians. Placement of infrastructure within or near playas could impact wildlife habitat, increase avian collision risk, and alter playa hydrology. CPW recommends that projects with impacts to large playas and high priority playa clusters follow the Best Management Practices as put forth by Playa Lakes Joint Venture. If site development equates to a significant loss of habitat for any wildlife and/or a barrier to wildlife movement across the landscape, CPW may recommend project-specific compensatory mitigation. CPW recommends that any compensatory mitigation, including projects funded with monetary compensation, occur in the same geographical area as the impacts. A comprehensive statewide standard compensatory mitigation program would help address the significant habitat impacts resulting from anticipated future solar development throughout the state.

**5. Study Protocols and Monitoring.** *Consult with CPW for review and comment on wildlife and habitat survey protocol before the protocol is finalized.* CPW recommends that surveys be conducted to determine the site use and temporal and spatial distribution for wildlife that are potentially impacted by the development. The minimum recommended length of study for both pre and post-construction surveys for utility-scale solar projects is one year. It is recommended that pre-construction and construction/post-construction monitoring be conducted using similar methods, so that valid comparisons can be made. CPW requests the opportunity to comment on baseline or impact surveys, as well as amendments made to infrastructure/facility placement, county permit requirements, or recommendations. CPW encourages developers to be proactive in bringing plans for additional phases or developments to our attention prior to establishing infrastructure placement and routing. Proactive, cooperative efforts will identify concerns early in the project so that they may be appropriately addressed prior to final planning and construction. CPW requests the developer/operator provide pre-construction and post-construction reports with all forms of raw data collected at onset, during, and post construction surveys to CPW's Regional Energy Liaison in a timely manner.

**6. Wildlife Protection.** The development of new solar energy project sites could impact wildlife diversity and regionally unique habitat types. CPW recommends that sensitive wildlife species and high priority habitat features be identified and buffered when considering infrastructure placement and operation, especially during critical nesting periods. We suggest continued contact with CPW representatives throughout the planning process to determine specific sensitive areas for each of these species.

***The species listed below are suggested as examples only. Please consult with CPW regional staff for site-specific impacts and recommendations.***

o **Big Game Species.** *It is recommended that developers work with CPW to identify high priority habitat for ungulate species within the proposed project area.* CPW recommends avoiding development in big game winter range, parturition areas, and migration pathways or pinch points. Loss of habitat elsewhere within the range of big game species should be evaluated for impacts, including implications for wildlife management.

o **Raptors.** *Identify raptor nests within the project area and implement an appropriate buffer from solar infrastructure and transmission lines. During nesting periods, observe timing stipulations for construction activities located near nests.* Raptor species included in CPW's high priority habitat list include bald and golden eagles, Ferruginous hawks, prairie and peregrine falcons, goshawks, and Mexican spotted owls. Raptors are likely to use any trees or larger rock escarpments for nesting or perching. Prairie dog towns located in the project area provide excellent foraging habitat for numerous resident and migratory raptors as well as shelter and nesting habitat for burrowing owls. By affording these areas a buffer when considering infrastructure placement, impacts to raptor species can be greatly reduced. Species-specific recommendations are available in CPW's Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors (attached).

o **Migratory Birds.** *Consultation with the US Fish & Wildlife Service (USFWS) is recommended to ensure compliance with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act.* The best way to avoid impacts on the nesting efforts of migratory birds is to focus construction activities outside of the breeding season. For the majority of species that breeding season would be within the time frame April 1 to August 31. If construction must occur during the breeding season, CPW recommends surveys for active nests be conducted prior to ground disturbance. All migratory birds are protected under the MBTA and removal or disturbance of any active migratory bird nest requires consultation with USFWS prior to disturbance.

o **Grouse species (Gunnison sage-grouse, Greater sage-grouse, Columbian sharp-tailed grouse, Plains sharp-tailed grouse, Greater prairie-chicken, Lesser prairie-chicken).** *Consult with CPW to site infrastructure, including transmission lines, away from breeding and production areas.* Grouse species are known to avoid areas of man-made disturbance, including tall structures, such as transmission towers and buildings. Roads contribute traffic noise and the possibility of collision. Such infrastructure could be a factor in the abandonment of leks, failure of nests, and reduced brood-rearing success, and thus, appropriate setbacks are recommended. Consult with CPW for species-specific recommendations for buffers from leks, buffers from brood rearing habitat, and any associated timing stipulations. ***Gunnison sage-grouse:*** *The Gunnison sage-grouse is listed as a threatened species by the USFWS. The USFWS has produced a map of Critical Habitat for the species. In some situations (where the landowner has a federal nexus) the landowner (and perhaps the operator) may need to consult with the USFWS.*

o **Mountain plover and long billed curlew.** *Identify habitat and plover/curlew nests within the project area, and plan construction activity outside of critical nesting periods, April 1st through August 15 where these species are found.* Mountain plovers can nest in short-grass prairie, dryland cultivated farms, and prairie dog towns. Long billed curlews can nest in short grass prairie. *Mountain Plover and Long Billed Curlew are Colorado species of special concern.*

o **Burrowing owls.** *All prairie dog towns within and adjacent to the proposed project should be located prior to construction. If any prairie dog colonies are located within the project area and development in prairie dog towns will occur between February 1 and October 31, CPW recommends surveys to determine the presence/absence of burrowing owls.* If nesting burrowing owls are present, CPW recommends no permitted or authorized surface disturbing activities within 660 feet of a burrowing owl nest during the nesting season (March 15 - August 31) and buffers of 0.25 mile for large industrial disturbances. If burrowing owls merely occupy the site, it is recommended that earthmoving and other disturbance activities be delayed until late fall after they have migrated. *Burrowing Owls are protected under the MBTA and are a State Threatened Species.*

o **Bats**. *Acoustic monitoring of bats is recommended for areas with habitat for bats, near water bodies, and near where bats roost.* Acoustic monitoring is recommended for spring and fall seasons. It is recommended that all survey data collected be accessible and provided to CPW.

o **Kit fox:** *Identify and avoid maternal kit fox den sites.* CPW recommends surveys of suitable kit fox habitat for active dens prior to surface disturbance. If dens are present, we recommend the operator avoid surface disturbance within 0.25 mile of den sites while young are den dependent (approximate dates: Feb 1 to May 1). Any disturbance or destruction of dens while young are dependent would be detrimental to the species.

- **Reptiles and amphibians.** *Identify high priority reptile and amphibian habitat, including escarpments, ephemeral ponds, and wetlands, and avoid during construction and when siting infrastructure*. With an increase in roads and traffic, reptiles and amphibians could be negatively impacted within the project area. CPW recommends the "construction and operational considerations" portion of this document be considered to minimize impacts to these species.

**7. Construction and Operational Considerations.** During construction and operations, CPW recommends limiting vehicle speeds to 25 mph on project roads. CPW also recommends that the construction plan minimize the amount of exposed or open trenches. If spans of trenching will be open for extended periods of time CPW recommends the installation of trench plugs, earthen ramps, or other means as necessary to ensure that open trenches do not trap wildlife or impair wildlife movements. During operations, CPW may have site-specific suggestions on limits for on-site visit frequency and timing by service personnel, especially during critical nesting periods, to minimize impacts to wildlife. In consultation with CPW, projects should include training for construction and operations personnel on wildlife laws and enforcement. We also recommend providing education on wildlife issues, such as where species might be found, and at what time of day. During the operational phase, CPW recommends the operator provide staff training in documenting wildlife mortalities and notifying local wildlife officials in a timely manner.

**8. Weed Management.** *Weed control measures should be conducted in compliance with the Colorado Noxious Weed Act, C.R.S. §35-5.5-115 and the current rules pertaining to the administration and enforcement of the Colorado Noxious Weed Act.* CPW recommends the developer actively eradicate noxious weeds, and develop and implement a noxious weed and re-vegetation management plan where there will be disturbance due to construction or maintenance activities. Care should also be taken to avoid the spread of noxious weeds, and all construction equipment should be cleaned prior to leaving the site. CPW would appreciate the opportunity to review the project's Noxious Weed Management Plan prior to the start of construction.

**9. Security Fencing and Lighting.** *The CPW publication "Fencing with Wildlife in Mind" is available for your consideration and review when designing fencing for a project.* CPW is aware that the solar project may include security fencing. The typical specifications for security fencing make this fence type exclusionary for most wildlife. In these cases CPW requests that the project design adhere to the recommendations for exclusionary fencing that are safe for wildlife. If wildlife exclusion fencing is installed, CPW requests that efforts be taken to avoid entrapping wildlife within the facility during construction of the fence and that the solar facility be checked regularly or structures installed to allow animals to escape, in the unlikely event that a deer or other wildlife becomes trapped in the facility. CPW recommends any non-security fencing on the project site be wildlife friendly. CPW also recommends that any security lighting be designed to minimize light pollution and take into consideration lighting initiatives that aim to reduce impacts to wildlife.

**10. Transmission Line Development**. *CPW recommends new transmission lines be co-located with existing transmission lines or infrastructure corridors whenever possible to minimize additional impacts on wildlife and reduce habitat fragmentation.* Of high concern regarding electrical transmission lines is the potential for collisions and raptor electrocution. The Edison Electric Institute and the Avian Power Line Interaction Committee, in cooperation with the USFWS, have developed Best Management Practices to minimize impacts to avian species. CPW recommends that both the *"Suggested Practices for Avian Protection on Power Lines, the State of the Art in 2006"* and the *"Reducing Avian Collisions with Power Lines: The State of the Art in 2012"* documents be consulted for proper design considerations to minimize raptor electrocution. These documents can be ordered at the Edison Electric Institute website (www.eei.org) or can be downloaded at the Avian Power Line Interaction Committee website (www.aplic.org). This recommendation is applicable to all segments included in the project.

**11. Avian Fatality Risk.** *Proximity of the project site to rivers, reservoirs, migratory stop-over habitat, and habitat for wintering roosts for bald eagles may be a factor in the overall risk to birds.* Waterfowl and other avian species that utilize the area during migration may be at risk of collision with solar panels. There are also technology-specific factors associated with avian fatality risk at solar facilities and the final site plans could influence the potential risk for birds at the location. Any industrial surface water or evaporation ponds associated with the site could increase the risk to wildlife on the installation either due to toxicity issues or by acting as an attractant. CPW recommends a site design that prevents wildlife access to any artificial water sources associated with the project that could be a risk to wildlife. In locations with high avian migration and use and where there is a potential risk to avian species, CPW recommends development of a post-construction monitoring program in accordance with the USGS 2016 report Mortality Monitoring Design for Utility-Scale Solar Power Facilities. Design adjustments or additional features to mitigate collision or other fatality risks may be requested if fatalities related to on-site concerns are identified during monitoring.

**12. Reclamation and Decommissioning.** *Reclaim areas disturbed by construction and develop long-term decommissioning and reclamation plans in the event that it is decided to decommission any infrastructure of the facility.* CPW prefers that native vegetation be retained on site during the operational lifespan of the project, both as habitat for wildlife and to ensure successful reclamation of the project area. Proper reclamation, from a wildlife perspective, involves not only stabilizing the soil and establishing ground cover, but fostering plant communities with a diversity of species and plant types -grasses, woody plants, and broadleaf forbs- which will fully serve the nutritional and hiding cover needs of wildlife. Areas should be reclaimed with seed for native vegetation appropriate for the site, as recommended by CPW and the local Natural Resources Conservation Service office. CPW recommends that decommissioning plans include (but not be limited to) timing of decommissioning individual or project wide infrastructure and plans to reclaim areas back to pre-construction conditions.

# Attachment 9 – Wetlands Resources Delineation Report and AJD Request

March 21, 2023

MK Kim
Project Manager
US Solar Group
Samsung Energy Division
mkmk.kim@samsung.com

***Re: Wetlands Summary***
***Haynach Solar Project (1,105 acres)***
***Alamosa County, Colorado***

Dear Ms. Kim:

Samsung Energy Division is proposing a solar generation project located along North County Road 104 in Alamosa County, Colorado. The 1,105-acre site consists of a majority agriculture land, as well as disturbed rangeland. The surrounding lands consist of agriculture lands, solar generation facilities (Hooper Solar), and disturbed rangeland.

On November 29 and 30, 2022, Kimley-Horn environmental scientist, Jesse Carlson, conducted site visits to document onsite conditions. Field reconnaissance was conducted via windshield and pedestrian surveys within the project limits. In addition, representative photographs to document general conditions were also taken. During the field visit, the approximate temperature was 20 degrees Fahrenheit with sunny skies and winds were light and variable. Vehicle access to the site was provided via Lane 8 North, Lane 9 North, North County Road 102, and North County Road 104. Access within the site was provided via unpaved dirt roads and driving overland with a 4x4 vehicle.

## SUMMARY OF FINDINGS

No potential wetlands, as defined by the U.S. Army Corp of Engineers (USACE), or other Waters of the U.S. (WOTUS) features of concern were observed during field reconnaissance. National Wetlands Inventory (NWI) mapped features were incorrectly mapped and were not present. No other potential wetland or WOTUS constraints to development were identified during the field visit. **Solar development of this site will not impact wetlands or WOTUS features and will not require USACE permitting.**

## SITE CONDITIONS

The project area was dominated by both active and fallow agriculture areas with isolated pockets of disturbed rangeland. Active agriculture areas were dominated by wheat (*Triticum aestivum*) cultivation; however, no wheat was actively growing at the time of the site visit. Fallow agriculture areas were dominated by species typical of unmanaged areas such as Russian thistle (*Salsola tragus*) and kochia (*Bassia scoparia*). Both of these species are considered invasive plants in Colorado but are not Colorado Department of Agriculture listed species. Disturbed rangeland areas in between agriculture fields were dominated by big sagebrush (*Artemisia tridentata*), a plant commonly found in arid and semi-arid regions of the Intermountain West. Transmission utility poles, buildings and structures, agriculture production

equipment, an excavated gravel pit, upland swales, and unpaved dirt roads were also present within the site.

Wetlands

The U.S. Fish and Wildlife Service NWI Program provides users with preliminary information on wetland locations, extent, type and change. There are NWI mapped features within the project limits; however, the NWI database is often outdated, mismapped, and not accurate to onsite conditions. Field reconnaissance determined that these NWI mapped features were not present as these areas lacked the wetland plants, hydric soils, and/or hydrology necessary to be considered a wetland or WOTUS feature. Instead, the landscape features in the locations were isolated depressional features, upland swales, or were entirely absent altogether.

Soils

Alamosa County lies within the San Luis Alluvial Flats and Wetlands (22b) Sub-Region of the Arizona/ New Mexico Plateau Ecoregion. There are six (6) different Soil Map Units (SMU) identified within the project area by the National Resources Conservation Service (NRCS) Web Soil Survey. These soils are listed in **Table 1.** The dominant (over 20 percent of the property) SMUs of the project are Gunbarrel loamy sand (0 to 1 percent slopes) and Gunbarrel loamy sand (saline). Gunbarrel loamy sand (0 to 1 percent slopes) constitutes a total of 35.0%, or 387 acres, of the project area and is characterized as a loam sand or loamy coarse sand soil with a parent material derived from alluvium. Gunbarrel loamy (saline) constitutes a total of 25.8%, or 285 acres, of the project area and is characterized as a loamy sand or loamy coarse sand with a parent material derived from alluvium. Gunbarrel loamy sand (saline) and Mosca loamy sand (wet) have hydric soil components; however, these are considered by NRCS as being minor components of these SMUs.

**Table 1. Soil Map Units within the Project area**

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI | Hydric Soil Components | Farmland |
|---|---|---|---|---|---|
| Gn | Gunbarrel loamy sand, 0 to 1 percent slopes | 387.0 | 35.0 | No | Farmland of unique importance |
| Gs | Gunbarrel loamy sand, saline | 285.1 | 25.8 | Yes | Not prime farmland |
| Mc | McGinty sandy loam | 38.7 | 3.5 | No | Not prime farmland |
| Mo | Mosca loamy sand | 147.8 | 13.4 | No | Farmland of unique importance |
| Ms | Mosca loamy sand, wet | 87.9 | 8.0 | Yes | Not prime farmland |
| Se | San Luis sandy loam, 0 to 1 percent slopes | 158.6 | 14.4 | No | Not prime farmland |

Hydrology

The subject property is located within the Western Flats - Short Creek subarea within the San Luis Hydrologic Region. Site conditions were generally dry, and no standing water was observed during the site visit. Inundation and erosion issues are of minimal concern. Although soils will drain quickly, they are also more susceptible to scour in dry conditions. More precipitation may be converted to runoff and will result in higher ponding depths than if the soil received regular rainfall. If a larger storm event were to

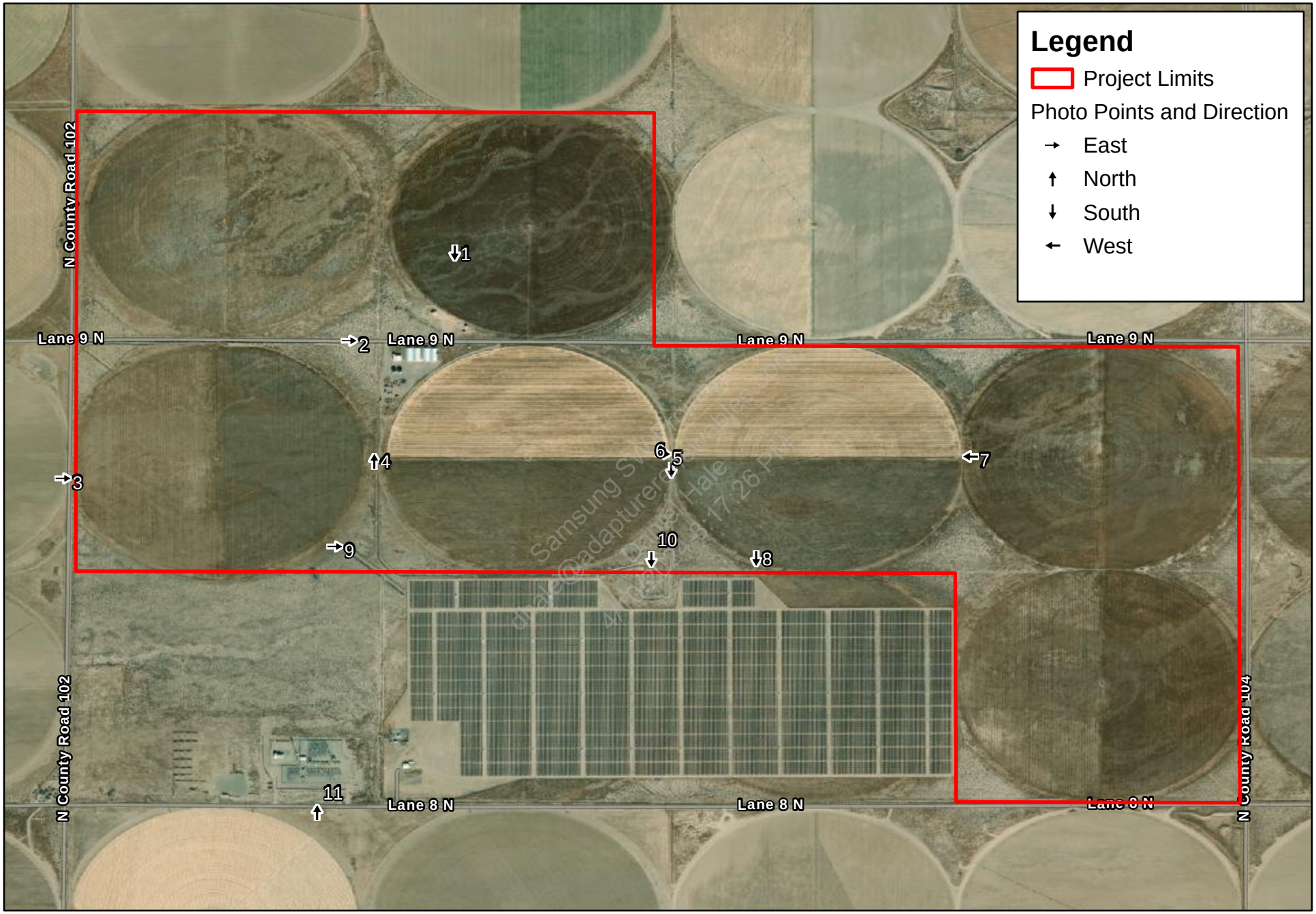
occur, it is possible that ponding depths in low lying areas would initially be severe before water absorption into the soil. A hydraulic model of existing conditions would be needed to fully understand inundation and erosion concerns.

Attachments

- Photograph Locations Map
- Ground Photographs
- Hydrology Map
- Soils Map

Samsung SW Projects
dhale@adapturerenewables.com
Daniel Hale
4/10/2024 8:17:26 PM

Aerial Source/Date: ESRI, 2022




Photograph Locations Map
Wetlands Summary
Haynach Solar Project
Alamosa County, CO

SAMSUNG C&T Kimley»Horn Expect More. Experience Better.

0 1,250 2,500 5,000 Feet

0 500 1,000 2,000 Meters

N W E S

## Photo No. 1



View from the northwestern portion of the project area looking south at a non-existent NWI mapped feature. Note the lack of wetland plants and hydrology.

## Photo No. 2



View from the western portion of the project limits looking east towards Lee Welch Farm structures and 230kV TriState – PSCo Transmission Line.

## Photo No. 3



View from the western portion of the project area looking east towards typical fallow agriculture.

## Photo No. 4



View from the western portion of the project area looking north towards agriculture equipment and 230kV TriState – PSCo Transmission Line.

## Photo No. 5



View from the central portion of the project area looking east towards typical fallow (north) and active agriculture (south).

## Photo No. 6



View from the central portion of the project area looking south along an unpaved agriculture road.

## Photo No. 7



View from the eastern portion of the project area looking west towards typical fallow (north) and active agriculture (south).

## Photo No. 8



View from the south-central portion of the project area looking south at solar panels on adjacent property (Hooper Solar).

## Photo No. 9



View from the southwestern portion of the project area looking east at a non-existent NWI mapped feature. Feature is an upland swale.

## Photo No. 10



View from the south-central portion of the project area looking south at a non-existent NWI mapped feature. Feature is a gravel pit excavated in uplands.

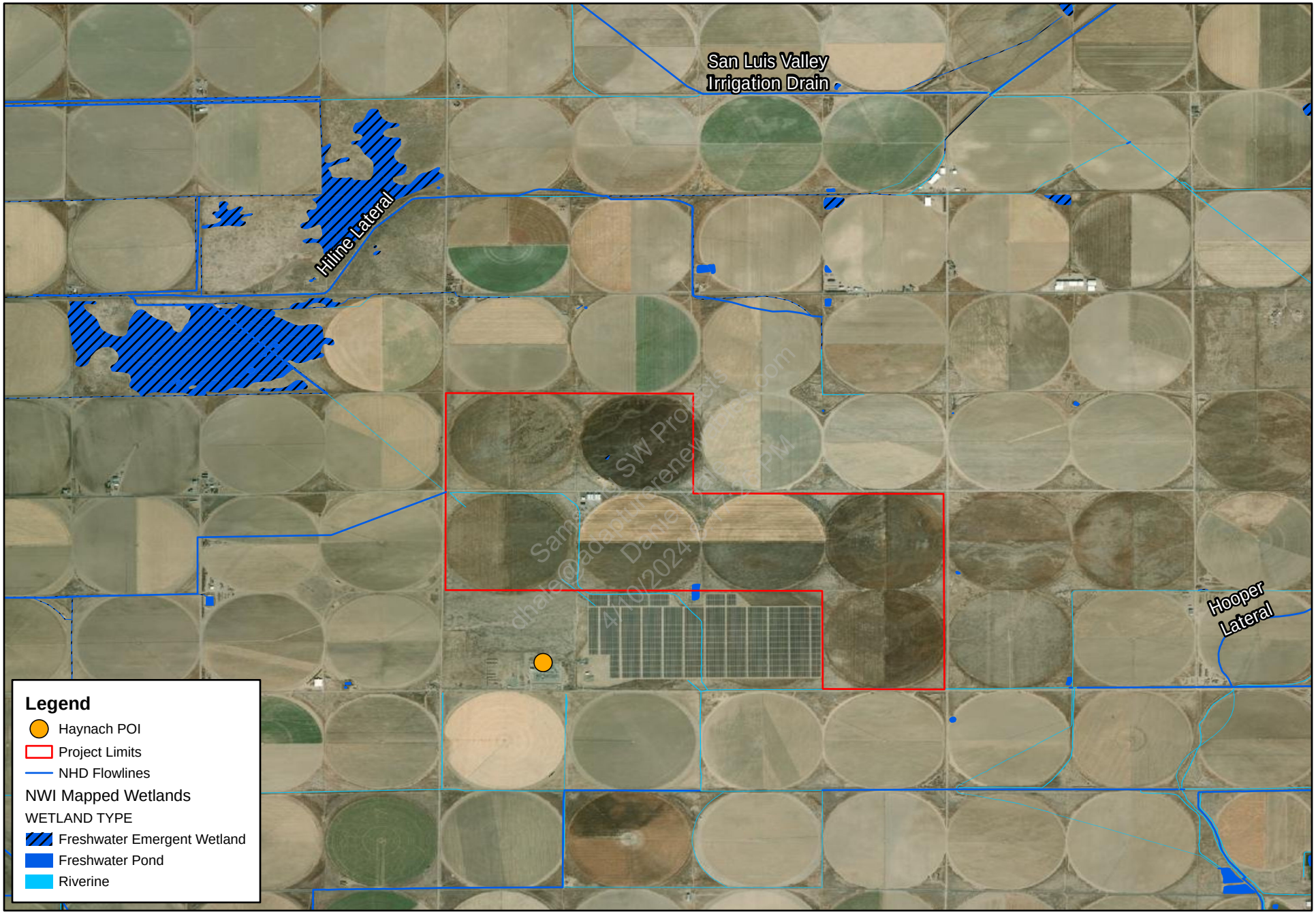
## Photo No. 11



Photo of the point of interconnection (POI) looking north. Taken from outside of and to the south of the project area.

Samsung SW Projects
dhale@adapturerenewables.
Daniel Hale
4/10/2024 8:17:26 PM

Aerial Source/Date: ESRI, 2022



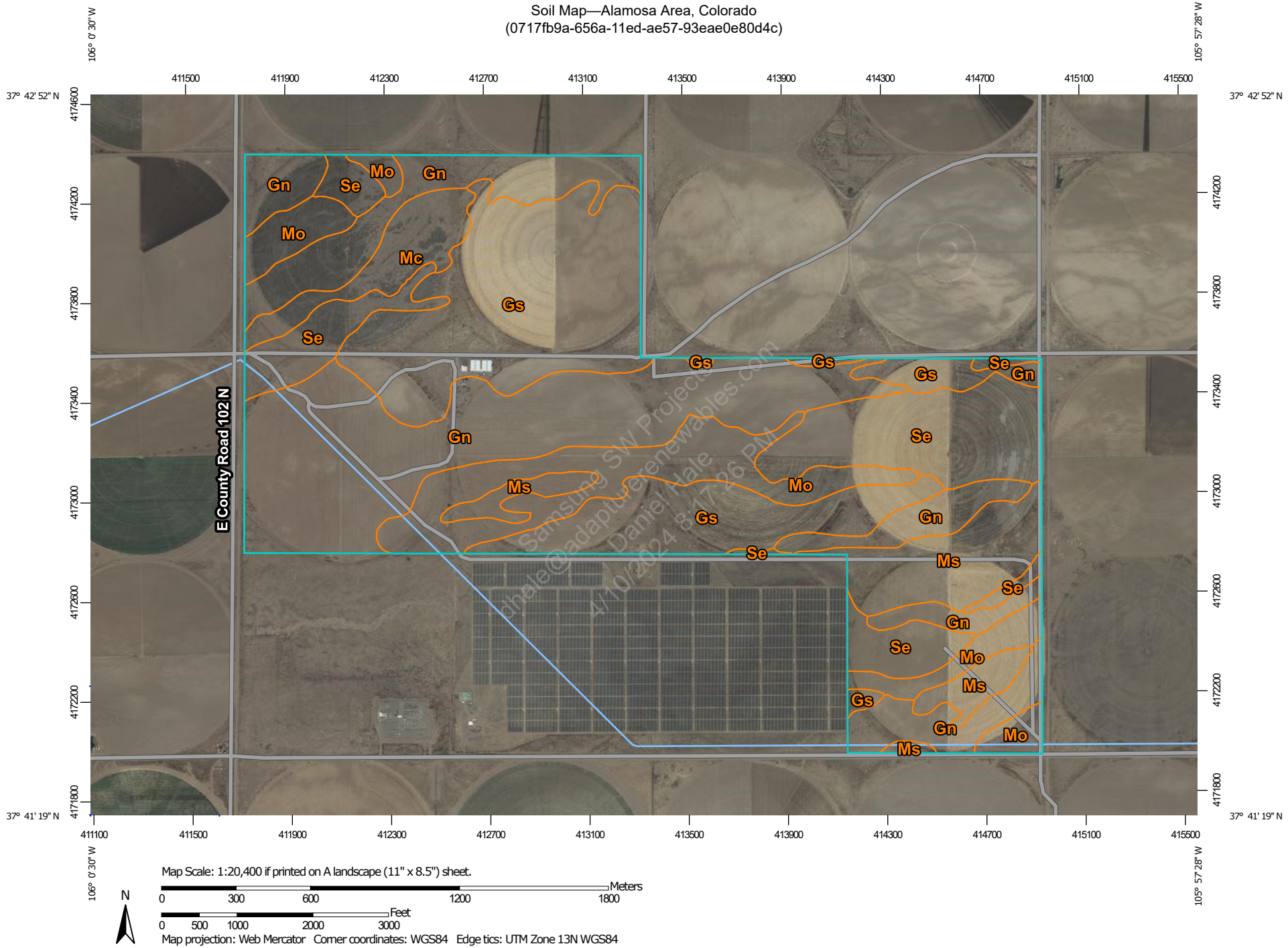

Hydrology Map
Wetlands Summary
Haynach Solar Project
Alamosa County, CO

SAMSUNG SAMSUNG C&T Kimley»Horn Expect More. Experience Better.

0 3,000 6,000 12,000 Feet
0 1,000 2,000 4,000 Meters

N
W E
S

Soil Map—Alamosa Area, Colorado
(0717fb9a-656a-11ed-ae57-93eae0e80d4c)



## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alamosa Area, Colorado
Survey Area Data: Version 16, Sep 7, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 18, 2020—May 21, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

dhale@samsung SW Projects
@capturerenewables.com
Daniel Hale
4/10/2024 8:17:26 PM

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| Gn | Gunbarrel loamy sand, 0 to 1 percent slopes | 387.0 | 35.0% |
| Gs | Gunbarrel loamy sand, saline | 285.1 | 25.8% |
| Mc | McGinty sandy loam | 38.7 | 3.5% |
| Mo | Mosca loamy sand | 147.8 | 13.4% |
| Ms | Mosca loamy sand, wet | 87.9 | 8.0% |
| Se | San Luis sandy loam, 0 to 1 percent slopes | 158.6 | 14.4% |
| **Totals for Area of Interest** | | **1,105.1** | **100.0%** |

Samsung SW Projects
dhale@adapturerenewables.com
Daniel Hale
4/10/2024 8:17:26 PM

U.S. Army Corps of Engineers (USACE)

# REQUEST FOR JURISDICTIONAL DETERMINATION (JD)

For use of this form, see Sec 404 CWA, Sec 10 RHA, Sec 103 MPRSA; the proponent agency is CECW-COR.

*Form Approved - OMB No. 0710-0024*
*Expires 2027-09-30*

## DATA REQUIRED BY THE PRIVACY ACT OF 1974

**Authority** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332.

**Principal Purpose** The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the review area that are or that may be subject to federal jurisdiction under the regulatory authorities referenced above.

**Routine Uses** This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice or FOIA request as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in any approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.

**Disclosure** Submission of requested information is voluntary, however, if the information is not provided there may be some delay in processing your request. Failure to provide this information will not result in an adverse action.

System of Record Notice (SORN): The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: **http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx**

## The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0024, is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. To (*District Name*): Albuquerque District

2. I am requesting a JD on property located at (*Street Address*): _____

City/Township/Parish: Mosca County: Alamosa County State: CO

Acres of Parcel/Review Area for JD: 1150.358417

Section: 22 Township: 040 N Range: 009 E

Latitude (*decimal degrees*): 37.7016601 ° Longitude (*decimal degrees*): -105.9831302 °

(*For linear projects, please include the center point of the proposed alignment.*)

3. Please attach a survey/plat map and vicinity map identifying location and review area for the JD.

4. ☐ I currently own this property. ☐ I plan to purchase this property.

☐ I am an agent/consultant acting on behalf of the requester.

☑ Other (provide explanation):

I am an agent/consultant acting on behalf of the applicant.

5. Reason for request: (*check as many as applicable*)

- ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
- ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under USACE authority.
- ☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the USACE, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
- ☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the USACE; this request is accompanied by my permit application and the JD is to be used in the permitting process.
- ☐ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
- ☐ A USACE JD is required in order to obtain my local/state authorization.
- ☐ I intend to contest jurisdiction over a particular aquatic resource and request the USACE confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
- ☑ I believe that the site may be comprised entirely of dry land.
- ☐ Other

6. Type of determination being requested:

- ☑ I am requesting an approved JD.
- ☐ I am requesting a preliminary JD.
- ☐ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
- ☐ I am unclear as to which JD I would like to request and require additional information to inform my decision.

7. Typed or Printed Name: Luis Meneses

Email: lmeneses@adapturerenewables.com

Business: +13104255608

Company Name: Adapture Renewables, Inc.

Address: 1901 Harrison St Ste 1630, Oakland, CA 94612

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

Signature: Mike Fitzgerald

Date: 06/24/2025

U.S. Army Corps of Engineers (USACE)

# DELINEATION REPORT AND JURISDICTIONAL DETERMINATION
# PROJECT INFORMATION SHEET

| 1. APPLICATION NO. | 2. FIELD OFFICE CODE | 3. DATE RECEIVED |
|---|---|---|
| 5282 | | 06/24/2025 |

**APPLICANT AND AGENT INFROMATION**

| 4. APPLICANT'S NAME | 7. AGENT'S NAME |
|---|---|
| Luis Meneses<br>Company – Adapture Renewables, Inc.<br>E-mail Address – lmeneses@adapturerenewables.com | Mike Fitzgerald<br>Company – Barr Engineering, Co<br>E-mail Address – fitz@barr.com |
| 5. APPLICANT'S ADDRESS<br>Address – 1901 Harrison St Ste 1630<br>City – Oakland State – CA Zip – 94612 Country – US | 8. AGENT'S ADDRESS<br>Address – 776 east 2nd ave<br>City – Durango State – CO Zip – 81301 Country – US |
| 6. APPLICANT'S PHONE NOs. w/AREA CODE<br>a. Business b. c. Fax<br>+13104255608 | 9. AGENTS PHONE NOs. w/AREA CODE<br>a. Primary b. c. Fax<br>+19707594830 |

**NAME, LOCATION, AND DESCRIPTION OF PROJECT SITE**

10. PROJECT NAME OR TITLE

Haynach Solar Hybrid Project

11. FILE NUMBER(S) OF PREVIOUS DETERMINATIONS ISSUED ON THE SITE

| 12. PROJECT COORDINATES (in decimal degrees) | 13. PROJECT STREET ADDRESS (if applicable) |
|---|---|
| Latitude: ◦N 37.7016601 Longitude: ◦W<br>-105.9831302 | Address –<br>City – Mosca State – CO Zip – 81146 |

14. OTHER LOCATION DESCRIPTIONS

Tax Parcel ID(s) – The proposed Haynach Solar Hybrid Project would be located on the parcels 500921200173, 500921100172, 500922100171, and 500916300040)

Acreage of Parcel/Review Area – 1150.358417

County – Alamosa County

Section – 22 Township – 040 N Range – 009 E

15. DIRECTIONS TO THE PROJECT SITE

16. REASON FOR REQUEST

17. TYPE OF REQUEST:

- [x] I am requesting an approved Jurisdictional Determination
- [ ] I am requesting a preliminary Jurisdictional Determination
- [ ] I am unclear as to which Jurisdictional Determination and I would like to request and require additional information to inform my decision
- [ ] I am requesting a verification of an aquatic resources delineation but I am not requesting a JD

**Appendix H.** Supporting Information:

| *Document Type* | *Document Created Date (YYYY-MM-DD)* | *Document Label* | *Information Source/Citation* | *Uploaded file name* |
|---|---|---|---|---|
| Other Information | 2023-05-22 | Haynach Wetlands Summary | Consultant report | 1.3.4.4 Haynach_Wetlands Summary Report.pdf |
| Other Information | 2023-05-22 | Hydrology Study | consultant reports | 1.3.4.8 Haynach Solar Existing Hydrology Study (1).pdf |

**Appendix B.** Aquatic Resource Inventory:

| *Aquatic Resource Name* | *State* | *Cowardin System* | *Cowardin Class* | *HGM Class* | *Local Waterway Name* | *Measurement Type* | *Measurement Amount* | *Measurement Units* | *Waters Type* | *Latitude* | *Longitude* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PUSAx | COLORADO | PALUSTRINE | PUB-PALUSTRINE, UNCONSOLBOT | DEPRESS | | Area | 1.66 | ACRE | DRY.LAND | 37.693 | -106.008 |

Docusign Envelope ID: 500DACB8-FB35-4C94-9ACC-BC55E5CC56CE

U.S. Army Corps of Engineers (USACE)

# AUTHORIZATION TO ACT AS AN AGENT

For use of this form, see Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act, the proponent agency is CECW-COR.

***Form Approved - OMB No. 0710-0003***
***Expires 2027-10-31***

**The Agency Disclosure Notice (ADN)**

The Public reporting burden for this collection of information, 0710-003, is estimated to average 5 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**Purpose**: This form is used by members of the public to authorize an agent (for example - a private consultant) to act on their behalf in all matters relating to all dealings with the USACE regarding the project. This includes taking all necessary actions for the application, processing, issuance, and/or acceptance of a Clean Water Act and/or Rivers and Harbors Act delineations, determinations, and/or permits.

This form is a component in the Corps Regulatory Request System (RRS), which is an online permitting application portal for the Regulatory Program.

**ITEMS 1 THRU 3 - FOR USACE USE ONLY**

| APPLICATION NO. | 2. FIELD OFFICE CODE | 3. DATE RECEIVED |
|---|---|---|
| | | |

**ITEMS 4 THRU 14 - COMPLETD BY THE APPLICANT or REQUESTOR**

| 4. PROJECT NAME | 5. PROJECT LOCATION |
|---|---|
| Haynach Solar Hybrid Project | Mosca, CO 81146 Alamosa County |
| **6. APPLICANT NAME** (*first, middle, last*) | **7. AGENT NAME** |
| Luis Meneses | Mike Fitzgerald |
| Company (*if applicable*): | Company: |
| Adapture Renewables, Inc. | Barr Engineering, Co |
| E-mail Address: | E-mail Address: |
| lmeneses@adapturerenewables.com | fitz@barr.com |
| **8. APPLICANT ADDRESS** (*if applicable*) | **9. AGENT ADDRESS** (*if applicable*) |
| Address | Address |
| 1901 Harrison St Ste 1630 | 776 east 2nd ave |
| City: | State: |
| Oakland | CA |
| City: | State: |
| Durango | CO |

| 10. APPLICANT PHONE NUMBERS. w/AREA CODE | | | 11. AGENT PHONE NUMBERS. w/AREA CODE | | |
|---|---|---|---|---|---|
| a. Business | b. | c. Fax | a. Primary | b. | c. Fax |
| +13104255608 | | | +19707594830 | | |

12. APPLICANT/AGENT CERTIFICATION

By signing below, I hereby authorize the agent listed above, to act on my behalf in all matters relating to all dealings with the USACE regarding the project and properties listed above, including taking all necessary actions for the application, processing, issuance, and/ or acceptance of a Clean Water Act and/or Rivers and Harbors Act delineations, determinations, and/or permits. Any and all acts carried out by my agent on my behalf as it relates to this project and property shall have the same effect as acts of my own.

Docusign Envelope ID: 500DACB8-FB35-4C94-9ACC-BC55E5CC56CE

I agree to review all information submitted to the USACE on my behalf by my agent and certify that any information submitted on my behalf is true and correct.

| 13. SIGNATURE of APPLICANT or REQUESTOR | 14. DATE |
| --- | --- |
| Signed by: Luis Meneses 5F64AF6D35A3460... | June 24, 2025 |

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Docusign Envelope ID: 5DC2C737-F647-4D39-A9F5-D7C767B26805

U.S. Army Corps of Engineers (USACE)

# RIGHT OF ENTRY

For use of this form, see Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act, the proponent agency is CECW-COR.

***Form Approved - OMB No. 0710-0003***
***Expires 2027-10-31***

**The Agency Disclosure Notice (ADN)**

The Public reporting burden for this collection of information, 0710-003, is estimated to average 5 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**Purpose**: This form is used by members of the public to authorize the USACE to enter their property for site investigations relating to USACE project reviews. These reviews include onsite investigations needed to support application review, processing, and issuance of a Clean Water Act and/or Rivers and Harbors Act delineations, determinations, and/or permits.

This form is a component in the Corps Regulatory Request System (RRS), which is an online permitting application portal for the Regulatory Program.

**ITEMS 1 THRU 3 - FOR USACE USE ONLY**

| 1. APPLICATION NO. | 2. FIELD OFFICE CODE | 3. DATE RECEIVED |
|---|---|---|
| | | |

**ITEMS 4 THRU 12 - COMPLETD BY THE PROPERTY OWNER**

**LOCATION AND LEGAL DESCRIPTION OF PROPERTY**

| 7. PROJECT STREET ADDRESS (*if applicable*) | | | | 8. LOCATION OF PROPERTY (*in decimal degrees*) | |
|---|---|---|---|---|---|
| Address | City: | State: | ZIP: | Latitude: ◦N | Longitude: ◦W |
| | Mosca | CO | 81146 | 37.7016601 | -105.9831302 |

9. TAX PARCEL ID(s)

The proposed Haynach Solar Hybrid Project would be located on the parcels 500921200173, 500921100172, 500922100171, and 500916300040)

10. PROPERTY OWNER CERTIFICATION

By signing below, I authorize representatives of the USACE to enter upon the property described above for the purpose of conducting on-site investigations, if necessary, and issuing a jurisdictional determination pursuant to Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. I, the undersigned, am a duly authorized owner of record of the property identified herein.

| 11. SIGNATURE OF PROPERTY OWNER | 12. DATE |
|---|---|
| Signed by: 9D64520D85D8446... | June 24, 2025 |

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

# Attachment 10 – Water Rights Summary

# Technical Memorandum

**To:** Luis Meneses, Development Manager
**From:** Mike Fitzgerald, Senior NEPA Consultant
**Subject:** DRAFT WaterBank's Water Rights Summary
**Date:** March 25, 2025
**Project:** Haynach Solar Project

Barr Engineering Co. (Barr) was contracted by Adapture Solar Development, Inc. (Adapture) to complete a waters rights assessment of private land parcels that comprise the Haynach Solar Hybrid Project (Project) in Alamosa County, Colorado. Adapture proposes to construct and operate a 110 megawatt (MW) solar photovoltaic and 110 MW, 4-hour, battery energy storage system (BESS) and substation that would be installed on an approximately 1,109-acre site. The proposed facility would be located north of the existing San Luis Valley Substation, jointly owned and operated by Tri-State Generation and Transmission Association and Public Service Company of Colorado. This technical memorandum summarizes WaterBank's (subconsultant to Barr) land parcel and water rights review associated with the Project site. Barr subcontracted Matt Rawlings, WaterBank®, to complete the review of the land parcels and water rights.

## 1 Water Rights Summary

The subject land for this Project is owned by Mr. Lee A. Welch. There are approximately 1,109 acres associated with the site which are divided into 4 parcels. The Alamosa County Assessor's Office identifies these parcels as Parcel Number 500922100171 (476.36 acres), Parcel No. 500921100172 (154.08 acres), Parcel No. 500921200173 (158.13 acres), and Parcel No. 500916300040 (316.36 acres). Lee A. Welch acquired these parcels, including all appurtenances, from Myron L. Smith via Warranty Deed dated June 9th, 2005. The warranty deed was filed with the Alamosa County Recorder's Office on June 10th, 2005, and is identified as Document No. 321970. Each parcel of land is comprised of one or more quarter sections, with each quarter section being irrigated within the last ten years with center pivot irrigation systems. Each center pivot can irrigate approximately 122-130 acres of land per quarter section. The source of water for the subject lands is groundwater from the unconfined San Luis Valley Aquifer within Alamosa County. All the associated water rights and permits were in the name of Lee A. Welch until recently when Mr. Welch transferred numerous water rights and permits to the Rio Grande Water Conservation District via Warranty Deeds dating from December 2021 and October 2022. The water rights and permits retained by Mr. Welch, as well as those transferred to Rio Grande Water Conservation District are highlighted below.

**Parcel No. 500922100171 (476.36 acres)** is comprised of the SE1/4, the NW1/4, and the NE1/4 of Section 22, Township 40 North, Range 9 East, and has associated Division of Water Resources (DWR) Permit Numbers 10345-F, 25363-F, 17512-F, 24418-F, 29660-F, and 10344-F.

Permit Numbers 10345-F (WDID 2005698) and 25363-F (WDID 2005699), which permit irrigation of the SE1/4, were conveyed via Warranty Deed (No. 389869) from Lee A. Welch to the Rio Grande Water Conservation District in December 2021. These permits and associated groundwater wells, Well No. 3 (AKA #5) and Well No. 3-S (AKA#5), were inactivated in April 2023 by the Rio Grande Water Conservation District. The SE1/4 of Section 22, Township 40 North, Range 9 East is now followed. At the present time, the subject wells are operationally disabled and are not part of an approved water conservation program.

Permit Numbers 17512-F (WDID 2006668) and 24418-F (WDID 2006669), which permit irrigation of the NW1/4 were conveyed via Warranty Deed (No. 389857) from Lee A. Welch to the Rio Grande Water Conservation District in October 2022. These permits and associated groundwater wells, Well No. 5 (AKA #3) and Well No. 5A (AKA #3), were inactivated in November 2022 by the Rio Grande Water Conservation District. The NW1/4 of Section 22, Township 40 North, Range 9 East is now fallowed. At the present time, the subject wells are not operationally disabled but are inactivate as part of an approved water conservation plan.

Permit Numbers 29660-F (WDID 2014189) and 10344-F (WDID 2009110), which permit irrigation of the NE1/4 remain in Mr. Welch's name. These permits and associated groundwater wells, Well No. 29660-F (AKA #4) and W0457 Well No. 02 (AKA #4), were inactivated in December 2023 by Mr. Welch. The NE1/4 of Section 22, Township 40 North, Range 9 East is now fallowed. At the present time, the subject wells are operationally disabled and are inactivate as part of an approved water conservation plan.

**Parcel No. 500921100172 (154.08 acres)** is situated within the NE1/4 of Section 21, Township 40N, Range 9E, and has associated DWR Permit Numbers 10341-F, 17515-F, and 24417-F.

Permit Numbers 10341-F (WDID 2006306), 17515-F (WDID 2006307), and 24417-F (WDID 2006670) which permit irrigation of the NE1/4 were conveyed via Warranty Deed (No. 389859) from Lee A. Welch to the Rio Grande Water Conservation District in October 2022. These permits and the associated groundwater wells, Well No. 01, Well No. ALT 01 (AKA #2), and Well No. 01AA (AKA #2), were inactivated in May 2023 by the Rio Grande Water Conservation District. The NE1/4 of Section 21, Township 40 North, Range 9 East is now followed. At the present time, the subject wells are operationally disabled and are inactivate as part of an approved water conservation program.

**Parcel No. 500921200173 (158.13 acres)** is situated within the NW1/4 of Section 21, Township 40N, Range 9 East, and has associated DWR Permit Numbers 17516-F, 10342-F, and 57055-F.

Permit Numbers 17516-F (WDID 2006297), 10342-F (WDID 2006298) and 17516-F (WDID 2014188) which permit irrigation of the NW1/4 were conveyed via Warranty Deed (No. 389871) from Lee A. Welch to the Rio Gande Conservation District in December 2021. There may be a mistake on the deed related to WDID 2014188, as this WDID identifies Permit 57055-F within the DWR database, not Permit 17516-F, which is identified as WDID 2006297. Permit 17516-F is duplicated in the deed, but the correct WDID appears to take precedence in the identification of the permit. The permits and associated wells, WO457 Well No. 01-A (AKA #1) and WO457 Well No. 1, were inactivated in April of 2023 by the Rio Grande Water Conservation District. At the present time, the subject wells are operationally disabled and are not part of an approved water conservation program.

**Parcel No. 500916300040 (316.36 acres)** is comprised of the SW1/4 and the SE1/4 of Section 16, Township 40 North, Range 9 East, and has associated DWR Permit Numbers 17513-F, and 17514-F-R.

Permit Numbers 17513-F (WDID 2009113) and 17514-F-R (WDID 2009114), which permit irrigation of the SW1/4 and the SE1/4, respectively, remain in Mr. Welch's name. These permits and associated groundwater wells, Well No. WO457 No. 7 (AKA #8) and W0457 Well No. 08 (AKA #9), remain active and appear to be in good standing with the DWR. Upon review of the Water Use Data Submittal Form (meter readings) dated November 22, 2024, submitted by Mr. Welch, the SW1/4 has been placed in a Conservation Resource Program (CRP) and is fallowed. The SE1/4 appears to have been irrigated as recently as the 2024 growing season.

## 2 Summary

The proposed Project is a large solar facility and related uses. The primary use of water for the Project would be for construction, dust control, and solar panel washing over the life span of the facility. The water permits associated with the subject parcels that are currently permitted for irrigation use would

need to be converted to commercial or industrial use via an application with the Colorado DWR (Personal communication with Pat McDermott, DWR). Any excess water not needed for commercial or industrial use could be transferred or sold by the owner to other water users within the area or placed in the U.S. Department of Agriculture Conservation Resource Program for later use. Lee A. Welch still owns water rights and permits associated with the NE1/4 of Section 22, Township 40N R9E under DWR Permit Numbers 29660-F (WDID 2014189) and 10334-F (WDID 2009110) within Parcel Number Parcel No. 500922100171. He also owns water rights and permits associated with the SW1/4 and SE1/4 under Permit Numbers 17513-F (WDID 2009113) and 17514-F-R (WDID 2009114), respectively, within Parcel No. 5009163000040.

## 3 Suggestions/Recommendations

1. Identify the amount of water needed for the proposed solar facility buildout and operations and maintenance.
2. Additional research and interviews with Mr. Welch, the Colorado Division of Water Resources (Alamosa Office), and the Rio Grande Water Conservation District (District No. 1) may be prudent for further due diligence regarding the subject water rights and possible use for the project.
3. If feasible, purchase or lease the property from Mr. Welch with enough water rights to accommodate the necessary water-use requirements over the life of the project. Any excess water rights could be sold, leased, or donated to another entity, including the Rio Grande Water Conservation District.

## 4 Supporting Documents

Alamosa County Parcel Data

Warranty Deed from Myron L. Smith to Lee A. Welch
dated June 9, 2005, and recorded June 10, 2005

Warranty Deeds from Mr. Lee A. Welch to Rio Grande Water Conservation District.
Deed Numbers 389869, 389857, 389859, 389871

Water Meter Readings (November 2024)

Permit Data for Lee A. Welch and Rio Grande Water Conservation District.

Notices of Inactivation

DWR Field Inspection Reports.

## 5 Data Sources

https://www.alamosacounty.org/163/Assessor
https://dwr.state.co.us/Tools/WellPermits
https://www.alamosacounty.org/164/Clerk-Recorder

Telephone Conversation; Linda Ramirez, Assistant Manager, Rio Grande Water Conservation District (March 14, 2025)

Telephone Conversation; Pat McDermott, Non-Exempt Well Manager, Colorado DWR, Alamosa Field Office (February 26, 2025).

# Attachment 11 – Hydrology Study

# Attachment 12 – Final Hazardous Materials, Waste Management, and Emergency Response Plan

# Hazardous Materials, Waste Management and Emergency Response Plan

*Haynach Solar Hybrid Project*

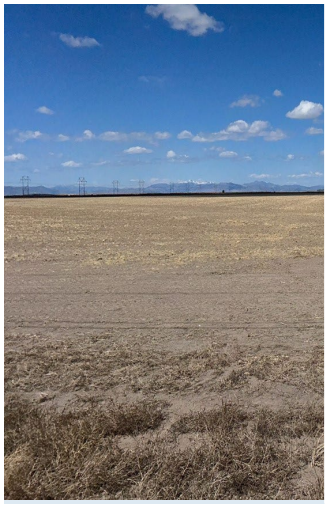
Prepared for
Adapture Solar, LLC

Prepared by
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May 2025

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# Hazardous Materials, Waste Management and Emergency Response Plan

May 2025

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# Abbreviations

| | |
|---|---|
| BESS | battery energy storage system |
| Btu | British thermal units |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| DOT | Department of Transportation |
| EPCRA | Emergency Planning and Community Right-to-Know Act |
| HID | high-intensity discharge |
| LQG | large quantity generators |
| MW | megawatt |
| NEMA | National Electric Manufacturers Association |
| NRC | National Response Center |
| OSHA | Occupational Safety & Health Administration |
| PCBs | Polychlorinated biphenyls |
| Plan | Hazardous Materials and Waste Management Plan |
| ppm | parts per million |
| Project | Haynach Solar Hybrid Project |
| RCRA | Resource Conservation and Recovery Act |
| SDSs | safety data sheets |
| SPCC | Spill Prevention Control and Countermeasures |
| SQG | small quantity generators |
| SQH | small quantity handler |
| USEPA | U.S. Environmental Protection Agency |
| VSQG | very small quantity generators |

# 1 Hazardous Materials, Waste Management and Emergency Response Plan

## 1.1 Introduction

Barr Engineering Co. (Barr) has prepared this Hazardous Material, Waste Management, and Emergency Response Plan (ERP) on behalf of Adapture Solar Development, Inc. (Adapture), in support of the Haynach Solar Hybrid Project (Project) in Alamosa County, Colorado. The Project includes the construction and operation of a 110 megawatt (MW) solar photovoltaic and 110 MW, 4-hour, battery energy storage system (BESS) and substation installed on an approximately 1,109-acre site. The Project would require a new 0.4-mile 230-kilovolt (kV) generation interconnect (gen-tie line) to interconnect the Project substation to the existing jointly owned Tri-State and Public Service Company of Colorado (PSCo) San Luis Valley Substation. The purpose of this ERP is to outline how Adapture will manage hazardous materials and solid waste during the construction, operation, and closure phases of the Project and to establish emergency response procedures at the facility.

Adapture will coordinate with Alamosa County, the State Division of Emergency Management, the U.S. Environmental Protection Agency (USEPA), the Colorado Department of Public Health and Environment (CDPHE) and the San Luis Valley (SLV) All-Hazards Emergency Planning Committee to assess and mitigate potential impacts associated with the management of hazardous materials and solid waste. Adapture will also coordinate emergency response planning and response procedures with these same agencies as appropriate.

This ERP has been developed for consistency with the Alamosa County Emergency Operations Plan (EOP) and the San Luis Valley Hazard Mitigation Plan 2023-2028 to ensure compliance with federal, state, and local regulatory requirements on generating and managing hazardous materials and solid waste.

## 1.2 Hazardous Materials Management Regulatory Overview

There is no single common "term" used by federal and state environmental, health, and safety statutes to describe a chemical, material, or waste that poses harm or risk to human beings or the environment. Instead, each federal statute and regulatory program creates its terms, such as "hazardous chemical," "hazardous material," "hazardous waste," or "hazardous substance," with their definitions and program requirements. As a result, the terms hazardous chemical and hazardous materials are very broad and include thousands of chemicals.

The Federal Occupational Safety and Health Act administered by the Occupational Safety & Health Administration (OSHA), regulates "hazardous chemicals" in the workplace. OSHA's hazard communication standard requires chemical manufacturers and distributors to evaluate the chemicals they manufacture or distribute and provide information on hazardous chemicals to customers and employees. This information is provided as material safety data sheets (or MSDSs).

The Federal Hazardous Materials and Transportation Act regulates hazardous materials, including common substances like gasoline and propane, that pose health and safety risks during truck, train, air, and pipeline transport. The U.S. Department of Transportation (DOT) administers these requirements.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), along with the Emergency Planning and Community Right-to-Know Act (EPCRA), regulates releases of hazardous substances at or above a reportable quantity into the environment—which is defined to include the land, surface waters, subsurface waters, and the atmosphere. Superfund requires immediately reporting hazardous substances into the environment to the National Response Center (NRC). EPCRA requires reporting spills or releases of hazardous substances along with "extremely hazardous substances" that leave the facility property line to local emergency planning authorities. States also often require reporting these releases to state emergency planning commissions.

The Federal Resource Conservation and Recovery Act (RCRA) regulates hazardous waste, used oil, universal waste, and solid waste. Adapture's process for managing wastes generated by the Project during the construction, operation, and closure is described in Section 2.0.

## 1.3 Hazardous Materials Management

This ERP outlines the programs that Adapture will implement to manage hazardous materials at the Project facility to protect employees in the workplace and surrounding community and environment. This ERP applies to the construction, operation, and closure phases of the Project and will be updated and modified on an as-needed basis.

### 1.3.1 Hazardous Communication Program for Employees and Contractors

OSHA has established a hazardous communication program for employers that use hazardous chemicals in the workplace. A hazardous chemical is any chemical used in the workplace that poses a physical or health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or other hazards that are regulated by the OSHA. Manufacturers and distributors must prepare an MSDS to accompany any product or material that contains a hazardous chemical.

Adapture will implement a worker hazard communication program for the Project, including the elements listed in Table 1-1.

**Table 1-1 Hazard Communication Program**

| Element | Strategy |
|---|---|
| Hazardous Chemical Labeling | Chemical manufacturers and distributors are required to provide labels on shipped containers to ensure that employers receive properly labeled hazardous chemicals. Adapture will either maintain this labeling or implement another system like the National Fire Protection Association or Hazardous Materials Identification System. At a minimum, any container of a hazardous chemical in the workplace must specify the chemical(s) and provide general information concerning the chemical(s) hazards. |
| Material Safety Data Sheets (MSDSs) | Adapture will maintain copies of MSDSs for all hazardous chemicals in the workplace and ensure that these MSDSs are readily accessible to workers in their work areas. |
| Hazard Communication Training | Adapture will train all employees and contractors on the hazards of chemicals found in its workplace. This training will be provided upon initial assignment and updated whenever chemical hazards are introduced. The training will include the identifying specific hazards of on-site chemicals, protective measures and precautions, proper labeling, the location of and how to read and understand an MSDS, the proper use of required protective equipment, and who to contact should issues arise. |

### 1.3.2 Community Right-to-Know Reporting

EPCRA requires facilities to provide information on hazardous chemicals above threshold levels to the local fire departments, the local emergency planning committee, and the state emergency response commission. Hazardous chemicals include substances regulated under OSHA that require an MSDS. In addition, the following thresholds for Tier I and Tier II reporting apply:

- 10,000 pounds for any hazardous chemical, and
- 500 pounds for any extremely hazardous substance

All extremely hazardous substances are listed in 40 Code of Federal Regulations (CFR) Part 355, Appendices A and B.

Adapture will comply with all applicable federal and Colorado standards pertaining to EPCRA and community right-to-know reporting. Table 1-2 summarizes anticipated requirements that will apply to the Project.

**Table 1-2 Community Right to Know Program**

| Requirement | Strategy |
|---|---|
| Tier 1 Reporting | Submit MSDS or chemical inventory to the local fire department, Alamosa County Emergency Planning Committee, and CDPHE:<br>• Within 3 months after hazardous chemical or extremely hazardous substance becomes present at the facility, or<br>• Within 30 days, if requested by the local fire department or the Alamosa County Emergency Response Commission. |
| Tier 2 Reporting | Submit annual notifications to the local fire department, Alamosa County Emergency Management, and CDPHE by March 1 of each year using the EPA Tier 2 software. |

### 1.3.3 Spill Prevention Procedures

Construction, operation, and maintenance of the Project will require using certain potentially hazardous chemicals and hazardous materials, including gasoline, diesel fuel, lubricating and hydraulic oil, and mineral oil. Smaller quantities of other hazardous chemicals may also be used, including cleaners, paints, solvents, fertilizers, pesticides, and herbicides. Adapture will follow a "just-in-time" ordering system to minimize the on-site inventory of hazardous chemicals at any given time.

The following summarizes spill prevention procedures that will be implemented for the Project:

- If used, only aboveground storage tanks will be used at the site and they will be constructed of welded steel or fiberglass suitable to handle the stored materials.
- All fuel storage, dispensing, and refueling areas will be on a concrete slab or foundation equipped with secondary containment.
- All tanks, containers, totes, and oil-containing transformers associated with the Project will be situated on a concrete slab or foundation with secondary containment.

- Monthly inspections of all tanks, containers, and oil-containing transformers will be conducted to detect equipment failure, leaks, or discharge, and corrective action will be implemented in a timely manner.

- The Project will receive new products and ship waste materials by tanker truck and permitted transporters. These products and materials will be transferred at designated loading/unloading locations in bermed areas where staff are present, and loading and unloading protocols will be followed.

- All construction and operations trucks and vehicles will be parked in areas that are either bermed or in areas where there is no possibility of a discharge of oil to "waters of the U.S." All trucks and vehicles will be regularly inspected to detect the presence of leaks and corrective action will be implemented. Hazardous Substances Spill and Release Reporting

CERCLA or Superfund requires the immediate reporting of any spill or release of a hazardous substance at or above a reportable quantity that enters the environment to the NRC at (800) 424-8802. The environment includes all surface water, groundwater, land surface or subsurface strata, and the ambient air or atmosphere. The term “on-site release” includes any release that escapes a building or containment but remains on the property.

The term "hazardous substance" is defined to include:

- Any hazardous waste regulated under RCRA

- All hazardous pollutants and toxic pollutants regulated under the federal Clean Water Act

- All hazardous air pollutants regulated under the federal Clean Air Act

- Any imminently hazardous chemical or mixture regulated under the federal Toxic Substances Control Act

- Any other substances specifically listed under CERCLA, including radionuclides.

All CERCLA hazardous substances, including reportable quantities, are identified at 40 CFR § 302.4.

In addition, EPCRA requires the immediate reporting of any spill or release of a hazardous or extremely hazardous substance above a reportable quantity to the Alamosa County Emergency Management and CDPHE.

Colorado law also states that any discharge of oil or other water contaminants in such a quantity that may injure or be detrimental to human health, animals, plant life, property, or interfere with the public welfare or use of the property must be reported within 24 hours.

Adapture will comply with all applicable federal and Colorado reporting requirements pertaining to the notification of hazardous substances and hazardous material spills, releases, and incidents. Table 1-3 summarizes these requirements.

**Table 1-3 Environmental Spill, Release, and Incident Reporting Requirements**

| Statute | Agency | Requirement | Reporting Contact |
|---|---|---|---|
| Federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or Superfund | EPA | Requires immediate reporting of a hazardous substance above a reportable quantity (RQ) to the environment, including the land, surface water, groundwater, and atmosphere. | • National Response Center (NRC) at (800) 424-8802 |
| Federal Emergency Planning and Community Right-to-Know Act (EPCRA) | EPA | Requires immediate reporting of a hazardous or extremely hazardous substance to the land surface, surface water, groundwater, or atmosphere over a RQ to the environment that leaves the property boundary. | • 911<br>• Alamosa County Emergency Operation Center at (719) 480-4692<br>• CDPHE Environmental Release Line at (877) 508-5608 (24 hours) |
| Colorado Hazardous Waste Control Act | CDPHE | Requires immediate reporting of a release or any discharge of oil or other water contaminants to the land surface, surface water, or groundwater in such quantity that it causes pollution or may, with reasonable probability, injure or be detrimental to human health, animal or plant life, or property or unreasonably interfere with public welfare or the use of a property. | • CDPHE Environmental Release Line at (877) 508-5608 (24 hours) |
| Federal Clean Water Act and Federal Oil Pollution Act | EPA | Requires immediate reporting of a release of any chemical, oil, or petroleum product on waters of the U.S., including rivers, lakes, streams, creeks, natural ponds, wetlands, ditches, intermittent streams, and their tributaries or arroyos. | • NRC at (800) 424-8802 |
| Federal Hazardous Materials Transportation Act | DOT | Requires the reporting of a hazardous materials incident by a carrier where:<br>• A person is killed or injured, requiring hospitalization,<br>• Estimated property damage exceeds $50,000,<br>• An evacuation of the area occurs for one or more hours,<br>• One or more transportation arteries are closed for one hour or more,<br>• The operational flight pattern or routine of an aircraft is altered,<br>• Fire, breakage, spillage, or suspected contamination occurs involving a shipment of radioactive material or an etiologic agent,<br>• A release of a marine pollutant has occurred exceeding 119 gallons or 882 pounds for solids, or<br>• A situation exists of such a nature that, in the carrier's judgment, should be reported. | • NRC at (800) 424-8802 |

| Statute | Agency | Requirement | Reporting Contact |
|---|---|---|---|
| Federal Occupational Safety and Health Act | OSHA | Requires reporting any worker fatality within 8 hours and any worker amputation, loss of an eye, or hospitalization within 24 hours. (Any recordable work-related injury or illness must be reported on OSHA Form 301.) | • Local OSHA Office @ (303) 843-4500<br>• 1-800-321-OSHA (24 hours) |

Notes: RQ reportable quantity

### 1.3.4 Hazardous Materials Transportation

Hazardous material means a substance or material that the DOT has determined poses health and safety risks when transported in commerce by truck, train, air, or pipeline. The term includes:

- All Class 1 explosives
- All Class 2 gases, including flammable gases, nonflammable gases, and toxic or poisonous gases
- All Class 3 flammable liquids
- All Class 4 flammable solids
- All Class 5 oxidizing substances and organic peroxides
- All Class 6 poison or toxic substances, including infectious materials
- All Class 7 radioactive materials
- All Class 8 corrosives
- All Class 9 dangerous goods, including hazardous substances regulated under CERCLA, hazardous wastes regulated under RCRA, marine pollutants regulated under the Clean Water Act, and elevated temperature materials.

The DOT requirements apply to shippers and transporters of hazardous materials. Adapture would be subject to these requirements for shipment of hazardous materials, including hazardous waste from its facility. Adapture will establish a dedicated area with secondary containment for off-loading hazardous material transport vehicles. In addition, Table 1-4 summarizes anticipated requirements that will apply to the Project.

**Table 1-4 Hazardous Materials Transportation Requirements**

| Element | Strategy |
|---|---|
| Hazardous Materials Training | The following individuals are subject to DOT hazardous materials training requirements:<br>• Persons who offer hazardous materials for transportation,<br>• Persons who package, mark, or label hazardous materials for transport,<br>• Persons who load or unload hazardous materials transport vehicles,<br>• Persons who transport hazardous materials, and<br>• Persons who receive and forward packages containing hazardous materials. |
| Hazardous Materials Registration | Companies that offer or transport certain hazardous materials are required to file a registration statement with DOT and pay an annual registration fee. |
| Proper Classification of Hazardous Material | Companies that offer hazardous materials for transport are required to determine the proper shipping name, hazard class or division, and identification number. |
| Hazardous Materials Shipping Papers and Emergency Response Information | Companies that offer hazardous materials for transport are required to accurately describe the material in shipping papers and retain copies of these papers for 2 years. In addition, the shipping papers must include the required emergency response information, including a 24-hour emergency response phone number. |
| Hazardous Materials Marking and Labeling | Companies that offer hazardous materials for transport must properly mark and label each package and freight container. |
| Hazardous Materials Placarding | Companies that offer hazardous materials for transport must ensure that the transporter uses proper placarding. |

## 1.4 Fire Safety

The Project is designed to minimize the risk of fire. Table 1-5 summarizes the proposed fire safety design features for the Project. Adapture will coordinate with Alamosa County and local fire authorities early in the Project planning process to identify and minimize fire risk. Project-specific potential fire sources include site electrical equipment (including inverters and transformers), on-site flammable liquid and gas cylinder storage, fueling operations, electrical and construction work (including welding operations), and vehicle exhaust systems. Metal or concrete electrical equipment enclosures will be used to house the inverters, transformers, and BESS. Enclosures will be designed to meet National Electric Manufacturers Association (NEMA) 1 or NEMA 3R IP44 standards for electrical enclosures (heavy-duty sealed design to withstand harsh outdoor environmental conditions).

**Table 1-5 Fire Safety Design Features**

| Subject | Design Feature |
|---|---|
| Fire Protection System | If deemed necessary by Alamosa County authorities, the Project's fire protection water system will be supplied from water storage tanks located near the operations and maintenance building. Fire pump installations will meet the requirements of National Fire Protection Association (NFPA) Standard 20 (Standard for the Installation of Stationary Pumps for Fire Protection), and water storage tanks will meet the requirements of NFPA 22 (Standard for Water Tanks for Private Fire Protection). During construction, a fire protection water system will be installed within the temporary construction trailers. Fire protection systems will meet the requirements of 29 Code of Federal Regulations (CFR) Part 1910, Subpart L. |
| Fire Alarm | The Project's fire alarm system will be designed, installed, and operated per the requirements of the 2015 International Fire Code (IFC), and NFPA Standard 72 (National Fire Alarm and Signaling Code). In addition, fire detection systems and employee alarm systems will meet the requirements of 29 CFR Part 1910, Subpart L. |

| Subject | Design Feature |
|---|---|
| Exit Routes and Emergency Planning | The Project will design, install, and maintain adequate exit routes to evacuate the facility in an emergency that meets the requirements of NFPA Standard 101 (Life Safety Code) and 29 CFR Part 1910, Subpart E. |
| Electrical Equipment | The Project's electrical equipment enclosures that house the inverters and transformers will be metal or concrete structures. Any fire that could occur would be contained within the structures and designed, installed, and operated to meet National Electric Manufacturers Association (NEMA) 1 or NEMA 3R IP44 standards for electrical enclosures. |
| Flammable Liquid and Gas Cylinder Storage | The Project's flammable liquid and gas cylinder storage areas will be designed, installed, and operated to meet the detailed standards found in NFPA Standard 30 and 29 CFR Part 1910, Subpart H (Flammable and Combustible Liquids Code). |
| Fueling Operations | The Project's motor fuel-dispensing facilities will be designed, installed, and operated to meet the requirements of NFPA Standard 30a (Motor Fuel Dispensing Facilities and Repair Garages). |
| Firebreak | A 20-foot-wide firebreak will be constructed around or within the perimeter of the solar facility boundary to prevent a wildfire from entering or exiting the site. Construction of the firebreak would require removing all vegetation through discing or using a grader. The firebreak will not be constructed within the high banks or established channels of ephemeral washes. |
| Vegetation Height and Mowing | Vegetation height on the Project will be maintained to one of two requirements: 1) Keep it from shading the leading edge of the module 2) Cut to minimize buildup of dry, woody debris, which can cause the spread of fires. Vegetation is also managed to reduce wildlife potential by scalping around electrical equipment/spraying electrical pads, spraying underneath the tracker tables. |
| Welding, Cutting, and Other Hot Work | The Project will ensure that fire prevention and protection precautions are taken during all welding, cutting, and hot work operations found in 29 CFR § 1910.252 and NFPA Standard 51B (Standard for Fire Prevention During Welding, Cutting and other Hot Work). |
| Emergency Response Plan | The Project will develop and maintain a written ERP meeting the requirements of 29 CFR § 1910.38 and the Appendix to 29 CFR Part 1910, Subpart E. See Section 3. |

# 2 Waste Management

## 2.1 Introduction

RCRA is the federal environmental statute that provides the EPA with the statutory authority and the legal framework to regulate solid wastes, including hazardous waste, universal waste, used oil, electronic waste, and municipal solid waste in the United States.

This section describes how Adapture will manage regulated wastes, including solid and hazardous waste, during construction, operations, and closure phases of the Project. In Colorado, regulated wastes include hazardous waste, universal waste, used oil, electronic waste, toxic substances, municipal solid waste, and recycled material, including scrap metal.

Adapture will follow the waste management requirements described in the following sections during all phases of the Project. Adapture will schedule waste disposal shipments on a regular "as needed" basis. At a minimum, all wastes, including hazardous waste, universal waste, and used oil, will be shipped off-site at least once each calendar year.

## 2.2 Waste Management Requirements

The State of Colorado has established regulatory standards administered by the CDPHE for managing special waste. Special waste includes petroleum-contaminated soils, petroleum-contaminated debris (e.g., filters, floor dry, absorbents), wastewater treatment sludge, ash, and cleanup of contaminated soils and media from spills of chemical products not regulated as hazardous waste under RCRA.

## 2.3 Hazardous Waste Requirements

A hazardous waste generator is any person, business, or site that produces or generates a waste regulated as a characteristic or listed hazardous waste. A waste is regulated as hazardous waste if:

- It exhibits one of four hazardous characteristics, including ignitability, corrosivity, reactivity, and toxicity, or
- EPA specifically listed it as hazardous waste based upon ignitability, corrosivity, reactivity, toxicity, or acute toxicity.

Common hazardous wastes include solvents, cleaners, paints, pesticides, and corrosive materials. Colorado specifies three categories of hazardous waste generators: very small quantity generators (VSQG), small quantity generators (SQG), and large quantity generators (LQG). Adapture will comply with federal and Colorado hazardous waste generator requirements and currently expects to be a VSQG of hazardous waste. The current requirements for a VSQG are summarized in Table 2-1.

**Table 2-1 Hazardous Waste Generator Requirements**

| Hazardous Waste Requirements | Very Small Quantity Generator (VSQG) |
|---|---|
| Accurately determine whether wastes are regulated as hazardous wastes | Required |
| Obtain an EPA identification number | Not Required |
| Monthly waste generation limits | ≤ 100 kg |
| Total accumulation amount limits | ≤ 1,000 kg |
| Accumulation time limits | None specified |
| Container requirements (i.e., closed, DOT-approved containers in good condition) | Recommended |
| Hazardous waste label and marked accumulation date | Recommended |
| Weekly inspections | Recommended |
| Hazardous waste training | Recommended |
| Emergency procedures | Recommended |
| Proper disposal at hazardous waste treatment, storage, or disposal facility | Required |
| Use of hazardous waste manifest and approved hazardous waste transporter | Recommended |
| Compliance with DOT packaging and shipping requirements | Required |

Note: EPA = U.S. Environmental Protection Agency; ≤ = less than or equal to; ≥ = greater than or equal to; < = less than; > = greater than; kg = kilogram; DOT = U.S. Department of Transportation.

## 2.4 Universal Waste Requirements

Universal waste is a special hazardous waste category that can be managed under the less stringent universal waste requirements. It is important to note that if these wastes are not managed under universal waste regulations, they are fully regulated as hazardous wastes. Universal wastes in Colorado include:

- Waste batteries that exhibit a hazardous characteristic such as toxicity or ignitability (e.g., nickel-cadmium, lithium-ion, lead-acid, mercury, silver)
- Waste lamps that contain mercury, such as fluorescent lamps, mercury vapor, halogen, high-intensity discharge (HID) lamps, metal halide, neon, and high-pressure sodium bulbs
- Waste aerosol cans which are ignitable and may contain listed or characteristic hazardous wastes
- Waste mercury-containing equipment such as thermometers, thermostats, barometers, mercury switches, smoke detectors, and ampules
- Waste pesticides

The state of Colorado defines two categories of universal waste handler: Large Quantity Handlers and Small Quantity Handlers (SQH). Adapture will follow federal and Colorado universal waste handler requirements and currently expects to be a SQH. The current requirements are summarized in Table 2-2.

**Table 2-2 Universal Waste Handler Requirements**

| Universal Waste Requirements | Small Quantity Handler (SQH) |
|---|---|
| Obtain an EPA identification number | Required |
| Total accumulation amount limits | < 5,000 kilogram |
| Accumulation time limits | 1 year |
| Container requirements (i.e., closed, structurally sound containers that prevent any release to the environment) | Required |
| Universal waste label along with the type of waste (e.g., waste batteries, etc.) and marked with an accumulation date | Required |
| Weekly inspections | Recommended |
| Universal waste training | Required |
| Emergency procedures | Spills and releases must be immediately contained with the residue managed as hazardous waste. |
| Proper disposal at an approved universal waste destination facility or another universal waste handler | Required |
| Tracking of universal waste shipments using manifests, bill of lading, shipping document, or log | Recommended |
| Compliance with DOT packaging and shipping requirements | Required |

Note: EPA = U.S. Environmental Protection Agency; < = less than; DOT = U.S. Department of Transportation.

## 2.5 Used Oil Requirements

Used oil means any oil that has been refined from crude oil or any synthetic oil that has been used and because of such use, becomes contaminated by physical and chemical impurities. Used oil includes used synthetic oil, engine oil, transmission fluid, gear oil, refrigeration oil, compressor oil, metalworking fluids and oils, hydraulic oil, mineral oil, laminating oil, copper and aluminum wire drawing solution, industrial process oils, and oils used as a buoyant. Used greases may also be managed as used oil. Used oil does not include antifreeze, kerosene, vegetable oil, animal oil, or petroleum distillates used as solvents.

Adapture will comply with federal and Colorado standards for managing used oil. The current requirements are summarized in Table 2-3.

**Table 2-3 Used Oil Generator Requirements**

| Used Oil Requirements | Summary |
|---|---|
| Hazardous waste mixture prohibition | Generators are prohibited from mixing used oil with hazardous waste (and such mixtures become regulated as hazardous waste). Used oil containing > 1,000 parts per million (ppm) total halogens is presumed to be hazardous waste because it has been mixed with halogenated hazardous waste (e.g., chlorinated solvents). |
| Container and aboveground storage tank requirements | Used oil must be accumulated and stored in closed, structurally sound containers or aboveground tanks that prevent the possibility of any release to the environment. |
| Label requirements | Used oil containers and aboveground tanks and their associated fill pipes must be marked with the words "Used Oil". |
| Training | Employees must be familiar with adequately used oil handling and emergency procedures. |
| Response to releases | In the event of a spill or release:<br>Stop and contain released oil,<br>Clean up and manage properly the released used oil and other materials, and<br>Repair or replace any leaking containers or tanks before returning them to service.<br>It is important to note that released used oil and contaminated residues (e.g., soil, absorbents) may be regulated as hazardous waste. As a result, laboratory analysis will be required to determine how to manage the release. |
| On-site used oil burning | Generators may burn used oil on-site in used oil-fired space heaters provided that:<br>The heater is designed to have a maximum capacity of not more than 0.5 million British thermal units (Btu) per hour, and<br>The combustion gases from the heater are vented to the ambient air. |
| Used oil disposal | Used oil must be disposed of at an approved facility that burns it for energy recoveries, such as a cement kiln or asphalt batch plant, or re-refines and recycles the material. |
| Tracking of used oil shipments | Recommended that used oil shipments are tracked using either manifests, bill of lading, shipping documents, or a logbook. |

## 2.6 Electronic Waste Requirements

Electronic waste (or E-waste) refers to discarded electronic equipment and devices destined for refurbishment, reuse, resale, or salvage recycling through material recovery or disposal. Many items, including monitors, computers, printed circuit boards, solar energy panels, and cell phones, may contain toxic metals (e.g., lead, cadmium, mercury, silver) or possibly exhibit hazardous characteristics (e.g., ignitability, reactivity) that would result in the device or equipment to be regulated as a hazardous waste. Electronic waste that is legitimately reclaimed or recycled is not regulated as hazardous waste.

Adapture will comply with the requirements for managing all E-waste, including printed circuit boards and solar panels. The current requirements are outlined in Table 2-4.

**Table 2-4 Electronic Waste Requirements**

| Electronic Waste | Summary |
|---|---|
| Used or Spent Batteries | All spent batteries will be managed as universal waste. See Section 2.2. |
| Used or Spent Monitors, Computers, Printed Circuit Boards, and Cell Phones | These devices and electronic equipment will be collected in closed and secure containers and shipped to a legitimate recycler for reuse or reclamation. If no market exists for these devices or equipment, the items will instead be characterized to determine whether they are hazardous waste or considered special waste and managed appropriately. See Section 2.1 and Section 2.5. |
| Used or Spent Solar Panels | Used or spent solar cells will be collected in closed and secure containers and shipped to a legitimate recycler for reuse or reclamation. If no market exists for the cells, they will be characterized to determine whether they are hazardous or non-hazardous waste and managed appropriately. See Section 2.1 and Section 2.5. |
| Spills and Releases from Broken Equipment | Spills and releases must be immediately contained. The residue and any contaminated soil will be characterized to determine whether it is hazardous waste or considered special waste and managed appropriately. See Section 2.1 and Section 2.5. |
| Shipments | Shipments of E-waste, including batteries and used or spent solar cells, will be tracked using manifests, bills of lading, shipping documents, or a logbook. |

## 2.7 Municipal Solid Waste

Municipal solid waste refers to trash or garbage, consisting of everyday items used by homes or offices and then disposed of, including product packaging, cardboard, grass clippings, food scraps, furniture, clothing, plastics, glass, cans, scrap metal, paper, and newspapers.

Adapture will review municipal solid waste streams and identify those wastes that can be readily and economically recycled. Recycled wastes may include cardboard, paper products, plastics, glass, and scrap metal, including cans. Wastes that cannot be recycled will be managed at a permitted municipal solid waste landfill.

## 2.8 Waste Management Plan

Adapture has identified the following potential waste streams associated with the Project's construction, operation, and closure. Table 2-5 will be updated and modified throughout the Project life as applicable. Adapture will schedule waste disposal shipments on a regular "as needed" basis. At a minimum, all wastes, including hazardous waste, universal waste, and used oil, will be shipped off-site at least once each calendar year.

**Table 2-5 Waste Management Plan**

| Waste Stream | Management Strategy |
|---|---|
| Cleared Vegetation | Adapture will manage this material as municipal solid waste. |
| Excavated Soil, Rock, and Topsoil | Adapture will stockpile and reuse this material on-site. |
| Packaging Material | Adapture will recycle this material where possible. Otherwise, this material will be managed at a municipal solid waste landfill. |
| Scrap Metal | Scrap metal will be sent to a scrap metal dealer for recycling. |
| Concrete (from washouts) | Where possible, crushed concrete will be used as aggregate for fill, footings, construction pads, or road base on-site. Alternatively, this material can be managed at a municipal solid waste landfill. |
| Wood (from pallets and forms) | Adapture will recycle or reuse wood waste where possible. Otherwise, this material will be managed at a municipal solid waste landfill. |
| Biowaste (from septic system) | An approved septic waste hauler will manage septic waste. |
| Chemical Wastes (including paint, solvents, coolants, and other chemicals) | Adapture will characterize chemical wastes to determine whether they should be managed as hazardous waste (under Section 2.3) and will comply with the appropriate requirements. |
| Used Oil | Used oil will be managed and recycled as described in Section 2.5. |
| Petroleum Contaminated Soil and Spill Residues | Adapture will characterize waste generated from petroleum spills to determine whether it should be managed as hazardous waste (under Section 2.1) and comply with the appropriate requirements. |
| Chemical Contaminated Soil and Spill Residues | Adapture will characterize waste generated from chemical spills to determine whether it should be managed as hazardous waste (under Section 2.3) and comply with the appropriate requirements. |
| Waste Batteries | Waste batteries will be managed as universal waste, as described in Section 2.2. |
| Waste Lamps | Waste lamps will be managed as universal waste, as described in Section 2.4. |
| Waste Aerosol Cans | Waste aerosol cans will be managed as universal waste, as described in Section 2.4. |
| Waste Mercury-Containing Equipment | Waste mercury-containing equipment will be managed as a universal waste, as described in Section 2.4. |
| Waste Pesticides | Waste pesticides will be managed as universal waste as described in Section 2.4. |
| Discarded Electronic Equipment | Discarded electronic equipment will be sent to a reputable E-waste recycler who will reuse, recycle, or reclaim the equipment as described in Section 2.6. Electronic equipment that cannot be recycled will be characterized to determine if it is hazardous waste and, if so, managed as hazardous waste under Section 2.3. |
| Discarded Solar Panels | Discarded solar panels will be sent to a reputable e-waste recycler who will reuse, recycle, or reclaim the equipment as described in Section 2.6. Panels that cannot be recycled will be characterized to determine if it is hazardous waste and, if so, managed as hazardous waste under Section 2.3. |
| Office Trash or Garbage | Office trash or garbage that is not hazardous waste, not universal waste, not regulated as special waste, and cannot be recycled will be managed at a municipal solid waste landfill. |

# 3 Emergency Response Plan

The following ERP has been established to ensure the Adapture on-site personnel, and first responders can adequately and effectively respond to an emergency during the construction and/or operations phases of the Project. The ERP incorporates elements of the Battery Energy Storage System Emergency Response Plan Guide prepared by the Fire Risk Alliance (FRA and NYBEST 2023) and the American National Fire Protection Association (NFPA), Standard for the Installation of Stationary Energy Storage Systems (publication NFPA 855).

## 3.1 Hazards Associated with Battery Energy Storage Systems

In 2020, the NFTA published NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, which addresses the dangers of toxic and flammable gases, stranded energy, and increase fire intensity associated with stationary energy storage systems. In general, the hazards inherent in BESS include fire and explosion, chemical, electrical, stranded or stored energy, and physical hazards. These hazards vary based on the technology used and the operating conditions. The Project currently contemplates the use of lithium-ion (Li-ion) batteries. Hazards specific to Li-ion batteries under normal conditions include:

- Fire due to latent defects in the cells themselves or design issues related to the system controls
- Electrical hazards due to the risk of direct contact with high voltage equipment or high battery energy levels
- Stranded or stored energy hazards can exist if the batteries cannot be discharged or isolated for routine maintenance or replacement

Hazard considerations for Li-ion batteries under abnormal/emergency conditions include:

- Fire due to short circuiting and thermal runaway conditions if batteries are not maintained at appropriate operating parameters due to abnormal conditions
- Chemical hazards may be present via off-gassing or hazardous vapors
- Electrical hazards may exist if the BESS is at hazardous voltage and energy levels
- Stranded or stored energy under normal and abnormal conditions are similar. Damaged batteries may contain stored energy, which may pose a hazard during disposal
- Physical hazards may exist due to overheating parts or damaged moving parts (e.g. fans)

## 3.2 Hazards Associated with Solar Photovoltaic

Photovoltaic (PV) solar arrays present a unique challenge for fire fighters. Unlike a typical electrical or gas utility, a PV array and collection system does not have a single point of disconnect. Whereas there are disconnects that will de-energize select parts of the system, if the PV panels are illuminated, the individual strings of PV panels are energized and capable of producing up to 1,500 volts. Below is a summary of the hazards associated with firefighting activities in photovoltaic solar arrays:

- Shock hazard due to the presence of water and PV power during suppression activities

- Outdoor-rated electrical enclosures may not resist water intrusion from the high-pressure stream of a fire hose.
- PV panels damaged in the fire may not resist water intrusion
- Damaged conductors may not resist water intrusion
- Shock hazard due to direct contact with energized components
- No means of complete electrical disconnect
- Multiple power sources
- Due to the dangers presented above, it is not typical to practice fire suppression by means of water inundation within solar PV arrays.

## 3.3 Types of Emergencies

This ERP is in preparation for the following potential emergencies:

- Medical Emergency - worker injury or personal medical issue
- Fire - wildland/grassfire or electrical fire
- Severe Weather/Catastrophic Emergency - tornado, high wind event, blizzard, flood, lightning
- Hazardous Material Emergency - chemical spills, equipment failures, environmental conditions dangerous to personnel
- Electrocution - contact with AC or DC conductors or step and touch hazards
- Vehicle - vehicle incident

### 3.3.1 Emergency Classification

Emergencies at the site are classified as either “controllable” or “uncontrollable,” based on the site’s ability to manage the situation without outside assistance.

**Controllable Emergency**

A “Controllable Emergency” meets all of the following definitions:

- Minor in nature, meaning:
  - No one has or is likely to become injured or if injuries have occurred, they are first aid only, and
  - Onsite personnel have the training and equipment needed to contain or stop the release of a hazardous material (liquid, solid, gas, including smoke) without the assistance of off-site responders.
- Confined to the site and falls within the training of site personnel.
- Can be handled without the assistance of off-site emergency responders.

Examples of Controllable Emergencies that may occur include the following:

- An injury to a site contractor that requires basic first aid for treatment, or
- A small leak of an oil, which can be absorbed, neutralized or otherwise controlled at the time of release.

**Uncontrollable Emergency**

An “Uncontrollable Emergency” meets any of the following definitions:

- An event that has or could potentially go beyond the defensive capabilities of site personnel,
- Involves injuries that require treatment beyond first aid, or
- Requires off-site emergency response resources because the expertise or equipment required to respond is not available or because the emergency could impact off-site receptors.

Examples of Uncontrollable Emergencies that may occur include the following:

- An injury which requires advanced medical treatment (bracing, splinting, stitches)
- Any fire within the equipment which has the potential to become bigger, or
- A significant gas leak during a fire.

## 3.4 Emergency and Safety Training

All Project employees, contractors and subcontractors will receive safety training and a briefing regarding the ERP before they begin work onsite. This training will include pertinent information regarding hazardous material and fire prevention.

The Primary Company Point-of-Contact (POC) will be responsible for ensuring proper training is received by all personnel. The Project POC will maintain a directory of all project participants and subcontractor leadership contacts to adequately communicate any emergency situations.

### 3.4.1 Site-Specific Training

Adapture will offer training for members of the local fire services after solar and BESS equipment arrive on location. Training and familiarization tours on the systems, hazards and response tactics associated with the facility should be provided annually. This ERP serves as the platform for the training program and includes the following:

- System Overview
- Equipment
- Battery Management System
- Detection & Suppression
- Emergency System Shutdown
- Hazards

- Suppression Agents & Exposure Control
- Response Tactics
- Post-Fire Operations

### 3.4.2 Emergency Equipment Requirements

The following equipment will be kept onsite (at a minimum) to support onsite care:

- First Aid Kits - standard kits containing supplies for care of minor injuries or ailments. One (1) kit per facility vehicle and one (1) kit in the operations and maintenance office.
- Automated External Defibrillator (AED) - portable device capable of restoring normal cardiac rhythm during cardiac arrest. One (1) kit in the operations and maintenance office.
- Emergency use non-conductive rescue hook - One (1) at substation once energized or in the operations and maintenance office.

All first aid equipment should be stored in a clean, dry area, accessible for regular inspection by crews and have documentation indicating equipment is in proper working order and the supply is adequate. Any questionable, expired or exhausted supplies will be immediately replaced.

## 3.5 Emergency Response Authority and Points of Contact

The designated Project Emergency Response POC will be responsible for overseeing emergency service compliance. Their duties will include ensuring that the measures in this ERP are clearly communicated to Project personnel as well as all agencies that the Project interacts with. In addition, their duties will include compliance with this ERP and that all agencies and appropriate stakeholders (including but not limited to local residents, emergency response units, transmission utility, and project owner) are properly notified in the event notification is required, and that all required plans and reports are prepared and submitted in a timely manner.

The POC during the construction phase of the Project will be designated as a representative of the Engineering, Procurement, Construction, and Management (“EPCM”) contractor. During the operations and maintenance (O&M) phase, a site operations manager will assume responsibility for emergency services. Table 3-1 provides emergency contacts for each phase of development and for local emergency response agencies.

**Table 3-1 Emergency Response Contacts**

| Adapture Emergency Contacts | | | |
|---|---|---|---|
| Primary Company POC | Orion Bashkiroff | Cell Phone: 805.217.1136 | Email:obashkiroff@adapturerenewables.com |
| Secondary Contact | Zack Zoller | Cell Phone: 510.697.6832 | Email zzoller@adapturerenewables.com |

| Construction EPCM Phase Contacts | | | |
|---|---|---|---|
| EPCM POC | TBD | Cell Phone: | Email: |
| Secondary Contact | TBD | Cell Phone | Email |
| **Operations and Maintenance Phase Contacts** | | | |
| Project POC | TBD | Cell Phone: | Email: |
| Secondary Contact | TBD | Cell Phone | Email |

| Emergency Response Contacts | | |
|---|---|---|
| **Department** | **Contact** | **Telephone** |
| Colorado State Patrol | Dispatch | 911 |
| Alamosa County Sheriff | Dispatch | 911 |
| Alamosa County Emergency Management | Via dispatch | Non-emergency 719-589-1131 |
| Local Fire | Dispatch | 911 |
| San Luis Valley (SLV) Emergency Preparedness and Response (EPR) | SLV EPR Regional Coordinator | 719-589-6639, ext. 1214 |
| Alamosa County Fire Protection District No. 1 | Mosca-Hooper Volunteer Fire Department | 911 |

| | | |
|---|---|---|
| Colorado Department of Public Health and Environment (CDPHE) | Colorado health emergency line | 877-462-2911 |

## 3.6 Site Emergency Access

The Project location is depicted in Figure 1. During the construction phase, access to the Project site will be from multiple access points and will follow project access routes.

## 3.7 Emergency Response

In the event of an emergency response, the following measures will be conducted by the individual discovering the emergency.

- First, personnel will assess the situation to determine potential safety concerns and hazards posed to personnel and the environment. Protective actions for life safety is the first priority. All personnel will be moved or evacuated to a safe location. Access will be prohibited to the affected area to other employees or contractors.
- The second priority is the stabilization of the incident. Anyone who witnesses an unusual situation that cannot be corrected routinely must notify their supervisor immediately and, while respecting the jurisdiction and ability, he/she must take the necessary measures to control the situation until the arrival of the Emergency Coordinator or supervisor.

The EPCM POC, the Project POC, trained employees, and/or contractors may become involved in emergency response for Controllable Emergencies that are within the capabilities of personnel. In the case of an Uncontrollable Emergency, either the EPCM or Project POC (depending upon Project phase) relinquishes emergency response and management to the outside emergency first responder when they arrive on the scene. The “Incident Commander” for Uncontrollable Emergencies will always be an outside responder. The EPCM or Project POC will have the responsibility of briefing the outside Incident Commander upon their arrival on-site, providing Project communications throughout the incident and acting as liaison between the response agencies and the Company POC.

### 3.7.1 Emergency Communication

Communication of an emergency event to outside responders will be made through a landline or cellular phone call to 911. The call to 911 will be made by either the EPCM or Project POC. The following preliminary information should be available to provide to the 911 dispatcher:

- Nature of emergency
- Time of emergency
- Location of emergency
- Medical issues of personnel involved
- Chemicals involved, if any, and
- Other information requested by dispatcher

Complete information may not yet be available at the time of the 911 call, but the aim is to provide responders with as much initial information as possible to prepare for their response (i.e., fire response, medical, etc.). Upon arrival, designated personnel will meet the responders at the Project and provide additional information regarding the event.

Emergency response is complete when there is no longer imminent danger to human health, the environment or project equipment.

### 3.7.2 Emergency Medical Care

Only provide care to injured persons if it is safe to do so and the responder is trained in First Aid/CPR or for the care required. The EPCM and Project POCs will identify the member(s) of their respective crews who are First-Aid/CPR trained. In the event of a major-medical emergency, on-site personnel who are professionally trained will immediately assess the patient in conjunction with immediate notification to 9-1-1 and/or local Emergency Medical Services (Table 3-1).

## 3.8 Incident Command

Incident Command would follow procedures outlined in the Alamosa County Emergency Operations Plan (EOP). Among other things, the EOP describes operations and response to disasters and emergencies in the county. The purpose of the EOP is to provide a consistent, familiar framework for emergency response in the county. In the EOP, Section 8.0 Organizations and Responsibilities, describes the emergency response organizations and the role each plays during an emergency, and Section 9.0 Incident Direction, Control and Coordination, outlines the communication and coordination between these emergency response organization.

## 3.9 Emergency Reporting

During construction, the EPCM POC will notify the Company POC of any emergencies immediately after local emergency first responders have been contacted. The EPCM contractor will be responsible for implementing the ERP in the course of all work performed by the general contractor and all site subcontractors during project construction and for coordination with local first responders. During O&M, these reporting responsibilities will shift to the Project POC.

During construction and O&M emergencies, the Company POC will notify federal, state, and local authorities, as appropriate.

# Attachment 13 – Revegetation Management and Weed Plan

# Revegetation and Weed Management Plan

*Haynach Solar Hybrid Project*

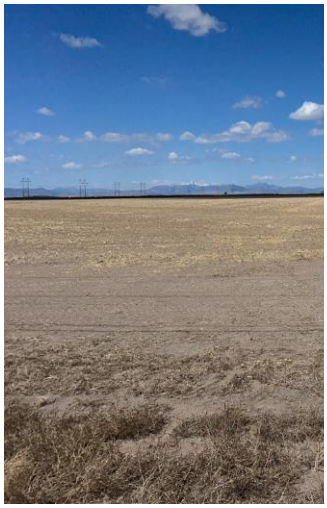
Prepared for
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March 2025

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# Revegetation and Weed Management Plan

March 2025

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## Abbreviations

| | |
|---|---|
| Adapture | Adapture Solar Development, Inc. |
| Barr | Barr Engineering Co. |
| BESS | battery energy storage facility |
| BOCC | Board of County Commissioners |
| CDA | Colorado Department of Agriculture |
| EDIT | Ecosystem Dynamics Interpretive Tool |
| EO | Executive Order |
| kV | kilovolt |
| MW | megawatt |
| NRCS | National Resources Conservation Service |
| NWI | National Wetlands Inventory |
| Plan | Revegetation and Weed Management Plan |
| Project | Haynach Solar Hybrid Project |
| PSCo | Public Service Company of Colorado |
| SWReGAP | Southwest Regional Gap Analysis Project |
| WOTUS | waters of the U.S. |

# 1 Introduction

Barr Engineering Co. (Barr) has prepared this Revegetation and Weed Management Plan (Plan) on behalf of Adapture Solar Development, Inc. (Adapture), in support of the Haynach Solar Hybrid Project (Project) in Alamosa County, Colorado. The Project would construct and operate a 110 megawatt (MW) solar photovoltaic and 110 MW, 4-hour, battery energy storage system (BESS) and substation installed on an approximately 1,109-acre site. The Project would require a new 0.4 mile 230-kilovolt (kV) generation interconnect (gen-tie line) to interconnect the Project substation to the existing jointly owned Tri-State and Public Service Company of Colorado (PSCo) San Luis Valley Substation. Adapture is coordinating with the Alamosa County Planning Department and Board of County Commissioners (BOCC) to permit Project construction, operation, and decommissioning.

Specifically, this Plan is intended to guide site preparation, vegetation/seed selection, invasive species control, and long-term vegetation monitoring on the Project site. The Plan outlines revegetation and weed management success by identifying best management practices, including proper initial installation methods, and managing invasive species and noxious weeds. The Plan has been developed to ensure the establishment and maintenance of stable vegetative cover while facilitating efficient Project facility operation. The Plan is proposed to be implemented in coordination with Alamosa County.

# 2 Project Summary

The Project proposes constructing a 110 MW solar photovoltaic facility and a 110 MW BESS about 17 miles northwest of Alamosa, in Alamosa County, Colorado. The Project area—including the generation, battery storage, and gen-tie line—would encompass approximately 1,109 acres and be entirely on private land. The Project is proposed to include constructing an approximately 0.4-mile gen-tie line to connect to the San Luis Valley Substation. Project area maps are included in Appendix A.

At full build-out, solar panels, single-axis trackers (solar panel mounting structures), and related equipment would occupy most of the Project site. Temporary construction laydown or on-site assembly facility areas, construction trailers, and parking areas would be within the Project area.

# 3 General Environmental Setting

## 3.1 Physiography and Climate

The Project area is in the Level III ecoregion referred to as the Arizona/New Mexico Plateau in Alamosa County (Shannen 2012). The Project site is situated at an elevation of 7,600 feet above mean sea level. Almosa County's average annual temperatures range from 24.3 to 60.3 degrees Fahrenheit. The mean annual precipitation, including rain and snowfall, is 7.4 inches (U.S. Department of Commerce 2024).

The Level IV ecoregion includes the San Luis Alluvial Flats and Wetlands (Shannen 2012). According to the Ecosystem Dynamics Interpretive Tool (EDIT), produced by the United States Department of Agriculture, the San Luis Alluvial Flats and Wetlands reside in a major land resource area 051X (USDA 2022). This area consists of a network of braided ephemeral streams on nearly level topography due to sheet floods. Soils with the highest alkalinity in the area will have a finer texture (USDA 2022).

## 3.2 Soil Resources

Six different Soil Map Units are identified within the study area by the National Resources Conservation Service (NRCS) Web Soil Survey. Appendix B includes an NRCSsoil map of the Project site. The most prevalent soil unit on the Project site is Gunbarrel loamy sand, at 387.0 acres or 35 percent of the Project site. The Gunbarrel series consists of very deep, somewhat poorly drained soils formed in wind-reworked alluvium from volcanic rocks containing dominant amounts of dark gray and red volcanic mixed grains. Gunbarrel soils are on flood plains, terraces, and low alluvial fans. These soils are used as native pastureland and for irrigated cropland, principally potatoes. Principal native plants are tall rabbitbrush, greasewood, alkali sacaton, and saltgrass.

Gunbarrel loamy sand and Mosca loamy sand are each farmland of unique importance in the NRCS database. These soils are both found in floodplains on valley floors. Gunbarrel loamy sand and Mosca loamy sand are in a very low run-off class. Neither soil frequently floods or ponds, and they are not classified as hydric. Gunbarrel loamy sand, saline is the only soil that is in a very high run off class. This soil is somewhat poorly drained but does not flood or pond frequently. Other soils present include Gunbarrel loamy sand, saline (another Gunbarrel series soil), which makes up another 25.7 percent of the site, San Luis sandy loam at 14.4 percent, and Mosca loamy sand at 13.4 percent respectively. Gunbarrel loamy sand (saline) and Mosca loamy sand (wet) have hydric soil components; however, NRCS considers these minor components of these soil map units.

The San Luis series consists of very deep, somewhat poorly drained soils formed in alluvium derived from basalt. San Luis soils are on floodplains or valley floors and have 0 to 4 percent slopes. These soils exhibit slow runoff and slow or very slow permeability. They are used as native pastureland and for irrigated cropland. Principal native plants are saltgrass, alkali sacaton, rabbitbrush, and greasewood. Common crops are alfalfa and small grains.

The Mosca series consists of very deep, well-drained soils formed in alluvium derived from igneous and metamorphic rock. Mosca soils are on alluvial flats, alluvial fans, or alluvial terraces and have slopes of 0 to 4 percent. These soils are well drained, low runoff, with moderately rapid permeability. These soils are used as native pastureland or as irrigated cropland where salts are leached successfully to produce potatoes, alfalfa, barley, oats, and sweet clover. Principal native plants are blue grama, rabbitbrush, snakeweed, sandhill muhly, annual buckwheat, mustard, prickly pear, fringed sage, greasewood, saltgrass, and alkali sacaton.

## 3.3 Water Resources

The Project area is within the Sand Creek-San Luis Creek watershed (10-digit hydrologic unit code [HUC10] 1301000306). According to the National Hydrography Dataset, there are no surface waters or prominent waterbodies within the Project area (Appendix C). The flowlines shown by the National Hydrography Dataset are identified as canals and/or ditches. Based on a review of National Wetlands Inventory (NWI) data, five potential wetland and/or waterbody features were identified within the Project area, including three riverine features, one freshwater pond, and one freshwater emergent wetland feature.

Kimley-Horn personnel conducted a site visit on April 14th, 2023, to identify potential wetlands and/or waters of the U.S. (WOTUS). A *Wetlands and Aquatic Resources Delineation Report* (Kimley-Horn 2023a) was prepared for the Project to document field assessment methods and results. Kimley-Horn

identified six swales within the Project area. A swale is characterized by low or infrequent flow, which agencies typically will not assert jurisdiction over unless the swale contributes to hydrological connection. An ordinary high-water mark was not found in any swales identified within the Project area. The NWI-mapped features summarized above were either incorrectly mapped by USFWS, or are no longer present due to agricultural practices over time. Biologists from Barr confirmed these aquatic resource findings during a spring 2025 site visit.

## 3.4 Vegetation Communities

The following information is excepted from the Project Biological Resources Survey Report (Kimley Horn 2023b). Site photographs from the 2025 field reconnaissance are provided in Appendix D.

The field survey documented plant community types within the study area. Vegetation on the property was dominated by both native and invasive species commonly observed in the arid West. Community types in the Project Area are as follows:

- 66 percent (736 acres) – fallow agriculture dominated by Russian thistle, kochia (*Bassia scoparia*), and bare ground areas.
- 21 percent (235 acres) – disturbed rangeland dominated by big sagebrush (*Artemisia tridentata*), Russian thistle (*Salsola tragus*), and bare ground areas
- 11 percent (126 acres) – active agriculture dominated by common wheat (*Triticum aestivum*).

Based on the National Landcover Database, the study area consists of mostly cultivated crop lands with small portions of shrub/scrub and hay/pastureland cover types. The site visit determined that the National Landcover Database land cover type locations were generally accurate when compared to field observations. Colorado Department of Agriculture-listed noxious weed species and other invasive plant species were observed on-site and are included in Table 3-1. Noxious weeds and invasive plants, which are found primarily within the disturbed rangeland and fallow agriculture communities, account for approximately 52 percent (579 acres) of vegetation surface cover.

**Table 3-1. CDA Noxious Weed and Other Invasive Plants within the Study Area**

| Species | CDA/Alamosa County Designation | Eradication Requirements |
|---|---|---|
| Kochia (*Bassia scoparia*) | Unlisted – Nuisance Species | None |
| Russian Thistle (*Salsola tragus*) | Unlisted – Nuisance Species | None |

According to GIS desktop analysis for vegetative land cover and community type data from the Southwest Regional Gap Analysis Project (SWReGAP) (Lowery et al. 2005), coupled with biological field surveys completed in 2023, 2024, and 2025, there are three predominant vegetation communities in the Project area: agriculture, inter-mountain basins greasewood flat, and inter-mountain basins semi-desert shrub steppe. All communities reflected the dominant and associated plant species that typically occur within these communities. Each community type and the percentage of each type within the Project area is described below.

The largest community type identified within the Project area is Agriculture. According to the field survey performed in 2023, the agricultural type is fallow agriculture dominated by Russian thistle (*Salsola tragus*), kochia (*Basia scoparia*), and bare ground. SWReGAP identifies 72 percent of the Project area as agricultural, while the field assessment observed 66 percent of the project area as agricultural (NatureServe 2024).

Inter-Mountain Basins Greasewood Flat was the second largest plant community within the project area. This plant community is typically found near drainages, on stream terraces, and flats (Malone 2016). Species associated with this plant community include greasewood (*Sarcobatus vermiculatus)*, four-wing saltbush (*Atriplex canescens*), spiny saltbush (*Atriplex confertifolia*), or winterfat (*Krascheninnikovia lanata)* (Schulz 2024).

The Inter-Mountain Basins Semi-Desert Shrub Steppe is the third largest plant community in the Project area at 12 percent. This community is represented by the following dominant shrub species and associated forbs. Overstory shrub species include four-wing saltbush, big sagebrush *(Artemisia tridentata),* Greene's rabbitbrush *(Chrysothamnus greenei),* yellow rabbitbrush *(Chrysothamnus viscidiflorus), Ephedra spp.,* rubber rabbitbrush (*Ericameria nauseosa),* broom snakeweed *(Gutierrezia sarothrae),* and winterfat (*Krascheninnikovia lanata*) (NatureServe 2024). Dominant graminoids include Indian ricegrass (*Achnatherum hymenoides),* blue grama *(Bouteloua gracilis),* desert saltgrass *(Distichlis spicata),* Sandberg bluegrass *(Poa secunda),* muttongrass *(Poa fendleriana),* alkali sacaton *(Sporobolus airoides),* needle and thread *(Hesperostipa comata),* James' galleta *(Pleuraphis jamesii),* and saline wildrye *(Leymus salinus)* (Schulz 2024).

# 4 Revegetation Plan

## 4.1 Overall Strategy

Generally, revegetation will be conducted to minimize dust, erosion, and weed infestations. Areas will be seeded with a native or dryland seed mix developed in coordination with a Reclamation Specialist. Implementing the Weed Management Plan (Section 5) will minimize the potential for the introduction of new weeds and the spread of existing weeds due to Project development.

## 4.2 Site Preparation

Due to the site's flat nature, limited grading or soil removal during site construction is anticipated during site construction; therefore, measures for topsoil salvage, storage, or replacement are not needed. Any trenches, bores, or other excavations would be backfilled to the original grade and recompacted in accordance with accepted engineering practices using native soils.

Soil decompaction can increase soil vulnerability to weeds or erosion, increase dust, or cause further damage to surviving rootstocks that may be present. The Reclamation Specialist would evaluate soil compaction and prescribe no treatment, limited treatment using hand tools, light harrowing or disking with a tractor, or deeper disking or ripping. Where soil decompaction is implemented, follow-up measures to control dust and erosion would also be prescribed.

## 4.3 Plant Materials

Adapture would re-seed reclaimed areas with a native or dryland seed mix, as prescribed by the Reclamation Specialist in consultation with the County. The determination whether to re-seed and, if so, seeding rates (i.e., pounds per acre) would be made by the Reclamation Specialist based on the nature of the disturbance, condition of soils, and pre-disturbance cover and species diversity. The seed mix would consist primarily or exclusively of native early-successional or dryland cover species. No re-seeding would occur on sites where prior Project activities have left sufficient native vegetation in place or where vegetation has recovered to meet the success criteria listed in Section 4.6.

In general, the total seeding rate would be at least 20 pounds per acre. Specific proportions would be based on seed availability and recommendations of the Reclamation Specialist. Any seed from vendors or contracted collectors would be certified weed-free. Adapture or their EPC contractor would be responsible for acquiring seed to implement this plan.

## 4.4 Seeding Methods and Schedule

The Reclamation Specialist would prescribe seeding methods and schedule. Seeding methods may employ equipment (e.g., seed drill or hydroseeding equipment) for large areas. Some reclamation areas are expected to be small or inaccessible to equipment. In these areas, seeds would be broadcast using manually operated cyclone-type bucket spreaders, mechanical seed spreaders, or rubber-tired all-terrain vehicles equipped with mechanical broadcast spreaders. Seed in the spreader hoppers would be mixed to discourage separation of the component seed types. Where broadcast seeding is employed, seeded areas may be raked or harrowed to cover the seed at the direction of the Project Reclamation Specialist.

Reseeding would be scheduled to maximize exposure to seasonal rainfall. Seeding would typically be done in late summer or early fall to ensure that seed is in place before the onset of seasonal monsoon rains in July or in advance of winter precipitation.

## 4.5 Revegetation Site Maintenance

Revegetation sites would not be irrigated. The sites would be monitored for weed presence and abundance, and weed control would be implemented as needed, according to the Project Weed Management Plan (Section 5). Additional maintenance activities would consist of erosion control, soil stabilization, or other measures as needed, based on the results of monitoring.

## 4.6 Revegetation Monitoring and Performance Standards

Revegetation monitoring will include the following:

- Monitoring for appearance and function will be conducted once annually for 5 years and may be extended if performance standards have not been achieved.
- A survey of the revegetation areas to be conducted in the late spring of each year. Qualitative data will be collected on vegetation cover, species composition, appearance, and function of the plant community. In addition to qualitative data, quantitative data on vegetation cover and species composition will be collected using ocular estimates within the revegetation areas. The data collected will be compared against similar data collected within a community reference site (i.e.,

associated undisturbed areas immediately adjacent to the Project site) or pre-disturbance conditions within the Project site.

The purpose of monitoring and reporting is to document the progress toward success of the performance standards on an annual basis and to identify any required corrective actions to ensure the success of the overall revegetation efforts. The goal of qualitative monitoring is to document conditions and evaluate the need for remediation to ensure the reclaimed areas are progressing toward the performance success standard.

### 4.6.1 Performance Standard

The revegetation will be considered successful when the following Performance Standard is met:

- Total vegetative cover and relative cover of native and nonnative plant species within restored lands is like that, or approximately 70 percent of cover observed in reference areas in the immediate Project site vicinity. This is a performance metric similar to that required by the Project Stormwater Management Plan and the Colorado Department Public Health and Environment.

If performance standards are not achieved, remedial actions may need to be implemented, and monitoring may need to be extended until success criteria are met or an alternative strategy is approved.

## 4.7 Monitoring, Remediation, and Reporting

Following the implementation of reclamation measures, the site would be monitored annually to evaluate revegetation relative to the performance standard above. Monitoring will continue for a period of no less than 5 years or until the defined success criteria are achieved.

Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) would be performed during the 5-year monitoring period, if necessary, to ensure the success of the reclamation effort. If the site fails to meet the performance criteria after the 5-year maintenance and monitoring period, monitoring and remedial activities will continue yearly until the criteria are met.

Throughout the revegetation monitoring, the Reclamation Specialist will provide annual Reclamation Progress Reports to Adapture and/or to the county for review and approval. Each annual report would include the following components:

- Summary of revegetation status, including a comparison of replanted areas monitored during the preceding year
- Summary of reclamation progress and results since the previous report, including a map of all reclamation activity since the previous report
- Seed inventory that accounts for materials acquired or used since the previous report
- Recommendations, as applicable, for remedial work such as reseeding, erosion control, weed control, or other maintenance activity
- Representative site photographs
- Notation of any other pertinent concerns (e.g., vehicle trespass)

# 5 Weed Management Plan

The Colorado Weed Management Act mandates management of noxious weeds and invasive plant species: C.R.S. Title 35, Article 5.5, as amended. The BOCC has adopted a noxious weed management plan for all unincorporated lands within its jurisdiction to comply with the Law. The BOCC may adopt regulations, ordinances, or resolutions to enforce this plan and promote noxious weed management in the county. The Noxious Weed Advisory Board, a commission of resident private landowners, designates which species will be managed within the County, thereby establishing the County Noxious Weed List. The Board can require identified landowners to submit weed management plans when species on the list are found on their property. The Project weed management plan follows the recommendations outlined in the Alamosa County Noxious Weed Management Plan (approved by the BOCC, 2014).

## 5.1 Priority Weed Species

The Colorado Department of Agriculture (CDA) developed the Colorado Noxious Weed List, which designates species for control or eradication. The CDA list is available here: https://drive.google.com/file/d/1Kv7vzdvkjs9ud9gsG7o4AqXA2JjYlbxO/view. The CDA identifies List A, B, C, and Watch List species. Management strategies for each classification are:

- List A species are currently in Colorado and are designated by the Commissioner for eradication.
- List B species are those that exist in Colorado, and a noxious weed management plan is being designed to stop their spread.
- List C are species for which a plan will be developed and implemented for the noxious weeds. This plan is designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of these plans is not to stop the spread of the noxious weeds but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.
- Watch List species are state-concern species that have the potential to become problematic. More data is needed to determine whether these species should be listed.

In addition, Alamosa County maintains its own noxious weed list:

**Primary Species (Most prevalent in the County)**

- Russian Knapweed (*Centaurea repens*)
- Perennial Pepperweed (*Lepidium latifolium*)
- Downy Brome (*Bromus tectorum)*
- Canada Thistle *(Cirsium arvense)*
- Hoary Cress *(Cardaria draba)*

**Secondary Species**

- Leafy Spurge (*Euphorbia esula*)
- Black Henbane (*Hyoscyamus niger*)
- QuackGrass (*Elymus repens)*

- Field Bindweed (*Convolvulus arvensis*)

## 5.2 Pre-Construction Field Surveys

A pre-construction, noxious weed survey is planned prior to the commencement of Project construction. The pre-construction survey will establish the baseline of noxious weed occurrence in the Project area. It will guide the implementation of management actions (i.e., eradication and/or control), monitoring, and reporting outlined in this Plan. Data collected should conform to the North American Weed Management Association's standards and be provided to the Alamosa County Weed Inspector. The mapping standards are available here: https://naisma.org/wp-content/uploads/2019/06/NAISMA_Mapping_Standards.pdf. The Weed Inspector provides this data to the CDA for the state weed mapping program.

## 5.3 Weed Management Techniques

Adapture will employ an integrated weed management approach that utilizes treatment methods to control and/or eradicate weeds. No single control method or any 1-year treatment program will achieve effective control of any weed-infested area. Comprehensive weed management methods (manual, mechanical, chemical, biological, and cultural controls) for each target weed species can be found in the Alamosa County Noxious Weed Management Plan available on the San Luis Valley Weed Management Association webpage available here: https://www.slvnoxiousweeds.org/about-us/.

## 5.4 Weed Monitoring and Reporting

Annual Project area weed monitoring will be completed according to the following schedule:

- **Class A or B weeds present**: Monitor management measures (qualitative and quantitative) for 5 years
- **Class C weeds are present**: Monitoring treatment area for 3 years
- **No weeds present**: Monitor every 5 to 10 years

Weed monitoring and reporting will be documented in an annual Weed Management Report submitted to the Alamosa County Weed Inspector. Specifically, monitoring and reporting would continue for no less than 5 years or until the defined revegetation success criteria are achieved. The monitoring report will include the species controlled, method of treatment(s) used, a map of the treated area, issues encountered, and overall control achieved at the site. If using chemical treatments, the name and amount of herbicide used and dates sprayed will be included in the report.

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