Application for

Special Use Permit

Pawnee II Solar BESS

Prepared for:

Morgan County Planning Department

Submitted by:

Pawnee Solar 2 LLC

A wholly owned subsidiary of
ACE Development Company LLC

AES Clean Energy
282 Century Pl #2000, Louisville, CO 80027
(303) 444-3020

January 26, 2023

Nicole Hay
Director of Planning and Zoning
Morgan County Planning and Zoning Department
231 Ensign Street, P.O. Box 596
Fort Morgan, CO 80701

RE: Pawnee Solar 2 LLC
Application for Special Use Permit for Battery Energy Storage System

Dear Ms. Hay:

Pawnee Solar 2 LLC, a wholly owned subsidiary of ACE Development Company LLC (AES) seeks approval of this Special Use Permit application for a new battery energy storage system (BESS) to be constructed and operated in Morgan County, Colorado. For over 40 years, AES has advanced the economic, social, and environmental benefits of clean electrification in the United States and around the globe for sustainable development.

This new BESS is not a standalone facility, but part of an integrated utility-scale solar energy development by AES referred to as the Pawnee II Solar Project (Project). This Special Use Permit application for the BESS is a connected action to the photovoltaic solar facility application being submitted concurrently; whereby, the BESS would not be constructed without the photovoltaic solar facility. Thus, the Special Use Permit-based project impact analysis for the BESS is closely related to the photovoltaic solar facility and should be considered together. the Pawnee II Solar Project (Project) — a new solar energy facility and battery energy storage system (BESS) to be constructed in Morgan County, Colorado. AES is one of the world's most dependable and innovative renewable energy companies.

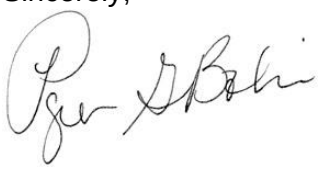
The enclosed Special Use Permit application is specifically for the new BESS; and a separate Special Use Permit application has been submitted concurrently with this application for the connected photovoltaic solar facility (Pawnee II Solar Project). The Project will be located approximately 9 miles southeast of the town of Fort Morgan, Colorado, entirely on private land adjacent to County Road K. The new BESS (6.04 acres in footprint) will include a 125-megawatt alternating-current-coupled BESS. The Project would be constructed in one phase, with construction expected to begin in the third quarter of 2024 and the integrated solar facility operation expected to commence in the second quarter of 2026. The Project is proposing to interconnect into the to-be constructed Canal Crossing substation, which was reviewed and approved by Morgan County, under the 1041 regulations, in September 2022.

Pawnee Solar 2 LLC and AES are enthusiastic about adding economic, social, and environmental benefits to Morgan County and its residents through the development of this clean, renewable energy project. The Project area provides an ideal suitable location for utility-scale solar energy development due to the existing solar resource, site topography, and

proximity to a point of interconnection. The Project will support community and economic development in Morgan County through job creation, local taxes, and construction activities, as well as contributing towards Colorado's renewable energy portfolio standard for climate change mitigation and a low-carbon economy.

AES stands ready to address comments or questions from Morgan County staff, commissioners, and referral agencies, as necessary, to deem the enclosed Special Use Permit application is complete and present the Project for public hearing.

Sincerely,



Page Bolin
Development Manager
AES Clean Energy

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MORGAN COUNTY PLANNING
ZONING & BUILDING DEPT.
231 Ensign, P.O. Box 596
Fort Morgan, Colorado 80701
PHONE (970)542-3526
FAX (970)542-3509
EMAIL: permits_licensing@co.morgan.us

PERMIT #_____-_____

Date Received___/___/___Received By_____
App Fee $____ Ck/CC #:_____ Paid ___/___/___
Minor Amend Fee: $____ CK/CC #:____ Paid ___/___/___
Recording Fee $____ Ck/CC #:_____ Paid___/___/___
PC Date: ___/___/___ BOCC Date: ___/___/___
100 Year Floodplain? Y / N Taxes Current? Y / N

SPECIAL USE PERMIT APPLICATION

(Also to be used as application for Amendments to Existing Special Use Permits)
Landowner **MUST** Sign Application and Right to Farm Policy

APPLICANT

Name Pawnee Solar 2 LLC
Address 282 Century Pl, Suite 2000
Louisville, CO 80027
Phone (303) 915-4789
Email page.bolin@aes.com

LANDOWNER

Name Stephen and JoAnn Cecil
Address P.O. Box 102
Fort Morgan, CO 80701
Phone (720) 237-2594
Email j.cecil1@gmail.com

BRIEF DESCRIPTION OF APPLICATION

Request approval of a Special Use Permit for a Large Scale Renewable Energy Project (Solar) - 250 MW Solar PV + 125 MW Battery Energy Storage System (BESS)

PROPERTY LEGAL DESCRIPTION

Address (if available):
See attached for full legal description

S:___T:___R:___ ___½___¼___¼ Property Size_____(sq. ft. or acres)
Parcel #:_____-_____-_____-_____ Zone District: _____
Subdivision:_____ Lot #(s): _____

Is property located within 1320' (1/4 mile) of a livestock confinement facility? Y (N)

SEE REQUIRED ATTACHMENT LIST ON BACK OF THIS PAGE.

INCOMPLETE APPLICATIONS WILL NOT BE ACCEPTED OR PROCESSED.

SPECIAL USE PERMIT REQUIRED ATTACHMENT LIST

Fee: ☑ **Non-Refundable Application Fee**

**Additional fees and charges may be required pursuant to Section 2-160 of Morgan County Zoning Regulations*

Project Narrative: ☑ **Narrative– Including the following:**

- ☑ Project Description
- ☑ Purpose of request
- ☑ How this proposal complies with the Morgan County Comprehensive Plan
  See: *https://morgancounty.colorado.gov/sites/morgancounty/files/Comprehensive-Plan-2008.pdf*
- ☑ How this project/proposed use meets the criteria for Special Use Permit pursuant to Sec. 2-395 of the Zoning Regulations
- ☑ How the project/proposed use meets any specific criteria related to the project/proposed use. *See Morgan County Zoning Regulations Chapter 4-Supplementary Regulations, including but not limited to: Campgrounds, Livestock Confinement, Kennels, Outdoor Shooting Ranges, Home Occupations, Oil and Gas, Mobile Home Parks, Wireless Service Facilities, Solar, Wind and BESS*
- ☑ How project will relate to or impact existing adjacent uses
- ☑ All off-site impacts and proposed mitigation measures
- ☑ Development or implementation schedule of project
- ☑ Proposed length of time the permit, if applicable
- ☑ Discussion of any public improvements required to complete the project

Environmental Impacts: ☑ Discuss any environmental impacts the Special Use will have on the following and the proposed mitigation measures:

☑ Air Quality	☑ Dust	☑ Existing Vegetation	☑ Land Forms
☑ Noise	☑ Odor	☑ Storm Water Runoff	☑ Water Resources
☑ Wetlands	☑ Wildlife	☑ Visual Amenities	☐ Other _____

Map & Plans: ☑ **Special Use Map** meeting the requirements of Sec. 2-420 and any specific map requirements for the proposed use including but not limited to: *Campgrounds, Livestock Confinement, Kennels, Outdoor Shooting Ranges, Home Occupations, Oil and Gas, Mobile Home Parks, Wireless Service Facilities, Solar, Wind and BESS. Sample Map attached to application for reference*

☑ **Drainage/Run-Off Control Plan** may be required if the Planning Administrator determines that the use or building meets one of the following criteria:

(1) The accessory use or building may have a drainage impact on adjacent properties;
(2) The accessory use or building may have a drainage impact on adjacent right of ways;
(3) The accessory structure is 5000 square feet or larger.

☑ **Decommissioning Plan** [Wind, Solar, BESS]
☐ **Geotechnical Report** [Wind, Solar]
☑ **Maintenance Statement** [Wind, Solar, BESS]
☐ **Water and/or Wind Erosion Control Plan** [Wind, Solar]
☑ **Fire Mitigation Plan** [BESS]
☑ **Specification Sheet** [BESS]
☑ **Emergency Operation Plan** [BESS]

Ownership: ☑ **Current title insurance commitment (last 6 months)**
☑ **Mineral Rights Holders Notification**
☐ **Notice to FFA & Approval Letter** [Wind]
☐ **Notice to Operator of Communication Link (if applicable)** [Wind]
☑ **Proof of current paid taxes**

Utilities/Access: ☐ **Water tap (Will Serve letter or proof of access to a well)**

☐ **Sewer (Septic Permit, Will Serve Letter from NCHD or proof of other public system)**

☐ **Electric (Electric bill or letter of commitment from electricity provider)**

☐ **Driveway Permit from CDOT or Morgan County Road & Bridge (If required by staff)**

☐ **Ditch Company- Proof of contact if there is a ditch on or next to subject property**

☐ **Architecture Control Approval (if applicable)**

☐ **Utility Interconnection or Crossing Certification** [Wind, Solar]

☑ **Road Agreement** [Wind, Solar]

☑ **Electrical Diagram** [BESS]

Vested Rights: ☐ **Vesting Rights** (Optional). If applying for vested rights with special use application, the following must be submitted:

- ☐ Period of time Vesting Rights are requested
- ☐ Development schedule including timeline and phases
- ☐ Reason for request
- ☐ Other pertinent factors concerning the development
- ☐ Additional application fee for vesting rights application

Miscellaneous: ☑ **Right to Farm Policy** signed by Landowner(attached)

☑ **Liability Insurance for Solar, Wind and/or BESS projects**

☑ 1 **# Paper Application sets**

☑ 1 **Digital Copy of Application** (One sided only)

☐ **Posted Public Notice Verification:**

☐ Notarized affidavit with photographs from a distance & close-up

This must be submitted PRIOR to Planning Commission hearing and PRIOR to Morgan County Board of Commissioners hearing

☐ **Additional Information required by staff:**

_____

APPLICANT & LANDOWNERS **MUST** SIGN APPLICATION ON NEXT PAGE

APPLICANT & LANDOWNER'S STATEMENT

I certify that the information and exhibits I have submitted are true and correct to the best of my knowledge.
Application must be signed by landowners as shown on title insurance/commitment.

[signature]	2/9/23	Stephen Cecil	12-12-2022
Applicant Signature	Date	Landowner Signature	Date
		Joann Cecil	12-12-2022
Applicant Signature	Date	Landowner Signature	Date

MORGAN COUNTY, PLANNING, ZONING & BUILDING DEPT.
231 Ensign, P.O. Box 596
Fort Morgan, Colorado 80701
PHONE (970) 542-3526 FAX (970) 542-3509

MORGAN COUNTY RIGHT TO FARM POLICY / NOTICE

Morgan County is one of the most productive agricultural counties in Colorado. Ranching, farming, animal feeding, and all other manner of agricultural activities and operations in Morgan County are integral and necessary elements of the continued vitality of the county's economy, culture, landscape and lifestyle. Morgan County specifically recognizes the importance of agricultural operations as necessary and worthy of recognition and protection.

Landowners, residents and visitors must be prepared to accept as normal the effects of agriculture and rural living. These may include noise from tractors, equipment, and aerial spraying sometimes at night or in the early morning; dust from animal pens, field work, harvesting, and gravel roads; odor from animal confinement operations, silage and manure; smoke from ditch burning; flies and mosquitoes; the use of pesticides and fertilizers, including aerial spraying; and movement of livestock or machinery on public roads. Under the provisions of the State of Colorado's "Right to Farm" law (Section 35-3.5-101 and following, C.R.S.), all normal and non-negligent agricultural operations may not beconsidered nuisances.

Also public services in a rural area are not at the same level as in an urban or suburban setting. Road maintenance may be at a lower level, mail delivery may not be as frequent, utility services may be nonexistent or subject to interruption, law enforcement, fire protection and ambulance service will have considerably longer response times, snow may not be removed from county roads for several days after a major snow storm. First priority for snow removal is that school bus routes are normally cleared first.

Children are exposed to different hazards in a rural setting than they are in an urban or suburban area. Farm and oilfield equipment, ponds, and irrigation ditches, electrical service to pumps and oil field operations, high speed traffic, noxious weeds, livestock, and territorial farm dogs may present real threats to children. It is necessary that children's activities be properly supervised for both the protection of the children and protection of the farmer's livelihood.

All rural residents and property owners are encouraged to learn about their rights and responsibilities and to act as good neighbors and citizens of Morgan County. This includes but is not limited to obligations under Colorado State law and Morgan County Zoning Regulations regarding maintenance of fences, controlling weeds, keeping livestock and pets under control. There may be provisions of which you are unaware. For example, because Colorado is a Fence Law State, owners of property may be required to fence livestock out.

Information regarding these topics may be obtained from the Colorado State University Cooperative Extension Office and the County Planning and Zoning Department, and County Attorney.

RECEIPT AND STATEMENT OF UNDERSTANDING

I hereby certify that I have received, read, and understood the Morgan County Statement of Policy and Notice regarding Right to Farm.

I further state that I am aware that the conditions of living in an unincorporated area are different than living in a town or city and that the responsibilities of rural residents are different from urban or suburban residents. I understand that under Colorado law that a pre-existing, non-negligent agricultural operation may not be considered a public or private nuisance.

Stephen Cecil : Joann Cecil 12-12-2022
Signature Date

To Be Signed by Landowner

Stephen and JoAnn Cecil
Printed Name

P.O. Box 102
Address

Fort Morgan, CO 80701

Adopted by the Morgan County Board of County Commissioners by Resolution #96BCC41 on July 23, 1996 and amended by Resolution 2008 BCC 34 on September 2, 2008.

EXHIBIT 1

PROJECT NARRATIVE

Pawnee II Solar BESS

SECTION 4-855(A). CHANGE CONDITIONS & PROJECT NARRATIVE

(1) Change Conditions Narrative. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, and screening vegetation or structures. Project description and proposed phasing of development.

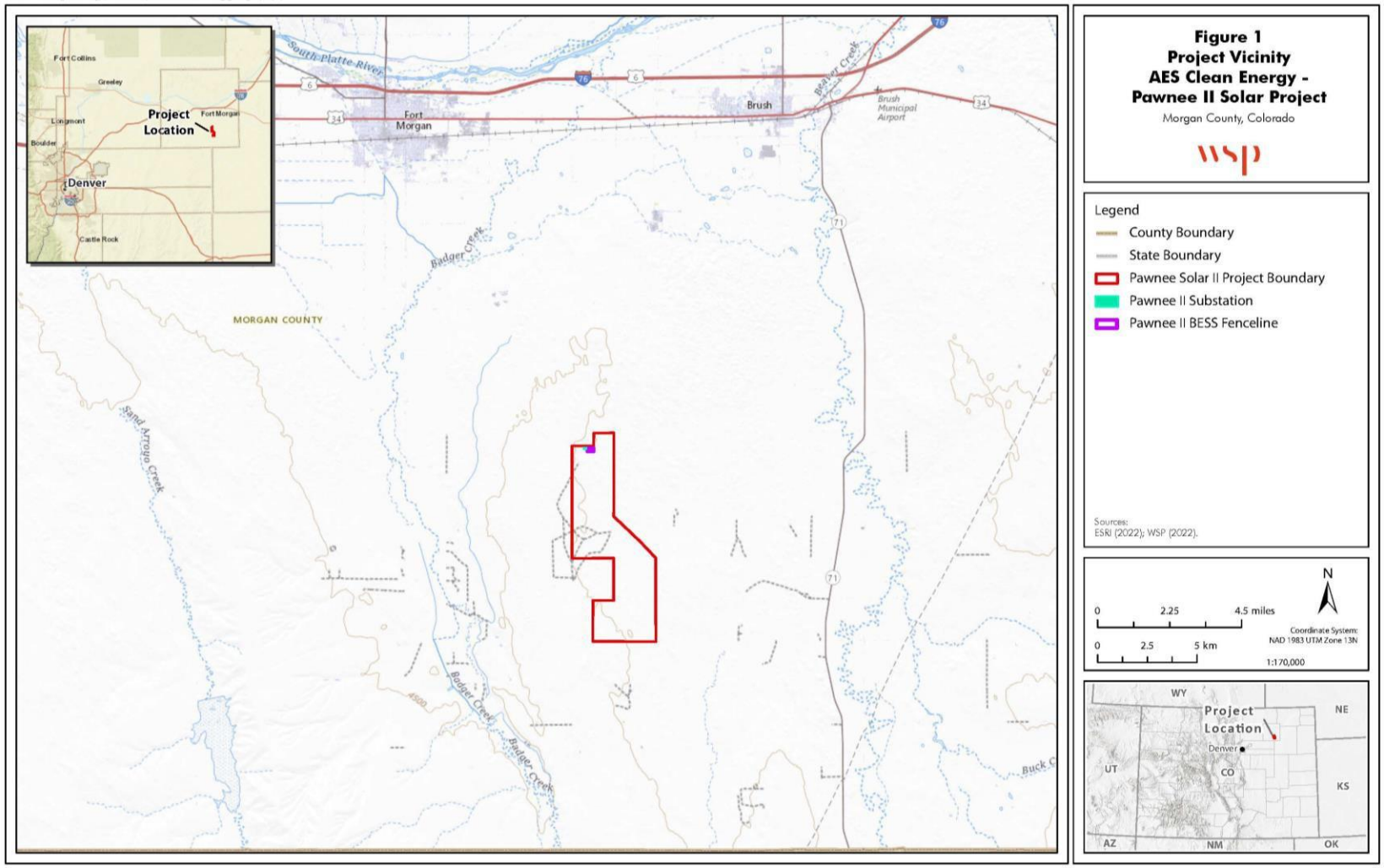
(5) Narrative. A narrative providing an explanation of the project, the above grade and below grade infrastructure, the type of battery, temperature control (if applicable) for the BESS system, identified environmental impacts and mitigation [refer to Exhibit 5 for Environmental Impacts].

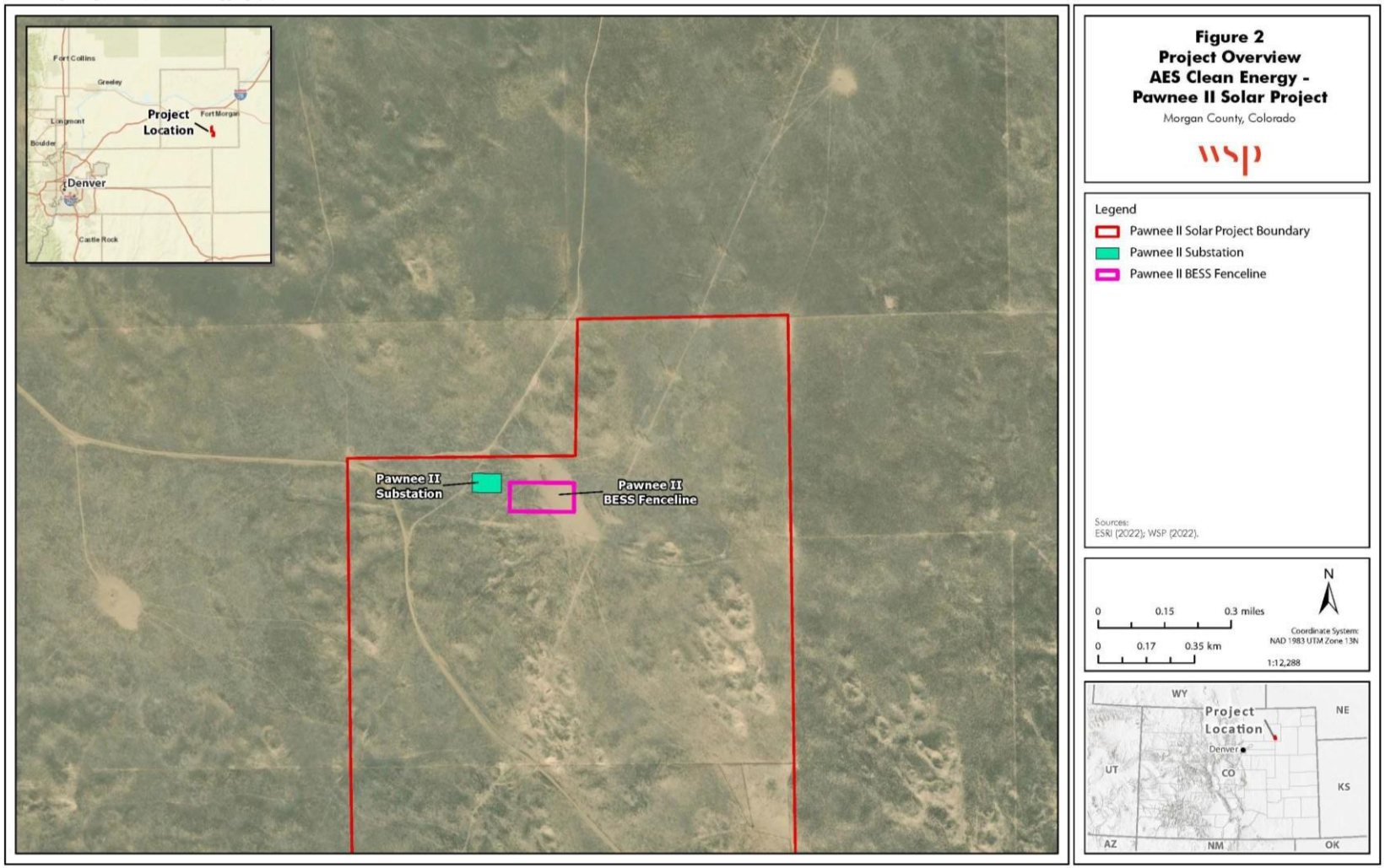
INTRODUCTION

Pawnee Solar 2 LLC, a wholly owned subsidiary of ACE Development Company, LLC (AES), is submitting this Special Use Permit (SUP) application for the proposed Pawnee II Solar Battery Energy Storage System (BESS) Project (Project). The Project will be located along County Road K, approximately 9 miles southeast of the town of Fort Morgan on private property owned by Stephen and Joann Cecil (refer to the Vicinity Map). The Project will be located within Section 13, of Township 02 North and Range 57 West, in a rural portion of unincorporated Morgan County, adjacent to other agricultural/grazing lands (Project Area). The parcel number and land ownership for the Project Area is as follows:

Parcel Number	Account Number	Owner	Owner Address
129113000001	R010915	Cecil, Stephen & Joann	P.O. Box 40 Fort Morgan, CO 80701

AES is pursuing this Project in anticipation of the sale of renewable energy to an electric utility company serving Colorado. The Project would interconnect to Xcel Energy's transmission system via the new, to-be-constructed Canal Crossing Substation, which will be located directly adjacent to the Project Area on the northeast side (west side of Section 13). The Project Area provides an ideal location for Batter Energy Storage due to, topography, location adjacent to an existing County Road and proximity to the point of interconnection. The Project will support the adjacent proposed solar PV project by providing flexibility in the collection and distribution of power during times that the sun is not shining or in the evening hours, when electricity use peaks. It will also support community and economic development in Morgan County through job creation, local taxes, and construction activities, as well as contributing towards Colorado's renewable energy portfolio standard for climate change mitigation and a low-carbon economy.


Fort Collins
Greeley
Longmont
Boulder
Project Location
Fort Morgan
Denver
Castle Rock
South Platte River
Fort Morgan
Brush
Beaver Creek
Brush Municipal Airport
Badger Creek
MORGAN COUNTY
Sand Arroyo Creek
Buck C
Figure 1
Project Vicinity
AES Clean Energy -
Pawnee II Solar Project
Morgan County, Colorado
Legend
County Boundary
State Boundary
Pawnee Solar II Project Boundary
Pawnee II Substation
Pawnee II BESS Fenceline
Sources:
ESRI (2022); WSP (2022).
N
0 2.25 4.5 miles
0 2.5 5 km
Coordinate System:
NAD 1983 UTM Zone 13N
1:170,000
WY
NE
Project Location
Denver
UT
CO
KS
AZ
NM
OK


Fort Collins
Greeley
Longmont
Boulder
Denver
Castle Rock
Fort Morgan
Project Location
Pawnee II Substation
Pawnee II BESS Fenceline
Figure 2
Project Overview
AES Clean Energy -
Pawnee II Solar Project
Morgan County, Colorado
wsp
Legend
Pawnee II Solar Project Boundary
Pawnee II Substation
Pawnee II BESS Fenceline
Sources:
ESRI (2022); WSP (2022).
N
0 0.15 0.3 miles
0 0.17 0.35 km
Coordinate System:
NAD 1983 UTM Zone 13N
1:12,288
WY
NE
UT
CO
KS
AZ
NM
OK
Project Location
Denver

PURPOSE OF REQUEST

The purpose of this application is to provide Morgan County with pertinent information regarding the Project, subject to the Morgan County *Zoning Regulations Concerning the Regulation of Wind Energy, Solar Collector, and Battery Energy Storage Systems,* adopted in June 2022.[1]

An in-person pre-application meeting about the Project was held August 24, 2022, with Morgan County Planning Director, Nicole Hay. The applicant and proponent, Pawnee Solar 2 LLC, understands that the approval or denial of the final SUP by the Board of County Commissioners will occur after the submittal of this application. Approval or denial will be based on the information included herein, as well as any additional information that is requested upon review by Morgan County Planning Department and Planning Commission (hereafter referred to as "Morgan County" or "the County"). In accordance with the submittal requirements, one hard copy and one electronic submittal of this application have been provided to the County. It is anticipated that, after an initial review by Morgan County, the final submission before Planning Commission consideration will consist of a total of 11 hard copies to be provided to Morgan County. Furthermore, to assist with the County's review of this application, each section of the application is cross-referenced with the corresponding section names of the *SUP Checklist* and requirements of the *Morgan County Zoning Regulations Section 2-380 SUP Submittal Requirements, Section 4-820 Solar Collector Facility Submittal Requirements* and *Section 4-855 BESS Submittal Requirements*.

APPLICANT INFORMATION

Pawnee Solar 2 LLC is a wholly owned subsidiary of ACE Development Company, LLC (AES). Founded in 1981 and headquartered in Arlington, Virginia, the AES Corporation (NYSE: AES) is a Fortune 500 global energy company accelerating the future of energy by helping businesses to transition to clean, renewable energy. The U.S. business unit, AES Clean Energy, has a corporate headquarters in Louisville, Colorado. Together with its many stakeholders, AES is improving lives by delivering the greener, smarter energy solutions the world needs. Its diverse workforce is committed to continuous innovation and operational excellence, while partnering with customers on their strategic energy transitions and continuing to meet their energy needs today. AES is committed to a wide range of social, economic, and environmental initiatives that will improve the lives of customers and their communities, protect the environments in which it operates, and empowers people and businesses. The AES Corporation has over 10,000 employees, with the U.S. clean energy business unit making up 1,000 of those employees.

AES' business model is to develop, own, and operate each renewable energy project, and each project represents its expertise in design, construction, financing, and long-term operations and maintenance. AES's U.S. renewable energy portfolio consists of utility-scale solar facilities, solar plus BESS, standalone storage, and wind energy, totaling more than 5 gigawatts (GW) of operating facilities (the majority of which have been developed in the past five years) and 40+ GW of projects in various development and construction stages across the United States.

Operations and Maintenance Experience

AES is a highly experienced, long-term owner and operator currently operating more than 3 GW of photovoltaic (PV) solar facilities. AES provides ongoing operations and maintenance (O&M)

[1] Morgan County Board Of County Commissioners. 2022. Resolution No. 2022 BCC 017, An Resolution Amending the Morgan County Zoning Regulations Concerning the Regulation of Wind Energy, Solar Collector, and Battery Energy Storage Systems

and asset management services under long-term service agreements. Services may include overseeing the day-to-day operation of the PV system, safety, and security; maximizing energy production; vegetation control; and management of reliability, site services, and power purchase agreements. Additionally, AES O&M teams offer land use and environmental permits and approvals, and other regulatory or contract-based compliance; compliance monitoring and reporting; power system forecasting; preventative and scheduled maintenance; and spare parts inventory management. O&M services may also include certain warranties or guarantees relating to the power plant.

At AES, Safety First is its motto. It is AES's practice to maintain and operate Projects in accordance with manufacturer specifications, applicable local, state, and federal safety regulations and requirement to ensure the safety of personnel, the public and in a manner that reduces risks to the project and the environment.

Regional Experience

AES has extensive experience in solar energy development for electric utility companies in the Rocky Mountain region. Below is a list of renewable energy projects, both at community-scale and utility-scale, that AES companies have completed or that are under construction in the region in the last five years. Projects under construction are denoted by italics.

Project Name	Technology	State	Status	MW DC	MW AC	MW BESS	COD
Comanche	Solar	CO	Operational	156	120		2016
Pioneer	Wind	WY	Operational	80			2016
ID Solar I	Solar	ID	Operational	55	40		2016
Latigo	Wind	UT	Operational	60			2016
San Luis Solar	Solar	CO	Operational	1.2	1.5		2017
Lafayette Horizon	Solar	CO	Operational	1.6	2		2019
Alden	Solar	CO	Operational	1.6	2		2020
Platteville	Solar	CO	Operational	1.2	1.6		2019
Monte Vista 2	Solar	CO	Operational	1.6	2		2020
Rock Creek 2	Solar	CO	Operational	1.6	2		2020
Alamosa South	Solar	CO	Operational	1.6	2		2020
East Line	Solar	AZ	Operational	120	100		2020
Hunter	Solar	UT	Operational	129.8	100		2021
Sigurd	Solar	UT	Operational	112	80		2021
Clover Creek	Solar	UT	Operational	107.3	80		2021
Central Line	*Solar*	*AZ*	*Construction*	*125*	*100*		*2022*
McFarland A	*Solar + Storage*	*AZ*	*Construction*	*250*	*200*	*100*	*2023*
Chevelon Butte Wind	*Wind*	*AZ*	*Construction*		*238.2*		*2023*

PROJECT DESCRIPTION

The Pawnee II Solar BESS Project is a 125-MW Alternating Current (AC)-coupled BESS. The BESS and appurtenant facilities are planned to be located within a 6.04-acre concrete pad footprint based on the layout included in this application. The Project Area presented in figures and appendices to this application represent the area where the batteries and their containers are planned to be sited. The footprint of the Project Area may vary slightly due to final design, materials, and more detailed engineering. Pawnee II Solar BESS is anticipated to be constructed in one phase at the same time as the adjacent solar PV system.

In addition to the BESS, the Project includes a PV solar array, a new project substation, and other appurtenant equipment (refer to the Vicinity Map and Project Overview Map). The Project would be located adjacent to the project substation, providing 680 MWh on a 4-hour cycle. The accompanying solar array will consist of approximately 610,551 PV solar panels mounted on a single-axis tracking (SAT) system supported by driven pile foundations (or equivalent) with minimal anticipated ground disturbance required. The SAT system aligns the panels in rows that rotate to face east in the morning hours and west in the afternoon hours, tracking the sun along a north/south axis to maximize solar energy production. At their highest point, the top edge of the PV panels would be approximately 8 to 10 feet above ground level, depending on spot topography.

The associated solar project would utilize UL-listed, commercially available crystalline silicon or thin film PV modules. The final quantity of PV solar panels would be determined during final engineering, when detailed technical and engineering studies are available. Inverters and associated transformers, for purposes of converting the direct current (DC) electricity from the modules to AC electricity for the grid, will be installed throughout the site on concrete equipment pads. Impervious areas would be limited to the pile foundations, equipment pads, substation, and access roads.

The Project Area perimeter will be fenced by a chain-link fence with three-strand barbed wire affixed on top, approximately 8 feet high (minimum recommended by CPW). Gated and locked access points would be provided for the Project Area (locations to be determined). The main Project entrance is proposed along County Road K. Internal access roads to major equipment pad locations would be all-weather to ensure first responder access and circulation for O&M. Access gate locks would allow first responder access at all times.

Morgan county will be notified in writing prior to the start of decommissioning.

Battery Energy Storage System

The Pawnee II Solar BESS Project is a 125-MW AC-coupled BESS. The area required for the BESS is 6.04 acres on parcel number 1291-130-00-001, Section 13 of Township 02 North, Range 57 West. The BESS will be sited on a concrete pad, that will be poured on a flat surface. Vegetation within the footprint of the concrete pad and BESS will be removed prior to construction as well as a buffer area sufficient to provide access for construction equipment. The BESS will be equipped with a liquid cooling system with an operating temperature range of -30 to 50 degrees Celsius.

The BESS area perimeter will be surrounded by an approximately 8-foot-high chain-link fence with three-strand barbed wire affixed on top. Because of the remote nature of the BESS location and the harsh desert environment, no plantings and/or screening are planned either around or in the vicinity of the BESS at this time.

Lighting installed for the Project will be designed to code to provide the minimum illumination

needed to achieve safety and security and would be downward-facing and shielded to focus illumination on the desired areas only. Security lighting may be provided at the onsite dedicated substation, inverters, and points of access.

Operation and Maintenance

Maintenance of the Project will require occasional visual inspections, equipment servicing, and minor repairs. Overall, minimal maintenance requirements are anticipated. Power electronics will be serviced annually or bi-annually, depending on the equipment type. On intermittent occasions, the presence of several workers may be required if major repair or replacement of equipment is necessary. However, due to the nature of the Project, such maintenance activities are anticipated to be infrequent.

Onsite vegetation will be managed by typical landscape maintenance techniques, including the application of herbicides and manual weeding. All open and un-landscaped portions of the Project Area will be maintained in good condition, with weeds, trash, and debris routinely removed from the site.

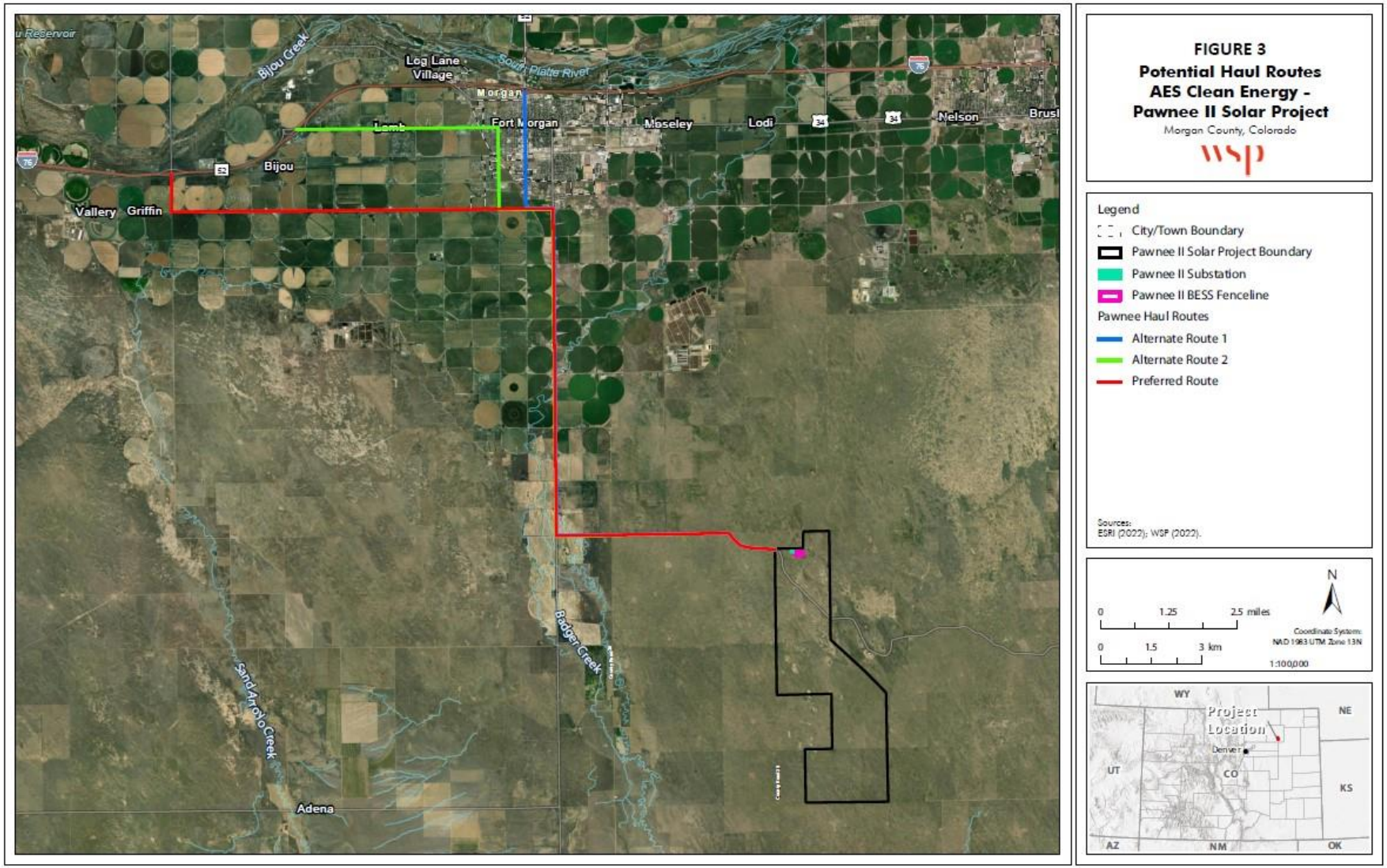
WATER TRUCK HAUL ROUTES

Pawnee Solar 2 LLC has analyzed and considered three alternative haul routes for accessing the Project Area (Figure 3). The Preferred Route was selected based on having the least impact to traffic patterns and residential subdivisions within the Town of Fort Morgan and the surrounding area. Additionally, the Preferred Route is within a more rural setting where fewer residences are located.

Haul Route	Distance (miles)
Preferred Route	18.7
Alternate Route 1	13.6
Alternate Route 2	17.1

All three analyzed haul routes would utilize paved roads for the majority of the route with the exception of County Road K, which is unpaved for approximately 5 miles. The total distance for each of the haul routes analyzed is provided above. Although Alternate Routes 1 and 2 are shorter overall routes to the Project Area, it was determined that decreased potential impacts to usual traffic patterns and residences resulting from increased noise and traffic outweigh the longer pathway required for the Preferred Route.

While impacts to paved roads along the haul routes are not anticipated, Pawnee Solar 2 LLC will document the baseline conditions of roadways along the haul route, with special attention to the unpaved County Road K. The purpose of documenting baseline conditions prior to construction is to determine any impacts to the roadways as a result of construction activities. Following the completion of construction, Pawnee Solar 2 LLC will restore haul routes to pre-construction conditions, which will be required per the Road Use Agreement between Morgan County and Pawnee Solar 2 LLC.


Bijou Creek
Log Lane Village
South Platte River
Morgan
Fort Morgan
Lamb
Bijou
Vallery
Griffin
Moseley
Lodi
Nelson
Badger Creek
Sand Arroyo Creek
Adena
FIGURE 3
Potential Haul Routes
AES Clean Energy -
Pawnee II Solar Project
Morgan County, Colorado
Legend
City/Town Boundary
Pawnee II Solar Project Boundary
Pawnee II Substation
Pawnee II BESS Fenceline
Pawnee Haul Routes
Alternate Route 1
Alternate Route 2
Preferred Route
Sources:
ESRI (2022); WSP (2022).
N
0 1.25 2.5 miles
0 1.5 3 km
Coordinate System:
NAD 1983 UTM Zone 13N
1:100,000
WY
NE
Project Location
Denver
UT
CO
KS
AZ
NM
OK

Proposed Phasing

The Project would be constructed in one phase, with construction expected to begin in the second quarter of 2024 and operations expected to commence in the second quarter of 2026. The Project will generally be developed in parallel with the Pawnee II Solar project, according to the schedule shown below:

Activity	Date
Design/Engineering	Q4 2022 to Q4 2023
Permitting	Q1 2023 to Q3 2023
Interconnection	Q4 2023-Q1 2024
Start of Array Construction	Q2 2024 to Q3 2024
Substation Construction	Q2 2025
Commercial Operation	Q2 2026

COMPLIANCE WITH MORGAN COUNTY COMPREHENSIVE PLAN

Review of Morgan County's *Comprehensive Plan* (2008) indicates that the Project and its associated facilities will not conflict with the interests of the County, nor will they place an undue financial burden on the County, including its current or future residents. Rather, the electricity delivered to the power grid as a result of this Project would benefit the current citizens and will support future community development and energy demands of Morgan County and the broader region served by the power network. The Project is consistent with the following goals and policies from the Morgan County Comprehensive Plan:

- Economic Development:
  - Goal: *"Diversify the economy in Morgan County to broaden business employment opportunities for residents and to further economic growth."*
    - Policy 10: *"Contribute to the Colorado New Energy Economy; work to attract and maintain renewable energy projects to capture this."*

The Project would provide a new sustainable and renewable source of energy to Morgan County and its residents. Pawnee II Solar BESS will create positive impacts to public welfare through employment opportunities and opportunities for local residents to benefit from economic opportunities associated with the clean energy transition. Local, regional, and statewide employment during the construction phase will primarily benefit those in the construction trades, including equipment operators, truck drivers, laborers, and electricians. Pawnee Solar 2 LLC expects that the majority of these construction jobs would be filled by residents of Morgan County. Facility construction will also require workers with specialized skills, such as crane operators, solar energy facility assemblers, specialized excavators, and high-voltage electrical facility workers. Pawnee Solar 2 LLC would hire residents from the local labor market to fill highly specialized positions (e.g., engineers and other professional services) to the extent possible.

The Pawnee II Solar Project will also generate increased revenues to County, local municipality, and school district tax bases. Additionally, throughout the construction period, workers will support local businesses, including hardware supply stores, restaurants, gas stations, and hotels.

- Environment:
  - Goal: *"To preserve the manmade and natural environment in order to enhance the quality of life in Morgan County."*
    - Policy 14*: "Encourage use of renewable resources and production of biofuels and electric power from such resources."*

  There are no wetlands mapped in the Project Area, according to the U.S. Fish and Wildlife Service National Wetlands Inventory. No waterbodies were found in the Project Area and the Project Area lies in an area of minimal flood hazard outside of the 100-year or 500-year floodplains. No previous air pollution, toxic releases to air, toxic releases to water, superfund sites, hazardous waste, or toxic releases to land sites were identified in the Project Area. The Phase I Environmental Site Assessment did not uncover any Recognized Environmental Conditions (RECs), Controlled Recognized Environmental Conditions (CRECs), or Historical Recognized Environmental Conditions and no cultural resources or previous cultural resource surveys were found in the Project Area. Refer to the Impact Analysis (Exhibit 2) for details on environmental conditions and potential impacts.

  Pawnee II Solar will contribute to fuel diversity within the State of Colorado by providing 250 MW of electricity produced by renewable energy and 125-MW AC-coupled BESS to enhance diversity and replace fossil fuels.

- Land Use:
  - Goal: *"To encourage development where: 1) it is in proximity to the activity centers; 2) the proposed development is compatible with existing land uses; 3) there is access to established public infrastructure (primarily road and utilities); and 4) where, in outlying areas of the county, there is access to utilities and there is little additional burden on rural services."*

  Existing land uses in the Project Area consist of active rangeland for livestock grazing, with scattered areas developed for irrigated croplands. According to the U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey, the Project Area does not contain prime farmland or farmland of statewide importance. According to the Natural Resource Strategy report conducted for the Pawnee II Solar Project, the Project Area received a low (2-star) score for water infiltration and soil organic matter. The *Morgan County Comprehensive Plan* includes goals to preserve agricultural lands to the greatest extent practical. The Project Area does not contain soils of farmland importance nor characteristics that would support productive agricultural resources.

  The Project Area is zoned within the Agriculture Production Zone (A) which allows for large scale solar development, including BESS, through a SUP (Morgan County Zoning Regulations, Section 3-180 (Y)(AA) October 2022). Additionally, the proposed Project Area is located directly adjacent to public infrastructure (County Road K) and utilities by being located directly adjacent to the new Canal Crossing substation and the transmission line being built as part of the Colorado Power Pathway. The Project is located such that there will be minimal to no impact to rural services.

- Utilities:
  - Goal: *"To ensure that adequate and financially secure public utilities are provided to all developments in Morgan County."*

Pawnee II Solar BESS will require access to telecommunications in the form of Internet, which is also present in the vicinity. The Project will interconnect to Xcel Energy's existing electrical infrastructure through a new collection and substation. Pawnee II Solar BESS is compatible with the existing transmission infrastructure and it will not adversely impact transmission uses already existing in the region.

- Circulation and Transportation:
  - Policy 1: Traffic and Roads
    - *"Require new developments to mitigate impacts to adjacent county roads"*
    - *"Require traffic generation studies for large developments"*

Traffic on area roadways will temporarily increase during approximately 24 months of construction. The most intense construction traffic will happen in the beginning of the construction phase as equipment and materials are brought into the Project site. Following the delivery of basic equipment (panels, racking and inverters), much of the construction work happens on-site in smaller construction vehicles. Another intense phase of construction will be the delivery of transformers and BESS equipment. These delivery periods are short and spaced out over the construction phase. Pawnee Solar 2 LLC anticipates that most traffic during phases of construction will occur outside of the peak traffic times. Vehicle trips generated by construction and operation of Pawnee II Solar BESS will be minimal and will remain below the maximum capacity for two-lane rural roadways. Pawnee Solar 2 LLC will consult with the Morgan County Road and Bridge Department to plan and design final transportation routing to avoid/minimize, to the extent practical, safety issues associated with the use of approved haul routes. Following construction, Pawnee Solar 2 LLC will repair damage to the approved haul routes sustained during construction of Pawnee II Solar BESS to a condition equal to or better than the roadway's condition prior to construction, consistent with Road Use Agreements to be negotiated with the County. Pawnee Solar 2 LLC will document road conditions using pre- and post- construction video and/or photographs.

As outline above, the proposed Project is consistent with the guiding principles and goals and policies for economic development, environment, land use, utilities, and transportation identified in the plan.

COMPLIANCE WITH MORGAN COUNTY ZONING REGULATION SECTION 2-395

Pawnee Solar 2 LLC has reviewed Morgan County's *Zoning Regulations* (Adopted June 2007, updated through October 2022) for compliance under a SUP for a large-scale solar development including a BESS. The Project will be a permitted use under a SUP within the Agriculture Production Zone (A), with waivers for Section line roads and parcel line setbacks in the Project Area. The Project will be in compliance with the following criteria based on Morgan County's Zoning Regulations, Section 2-395 - Review Criteria:

(A) ***The use and its location as proposed are in conformance with the Morgan County Comprehensive Plan***

The Project is allowed under a SUP within the Agriculture Production Zone and aligns with Morgan County's Comprehensive Plan, as indicated above. Project plans are consistent with goals and policies related to economic development, environment, land use, and transportation. The Project will provide support to a new renewable energy source to the County with economic benefits to its residents and school district.

(B) ***All the application documents are complete and present a clear picture of how uses are to be arranged on the site or within Morgan County***

Pawnee Solar 2 LLC intends to submit a complete SUP application package for the Pawnee II Solar BESS Project. The package presents existing conditions of the Project Area and potential mitigation strategies (if needed) in the Impact Analysis (Exhibit 2). The submittal will be provided electronically, fulfilling submittal requirements in Section 2-380 of the *Morgan County Zoning Regulations*.

(C) ***The site plan conforms to the district design standards of these Regulations***

The Pawnee II Solar BESS site plan is in compliance with Section 2-410 - Site Plan and 2-420 - Special Use Plan Map and will be reviewed by the Planning Administrator.

(D) ***All on and off-site impacts have been satisfactorily mitigated either through agreement, public improvements, site plan requirements or other mitigation measures***

Pawnee Solar 2 LLC plans to enter into a Road Use Agreement with Morgan County and will restore roads to better or existing conditions after construction is completed. All mitigation efforts have been disclosed in the Impact Analysis section of this SUP application (Exhibit 2).

(E) ***The special use proposed has been made compatible with the surrounding uses and adequately buffered as determined by the County***

Pawnee II Solar BESS is sited on active rangeland with no statewide farmland of importance. Conclusions from the Natural Resource Strategy report found that the Project Area has poor water infiltration and soil conditions for productive agriculture; therefore, a solar development would provide the most economic benefit for Morgan County in this area.

The Project will introduce new visual elements (i.e., solar panels) into the existing landscape, which could be considered a change in community character from the primarily agricultural and rural residential areas in the vicinity of the Project Area. Characteristics of the type and extent of visibility and visual impact of a utility-scale solar energy facility would be highly variable based on distance, number of panels in view, weather conditions, sun angle, extent of visual screening from topography and vegetation, aesthetic quality, viewer sensitivity, and/or existing land uses. In many areas, topography and vegetation act as a visual buffer between solar arrays, minimizing the visual impact of the Project and helping to maintain a community character based in agriculture or rangeland. Due to the extremely rural location of the Project, and the lack of adjacent residences (other than the Project landowner) or other public uses, the extent to which the change in landscape will affect current residents of the County is minimal. The Project is sited in an area lacking existing sensitive receptors such as local residents and scenic roadways.

(F) ***The special use poses only the minimum amount of risk to the public health, safety and welfare as set by either federal, state or county regulation, whichever is the strictest***

In general, Battery Energy Storage facilities are not known to pose significant health dangers to the public at large, or to properties in the vicinity of facilities. Pawnee Solar 2 LLC assessed potential public health, safety, and security impacts associated with the construction and operation of the BESS Facility to ensure those impacts are avoided and

minimized to the maximum extent practicable through project design and planning. A Fire Mitigation Plan is included as part of this SUP Application and demonstrates that the Project is compliant with the appropriate fire protection systems for the BESS.

Pawnee Solar 2 LLC is committed to developing and operating the Project in a safe and environmentally responsible manner. Pawnee Solar 2 LLC will construct the Facility in accordance with applicable health and safety standards. Public health considerations associated with construction of the Facility are limited to typical risks associated with commercial construction projects. Solid waste generated during construction will consist primarily of brush and timber from site preparation; cardboard, plastic, and metal packing materials; construction scrap; and general refuse.

The presence of energized equipment could result in public health or safety concerns. Appropriate site design controls such as fences; secured access to buildings; and adherence to applicable codes and standards in the design, construction and operation of the Project will avoid, minimize, and mitigate these concerns. Pawnee Solar 2 LLC is also committed to regularly training and informing local first responders about the Project and its components to respond appropriately in the unlikely event of an emergency. Based on this analysis and the mitigation and protection measures proposed by Pawnee Solar 2 LLC, significant impacts on public health, safety, and security would not occur.

(G) ***The special use proposed is not planned to be developed on a non-conforming parcel***

The Project Area is found on private land in the Agriculture Production Zone which allows a solar development with BESS under a SUP, therefore the Project would be a conforming use.

(H) ***The applicant has adequately documented a public need for the project, all pertinent technical information, adequate financial resources to implement it, and has paid all fees and review costs levied by the County for application processing and review***

The Pawnee II Solar BESS Project will contribute to Colorado's renewable energy portfolio standard, assist in providing sustainable source of energy to the County, and create economic benefit via tax base to the County and school district. Additionally, the Project Area is on land suitable for a large solar development. The Project would interconnect to Xcel Energy's transmission system.

AES has experience in developing solar and Storage projects in the Rocky Mountain region with expertise in design, construction, financing, and long-term maintenance and operations.

Pawnee Solar 2 LLC will adhere to the County's Submittal Requirements (Section 2-380), Review Procedures (2-385), and Notice Requirements (2-390).

(I) ***For any special use requiring a supply of water that the applicant has demonstrated a source of water which is adequate for the proposed use in terms of quantity and reliability and in the case of human consumption, quantity, quality, and reliability***

Pawnee II Solar BESS is expected to require a supply of water during the construction of the Project. All potable water will be brought and stored in above ground tanks on-site and no new water well will be needed. Any water required for construction of the Project would be brought in via truck from an off-site location.

COMPLIANCE WITH MORGAN COUNTY ZONING REGULATIONS FOR SOLAR AND BESS

Pawnee Solar 2 LLC has reviewed Morgan County's *Zoning Regulations Concerning the Regulation of Wind Energy, Solar Collector, and Battery Energy Storage Systems* (Resolution No. 2022 BCC 017) for compliance as a Solar Collector Facility and a Battery Energy Storage System. The Project is a permitted use under a SUP within the Agriculture Production Zone (A). The Project is in compliance with the following criteria based on Morgan County's Solar Collector Facility and Battery Energy Storage Systems Regulations.

- Battery Energy Storage System (BESS) Standards (Section 4-860)
    - ***BESS shall comply with all applicable requirements of the underlying zone district and the Accessory Uses and Structures requirements in Sec.3-130 of these Zoning Regulations.***

      The Project Area is zoned within the Agriculture Production Zone (A) which allows for a BESS through a SUP (Morgan County Zoning Regulations, Section 3-180 (AA), October 2022). All accessory uses and structures would be consistent with Section 3-130.

    - ***All BESS, including all mechanical equipment, shall been closed by a minimum of a six (6) foot tall fence with a self-locking gate to prevent unauthorized access, unless housed in a building dedicated to the BESS. No fencing may interfere with any ventilation or exhaust ports.***

      The Project would include all appropriate security measures including an 8-foot-high chain-link fence with three-strand barbed wire affixed on top. Gated and locked access points would be provided for the Project Area (locations to be determined).

    - ***All BESS, their components, and associated ancillary equipment shall be placed with required working space clearances, and electrical circuitry shall be within weatherproof enclosures marked with the environmental rating suitable for the type of exposure incompliance with applicable electric code, as adopted by the State of Colorado.***

      Pawnee Solar 2 LLC will ensure that the BESS is consistent with applicable electric codes and designed to comply with working space clearances and weatherproofing elements.

IMPACT ON ADJACENT USES AND OFF-SITE IMPACTS

The Project would have minimal impacts on surrounding adjacent uses since the facility would generally be unstaffed, generate no emissions, emit little to no light or discernible noise, and generate little to no daily traffic. All construction vehicles would park on site, thus minimizing any additional traffic created on public roads.

IMPACT ON COUNTY SERVICES AND CAPITAL FACILITIES

Please refer to Exhibit 2 – Impact Analysis for a discussion of impacts on County services and capital facilities.

LENGTH OF PERMIT

The length of the permit coincides with the life of the Project, i.e., 35 years.

PUBLIC IMPROVEMENTS

Public improvements associated with the Project are not planned at this time.

SECTION 4-855 (A)(4). BESS CONTACT INFORMATION

ACE Dev Co, LLC
Attn: Nikki Anderson, Execution Project Manager
2180 1300 E #500
Salt Lake City, UT 84106
Telephone: (801) 243-4554

EXHIBIT 2

IMPACT ANALYSIS

Pawnee II Solar BESS

SECTION 4-855 (A). ENVIRONMENTAL IMPACT ANALYSIS

(5) A narrative providing… identified environmental impacts and mitigation.

BASELINE CONDITIONS

Baseline conditions for the Pawnee II Solar Battery Energy Storage System (BESS) Project Area were assessed using, among other methods, desktop reviews using publicly available databases and field-based preliminary studies and reports contracted by Pawnee Solar 2 LLC in 2022, including:

- Ecological Characterization and Natural Resources Planning, including field-based biological resource surveys (WEST 2022a)
- Class I Cultural Resources Desktop Review (Westwood 2022b)
- Colorado Parks and Wildlife's Comments on the Proposed Pawnee Solar Project, unincorporated Morgan County (portions of T2N-R57W, T2N-R56W, T1N-R57W, and T1N-R56W). December 21, 2022.
- Critical Issues Analysis (Westwood 2022c)
- Phase I Environmental Site Assessment (Terracon 2022)
- Preliminary Hydrology Study (Westwood 2022a)
- Wetland and Waterbody Delineation (WEST 2022b)

A summary of these reviews and studies-based reporting is provided below and broken into sections for physiography and land use, hazardous materials, cultural resources, vegetation/land cover, soils, water resources, and protected wildlife species.

Physiography and Land Use

Elevation within the 6.04-acre Project Area is approximately 4,520 (1,374 meters) above mean sea level (USGS 2018). Topography within the Project Area is relatively flat with a slight slope to the northeast and steeper slopes in the western portion.

Land use in the broader vicinity consists of active rangeland for livestock grazing (Chapman et al. 2006). The Project Area is located entirely on private land within Agriculture Production Zone (A) under the Morgan County Zoning Regulations. The Pawnee II Solar BESS is in the northern portion of the larger Pawnee II Solar Project Area on land owned by Stephen & Joann Cecil in Section 13 of Township 02 North, Range 57 West. No conservation easements or federal, state, or other public lands are mapped within the Project Area.

Aerial photographs indicate that there are no buildings within the Project Area. County Road K meanders north of the Project Area; no roads traverse through the Project Area. No water wells or oil/gas wells are located within the Project Area (Westwood 2022c). Currently, there are no electrical substations or railroad tracks within the Project Area.

Hazardous Materials

A Phase I Environmental Site Assessment (desktop review plus site reconnaissance) for the Project Area did not identify any Recognized Environmental Conditions (RECs), Controlled

Recognized Environmental Conditions (CRECs), or Historical Recognized Environmental Conditions (HRECs; Terracon2022). No previous air pollution, toxic releases to air, toxic releases to water, superfund sites, hazardous waste, or toxic releases to land sites were identified in the Project Area.

Cultural Resources

No cultural resources or previous cultural resource surveys were found in the Project Area, according to the Colorado Office of Archaeology and Historic Preservation and the National Register of Historic Places (Westwood 2022b).

Vegetation/Land Cover

Plant Communities

The Project Area is limited to a total of 6.04 acres and is located within the High Plains Level III ecoregion and the Rolling Sand Plains Level IV ecoregion. The High Plains ecoregion is characterized by smooth to slightly irregular plains with a high percentage of cropland compared with surrounding ecoregions (Chapman et al. 2006). The Rolling Sand Plains ecoregion is characterized by grass-stabilized sand plains, sand dunes, and sand sheets. Typical plants associated with these ecoregions include sand sagebrush (*Artemisia tridentate*), rabbitbrush (*Ericameria nauseosa*), sand bluestem (*Andropogon hallii*), prairie sandreed (*Calamovilfa longifolia*), and Indian ricegrass (*Achnatherum hymenoides*).

The Project Area consists of predominantly herbaceous grasslands. Surrounding areas also consist of predominantly herbaceous grasslands, with more agricultural and developed lands located west of the Project Area adjacent to the South Platte River.

The predominant vegetation community is shortgrass prairie in the loamy uplands of eastern Colorado (NVCS 2022). Species associated with the shortgrass prairie recorded during a field survey conducted by Western EcoSystems Technology, Inc. (May 2022) included blue grama (*Bouteloua gracilis*), western wheatgrass (*Pascopyrum smithii*), needle-and-thread (*Hesperostipa comata*), and threadleaf sedge (*Carex filifolia*). Grasses dominate the landscape, with herbaceous species comprising the majority of the vegetation within the Project Area.

Noxious Weeds

The Colorado Noxious Weed Act (Colorado Revised Statutes [C.R.S.] 35-5.5; 1990, revised 2006) identifies noxious weeds by three different priority levels:

- List A: weeds currently found in small, isolated patches in Colorado and are required to be eradicated.
- List B: weeds found in such large numbers that the goal is to stop the spread; they are required to be contained and suppressed.
- List C: weeds so common that control is left up to the individual landowners and the weeds are to be monitored and managed as funds are available (CDA 2022).

The most frequently encountered noxious weed species in the Project Area was cheatgrass (*Bromus tectorum*), classified by the Colorado Department of Agriculture as a List C noxious weed.

Soils

The Project Area contains a soil type that is classified as loamy sand or sand. The majority are very deep, well drained, and moderately to rapidly permeable. Soils are classified as non-hydric soil units. The Project Area is composed of one soil type, Truckton loam sand, 0 to 3 percent slopes. The Project Area does not contain prime farmland. (USDA NRCS 2019a, 2019b)

Water Resources

Groundwater

No water wells were identified in the Project Area (Westwood 2022c).

Surface Waters

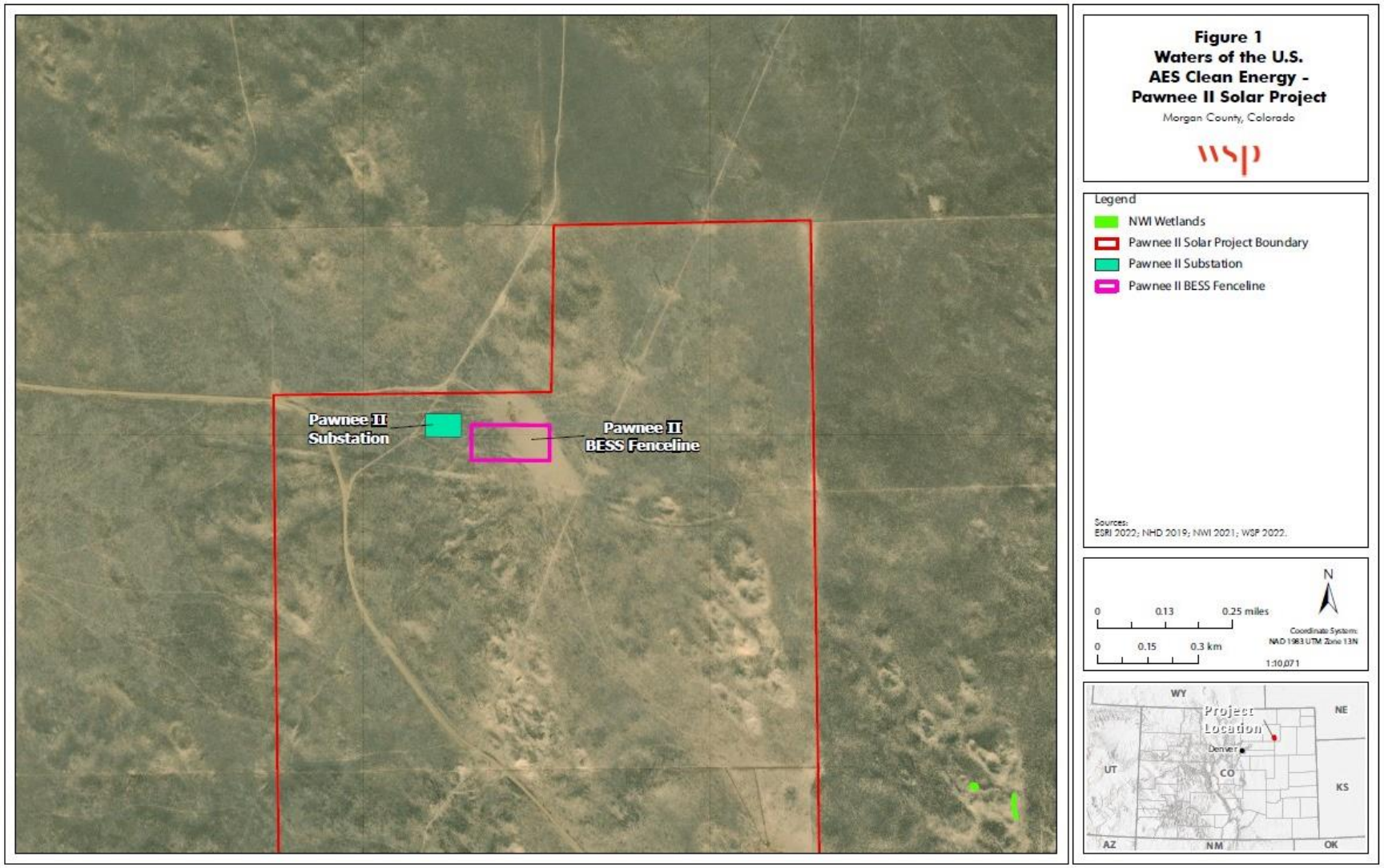
The Project Area is located within the South Platte Watershed, west of Beaver Creek and east of Badger Creek, both of which flow from south to north. The Project Area generally drains east toward Beaver Creek. The Project Area is located within the upstream portion of the Town of Ninemile Corner – Beaver Creek HUC 12 Boundary.

A field-based aquatic resources assessment was conducted in May 2022 and no wetlands or waterbodies were identified in the Project Area (Figure 1; WEST 2022b).

Waters of the U.S., including Wetlands

Aerial photographs, topographic maps, vegetation types, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data, and Natural Resources Conservation Service maps (for hydric soils) and data were used to preliminarily screen for the potential presence and locations of wetlands within the Project Area, according to the USFWS NWI (USFWS NWI 2022). No hydric soils were found to be mapped in the Project Area.

A field survey for aquatic resources was conducted in the Project Area in May 2022 (WEST 2022b). No wetlands or waterbodies were identified in the Project Area. Therefore, no waters of the U.S. were identified in the Project Area.


Pawnee II Substation
Pawnee II BESS Fenceline
Figure 1
Waters of the U.S.
AES Clean Energy -
Pawnee II Solar Project
Morgan County, Colorado
Legend
NWI Wetlands
Pawnee II Solar Project Boundary
Pawnee II Substation
Pawnee II BESS Fenceline
Sources:
ESRI 2022; NHD 2019; NWI 2021; WSP 2022.
N
0
0.13
0.25 miles
0
0.15
0.3 km
Coordinate System:
NAD 1983 UTM Zone 13N
1:10,071
WY
NE
Project Location
Denver
UT
CO
KS
AZ
NM
OK

Floodplains

Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation due to rain or melting snow. Flood potential is evaluated by the Federal Emergency Management Agency, which defines the 100-year floodplain as an area within which there is a 1 percent chance of inundation by a flood event in a given year. Risk of flooding is influenced by local topography, frequency of precipitation events, size of the watershed above the floodplain, and upstream development. These federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

The Project Area lies within Flood Zone X or "area of minimal flood hazard." The Project Area is not located within a 100-year or 500-year floodplain (Westwood Professional Services 2022a).

Stormwater Runoff

Stormwater runoff from the Project Area will be managed in accordance with applicable county, state, and federal regulations. The Project will utilize standard construction Best Management Practices for mitigating stormwater runoff. A Stormwater Management Plan will be developed to comply with the National Pollutant Discharge Elimination System (NPDES) permit issued by the Colorado Department of Public Health and Environment prior to construction of the Project. Additional details are provided in the Drainage and Erosion Control Plan.

Protected Wildlife Species

For the purposes of this summary, 'special status wildlife species' are species listed by the US Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA) as endangered, threatened, or candidate; species listed by the state of Colorado as threatened, endangered, or species of concern; and species managed by Colorado Nongame Wildlife Regulations (CPW 2022c). The state of Colorado does not list special status plant species.

Federally Listed Species

Pursuant to Section 7 of the ESA, the USFWS is required to assist other federal agencies to ensure that any action they authorize, implement, or fund, including development of renewable energy projects, would not jeopardize the continued existence of any endangered or threatened species listed under the ESA. Section 7 of the ESA requires consultation with the USFWS regarding a proposed project when there is a federal nexus, such as proposed impacts to species protected under the ESA or their habitat. Consultation is not required when it is determined that an action would have no effect on federally listed species or designated critical habitat.

A record of ESA-listed species was obtained from the USFWS Information, Planning, and Consultation (IPaC) report to determine which species may potentially be present within the Project Area (USFWS 2022). The IPaC report identified one federal listed mammal, two birds, one fish, one plant, and one candidate insect species with the potential to occur in the Project Area. None of the threatened or endangered species have documented occurrences in the Project Area, based on the Colorado Conservation Data Explorer (CODEX) data (CNHP 2022), and only the candidate species (monarch butterfly [*Danaus plexippus*]) has potential to occur in the Project Area. These species are identified in shaded text in Table 1, below, along with their likelihood of occurrence in the vicinity of the Project Area based on the presence of suitable habitat. State-protected species are also listed in Table 1. No USFWS-designated critical habitat for any ESA-listed species was identified by IPaC within the vicinity of the Project Area.

Table 1. Federal and State Protected Species with Potential to Occur in the Project Area

Common Name	Scientific Name	Status	Habitat	Likelihood of Occurrence in Project Area	Rationale
			MAMMALS		
Black-tailed prairie dog	*Cynomys ludovicianus*	SOC	Occurs in grasslands or prairies in large communities	Low	This species has been documented approximately 5 miles southeast of the Project Area. No burrows identified within the Project Area.
Gray wolf	*Canis lupus*	FE, SE	Habitat generalist; currently found in northwest corner of Colorado	N/A (see Rationale)	This species only needs to be considered under the ESA for predator management programs.
			BIRDS		
Burrowing owl	*Athene cunicularia*	ST	Project is within species' range; habitat consists of grasslands with burrowing mammals (e.g., prairie dogs, ground squirrels, and badgers)	Moderate	This species has been documented approximately 3.5 miles southwest of the Project Area. No burrows identified within the Project Area.
Ferruginous hawk	*Buteo regalis*	SOC	Occurs in open grasslands, shrub-steppe; nests in trees and shrubs, cliffs, utility structures, ground and outcrops, haystacks, and buildings	Moderate	Suitable foraging habitat is within the Project Area.
Long-billed curlew	*Numenius americanus*	SOC	Nests in shortgrass or mixed-grass prairie habitat with flat to rolling topography; prefers short vegetation, generally less than 11 inches (centimeters [cm]) tall (often less than 4 inches [10 cm]), and generally avoid habitats with trees, a high density of shrubs (e.g., sagebrush), and tall, dense grass	Moderate	Suitable habitat is present within the Project Area.
Mountain plover	*Charadrius montanus*	SOC	Occurs in grasslands, arid plains, and fields; nesting plovers choose shortgrass prairies grazed by prairie dogs, bison, and cattle, and overgrazed tallgrass and fallow fields	Moderate	Suitable habitat is present within the Project Area.
Piping plover	*Charadrius melodus*	FT, ST	Found in Colorado during the breeding season; uses sandy beaches or gravel edge of reservoirs and gravel pits for nesting.	None	No suitable habitat is present within the Project Area.
Whooping crane	*Grus americana*	FE, SE	During migration, roosts in shallow, sometimes marshy, wetlands near foraging habitat, often in the form of croplands	None	No suitable habitat is present within the Project Area.

Table 1. Federal and State Protected Species with Potential to Occur in the Project Area

Common Name	Scientific Name	Status	Habitat	Likelihood of Occurrence in Project Area	Rationale
			FISH		
Pallid sturgeon	*Scaphirhynchus albus*	FE	Found in the Mississippi-Missouri River system; prefers fast-moving water with turbid conditions and relatively deep waters	N/A (see Rationale)	This species only needs to be considered under the ESA for projects with water-related activities and/or use in the North Platte, South Platte, and Laramie River basins.
			INSECTS		
Monarch butterfly	*Danaus plexippus*	FC	Project is in the species' general range; occurs in wetlands or riparian areas with milkweed and grassland with flowering plants	Moderate	Foraging habitat is present within the Project Area.
			PLANTS		
Ute Ladies'-tresses	*Spiranthes diluvialis*	FT	Found along streams and open seepage areas in cottonwoods; prefers moist meadows at moderate elevations, usually occurring on floodplains near abandoned stream channels and meanders where the vegetation is not too dense or overgrown; found in both sandy and stony soils.	None	No suitable habitat is present within the Project Area.
Western prairie fringed orchid	*Platanthera praeclara*	FT	Found in tallgrass prairies and sedge meadows; depends on periodic disturbance by fire, mowing, or grazing	None	Project Area is outside the range of the species.

Source: WEST 2022; **Note**: ESA-listed (Threatened, Endangered, Proposed, or Candidate) species are shaded in gray in Table 1; **Abbreviations**: ESA = Endangered Species Act; FE = federally listed as endangered; FT = federally listed as threatened; FC = candidate for federal listing; SE = state-listed as endangered; ST = state-listed as threatened; SOC = Colorado species of concern; N/A = not applicable.

Raptors and Migratory Birds

The Project Area provides grassland habitat, common throughout the eastern high plains of Colorado, that is suitable for several for migratory birds and generalist avian species. Raptors may utilize the Project Area for hunting; no nesting substrate for raptors is present within the Project Area.

Raptor nest sites are identified as High Priority Habitats by Colorado Parks and Wildlife (CPW) (2021a). CPW recommends development and no-activity buffers for active raptor nests, such as golden eagles (*Aquila chrysaetos*), ferruginous hawks (*Buteo regalis*), burrowing owls (*Athene cunicularia*), and prairie falcons (*Falco mexicanus*). No raptor nests were observed in or near the Project Area during the May 2022 field survey (WEST 2022a). Moreover, the 6.04-acre Project Area does not contain suitable nesting substrate such as trees or rocky outcrops.

The red-headed woodpecker (*Melanerpes erythrocephalus*) and chimney swift (*Chaetura pelagica*) were identified in the IPaC report as Migratory Birds of Conservation Concern (BCC) that may occur in the Project Area. Both red-headed woodpeckers and chimney swifts are associated with forest groves and trees (Cornell Lab of Ornithology 2022; Audubon 2022), which are absent from the Project Area. Two additional BCC, ferruginous hawk and grasshopper sparrow (*Ammodramus savannarum*) were observed during field investigations outside of the Project Area (WEST 2022a). The designation of BCC does not afford additional statutory protection, but rather identifies species of higher conservation priority among birds protected under the Migratory Bird Treaty Act (MBTA; USFWS 2021).

Suitable habitat was identified in the Project Area for mountain plover (*Charadrius montanus*) and long-billed curlew (*Numenius americanus*), both state species of special concern that are known to nest in prairie grasslands, arid plains, and agricultural fields. There are no documented occurrences of these species within one mile of the Project Area (CNHP 2022). Furthermore, the Project Area is limited to 6.04 acres and is located adjacent to County Road K, which may limit the attractiveness of the Project Area to wildlife such as mountain plover and long-billed curlew.

Colorado Parks and Wildlife-Managed Wildlife Species

CPW has a statutory responsibility to manage all wildlife species in Colorado. Accordingly, protection of Colorado's wildlife species and habitats is encouraged through responsible energy development and land use planning (i.e., protection of core wildlife areas, quality fisheries and aquatic habitat, big game production and winter range, and other sensitive wildlife habitats). 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 species and habitats across the state of Colorado (CPW 2021b).

Alignment and Compliance with Colorado Public Utilities Commission (CPUC) Rule 3668-Environmental Impacts is highlighted in CPW's Best Management Practices for Solar Energy Development (CPW 2021b). 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 (CPW 2021b).

Burrowing Owls and Black-Tailed Prairie Dogs

The black-tailed prairie dog (*Cynomys ludovicianus*), a state species of special concern that typically occurs in grassland habitats, was confirmed to be present in the vicinity of the Project Area. In July 2022, one prairie dog colony was delineated within 3.5 miles of the Project Area, and it was determined to be inactive (Figure 2; WEST 2022a). Active burrowing owl nests were documented in the inactive colony approximately3.5 miles south of the Project Area (WEST 2022a). Burrowing owls are protected under the MBTA and are state-listed as threatened (CPW 2021b). It is important to note that no burrows of suitable size for burrowing owl or black-tailed prairie dog were identified within the Project Area.

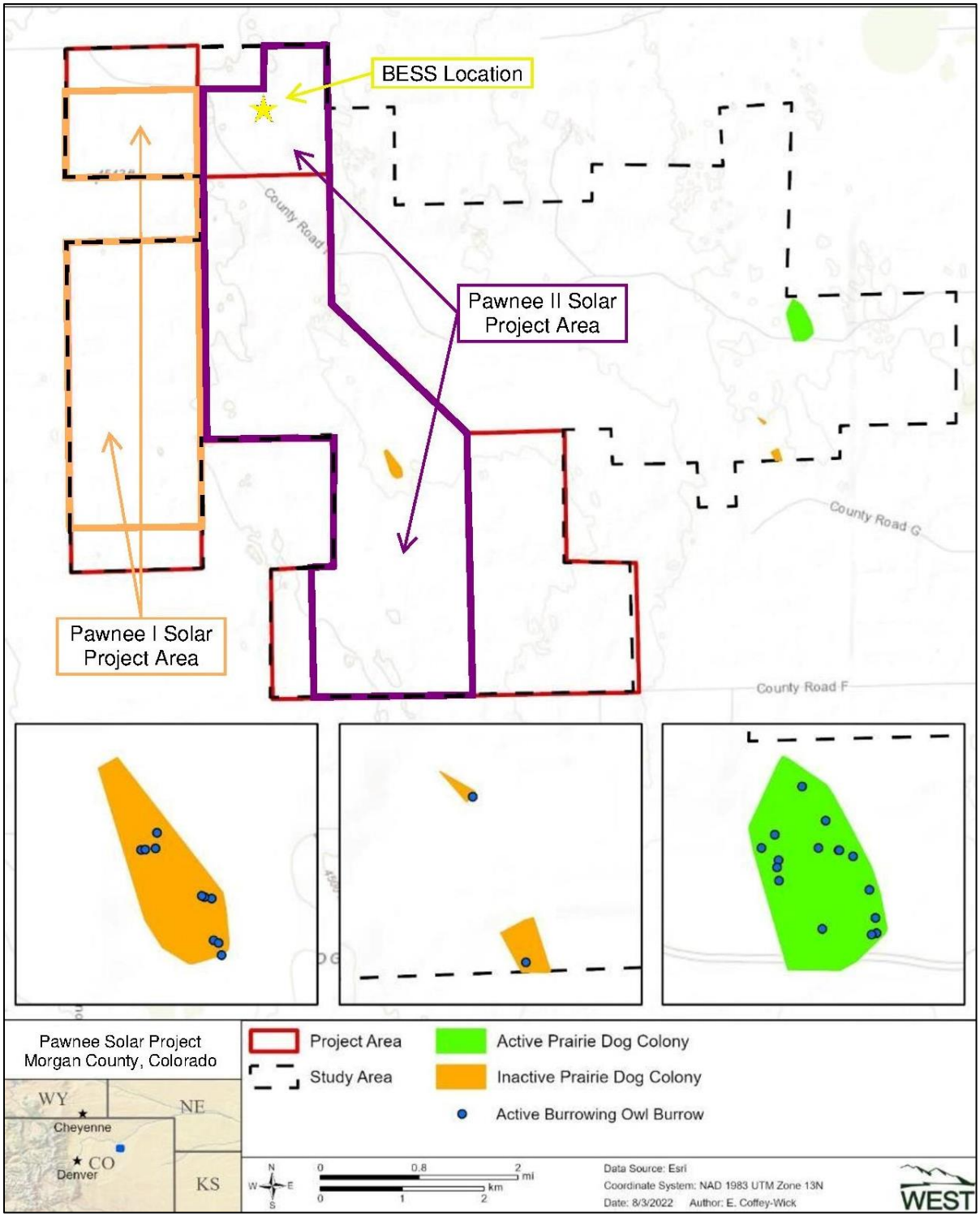


Figure 2. Delineated prairie dog colonies and burrows actively used by burrowing owls in the Study Area.

Greater Prairie-chicken

The greater prairie-chicken (*Tympanuchus cupido*) is managed by CPW as a small-game bird. CPW recognizes greater prairie-chicken leks and production areas as High Priority Habitat. The nearest High Priority Habitat for this species is mapped approximately 13 miles east of the

Project Area, with the exception of one mapped historic lek that is located approximately 4.0 miles south of the southern extent of the Project Area (Figure 3). Thus, the Project Area is likely located outside the western boundary of the species' typical range in Colorado, indicating that greater prairie chicken presence is possible, but highly unlikely, in the Project Area.

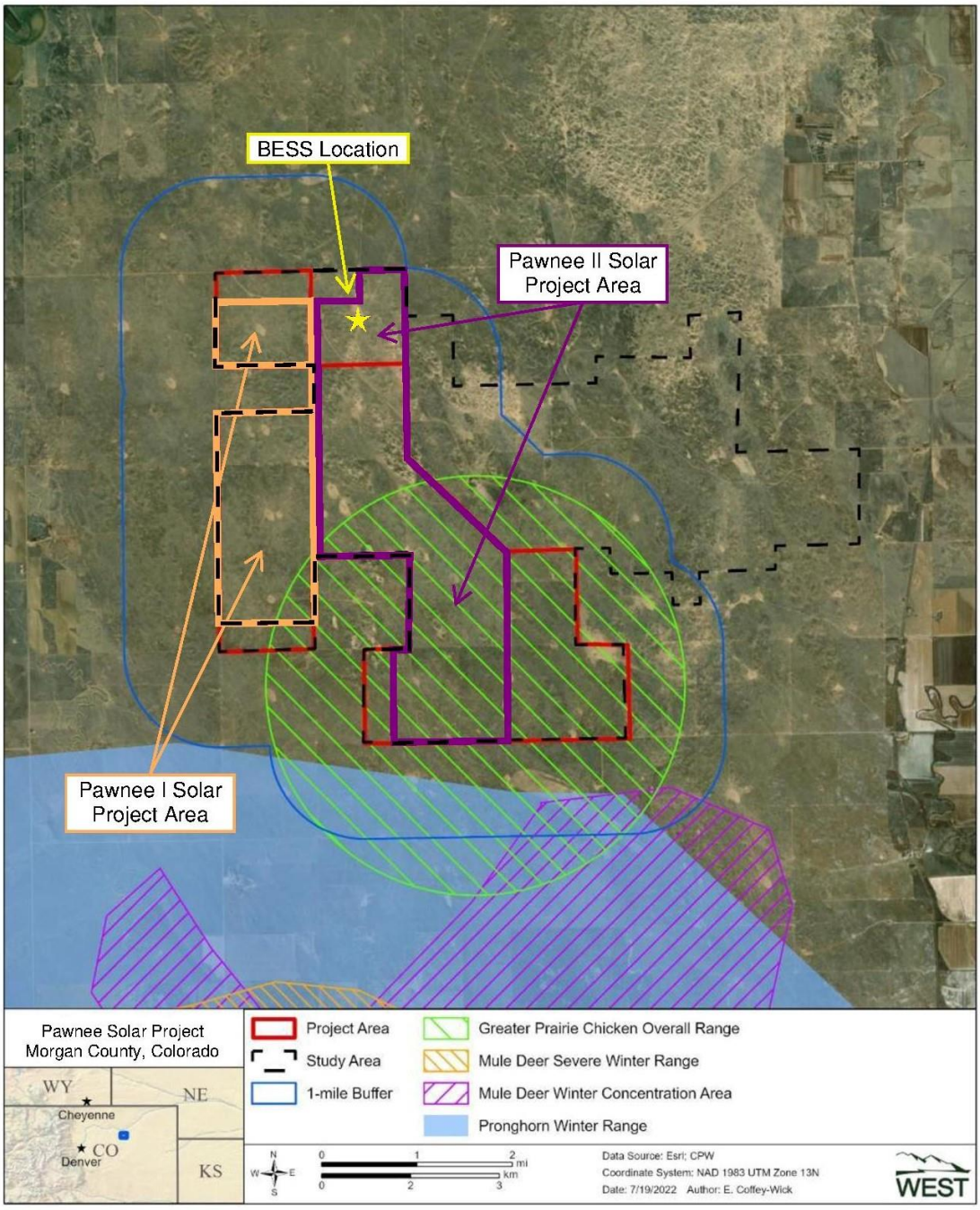


Figure 3. High priority habitat and range in the vicinity of the Pawnee II Solar BESS Project Area.

Big Game

No CPW-designated big game High Priority Habitat occurs within the Project Area; however, the Project Area is within approximately 2.5 miles of mule deer (*Odocoileus hemionus*) winter range and within 5.0miles of pronghorn (*Antilocapra americana*) Winter Range and Concentration Area (Figure 3). Mule deer were observed during the 2022 field survey, and CPW has confirmed that both mule deer and pronghorn use the area (WEST 2022a).

On the eastern plains in Colorado, mule deer winter range is defined as areas that provide thermal cover for deer. Examples are riparian areas dominated by trees and shrubs, areas of pinyon/juniper, topographic cover such as gullies, draws, canyons, shelter belts, and Conservation Reserve Program fields that provide adequate cover (CPW n.d.).

On the eastern plains, pronghorn Winter Range is defined as specific areas where pronghorn are known to migrate to on a consistent basis. Concentration Areas include the part of the overall range where densities are at least 200 percent greater than the surrounding area during a season other than winter (CPW n.d.).

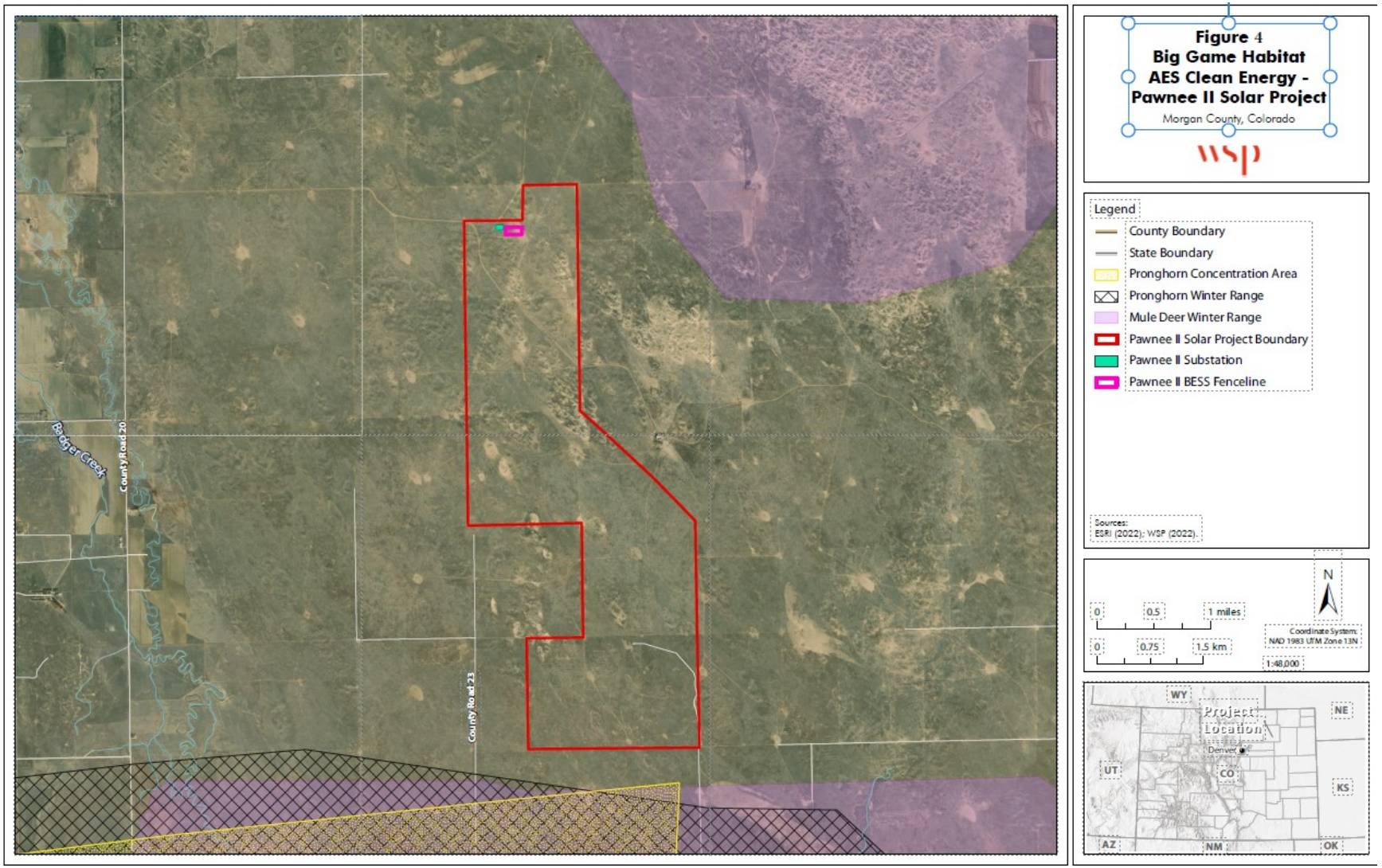


Figure 4
Big Game Habitat
AES Clean Energy -
Pawnee II Solar Project
Morgan County, Colorado
Legend
County Boundary
State Boundary
Pronghorn Concentration Area
Pronghorn Winter Range
Mule Deer Winter Range
Pawnee II Solar Project Boundary
Pawnee II Substation
Pawnee II BESS Fenceline
Sources:
ESRI (2022); WSP (2022).
Badger Creek
County Road 20
County Road 23
0
0.5
1 miles
0
0.75
1.5 km
N
Coordinate System:
NAD 1983 UTM Zone 13N
1:48,000
WY
NE
UT
CO
KS
AZ
NM
OK
Project Location
Denver

IMPACT ASSESSMENT

Impact on Existing Adjacent Uses

With the exception of a temporary increase in traffic flow during construction, the Project is not anticipated to affect the long-term land use of any adjacent properties.

Off-Site Impacts

The Project is not expected to result in permanent off-site impacts. Temporary impacts could occur on a short-term basis resulting from construction-related activities. Specifically, off-site areas would be expected to experience increased traffic due to construction-related vehicles. No other off-site impacts would be expected as a result of the Project.

Impact on County Services and Capital Facilities

The Project is not expected to result in any additional operating or infrastructure costs to Morgan County, public agencies, or local utilities. The Project is anticipated to result in economic benefits for the following taxing jurisdictions: Morgan County and Morgan County School District Re-3 (Morgan County n.d.).

The Project Area is located within the boundaries of the Brush Fire Protection District. Two fire stations are located within one mile of the Project Area: the Fort Morgan City Fire Department and the Brush City Fire Department. Pawnee Solar 2 LLC is committed to regularly training and informing local first responders about the Project and its components to respond in the unlikely event of an emergency. Local emergency responders are not expected to require new or additional equipment to respond to a fire, hazardous substance, or medical emergency relating to the Project beyond the first aid, medical emergency, and fire vehicles and equipment typically found at rural fire departments. Details on fire protection systems in regard to the BESS are included in the Fire Mitigation Plan (Exhibit 8).

Pawnee Solar 2 LLC will be responsible for collecting and transporting construction waste and paying applicable fees for disposal at the Morgan County Landfill or other nearby recycling facility. Minor waste volumes would include used oil from vehicle maintenance, and concrete washout. The construction equipment that would be used, including excavators, dozers, graders, concrete mixing trucks, and cranes, produces typical liquid and solid wastes such as used oil and oil filters. These wastes will be disposed off-site in accordance with applicable laws and regulations. Numerous service and retail locations in Morgan County accept used oil for recycling.

Pawnee Solar 2 LLC will address impacts on roadways from transportation of heavy equipment in accordance with pre-construction compliance filing, Traffic Control Plans, and road use agreements with the host towns and, if requested, Morgan County. These agreements would require Pawnee Solar 2 LLC to restore any roadways impacted by the transportation of Project components during construction and operation of the Project. By virtue of these agreements, the county in which the Project would be located would not incur any additional road maintenance costs related to the Project other than normal wear and tear associated with the use of non-oversize/overweight vehicles required to transport workers and equipment to and from the Project Area for O&M purposes.

Oversized vehicles used to transport the Project equipment and the BESS containers could cause minor temporary traffic delays; however, Pawnee Solar 2 LLC will use flaggers to assist with traffic flow and will enter into a road use agreement with Morgan County or another appropriate jurisdiction, as required. Pawnee Solar 2 LLC's contractor will obtain any necessary ministerial oversize/overweight vehicle permits to authorize transportation and delivery of these loads. Final transportation routing will be designed in consultation with the Morgan County Road and Bridge Department to avoid/minimize, to the extent practical, safety issues associated with the use of the approved haul routes.

Local, regional, and statewide employment during the construction phase will primarily benefit those in the construction trades, including equipment operators, truck drivers, laborers, and electricians. Pawnee Solar 2 LLC expects that the majority of these construction jobs will be filled by residents of Morgan County. Facility construction will also require workers with specialized skills, such as crane operators, solar energy facility assemblers, specialized excavators, and high-voltage electrical facility workers. Pawnee Solar 2 LLC will hire residents within the labor market area to fill highly specialized positions (i.e., engineers and other professional services) to the extent possible.

Workers located outside the labor market area will be expected to remain in the region only for the duration of construction.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Quality

Potential Impacts

Air emissions during construction may include vehicle exhaust from construction equipment and workers' personal vehicles. Providing electrical service to construction trailers located at the temporary staging areas and laydown yards may require fossil-fuel-fired generators that will produce air emissions. During operation, exhaust emissions will be generated from vehicles during maintenance activities. These emissions will be temporary and minor in nature. Therefore, the Project will have no substantial adverse impacts on air quality.

Mitigation Measures

The following BMPs will be implemented to reduce or control emissions during the BESS construction and operations:

- Vehicles and equipment will comply with applicable state and federal emissions standards.
- Vehicles and equipment used during construction will be properly maintained to minimize exhaust emissions.
- Limiting engine idling time and shutting down equipment when not in use will be implemented.
- Carpooling among workers will be encouraged to minimize vehicular traffic and associated emissions.

Additionally, Pawnee Solar 2 LLC will be responsible for any road repairs and/or improvements consistent with the Road Use Agreement (see Exhibit 14).

Dust

Potential Impacts

Fugitive dust may be generated during site preparation and construction activities, including land clearing and grading for the Project. Dust is not expected to be a concern during operations. Therefore, the Project is not expected to cause substantial adverse impacts resulting from dust.

Mitigation Measures

Any fugitive dust generated during construction will be managed through the application of either water or dust control chemicals and will be addressed in the Road Use Agreement (see Exhibit 14).

During the construction phase of the Project, activities will be scheduled in stages as much as possible in order to minimize dust generation and decrease the time for site soil stabilization. Traffic speeds on unpaved roads will be kept to 25 miles per hour to minimize generation of dust.

Noise

Potential Impacts

The Project will comply with the statutory provisions for maximum permissible noise levels in C.R.S. 25-12-103. During construction, equipment operation may produce temporary noise levels at or above 80 decibels; however, these levels will be primarily limited to the immediate vicinity of operating equipment and are therefore not expected to violate C.R.S. 25-12-103. Much of the Project-related activity will be similar to that performed during modern agricultural production. Construction will not require blasting. Due to the remote nature of the Project location, no sound related adverse impacts are anticipated.

Mitigation Measures

Pawnee Solar 2 LLC will make a good faith effort to address any reasonable noise complaints.

Odor

Potential Impacts

Odors are the form of air pollution that is most obvious to the general public. Odors can present significant problems for both the source and surrounding community. Although offensive odors seldom cause physical harm, they can be annoying and cause concern.

Construction of the Project may result in the emission of diesel fumes and other odors typically associated with construction activities. These compounds will be emitted in varying amounts on the site, depending on where construction activities are occurring, number and types of construction activities occurring, and prevailing weather conditions, among other factors. Sensitive receptors located in the vicinity of the construction site may be affected.

The nearest sensitive receptor to odor is the landowner's single-family residence located approximately 2.2 miles east of the Project Area. Odors will be highest near the source and will quickly dissipate off site. Any odors associated with construction activities will be temporary and will cease upon completion. No long-term impacts associated with odor are expected to result

from Project O&M. Therefore, the Project is not expected to cause substantial adverse impacts resulting from odor.

Mitigation Measures

No specific measures are needed to mitigate odor impacts. Odors associated with construction activities will be temporary and will cease upon completion.

Visual Resources

Potential Impacts

The Project will utilize a BESS connected to tracking PV arrays, which maintain low incidence angles by following the sun's position throughout the day. The BESS will be enclosed in fencing, limiting visibility from County Road K. Moreover, the remote nature of the Project Area and lack of nearby residences will preclude potential visual impacts to the public.

Mitigation Measures

No mitigation measures are proposed due to the remote nature of the Project.

Landform

Potential Impacts

A landscape can be characterized into landforms or landform segments that have similar use and management requirements, as defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. The Project Area is located entirely within the gently rolling plains landform that characterizes the Western Great Plains Range and Irrigated Region (Land Resource Region G; NRCS 2006). This region includes parts of Montana (22 percent), New Mexico (16 percent), South Dakota (16 percent), Colorado (15 percent), Nebraska (15 percent), Wyoming (14 percent), North Dakota (1 percent), and Texas (1 percent). Very small portions of Oklahoma and Kansas also are in this region. The region makes up 213,945 square miles (554,395 square kilometers). The Project will impact a very small portion of this area (6.04 acres) and will not affect the general landform in the Project Area.

Mitigation Measures

No specific mitigation measures are being proposed to offset impacts to landforms within the Project Area. In general, the natural contours of the land based on baseline conditions will be returned where feasible following construction.

Existing Vegetation

Potential Impacts

The BESS site will require clearing or grubbing or approximately 6.04 acres of existing vegetation. The land disturbance impacts from grading or earthwork would be considered permanent.

Mitigation Measures

Following decommissioning of the BESS, an appropriate seed mix, chosen in consultation with the landowner, that emphasizes native plant species and pollinator-friendly plants will be used to encourage plants that thrive in local climate conditions, improve soil retention, and benefit the widest range of local species.

Water Resources

Groundwater, Surface Waters, and Waters of the U.S., including Wetlands

Potential Impacts

No water wells or surface water (including waters of the U.S.) have been identified in the Project Area; therefore, no impacts to water resources are likely to occur as a result of Project activities. Any water needs for the Project, specifically to serve the operations and maintenance building anticipated in this application, will be served through an above ground tank with water trucked in as needed.

Mitigation Measures

No mitigation measures for groundwater, surface water, or waters of the U.S., including wetlands, will be required.

Floodplains

Potential Impacts

The Project Area lies within Flood Zone X or “area of minimal flood hazard.” The Project Area is not located within any 100-year or 500-year floodplains.

Westwood (2022a) conducted a desktop hydrology study of the Project Area and concluded that the Project Area is suitable for the Project development and that hydrologic concerns can be addressed by either avoiding areas of high 100-year maximum flood depths or through detailed engineering design. Given the minimal velocities and channelized flow based on the existing conditions, minimal scour will be expected on site.

Mitigation Measures

Areas of deeper flow depth (greater than 2 feet) during 100-year storm events will be avoided where possible in on-going engineering design.

Stormwater Runoff

Potential Impacts

Adherence to an approved Stormwater Management Plan will mitigate potential impacts related to runoff and minimize impacts on adjacent properties. It is anticipated that erosion control measures will be in place until temporary construction impacts have stabilized.

Mitigation Measures

No adverse impacts related to stormwater runoff are anticipated with adherence to an approved Stormwater Management Plan. As the Project design advances, the post-construction Stormwater Management Plan will be reviewed in further detail with the County Engineer (Westwood 2022a).

Protected Wildlife Species

Potential impacts to special status species include direct wildlife mortality; wildlife displacement and barrier effects; and wildlife habitat loss and degradation due to the Project. During the Project construction phase, it is expected that special status wildlife species, if present, will be temporarily displaced from the Project Area because of disturbance associated with the influx of humans and heavy construction equipment. Security fencing at the perimeter of the solar arrays will restrict some animals from entering or utilizing the Project Area during the operations phase.

Construction of the Project (6.04-acre footprint) will result in minimal permanent loss of the habitat.

Federally Listed Species

No potential impacts to federally listed species are anticipated, as listed species are not likely to occur in the Project Area.

Monarch Butterfly

Potential Impacts

In recent years, monarch butterflies and their host plant, milkweeds (primarily *Asclepias* spp.) have been the subject of escalating conservation concern. The species is currently a candidate for listing under the ESA and is under consideration by USFWS for official listing. It is not currently protected under the ESA.

The Project Area consists of predominantly herbaceous grasslands, which is likely to support monarch butterfly host plants and nectaring plants. Colorado is located on the edge of the monarch butterfly eastern flyway and is a significant reproductive and migratory area, suggesting a high likelihood of occurrence (WEST 2022a).

If milkweed species are present in the Project Area, potential impacts on monarch butterfly breeding habitat may result from removal of milkweeds during construction activities (land clearing for site preparation), locations for monarch egg placement, and potentially removing existing viable eggs.

Conservation or Mitigation Measures

To minimize adverse impacts to monarch butterfly breeding habitat, Pawnee Solar 2 LLC will use herbicides that minimize impacts to pollinators.

Burrowing Owl and Black-Tailed Prairie Dog

Potential Impacts

An inactive prairie dog colony was identified within 3.5 miles of the Project Area, and active burrowing owl nests were observed within this inactive prairie dog colony (Figure 2; WEST 2022a). Habitat within the Project Area lacks any burrows of suitable size for burrowing owl and black-tailed prairie dog, thus it is unlikely that either of these species would utilize the Project Area.

Habitat loss and wildlife displacement associated with the removal of shortgrass prairie vegetation where the BESS is sited will be long term; however, the potential impact will likely be low, as herbaceous grasslands and prairie dog colonies are abundant in the region (CPW 2020a).

Conservation or Mitigation Measures

No prairie dogs or burrowing owls are anticipated to utilize the Project Area; however, if any prairie dog colonies are identified within or adjacent to the Project Area, they will be geolocated prior to the site preparation and construction phase. If prairie dog colonies are located within the Project Area and development in prairie dog towns will occur between March 15 through August 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 an active burrowing owl nest during the nesting season (March 15 -

August 31). For the purposes of this Project, surface disturbances will include site preparation and all construction-related activities with the exception of existing road use.

Raptors and Migratory Birds

Potential Impacts

The pattern of temporary displacement during construction, and gradual return following construction, is expected for wildlife currently utilizing the Project Area.

Raptors are likely to use any trees or larger rock escarpments for nesting or perching. The Project Area lacks these nesting or perching features, thus it is unlikely that raptor species would directly utilize the Project Area aside from potential foraging or hunting habitat.

Conservation or Mitigation Measures

Pawnee Solar 2 LLC has consulted with CPW to site infrastructure, including transmission lines, to minimize impacts to wildlife including active raptor nests, which will be identified prior to construction. A qualified biologist will complete pre-construction nesting surveys for the following species and survey results will be provided to CPW prior to construction:

- Tree and ground-nesting raptors: if construction begins between December 1 to July 15 (depending on the species observed).
- Migratory songbirds: if construction begins between April 1 to August 31.

If no migratory birds are found nesting in the Project footprint or survey buffer area, then site clearing and construction associated activities will proceed as planned.

If active raptor nests are identified withing the Project Area, the nest will be afforded the appropriate spatial buffer from solar infrastructure and transmission lines and timing stipulations for construction activities located near nests will be observed. 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. 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* (CPW 2020b).

If active migratory bird nests are identified within the Project Area, consultation with the USFWS would ensure compliance with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act. 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.

Greater Prairie Chicken

Potential Impacts

Grouse species are known to avoid areas of human-made disturbance, including tall structures, such as transmission towers and buildings. Roads contribute traffic noise and the possibility of collision. Such built infrastructure could be a factor in the abandonment of leks, failure of nests, and reduced brood-rearing success, and thus, appropriate setbacks are recommended (CPW 2021b).

According to CPW Species Activity Map data, greater prairie chicken overall range is mapped approximately 13 miles east of the Project Area, with the exception of one mapped historic lek

located approximately 4.0 miles south of the Project Area (Figure 3). Thus, indicating that greater prairie chicken presence is possible, but highly unlikely, in the Project Area.

Conservation or Mitigation Measures

Pawnee Solar 2 LLC has consulted with CPW on siting the solar energy infrastructure, including transmission lines, away from breeding and production areas. CPW recommended surveys for greater prairie chickens during spring 2023 (two springs prior to construction, allowing time for any siting changes). If observed, the avoidance season for construction is March 1 to June 30 within 0.6 mile of an active greater prairie chicken lek site (CPW 2021a).

Big Game

Potential Impacts

No CPW-designated big game High Priority Habitat occurs within the Project Area; therefore, there will be no direct impacts to big game within designated wildlife management areas as a result of Project activities.

Conservation or Mitigation Measures

With the Project Area limited to 6.04 acres and located outside the big game High Priority Habitat as well as sited adjacent to County Road K, no conservation or mitigation measures are proposed with the exception of an 8-foot tall security fence surrounding the permitter of the Project Area to preclude big game from entering.

REFERENCES

Chapman, S. S., G. E. Griffith, J. M. Omernik, A. B. Price, J. Freeouf, and D. L. Schrupp. 2006. Ecoregions of Colorado. (Color poster with map, descriptive text, summary tables, and photographs.) U.S. Geological Survey (USGS) map (map scale 1:1,200,000). USGS, Reston, Virginia. Available online: https://www.epa.gov/eco-research/ecoregion-download-files-state-region-8#pane-05

Colorado Department of Agriculture (CDA). 2022. Noxious Weed Species ID. CDA, Broomfield, Colorado. Accessed August 2022. Available online: https://ag.colorado.gov/conservation/noxious-weeds/species-id

Colorado Natural Heritage Program (CNHP). 2022. Colorado's Conservation Data Explorer (CODEX). CODEX 1.0.1. CNHP, Colorado State University, Fort Collins, Colorado. Accessed August 2022. Available online: https://codex.cnhp.colostate.edu/

Cornell Lab of Ornithology. 2022. All About Birds. Cornell University, Ithaca, New York. Accessed August 2022. Available online: https://www.allaboutbirds.org/

Colorado Parks and Wildlife (CPW). 2020a. Colorado Black-Tailed Prairie Dog Range-Wide Monitoring 2020. CPW, Denver, Colorado. Available online: https://cpw.state.co.us/Documents/WildlifeSpecies/SpeciesOfConcern/BlackTailedPrairieDog/BTPD-Monitoring-Report-2020.pdf

Colorado Parks and Wildlife (CPW). 2020b. Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors 2020. CPW, Denver, Colorado. Available online: https://cpw.state.co.us/Documents/WildlifeSpecies/LivingWithWildlife/Raptor-Buffer-Guidelines.pdf

Colorado Parks and Wildlife (CPW). 2021a. Colorado Parks and Wildlife Best Management Practices for Solar Energy Development. CPW, Department of Natural Resources, Denver, Colorado. May 27, 2021. Available online: https://cpw.state.co.us/Documents/Commission/2021/June/Item.18-Colorado_Parks_and_Wildlife_Solar_Energy_BMPs_May_2021.pdf

Colorado Parks and Wildlife (CPW). 2021b. Colorado Parks and Wildlife's Recommendations to Avoid and Minimize Impacts to Wildlife from Land Use Development in Colorado. February 21, 2021. Available online: https://cpw.state.co.us/Documents/Conservation-Resources/Energy-Mining/CPW_HPH-Map-Layers.pdf

Colorado Parks and Wildlife (CPW). 2022a. Fact Sheets. CPW, Denver, Colorado. Accessed August 2022. Available online: https://cpw.state.co.us/Documents/Forms/AllItems.aspx?RootFolder=%2fDocuments%2fResearch%2f

Colorado Parks and Wildlife (CPW). 2022b. Google Earth™ (Kmz) Species Maps Page. Accessed August 2022. Available online: https://cpw.state.co.us/learn/Pages/KMZ-Maps.aspx

Colorado Parks and Wildlife (CPW). 2022c. Species Profiles. Threatened and Endangered Species. CPW, Denver, Colorado. Accessed August 2022. Available online: https://cpw.state.co.us/learn/

CPW (Colorado Parks & Wildlife). Not dated. Colorado Parks and Wildlife GIS Species Activity Mapping Definitions Publicly Available Data. https://cpw.state.co.us/learn/Maps/CPW-Public-GIS-Species-Activities-Definitions.pdf#search=elk%20production%20area

eBird. 2022. eBird: An Online Database of Bird Distribution and Abundance. eBird, Cornell Lab of Ornithology, Ithaca, New York. Accessed August 2022. Available online: http://ebird.org/content/ebird/

Morgan County. Not dated. Morgan County School Districts. https://cpw.state.co.us/learn/Maps/CPW-Public-GIS-Species-Activities-Definitions.pdf#search=elk%20production%20area

National Audubon Society (Audubon). 2022. Red-headed Woodpecker Melanerpes erythrocephalus. Guide to North American Birds, Audubon. Accessed August 2022. Available online: https://www.audubon .org/field-guide/bird/red-headed-woodpecker

National Park Service (NPS). 2022. Black-Tailed Prairie Dogs: Scotts Bluff National Monument. NPS, Washington, D.C. Accessed August 2022. Available online: https://www.nps.gov/articles/000/black-tailed-prairie-dogs.htm

Robb, L. A. and M. A. Schroeder. 2005. Greater Prairie-Chicken (*Tympanuchus Cupido*): A Technical Conservation Assessment. U.S. Department of Agriculture Forest Service, Rocky Mountain Region. April 15, 2005.

Robb, L. A. and M. A. Schroeder. 2005. Greater Prairie-Chicken (*Tympanuchus Cupido*): A Technical Conservation Assessment. U.S. Department of Agriculture Forest Service, Rocky Mountain Region. April 15, 2005.

Terracon Consultants, Inc. (Terracon). 2022. Phase I Environmental Site Assessment for the Proposed Pawnee Solar Generation Facility County Road K and County Road I. Fort Morgan, Morgan County, Colorado. Prepared on July 26, 2022.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). 2019a. SSURGO Soils Data. Soil Survey Geographic (SSURGO) Database, Web Soil Data, NRCS USDA Soil Survey Staff, Washington, D.C. Updated July 31, 2019. Accessed June 2022. Available online: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_053631

U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS). 2019b. Web Soil Survey. USDA NRCS, Washington, D. C. Last modified April 9, 2019. Accessed June 2022. Available online: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

U.S. Fish and Wildlife Service (USFWS). 2021. Birds of Conservation Concern 2021. United States Department of the Interior, U. S. Fish and Wildlife Service, Migratory Birds, Falls Church, Virginia. Accessed August 2022. Available online: https://www.fws.gov/media/birds-conservation-concern-2021pdf

U.S. Fish and Wildlife Service (USFWS). 2022. Initial Project Scoping: IPaC - Information for Planning and Consultation. IPaC, Environmental Conservation Online System, USFWS. Accessed August 2022a. Available online: https://ipac.ecosphere.fws.gov/

U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI). 2022. Wetlands Mapper, NWI: Surface Waters and Wetlands. USFWS NWI, Baileys Crossroads, Virginia. Accessed August 2022. Available online: https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/

U.S. Geological Survey (USGS). 2018. 3D Elevation Program. 3D elevation data from light detection and ranging (lidar) data: conterminous United States, Hawaii, and the U.S. territories. USGS, Reston, Virginia. Accessed August 2022. Available online: https://www.usgs.gov/core-science-systems/ngp/3dep

U.S. Geological Survey (USGS). 2019. National Land Cover Database 2019 - Landcover & Imperviousness (NLCD2019). Available online: https://www.mrlc.gov/data

U.S. National Vegetation Classification System (NVCS). 2022. G144 *Bouteloua gracilis - Bouteloua dactyloides - Pleuraphis jamesii* Shortgrass Prairie Group; Great Plains Shortgrass Prairie. NVCS. Accessed August 2022. Available online: https://www1.usgs.gov/csas/nvcs/unitDetails/856717

Western EcoSystems Technology, Inc. (WEST). 2022a. Pawnee Solar Project Ecological Characterization and Natural Resources Planning. Morgan County, Colorado. December 2022.

Western EcoSystems Technology, Inc. (WEST). 2022b.Technical Memorandum: Wetland and Waterbody Delineation at the Pawnee Solar Project. Morgan County, Colorado. Prepared on August 11, 2022.

Westwood Professional Services (Westwood). 2022a. Desktop Hydrology Study for the Pawnee Solar Project. Morgan County, Colorado. Prepared on July 18, 2022.

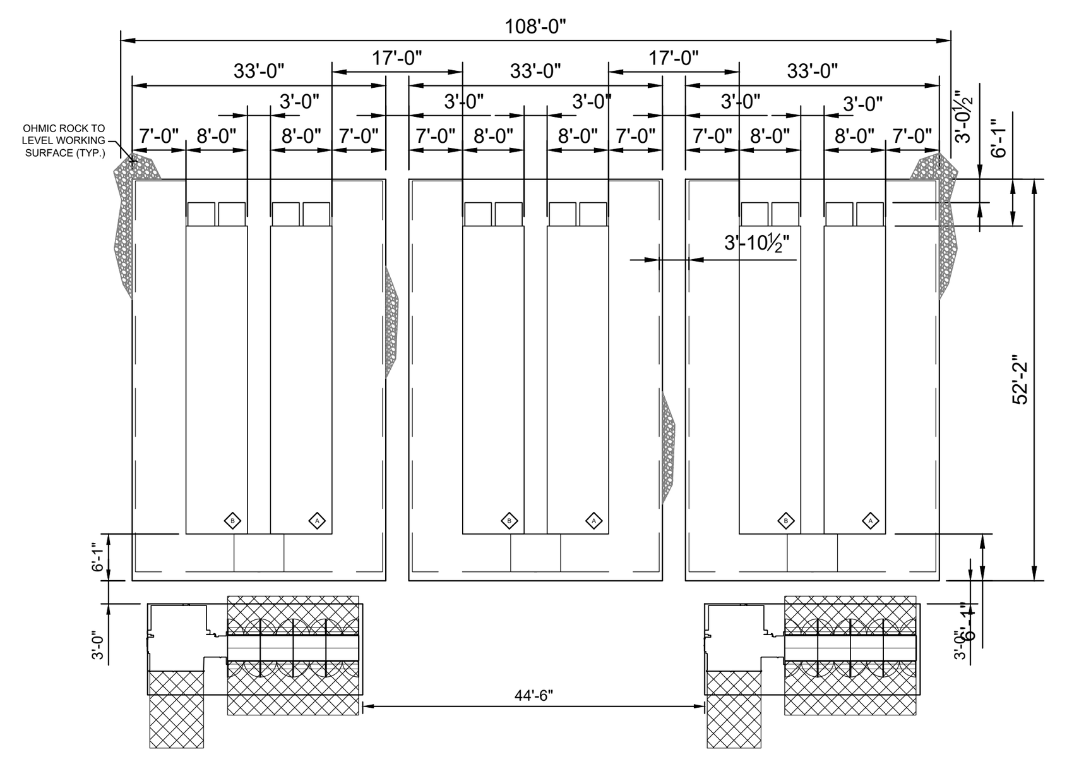
Westwood Professional Services (Westwood). 2022b. Class I Cultural Resources Desktop Review for the Pawnee Solar Project. Morgan County, Colorado. File R0036177.00. Prepared on July 18, 2022.

Westwood Professional Services (Westwood). 2022c. Critical Issues Analysis for the Pawnee Solar Project. Morgan County, Colorado. Prepared on July 18, 2022.

EXHIBIT 3

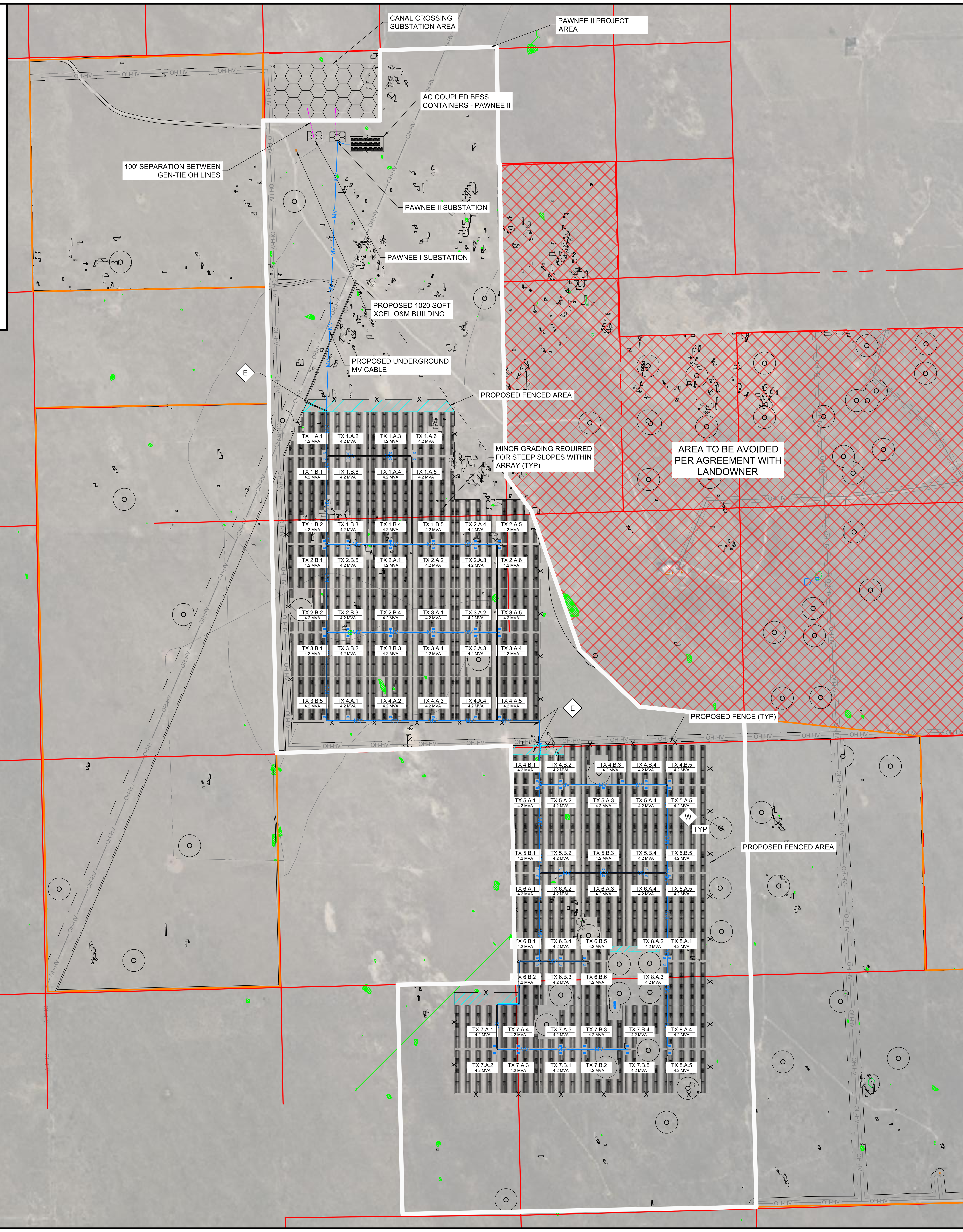
SITE PLAN/SPECIAL USE MAP

Pawnee II Solar BESS



1 TYPICAL PCS AND BESS EQUIPMENT DETAIL

SCALE: 1" = 25'



AES Titleblock 24X36 v210209

PLOTTED: 1/23/2023 9:42 AM
C:\AESCloud\Box\2. Projects\PSCo Large Scale\Pawnee II\4. Engineering\4. Design Sets\4.4.1 Dev Eng CAD\4.4.1.3 System Layout\Pawnee II-PV-E.01.01-Overall Electrical Plan.dwg
XREFs: ..\Pawnee-ALTA adjustment.dwg; ..\Pawnee-2ft Contours.dwg; ..\Pawnee-Buildable Area_08-10-2022.dwg

GENERAL NOTES

1. PRELIMINARY - NOT FOR CONSTRUCTION
2. THIS DRAWING IS FOR DIAGRAMMATIC PURPOSES ONLY. LOCATION OF ALL EXISTING ITEMS SHOWN IS APPROXIMATE AND MUST BE VERIFIED IN FINAL DESIGN.
3. ALL SPECIFIED EQUIPMENT IS PRELIMINARY, FINAL EQUIPMENT SELECTION SHALL BE APPROVED BY OWNER.

SHEET NOTES

E SITE ENTRANCE

W GAS WELL

TYP

LEGEND

EXISTING

PROPERTY LINE
20' SETBACK
10' ELEVATION CONTOURS
2' ELEVATION CONTOURS
MAJOR PUBLIC ROAD
SLOPE KEEPOUT AREA
APPROXIMATE WETLAND
FLOOD ZONE >2'
NHD WATERBODY
OH-HV OH-HV OVERHEAD TRANSMISSION LINE

PROPOSED

SITE BOUNDARY
LIMITS OF DISTURBANCE (LOD)
X X X FENCE
PROVISIONS FOR 2' DEEP WATER QUALITY MANAGEMENT
UTILITY SWITCHYARD
AES SUBSTATION
OH-HV OH-HV XXXKV OVERHEAD GEN-TIE LINE
INTERIOR ROADS
LAYDOWN AREA
MV MV MV UG MV FEEDER
XFMR SKID
PV PANELS

SYSTEM DETAILS

AC CAPACITY AT POI	250 MW
DC CAPACITY	333.8 MW
DC:AC RATIO AT POI	1.34
DESIGN TEMPERATURE	34.6° C
JINKO JKM535N-72HL4-TV MODULE COUNT	610,551
STRING SIZE	27 MODULES
PITCH	24.87'
INTER-ROW SPACING (MODULE TO MODULE)	17.41'
GCR	30%
GPTECH 3MWD3-V690 PCS COUNT	63
PCS NAMEPLATE RATING	4.2 MVA @ STC
RACKING TYPE	NEXTRACKER HORIZON 1P
TRACKER MOTOR COUNT	7927
2 STRING TRACKER ROWS	673
3 STRING TRACKER ROWS	7254
BESS CAPACITY AT POI	125 MW
BESS DURATION	4 HR
ENERGY CAPACITY AT POI BOL	680 MWh
ENERGY CAPACITY AT POI EOL	544 MWh
BATTERY MODULE (MANUF - MODEL)	SAMSUNG-E5D
AC COUPLED BESS INVERTER COUNT	37
CONTAINER TYPE	CEN 40 Rack
CONTAINER COUNT BOL	111
CONTAINER COUNT EOL	111
STRINGS PER CONTAINER BOL	19/20
STRINGS PER CONTAINER EOL	19/20
TOTAL PARCEL ACREAGE	5995
LINEAR FEET OF FENCE	71,574'
FENCED ACREAGE	1612.9
LINEAR FEET OF INTERIOR ROADS*	60728.85'
LAYDOWN AREA (ACRES)	52.5
WATER QUALITY MANAGEMENT TOTAL AREA (ACRES)	52.6

PRELIMINARY
NOT FOR CONSTRUCTION

aes
2180 South 1300 East, Suite 600
Salt Lake City, UT 84106-2749
(801) 679 - 3500

PE STAMP:

KEY PLAN:

REVISIONS:

NO.	DATE	DESCRIPTION
0	08/18/2022	PRELIMINARY 5% DESIGN
1	10/19/2022	AES 10% DESIGN
2	11/30/2022	UPDATED LAYOUT
3	01/10/2023	UPDATED LAYOUT
4	01/23/2023	UPDATED PROJECT BOUNDARY

PROJECT TITLE:

PAWNEE SOLAR II

PROJECT LOCATION:

FORT MORGAN, MORGAN COUNTY, COLORADO (40.127571, -103.712091)

SHEET TITLE & DESCRIPTION:

OVERALL ELECTRICAL LAYOUT

PAWNEE II: 250 MW PV + 125 MW AC COUPLED BESS

PROJ NUM:	
DES:	N. ANDEER
DWN:	Z. ELLERBY
CHK:	C. SANCHEZ
APV:	
DATE:	08/18/2022

SCALE AT 24" x 36": AS NOTED

SHEET NO: PV-E.01.01 REV: 4

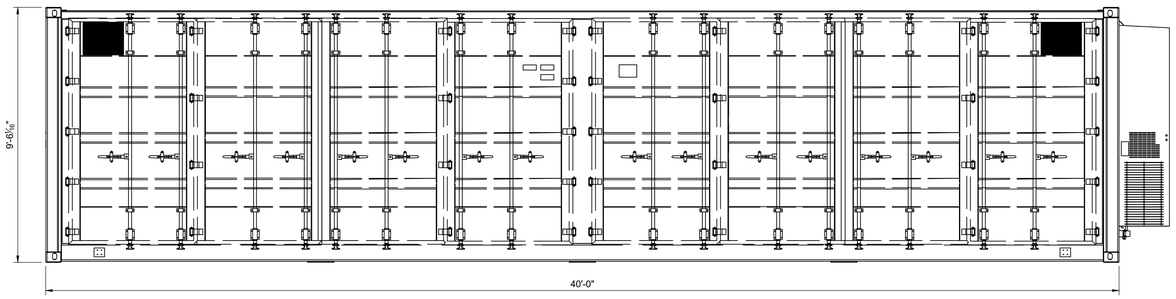
EXHIBIT 4

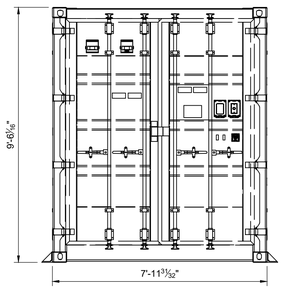
DRAWING SOLAR SCHEMATIC

Pawnee II Solar BESS

GENERAL NOTES

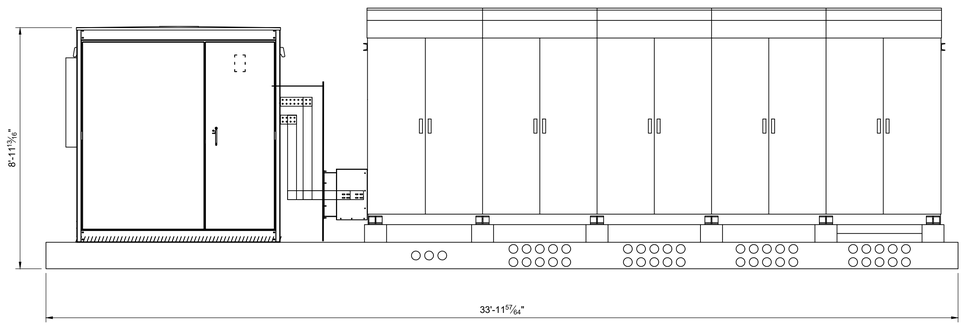
1. THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES - NOT FOR CONSTRUCTION
2. ALL EQUIPMENT AND DIMENSIONS SHOWN ARE PRELIMINARY AND MUST BE VERIFIED BY THE ENGINEER OF RECORD



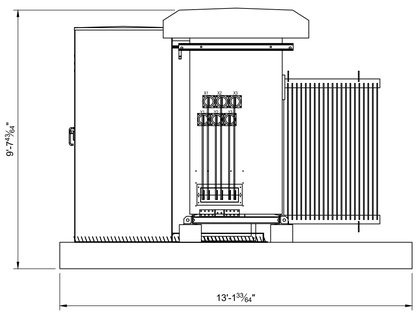


1 **40' BESS CONTAINER**
SCALE: N.T.S.

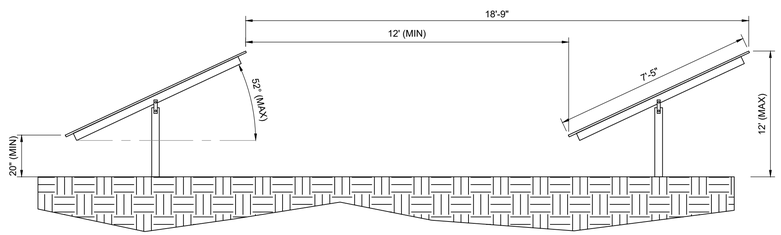
FRONT VIEW



SIDE VIEW



2 **GPTECH INVERTER W/ MV TRANSFORMER**
SCALE: N.T.S.



3 **PV TRACKER**
SCALE: N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION

aes
2180 South 1300 East, Suite 600
Salt Lake City, UT 84106-2749
(801) 679 - 3500

PE STAMP:

KEY PLAN:

REVISIONS:

NO.	DATE	DESCRIPTION
0A	12/16/2022	INITIAL REVISION

PROJECT TITLE:

TYPICAL PROJECT

PROJECT LOCATION:

SHEET TITLE & DESCRIPTION:

EQUIPMENT DETAILS

PV & BESS

PROJ NUM:	
DES:	B. SAVAGE
DWN:	L.ORTIZ
CHK:	P. CHIGULURI
APV:	
DATE:	12/16/2022

SCALE AT 24" x 36":

NTS

SHEET NO: PV-E.05.01

REV: 0A

PLOTTED: 12/16/2022 2:41 PM
C:\AES\Ourt\Box\Engineering\AutoCAD\2. Templates\PV Standalone\PV and BESS Equipment Details.dwg
User: lortiz

EXHIBIT 5

ENGINEERED DRAINAGE AND GRADING PLANS

Pawnee II Solar BESS

ACE DEVELOPMENT COMPANY, LLC

PAWNEE II SOLAR PROJECT

PRELIMINARY DRAINAGE STUDY

PAWNEE II SOLAR PROJECT

PRELIMINARY DRAINAGE STUDY

ACE DEVELOPMENT COMPANY, LLC

PRELIMINARY DRAINAGE STUDY

PROJECT NO.: 31403295.013
DATE: DECEMBER 2022

WSP
5613 DTC PKWY, SUITE 500
GREENWOOD VILLAGE, CO 80111
WSP.COM

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

1.1 PROJECT OVERVIEW

This Preliminary Drainage Report was prepared by WSP on behalf of Pawnee Solar 2 LLC, a wholly owned subsidiary of ACE Development Company, LLC (AES)to address drainage at the proposed Pawnee II Solar Project (Project). The project consists of a photovoltaic (PV) solar plant situated on 1,725 acres of land within Morgan County, Colorado, approximately 8 miles southeast of Fort Morgan, Colorado (Figure 1.1).

The purpose of this Preliminary Drainage Report is to establish the hydrology for the 5-year, 10-year, 50-year and 100-year storm events and provide flow rates, depths, and velocities that will be used to provide stormwater management recommendations (low water crossings), solar equipment elevations (panels, inverters, and pads), O&M building pad elevation, and buffers (development setbacks) from natural washes.

1.2 PROJECT DESCRIPTION

The Project site is located in Morgan County, Colorado. Access to the Project site is via County Road K on the west side. The Project consists of a photovoltaic (PV) solar farm with a nameplate capacity of 250 megawatts (MW) on approximately 1,725 acres of land.

Several existing roads and utilities are located within the Project boundary. At present, the land is classified as primarily Grassland/Herbaceous. Flow reaches the site from the north and discharges runoff to the south and southeast. Site conditions can be found on Figure 1.2.

The PV array facilities will be located within the Project boundary and major components include:

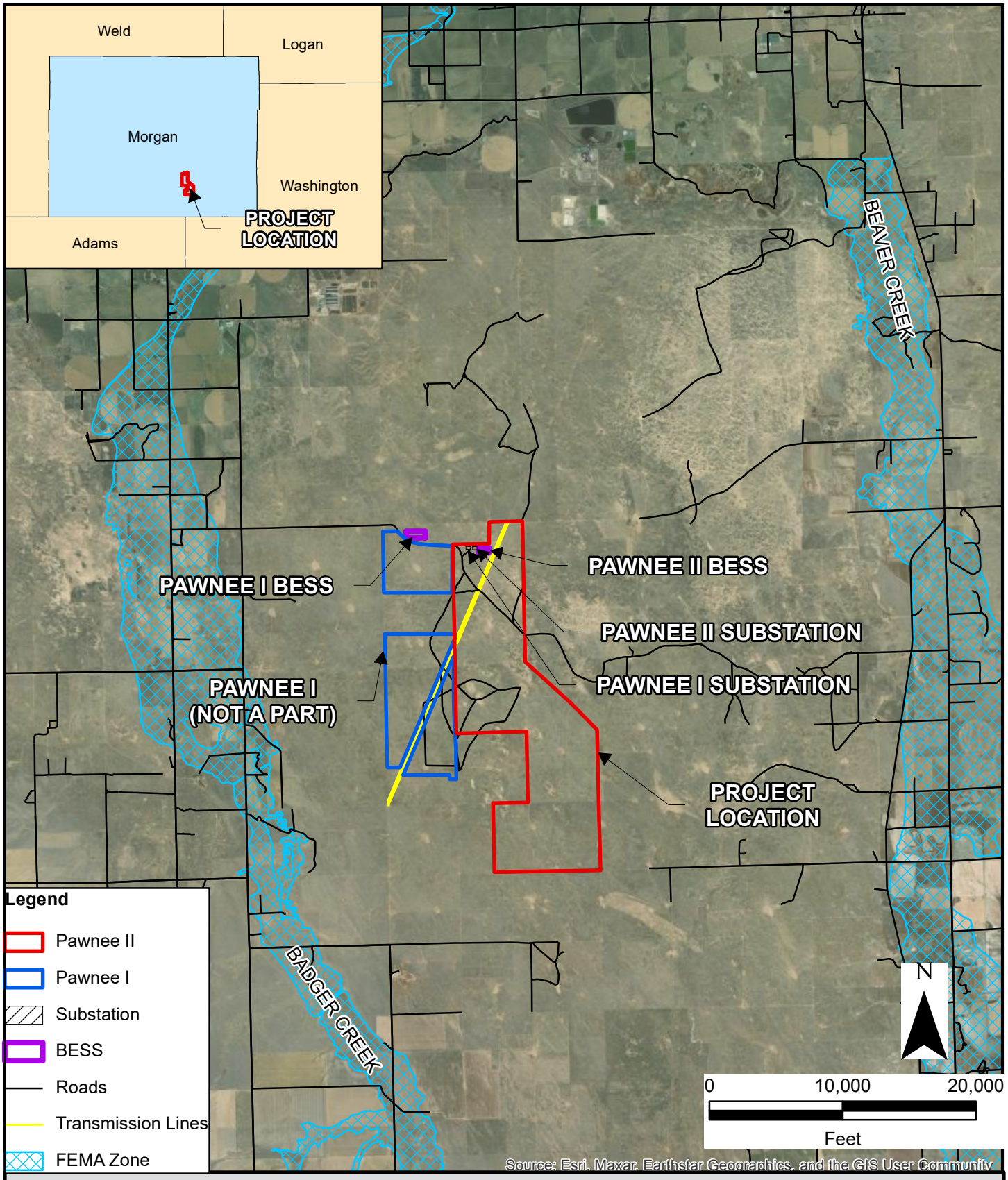
- PV modules/arrays
- Solar trackers or fixed support structures
- Direct current (DC) or alternating current (AC) collection cable and combiner or switch boxes
- Solar power inverters and medium-voltage transformers
- Battery energy storage system (BESS)
- Electrical collection system
- Onsite substation
- Administration/operations and maintenance (O&M) building
- Revegetation of ground cover

1.3 PURPOSE OF REPORT

The purpose of this report is to establish the 100-year, 50-year, 10-year and 5-year storm flow across the site under pre- and post-development conditions and present a preliminary stormwater management plan for the Project. This report presents an overview of the hydrologic methods, input parameters, and 100-year, 50-year, 10-year and 5-year hydraulic model results. This report is organized as follows:

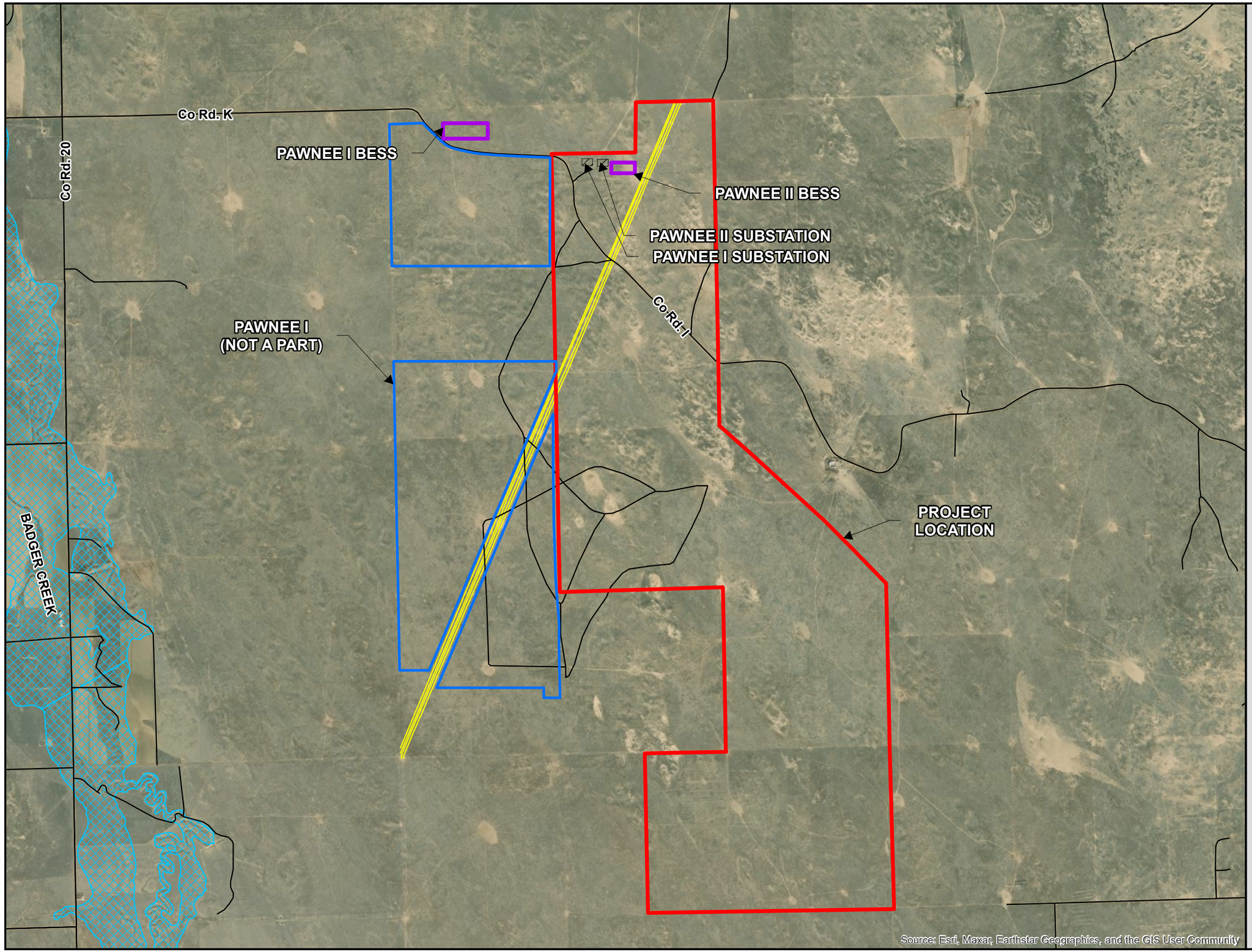
- Section 1 provides general project background;
- Section 2 presents previous studies related to the project;

- Section 3 discusses hydrologic and hydraulic analysis;
- Section 4 presents hydrologic and hydraulic results;
- Section 5 presents stormwater management recommendations;
- Section 6 provides the conclusion; and,
- Section 7 lists the references.



Pawnee II Solar Facility

Vicinity Map
Figure 1.1



Pawnee II Solar Facility

Legend

- Pawnee I
- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

N

0 3,000 6,000

Feet

Site Map
Figure 1.2

2 PREVIOUS STUDIES

2.1 FLOOD INSURANCE RATE MAPS

The Federal Emergency Management Agency (FEMA) publishes Flood Insurance Rate Maps (FIRM) that delineate special flood hazard areas (SFHAs) subject to flooding by the 1% annual chance (100-year) storm event. Other Flood Areas identified as Zone X (shaded) are defined by FEMA as areas of 0.2% annual chance (500-year) flood; areas of 1% annual chance flood with average depths of less than 1 foot, or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

Figure 2.1 and 2.2 are a reproduction of the FIRM panels for Morgan County where the Project is located. According to FIRM Number 08087C0650D, Panel 650 of 875 effective date April 4, 2018, and FIRM Number 08087C0825D, Panel 825 of 875 effective date April 4, 2018, the Project is not within a Special Flood Hazard Area. It is identified as unshaded Zone X, areas outside the 0.2% annual chance floodplain.

There is an existing Zone A (100-year) flood zone to the east and to the west of the site. Development of the site is not anticipated to cause any adverse impacts to the flood zone.

2.2 WESTWOOD DESKTOP HYDROLOGY STUDY

Westwood completed a preliminary hydrology study in July 2022 for the Pawnee Solar Project. The study analyzed the pre-development conditions to determine potential impacts with layout and design of the Project. The study encompassed approximately 128 square miles and incorporated USGS contours, StreamStats for Beaver Creek, and rainfall from NOAA Atlas.

WSP used Westwood's FLO-2D model that was provided by AES as a basis for the development of the 5-, 10-, 50-, and 100-year storms analyzed as a part of this Report. WSP incorporated the NOAA Atlas rainfall and StreamStats from the Westwood study for the additional storm scenarios.

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Anderson Consulting Engineers, Inc. This information was compiled from National Geodetic Survey (2004), National Agriculture Image Program (2005), Bureau of Land Management (2006), U.S. Department of Commerce (2006). Additional information was photogrammetrically compiled at 1 meter resolution from aerial photography dated 2005.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study Report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

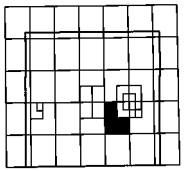
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

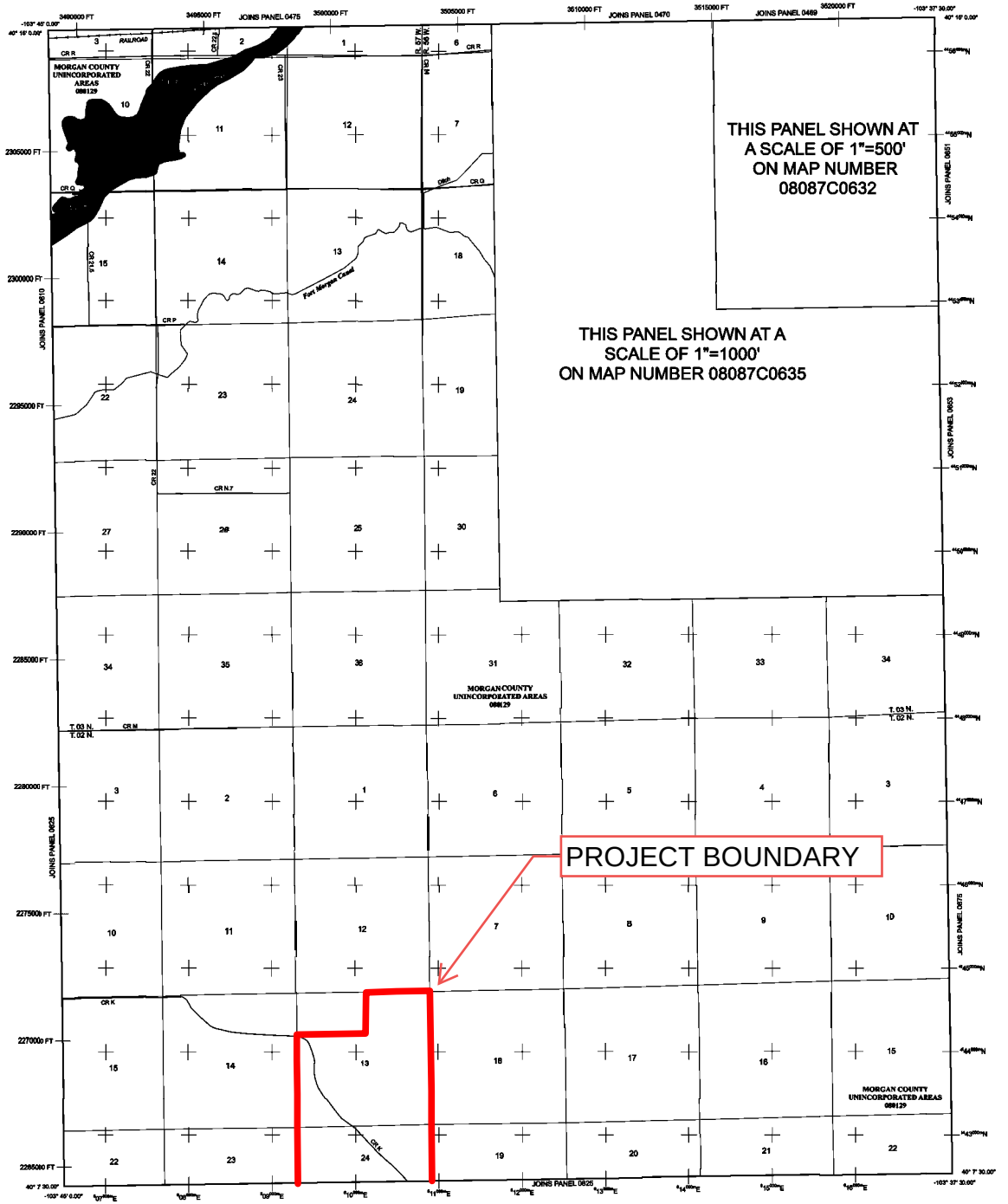
If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.
ZONE AE — Base Flood Elevations determined.
ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR — Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation is feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988 (NAVD 88)
A — A — Cross section line
23 — 23 — Transect line
87° 07' 30.00" 32° 22' 30.00" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4779000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT — 5000-foot grid ticks: Colorado State Plane coordinate system,north zone (FIPSZONE 0501), Lambert Conformal Conic Projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
EFFECTIVE DATE
APRIL 4, 2018

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
300 0 600 1200 METERS

NFIP — NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0650D

FIRM
FLOOD INSURANCE RATE MAP
MORGAN COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 650 OF 0875

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
MORGAN COUNTY	080129	0650	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 08087C0650D

EFFECTIVE DATE APRIL 4, 2018

Federal Emergency Management Agency

NOTES TO USERS

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Anderson Consulting Engineers, Inc. This information was compiled from National Geodetic Survey (2004), National Agriculture Image Program (2005), Bureau of Land Management (2009), U.S. Department of Commerce (2009). Additional information was photogrammetrically compiled at 1 meter resolution from aerial photography dated 2005.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the *Flood Insurance Study Report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

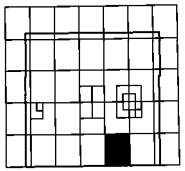
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

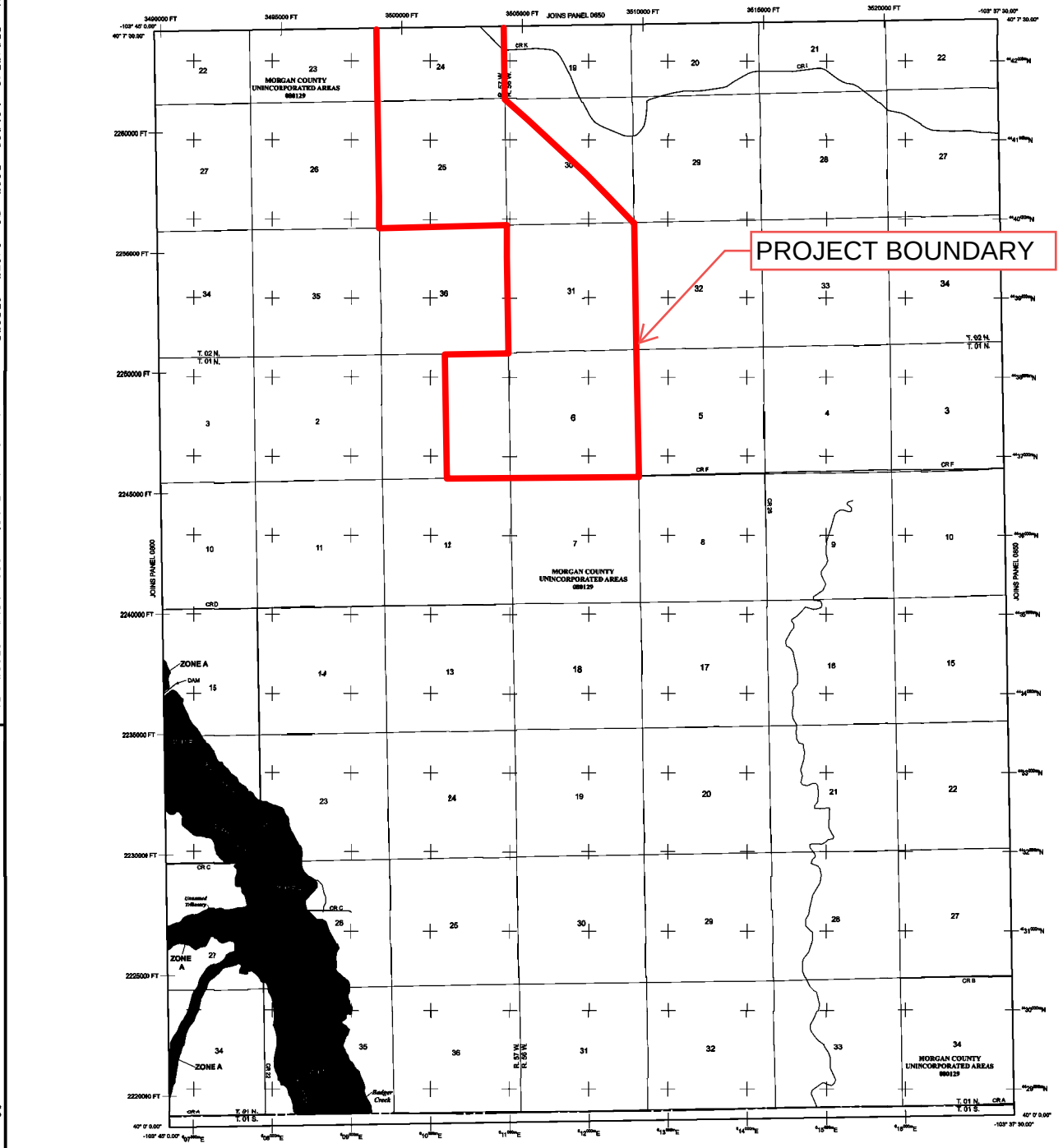
If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.
ZONE AE — Base Flood Elevations determined.
ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR — Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation is feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988 (NAVD 88)
A — A — Cross section line
23 — 23 — Transect line
97° 07' 30.00" / 32° 22' 30.00" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT — 5000-foot grid ticks: Colorado State Plane coordinate system,north zone (FIPSZONE 0501), Lambert Conformal Conic Projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
EFFECTIVE DATE
APRIL 4, 2018

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
300 0 600 1200 METERS

PANEL 0825D

FIRM
FLOOD INSURANCE RATE MAP
MORGAN COUNTY, COLORADO AND INCORPORATED AREAS
PANEL 825 OF 0875
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
MORGAN COUNTY	080129	0825	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
08087C0825D

EFFECTIVE DATE
APRIL 4, 2018

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

3 HYDROLOGIC AND HYDRAULIC METHODS

The following sections describe the methods and criteria used to develop the model and input parameters. Results of the model and hydraulic calculations are presented in Section 4 of this report.

3.1 DATA SOURCES

Input data for the hydrologic and hydraulic models were obtained from a variety of sources. This information is summarized in Table 3.1 below:

Table 3.1 Data Sources

DATA	PURPOSE	SOURCE	FORMAT
Elevation	Development of FLO-2D model	Survey (Provided by AES)	CAD Surface
Elevation	Development of FLO-2D Model	USGS National Map Viewer Download	Raster
Land use	Estimating precipitation losses (infiltration)	National Land Cover Database	Raster
Soil Types	Estimating precipitation losses (infiltration)	NRCS SSURGO Database (Web Soil Survey)	Shapefile
Preciptiation	100-year, 50-year; 10-year, and 5-year precipitation depths	NOAA Atlas 14, Vol. 2	PDF
Project Boundary	Horizontal limits of FLO-2D model	AES	Shapefile
FEMA Flood Zones	Reference	NFHL Data-County	Shapefile
Aerial Photography	Reference	ArcGIS Map Service	Raster

3.2 DESIGN STORM

3.2.1 PRECIPITATION

AES requested hydrologic and hydraulic analysis of the 5-year, 10-year, 50-year and 100-year 24-hour storm events. Precipitation values were obtained from NOAA Atlas 14 Point Precipitation Frequency Estimates: CO. The approximate

location of the site was located on the interactive map and rainfall depths were obtained in tabular and graphical form. The rainfall depths for the 5-year, 10-year, 50-year and 100-year 24-our storm events are 2.35 inches, 2.77 inches, 3.92 inches and 4.48 inches, respectively. PDF output from the Atlas is included in Appendix A.1.

3.2.2 STORM DISTRIBUTION

For the rainfall-runoff model, a 24-hour event with a 15-minute time interval and Type II temporal distribution was used for the 5-year through 100-year storm events. The NRCS Type II distribution was selected based on Figure B-2 in TR-55 (United States Department of Agriculture, NRCS, 1986). Type II storms are characterized by low intensity rainfall at the beginning of the event, with less than 25% of the precipitation occurring during the first 11 hours. This is followed by an hour of heavy rainfall (approximately 40% of the total), with the remaining 1/3 of the total precipitation occurring over the next 12 hours. For all simulations, the precipitation is assumed to fall uniformly throughout the watershed at any given time step.

3.2.3 SITE HYDROLOGY

The Project is located on land containing several high spots and depressions throughout the site. Flow is contributed to the site from the south but in the area generally surrounding Pawnee II, the flow drains to the east. Flow collects in existing washes and low points as it travels north towards the site, and discharges from the site to the east. The total area of the watershed that was originally modeled by Westwood is approximately 128 square miles.

An existing FEMA Flood Zone A is located west of the site within Badger Creek. Badger Creek is shown on FEMA FIRM Panel 08087C0650D, Panel 650 of 0875, as Flood Zone A. Zone A Flood Zones are categorized as areas of 100-year flood; base flood elevations and flood hazard factors not determined.

Westwood incorporated the StreamStats for Beaver Creek, which is a Zone A Flood Zone located to the east, into the base model. To stay consistent in the modeling, WSP updated the inflows for the 5-year through 100-year events based on StreamStats results provided in the previous study.

3.3 MODELS

The hydrologic and hydraulic analysis was modeled using FLO-2D software. FLO-2D is a 2-dimensional software that allows for a rain-on-grid analysis. This modeling was completed by Westwood in July 2022 for the 100-year storm.

WSP modeled the 5-, 10-, 50-, and 100-year storms. Eight (8) models were prepared for this report to provide results for pre- and post-development conditions for the design storms.

The following subsections address input parameters used to develop the flood models.

3.3.1 GRID SIZE AND NODES

A 50-foot by 50-foot grid size was modeled in FLO-2D for the 128-square mile watershed. This results in sufficient model resolution to evaluate flow patterns within the site without runoff becoming excessive. Outflow nodes were placed along the edge of the model to indicate flow leaving the model boundary.

3.3.2 TOPOGRAPHY

AES provided WSP with on-site elevation data. Figure 3.1 shows existing 10-foot contours based on the provided aerial survey. Supplemental elevation data was needed outside of the Project boundary for the model. Elevation data (LIDAR) for outside the study area was obtained from the USGS National Map 3DEP Downloadable Data Collection (United States Geological Survey, 2020), using the 1/3 arc-sec data set.

A Digital Elevation Model (DEM) for the study area was developed from this data. All GIS data are in the NAD 1983 Colorado South State Plane Coordinate System (feet). Unless noted otherwise, all elevation data in this report is based on the NAVD88 datum.

WSP evaluated slopes within the Project boundary. The results are presented on Figure 3.2, which shows locations where slopes exceed seven (7) percent. There are several locations of depressions throughout the site. Preliminary grading was conducted for this report and incorporated into the post-development model. More detailed grading will be required for final design.

3.3.3 LAND USE

According to the National Land Cover Database (NLCD), the project is located on land designated as Grassland/Herbaceous within the areas of the site that are proposed to be developed. Existing land use for the project site is shown in Figure A.3.1.

The solar development includes stabilizing the site with similar to native ground covering. Therefore, the post-development model assumes a land use of Herbaceous – Fair Condition within the developed areas of the site.

3.3.4 SOILS

Soil properties influence the relationship between rainfall and runoff because soils have differing rates of infiltration. Based on infiltration rates, the National Resources Conservation Service (NRCS) has divided soils into four hydrologic soil groups (HSG):

Hydrologic Soil Group A – Soils having a low runoff potential due to high infiltration rates. These soils consist primarily of deep, well-drained sands and gravels.

Hydrologic Soil Group B – Soils having a moderately low runoff potential due to moderate infiltration rates. These soils consist primarily of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures.

Hydrologic Soil Group C – Soils having a moderately high runoff potential due to slow infiltration rates. These soils consist primarily of soils in which a layer exists near the surface that impedes the downward movement of water, and soils with moderately fine to fine texture.

Hydrologic Soil Group D – Soils having a high runoff potential due to very slow infiltration rates. These soils consist primarily of clays with high swelling potential, soils with permanently high-water tables, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious parent material.

Soils types were obtained from the NRCS Web Soil Survey (WSS). Soils within the project boundary are generally Hydrologic Soil Group (HSG) A soils. The HSG soil rating is shown on Figure A.2.2.

3.3.5 CURVE NUMBERS

The Soil Conservation Service (SCS) method uses a combination of soil type and land use to assign a runoff curve number to an area. The runoff curve number (CN) indicates the runoff potential of an area. Curve numbers based on hydrologic soil groups and land use were obtained from TR-55 Table 2-2a through Table 2-2d. In general, on-site existing conditions are classified as herbaceous with HSG A soils. For the proposed condition, the ground was assumed to be revegetated and stabilized to the same or better as existing conditions for the fenced in areas.

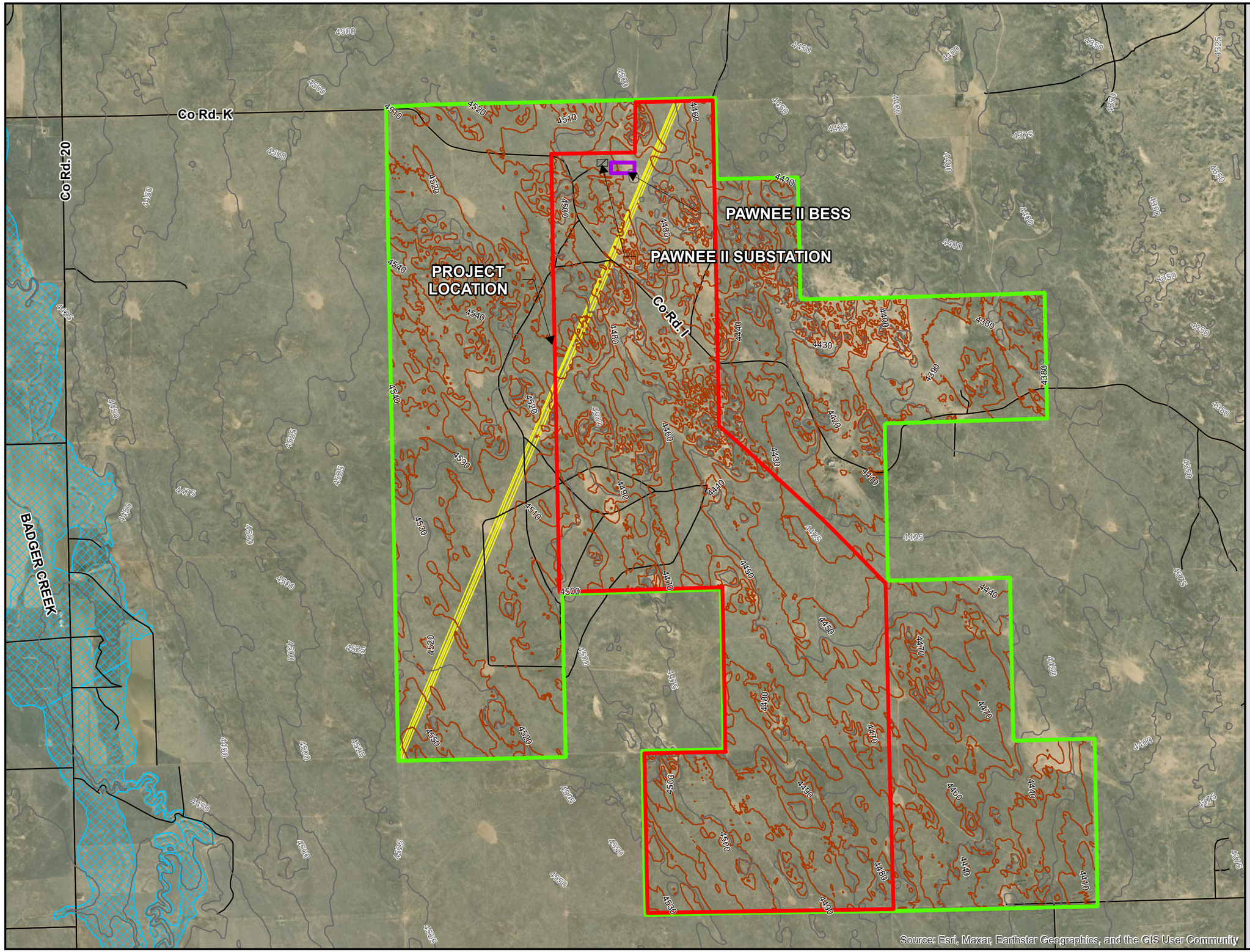
The BESS for Pawnee II was assumed to be placed on concrete and the substation placed on gravel. The curve numbers were adjusted to reflect the change in land cover accordingly, resulting in a CN of 98 for the BESS and a CN of 76 for the substation.

Table 3.2 Summary of Land Uses and Curve Numbers for FLO-2D Models

DESCRIPTION	LU Value	Curve Number for Hydrologic Soil Group			
		A	B	C	D
Open Water	1	98	98	98	98
Developed, Open Space	2	46	65	77	82
Developed, Low Intensity	3	61	75	83	87
Developed, Medium Intensity	4	77	85	90	95
Developed, High Intensity	5	89	92	94	95
Barren Land	6	77	86	91	94
Deciduous Forest	7	43	55	70	77
Evergreen Forest	8	43	55	70	77
Mixed Forest	9	43	55	70	77
Shrub/Scrub	10	55	71	81	89
Herbaceous	11	55	71	81	89
Hay/Pasture	12	55	71	81	89
Emergent Herbaceous Wetlands	13	45	66	77	83

3.3.6 MANNING'S N

FLO-2D uses Manning's *n* coefficients to account for the effects of surface roughness. The Manning's *n* values used in FLO-2D are specific to unsteady overland flow computations, which tend to be significantly higher than Manning's *n* values specific to steady state, open channel flow computations. Manning's *n* was applied based on Westwood's modeling and that value did not change for post-condition modeling because re-vegetation was assumed. Flow resistance factors were obtained from Table 3 of the FLO-2D Reference Manual (Appendix A.3).



Pawnee II Solar Facility

Legend

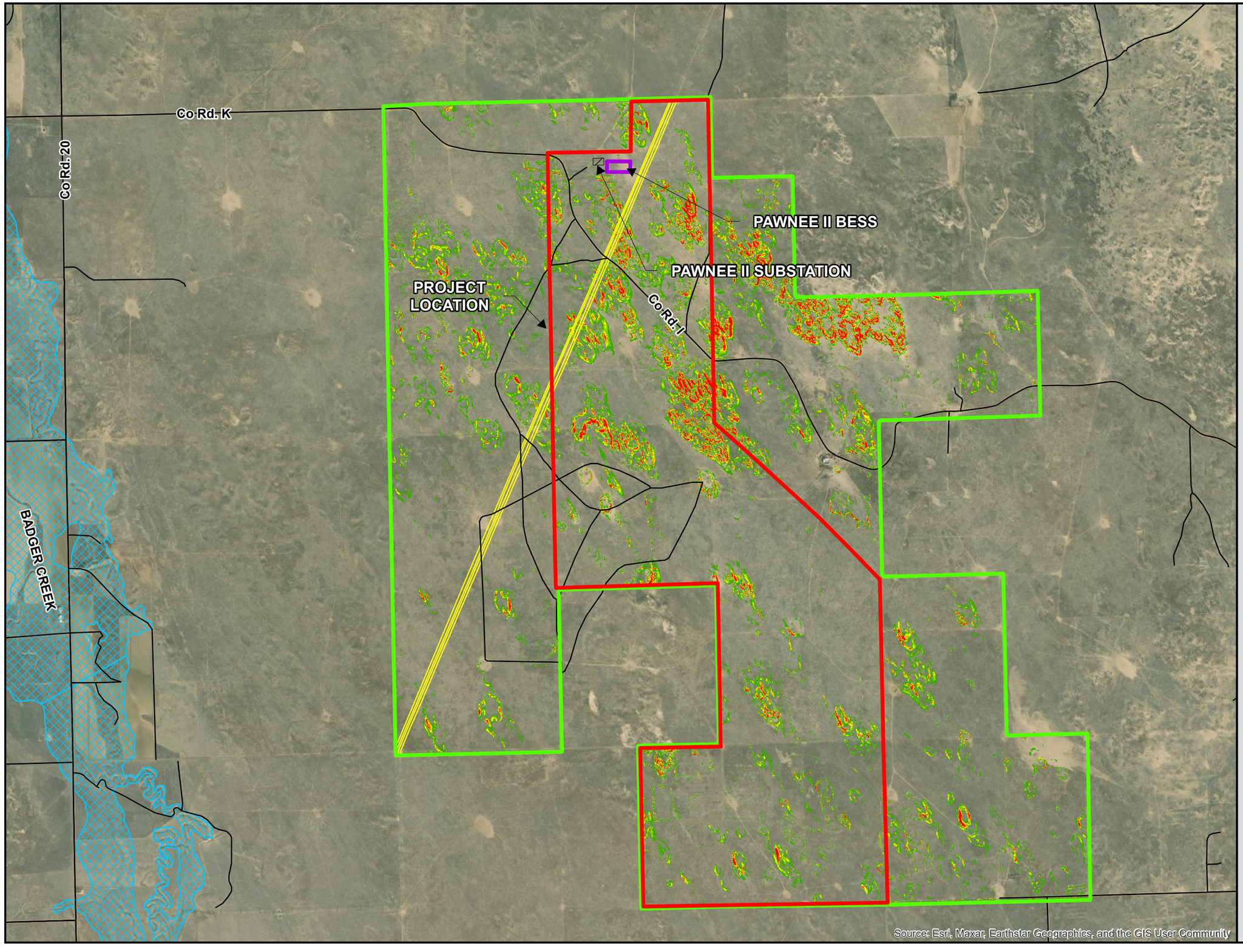
- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone
- Surface Boundary
- 25' Contour
- 10' Contour

N

0 3,000 6,000

Feet

Topography Map
Figure 3.1



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Surface Boundary

Slope (%)

- 7.00 - 10.00
- 10.00 - 12.00
- 12.00 - 14.00
- 14.00 - 16.00
- >16.00

N

0 3,000 6,000

Feet

Slope Map
Figure 3.2

4 HYDROLOGIC AND HYDRAULIC ANALYSIS RESULTS

This section presents the results of the 5-year, 10-year, 50-year and 100-year hydrologic and hydraulic models. Multiple figures have been prepared to illustrate the pre- and post-development model results.

4.1 GENERAL RESULTS

Runoff from the watershed is captured by various natural washes and low points running throughout the area. Both to the east and west sides of the site contains several depressed areas that capture runoff accumulating to various depths. There is a large wash to the east of the site that contributes to a FEMA Flood Zone A downstream of the site. The pre- and post- development flow velocities and depths will help determine any required countermeasures to prevent adversely impacting the flood zone.

The curve number adjustment discussed in Section 3.3.5 resulted in a change in runoff due to the change in infiltration. For post-development conditions, flow depths and velocities are generally greater than or equal to those of pre-development conditions. Proposed stormwater recommendations are presented in Section 5 of this report.

4.2 PRE-DEVELOPMENT CONDITION MODEL RESULTS

Figures 4.1a-b and 4.1c-d present the 100-year flow depths and velocities for pre-development condition, respectively. Figures 4.2a-b and 4.2c-d present the 50-year flow depths and velocities for pre-development condition, respectively. Figures 4.3a-b and 4.3c-d present the 10-year flow depths and velocities for pre-development condition, respectively. Figures 4.4a-b and 4.4c-d present the 5-year flow depths and velocities for pre-development condition, respectively. Note that flow depths less than 1.50 feet and velocities less than 0.25 feet/second (ft/s) are not shown for clarity.

Flow depths for the 100-year storm collects in well-defined low spots and washes throughout the development areas creating several areas of ponding in the 100-year storm. These ponds collect flow of various depths to a maximum of 5.12 feet. Velocities for the 100-year storm are generally less than 0.6 ft/s within the development areas and considered non-erosive.

Flow depths for the 50-year storm collects in well-defined low spots and washes throughout the development areas creating several areas of ponding in the 50-year storm. These ponds collect flow of various depths to a maximum of 5.0 feet. Velocities for the 50-year storm are generally less than 0.4 ft/s within the development areas and considered non-erosive.

Flow depths for the 10-year storm collects in well-defined low spots and washes throughout the development areas. This creates even fewer areas of ponding in the 10-year storm. These ponds collect flow of various depths to a maximum 3.5 feet for this storm event within the project area. The velocities for the 10-year storm are generally less than 0.3 ft/s within the development areas and considered non-erosive.

Flow depths for the 5-year storm collects in well-defined low spots and washes throughout the development areas. This creates even fewer areas of ponding in the 5-year storm. These ponds collect flow of various depths to a maximum 1.9 feet for this storm event within the project area. The velocities for the 10-year storm are generally less than 0.3 ft/s within the development areas and considered non-erosive.

4.3 POST-DEVELOPMENT CONDITION MODEL RESULTS

Figures 4.5a, 4.6a, 4.7a and 4.8a present the 100-year, 50-year, 10-year and 5-year flow depths for post-development condition, respectively. Figures 4.5b, 4.6b, 4.7b and 4.8b present the 100-year, 50-year, 10-year and 5-year velocities for post-development condition, respectively. Note that flow depths less than 1.50 feet and velocities less than 0.25 feet/second (ft/s) are not shown for clarity.

The post-development model incorporated a graded surface to reduce slopes within the site. Further grading to reduce the low spots throughout the site should be conducted for final design as described in Section 5.

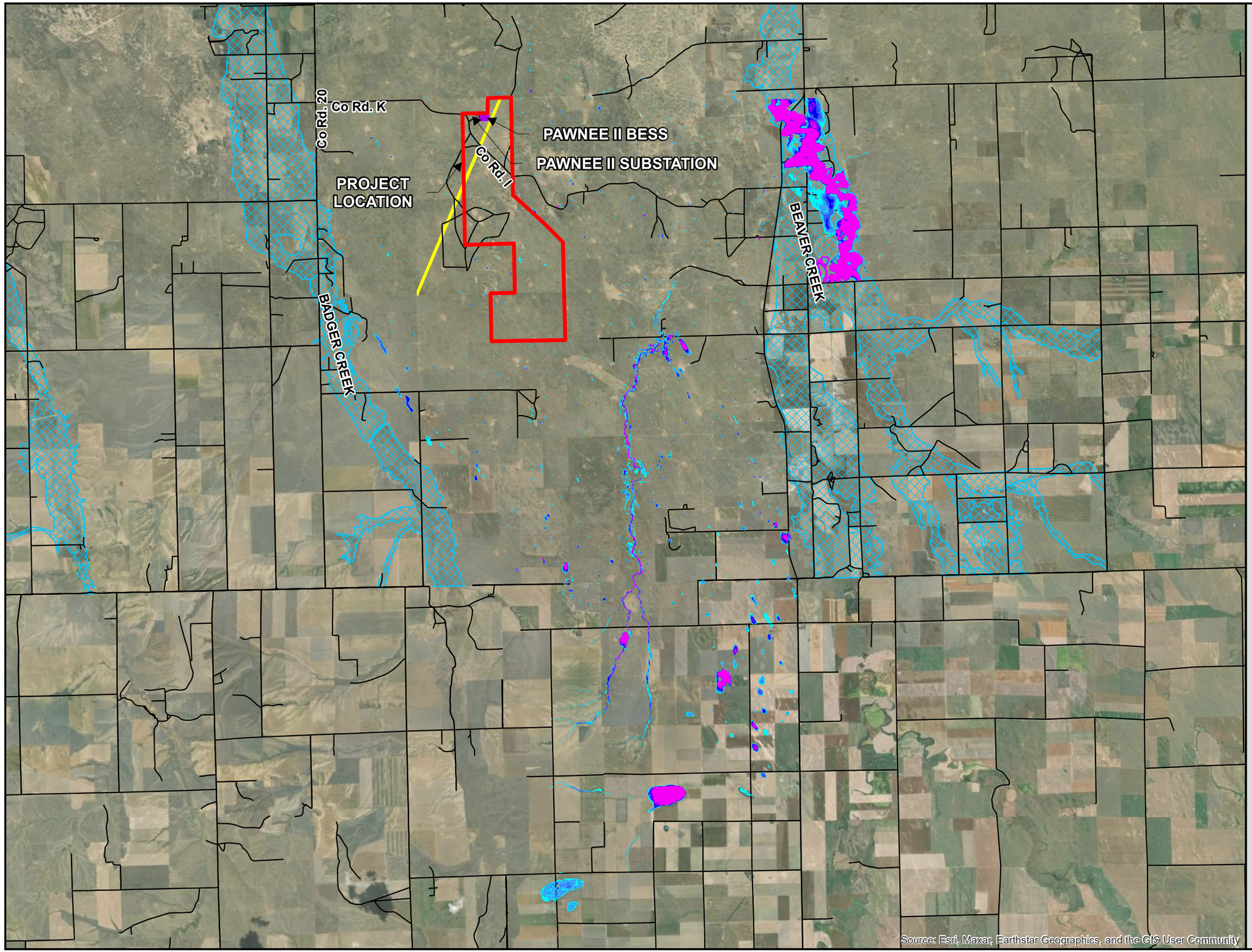
Flow depths for the 100-year storm collects in well-defined low spots and washes throughout the development areas creating several areas of ponding in the 100-year storm. These ponds collect flow of various depths to a maximum of 5.12 feet. Velocities for the 100-year storm are generally less than 0.6 ft/s within the development areas and considered non-erosive.

Flow depths for the 50-year storm collects in well-defined low spots and washes throughout the development areas creating several areas of ponding in the 50-year storm. These ponds collect flow of various depths to a maximum of 5.0 feet. Velocities for the 50-year storm are generally less than 0.4 ft/s within the development areas and considered non-erosive.

Flow depths for the 10-year storm collects in well-defined low spots and washes throughout the development areas. This creates even fewer areas of ponding in the 10-year storm. These ponds collect flow of various depths to a maximum 3.5 feet for this storm event within the project area. The velocities for the 10-year storm are generally less than 0.3 ft/s within the development areas and considered non-erosive.

Flow depths for the 5-year storm collects in well-defined low spots and washes throughout the development areas. This creates even fewer areas of ponding in the 5-year storm. These ponds collect flow of various depths to a maximum 1.9 feet for this storm event within the project area. The velocities for the 10-year storm are generally less than 0.3 ft/s within the development areas and considered non-erosive.

There is one (1) cross sections presented on the post-development figures to quantify the change in flow rates for the 5- through 100-year storms analyzed with this Report. Since the Curve Number and Manning's n was assumed to be the same between pre- and post-development conditions, there is no change in runoff throughout the site. However, there is a change in runoff due to the development of the BESS and substation. Stormwater management measures are presented in Section 5 to mitigate the impacts of the BESS and substation developments.



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

Flow Depth (ft)

- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

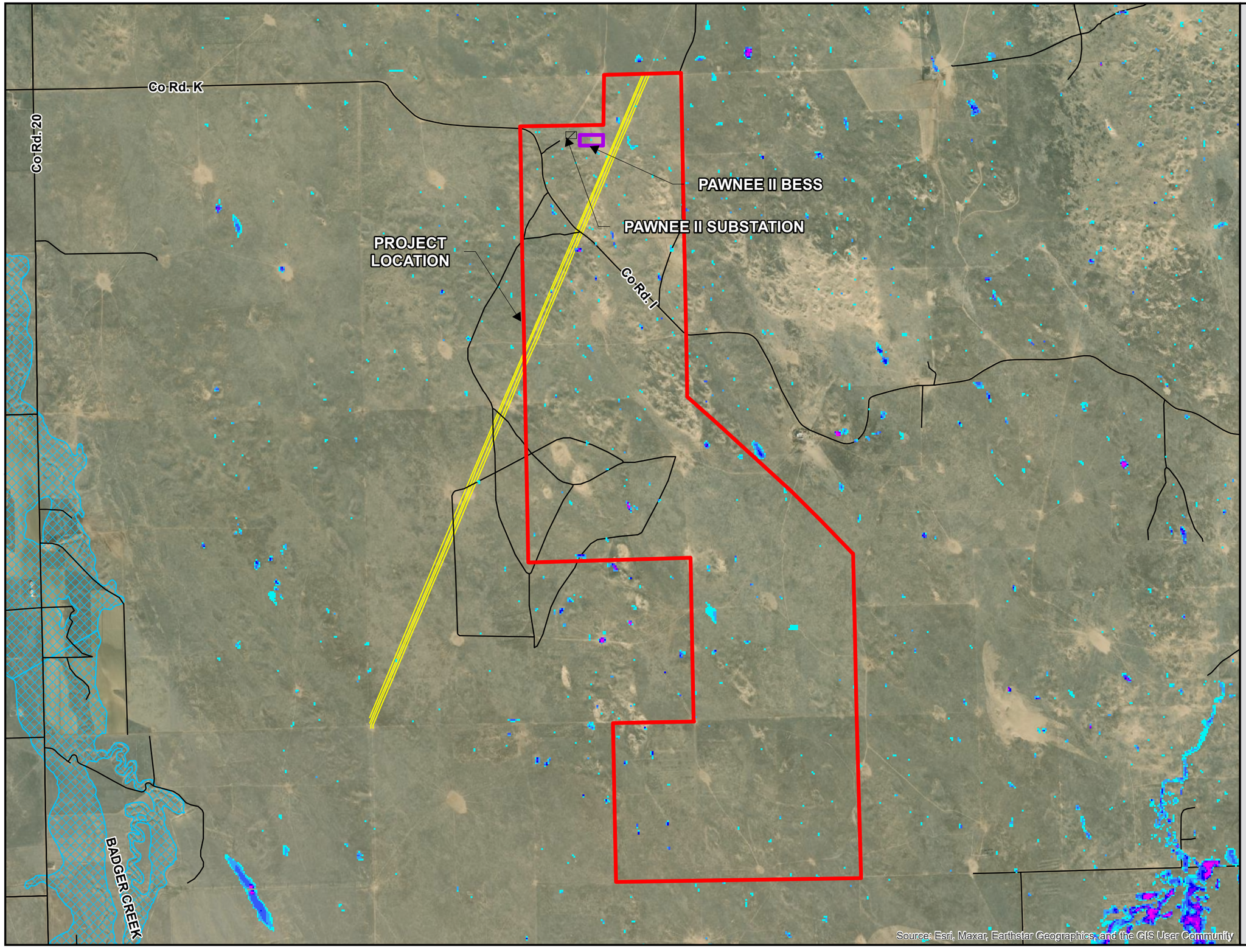
N

0 10,000 20,000

Feet

wsp

100-Year Storm Pre-Development Full Model Flow Depth Map
Figure 4.1a



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

Flow Depth (ft)

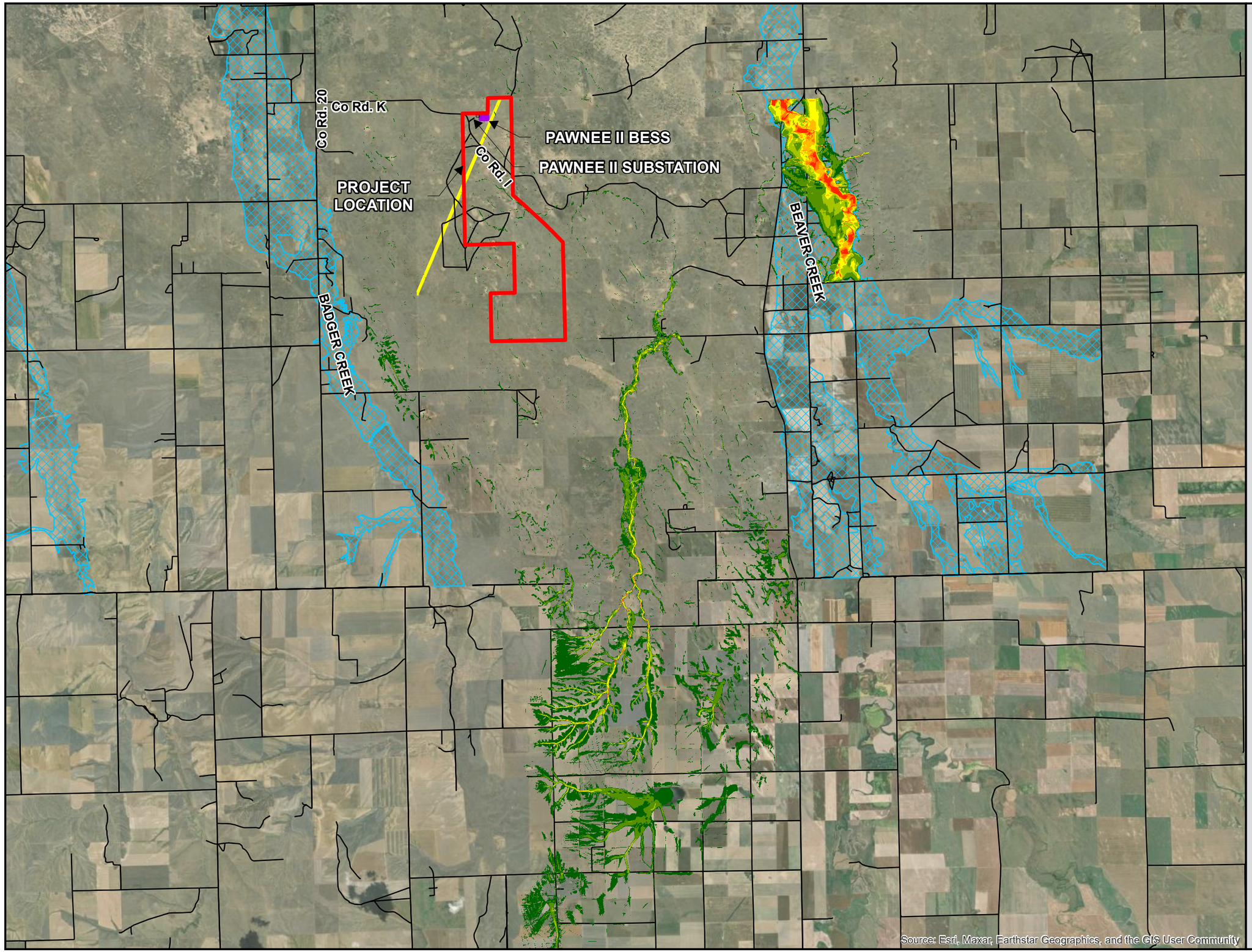
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

N

0 3,000 6,000

Feet

100-Year Storm Pre-Development Flow Depth Map
Figure 4.1b



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

Velocity (ft/s)

- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

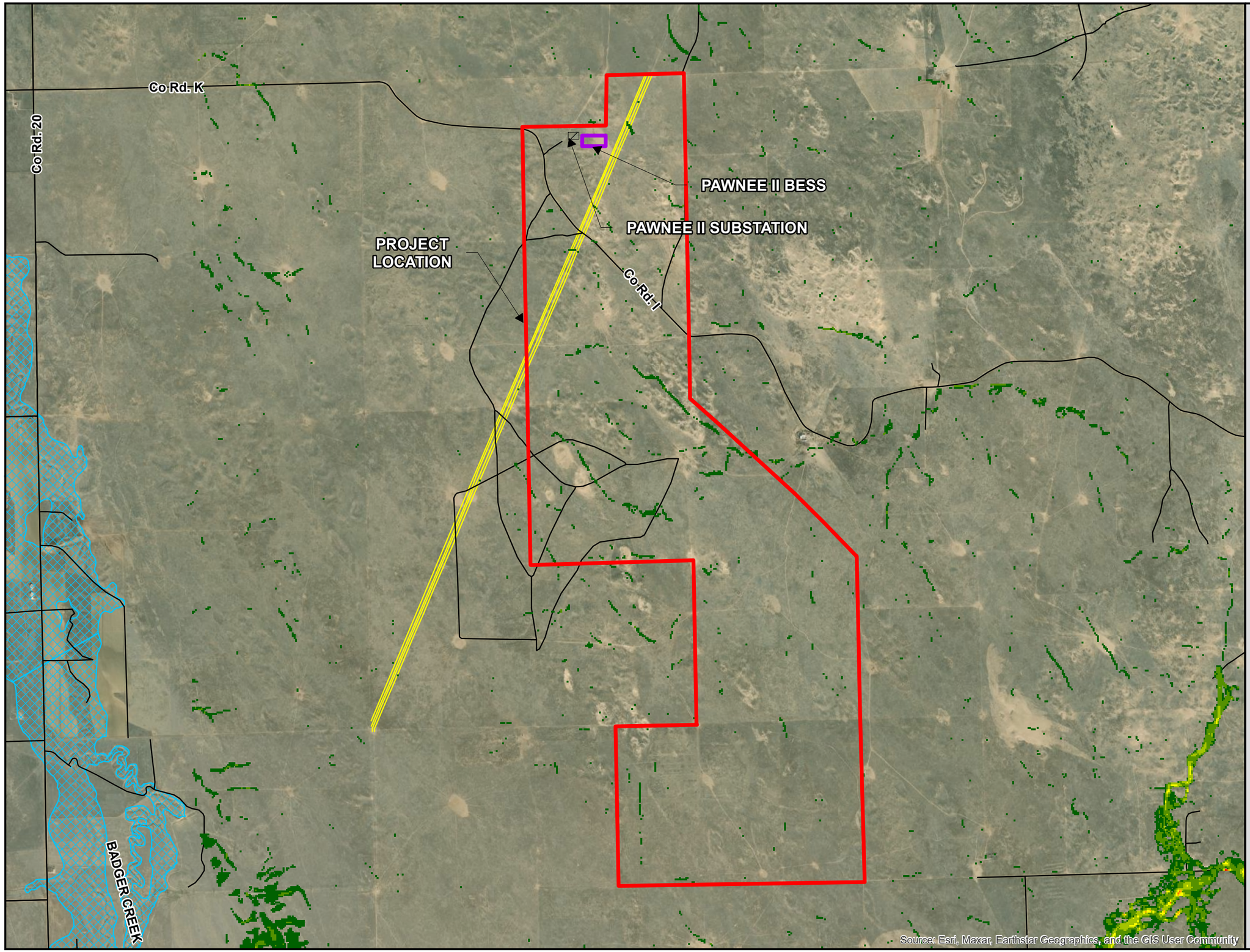
N

0 10,000 20,000

Feet

wsp

100-Year Storm Pre-Development Full Model Velocity Map
Figure 4.1c



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

Velocity (ft/s)

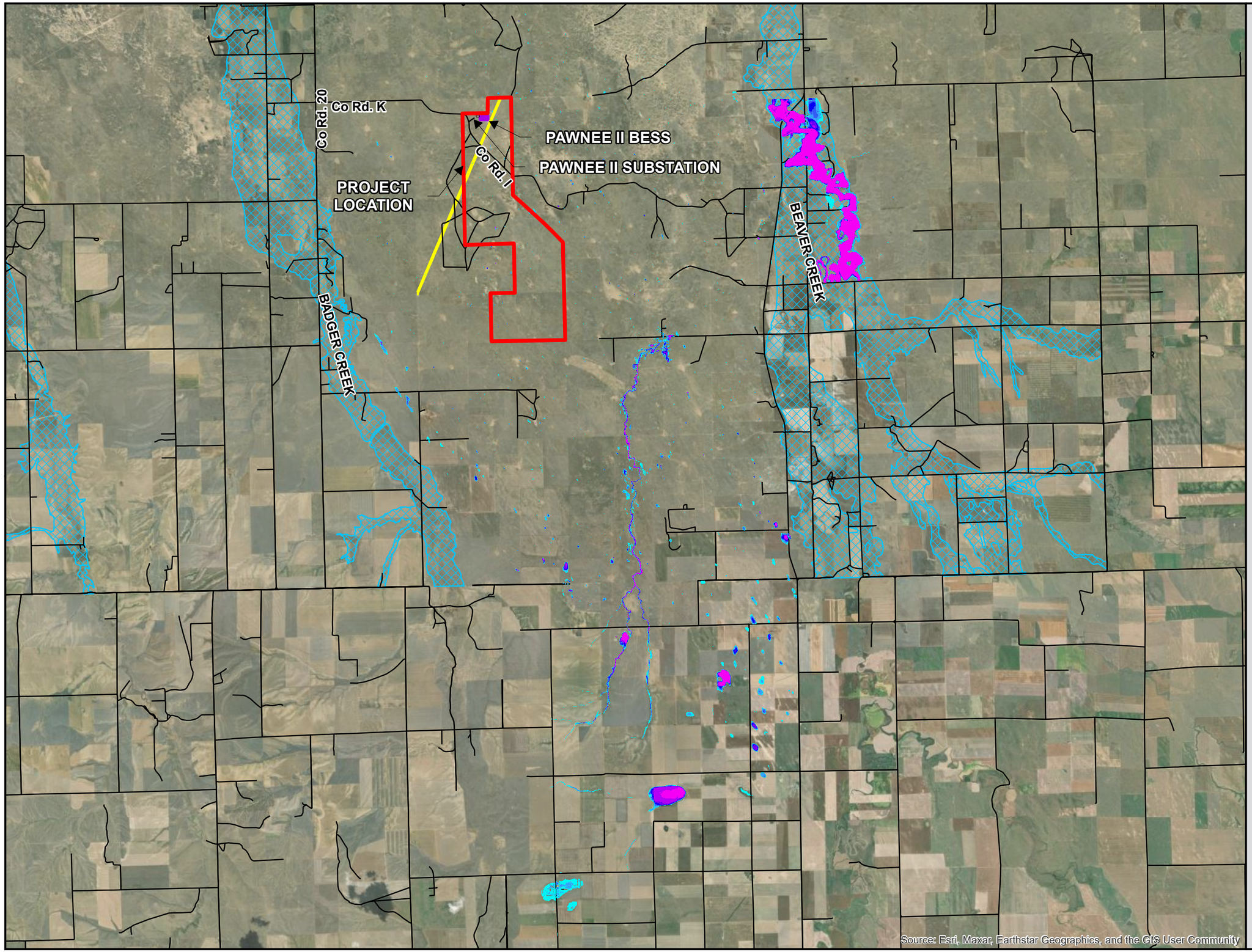
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

N

0 3,000 6,000

Feet

100-Year Storm Pre-Development Velocity Map
Figure 4.1d



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

Flow Depth (ft)

- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

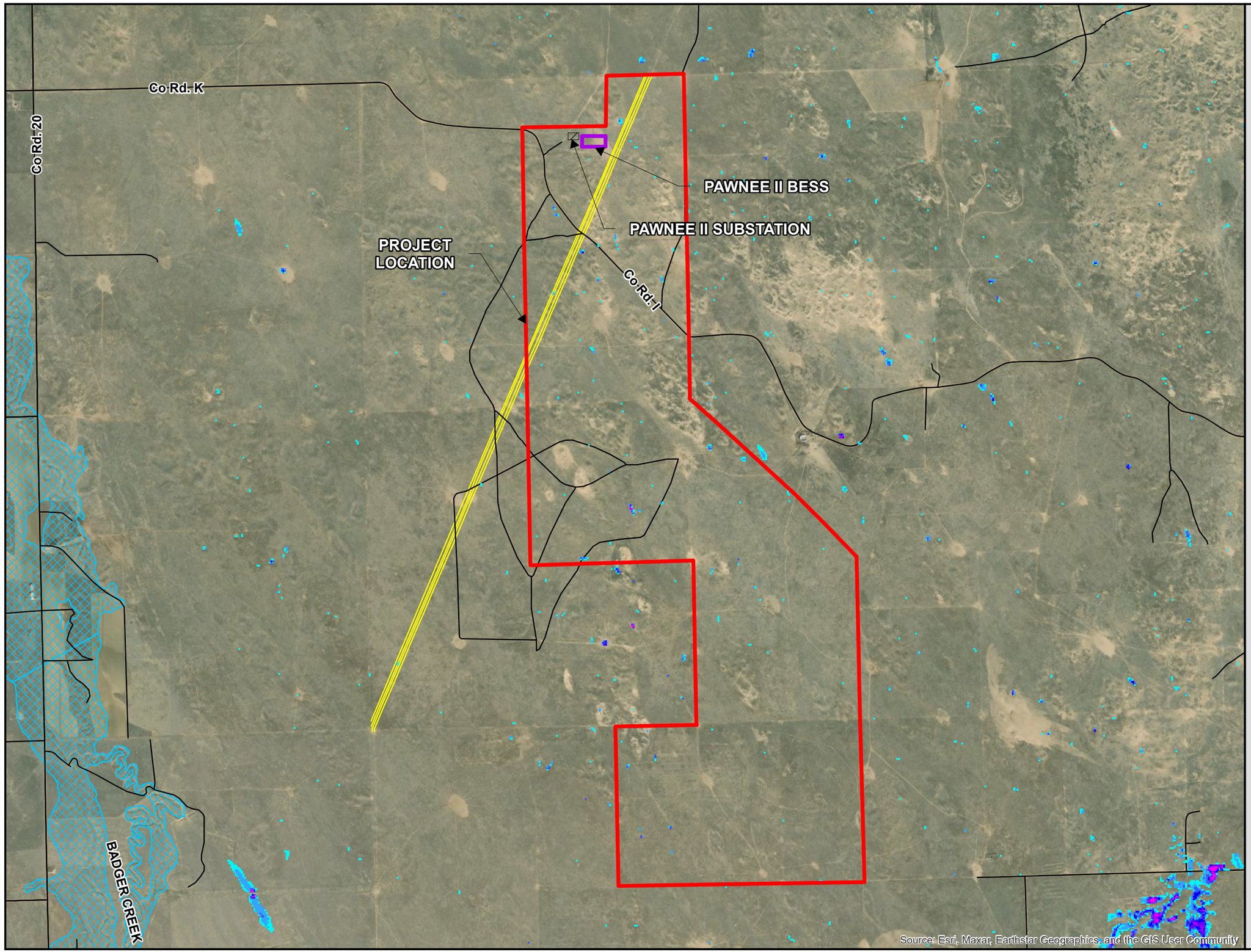
N

0 10,000 20,000

Feet

wsp

50-Year Storm Pre-Development Full Model Flow Depth Map
Figure 4.2a



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

Flow Depth (ft)

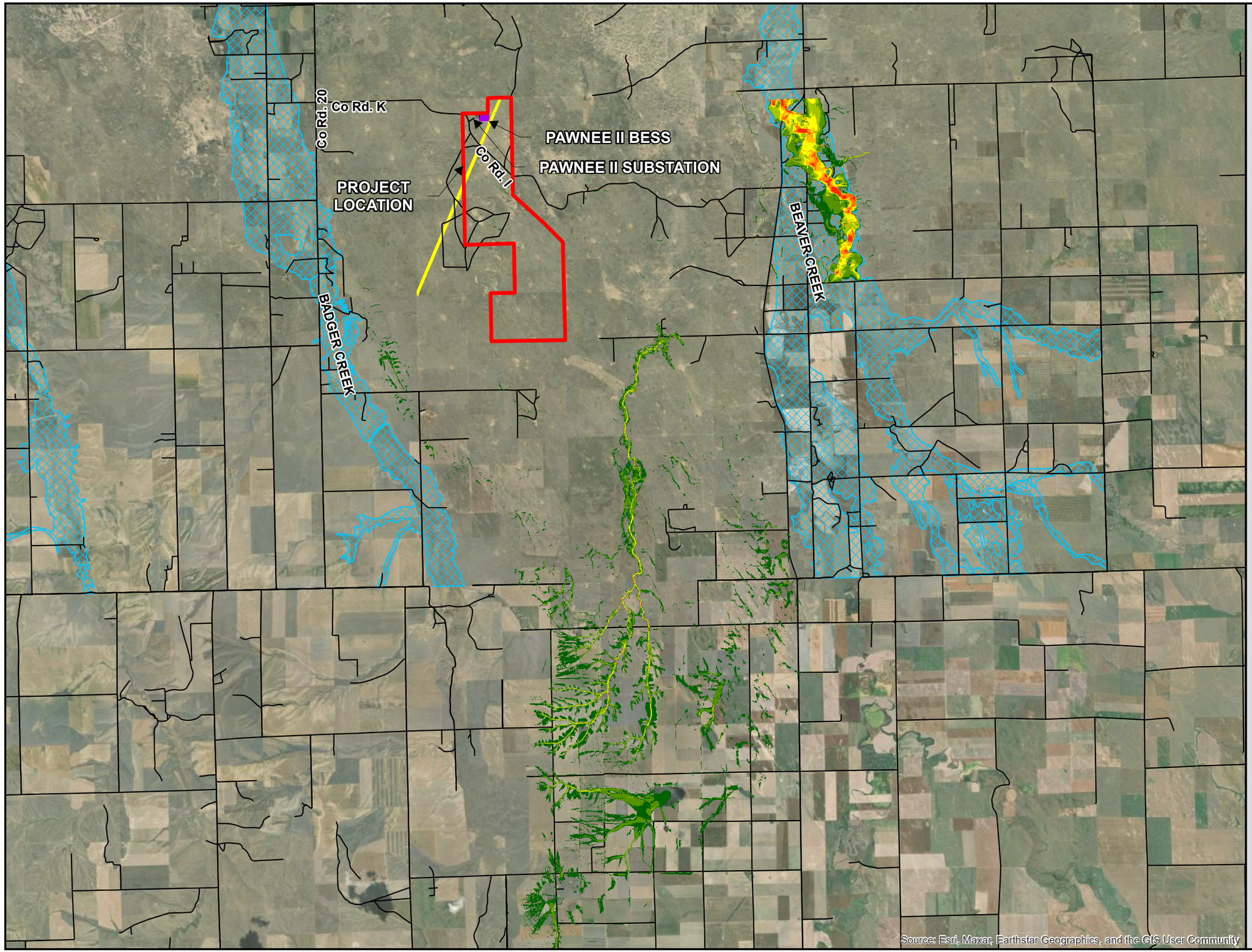
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

N

0 3,000 6,000

Feet

50-Year Storm Pre-Development Flow Depth Map
Figure 4.2b



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

Velocity (ft/s)

- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

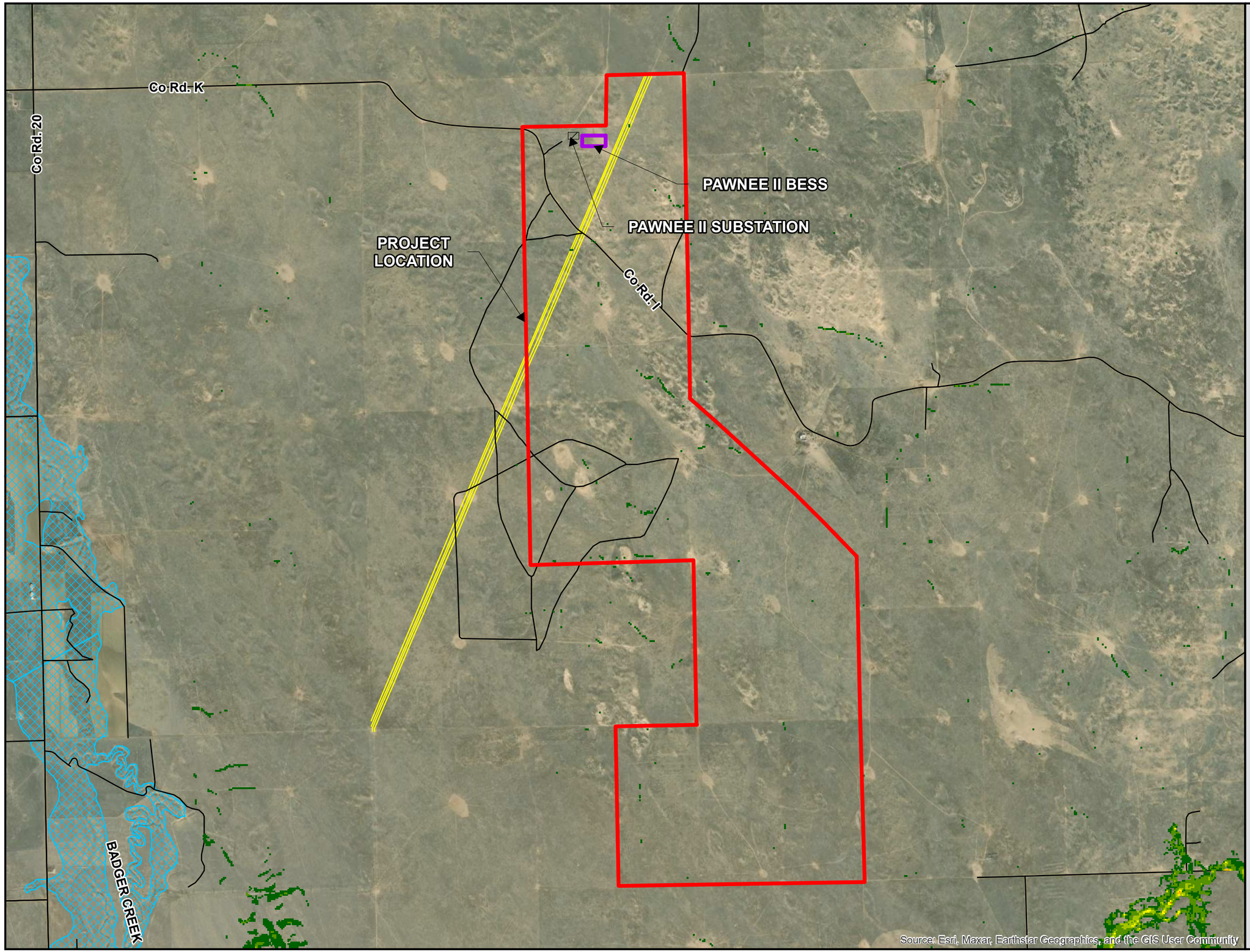
N

0 10,000 20,000

Feet

wsp

50-Year Storm Pre-Development Full Model Velocity Map
Figure 4.2c



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

Velocity (ft/s)

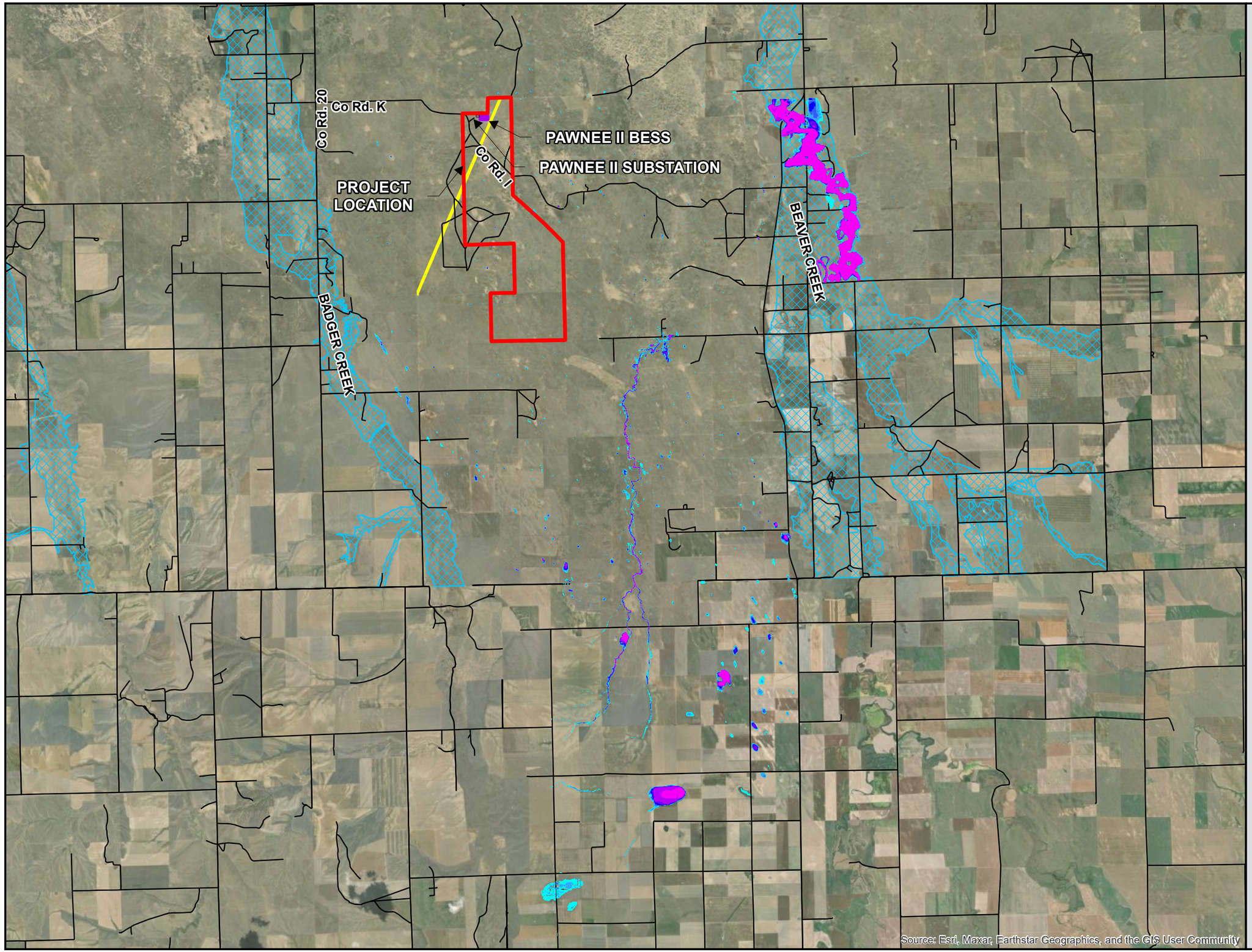
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

N

0 3,000 6,000

Feet

50-Year Storm Pre-Development Velocity Map
Figure 4.2d



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

Flow Depth (ft)

- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

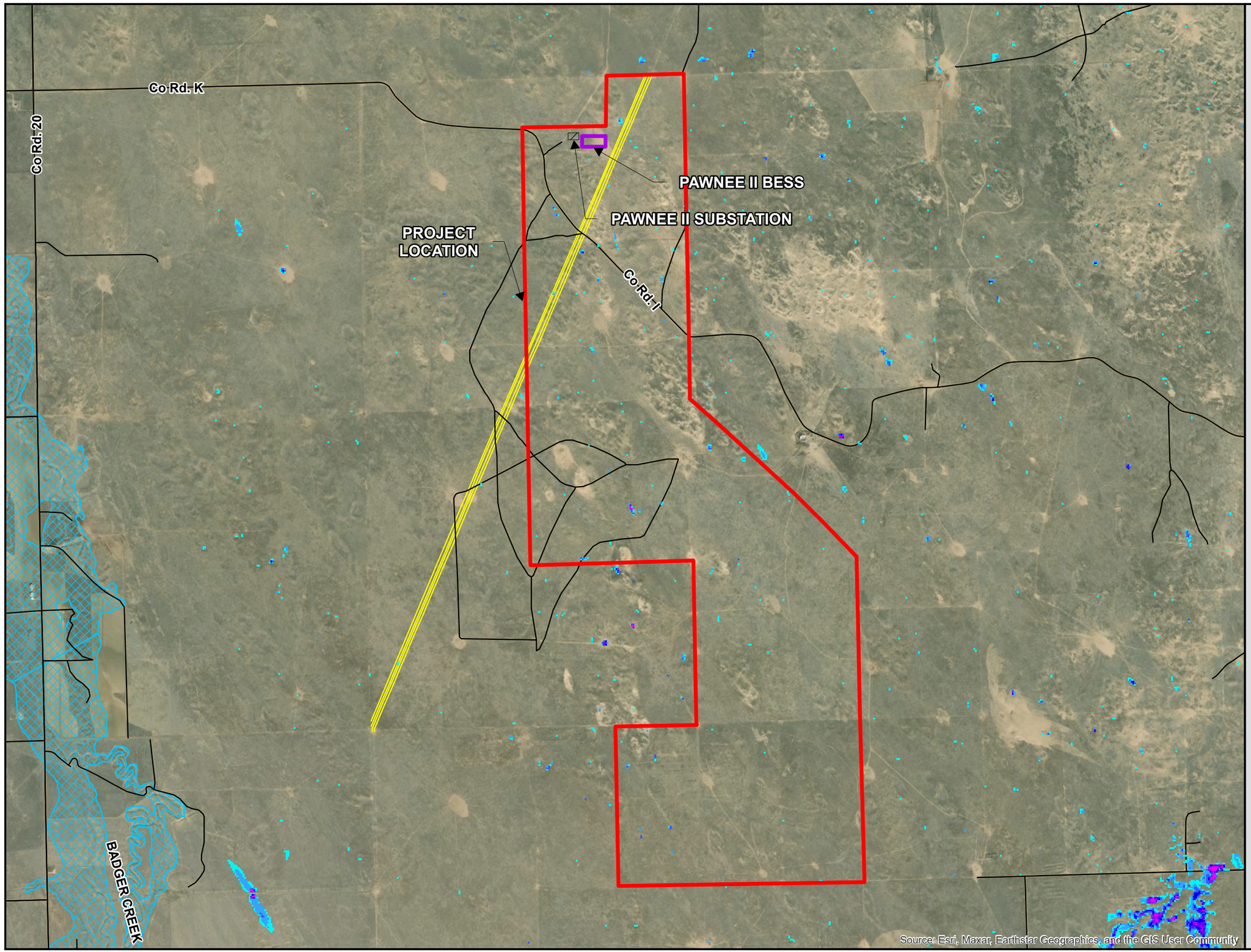
N

0 10,000 20,000

Feet

wsp

10-Year Storm Pre-Development Full Model Flow Depth Map
Figure 4.3a



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

Flow Depth (ft)

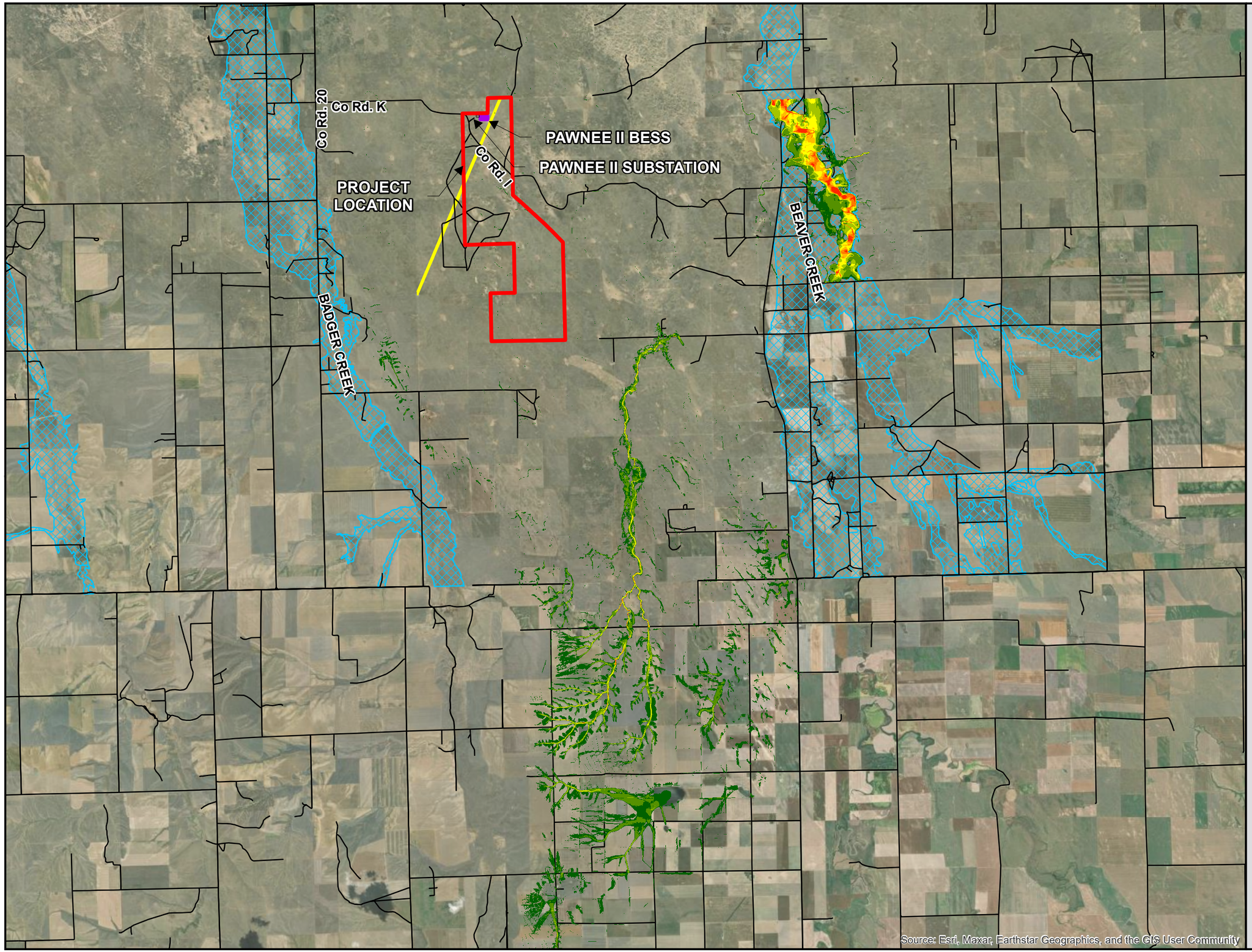
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

N

0 3,000 6,000

Feet

10-Year Storm Pre-Development Flow Depth Map
Figure 4.3b



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

Velocity (ft/s)

- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

N

0 10,000 20,000

Feet

wsp

10-Year Storm Pre-Development Full Model Velocity Map
Figure 4.3c

Co Rd. K

Co Rd. 20

PROJECT LOCATION

PAWNEE II BESS

PAWNEE II SUBSTATION

Co Rd. 1

BADGER CREEK

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

Velocity (ft/s)

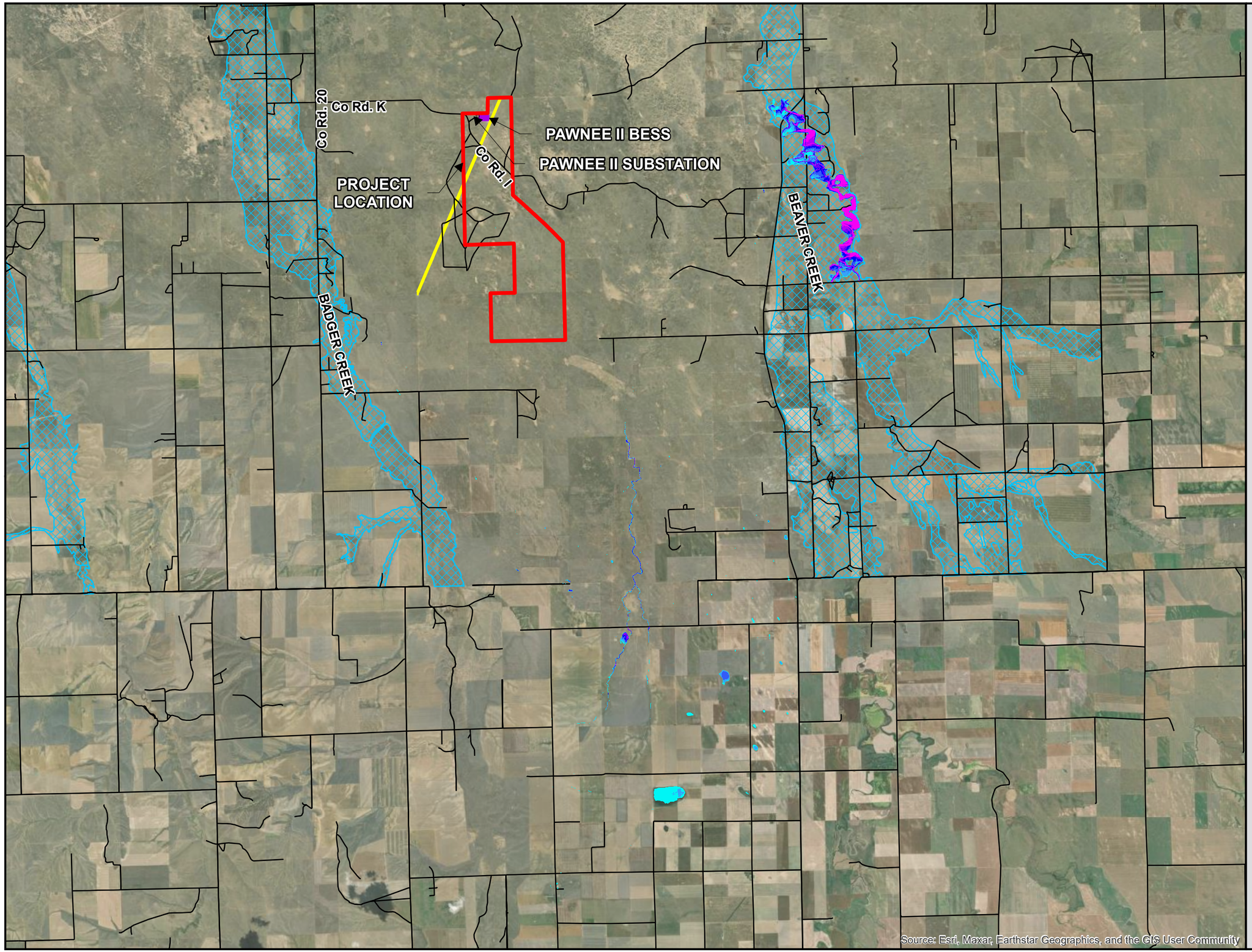
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

N

0 3,000 6,000

Feet

10-Year Storm Pre-Development Velocity Map
Figure 4.3d



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

Flow Depth (ft)

- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

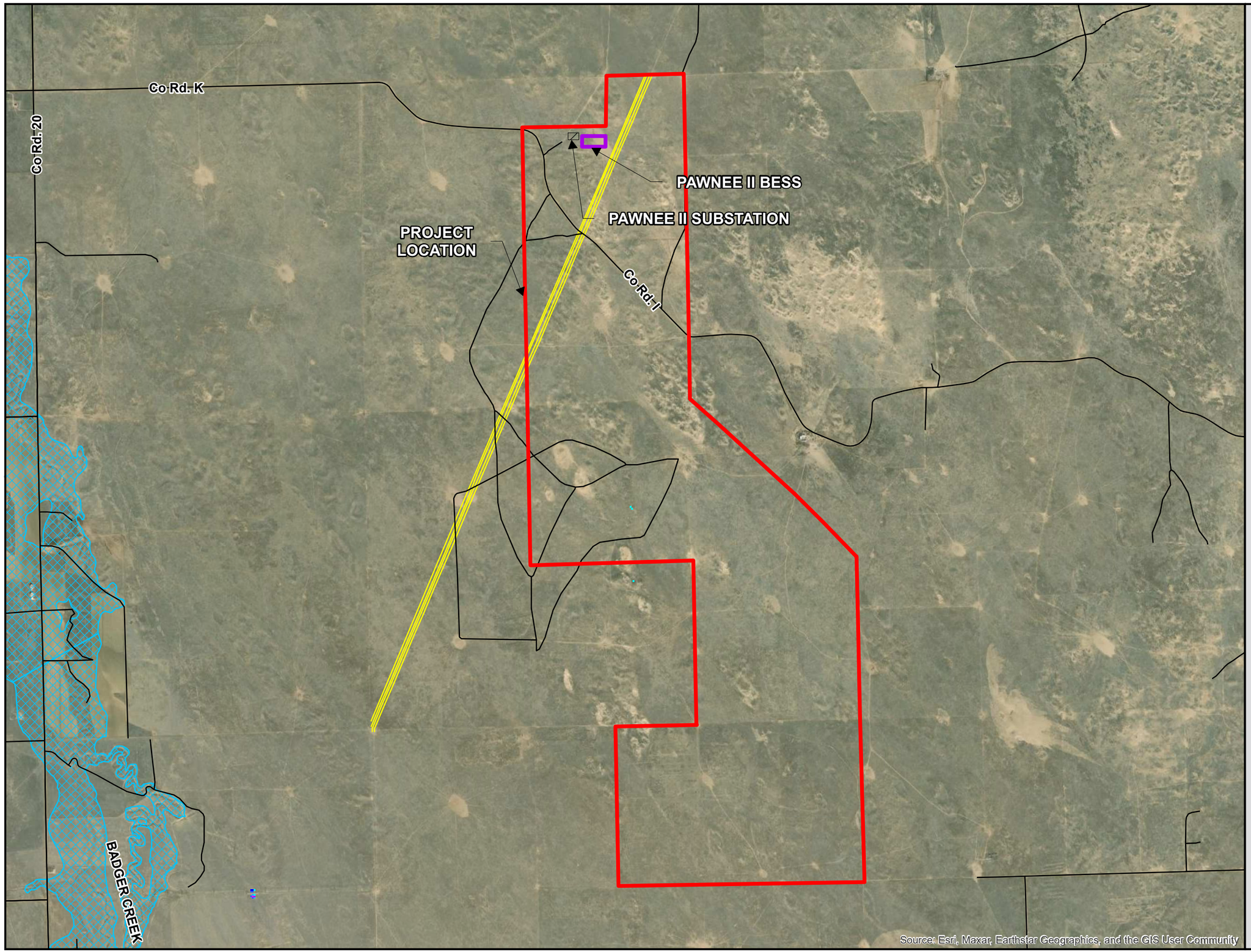
N

0 10,000 20,000

Feet

wsp

5-Year Storm Pre-Development Full Model Flow Depth Map
Figure 4.4a



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

Flow Depth (ft)

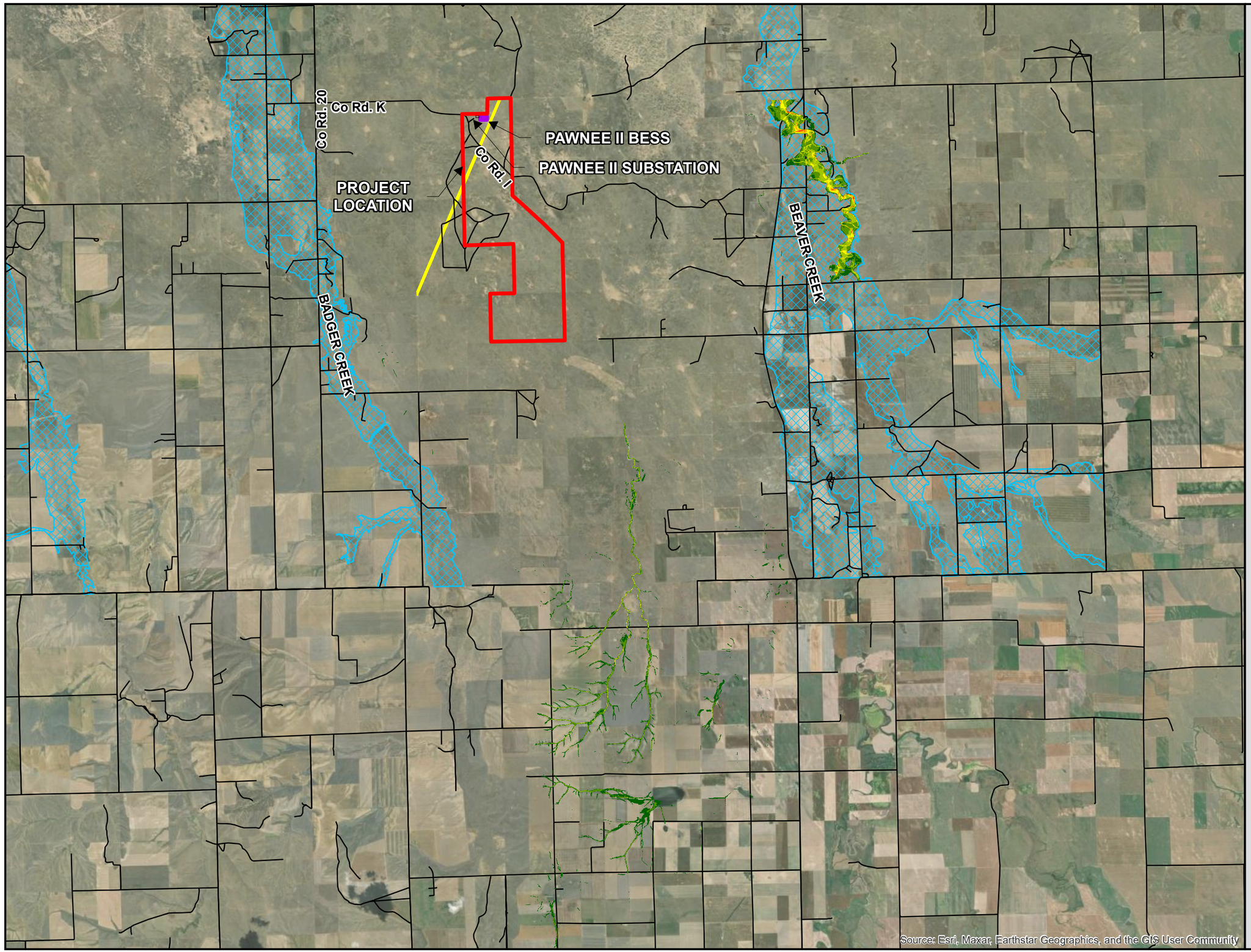
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

N

0 3,000 6,000

Feet

5-Year Storm Pre-Development Flow Depth Map
Figure 4.4b



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

Velocity (ft/s)

- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

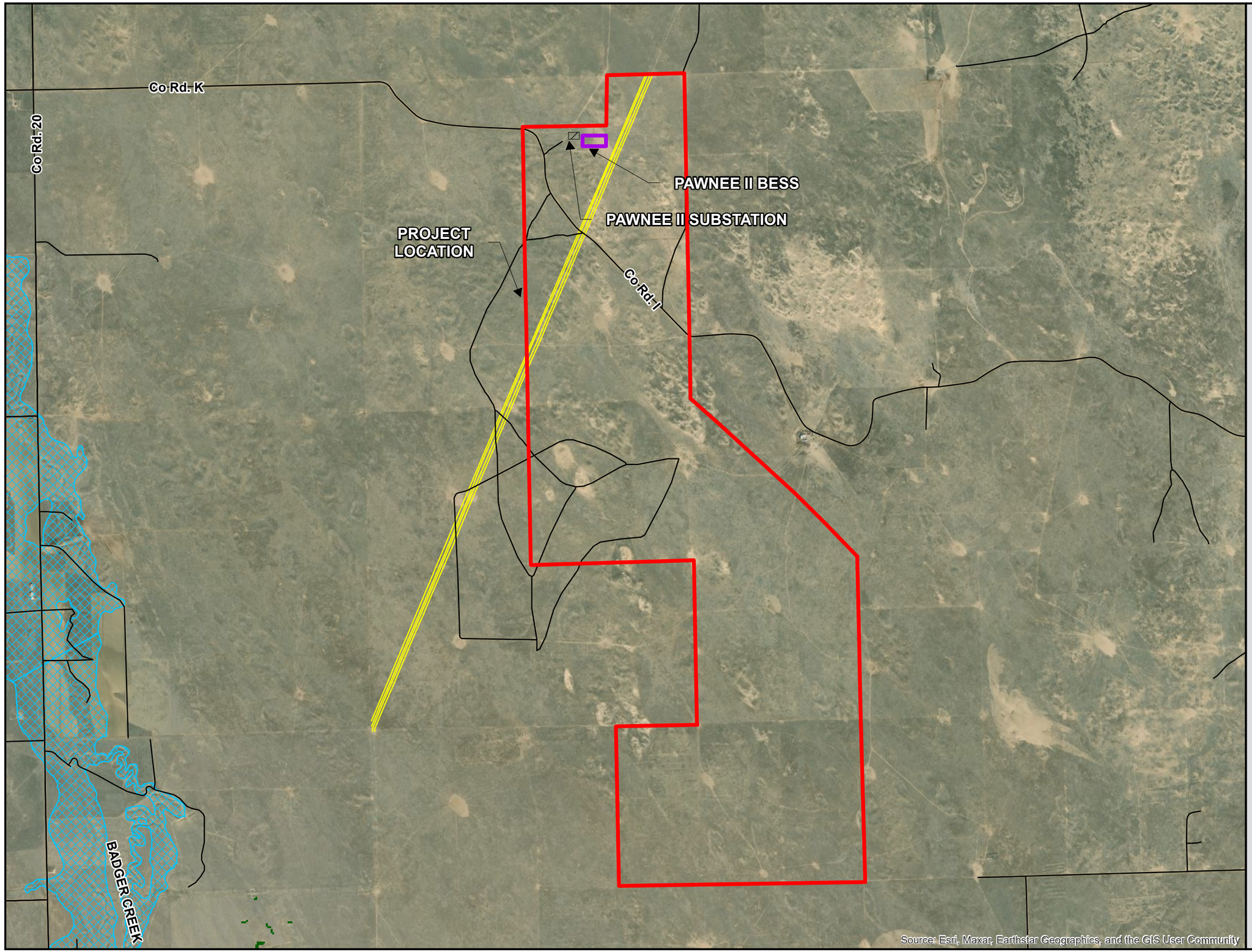
N

0 10,000 20,000

Feet

WSP

5-Year Storm Pre-Development Full Model Velocity Map
Figure 4.4c



aes

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

Velocity (ft/s)

- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

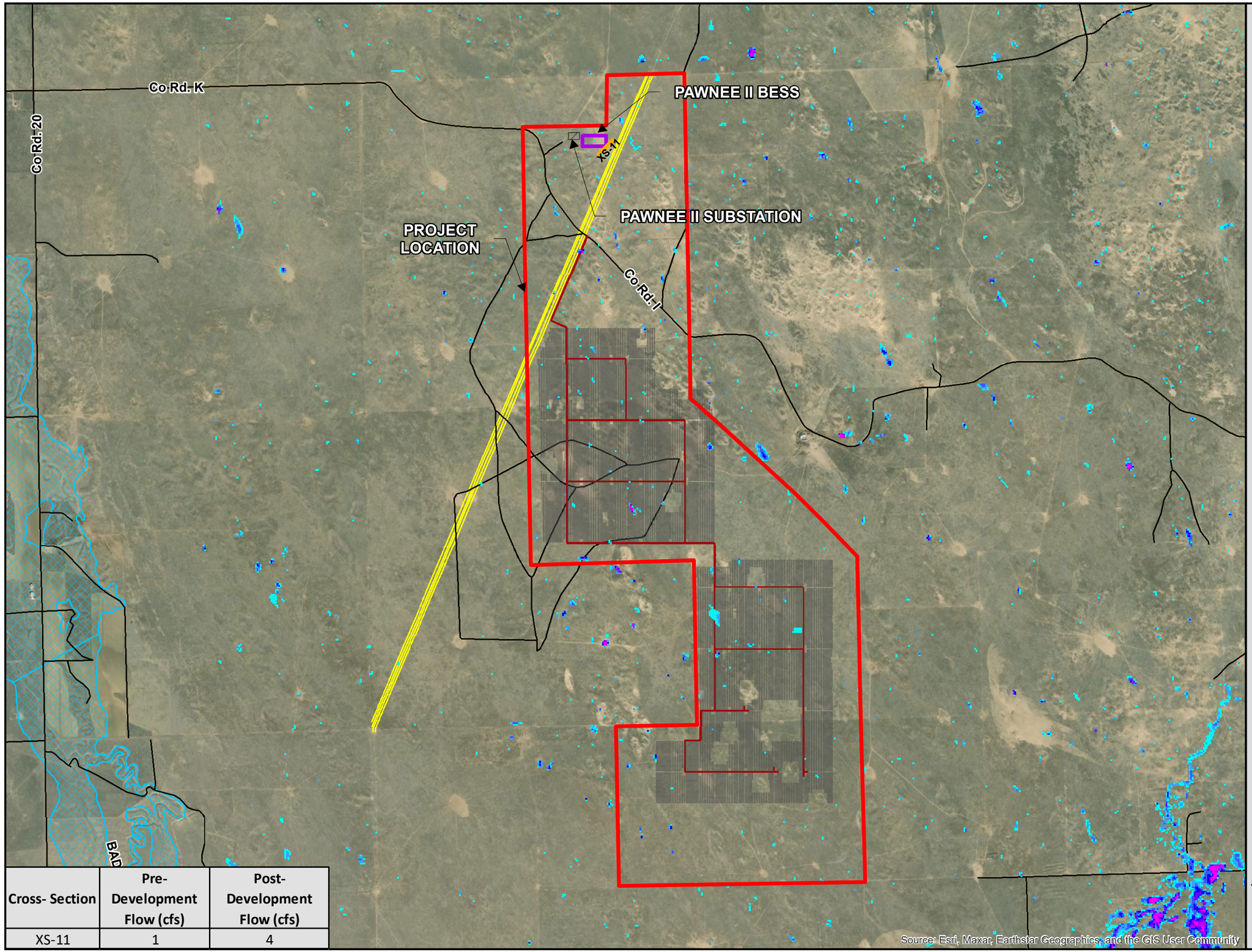
N

0 3,000 6,000

Feet

wsp

5-Year Storm Pre-Development Velocity Map
Figure 4.4d



Cross- Section	Pre-Development Flow (cfs)	Post-Development Flow (cfs)
XS-11	1	4

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Cross Sections

Flow Depth (ft)

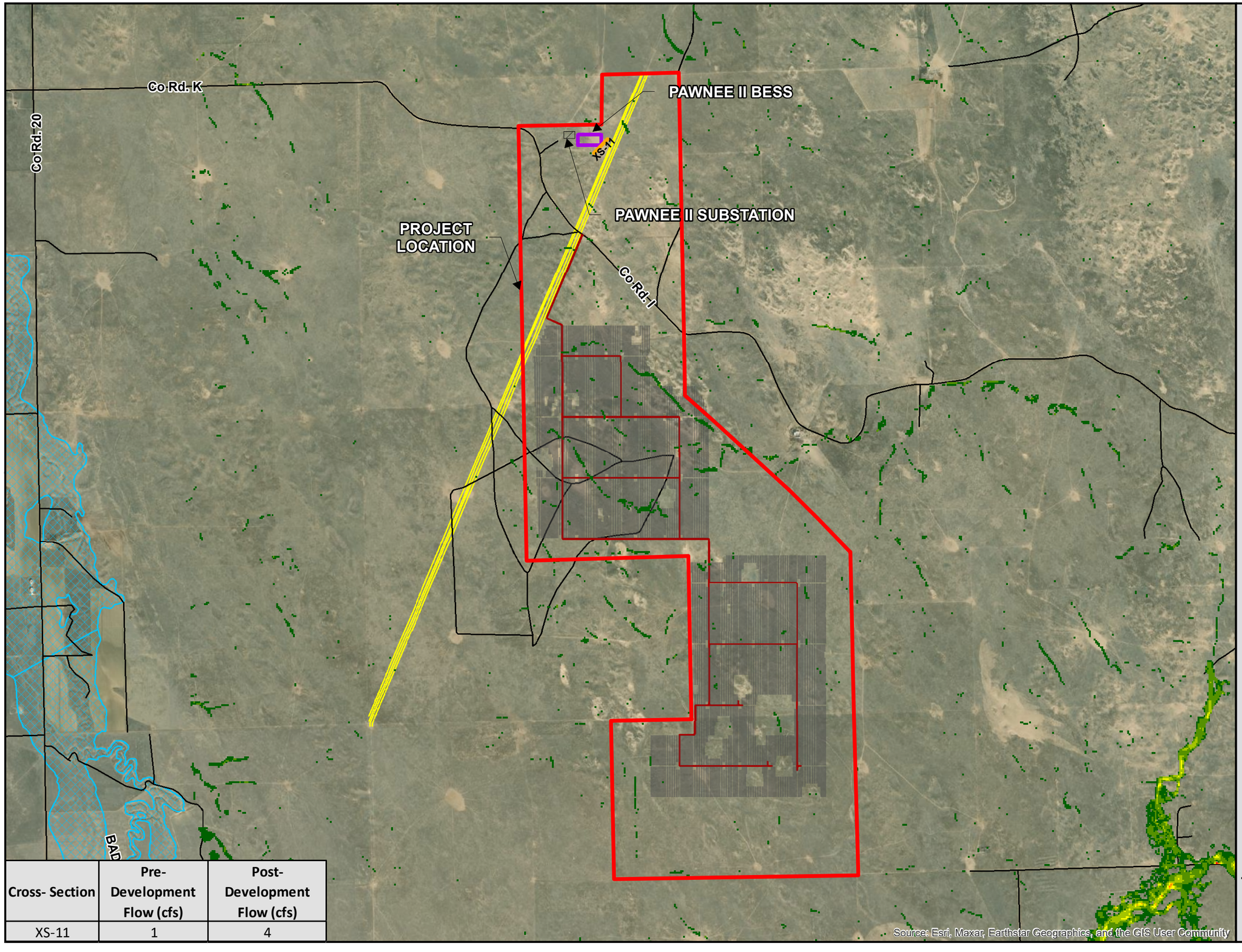
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

N

0 3,000 6,000

Feet

100-Year Storm Post-Development Flow Depth Map
Figure 4.5a



Cross- Section	Pre-Development Flow (cfs)	Post-Development Flow (cfs)
XS-11	1	4

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Cross Sections

Velocity (ft/s)

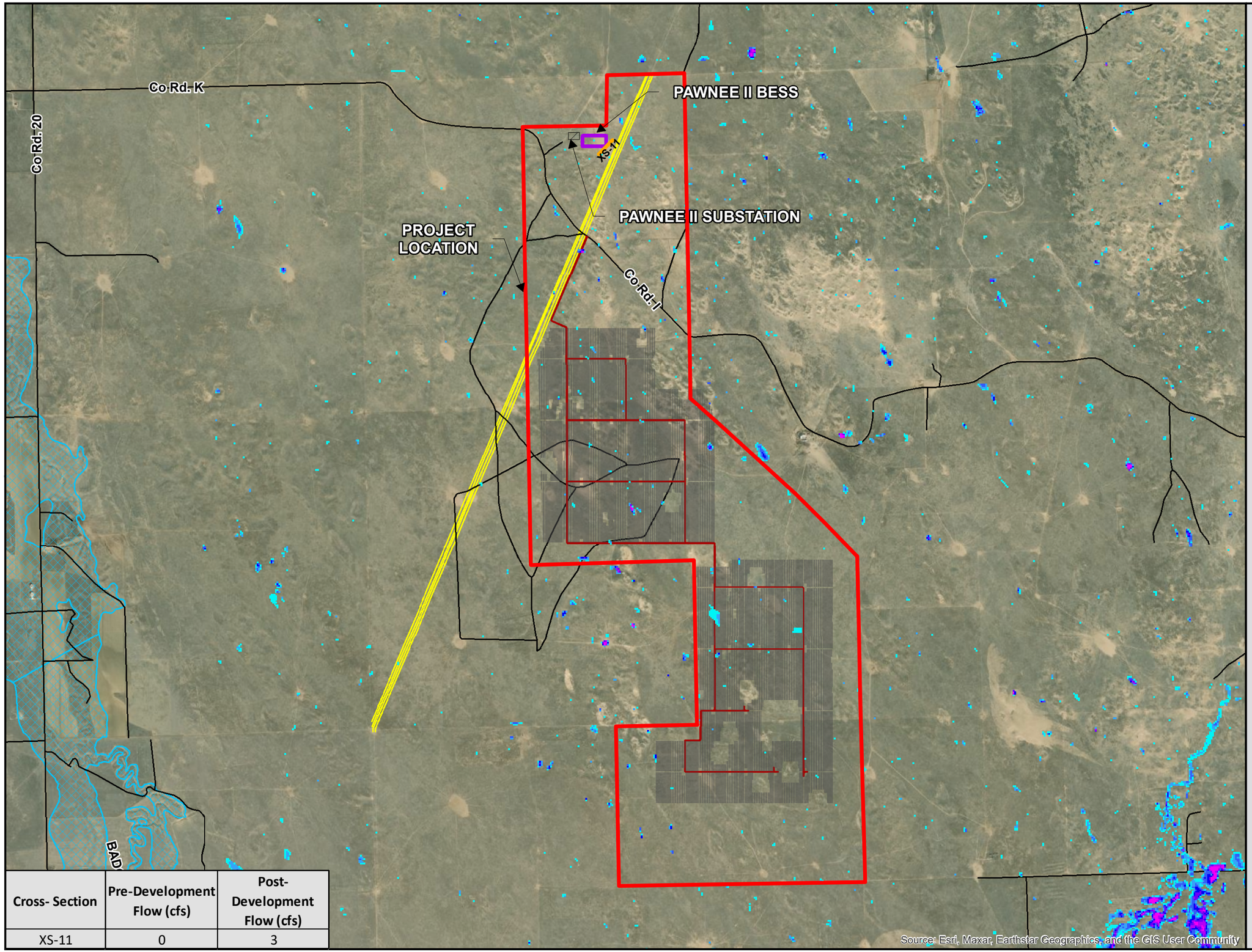
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

N

0 3,000 6,000

Feet

100-Year Storm Post-Development Velocity Map
Figure 4.5b



Cross- Section	Pre-Development Flow (cfs)	Post-Development Flow (cfs)
XS-11	0	3

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Cross Sections

Flow Depth (ft)

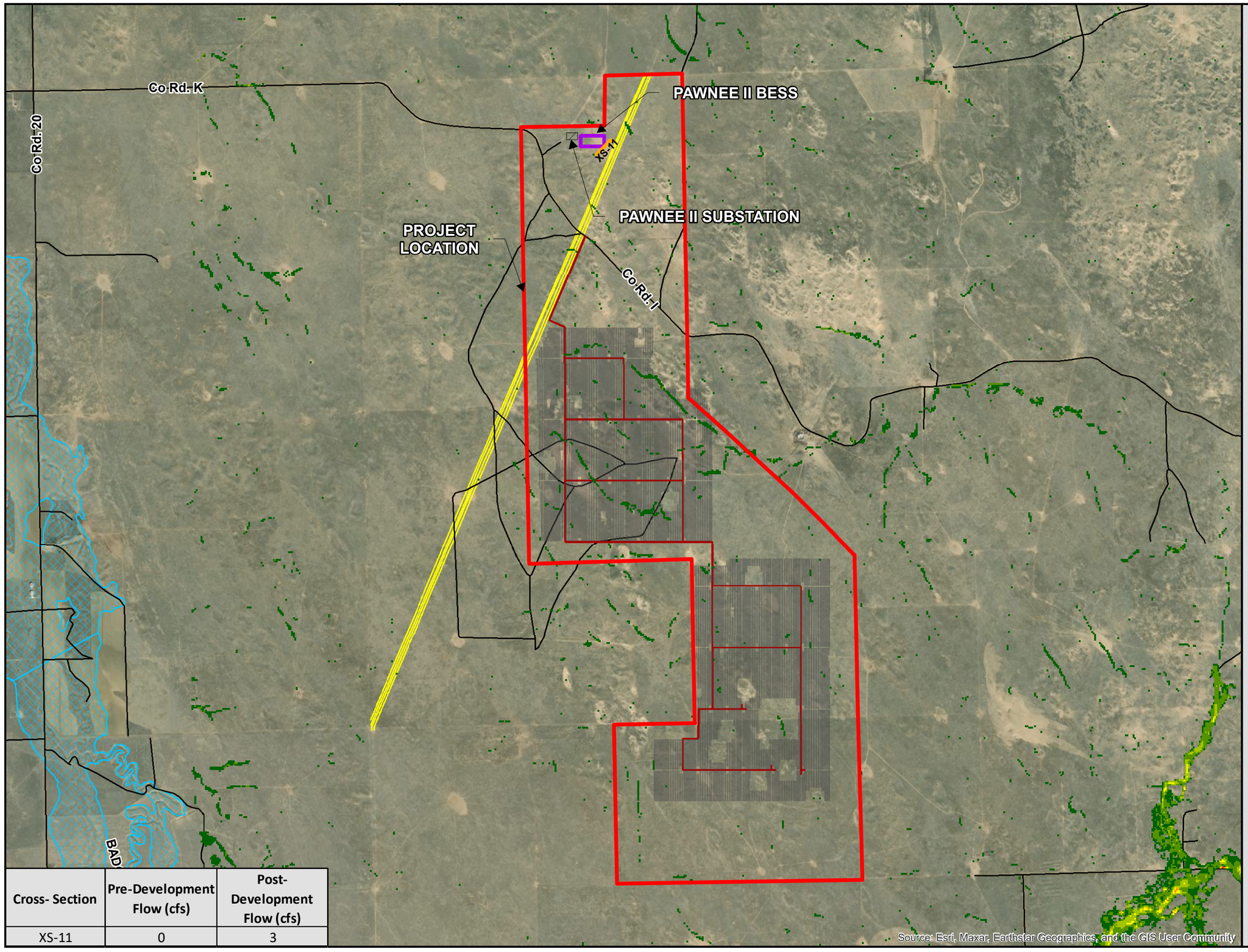
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

N

0 3,000 6,000

Feet

50-Year Storm Post-Development Flow Depth Map
Figure 4.6a



Cross- Section	Pre-Development Flow (cfs)	Post-Development Flow (cfs)
XS-11	0	3

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Cross Sections

Velocity (ft/s)

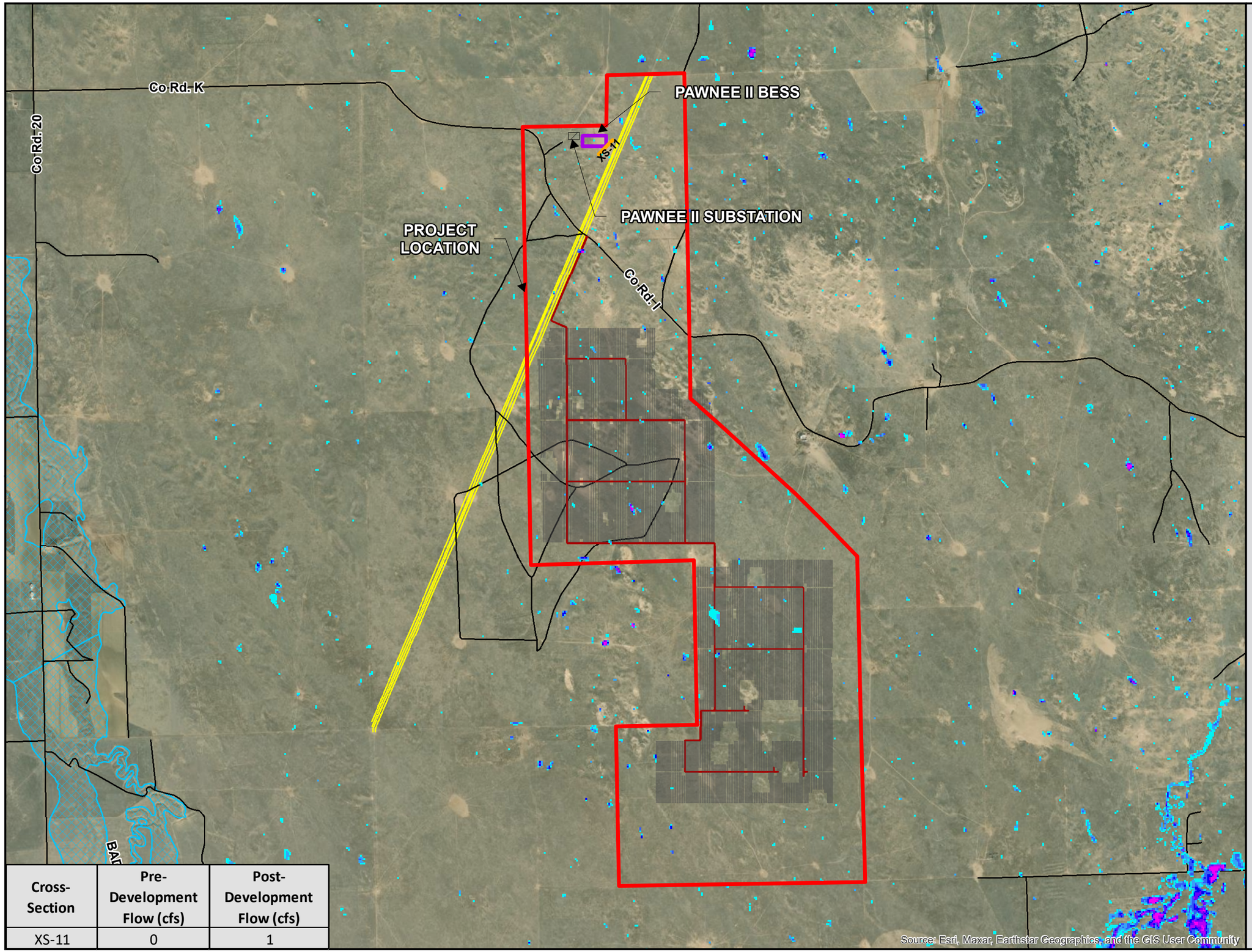
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

N

0 3,000 6,000

Feet

50-Year Storm Post-Development Velocity Map
Figure 4.6b



Cross-Section	Pre-Development Flow (cfs)	Post-Development Flow (cfs)
XS-11	0	1

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Cross Sections

Flow Depth (ft)

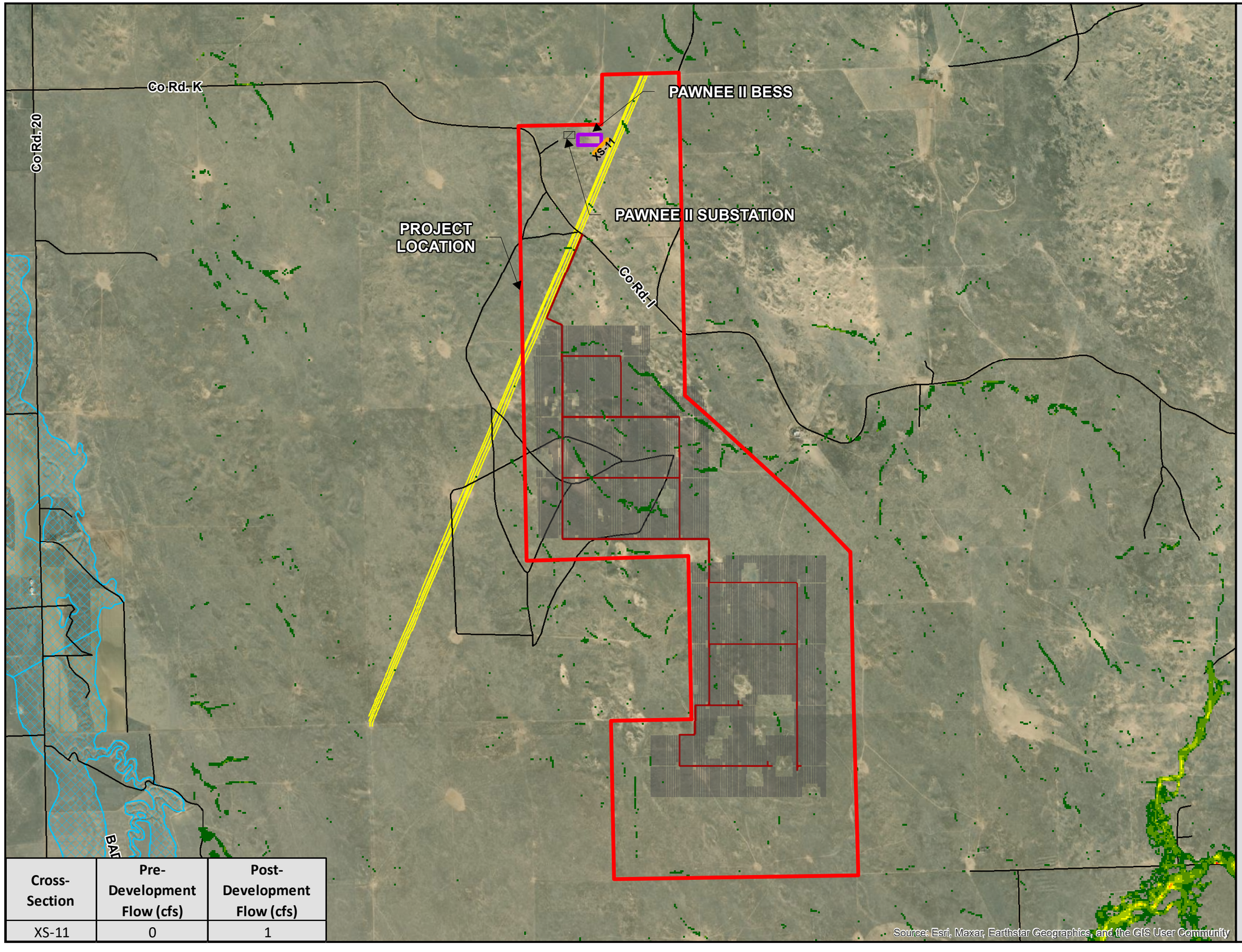
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

N

0 3,000 6,000

Feet

10-Year Storm Post-Development Flow Depth Map
Figure 4.7a



Cross-Section	Pre-Development Flow (cfs)	Post-Development Flow (cfs)
XS-11	0	1

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Cross Sections

Velocity (ft/s)

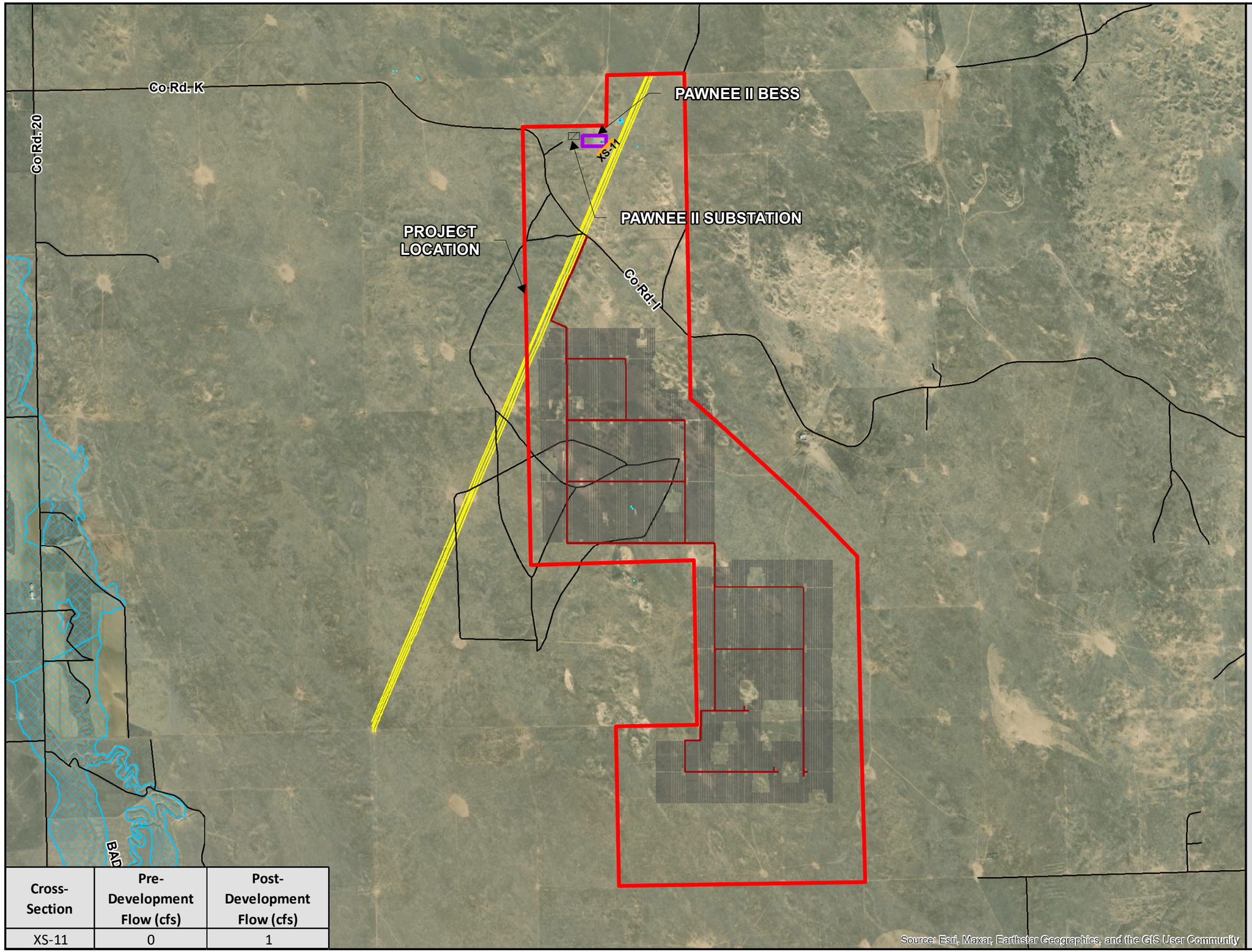
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

N

0 3,000 6,000

Feet

10-Year Storm Post-Development Velocity Map
Figure 4.7b



Cross-Section	Pre-Development Flow (cfs)	Post-Development Flow (cfs)
XS-11	0	1

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Cross Sections

Flow Depth (ft)

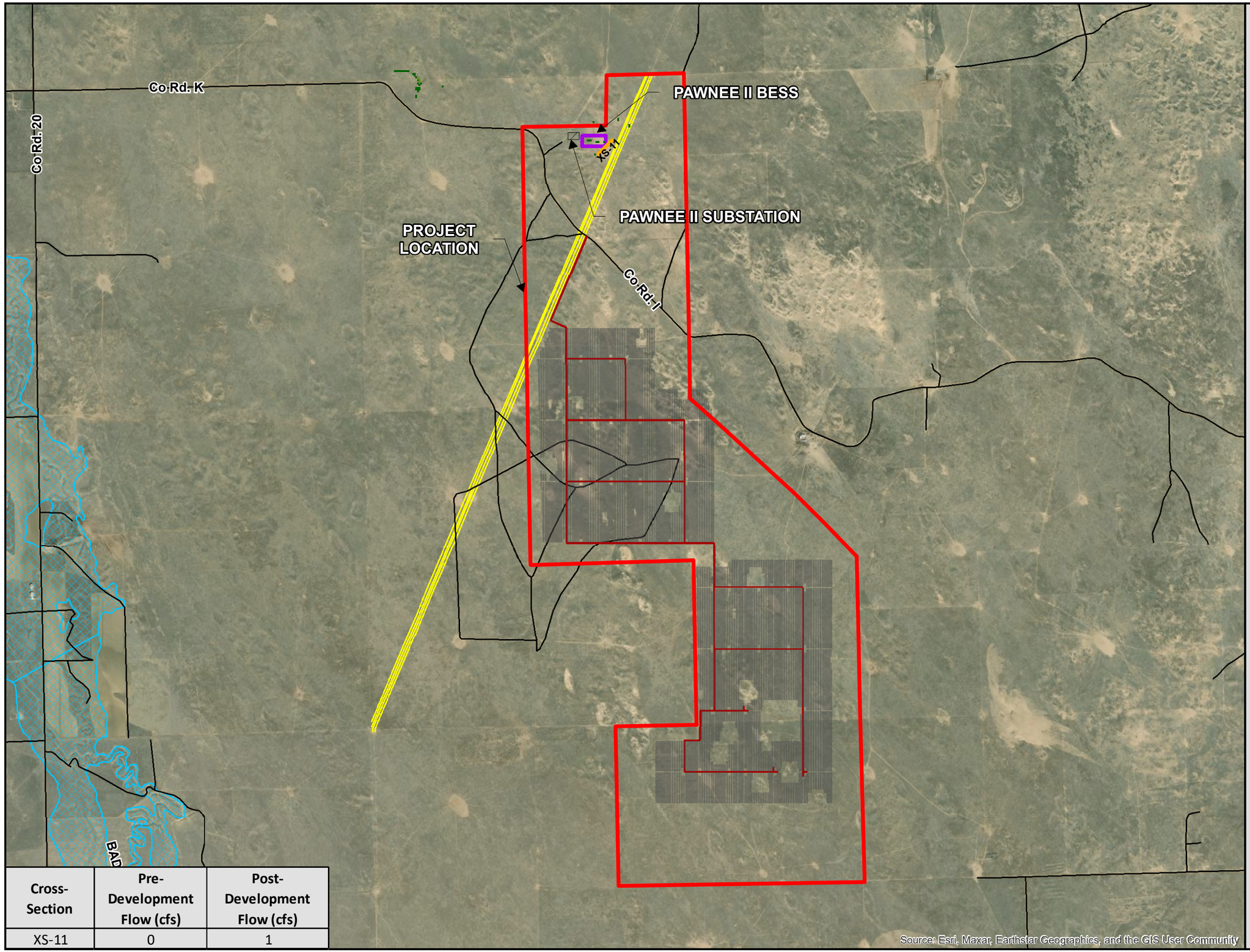
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

N

0 3,000 6,000

Feet

5-Year Storm Post-Development Flow Depth Map
Figure 4.8a



Cross-Section	Pre-Development Flow (cfs)	Post-Development Flow (cfs)
XS-11	0	1

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Cross Sections

Velocity (ft/s)

- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

N

0 3,000 6,000

Feet

5-Year Storm Post-Development Velocity Map
Figure 4.8b

5 STORMWATER MANAGEMENT RECOMMENDATIONS

In order to effectively convey the flow through the site and maintain existing flow patterns downstream, several stormwater management measures are recommended. Figure 5.1 shows, in concept, the proposed facilities that are described below.

5.1 SITE GRADING

Grading is recommended to eliminate the steeper slopes and low spots to perpetuate flow through the site and reduce ponding in several locations. The recommended grading areas total approximately 85 acres. These areas should be graded to balance earthwork at each location to the extent practical while maintaining natural flow patterns. Based on preliminary grading results, further grading may be necessary to meet the 1.5-foot flow depth requirement within the array area set by AES. The elimination of low spots and steep slopes will have an impact on the post-development flow, depths, and velocities and may impact further recommendations presented in this section. Additionally, grading for the BESS and substation pad should be incorporated into future models to better quantify their impacts. Grading areas are identified on Figure 5.1.

As the design progresses, post heights for panels and pad elevations for inverters and buildings should be set a minimum of 12-inches above the highest neighboring flow depth. Efforts should be made to keep structure pads out of defined flow paths and ponded areas.

5.2 LOW WATER CROSSINGS

In locations with low flow depths and velocities, low water crossings can be considered. These low water crossings would include a riprap scour protection pad upstream and downstream of the road to protect the proposed gravel road in the event of a storm. Length of the low water crossings may vary based on the width of flow through the crossing.

Two (2) low water crossing locations are identified on Figure 5.1 based on the 100-year flow depths and veolcities.

5.3 DETENTION BASIN

Detention basin(s) can be considered to mitigate the impacts of the development of the BESS and substation areas. WSP determined preliminary storage volumes of detention basin(s) based off the Mile High Flood District (MHFD) methodology presented in the MHFD Urban Storm Drainage Criteria Manual (USDCM).

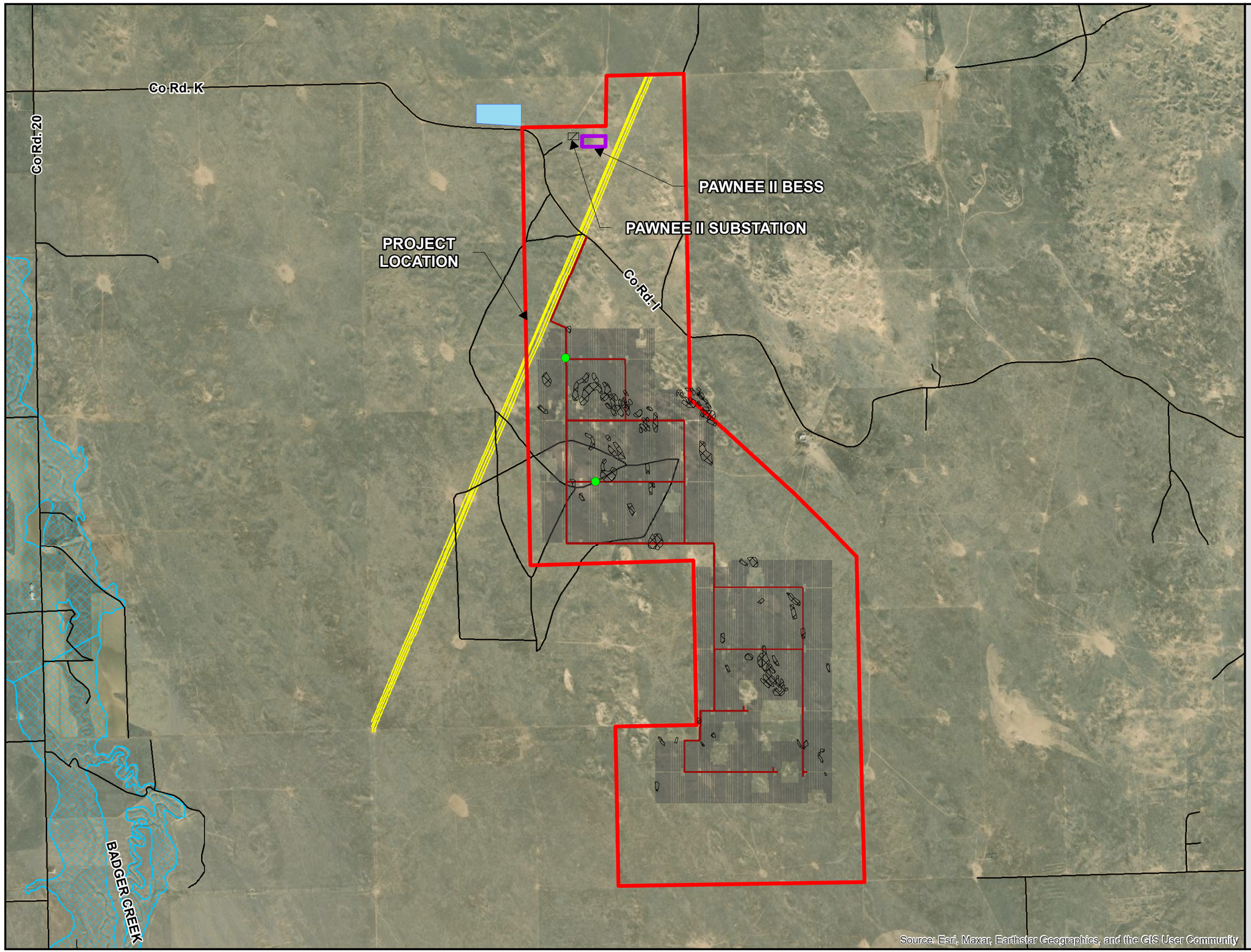
The USDCM refers to a spreadsheet set up by MHFD to determine approximate detention volumes due to impervious percent of the development and the 1-hour precipitation values obtained by NOAA Atlas 14 for the associated design storms. WSP assumed that these detention basins are to be for flood control only and do not incorporate the full spectrum detention volume presented in the USDCM.

Table 5.1 summarizes the impacts of development due to the BESS and substation associated with the Project. The detention basin(s) should be placed downstream of the developments to capture the excess runoff. The volumes presented in the table are approximate and based on assumed values for the grading of the pads. Further analysis and design of the detention basin(s) will be required for final design which will impact the detention volumes presented in this Report.

Table 5.1 Approximate Detention Volumes

DESIGN STORM (1-HR RAINFALL)	DEVELOPMENT AREA (AC)	IMPERVIOUS %	DETENTION VOLUME (AC-FT)*	TOTAL DETENTION VOLUME (AC-FT)*
5-Year (1.32 in)	Pawnee II BESS (6 ac)	100	0.6	0.7
	Pawnee II Substation (2 ac)	80	0.1	
10-Year (1.61 in)	Pawnee II BESS (6 ac)	100	0.8	1.0
	Pawnee II Substation (2 ac)	80	0.2	
50-Year (2.42 in)	Pawnee II BESS (6 ac)	100	1.2	1.5
	Pawnee II Substation (2 ac)	80	0.3	
100-Year (2.82 in)	Pawnee II BESS (6 ac)	100	1.3	1.6
	Pawnee II Substation (2 ac)	80	0.3	

*Detention volumes are preliminary and subject to modification during final design and analysis.



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A
- Arrays
- Maintenance Roads
- Low Water Crossing
- Grading (Areas > 17.5%)
- Basin

N

0 3,000 6,000

Feet

Stormwater Management Recommendations
Figure 5.1

6 CONCLUSION

6.1 CONCLUSIONS AND RECOMMENDATIONS

The Pawnee II Solar Project is being constructed on 1,725 acres of land in Morgan County, Colorado. The purpose of this drainage study is to:

1. Establish the 5-year, 10-year, 50-year and 100-year flow depths, and velocities that will ultimately be used for final design of the solar equipment elevations (panels, inverter, and pads), and O&M building and substation pad elevations.
2. Present a preliminary stormwater management plan for the Project.

The Project is being developed primarily on grassland/herbaceous land that will be revegetated after development, presenting similar conditions for stormwater management in most instances. The storm events were modeled using FLO-2D for pre- and post-development conditions to evaluate flow depths and velocities throughout the site and potential impacts from development of the site.

All electrical equipment including, but not limited to, solar panels, inverters, transformers, and switch boxes should be elevated to a minimum of 12 inches above the flow depths. The project substation, O&M building, and construction offices should be elevated on fill a minimum of 12-inches above the flow depths established in this study.

7 REFERENCES

Federal Emergency Management Agency. (2022). FEMA Flood Map Service Center. Retrieved from https://msc.fema.gov/portal/advanceSearch

National Oceanic and Atmospheric Administration. (2022). NOAA Atlas 14, Volume 2, Version 3. Point Frequency Data Server

Colorado Department of Transportation. (2012, July). M&S Standard Plans Book. Retrieved from https://www.codot.gov/business/designsupport/standard-plans/copy_of_2012-m-standards-plans

United State Department of Agriculture. (2022). National Resource Conservation Service. Retrieved from Web Soil Survey: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

United States Department of Agriculture, NRCS. (1986). Urban Hydrology for Small Watersheds Technical Release 55.

United States Geological Survey. (2022). The National Map - Data Delivery. Retrieved from https://apps.nationalmap.gov/downloader/#/

For additional data sources, see Table 3.1.

Appendix A – Hydrologic Parameters and Analysis

- A.1 NOAA Atlas 14 Rainfall Data
- A.2 TR-55 Rainfall Distribution Map
- A.3 Curve Number Calculations
- A.4 FLO-2D Manning's N Values

A.1 NOAA Atlas Rainfall Data

NOAA Atlas 14, Volume 8, Version 2
Location name: Brush, Colorado, USA*
Latitude: 40.1228°, Longitude: -103.7066°
Elevation: 4470.9 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.278 (0.220-0.358)	0.338 (0.268-0.435)	0.445 (0.352-0.576)	0.543 (0.427-0.706)	0.692 (0.530-0.944)	0.816 (0.607-1.12)	0.950 (0.681-1.34)	1.09 (0.752-1.58)	1.30 (0.857-1.93)	1.47 (0.936-2.19)
10-min	0.406 (0.323-0.524)	0.494 (0.392-0.638)	0.652 (0.515-0.843)	0.796 (0.625-1.03)	1.01 (0.776-1.38)	1.20 (0.889-1.65)	1.39 (0.998-1.96)	1.60 (1.10-2.32)	1.90 (1.25-2.83)	2.15 (1.37-3.21)
15-min	0.496 (0.393-0.639)	0.603 (0.478-0.778)	0.795 (0.628-1.03)	0.970 (0.762-1.26)	1.24 (0.946-1.69)	1.46 (1.09-2.01)	1.70 (1.22-2.39)	1.95 (1.34-2.83)	2.32 (1.53-3.45)	2.62 (1.67-3.91)
30-min	0.663 (0.526-0.854)	0.807 (0.640-1.04)	1.07 (0.843-1.38)	1.30 (1.02-1.69)	1.66 (1.27-2.27)	1.96 (1.46-2.71)	2.29 (1.64-3.22)	2.64 (1.81-3.82)	3.13 (2.07-4.65)	3.54 (2.26-5.29)
60-min	0.812 (0.644-1.05)	0.989 (0.784-1.27)	1.31 (1.03-1.69)	1.60 (1.25-2.08)	2.04 (1.56-2.79)	2.42 (1.80-3.33)	2.82 (2.02-3.97)	3.25 (2.23-4.71)	3.87 (2.55-5.75)	4.38 (2.79-6.54)
2-hr	0.960 (0.771-1.22)	1.17 (0.937-1.49)	1.55 (1.24-1.97)	1.89 (1.50-2.43)	2.42 (1.88-3.27)	2.87 (2.16-3.90)	3.35 (2.43-4.66)	3.87 (2.69-5.53)	4.61 (3.08-6.76)	5.21 (3.38-7.69)
3-hr	1.04 (0.839-1.31)	1.26 (1.02-1.59)	1.66 (1.34-2.11)	2.03 (1.63-2.58)	2.60 (2.03-3.47)	3.07 (2.33-4.15)	3.59 (2.63-4.95)	4.14 (2.91-5.87)	4.94 (3.33-7.18)	5.59 (3.65-8.17)
6-hr	1.20 (0.976-1.49)	1.44 (1.17-1.79)	1.87 (1.52-2.33)	2.27 (1.83-2.84)	2.87 (2.27-3.79)	3.38 (2.60-4.50)	3.93 (2.92-5.36)	4.53 (3.22-6.33)	5.38 (3.68-7.72)	6.08 (4.02-8.76)
12-hr	1.38 (1.14-1.69)	1.65 (1.36-2.02)	2.11 (1.74-2.60)	2.53 (2.07-3.13)	3.16 (2.51-4.08)	3.67 (2.85-4.80)	4.22 (3.16-5.64)	4.80 (3.45-6.59)	5.62 (3.89-7.92)	6.28 (4.22-8.93)
24-hr	1.62 (1.35-1.96)	1.88 (1.57-2.28)	2.35 (1.96-2.85)	2.77 (2.29-3.38)	3.40 (2.74-4.33)	3.92 (3.09-5.05)	4.48 (3.40-5.91)	5.08 (3.71-6.88)	5.93 (4.16-8.24)	6.61 (4.50-9.27)
2-day	1.88 (1.59-2.24)	2.15 (1.82-2.57)	2.62 (2.21-3.14)	3.05 (2.55-3.66)	3.68 (3.01-4.62)	4.21 (3.35-5.34)	4.77 (3.67-6.20)	5.38 (3.97-7.17)	6.23 (4.43-8.52)	6.91 (4.78-9.55)
3-day	2.06 (1.76-2.44)	2.33 (1.98-2.76)	2.80 (2.38-3.33)	3.23 (2.72-3.85)	3.87 (3.18-4.81)	4.40 (3.53-5.53)	4.96 (3.85-6.39)	5.57 (4.16-7.36)	6.43 (4.62-8.73)	7.12 (4.97-9.76)
4-day	2.20 (1.88-2.58)	2.47 (2.12-2.91)	2.96 (2.52-3.49)	3.39 (2.87-4.02)	4.04 (3.34-4.97)	4.57 (3.68-5.70)	5.13 (4.01-6.56)	5.74 (4.30-7.53)	6.59 (4.76-8.88)	7.28 (5.10-9.90)
7-day	2.51 (2.16-2.91)	2.83 (2.44-3.29)	3.37 (2.90-3.93)	3.84 (3.29-4.50)	4.52 (3.76-5.47)	5.06 (4.11-6.21)	5.62 (4.42-7.07)	6.21 (4.70-8.02)	7.01 (5.11-9.31)	7.64 (5.43-10.3)
10-day	2.78 (2.42-3.20)	3.15 (2.73-3.63)	3.76 (3.25-4.34)	4.27 (3.68-4.96)	4.99 (4.17-5.97)	5.55 (4.54-6.74)	6.12 (4.85-7.62)	6.71 (5.11-8.58)	7.50 (5.50-9.85)	8.11 (5.80-10.8)
20-day	3.63 (3.19-4.12)	4.11 (3.61-4.67)	4.89 (4.29-5.58)	5.53 (4.83-6.33)	6.41 (5.40-7.53)	7.07 (5.84-8.43)	7.72 (6.19-9.43)	8.38 (6.46-10.5)	9.23 (6.87-11.9)	9.87 (7.17-13.0)
30-day	4.35 (3.85-4.89)	4.93 (4.36-5.55)	5.85 (5.17-6.61)	6.60 (5.80-7.48)	7.60 (6.45-8.83)	8.34 (6.94-9.84)	9.07 (7.32-11.0)	9.79 (7.60-12.1)	10.7 (8.02-13.7)	11.4 (8.34-14.8)
45-day	5.25 (4.69-5.86)	5.96 (5.32-6.65)	7.06 (6.28-7.91)	7.94 (7.03-8.93)	9.09 (7.77-10.4)	9.93 (8.32-11.6)	10.7 (8.72-12.8)	11.5 (9.01-14.1)	12.5 (9.41-15.7)	13.1 (9.73-16.9)
60-day	6.02 (5.41-6.67)	6.83 (6.13-7.58)	8.10 (7.24-9.01)	9.09 (8.08-10.1)	10.4 (8.88-11.8)	11.3 (9.49-13.0)	12.1 (9.89-14.4)	12.9 (10.2-15.7)	13.9 (10.5-17.4)	14.5 (10.8-18.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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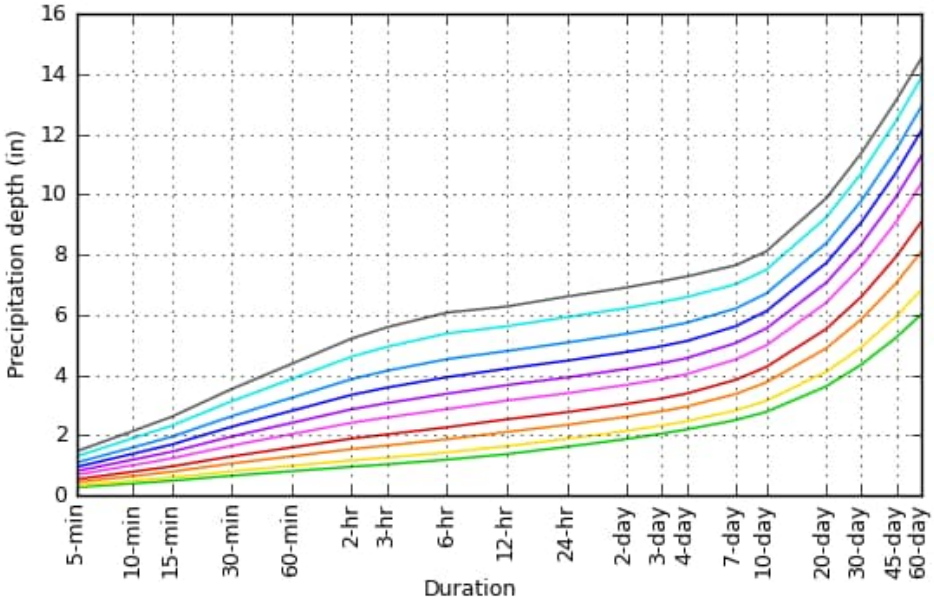
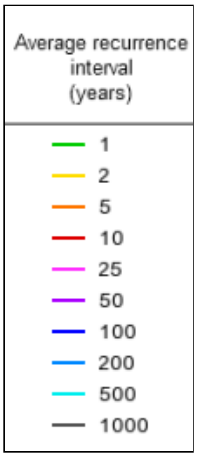
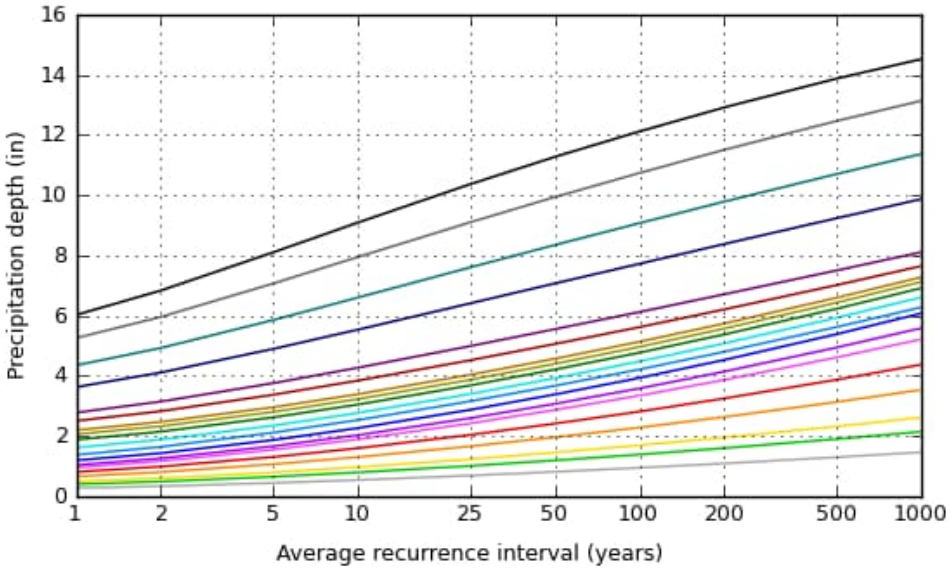
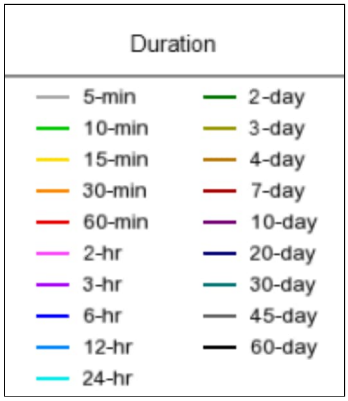
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 40.1228°, Longitude: -103.7066°









NOAA Atlas 14, Volume 8, Version 2 Created (GMT): Wed Nov 30 18:46:57 2022

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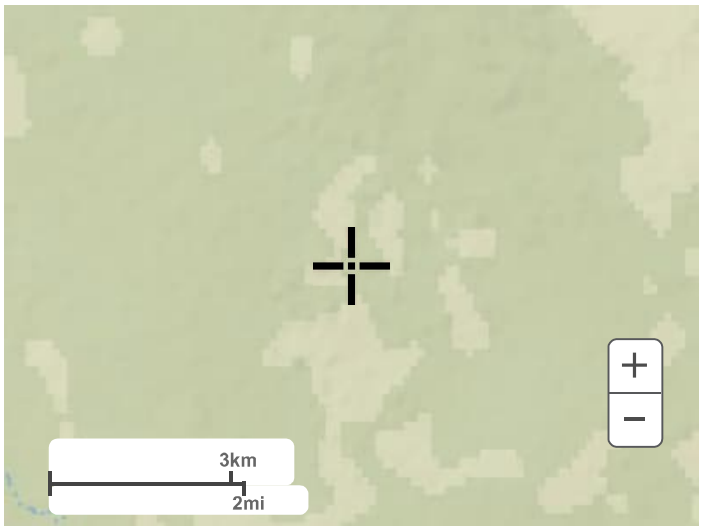
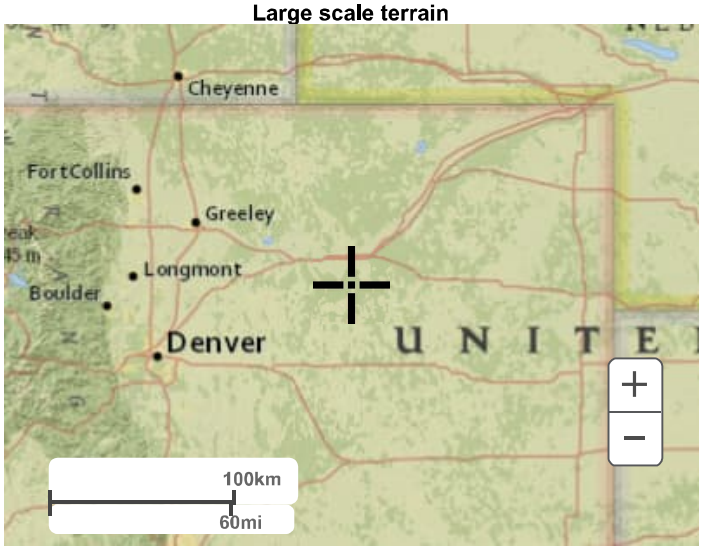
Maps & aerials

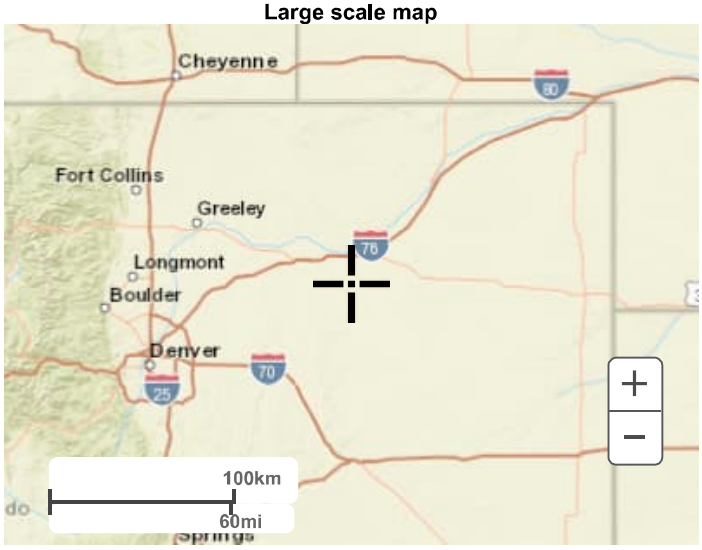
Small scale terrain



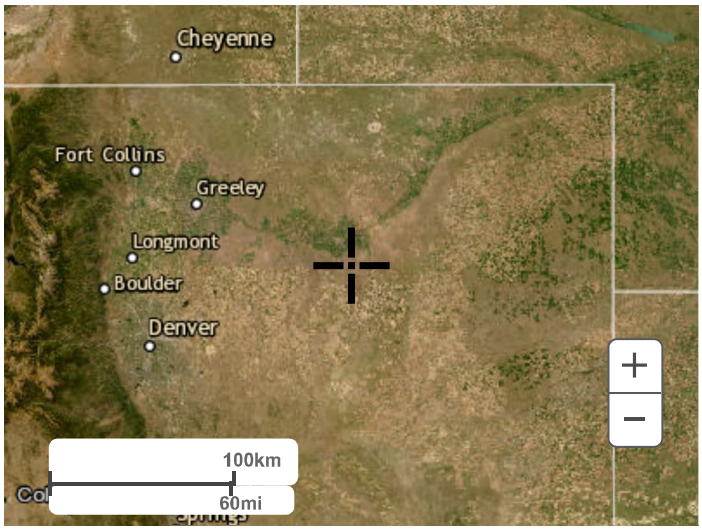
Large scale terrain



Large scale map



Large scale aerial



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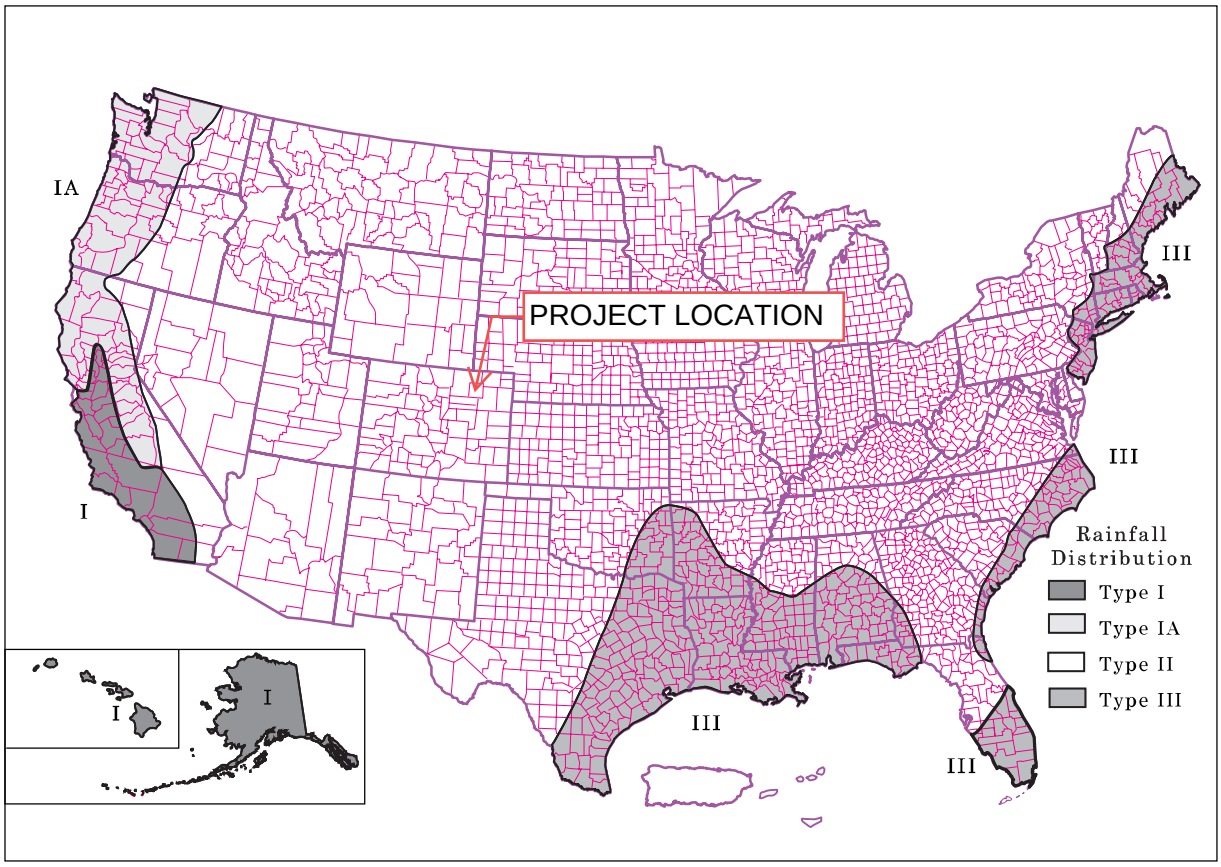
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

A.2 TR-55 Rainfall Distribution Map

Figure B-2 Approximate geographic boundaries for NRCS (SCS) rainfall distributions



Rainfall data sources

This section lists the most current 24-hour rainfall data published by the National Weather Service (NWS) for various parts of the country. Because NWS Technical Paper 40 (TP-40) is out of print, the 24-hour rainfall maps for areas east of the 105th meridian are included here as figures B-3 through B-8. For the area generally west of the 105th meridian, TP-40 has been superseded by NOAA Atlas 2, the Precipitation-Frequency Atlas of the Western United States, published by the National Ocean and Atmospheric Administration.

East of 105th meridian

Hershfield, D.M. 1961. Rainfall frequency atlas of the United States for durations from 30 minutes to 24 hours and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 40. Washington, DC. 155 p.

West of 105th meridian

Miller, J.F., R.H. Frederick, and R.J. Tracey. 1973. Precipitation-frequency atlas of the Western United States. Vol. I Montana; Vol. II, Wyoming; Vol III, Colorado; Vol. IV, New Mexico; Vol V, Idaho; Vol. VI, Utah; Vol. VII, Nevada; Vol. VIII, Arizona; Vol. IX, Washington; Vol. X, Oregon; Vol. XI, California. U.S. Dept. of Commerce, National Weather Service, NOAA Atlas 2. Silver Spring, MD.

Alaska

Miller, John F. 1963. Probable maximum precipitation and rainfall-frequency data for Alaska for areas to 400 square miles, durations to 24 hours and return periods from 1 to 100 years. U.S. Dept. of Commerce, Weather Bur. Tech. Pap. No. 47. Washington, DC. 69 p.

Hawaii

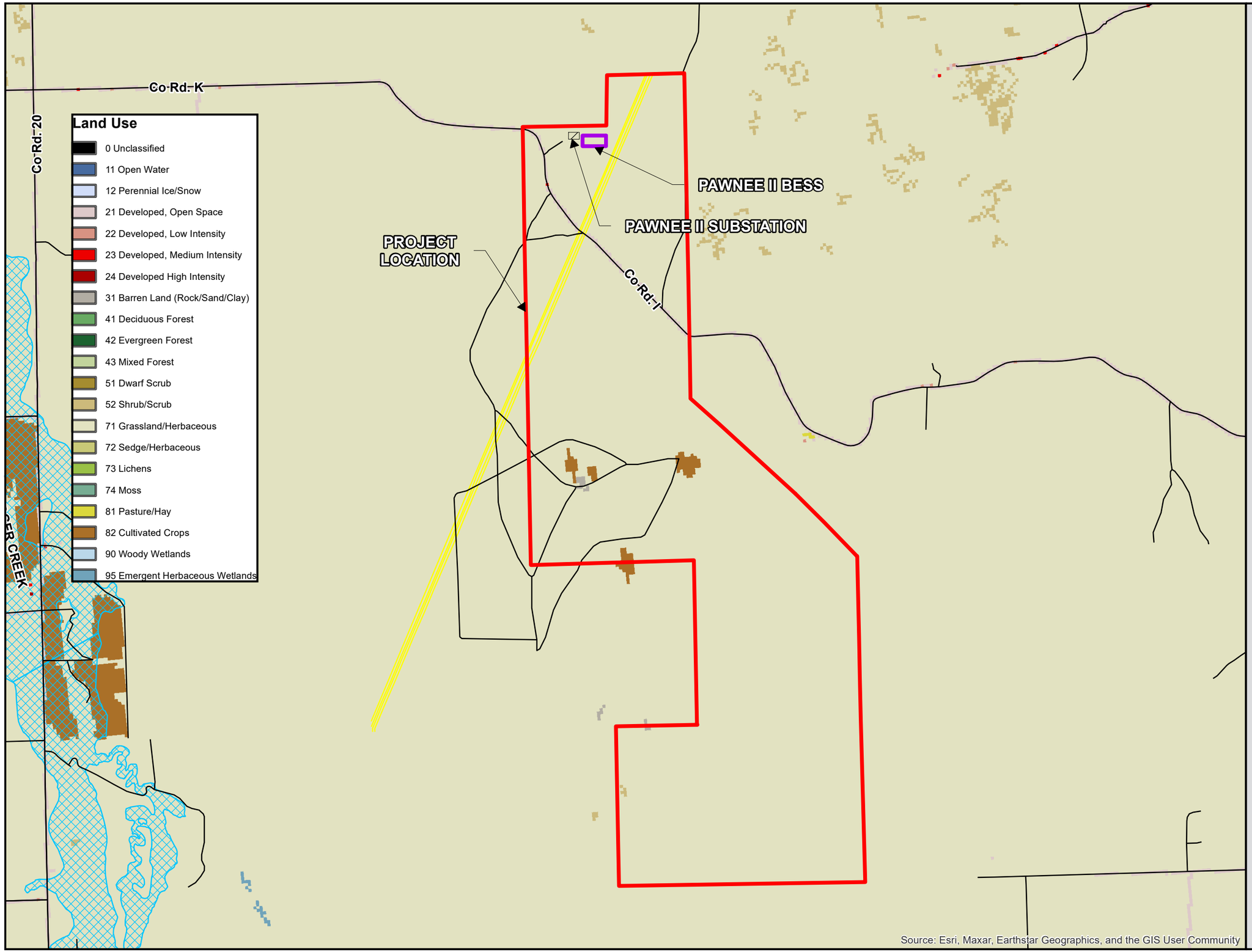
Weather Bureau. 1962. Rainfall-frequency atlas of the Hawaiian Islands for areas to 200 square miles, durations to 24 hours and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 43. Washington, DC. 60 p.

Puerto Rico and Virgin Islands

Weather Bureau. 1961. Generalized estimates of probable maximum precipitation and rainfall-frequency data for Puerto Rico and Virgin Islands for areas to 400 square miles, durations to 24 hours, and return periods from 1 to 100 years. U.S. Dept. Commerce, Weather Bur. Tech. Pap. No. 42. Washington, DC. 94 P.

A.3 Curve Number Calculations

- A.3.1 Land Use Map
- A.3.2 Soils Map



Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone A

N

0 3,000 6,000

Feet

Land Use Map
Figure A.3.1

Co Rd. K

PAWNEE II BESS

PAWNEE II SUBSTATION

PROJECT LOCATION

Co Rd. 1

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Pawnee II Solar Facility

Legend

- Pawnee II
- Substation
- BESS
- Roads
- Transmission Lines
- FEMA Zone

HSG

- A
- B
- C
- D

N

0 3,000 6,000

Feet

Soils Map
Figure A.3.2

A.4 FLO-2D Manning's N Values

4.2 Overland Flow

The simplest FLO-2D model is overland flow on an alluvial fan or floodplain. Typical overland flow as reflects the water surface elevation, roughness and 8-direction flow path. The floodplain element attributes can be modified to add detail to the predicted area of inundation. The grid element surface storage area or flow path can be adjusted for buildings or other obstructions. Using the area reduction factors (ARFs), a grid element can be completely removed from receiving any inflow. Any of the eight flow directions can be partially or completely blocked to represent flow obstruction. The area of inundation can also be affected by levees, channel breakout flows, flow constriction at bridges and culverts, or street flow in urban areas. Rainfall and infiltration losses can add or subtract from the flow volume on the floodplain surface. These overland flow components are shown in a computational flow chart in Figure 20.

Overland flow velocities and depths vary with topography and the grid element roughness. Spatial variation in floodplain roughness can be assigned through the GDS pre-processor program. The assignment of overland flow roughness must account for vegetation, surface irregularity, non-uniform and unsteady flow. It is also a function of flow depth. Typical overland flow roughness values (Manning's n coefficients) are shown in Table 3.

Table 3. Overland Flow Manning's n Roughness Values[1]

Surface	n-value
Dense turf	0.17 - 0.80
Bermuda and dense grass, dense vegetation	0.17 - 0.48
Shrubs and forest litter, pasture	0.30 - 0.40
Average grass cover	0.20 - 0.40
Poor grass cover on rough surface	0.20 - 0.30
Short prairie grass	0.10 - 0.20
Sparse vegetation	0.05 - 0.13
Sparse rangeland with debris	
0% cover	0.09 - 0.34
20 % cover	0.05 - 0.25
Plowed or tilled fields	
Fallow - no residue	0.008 - 0.012
Conventional tillage	0.06 - 0.22
Chisel plow	0.06 - 0.16
Fall disking	0.30 - 0.50
No till - no residue	0.04 - 0.10
No till (20 - 40% residue cover)	0.07 - 0.17
No till (60 - 100% residue cover)	0.17 - 0.47
Open ground with debris	0.10 - 0.20
Shallow glow on asphalt or concrete (0.25" to 1.0")	0.10 - 0.15
Fallow fields	0.08 - 0.12
Open ground, no debris	0.04 - 0.10
Asphalt or concrete	0.02 - 0.05

[1]Adapted from COE, HEC-1 Manual, 1990 and the COE, Technical Engineering and Design Guide, No. 19, 1997 with modifications.

EXHIBIT 6

DECOMMISSIONING PLAN

Pawnee II Solar BESS

PAWNEE SOLAR 2 LLC.

PAWNEE II SOLAR PROJECT

SITE RESTORATION AND DECOMMISIONING PLAN

PAWNEE II SOLAR PROJECT

SITE RESTORATION AND DECOMMISIONING PLAN

PAWNEE SOLAR 2 LLC.

FOR PERMIT APPLICATION USE

PROJECT NO.: 31403295.013
DATE: JANUARY 2023

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ONE PENN PLAZA
NEW YORK, NY 10119

TEL.: +1 212 465-5096
WSP.COM

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TABLES

APPENDICES

1 DECOMMISSIONING AND SITE RESTORATION

1.1 OVERVIEW

The Facility, located in Fort Morgan County of Colorado, spans 3,729 acres and is anticipated to generate 250 MW annually. Pawnee Solar 2 LLC (Pawnee Solar 2) is committed to decommissioning and restoring the Facility in a safe and environmentally responsible manner. Pawnee Solar 2 expects to commence operation in Q4 2025 and operate the Facility for 35 years. Pawnee Solar 2 will decommission the Facility in accordance with applicable health and safety standards. Public health considerations
associated with decommissioning the Facility are limited to typical risks associated with commercial construction projects.

The purpose of the Decommissioning and Site Restoration Plan (Plan) is to outline the Facility decommissioning and land reclamation work, at the end of the project's useful life, which is estimated to be 35 years after commissioning. As such, the Plan focuses on decommissioning activities to remove all equipment and materials related to the Facility and restore the property to its pre-construction condition when the Facility is no longer an operational energy facility.

In addition to providing detailed information concerning the Facility decommissioning process, this Plan includes a description of the lease agreements with landowners, shows the project developer's obligations with the County, and presents a preliminary cost estimate to support funding of the decommissioning and site restoration. Pawnee Solar 2 has obligations in its land lease agreements with landowners to remove the solar array and restore the land when the project is retired. The location and project-specific decommissioning cost estimate presented in this Plan will be reviewed and revised every 7 to 10 years to accommodate appropriate changes.

2 DECOMMISSIONING AND RESTORATION PLAN

2.1 PLAN COMPONENTS

This Decommissioning and Site Restoration Plan for solar facility decommissioning and land reclamation in the event the facility cannot be completed or after end of the useful life of the facility will address the following topics:

- Safety and removal of hazardous conditions;
- Environmental impacts;
- Aesthetic character;
- Recycle or reuse;
- Potential future uses for the site;
- Funding responsibility; and
- Completion schedule.

Pawnee Solar 2 expects to operate the Facility for 35 years (with the potential for extension). At the end of the Facility's life, the solar facility decommissioning and site reclamation work will restore the property to its preconstruction conditions, to the maximum extent practicable. Pawnee Solar 2 will provide notification to the applicable Towns, County, and County Zoning administration; impacted landowner(s), and other required parties about 30-40 days prior to the commencement of the de-commissioning and site restoration activities. Notification may be in the form of letters, newspaper notices, and/or updates on the Facility website. Governmental regulations at the time of Facility decommissioning and site restoration processes may require specific plans and permits. Pawnee Solar 2 will identify and acquire all local, state, and federal permits required for the solar facility decommissioning and land reclamation work.

This Plan assumes decommissioning will occur at the end of the 35-year operational lifespan of the Facility. However, decommissioning may also be triggered if the Facility is non-operational for a continuous period of 12 months or more. During periods when the Facility is not operational for maintenance, repair, or due to catastrophic events beyond Pawnee Solar 2's control, Pawnee Solar 2 will work diligently to return the Facility to full operating status.

At the time the Facility is no longer of use as an operational solar energy facility, it will first be de-energized and isolated from external electrical lines. Prior to any dismantling or removing equipment, staging areas will be delineated at appropriate locations within the Facility site, including near the substation and inverter locations. This Plan and the preliminary cost estimate assume that the decommissioning activities will remove all equipment and materials related to the Facility.

Components of the Facility decommissioning and site reclamation will include:

- Photovoltaic (PV) solar panels;
- Inverters;
- Buried electrical collection system;
- Battery Energy Storage System (BESS)
- Point of interconnection (POI) switchyard;
- Access roads; and
- Staging/laydown areas.

Photovoltaic solar panels mounted on galvanized steel piles with an aluminum or steel tracking rack system will be disconnected from the electrical system and unfastened from the mounting rack. After removal of the panel from the rack, it will be placed in a vehicle or container for transportation offsite for salvage, recycling or disposal, following applicable local,

state, and/or federal regulations. The tracking rack system that supports the solar panels will be disassembled and removed from the Facility site. The metal racking components may be reused or recycled for future use. Piles will be pulled out of the ground where conditions allow, otherwise they will be cut at a minimum of 2 feet below grade or flush with the top of shallow bedrock.

Inverters and inverter stepup transformer skids, including associated piling, will be removed and shipped offsite for eventual reuse or disposal. Piles and associated foundations will be removed from the Facility site and disposed of or recycled.

The battery energy storage system (BESS) and associated equipment will be reused, recycled, or disposed of. This includes energy storage buildings, all associated foundations, containers, pads, electrical equipment including inverters and transformers, as well as other supporting infrastructure. The manufacturer offers a BESS Battery Recycle Program for taking back full or partial systems that may be considered at the time of decommissioning.

Overhead and Underground Cables and Lines: non-utility owned cables and conduits buried deeper than 2 feet below grade will be abandoned in placed or removed. The cables and conduits will be removed entirely and shipped to a recycling facility. Topsoil excavated during cable removal activities will be segregated and stockpiled for later use. Subsurface soils will be stockpiled separately from topsoil. Following the removal of the cable and conduits, the excavations will be backfilled with the soils previously excavated. The subgrade will be compacted to a density of approximately 90 percent of Standard Proctor. Topsoil will be redistributed across the disturbed area.

All aboveground structures and electrical equipment including circuit breakers, chainlink fencing, control building(s), and grounding grid will be removed, and any concrete foundations will be removed to at least 2 feet below grade. Granular and geotextile materials will be removed from the Facility site by dump trucks or placed in a designated onsite area for use by the landowner. Electrical system components will be taken offsite for reuse or disposal. Ownership of the POI switchyard will be transferred to Xcel Energy following construction and will, therefore, not be decommissioned.

Perimeter fencing will be removed and recycled, reused, or disposed of. Landscape plantings (trees and shrubs) will be removed where they are sited on active agricultural land, unless the landowner requests that they be retained. Where appropriate, Pawnee Solar 2 will leave in place any access roads, driveway entrances, gates, buffer plantings, culverts, buildings or fencing that landowners request in writing to retain following decommissioning of the Facility.

Equipment storage, operation infrastructure, and any associated temporary improvements (e.g., temporary construction trailer) used during the decommissioning/reclamation phase will be removed from the Facility site by trucks. Any foundations associated with these facilities will be removed to a depth of at least 2 ft below grade.

After all equipment is removed, any holes or voids created by poles, concrete pads and other equipment will be filled in with soil to the surrounding grade and seeded with a previously approved seed mix. This may include revegetation as meadows, returning the site to use consistent with this Plan, or redevelopment of the land for other beneficial uses, based on consultation with the landowner.

The Facility has been designed to include setbacks or buffers for property lines, utilities, wetlands, streams and other waters. Encroachment will not be allowed in these areas for the solar facility decommissioning and land reclamation work.

2.2 SAFETY AND REMOVAL OF HAZARDOUS CONDITIONS

Prior to the solar facility decommissioning, Pawnee Solar 2 will complete a waste audit and prepare a waste reduction work plan in accordance with any relevant regulations in effect at time of decommissioning. The decommissioning will be supervised and carried out by trained personnel familiar with the risks associated with decommissioning of electrical equipment or other materials requiring special handling or disposal. During the solar facility decommissioning work, transformers and switchgear will be drained of materials requiring special handling or disposal, if applicable, and such materials will be disposed of offsite at appropriate facilities and in accordance with applicable laws.

Table 2.1 provides a list of typical waste materials and modes of disposal, recycling, or reuse. Although solar panels may be able to be reused or recycled at the time the Facility is decommissioned, for the purposes of this Plan it was assumed that these components will be disposed of at a licensed local or regional landfill. In future review and revision of this Plan, recycling or repurposing of solar components would be considered further rather than disposal in landfills.

Table 2.1 Typical Facility Decommissioning Waste Materials and Modes of Disposal

COMPONENT	TYPICAL MODE OF DISPOSAL
Concrete foundations	Crush and recycle as granular material
Solar panels	Reuse, recycle, or dispose of
Steel racks and mounts	Salvage for reuse or recycle for scrap
Cabling	Recycle
Inverter stepup transformers, inverters, and circuit breakers	Salvage for reuse, recycle for scrap, or dispose of
Granular material	Reuse or dispose of in landfill
Oils/lubricants	Recycle
Hazardous materials, if applicable	Dispose of through licensed hauler
Geotextile material	Dispose of in landfill
Miscellaneous non-recyclable materials	Dispose of in landfill
Inverters	Salvage for reuse or recycle for scrap
Transformers	Salvage for reuse or recycle for scrap
Fencing	Salvage for reuse or recycle for scrap
Battery Energy Storage System	Reuse, recycle, or dispose of

Hazardous materials or wastes will not be stored onsite during operation and maintenance of the Facility and would not require removal at decommissioning. Much of the Facility will consist of reusable or recyclable materials; therefore, residual wastes for disposal as a result of full decommissioning will be relatively limited. Small amounts of waste materials will be managed in accordance with applicable regulations and then-current environmental standards. Non-hazardous decommissioning wastes include human waste, trash, and cleared vegetation. Wastes that contain (or at any time contained) oil, grease, solvents, or other petroleum products fall within the scope of the oil and hazardous substances control, cleanup, and disposal procedures. Residual non-hazardous wastes will be disposed of at a licensed disposal facility or recycling center in operation at the time of decommissioning.

Pawnee Solar 2 will ensure that hazardous and potentially hazardous materials are transported, stored, and handled in accordance with applicable regulations and environmental standards. These materials include oil used in transformers and bulk fuel that may be stored onsite to fuel equipment used during decommissioning activities. None of the Facility components, solar modules and arrays, concrete foundations and metal piles, security fencing, or access road materials are considered hazardous. Hazardous materials will be disposed of at licensed waste disposal facilities. Hazardous wastes will not be disposed of in any other fashion such as unpermitted burying or burning.

2.3 ENVIRONMENTAL IMPACT

Solar facility decommissioning and land reclamation activities could result in environmental effects like those that occur during the construction phase. For example, there is the potential for land disturbance (i.e., soil erosion, sedimentation, or fuel spills) related to adjacent watercourses or environmental sensitive features. Prior to removal of equipment and site restoration activities, temporary erosion and sediment control measures will be designed and installed in accordance with the specific plan developed for the decommissioning/reclamation phase. As such, site-specific planning and permitting applied during the construction phase would be applied when performing decommissioning work to remove all equipment and materials related to the Facility, and restoring the property to its pre-construction condition. This will include, as appropriate, erosion and sediment control plan, dust control, and noise mitigation measures, traffic management plan, and containment plan.

A Stormwater Pollution Prevention Plan (SWPPP) will be required for decommissioning/reclamation activities and it will specify Best Management Practices (BMPs) and configurations for erosion and sediment control measures. The measures may be modified by the project owner as necessary to suit actual site conditions. However, all of the Facility-based decommissioning and reclamation work will be conducted in accordance with applicable permits and then-current environmental standards. Erosion control and stormwater management will utilize similar mitigation measures and BMPs outlined in the Facility's SWPPP in order to maintain downstream water quality and manage stormwater runoff during the decommissioning/reclamation phase. Design features of the erosion and sediment controls will account for location-specific climate, topography, and soils; and the vegetative cover to be reestablished at the Facility site.

The specified BMPs will include both temporary and permanent measures. Commonly used BMPs that may be employed during site restoration or land reclamation would include:

- Minimize disturbed areas and protect natural features of the site (native soil, topsoil, vegetation, topography, and drainage);
- Control stormwater runoff and flow to and from disturbed areas;
- Stabilize soils as quickly as possible following disturbance of work areas;
- Protect slopes and exposed soil;
- Protect culvert inlets, drainage structures, and nearby surface water features;
- Establish perimeter controls around areas to be restored;
- Retain sediment to prevent transport offsite in stormwater runoff; and
- Maintain controls including removal or accumulated sediment during reestablishment of vegetation.

Environmental protection plans, permitting requirements, and other measures will remain in place, as needed, until the Facility site is stabilized to mitigate soil erosion and silt/sediment runoff and any potential impacts to natural features or waterbodies located within and adjacent to the Facility site. Assuming the regulatory requirements or environmental standards for stormwater management are similar during the decommissioning/reclamation phase, Pawnee Solar 2 will require a stormwater discharge permit for clearing, grading, and excavation, of 5 acres or greater.

Pawnee Solar 2 will hire an environmental monitor (EM) with an understanding of regional agricultural/rangeland practices. Former agricultural lands will be returned to its former state where suitable conditions exist. Restoration of the property to its pre-construction condition will be in accordance with the existing landowner agreement. The Decommissioning Site Manager will coordinate with the EM to ensure compliance with applicable requirements during the decommissioning/reclamation phase. Solar facility decommissioning and land reclamation work, at the end of the Facility's useful life, will be performed as per the requirements of then-current applicable laws and regulations.

Any proposed solar facility decommissioning and land reclamation activities that could result in adverse impacts (e.g., culverts and drainage infrastructure removal) to wetlands, streams, or other waters will be coordinated with the appropriate regulatory agencies, as necessary, to determine applicable consultation, permitting or approval, and site-specific mitigation and/or remediation plans. Similar construction oversight and compliance monitoring and reporting implemented during the construction phase will be used during the decommissioning/reclamation phase.

2.4 AESTHETIC CHARACTER

At the time the Facility is no longer an operational energy facility, Pawnee Solar 2 will remove all aboveground features (equipment and materials) related to the Facility and restore the property to its pre-construction condition. With the solar facility decommissioning and land reclamation work, the Facility site would resemble the aesthetic character prior to the infrastructure construction. Site restoration-based activities to return the Facility site to its pre-construction aesthetic character may include, to the extent appropriate and not otherwise requested by the landowner(s):

- Pulling out and removing all perimeter/security fences from the project site.
- Minimizing ground disturbance to the extent practical.
- Restoring to meet adjacent ground contours to the extent practical. It may include regrading access roads and other features in specific areas to restore drainage patterns and reestablish pre-existing contours.
- Removing culverts and drainage infrastructure and restoring streams or drainage channels to preexisting elevations and stabilized in accordance with State of Colorado's erosion control standard practices.
- Using soils stockpiled onsite for the site restoration and not soils transported from offsite. Topsoil would be used for distributing (a minimum of 2 inches) across disturbed areas devoid of topsoil.
- During revegetation of disturbed areas, an appropriate seed mix, chosen in consultation with the landowner will be selected
- Leaving erosion and sediment control measures in place, as needed, until the project site is stabilized.

2.5 RECYCLE OR REUSE

Major pieces of solar facility-based equipment and materials may be recyclable or reusable, and Pawnee Solar 2 will pursue recycling or reuse of decommissioned equipment and materials to the extent practicable, as required by law and the availability of licensed recycling facilities. Photovoltaic modules would be sold for reuse or refurbishment to the extent there is an existing market for used solar panels. The galvanized steel racks would be sold for scrap or recycled metal. Electrical equipment, including inverter electronics, could either be salvaged for reuse or recycled. Components such as transformers and electrical cables would have a high resale value due to copper, steel, and aluminum content. Concrete from footings could be crushed and recycled as granular fill material. Spent oils, if any, could be recovered for recycling through existing oil reprocessing companies. Table 2.1 presents typical solar facility decommissioning related waste materials and modes of disposal, recycling, or reuse.

2.6 POTENTIAL FUTURE USES FOR THE SITE

At the end of the Facility's lifespan or it is no longer an operational energy facility, Pawnee Solar 2 anticipates to decommission the Facility by removing all equipment and materials and restore the land to its pre-construction condition. Although the future land use of the Facility site by the landowner(s) is not known, it is most probable that after decommissioning and reclamation the majority of the Facility site would be returned to its former agricultural land use. Therefore, this Plan has conservatively assumed that the future site uses will be primarily agricultural. However, if the project economics and solar energy needs remain viable, the Facility may be repowered with new technology to extend the system's performance period. Continued land use for the solar energy facility is subject to extension of landowner leases, land use permits, and interconnection agreements to continue operation.

2.7 AGREEMENTS WITH LANDOWNER AND COUNTY

Facility components are located on private land under lease or easement agreements with the landowners, and the leases and easements with private landowners contain a provision on the Facility's decommissioning and site restoration. All landowner agreements stipulate decommissioning of sites; the decommissioning plan is consistent with the requirements specified

within those respective agreements. Although the specific terms of landowner lease agreements are confidential, decommissioning and land reclamation will involve removing the aboveground Facility components and the below ground footings and foundations to a depth that is the lesser of the depth of bedrock or 24 inches below grade. Where requested by landowners in writing, Pawnee Solar 2 will leave in place any property improvements associated with the Facility, including access roads, driveway entrances, gates, buffer plantings, culverts, buildings, or fencing. The POI switchyard and transmission line with support structures near the POI switchyard will remain in place and will be owned by Xcel Energy following construction.

With this decommissioning and site restoration plan, the obligations of Pawnee Solar 2 to removal of the photovoltaic solar arrays and other equipment and restoration of the property to pre-construction conditions are established. As a responsible project owner, Pawnee Solar 2 takes financial responsibility for the costs of Facility decommissioning and land reclamation thus ensuring the landowner and county do not bear the costs. Pawnee Solar 2 will enter into an agreement with the host County to address Facility decommissioning and site restoration, including notification if the Facility is no longer an operational energy facility and the expected Facility decommissioning deadline.

2.8 DECOMMISSIONING/RECLAMATION COSTS

Table 2.2 provides a list of key components that will be removed during the decommissioning/reclamation phase. The decommissioning and site restoration-based preliminary cost estimate presented in Appendix A reflects probable costs for the Facility decommissioning/reclamation phase.

Table 2.2 Key Components Removed during Decommissioning/Reclamation

COMPONENT	ESTIMATED QUANTITY	UNITS
Fencing	71,574	Lineal Foot
PV Module and Piles	610,551	Module
Inverters	63	Each
BESS	111	Containers

The following information sources were used to prepare the preliminary cost estimate in Appendix A:

- Professional experience and internal construction cost data;
- Consultation with engineers and construction contractors experienced in the construction of utility-scale solar projects;
- Manufacturer and component datasheets; and
- Plans and drawings.

2.9 DECOMMISSIONING SCHEDULE

The Facility's is intended to operate for a term of 35 years from the date of commercial operation. It is estimated that the duration of the solar facility decommissioning and land reclamation activities will last approximately one (1) year, but not to exceed 18 months as the expected timeline for completion of all the tasks. Once Pawnee Solar 2 decides on the Facility decommissioning, Pawnee Solar 2 will notify the Morgan County Planning Administrator in writing of the proposed date of discontinued operations and plans of decommissioning activities to remove all equipment and materials related to the Facility and restore the property to it pre-construction condition.

APPENDIX

A GROSS AND NET DECOMMISSIONING AND SITE RESTORATION ESTIMATE

Note: Cost estimates in Appendix A are preliminary and subject to change due to unknown costs for certain equipment and materials, uncertainty of salvage market at end of project life, present-day cost vs future inflation rate, etc.

Gross and Net Decommissioning and Site Restoration Estimate

Task	Quantity	U/M	Unit Cost ($)	Budget ($)
Pre-Dismantling Activities	1	LS	500,000.00	$500,000.00
Management Fees	6	Months	60,150.00	$360,900.00
Fencing Removal	71,574	LF	4.37	$312,778.38
Removal	71,574	ft	4.32	$309,200
Haul to Scrap yard	18	loads	200.00	$3,579
Module Removal	610,551	Mod	3.25	$1,983,954.95
Module Removal & Transport	610,551	LS	1.30	$794,988
Haul Rack	1315	loads	200.00	$262,944
Disposal fee	18,927	$/T	36.00	$681,375
Cable Cutting	18927.081	LS	0.33	$6,151
Hauling to Scrap	477	loads	500.00	$238,496
Racking & Piles Removal	7,736	EA	111.71	$864,188.03
Rack Removal	7,736	/pile	5.88	$45,449
Haul Rack	9	loads	500.00	$4,642
Pile Pulling	50,879	/pile	14.10	$717,397
Haul Piles	193	loads	500.00	$96,700
AC Electrical Removal	142,656	$/FT	20.00	$2,853,120.00
Inverter Skid Removal	63	EA	6,222.05	$391,989.15
Skid removal	63	EA	4,022.05	$253,389
Haul to scrap	63	loads	2,200.00	$138,600
Substation Dismantling	250	MW	614.90	$153,725.00
Transformer Removal	1	LS	90,225.00	$90,225
Structure removal	1	LS	10,000.00	$10,000
Control Building Removal	1	LS	15,000.00	$15,000
UG Utility Removal	1	LS	25,000.00	$25,000
Foundation removal to 24 inches	27	cu-yd	500.00	$13,500
BESS Dismantling	1	EA	8,574.78	$8,574.78
Structure removal	111	LS	3,161.28	$3,161
Foundation removal to 24 inches	27	cu-yd	500.00	$5,414
Contingency	5%	LS	7,429,230.28	$371,461.51
Subtotal Decommission (Gross)	250	MW	31,202.77	$7,800,691.80

Task	Quantity	U/M	Unit Cost ($)	Budget ($)
Inverters Salvage Value	63	$/EA	22,860.00	$1,440,180.00
Steel	793,800.0	$/lb	0.16	$127,008
Copper	340,200.0	$/lb	3.86	$1,313,172
Module Salvage Value	610,551	/MOD	1.91	$1,168,632.77
Modules	13,355,803.13	$/Module	0.09	$1,168,633
Racking & Piles Salvage Value	7,736	/MOD	3.02	$23,325.51
Racking Salvage	185664	$/lb	0.10	$18,566
Piles Salvage	17626.33	$/lb	0.27	$4,759
Substation Equipment Salvage Value	250	MW	3,165.78	$791,444.00
MPT Steel	485800	$/lb	0.16	$77,728
MPT Copper	208200	$/lb	3.38	$703,716
Structures & other components	100000	$/lb	0.10	$10,000
Fence Salvage Value	357,870	$/LB	0.10	$35,787.00
BESS Salvage Value	1	$/EA		$0.00
Subtotal Salvage	250	MW	9,162.95	$2,290,736.51

Total Decommissioning Cost (Net)	250	MW	22,039.82	$5,509,955.29

EXHIBIT 7

MAINTENANCE STATEMENT

Pawnee II Solar BESS

SECTION 4-855 (A). MAINTENANCE PLAN

(6) A system and property maintenance plan describing continuing BESS maintenance and property upkeep during the operation of the BESS.

Prior to issuance of a construction permit, Pawnee Solar 2 LLC will submit an Operations and Maintenance Plan that is Project and equipment specific, and which has a goal of meeting all the required health and safety metrics of Pawnee Solar 2 LLC, the County, and in a manner that reduces fire risks in and around the project. The Plan will become a companion document to the Emergency Response Plan and will detail BESS maintenance and upkeep of the BESS project area during the operation of the BESS facility.

EXHIBIT 8

FIRE MITIGATION PLAN

Pawnee II Solar BESS

SECTION 4-855 (A). FIRE MITIGATION & EMERGENCY OPERATION PLAN

(7) Fire Mitigation Plan. A fire mitigation plan including identification of the nearest water source for fire suppression or written confirmation from the local fire department with jurisdiction over the property stating that the site has been evaluated for fire risks and sufficiently mitigated any such risk.

(10) Emergency Operation Plan. An emergency operation plan including the following:

(a) Procedures for safe shutdown, de-energizing, or isolation of equipment and systems under emergency conditions to reduce the risk of fire, electric shock, and personal injuries, and for safe start-up following cessation of emergency conditions.

(b) Procedures for inspection and testing of associated alarms, interlocks, and controls.

(c) Procedures to be followed in response to notifications from the BESS management system, when provided, that could signify potentially dangerous conditions, including shutting down equipment, summoning service and repair personnel, and providing agreed upon notification to fire department personnel for potentially hazardous conditions in the event of a system failure.

(d) Emergency procedures to be followed in case of fire, explosion, release of liquids or vapors, damage to critical moving parts, or other potentially dangerous conditions. Procedures can include sounding the alarm, notifying the fire department or district, evacuating personnel, de-energizing equipment, and controlling and extinguishing the fire.

(e) Response considerations similar to a safety data sheet (SDS) that will address response safety concerns and extinguishment when an SDS is not required.

(f) Procedures for dealing with BESS equipment damaged in a fire or other emergency event, including maintaining contact information for personnel qualified to safely remove damaged BESS equipment from the facility.

EMERGENCY RESPONSE PLAN

AES will create a project and equipment specific Emergency Response Plan (ERP) that will be submitted to Morgan County with the construction permit drawing package. The ERP will provide information and instruction to guide first responders in preparing for and safely responding to an accident, fire or other emergency associated with the Pawnee II Solar BESS project.

It is expected that the ERP will be reviewed, both internally and with local first responders, and updated at least annually. The ERP is created and released closer to completion of Project construction as changes often occur to a project throughout the design to the construction phase.

The ERP is not intended to address specific circumstances, nor address every potential scenario. The document is intended as a guide based on laws, ordinances, regulatory standards, and best practices. In the event of an emergency, on-scene judgement should also be utilized in conjunction with the ERP.

The ERP will include, at a minimum, the following components to give the County and first responders the best available information on the project to successfully address an emergency event:

- **Site Location (Address and GPS Coordinates)**
- **BESS Equipment Overview**
  - Manufacture, Model, and quantity
  - Total MW capacity
  - Fire Protection and Safety Measures
  - Alarms and Notifications
  - Enclosure Access
  - Ventilation
- **Site Overview**
  - Primary Site Access
  - How to gain entrance to the site
  - Site map and enclosure layouts
  - Enclosure Access
- **Public Safety Staging and First Responder Areas**
- **Emergency Response Considerations** (Risks That You Are Most Likely to See at this Facility):
  - Fire
  - Deflagration and Explosion
  - Electric Shock
  - Arc Flash
  - Chemical Release
- **Hazard and Risk Evaluation**
  - Potential Site-Specific Hazards
  - Safety Data Sheets (SDS)
  - Site Signage
- **Emergency Response Protocol**
  - Defensive Approach
  - Managing the Incident
  - Safe Stand-off Distances
  - Personal Protective Equipment (PPE)
  - Working in conjunction with a Subject Matter Expert (SME)

EXHIBIT 9

SPECIFICATIONS SHEET

Pawnee II Solar BESS

ST2752UX-US

Liquid Cooling Energy Storage System
2 - 8 hour application

Preliminary

LOW COSTS

- Highly integrated ESS for easy transportation and O&M
- All pre-assembled, no battery module handling on site
- 8 hour installation to commission, drop on a pad and make electrical connections

SAFE AND RELIABLE

- Integrated DC/DC converters actively limit fault current
- DC electric circuit safety management includes fast breaking and anti-arc protection
- Multi level battery protection layers formed by discreet standalone systems offer impeccable safety

EFFICIENT AND FLEXIBLE

- Intelligent liquid cooling ensures higher efficiency and longer battery cycle life
- Modular design supports parallel connection and easy system expansion
- IP54 outdoor cabinet and optional C5 anti-corrosion

SMART AND ROBUST

- Fast state monitoring and faults record enables pre-alarm and faults location
- Integrated battery performance monitoring and logging

SUNGROW
Clean power for all

Type designation	ST2752UX-US
Battery Data	
Cell type	LFP
Battery capacity (BOL)	2752 kWh
Battery voltage range	1160 ~ 1500 V
General Data	
Dimensions of battery unit (W * H * D)	9340*2600*1730mm
Weight of battery unit	26,400kg
Degree of protection	IP 54/Type 3R
Operating temperature range	-30 to 50 ℃ (> 45 ℃ derating)
Relative humidity	0 ~ 95 % (non-condensing)
Max. working altitude	3000m
Cooling concept of battery chamber	Liquid cooling
Fire safety	Fused sprinkler heads, NFPA 69 explosion prevention and ventillation IDLH gases
Communication interfaces	RS485, Ethernet
Communication protocols	Modbus RTU, Modbus TCP
Compliance	UL 9540,UL 9540A/NFPA 855
2 HOURS APPLICATION-ST2752UX*4-5000UD-MV-US	
BOL kWh(DC/AC LV Side)	11,008kWh DC/10,379kWh AC
ST2752UX Quantity	4
PCS Model	SC5000UD-MV-US
4 HOURS APPLICATION-ST2752UX*8-5000UD-MV-US	
BOL kWh(DC/AC LV Side)	22,016kWh/21,448kWh
ST2752UX Quantity	8
PCS Model	SC5000UD-MV-US
Grid Connection Data	
Max.THD of current	< 3 % (at nominal power)
DC component	< 0.5 % (at nominal power)
Power factor	> 0.99 (at nominal power)
Adjustable power factor	1.0 leading ~ 1.0 lagging
Nominal grid frequency	60 Hz
Grid frequency range	55 ~ 65 Hz
Transformer	
Transformer rated power	5,000 kVA
LV/MV voltage	0.9 kV / 34.5 kV
Transformer cooling type	ONAN (Oil Natural Air Natural)
Oil type	Mineral oil (PCB free) or degradable oil on request

EXHIBIT 10

LIABILITY INSURANCE

Pawnee II Solar BESS

EVIDENCE OF PROPERTY INSURANCE

DATE (MM/DD/YYYY)

THIS EVIDENCE OF PROPERTY INSURANCE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE ADDITIONAL INTEREST NAMED BELOW. THIS EVIDENCE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS EVIDENCE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE ADDITIONAL INTEREST.

AGENCY
MARSH USA INC.
1050 CONNECTICUT AVENUE, SUITE 700
WASHINGTON, DC 20036-5386

CN103029124-CE-4/23-22-23

PHONE (A/C, No, Ext):

FAX (A/C, No):

E-MAIL ADDRESS:

CODE:

SUB CODE:

AGENCY CUSTOMER ID #:

COMPANY
National Union Fire Ins Co Pittsburgh PA

INSURED
AES Clean Energy LLC
4300 Wilson Boulevard
Arlington, VA 22203

LOAN NUMBER

POLICY NUMBER
72112682

EFFECTIVE DATE
03/01/2022

EXPIRATION DATE
04/01/2023

☐ CONTINUED UNTIL TERMINATED IF CHECKED

THIS REPLACES PRIOR EVIDENCE DATED:

PROPERTY INFORMATION

LOCATION/DESCRIPTION

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS EVIDENCE OF PROPERTY INSURANCE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

COVERAGE INFORMATION

PERILS INSURED ☐ BASIC ☐ BROAD ☐ SPECIAL ☐

COVERAGE / PERILS / FORMS	AMOUNT OF INSURANCE	DEDUCTIBLE
ANY ONE OCCURRENCE, COMBINED SINGLE LIMIT PHYSICAL DAMAGE / BUSINESS INTERRUPTION	1,000,000,000	Per Policy
SPECIAL CONDITIONS / OTHER COVERAGES (AS PER ACORD 101)		
ALL RISK PHYSICAL LOSS OR DAMAGE, INCLUDING BOILER EXPLOSION AND MACHINERY BREAKDOWN, BUSINESS		
FLOOD, EARTHQUAKE AND TERRORISM AS DEFINED IN THE ORIGINAL POLICY.		
Other deductibles may apply as per policy terms and conditions.		

REMARKS (Including Special Conditions)

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

ADDITIONAL INTEREST

NAME AND ADDRESS

☐ ADDITIONAL INSURED ☐ LENDER'S LOSS PAYABLE ☐ LOSS PAYEE
☐ MORTGAGEE ☐

LOAN #

AUTHORIZED REPRESENTATIVE

Marsh USA Inc.

ADDITIONAL REMARKS SCHEDULE

AGENCY	NAMED INSURED
MARSH USA INC.	AES Clean Energy LLC 4300 Wilson Boulevard Arlington, VA 22203
POLICY NUMBER	
CARRIER / NAIC CODE	EFFECTIVE DATE:

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: 27 **FORM TITLE:** Evidence of Property Insurance

SPECIAL CONDITIONS/OTHER COVERAGES

SUBLIMITS:
USD 50,000,000 Debris Removal or 25% of loss, whichever the greater;
USD 50,000,000 Demolition and Increased Cost of Construction;
USD 50,000,000 Expediting Expenses;
USD 50,000,000 Service Interruption;
USD 100,000,000 Miscellaneous Unscheduled Locations;
USD 100,000,000 Newly Acquired Locations;
USD 100,000,000 Property in course of construction (excluding installation of Gas Turbine Generators with a generating capacity of greater than 25 MW);
USD 25,000,000 Transit- Physical Damage;
USD 10,000,000 Impounded Water;
USD 50,000,000 Errors and Omissions;
USD 10,000,000 Tenants and Neighbors Liability;
USD 25,000,000 Sue and Labor;
USD 10,000,000 Accounts Receivable;
USD 10,000,000 Valuable Paper;
USD 5,000,000 Fine Art;
USD 2,500,000 Fire Dept. Charges and Extinguishing Expenses;
USD 5,000,000 Rental Value;
USD 1,000,000 Leasehold Interest;
USD 2,500,000 Land & Water Containment or Pollution Clean up, Removal, & Disposal;
USD 2,500,000 Professional and Other Fees;
USD 1,000,000 Computer Systems Non Physical Damage and Data, Programs, or Software combined;
30 days Ingress/Egress (limited to 5 statute miles)
30 days Civil Authority (limited to 5 statute miles)
USD 350,000,000 Flood - United States of America (annual aggregate);
USD 675,000,000 Earthquake in the United States (annual aggregate), inclusive of USD 150,000,000 Earthquake as respects AES Clean Energy LLC locations in High Hazard Earthquake zones
USD 600,000,000 any one occurrence for an Act or series of Acts of Terrorism, whether TRIPRA or Non-Certified.

BUSINESS INTERRUPTION SUBLIMITS:
USD 50,000,000 Extra expense or increased cost of working;
USD 50,000,000 Direct Contingent Time Element

DEDUCTIBLES:
As per policy.

The property policies evidenced above contain various sublimits and are subject to Insured's deductibles and specific to various perils covered. If you would like additional information regarding these sublimiits or deductibles, please contact the Insured.

NOTICE OF CANCELLATION:
This policy may be canceled at any time at the request of the Insured, or it may be canceled by the Company by mailing to the Insured and to the additional insureds, loss payees, lenders, mortgagees, or other parties of interest endorsed hereon or indicated on the certificates of insurance issued during the term of this policy, written notice by registered mail stating when, not less than 120 days thereafter, such cancellation or non-renewal shall be effective.

The mailing of notice as aforesaid shall be sufficient proof of notice and the effective date and hour of cancellation stated in the notice shall become the end of the policy period. Delivery of such written notice either by the Insured or by the Company shall be equivalent to mailing.

EXHIBIT 11

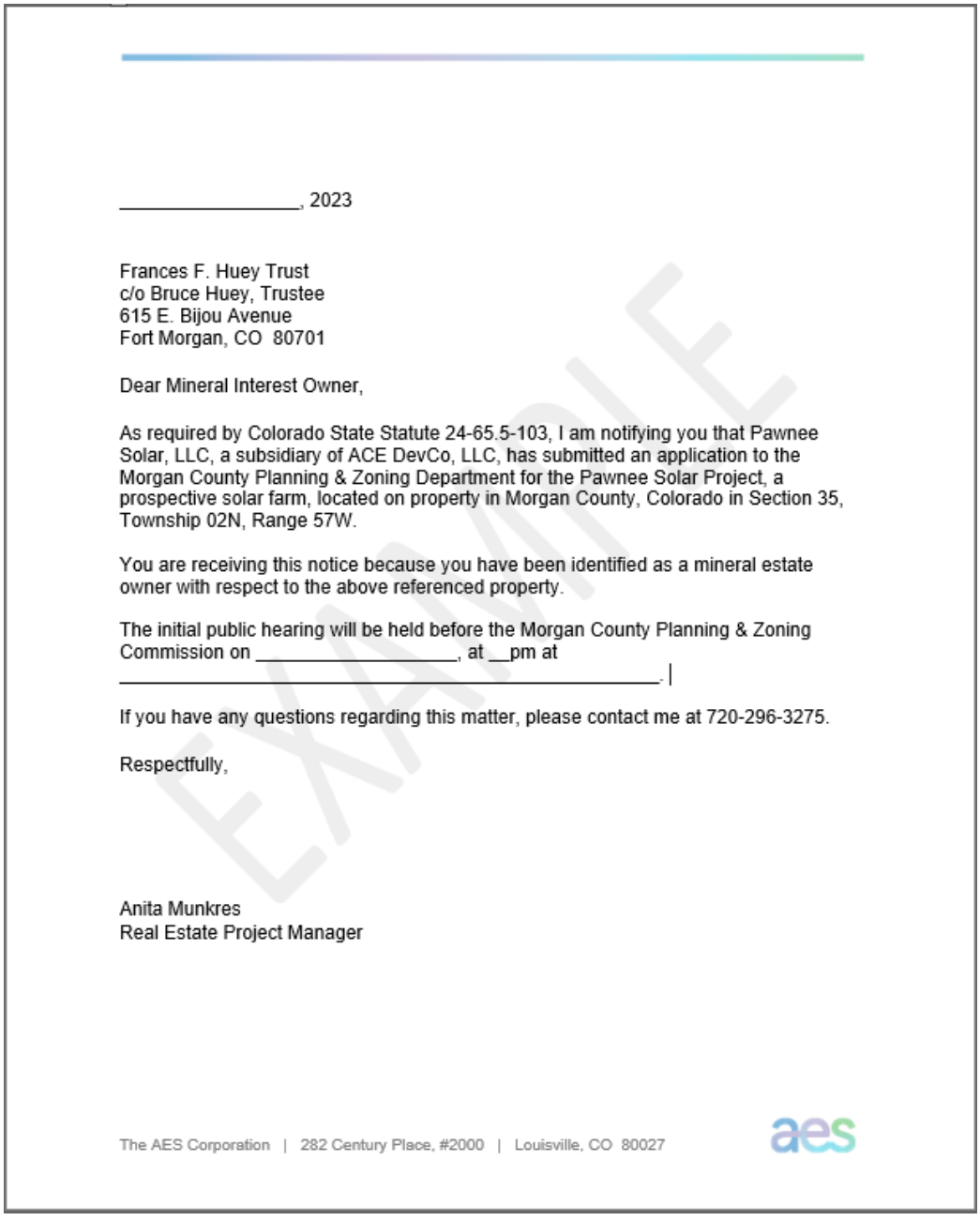
NOTICE TO MINERAL RIGHTS HOLDERS

Pawnee II Solar BESS

SECTION 4-820 (F). NOTIFICATION TO MINERAL RIGHTS HOLDERS

Applicant shall notify the individual mineral right holders within the project site in accordance with County and statutory notification requirements.

Pawnee Solar 2 LLC will provide the below shown notification (sample included herein for illustrative purpose) to current mineral rights holders regarding the proposed surface development within the Pawnee II Solar project area. The written notifications will be sent to mineral owners listed in Table 1 (see below) via U.S. Postal Service certified mail at least 30 days prior to the initial public hearing held before the Morgan County Planning and Zoning Commission.



_____, 2023

Frances F. Huey Trust
c/o Bruce Huey, Trustee
615 E. Bijou Avenue
Fort Morgan, CO 80701

Dear Mineral Interest Owner,

As required by Colorado State Statute 24-65.5-103, I am notifying you that Pawnee Solar, LLC, a subsidiary of ACE DevCo, LLC, has submitted an application to the Morgan County Planning & Zoning Department for the Pawnee Solar Project, a prospective solar farm, located on property in Morgan County, Colorado in Section 35, Township 02N, Range 57W.

You are receiving this notice because you have been identified as a mineral estate owner with respect to the above referenced property.

The initial public hearing will be held before the Morgan County Planning & Zoning Commission on _____, at __pm at _____.

If you have any questions regarding this matter, please contact me at 720-296-3275.

Respectfully,

Anita Munkres
Real Estate Project Manager

The AES Corporation | 282 Century Place, #2000 | Louisville, CO 80027

Table 1. Mineral Rights Holders in the Pawnee II Solar Project Area

APN	Name	Address	City, State, Zip	Section #
1489-010-00-001 1491-060-00-001	Allan K. Timpe	P.O. Box 174	Camp Meeker, CA 95419	1
1489-010-00-001	Apple Creek, LLC, a Colorado Limited Liability Company	335 S. York Street	Denver, CO 80209	1
1489-010-00-001	Baca County Title, LLC, a Colorado Limited Liability Company	4295 South Fox Street	Englewood, CO 80110	1
1289-310-00-001 1291-240-00-001	Beth Fuller	2401 Brookwood	Fort Collins, CO 80525	31
1489-010-00-001	Blackland Petroleum, LLC, a Colorado Limited Liability Company	17190 E. Dorado Place	Centennial, CO 80015	1
1289-310-00-001 1291-240-00-001	Bruce Huey (Beth Fuller, Maud Huey-Kenyon, and Mary Huey-Leleiwi, as tenants in common, as Grantee-Beneficiaries)	615 E. Bijou Avenue	Fort Morgan, CO 80701	31
1489-010-00-001 1491-060-00-001	Calvin L. Timpe	14660 E. Floyd Ave.	Aurora, CO 80014	1
1289-300-00-001 1291-250-00-001 1289-310-00-001	Frances F. Huey Trust c/o Bruce Huey, Trustee	615 E. Bijou Avenue	Fort Morgan, CO 80701	31
1489-010-00-001	Gene F. Lang & Co., a Colorado Corporation	19751 E. Mainstreet, Suite 334	Parker, CO 80138	1
1289-310-00-001 1291-240-00-001	Joann Cecil	P.O. Box 40	Fort Morgan, CO 80701	31
1489-010-00-001 1491-060-00-001	Laural M. Brownell	34403 CR 34	Fleming, CO 80728	1

APN	Name	Address	City, State, Zip	Section #
1289-310-00-001 1291-240-00-001	Mary Huey-Leleiwi	620 E. Beaver Avenue	Fort Morgan, CO 80701	31
1289-310-00-001 1291-240-00-001	Maud Huey-Kenyon	900 Baseline Road, Chautauqua #18	Boulder, CO 80302	31
1289-300-00-001 1291-250-00-001 1289-310-00-001	Millard I. Huey Trust c/o Bruce Huey, Trustee	615 E. Bijou Avenue	Fort Morgan, CO 80701	30
1489-010-00-001	Powder Morning, LLC, a Colorado Limited Liability Company	100 Fillmore Street, Suite 450	Denver, CO 80206	1
1491-060-00-001	Rivendell Royalty Corp.	P.O. Box 1410	Edmond, OK 73083-1410	6
1489-010-00-001 1491-060-00-001	Ruth M. Klein	11780 Truitt Street	Sterling, CO 80751	1
1289-310-00-001 1291-240-00-001	Stephen Cecil	P.O. Box 40	Fort Morgan, CO 80701	31
1489-010-00-001	Stephen William Runge and Jo Ann Runge	811 N. Elm	Yuma, CO 80759	1
1289-300-00-001 1291-250-00-001 1289-310-00-001	The Estate of Georgia Lou Seward, deceased c/o Karen J. Seward	39101 County Road E	Yuma, CO 80759	30
1489-010-00-001	The Estate of Joe I. Perry, Deceased c/o Albert G. English	41831 Highway 63	Akron, CO 80720	1
1289-300-00-001 1291-250-00-001 1289-310-00-001	The Estate of Millicent H. Pletcher, deceased c/o Robert Huey Pletcher	4530 Saulsbury Street	Wheatridge, CO 80033	30

APN	Name	Address	City, State, Zip	Section #
1289-300-00-001 1291-250-00-001 1289-310-00-001	The Estate of Robert Lee Seward, aka Robert L. Seward, aka Robert Seward, aka Bob Seward, deceased c/o Karen J. Seward	39101 County Road E	Yuma, CO 80759	30
1489-010-00-001	The Heirs and Assigns of Asher B. Wilson, deceased	*TBD*		1
1491-060-00-001	The heirs and assigns of Herman H. Rediess, deceased c/o Herman Arthur Rediess	13538 Ryton Ridge Lane	Gainesville, VA 20155	6
1491-060-00-001	The heirs and assigns of Herman H. Rediess, deceased c/o Mildred Irene Bumgarner	128 Evans Rd	Sylva, NC 28779	6
1291-250-00-001	The Heirs and Assigns of Richard F. McClimans	*TBD*		25
1489-010-00-001	The Heirs and Assigns of Sally June Baker	*TBD*		1
1289-300-00-001	The United States of America Colorado Bureau of Land Management	2850 Youngfield Street	Lakewood, CO 80215	30

EXHIBIT 12

PROPERTY OWNERS WITHIN 1320 FEET

Pawnee II Solar BESS

SECTION 2-380 (G). Property Owners within 1,320 Feet

A list of names and addresses of property owners within thirteen hundred and twenty feet (1,320') of the perimeter of the area where the special use will be located.

Owner	Address	Parcel Number	Account Number
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	128918000000	R003158
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	128919000000	R003159
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	129113000000	R010914
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	129114000000	R010915
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	129135000000	R010922
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	129126000000	R010920
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	129123000000	R010916
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	129124000000	R010917
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	129125000000	R010919
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	128929000000	R003163
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	128930000000	R011121
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	128931000000	R003164
Cecil, Stephen & Joann	P.O. Box 102 Fort Morgan, CO 80701	128932000000	R003165
Cecil, Stephen W & Joann M	P.O. Box 102 Fort Morgan, CO 80701	148901000000	R011094
Cecil, Stephen W & Joann M	P.O. Box 102 Fort Morgan, CO 80701	149104000000	R002945
Cecil, Stephen W & Joann M	P.O. Box 102 Fort Morgan, CO 80701	149105000000	R002946
Cecil, Stephen W & Joann M	P.O. Box 102 Fort Morgan, CO 80701	149106000000	R002947
Cook, Jeffrey A	29152 County Road O.5 Brush, CO 80723	128932000000	R003129

Owner	Address	Parcel Number	Account Number
Cook, Jeffrey A	29152 County Road O.5 Brush, CO 80723	128933000000	R003130
Cook, Michael L & Sandra K	18282 County Road 25 Brush, CO 80723	149104000000	R003128
Glenn Ranch & Cattle Company RLLLP	6432 County Road 19 Fort Morgan, CO 80701	129133000000	R011160
Glenn Ranch & Cattle Company RLLLP	6432 County Road 19 Fort Morgan, CO 80701	148901000000	R010878
Glenn Ranch & Cattle Company RLLLP	6432 County Road 19 Fort Morgan, CO 80701	148902000000	R010879
Glenn Ranch & Cattle Company RLLLP	6432 County Road 19 Fort Morgan, CO 80701	148903000000	R011151
Glenn Ranch & Cattle Company RLLLP	6432 County Road 19 Fort Morgan, CO 80701	129115000000	R010712
Glenn Ranch & Cattle Company RLLLP	6432 County Road 19 Fort Morgan, CO 80701	129128000000	R011154
Shifting Sands Ranch LLC	P.O. Box 175 Roggen, CO 80652	148912000000	R011093
Shifting Sands Ranch LLC	P.O. Box 175 Roggen, CO 80652	149107000000	R002906
Shifting Sands Ranch LLC	P.O. Box 175 Roggen, CO 80652	149108000000	R002923
Shifting Sands Ranch LLC	P.O. Box 175 Roggen, CO 80652	149109000000	R002924
State of Colorado - Board of Land Commissioners	1313 Sherman Street Room 620 Denver, CO 80203	129136000000	R802772
State of Colorado - Board of Land Commissioners	1313 Sherman Street Room 620 Denver, CO 80203	129123000000	R802771

EXHIBIT 13

PROOF OF CURRENT PAID TAXES

Pawnee I Solar BESS

Morgan County Treasurer
Statement of Taxes Due

Account Number R002947	Parcel 149106000001
Assessed To	CECIL, STEPHEN W & JOANN M P O BOX 102 FORT MORGAN, CO 80701

Legal Description **Situs Address**

S: 06 T: 1 R: 56 ALL (CORRECTION SECTION)

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	$541.16	$0.00	$0.00	$0.00	$541.16
Total Tax Charge					$541.16
Grand Total Due as of 01/10/2023					**$541.16**

Tax Billed at 2022 Rates for Tax Area 204 - 204 - RE 2J

Authority	Mill Levy	Amount
COUNTY GENERAL FUND	19.4830000	$117.68
ROAD AND BRIDGE FUND	7.5000000	$45.30
SOCIAL SERVICES FUND	2.0000000	$12.08
BRUSH RURAL FIRE DIST	3.5130000	$21.22
E MORGAN COUNTY HOSPITAL	4.5000000	$27.18
E MORGAN COUNTY LIBRARY	3.5000000	$21.14
RE 2-J BRUSH GENERAL FD	27.0400000	$163.32
RE 2-J BRUSH M/L OVRD	9.3120000	$56.25
RE 2-J BRUSH BOND RED	12.7470000	$76.99
Taxes Billed 2022	89.5950000	$541.16

Values	Actual	Assessed
GRAZING LAND	$22,890	$6,040
Total	$22,890	$6,040

**********TAX LIEN SALE REDEMPTIONS MUST BE PAID BY CASH OR CASHIER'S CHECK**********

Special taxing districts and the boundaries of such districts may be on file with the County Commissioners, County Clerk, or County Assessor. Unless specifically mentioned, this statement does not include land or improvements assessed under a separate account number, personal property taxes, transfer tax or miscellaneous tax collected on behalf of other entities, special or local improvement district assessments, or manufactured homes.

ROBERT A SAGEL, MORGAN COUNTY TREASURER
231 Ensign St, PO Box 593, Fort Morgan, CO 80701
Phone: 970-542-3518, Fax: 970-542-3520, Email: esale@co.morgan.co.us
Website: morgancounty.colorado.gov

Morgan County Treasurer
Statement of Taxes Due

Account Number R003164
Parcel 128931000001

Assessed To
CECIL, STEPHEN & JOANN
P O BOX 40
FORT MORGAN, CO 80701

Legal Description
S: 31 T: 2 R: 56 ALL (CORRECTION SECTION)

Situs Address

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	$539.36	$0.00	$0.00	$0.00	$539.36
Total Tax Charge					$539.36
Grand Total Due as of 01/10/2023					**$539.36**

Tax Billed at 2022 Rates for Tax Area 204 - 204 - RE 2J

Authority	Mill Levy	Amount
COUNTY GENERAL FUND	19.4830000	$117.28
ROAD AND BRIDGE FUND	7.5000000	$45.15
SOCIAL SERVICES FUND	2.0000000	$12.04
BRUSH RURAL FIRE DIST	3.5130000	$21.15
E MORGAN COUNTY HOSPITAL	4.5000000	$27.09
E MORGAN COUNTY LIBRARY	3.5000000	$21.07
RE 2-J BRUSH GENERAL FD	27.0400000	$162.78
RE 2-J BRUSH M/L OVRD	9.3120000	$56.06
RE 2-J BRUSH BOND RED	12.7470000	$76.74
Taxes Billed 2022	89.5950000	$539.36

Values	Actual	Assessed
GRAZING LAND	$22,760	$6,010
FARM/RANCH WASTE LAND	$10	$10
Total	$22,770	$6,020

**********TAX LIEN SALE REDEMPTIONS MUST BE PAID BY CASH OR CASHIER'S CHECK**********

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231 Ensign St, PO Box 593, Fort Morgan, CO 80701
Phone: 970-542-3518, Fax: 970-542-3520, Email: esale@co.morgan.co.us
Website: morgancounty.colorado.gov

Morgan County Treasurer
Statement of Taxes Due

Account Number R010919
Parcel 129125000001

Assessed To
CECIL, STEPHEN & JOANN
P O BOX 40
FORT MORGAN, CO 80701

Legal Description
S: 25 T: 2 R: 57 ALL

Situs Address

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	$415.76	$0.00	$0.00	$0.00	$415.76
Total Tax Charge					$415.76
Grand Total Due as of 01/10/2023					**$415.76**

Tax Billed at 2022 Rates for Tax Area 259 - 259 - RE 3

Authority	Mill Levy	Amount
COUNTY GENERAL FUND	19.4830000	$115.34
ROAD AND BRIDGE FUND	7.5000000	$44.40
SOCIAL SERVICES FUND	2.0000000	$11.84
BRUSH RURAL FIRE DIST	3.5130000	$20.80
RE 3 F M GENERAL FD	27.0840000	$160.34
RE 3 F M M/L OVRD	1.7730000	$10.50
RE 3 F M BOND RED	8.8740000	$52.54
Taxes Billed 2022	70.2270000	$415.76

Values	Actual	Assessed
GRAZING LAND	$22,440	$5,920
Total	$22,440	$5,920

**********TAX LIEN SALE REDEMPTIONS MUST BE PAID BY CASH OR CASHIER'S CHECK**********

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ROBERT A SAGEL, MORGAN COUNTY TREASURER
231 Ensign St, PO Box 593, Fort Morgan, CO 80701
Phone: 970-542-3518, Fax: 970-542-3520, Email: esale@co.morgan.co.us
Website: morgancounty.colorado.gov

Morgan County Treasurer
Statement of Taxes Due

Account Number R010917
Parcel 129124000001

Assessed To
CECIL, STEPHEN & JOANN
P O BOX 40
FORT MORGAN, CO 80701

Legal Description
S: 24 T: 2 R: 57 ALL

Situs Address

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	$419.24	$0.00	$0.00	$0.00	$419.24
Total Tax Charge					$419.24
Grand Total Due as of 01/10/2023					**$419.24**

Tax Billed at 2022 Rates for Tax Area 259 - 259 - RE 3

Authority	Mill Levy	Amount
COUNTY GENERAL FUND	19.4830000	$116.31
ROAD AND BRIDGE FUND	7.5000000	$44.77
SOCIAL SERVICES FUND	2.0000000	$11.94
BRUSH RURAL FIRE DIST	3.5130000	$20.97
RE 3 F M GENERAL FD	27.0840000	$161.69
RE 3 F M M/L OVRD	1.7730000	$10.58
RE 3 F M BOND RED	8.8740000	$52.98
Taxes Billed 2022	70.2270000	$419.24

Values	Actual	Assessed
GRAZING LAND	$22,520	$5,950
FARM/RANCH WASTE LAND	$60	$20
Total	$22,580	$5,970

**********TAX LIEN SALE REDEMPTIONS MUST BE PAID BY CASH OR CASHIER'S CHECK**********

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ROBERT A SAGEL, MORGAN COUNTY TREASURER
231 Ensign St, PO Box 593, Fort Morgan, CO 80701
Phone: 970-542-3518, Fax: 970-542-3520, Email: esale@co.morgan.co.us
Website: morgancounty.colorado.gov

Morgan County Treasurer
Statement of Taxes Due

Account Number R011121	Parcel 128930000001
Assessed To	CECIL, STEPHEN & JOANN P O BOX 40 FORT MORGAN, CO 80701

Legal Description

S: 30 T: 2 R: 56 ALL

Situs Address

24758 CO RD K

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	$2,794.04	$0.00	$0.00	$0.00	$2,794.04
Total Tax Charge					$2,794.04
Grand Total Due as of 01/10/2023					**$2,794.04**

Tax Billed at 2022 Rates for Tax Area 264 - 264 - RE 3

Authority	Mill Levy	Amount
COUNTY GENERAL FUND	19.4830000	$728.48
ROAD AND BRIDGE FUND	7.5000000	$280.42
SOCIAL SERVICES FUND	2.0000000	$74.78
BRUSH RURAL FIRE DIST	3.5130000	$131.35
E MORGAN COUNTY HOSPITAL	4.5000000	$168.25
RE 3 F M GENERAL FD	27.0840000	$1,012.67
RE 3 F M M/L OVRD	1.7730000	$66.29
RE 3 F M BOND RED	8.8740000	$331.80
Taxes Billed 2022	74.7270000	$2,794.04

Values	Actual	Assessed
GRAZING LAND	$22,660	$5,980
FARM/RANCH WASTE LAND	$10	$10
FARM/RANCH RESIDENCE	$136,340	$9,480
FARM/RANCH SUPPORT IMPS	$83,020	$21,920
Total	$242,030	$37,390

**********TAX LIEN SALE REDEMPTIONS MUST BE PAID BY CASH OR CASHIER'S CHECK**********

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ROBERT A SAGEL, MORGAN COUNTY TREASURER
231 Ensign St, PO Box 593, Fort Morgan, CO 80701
Phone: 970-542-3518, Fax: 970-542-3520, Email: esale@co.morgan.co.us
Website: morgancounty.colorado.gov

Morgan County Treasurer
Statement of Taxes Due

Account Number R011094
Parcel 148901000001

Assessed To
CECIL, STEPHEN W & JOANN M
P O BOX 102
FORT MORGAN, CO 80701

Legal Description
S: 01 T: 1 R: 57 E1/2 (CORRECTION SECTION)

Situs Address

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	$209.96	$0.00	$0.00	$0.00	$209.96
Total Tax Charge					$209.96
Grand Total Due as of 01/10/2023					**$209.96**

Tax Billed at 2022 Rates for Tax Area 259 - 259 - RE 3

Authority	Mill Levy	Amount
COUNTY GENERAL FUND	19.4830000	$58.26
ROAD AND BRIDGE FUND	7.5000000	$22.42
SOCIAL SERVICES FUND	2.0000000	$5.98
BRUSH RURAL FIRE DIST	3.5130000	$10.50
RE 3 F M GENERAL FD	27.0840000	$80.97
RE 3 F M M/L OVRD	1.7730000	$5.30
RE 3 F M BOND RED	8.8740000	$26.53
Taxes Billed 2022	70.2270000	$209.96

Values	Actual	Assessed
GRAZING LAND	$11,340	$2,990
Total	$11,340	$2,990

**********TAX LIEN SALE REDEMPTIONS MUST BE PAID BY CASH OR CASHIER'S CHECK**********

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ROBERT A SAGEL, MORGAN COUNTY TREASURER
231 Ensign St, PO Box 593, Fort Morgan, CO 80701
Phone: 970-542-3518, Fax: 970-542-3520, Email: esale@co.morgan.co.us
Website: morgancounty.colorado.gov

EXHIBIT 14

ROAD AGREEMENT

Pawnee II Solar BESS

SECTION 4-895 (K). ROAD AGREEMENT

If any County roads will be used during construction of a solar collector facility for the purpose of transporting parts, materials and/or equipment, the applicant shall enter into a road agreement with the County. The roads agreement shall comply with Section 4-825 and shall also include the following:

(1) A map showing which County roads will be used during construction.

(2) A pre-construction baseline survey of County roads to be used during construction to document their pre-construction condition. The applicant is responsible for obtaining and paying for the costs of the baseline survey.

(3) A mitigation plan to address traffic congestion and potential impacts to County roads to be used during construction.

(4) *A legally binding agreement between the applicant and the County that requires the applicant to return any County roads to their pre-construction baseline condition.*

Pawnee Solar 2 LLC will, at the appropriate time prior to the start of construction, enter into a Road Use Agreement with Morgan County which will document the pre-construction road conditions and commit to repair damage to County roads caused during construction of the Project so that roads will be restored to their pre-construction conditions. All potential adverse impacts-based mitigation measures, specifically related to traffic impacts, have been disclosed in the Environmental Impact Analysis section of this SUP application (Exhibit 2).

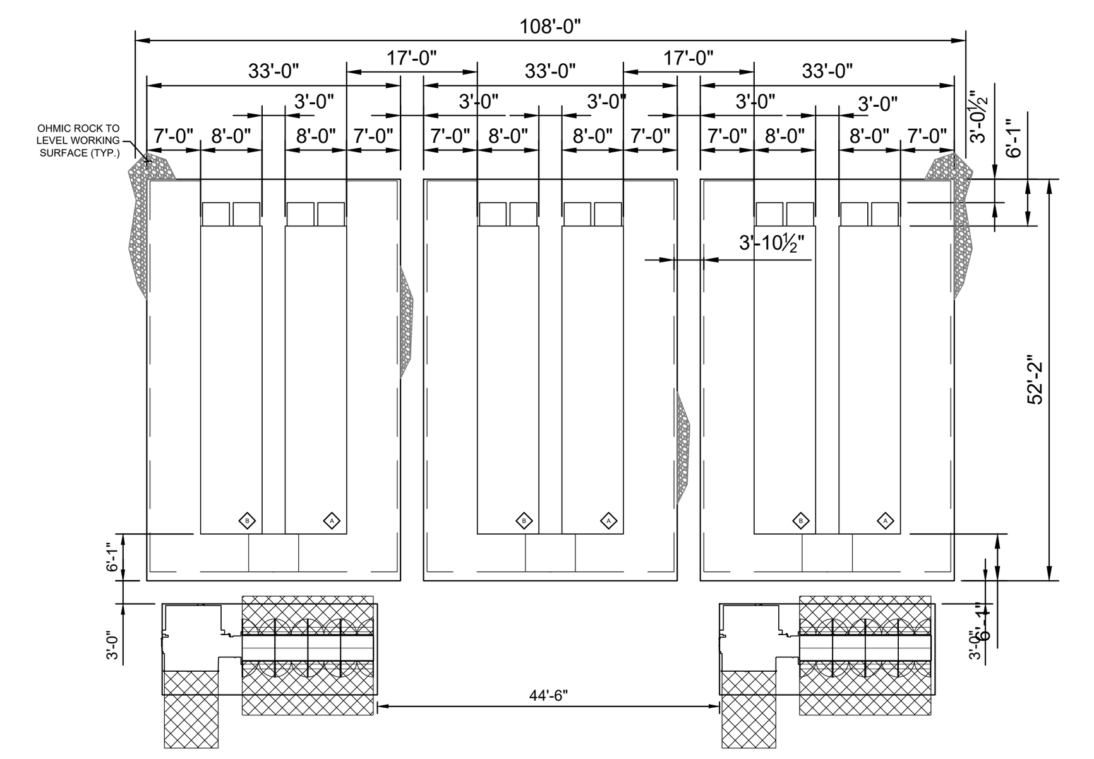
The main Project entrance is proposed along County Road K in Morgan County. Based on a pre-construction baseline survey of applicable County roads to be used during construction, Pawnee Solar 2 LLC will be responsible for any road repairs and/or improvements consistent with the Road Use Agreement. Fugitive dust generated on access roads during construction would be managed through the application of either water or dust control chemicals and would be addressed in the Road Use Agreement.

Pawnee Solar 2 LLC will consult with the Morgan County Road and Bridge Department to plan and design final transportation routing to avoid or minimize, to the extent practical, safety issues associated with the use of approved haul routes. Following construction, Pawnee Solar 2 LLC will repair damage to the approved haul routes sustained during construction of the Pawnee II Solar BESS Project to a condition equal to the existing roadway conditions prior to construction, consistent with the Road Use Agreement to be negotiated with Morgan County. Pawnee Solar 2 LLC will document road conditions using pre- and post-construction surveys using video and/or photographs to evaluate the damages.

EXHIBIT 15

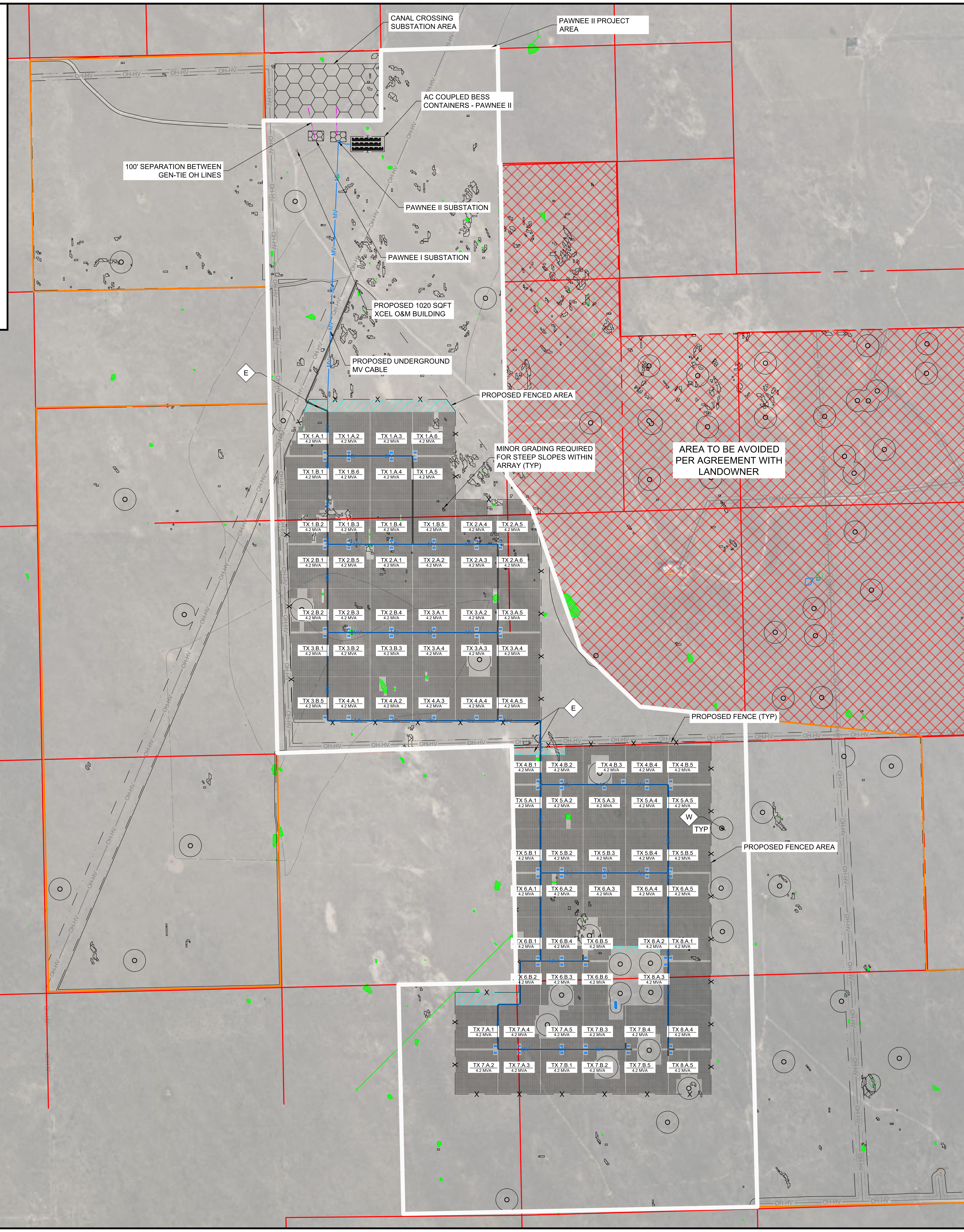
ELECTRICAL DIAGRAM

Pawnee II Solar BESS



1 TYPICAL PCS AND BESS EQUIPMENT DETAIL

SCALE: 1" = 25'



GENERAL NOTES

1. PRELIMINARY - NOT FOR CONSTRUCTION
2. THIS DRAWING IS FOR DIAGRAMMATIC PURPOSES ONLY. LOCATION OF ALL EXISTING ITEMS SHOWN IS APPROXIMATE AND MUST BE VERIFIED IN FINAL DESIGN.
3. ALL SPECIFIED EQUIPMENT IS PRELIMINARY, FINAL EQUIPMENT SELECTION SHALL BE APPROVED BY OWNER.

SHEET NOTES

E — SITE ENTRANCE

W — GAS WELL

TYP

LEGEND

EXISTING

- PROPERTY LINE
- 20' SETBACK
- 10' ELEVATION CONTOURS
- 2' ELEVATION CONTOURS
- MAJOR PUBLIC ROAD
- SLOPE KEEPOUT AREA
- APPROXIMATE WETLAND
- FLOOD ZONE >2'
- NHD WATERBODY
- OH-HV — OVERHEAD TRANSMISSION LINE

PROPOSED

- SITE BOUNDARY
- LIMITS OF DISTURBANCE (LOD)
- X — FENCE
- PROVISIONS FOR 2' DEEP WATER QUALITY MANAGEMENT
- UTILITY SWITCHYARD
- AES SUBSTATION
- OH-HV — XXXKV OVERHEAD GEN-TIE LINE
- INTERIOR ROADS
- LAYDOWN AREA
- MV — UG MV FEEDER
- XFMR SKID
- PV PANELS

SYSTEM DETAILS

AC CAPACITY AT POI	250 MW
DC CAPACITY	333.8 MW
DC:AC RATIO AT POI	1.34
DESIGN TEMPERATURE	34.6° C
JINKO JKM535N-72HL4-TV MODULE COUNT	610,551
STRING SIZE	27 MODULES
PITCH	24.87'
INTER-ROW SPACING (MODULE TO MODULE)	17.41'
GCR	30%
GPTECH 3MWD3-V690 PCS COUNT	63
PCS NAMEPLATE RATING	4.2 MVA @ STC
RACKING TYPE	NEXTRACKER HORIZON 1P
TRACKER MOTOR COUNT	7927
2 STRING TRACKER ROWS	673
3 STRING TRACKER ROWS	7254
BESS CAPACITY AT POI	125 MW
BESS DURATION	4 HR
ENERGY CAPACITY AT POI BOL	680 MWh
ENERGY CAPACITY AT POI EOL	544 MWh
BATTERY MODULE (MANUF - MODEL)	SAMSUNG-E5D
AC COUPLED BESS INVERTER COUNT	37
CONTAINER TYPE	CEN 40 Rack
CONTAINER COUNT BOL	111
CONTAINER COUNT EOL	111
STRINGS PER CONTAINER BOL	19/20
STRINGS PER CONTAINER EOL	19/20
TOTAL PARCEL ACREAGE	5995
LINEAR FEET OF FENCE	71,574'
FENCED ACREAGE	1612.9
LINEAR FEET OF INTERIOR ROADS*	60728.85'
LAYDOWN AREA (ACRES)	52.5
WATER QUALITY MANAGEMENT TOTAL AREA (ACRES)	52.6

PRELIMINARY

NOT FOR CONSTRUCTION

aes

2180 South 1300 East, Suite 600
Salt Lake City, UT 84106-2749
(801) 679 - 3500

PE STAMP:

KEY PLAN:

REVISIONS:

NO.	DATE	DESCRIPTION
0	08/18/2022	PRELIMINARY 5% DESIGN
1	10/19/2022	AES 10% DESIGN
2	11/30/2022	UPDATED LAYOUT
3	01/10/2023	UPDATED LAYOUT
4	01/23/2023	UPDATED PROJECT BOUNDARY

PROJECT TITLE:

PAWNEE SOLAR II

PROJECT LOCATION:

FORT MORGAN, MORGAN COUNTY, COLORADO (40.127571, -103.712091)

SHEET TITLE & DESCRIPTION:

OVERALL ELECTRICAL LAYOUT

PAWNEE II: 250 MW PV + 125 MW AC COUPLED BESS

PROJ NUM:	
DES:	N. ANDEER
DWN:	Z. ELLERBY
CHK:	C. SANCHEZ
APV:	
DATE:	08/18/2022
SCALE AT 24" x 36":	AS NOTED
SHEET NO: PV-E.01.01	REV: 4

AES Titleblock 24X36 v210209

PLOTTED: 1/23/2023 9:42 AM
C:\AESCloud\Box\2. Projects\PSCo Large Scale\Pawnee II\4. Engineering\4. Design Sets\4.4.1 Dev Eng CAD\4.4.1.3 System Layout\Pawnee II-PV-E.01.01-Overall Electrical Plan.dwg
XREFs: ..\Pawnee-ALTA adjustment.dwg; ..\Pawnee-2ft Contours.dwg; ..\Pawnee-Buildable Area_08-10-2022.dwg