

Exhibit C

Project Location and Maps

Nolin Hills Wind Power Project

February November 2020

Prepared for



RESPONSIBLE ENERGY
FOR TOMORROW

d/b/a Nolin Hills Wind, LLC

Prepared by



Tetra Tech, Inc.

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Acronyms and Abbreviations

Applicant	Nolin Hills Wind, LLC
ASC	Application for Site Certificate
<u>BESS</u>	<u>battery energy storage system</u>
<u>GE</u>	<u>General Electric</u>
kV	kilovolt
MW	megawatt
OAR	Oregon Administrative Rules
O&M	Operations and maintenance building
Project	Nolin Hills Wind Power Project

1.0 Introduction

Nolin Hills Wind, LLC (the Applicant) proposes to construct the Nolin Hills Wind Power Project (Project), a wind and solar energy project with a nominal generating capacity of approximately 350 600 megawatts (MW) and up to 117 397 average MW of energy (preliminarily 340 MW of wind generation and 260 MW of solar generation) located in Umatilla County, Oregon. The Project comprises up to 116 112 wind turbine generators, depending on the turbine model selected and the final layout determined during the micrositing process. If larger turbines are selected, fewer turbines will be installed. The solar array will include up to approximately 1,117,591 solar modules, depending on the final technology and layout selected. The Project will interconnect to the regional grid via either a transmission line leading from the northern Project substation northwest to the Umatilla Electric Cooperative Cottonwood Substation in Hermiston, or a new 230-kilovolt transmission line to the proposed Bonneville Power Administration Stanfield Substation, north of the town of Nolin. Other Project components include electrical collection lines, substations, a battery energy storage system (BESS), site access roads, one operations and maintenance building, meteorological data collection towers, and temporary construction yards. These facilities are all described in greater detail in Exhibit B. This exhibit contains information about the location of the Project under Oregon Administrative Rules (OAR) 345-021-0010(1)(c).

2.0 General Location – OAR 345-021-0010(1)(c)(A)

OAR 345-021-0010(1)(c) Information about the location of the proposed facility, including:

OAR 345-021-0010(1)(c)(A) A map or maps showing the proposed locations of the energy facility site, all related or supporting facility sites and all areas that might be temporarily disturbed during construction of the facility in relation to major roads, water bodies, cities and towns, important landmarks and topographic features, using a scale of 1 inch = 2000 feet or smaller when necessary to show detail;

The Project is entirely in northwestern Umatilla County, Oregon, as shown on the following maps:

- Figure C-1 is a vicinity map showing county and state boundaries, major roads, communities, and other recognizable features within approximately 40 miles of the Project.
- Figure C-2 is a facility location map depicting the proposed Site Boundary in relation to nearby major roads, water bodies, cities and towns, county boundaries, land ownership categories, and other geographic features.
- Figure C-3 shows other energy generation facilities that are known to be operating or proposed within 10 miles of the proposed Site Boundary.
- Figure C-4 provides site layout detail maps for Turbine Option 1, which consists of up to 58 the full Site Boundary Siemens Gamesa 6.0 MW turbines. Figures include large-scale

maps (Figures C-4.1 through C-4.38) showing the proposed micrositing corridor, and wind turbine configuration, and solar siting area boundary, including the locations of related or supporting facilities.

- ~~Figure C-5 provides site layout detail maps for Turbine Option 2, which consists of up to 116 General Electric (GE) 3.03 MW turbines. Figures include large scale maps (Figures C-5.1 through C-5.38) showing the proposed micrositing corridor and wind turbine configuration, including the locations of related or supporting facilities.~~
- Figure C-5 provides site layout details centered on the solar siting area, including illustrating the location of BESS options.

Although Figures C-4 and C-5 show ~~turbine Project component~~ locations, the intent of this application is to permit the micrositing corridors and solar siting area within the Site Boundary. Therefore, the turbine locations and solar array configuration as shown should be considered conceptual in nature and representative of a constructible design. These ~~turbine locationssite plans~~ are used for impact calculation purposes only, and are subject to change at the time of construction, with impacts less than or equal to the impacts presented in the Application for Site Certificate (ASC).

3.0 Location and Disturbance Areas – OAR 345-021-0010(1)(c)(B)

OAR 345-021-0010(1)(c)(B) A description of the location of the proposed energy facility site, the proposed site of each related or supporting facility and areas of temporary disturbance, including the total land area (in acres) within the proposed site boundary, the total area of permanent disturbance, and the total area of temporary disturbance. If a proposed pipeline or transmission line is to follow an existing road, pipeline or transmission line, the applicant must state to which side of the existing road, pipeline or transmission line the proposed facility will run, to the extent this is known;

The proposed Site Boundary encompasses a total of approximately 48,077 ~~196~~ acres of privately-owned land. Table C-1 identifies the Public Land Survey System sections in which the Site Boundary is located.

Table C-1. Location of Site Boundary by Township, Range, and Section

Township	Range	Section
1N	29E	1, 2, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 34, 35, 36
1N	30E	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34
2N	28E	1, 12
2N	29E	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 35, 36
2N	30E	2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36

Township	Range	Section
3N	27E	1
3N	28E	5, 6, 8, 7, 17, 19, 20, 23, 24, 25, 26, 27, 28, 29, 30, 36
3N	29E	19, 25, 30, 31, 35, 36
<u>3N</u>	<u>30E</u>	<u>31</u>
4N	27E	25, 26
4N	28E	30, 31

As noted in Exhibit B, a micrositing corridor is established within the Site Boundary. Project facilities will be constructed within the micrositing corridor. This approach allows some flexibility with specific component locations and design in response to site-specific conditions and engineering requirements that will be determined prior to construction. The micrositing corridor includes approximately ~~13,868~~15.726 acres. Within this area, the solar siting area encompasses 1,896 acres to accommodate the solar array, BESS, and associated roads and electrical infrastructure.

As described in Exhibit B, in order to allow flexibility in the choice of wind turbines available at the time of construction, this ASC analyzes impacts for ~~two~~the maximum turbine model ~~dimensions and number of turbines under consideration for the Project~~ that represent a range of alternative turbine technologies. For each of the ~~two~~ turbine models, a sample layout, including related or supporting facilities, has been prepared to represent maximum potential impacts. ~~Turbine Option 1 utilizes up to 58 Siemens Gamesa 6.0 MW turbines, along with the related or supporting facilities needed to support energy generation and transmission. Turbine Option 2~~The preliminary wind energy turbine layout utilizes up to 116~~112~~ General Electric 3.03-MW turbines, along with their corresponding related or supporting facilities. The final layout will have ~~58 to 116~~ turbines, with any combination of turbines within the size and characteristics described herein. The total number of turbines will not exceed ~~116~~112, and the total wind generation capacity will not exceed 350 MW. Analyzing impacts for two turbine types allows for the representation of a range of turbine technologies that are currently available. The solar configuration may also differ from that depicted in Figure C-5; however, solar facilities, including the BESS, will only be constructed within the solar siting area and the total area will not exceed the maximum 1,896-acre disturbance provided in this exhibit.

Table C-2 presents assumptions regarding disturbance areas related to the Project. These assumptions were used to calculate areas of temporary and permanent disturbance for ~~Turbine Option 1 and Turbine Option 2~~the Project, as presented in Attachment C-1, and Attachment C-2, respectively.

Table C-2. Disturbance Assumptions

Disturbance Type	Temporary Disturbance	Permanent Disturbance
Wind Turbines	6.5 acres per turbine based on a 600-foot-diameter circle, subtracting the permanent disturbance area. Includes a temporary laydown area at each turbine location.	5,274 square feet per turbine, based on a 82-foot-diameter circle; includes graveled area of pad, transformer, foundation, and graveled area for each tower.
Overhead 34.5-kilovolt (kV) Collector Lines	35-foot corridor for vehicle traffic and laydown along the full extent of the overhead collector lines, subtracting the overlapping permanent road disturbance area.	3-foot-diameter footprint per pole; monopole structures spaced approximately 225 feet apart; <u>within solar siting area, disturbance included in overall total.</u>
Underground 34.5-kV Collector Lines	35-foot corridor per collector line (with overlap merged for adjacent lines) for trench width, vehicle traffic, and laydown along the full extent of the underground collector line route, subtracting overlapping permanent road disturbance area.	No permanent disturbance; <u>within solar siting area, disturbance included in overall total.</u>
230-kV Project Substation Connector Line	108200 foot corridor for vehicle traffic and laydown along the full length of route, <u>except in identified locations of sensitive habitat where narrowed to 50-foot corridor, and In addition, 0.75 acres per pulling and tensioning area.</u>	4-foot-diameter footprint per pole, two poles per structure (H-frame configuration) spaced approximately 600 feet apart.
230-kV Umatilla Electric Cooperative Cottonwood Transmission Line Route	12200 foot corridor for vehicle traffic and laydown along the full length of route, <u>except in identified locations of sensitive habitat where narrowed to 50-foot corridor.</u>	5-foot-diameter footprint per pole with small percentage 10-foot diameter footprint (average 21 square feet per pole); monopole structures spaced approximately 600 feet apart.
230-kV Bonneville Power Administration Stanfield Transmission Line Route	108200 foot corridor for vehicle traffic and laydown along the full length of route, <u>except in identified locations of sensitive habitat where narrowed to 50-foot corridor. As only one would be used, acreage for the larger of the two alternative corridor locations included in disturbance.</u>	4-foot-diameter footprint per pole, two poles per structure (H-frame configuration) spaced approximately 600 feet apart. <u>As only one would be used, acreage for the larger of the two alternative corridor locations included in disturbance.</u>
Meteorological Towers	154,750 square-feet per tower, subtracting the permanent tower disturbance area.	1,764 square feet per tower, includes an approximately 24- by 24-foot foundation with surrounding graveled area extending approximately 18 feet beyond the edge of the foundation, for a total 42- by 42-foot permanent area.

Disturbance Type	Temporary Disturbance	Permanent Disturbance
Existing Access Roads to Be Improved	66-foot disturbance width, consisting of an 82-foot corridor, less the width of the existing road (assumed 16-foot width).	No permanent disturbance.
New Access Roads	66-foot disturbance width, consisting of an 82-foot corridor, less the 16-foot width of the permanent road disturbance.	16-foot corridor along the full length of all new access roads; <u>within solar siting area, disturbance included in overall total.</u>
Crane Paths	75-foot corridor for crane paths not co-located with new or existing access roads; where adjacent to access roads, subtracted overlapping permanent road disturbance.	No permanent disturbance.
Substations	50-foot buffer width from edge of permanent impact area of each substation.	10.5 acres for the northern substation and 5.9 acres for the southern substation, as designed, for maximum potential permanent disturbance. <u>For calculation, northern substation within permanent footprint of solar siting area.</u>
Construction Yards	1 central construction staging area (includes batch plant); 11 small distributed staging areas; all other temporary laydown areas adjacent to turbine locations or included in temporary impact corridors.	<u>No permanent disturbance at distributed staging areas; for maximum calculation, central construction yard within permanent footprint of solar siting area.</u>
O&M (Operations and Maintenance) Building	50-foot buffer width from edge of permanent impact area of the O&M Building.	<u>7.6-acres fence enclosed; within permanent footprint of solar siting area.</u>
<u>Solar Siting Area</u>	<u>6-foot exterior buffer along full length of fence line. All disturbance within fence line assumed to be permanent.</u>	<u>Entire area within fence line assumed to be permanently disturbed (approx. 1,896 acres); includes interior access roads, 34.5-kV collector lines, all solar and BESS components, as well as Project facilities noted as within fence line for purposes of maximum calculation (i.e., central construction yard, northern Project substation, O&M Building). Actual fencing of individual components may be constructed differently within overall permanent footprint.</u>

The individual component impact areas (for roads, laydown areas, towers, etc.) were calculated using preliminary design data, and represent the Applicant's best estimate of preliminary impacts for each

component. However, the individual component impacts do not sum to the totals shown at the bottom of ~~each the~~ table in Attachment C-1 and Attachment C-2. This is because many of the individual component impact areas will overlap, including but not limited to the features noted above in Table C-2 that are depicted within the solar siting area for analysis; simply summing the component impact areas would indicate greater impacts than would actually occur. Instead, the totals were calculated using consolidated data, with areas of overlap eliminated, to estimate total temporary and permanent impact areas. In addition, while Figure C-4 depicts two alternative corridors for the BPA Stanfield 230-kV transmission line route where it parallels the existing 500-kV transmission line, only the maximum disturbance from selecting a single corridor is included in the impact calculation. As a result, ~~Turbine Option 1~~ the Project will temporarily impact a total of approximately 1,302~~2,075~~ acres and permanently impact approximately ~~87~~2,035 acres. ~~Turbine Option 2 will temporarily impact approximately 1,821 acres and permanently impact approximately 123 acres~~ (Attachments C-1 and C-2).

4.0 Relation to Other Energy Generation Facilities – OAR 345-021-0010(1)(c)(C)

OAR 345-021-0010(1)(c)(C) For energy generation facilities, a map showing the approximate locations of any other energy generation facilities that are known to the applicant to be permitted at the state or local level within the study area as defined in OAR 345-001-0010 for impacts to public services.

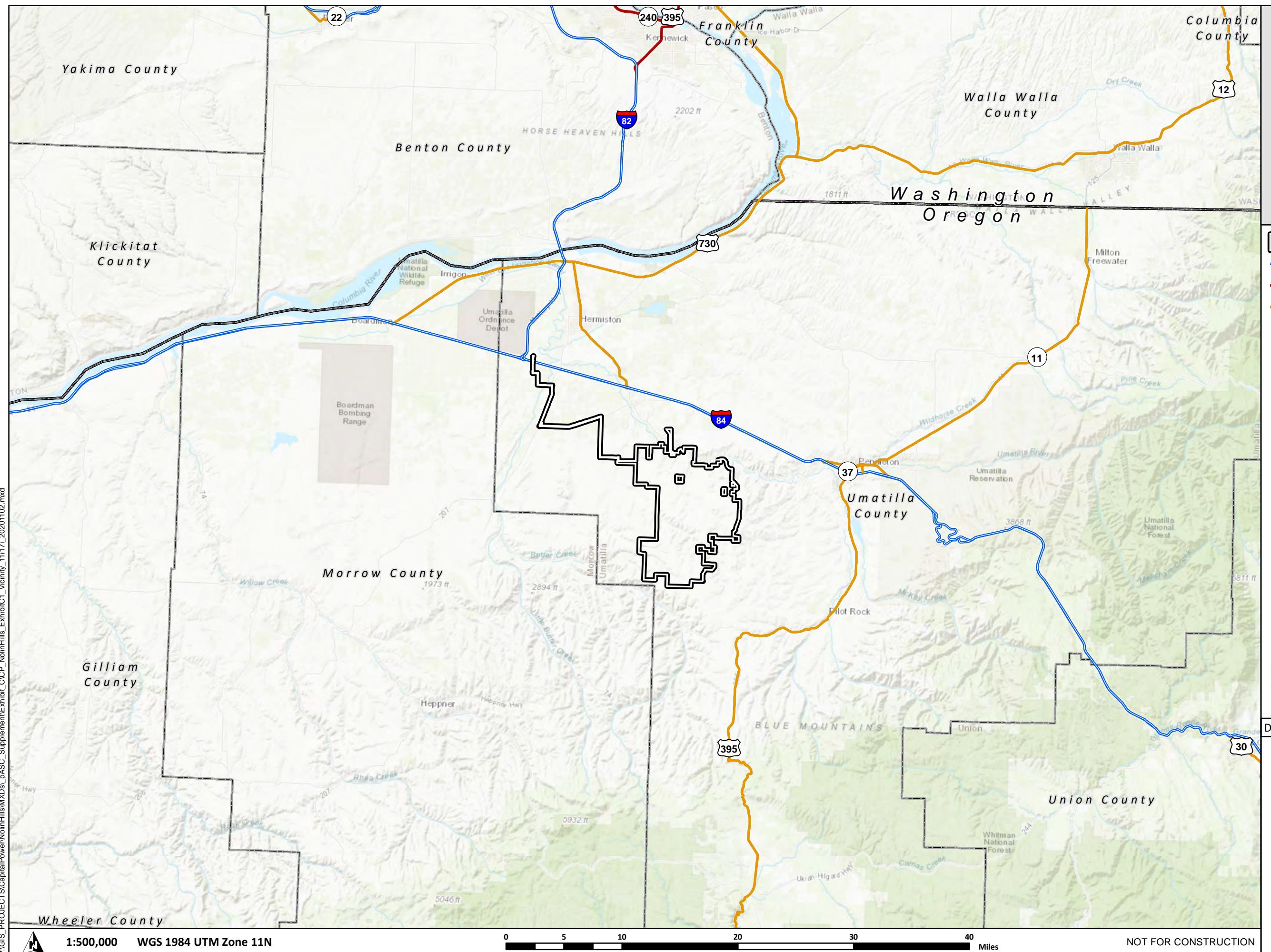
Figure C-3 shows the location of the Project in relation to other energy generation facilities that are known to the Applicant to be permitted or proposed at the state or local level within 10 miles of the Site Boundary. Based on the level of detail available in current data, Figure C-3 includes energy generation facilities currently operating and proposed; proposed facilities may include some that are already permitted, and others under state or local review. Within 10 miles of the Site Boundary, there ~~are is~~ four one operating wind farms, the Combine Hills, Echo, Stateline, and Vansycle Ridge Wind Energy facilities. In addition, the Wheatridge Wind Energy Facility is currently under construction in Morrow County. Other currently operating energy facilities in the study area include two hydropower plant and two natural gas plants, as well as several in-service transmission lines. Additional proposed facilities within the study area include two hydropower projects, four natural gas projects, eight solar projects, part of one proposed wind project, and three proposed transmission lines (Figure C-3). Figure C-3 also shows facilities identified outside of the 10-mile study area.

Figures

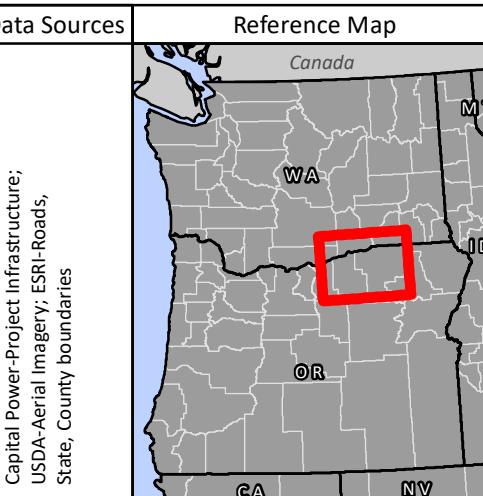
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**Nolin Hills
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**Figure C-1
Vicinity Map**



- Proposed Site Boundary
- Interstate Highway
- Primary Highway
- Secondary Highway
- State Boundary
- County Boundary



**Nolin Hills
Wind Power Project**

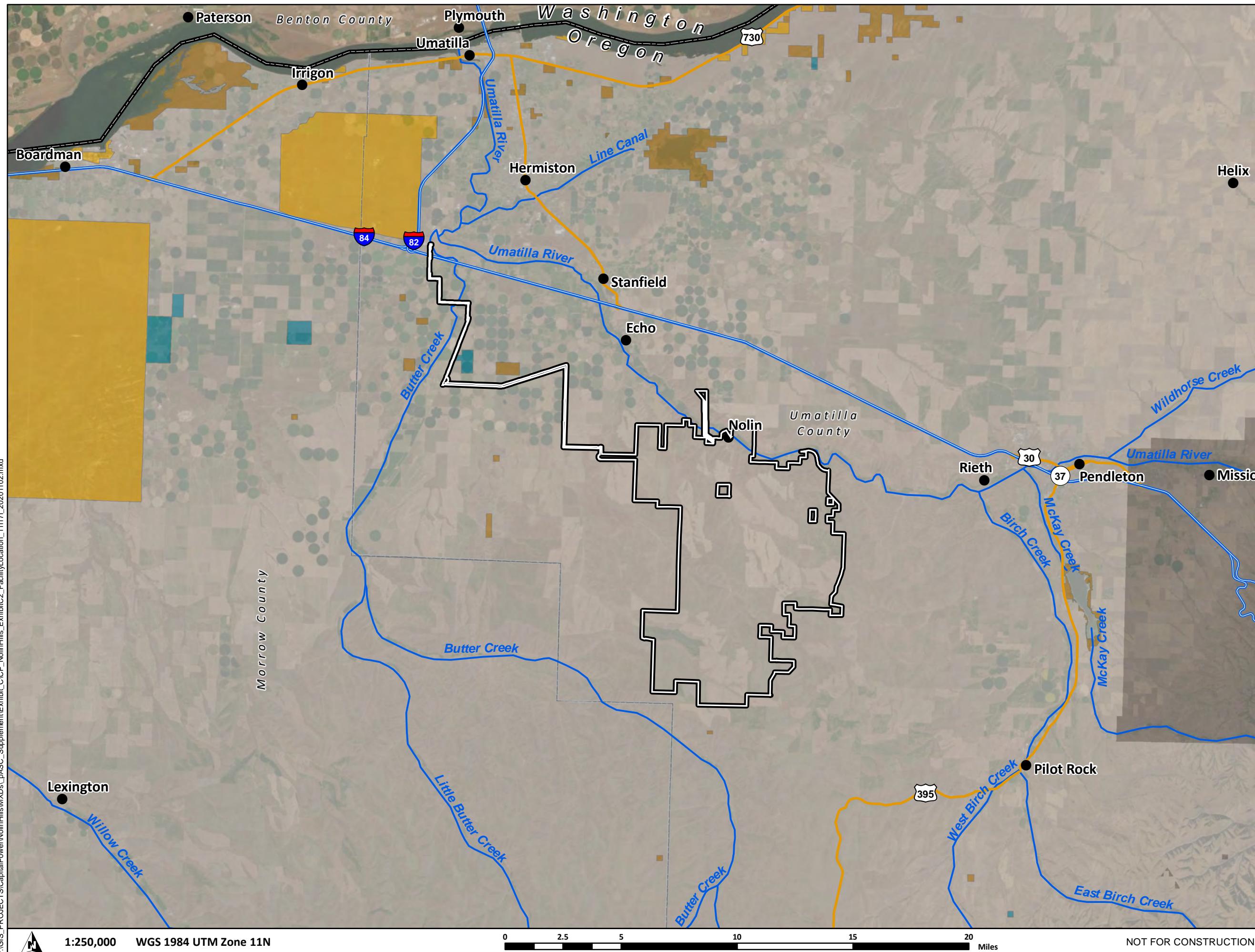
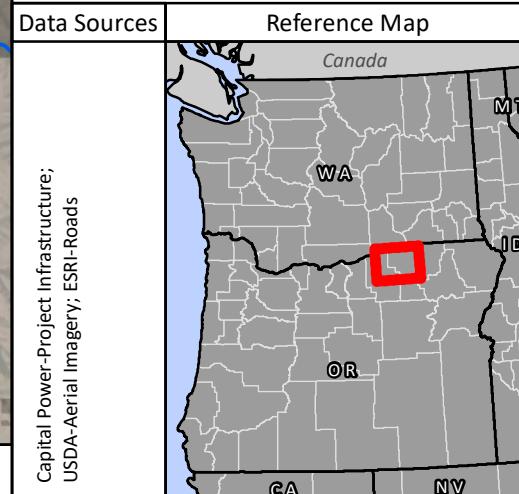
**Figure C-2
Facility Location**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- ~ River/Stream
- City/Town
- Interstate Highway
- Secondary Highway
- State Boundary
- County Boundary
- Land Ownership
 - Bureau of Indian Affairs
 - Bureau of Land Management
 - Department of Defense
 - Private
 - State

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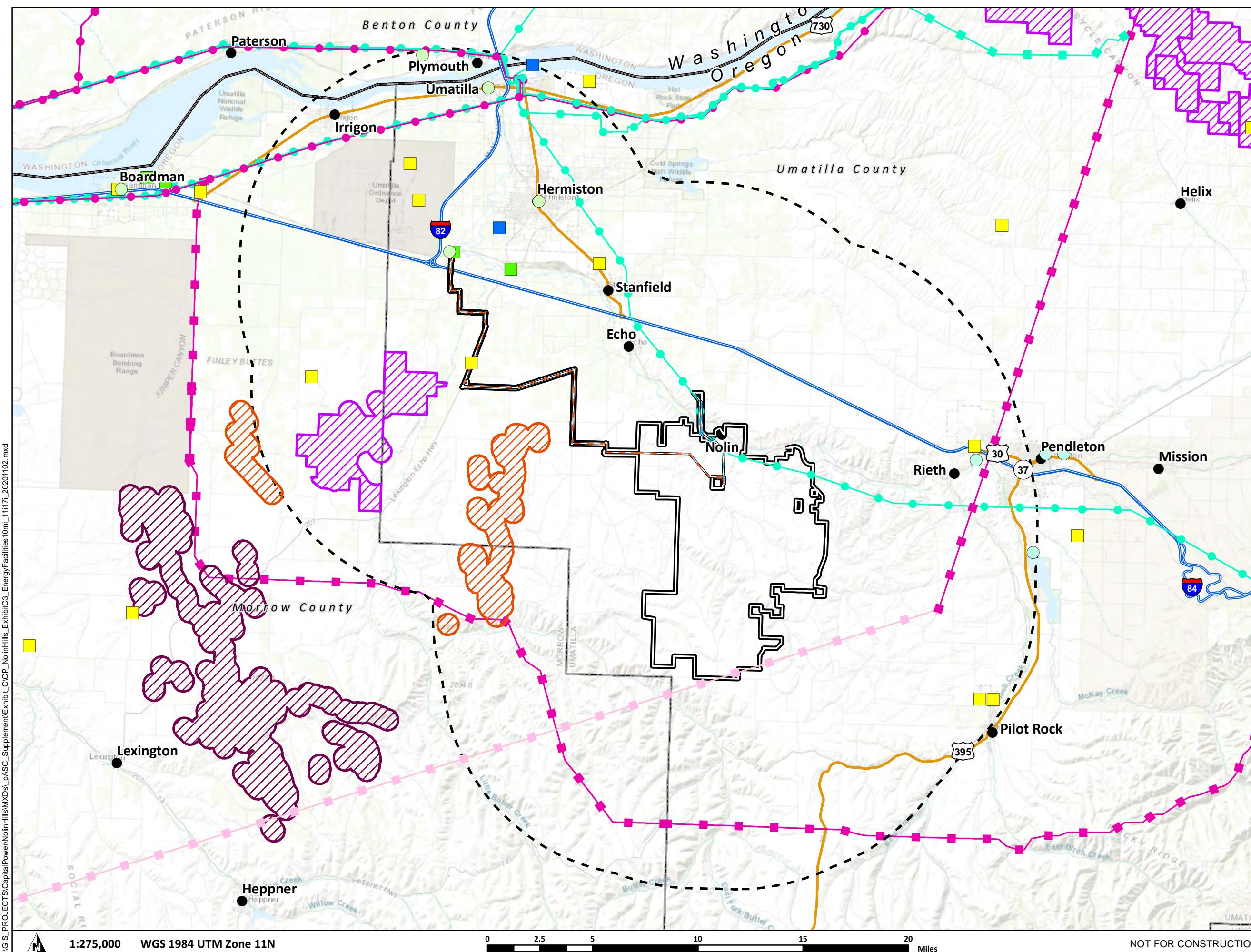
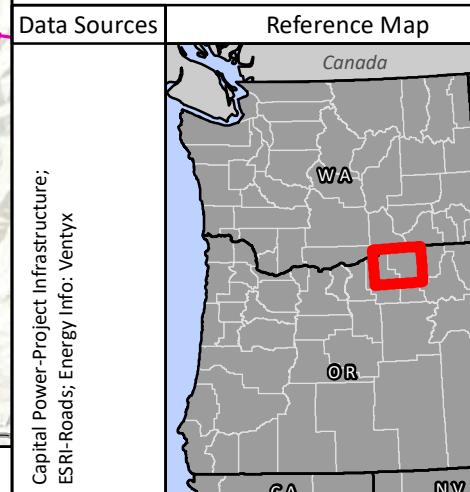
Nolin Hills Wind Power Project

Figure C-3
Energy Facilities
within 10 Miles

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Analysis Area (10-mile Buffer)
- Proposed BPA Stanfield
- Transmission Line Route, 230-kV
- Proposed UEC
- Transmission Line Route, 230-kV
- Interstate Highway
- Secondary Highway
- State Boundary
- County Boundary
- Transmission Line Status, kV Class
- In Service, 230-345
- In Service, 500
- Proposed, 230-345
- Proposed, 500
- Proposed, DC Line
- Electrical Generating Plant
- Hydro (Proposed)
- Hydro (Operating)
- Natural Gas (Proposed)
- Natural Gas (Operating)
- Solar (Proposed)
- Wind (Operating)
- Wind (Proposed)
- Wind (Under Construction)

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**Nolin Hills
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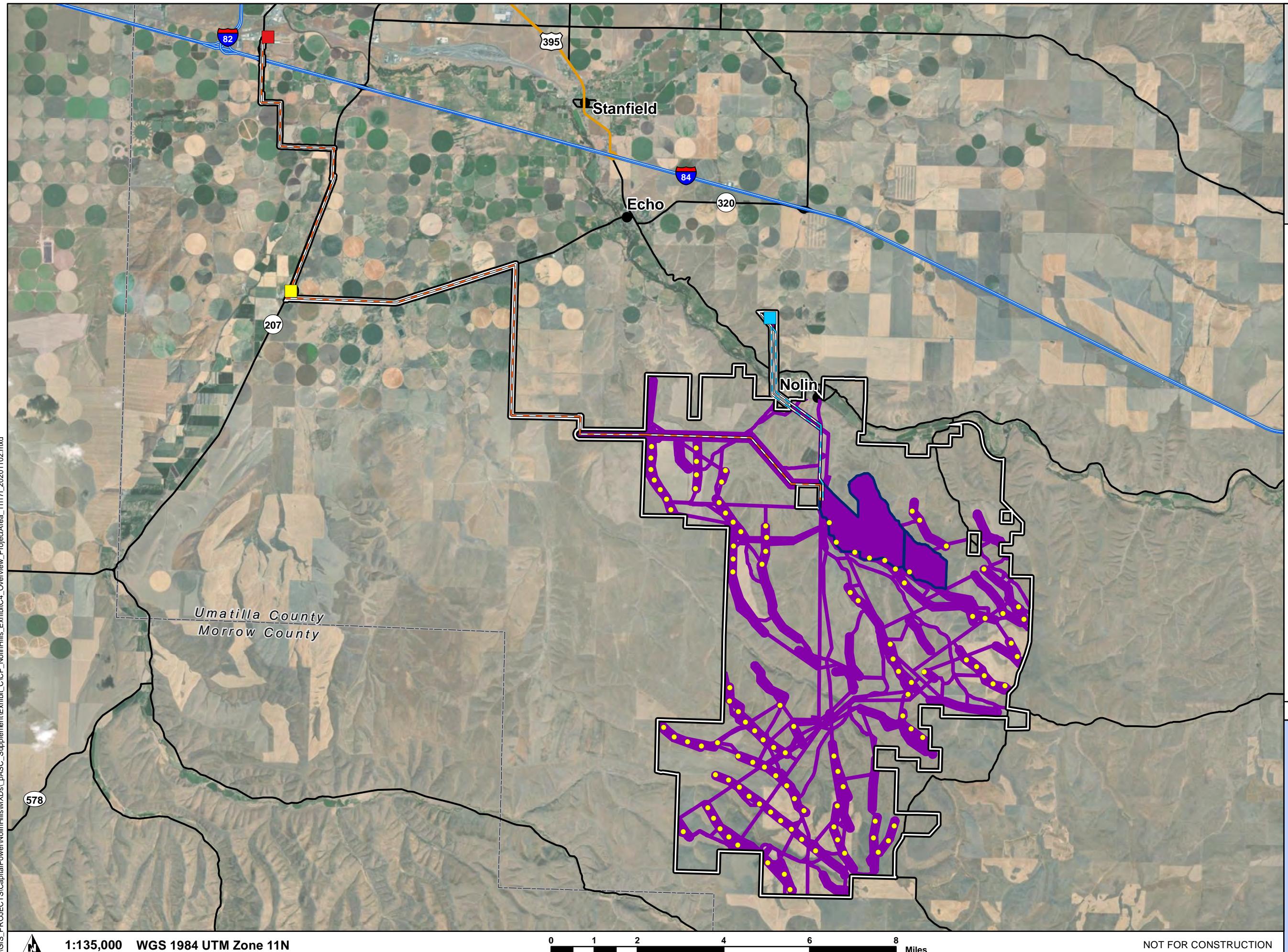
**Figure C-4
Project Layout Overview**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Solar Siting Area
- Micrositing Corridor
- Proposed Turbines
- Planned BPA Stanfield Substation
- UEC Buttercreek Substation
- UEC Cottonwood Substation
- Proposed BPA Stanfield
- Transmission Line Route, 230-kV
- Proposed UEC
- Transmission Line Route, 230-kV
- Interstate Highway
- Secondary Highway
- Secondary Road

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Reference Map



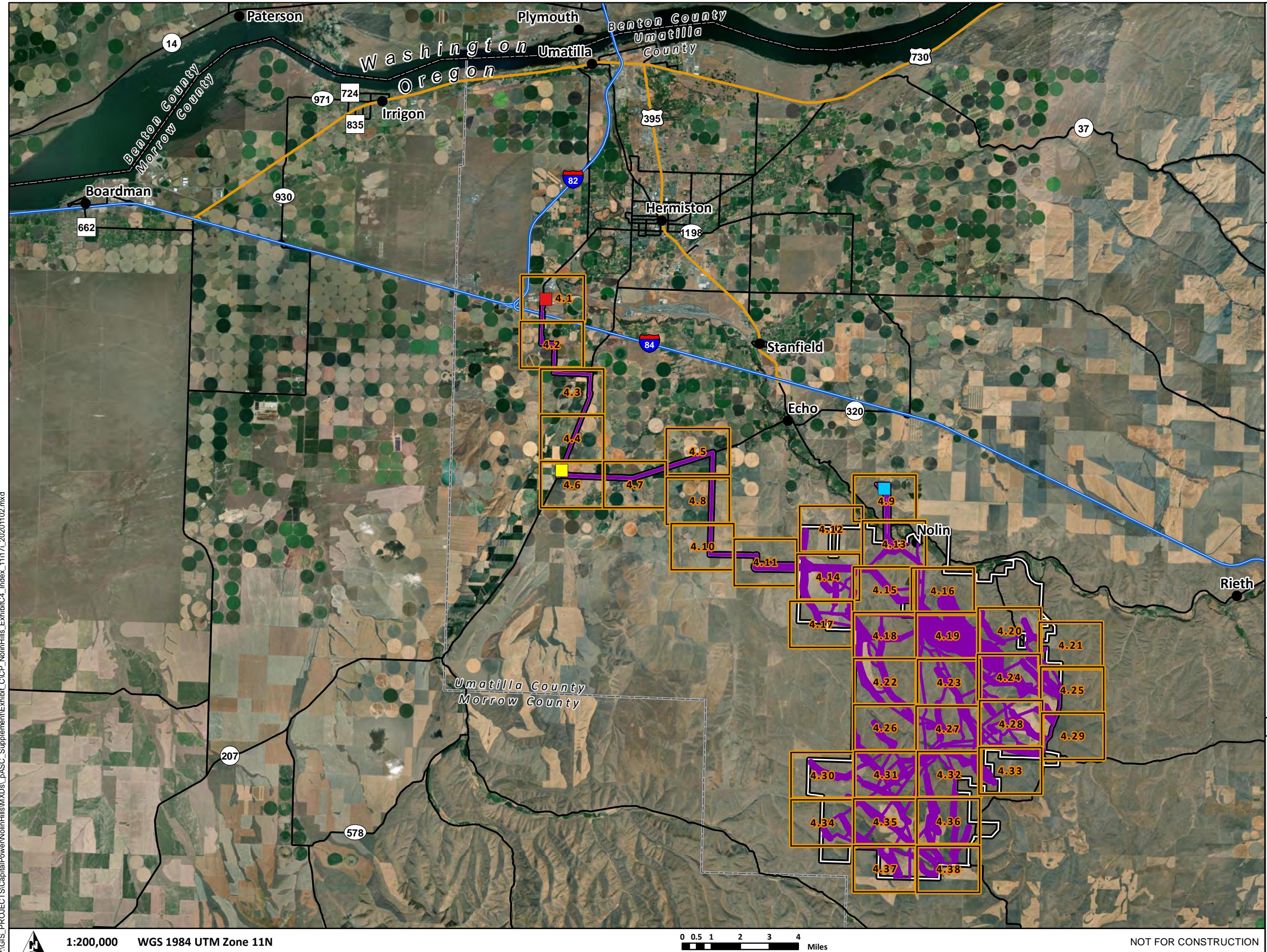
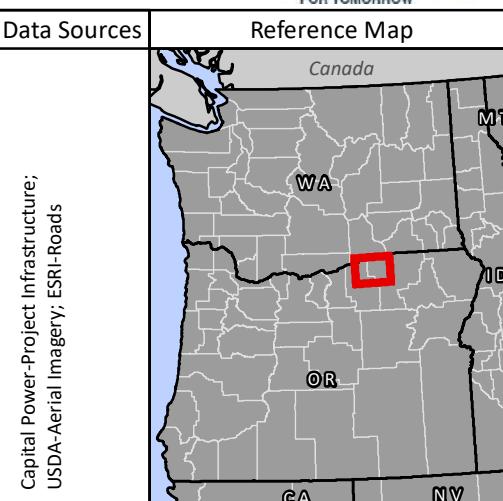
**Nolin Hills
Wind Power Project**

**Figure C-4
Detail Map Index
(Figures 4.1 through 4.38)**

UMATILLA COUNTY, OREGON

- Map Grid
- Proposed Site Boundary
- Micrositing Corridor
- Planned BPA Stanfield Substation
- UEC Buttercreek Substation
- UEC Cottonwood Substation
- City/Town
- Interstate Highway
- Secondary Highway
- Secondary Road
- State Boundary
- County Boundary

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**Figure C-4.1
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- UEC Cottonwood Substation
- Interstate Highway
- Secondary Road
- Railroad
- County Boundary



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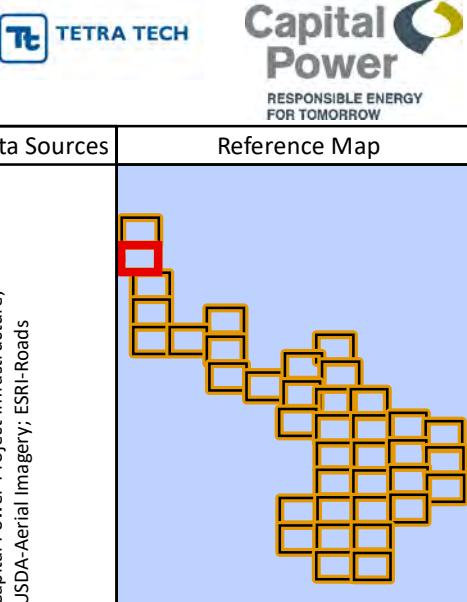
Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	

**Nolin Hills
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**Figure C-4.2
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- Interstate Highway
- County Boundary

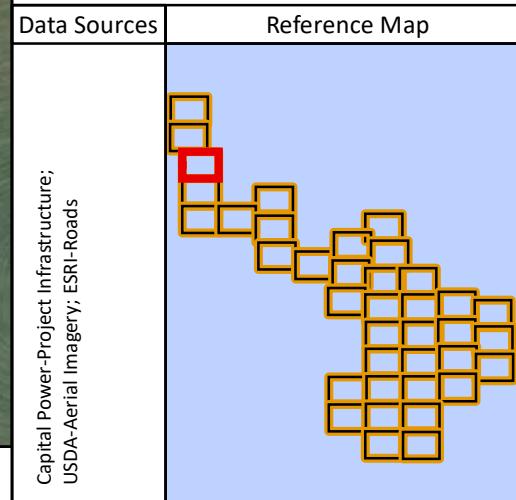


**Nolin Hills
Wind Power Project**

**Figure C-4.3
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary



**Nolin Hills
Wind Power Project**

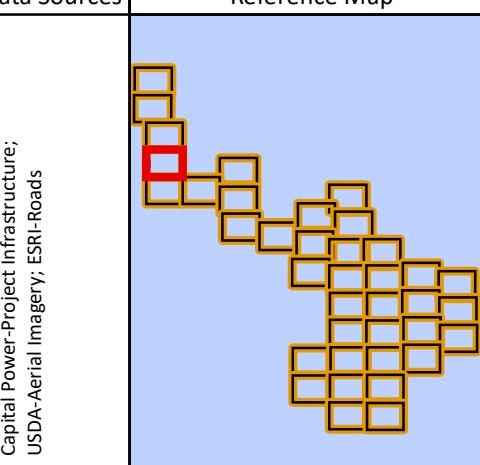
**Figure C-4.4
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

-  Proposed Site Boundary
-  Micrositing Corridor
-  Proposed UEC
-  Transmission Line Route, 230-kV
-  Limits of Temporary Disturbance
-  Secondary Road
-  County Boundary

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Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	



**Nolin Hills
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**Figure C-4.5
Project Layout
Detail Mapbook**

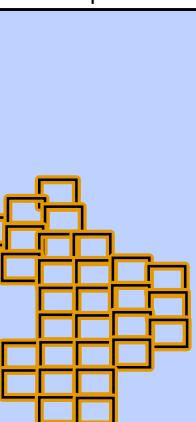
UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary



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Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	

**Nolin Hills
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**Figure C-4.6
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- UEC Buttercreek Substation
- Secondary Road
- County Boundary



Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	

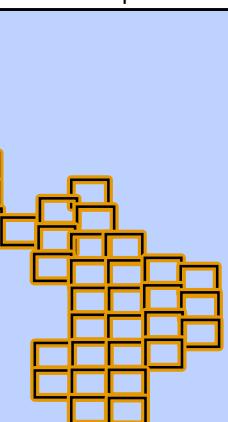
**Nolin Hills
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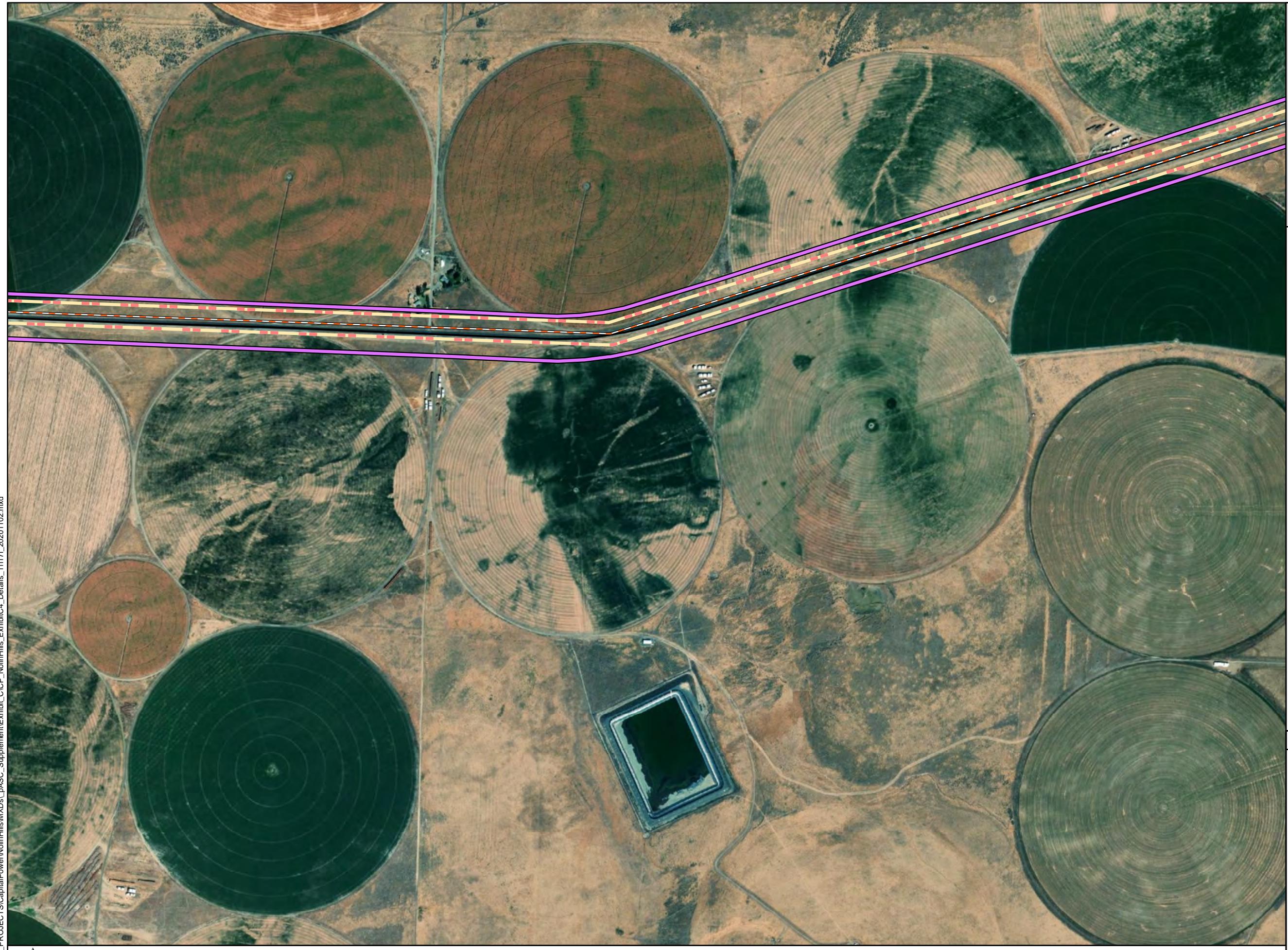
**Figure C-4.7
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- △ Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary

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Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	

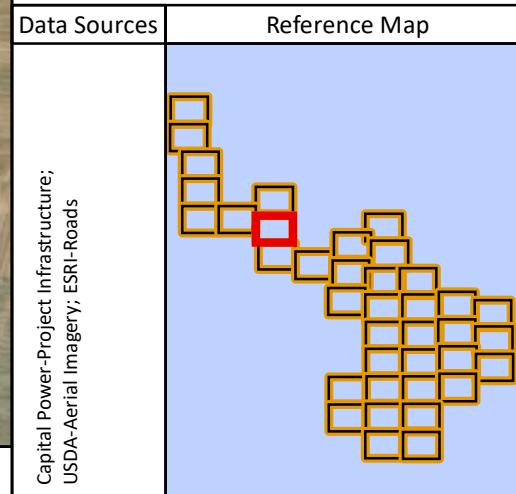


**Nolin Hills
Wind Power Project**

**Figure C-4.8
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- County Boundary

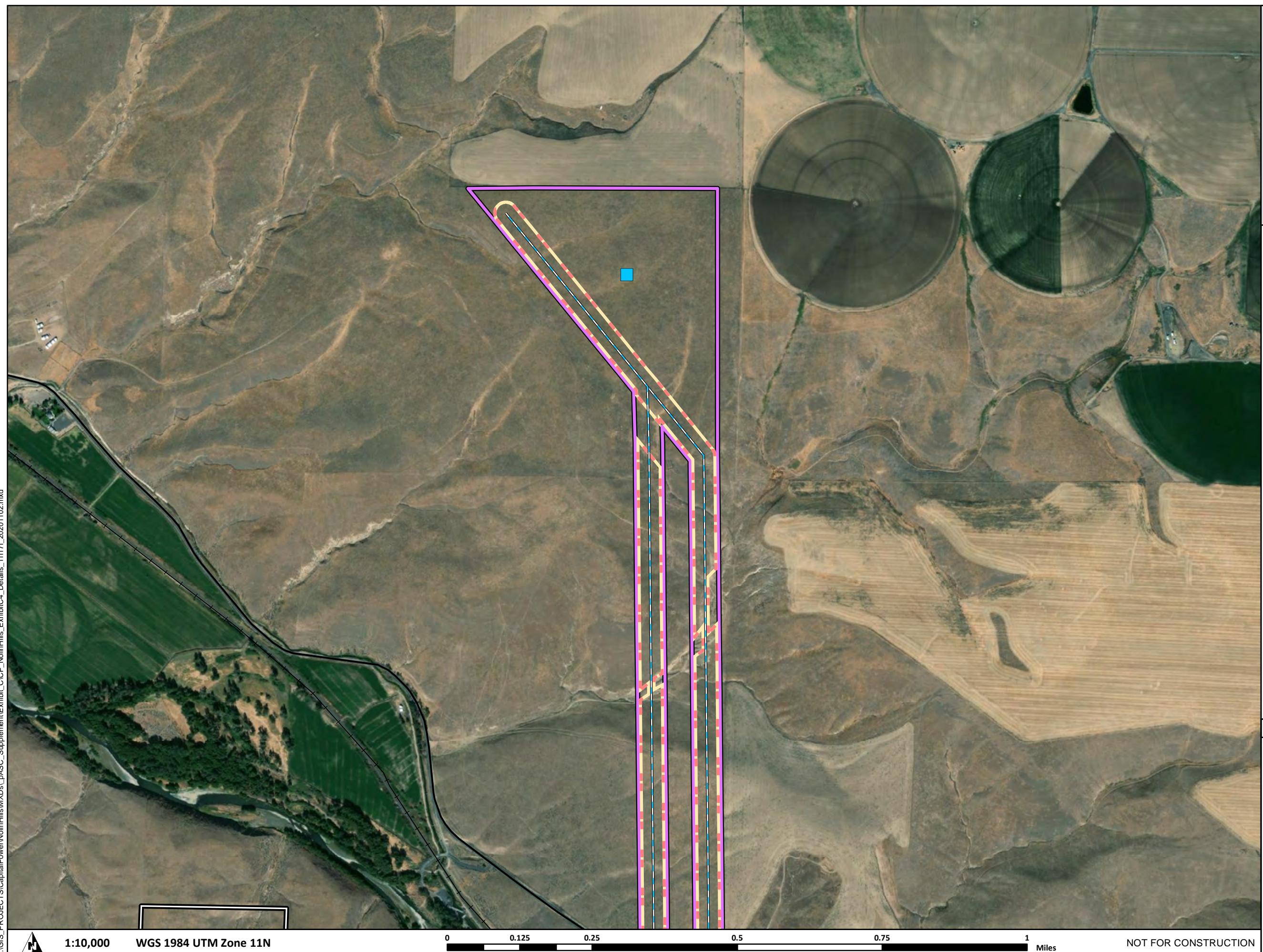
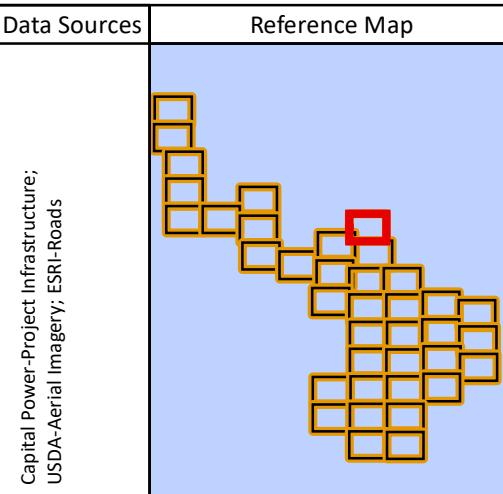


**Nolin Hills
Wind Power Project**

**Figure C-4.9
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed BPA Stanfield Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- Planned BPA Stanfield Substation
- Secondary Road
- Railroad
- County Boundary



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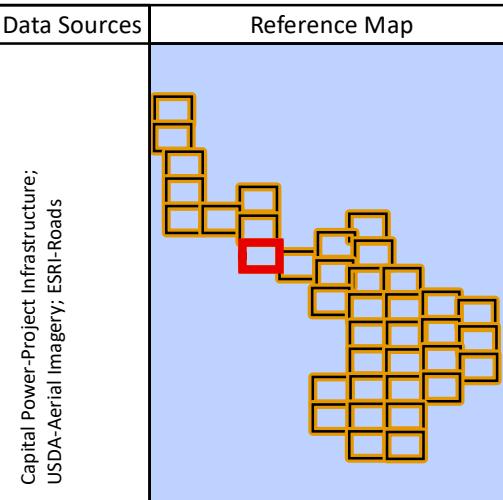
**Figure C-4.10
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- County Boundary

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**Nolin Hills
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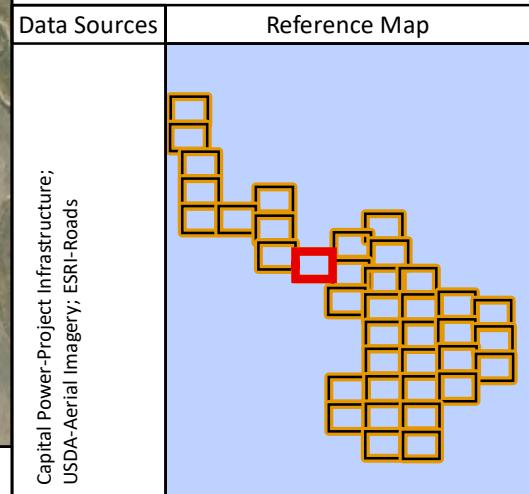
**Figure C-4.11
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Limits of Temporary Disturbance
- County Boundary

Corner of White House Road
and County Road 1348

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Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

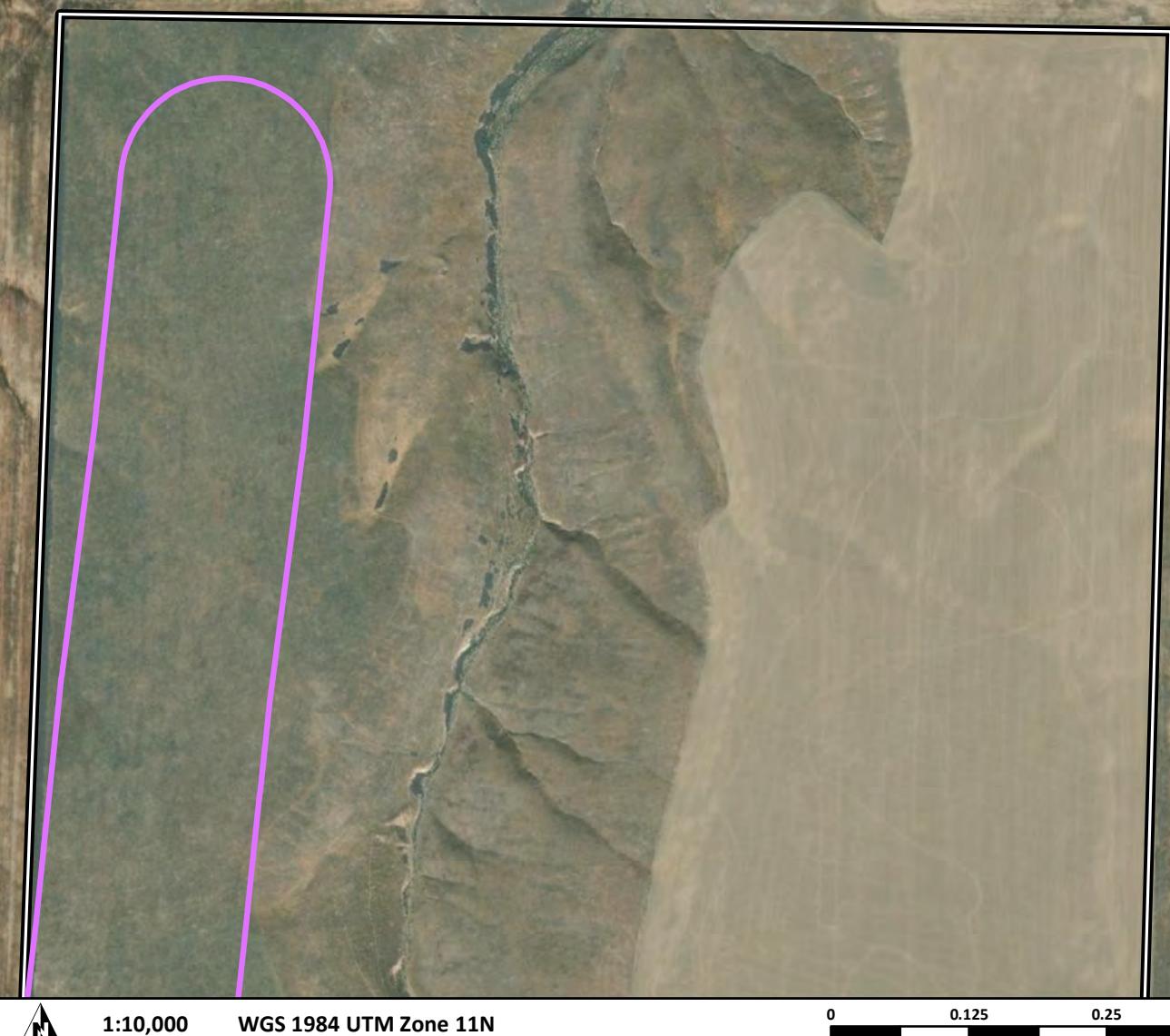
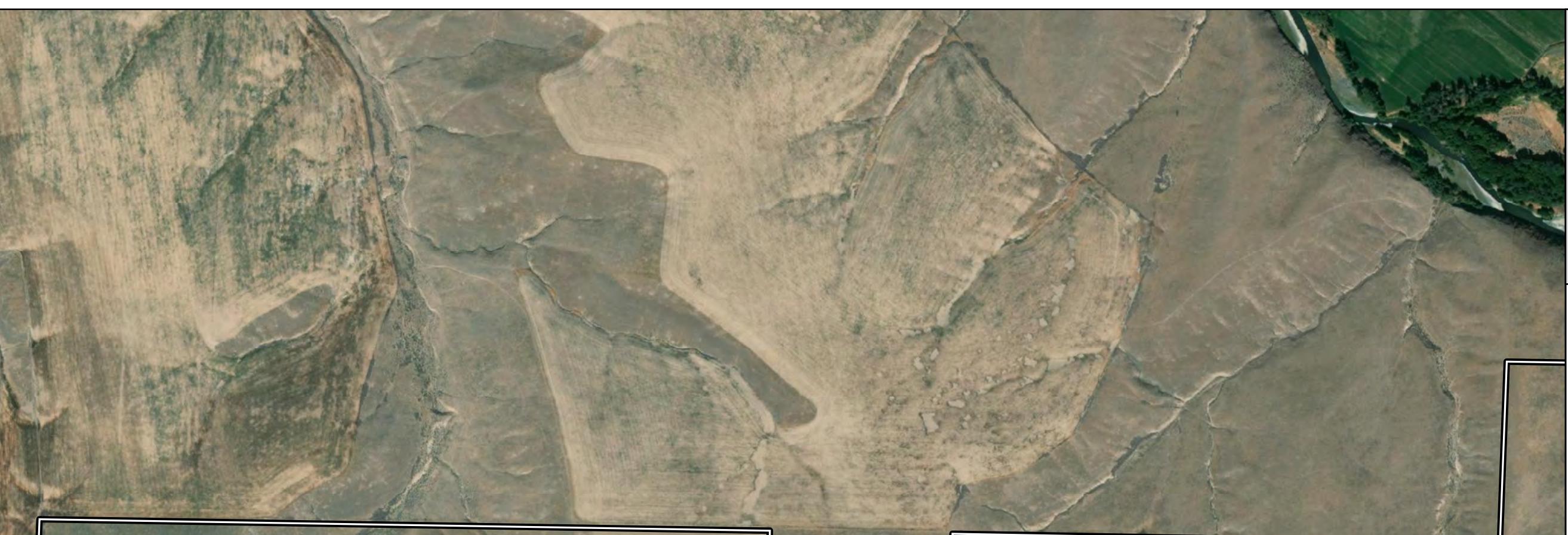
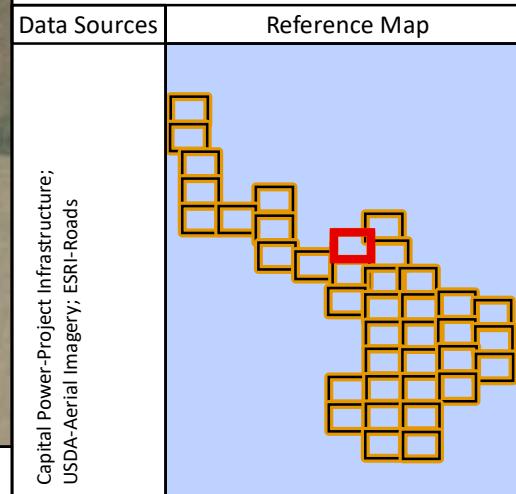


**Nolin Hills
Wind Power Project**

**Figure C-4.12
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- County Boundary



1:10,000 WGS 1984 UTM Zone 11N

0 0.125 0.25 0.5 0.75 1 Miles

NOT FOR CONSTRUCTION

**Nolin Hills
Wind Power Project**

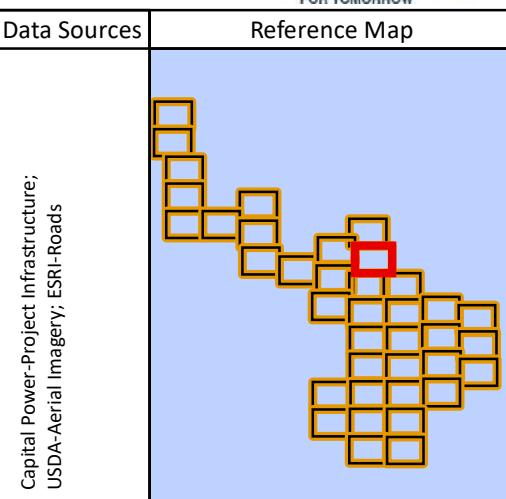
**Figure C-4.13
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed BPA Stanfield Transmission Line Route, 230-kV
- Access Road (Improve Existing)
- Proposed Transportation Route
- Overhead Collector Line
- Limits of Temporary Disturbance
- City/Town
- Secondary Road
- Railroad
- County Boundary

TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW



1:10,000 WGS 1984 UTM Zone 11N

0 0.125 0.25 0.5 0.75 1 Miles

NOT FOR CONSTRUCTION

**Nolin Hills
Wind Power Project**

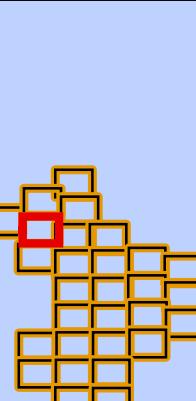
**Figure C-4.14
Project Layout
Detail Mapbook**

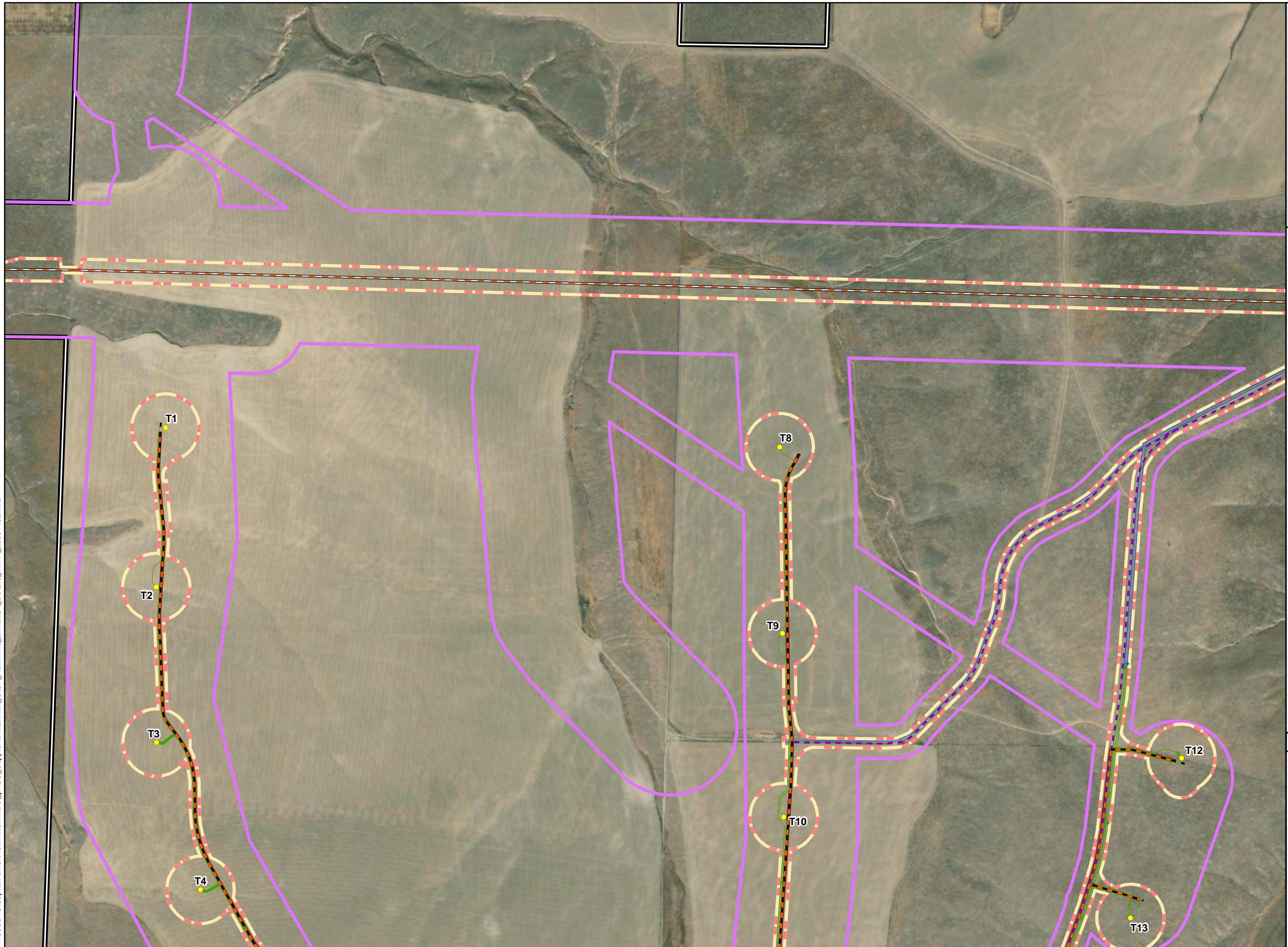
UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Proposed Turbines
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Overhead Collector Line
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- County Boundary

TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; ESRI-Roads USDA-Aerial Imagery	



**Nolin Hills
Wind Power Project**

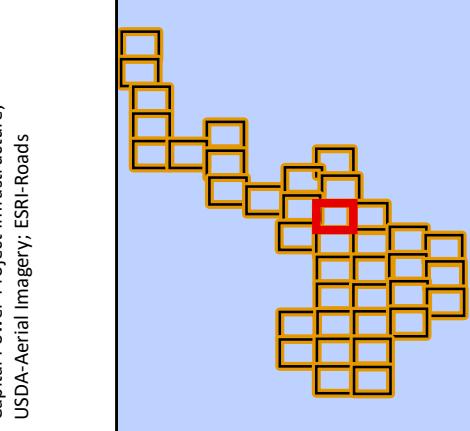
**Figure C-4.15
Project Layout
Detail Mapbook**

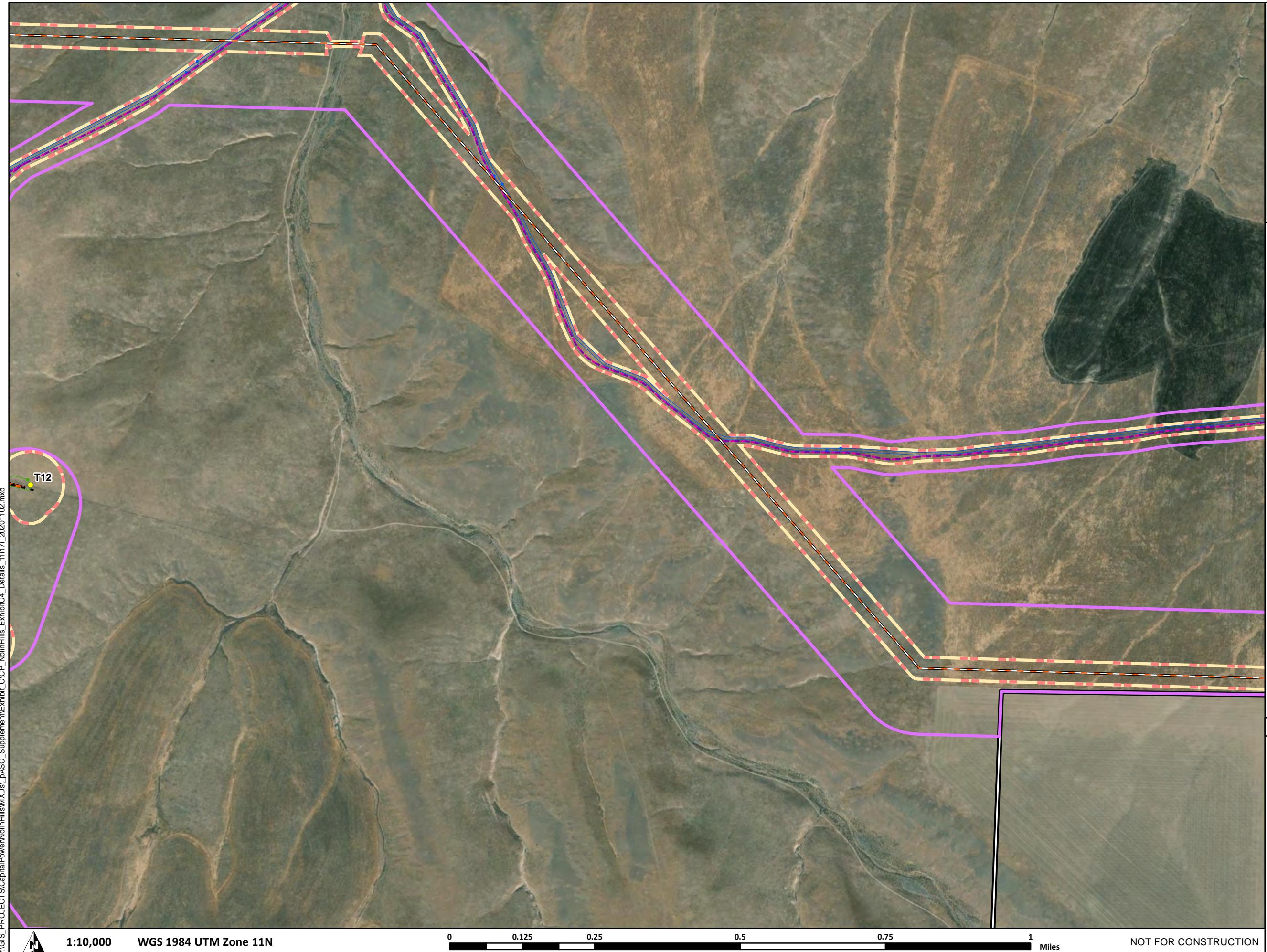
UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed UEC
- Transmission Line Route, 230-kV
- Proposed Turbines
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Overhead Collector Line
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- County Boundary

TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	



**Nolin Hills
Wind Power Project**

**Figure C-4.16
Project Layout
Detail Mapbook**

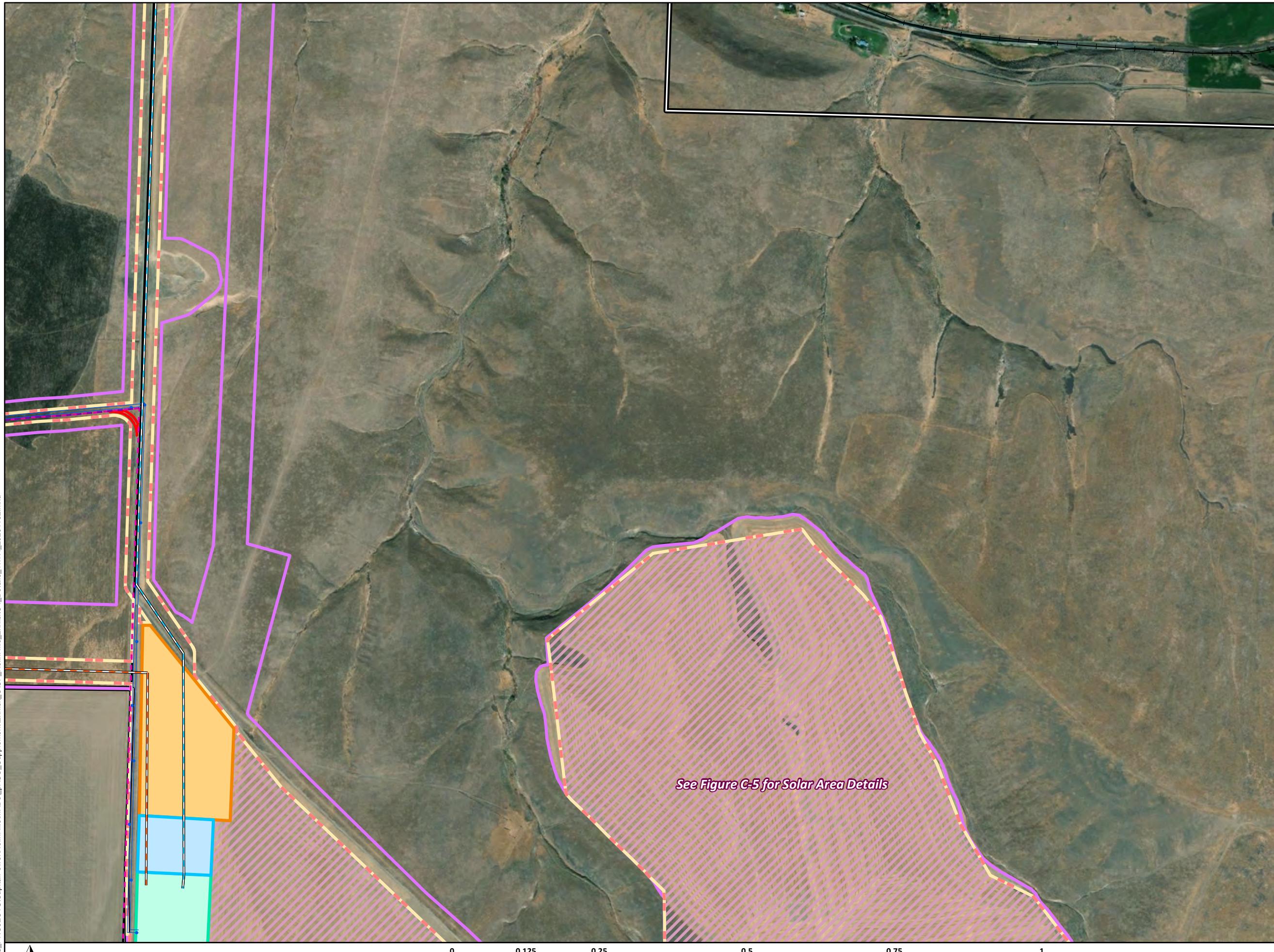
UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed BPA Stanfield Transmission Line Route, 230-kV
- Proposed UEC Transmission Line Route, 230-kV
- Access Road (Improve Existing)
- Proposed Transportation Route
- Overhead Collector Line
- O&M Facility
- Proposed Substation
- Proposed Laydown Area
- Proposed Turning Radius Improvement
- Limits of Temporary Disturbance
- Solar Siting Area
- Secondary Road
- Railroad
- County Boundary



RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; ESRI-Roads USDA-Aerial Imagery; ESRI-Roads	

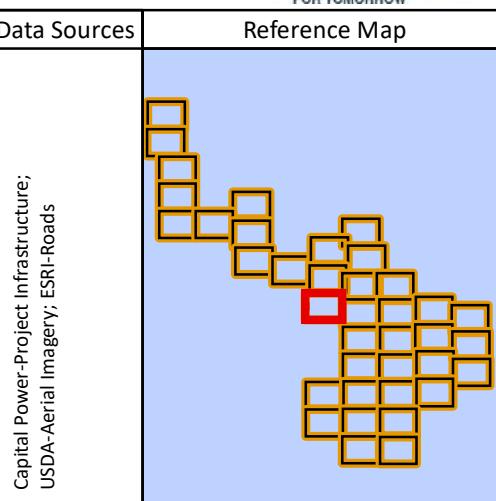


**Nolin Hills
Wind Power Project**

**Figure C-4.17
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Met Tower
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Proposed Laydown Area
- Limits of Temporary Disturbance
- County Boundary



**Nolin Hills
Wind Power Project**

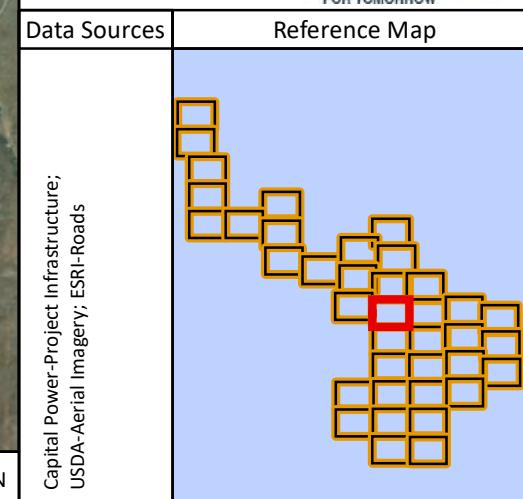
**Figure C-4.18
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- County Boundary

TETRA TECH

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FOR TOMORROW



**Nolin Hills
Wind Power Project**

**Figure C-4.19
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Overhead Collector Line
- Underground Collector Line
- Proposed Crane Path
- Proposed Project Substation Connector, 230-kV
- Proposed Substation
- Proposed Turning Radius Improvement
- Proposed Laydown Area
- Limits of Temporary Disturbance
- Solar Siting Area
- Secondary Road
- County Boundary

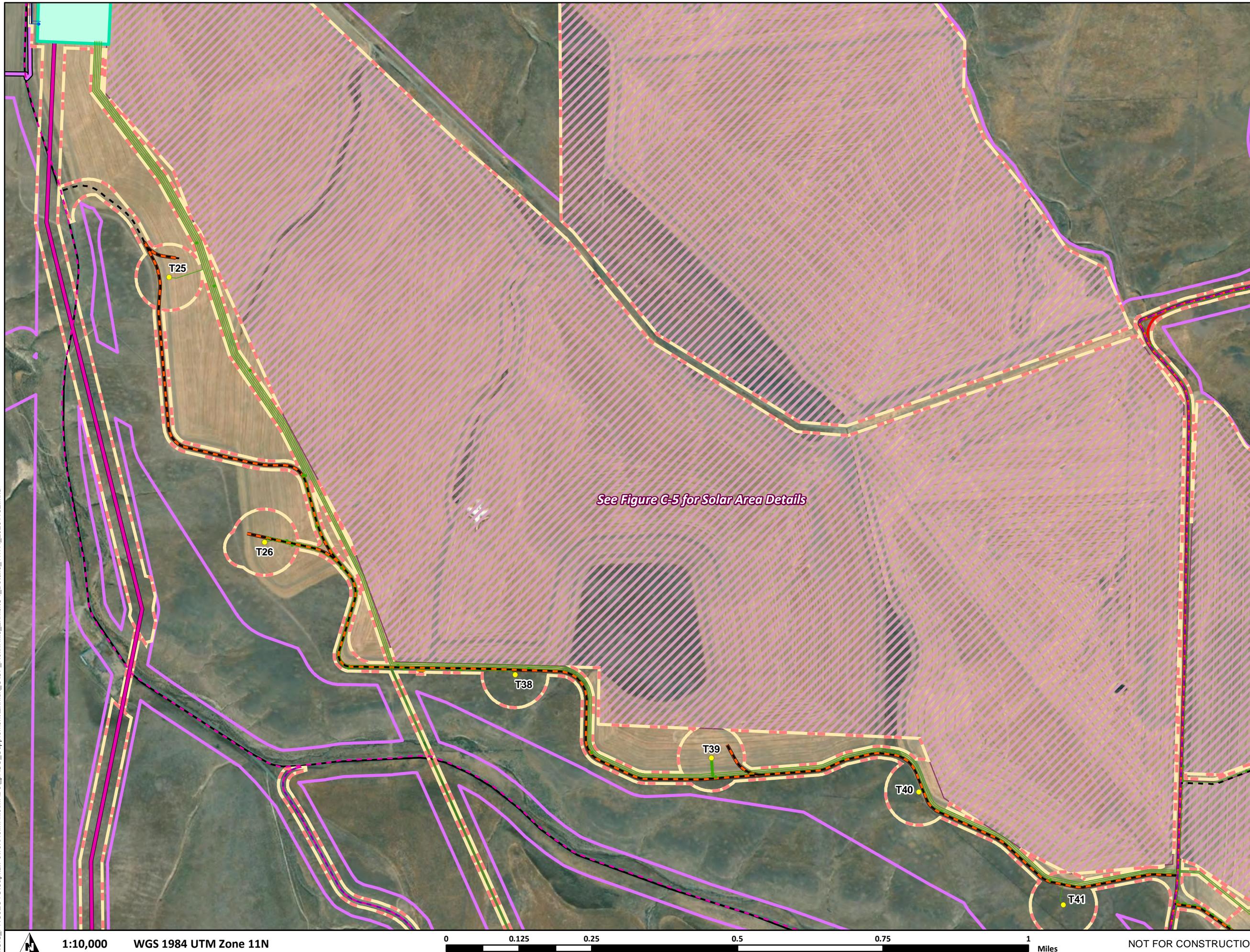
TETRA TECH

Capital Power

RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	

See Figure C-5 for Solar Area Details



**Nolin Hills
Wind Power Project**

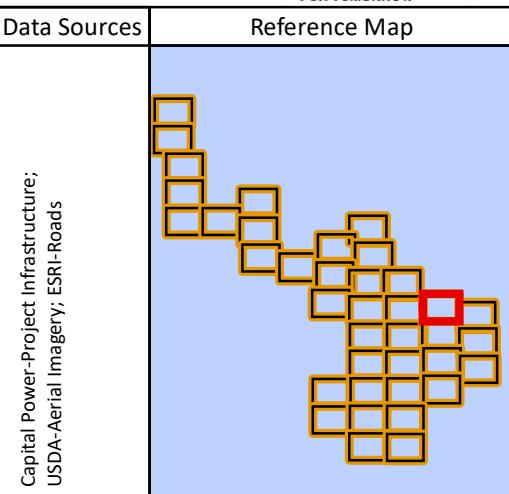
**Figure C-4.20
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- Solar Siting Area
- Secondary Road
- County Boundary

TETRA TECH

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RESPONSIBLE ENERGY
FOR TOMORROW



See Figure C-5 for Solar Area Details

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1:10,000 WGS 1984 UTM Zone 11N

0 0.125 0.25 0.5 0.75 1 Miles

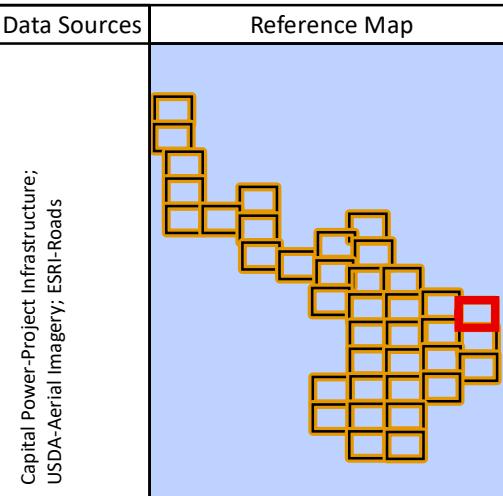
NOT FOR CONSTRUCTION

**Nolin Hills
Wind Power Project**

**Figure C-4.21
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Transportation Route
- Underground Collector Line
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary



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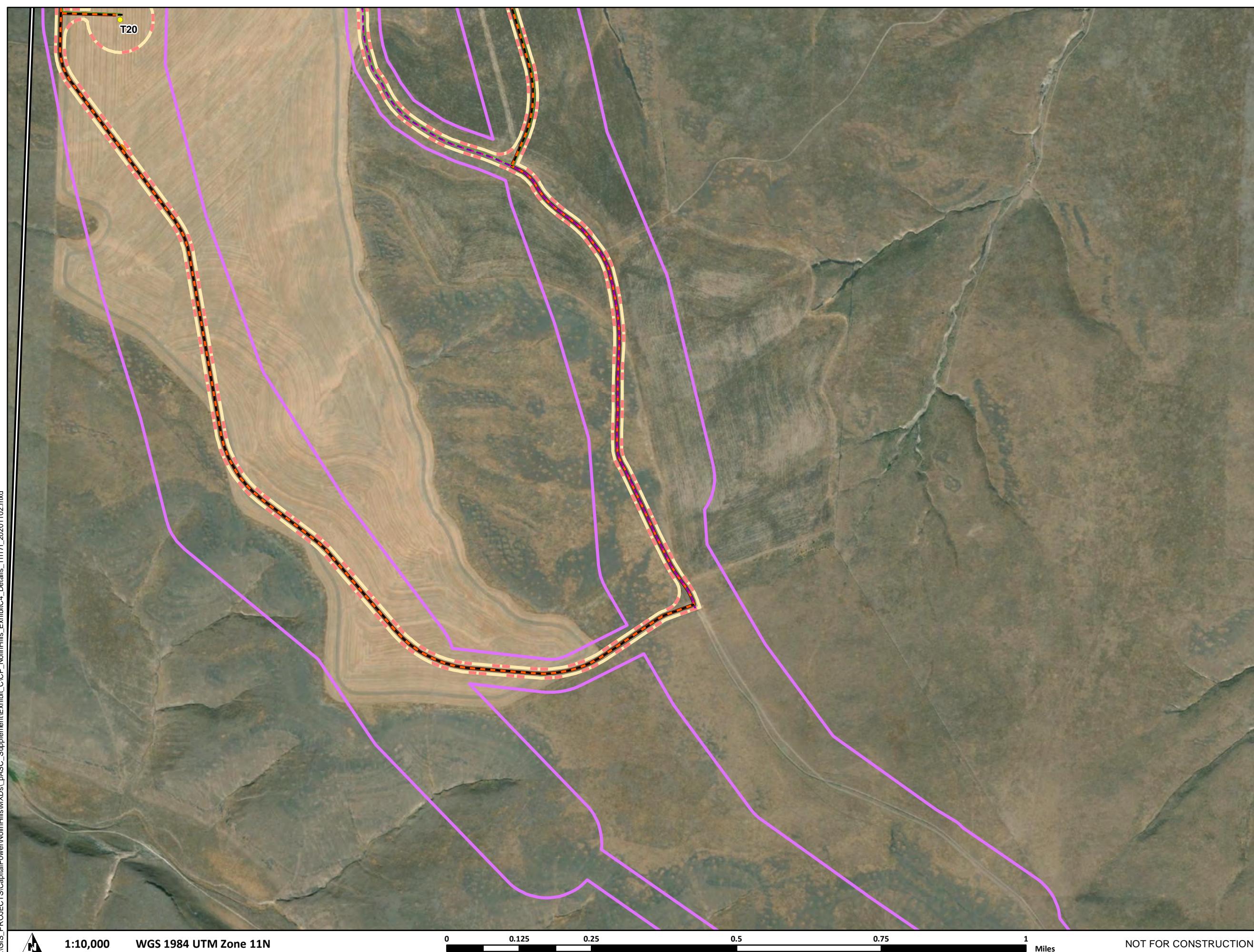
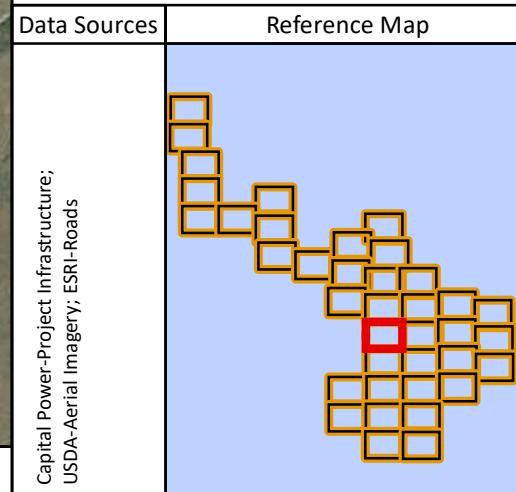


**Nolin Hills
Wind Power Project**

**Figure C-4.22
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Proposed Laydown Area
- Limits of Temporary Disturbance
- County Boundary



**Nolin Hills
Wind Power Project**

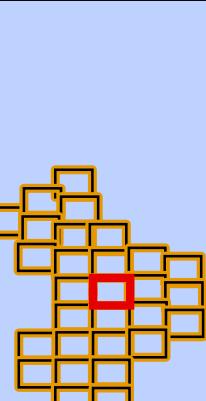
**Figure C-4.23
Project Layout
Detail Mapbook**

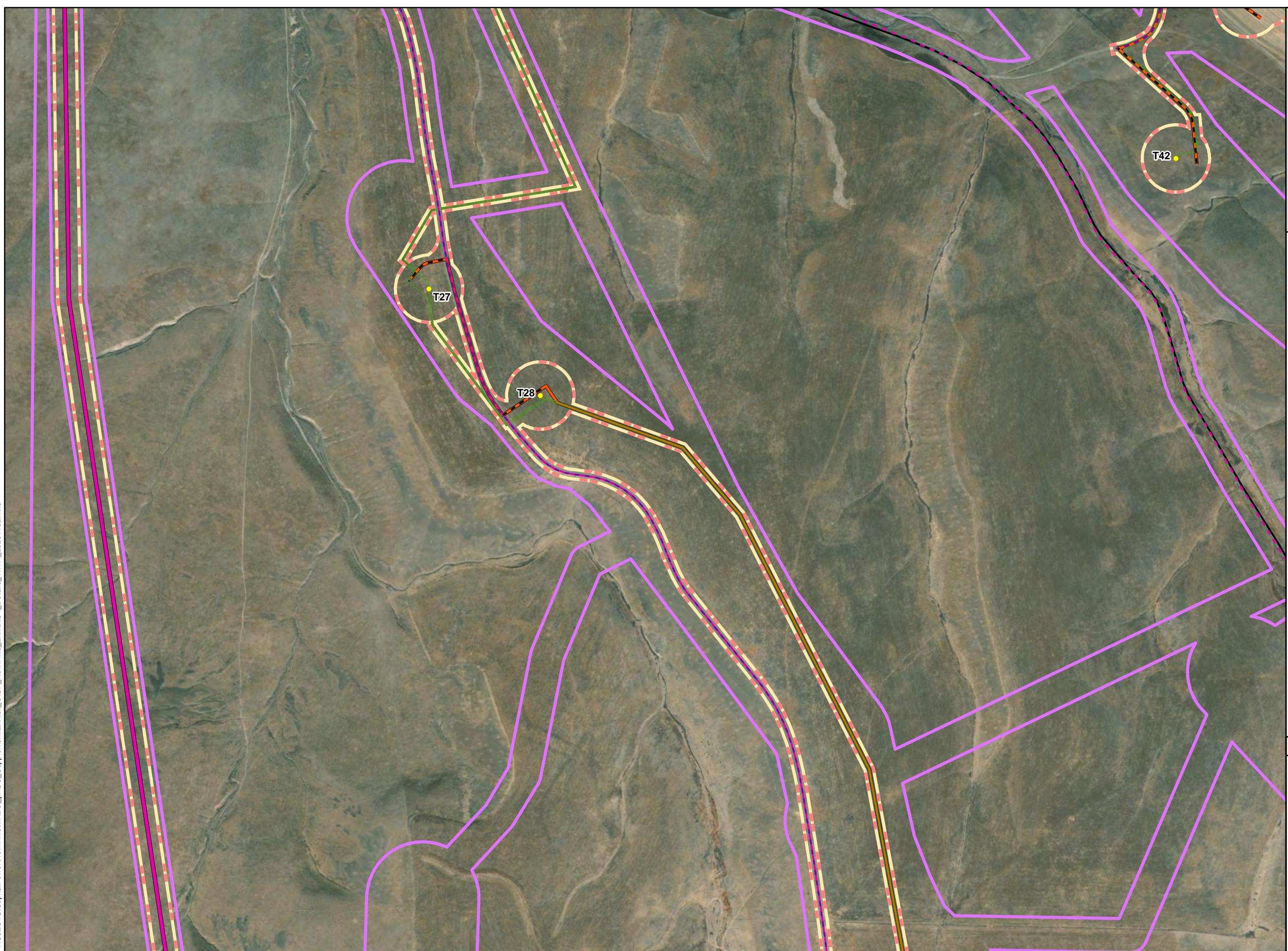
UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- - - Access Road (New)
- - - Access Road (Improve Existing)
- - - Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Proposed Project Substation
- Connector, 230-kV
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary

TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	



**Nolin Hills
Wind Power Project**

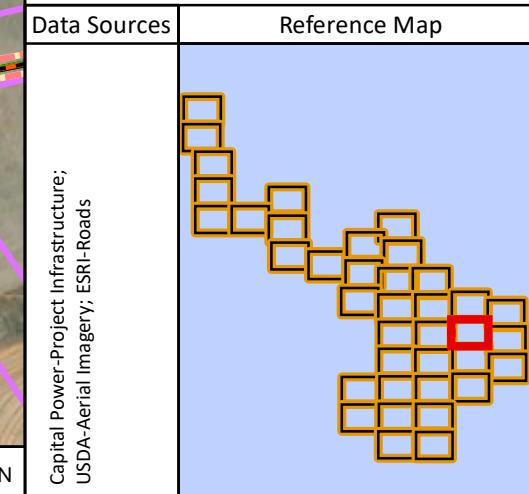
**Figure C-4.24
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

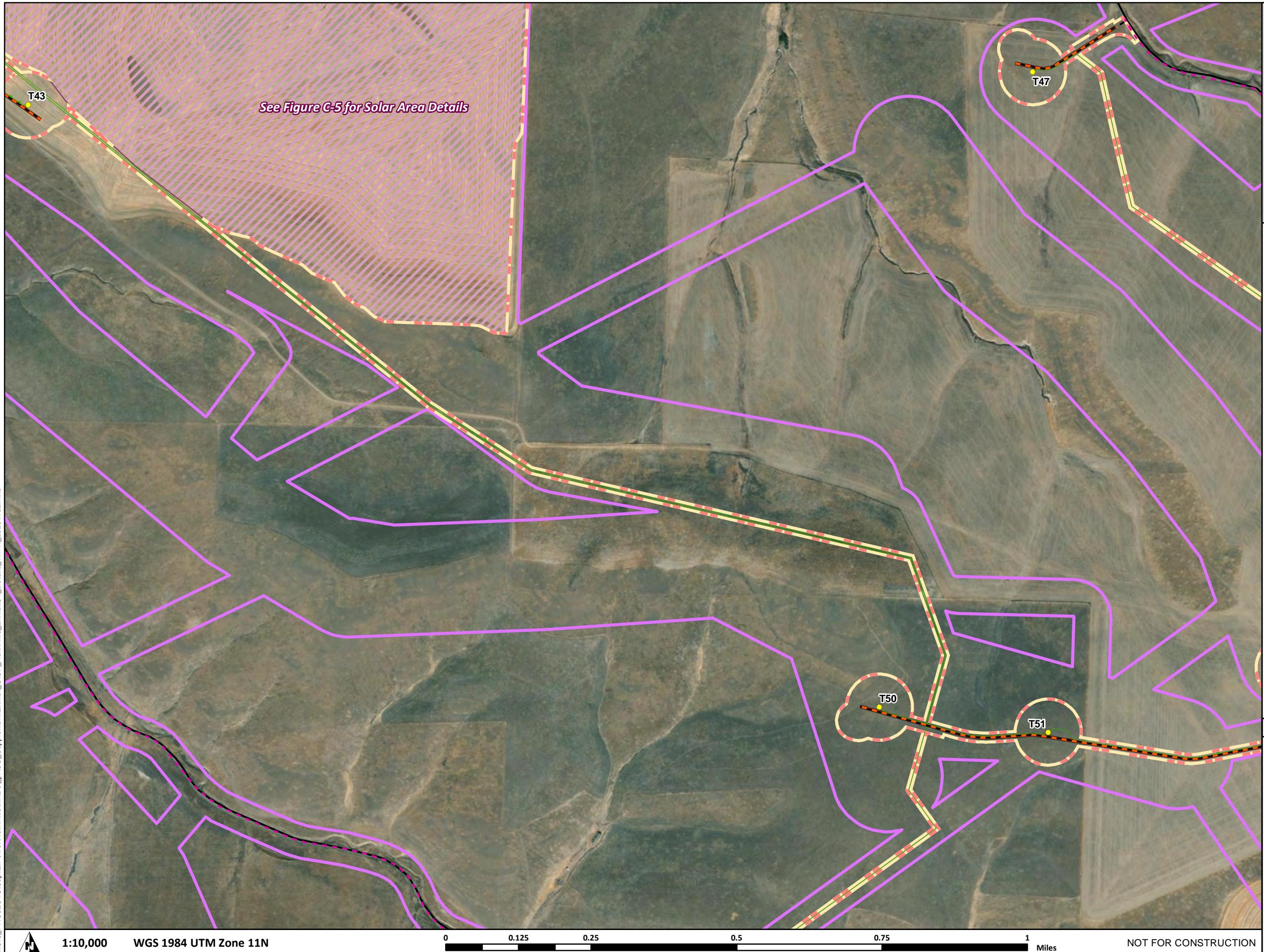
- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- Solar Siting Area
- Secondary Road
- County Boundary

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RESPONSIBLE ENERGY
FOR TOMORROW



See Figure C-5 for Solar Area Details



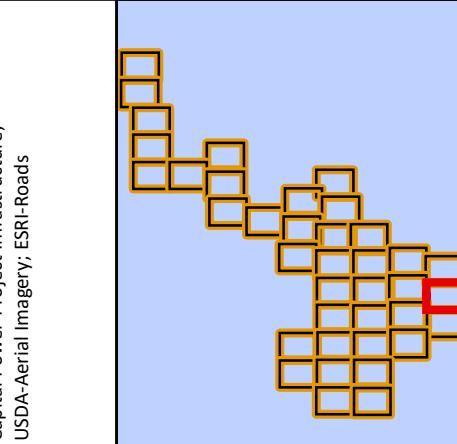
**Nolin Hills
Wind Power Project**

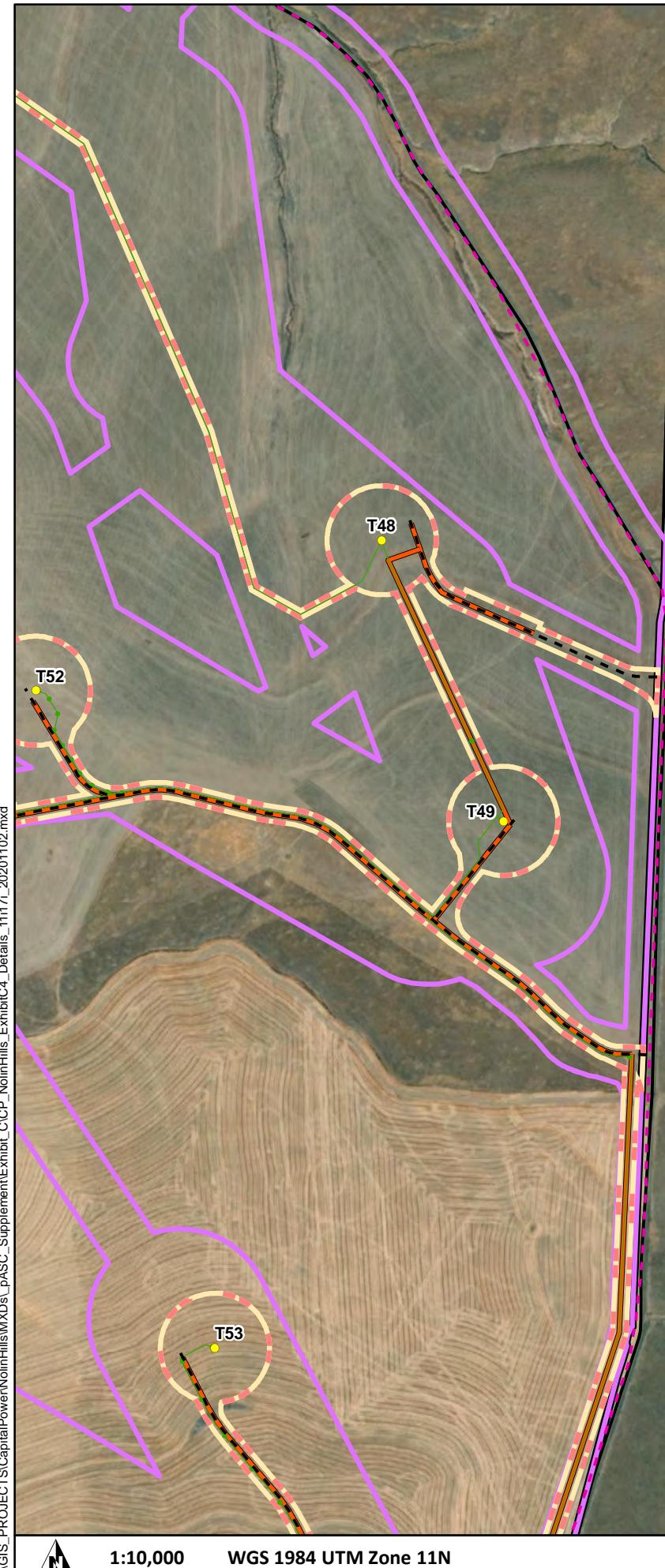
**Figure C-4.25
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- - - Access Road (New)
- - - Proposed Transportation Route
- Proposed Underground Collector Line
- Proposed Crane Path
- Proposed Laydown Area
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary

TETRA TECH
Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	

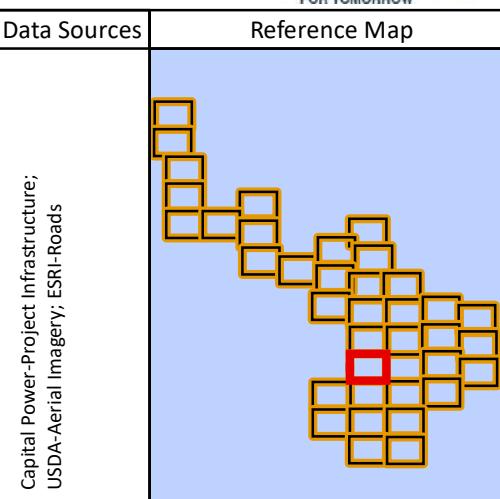
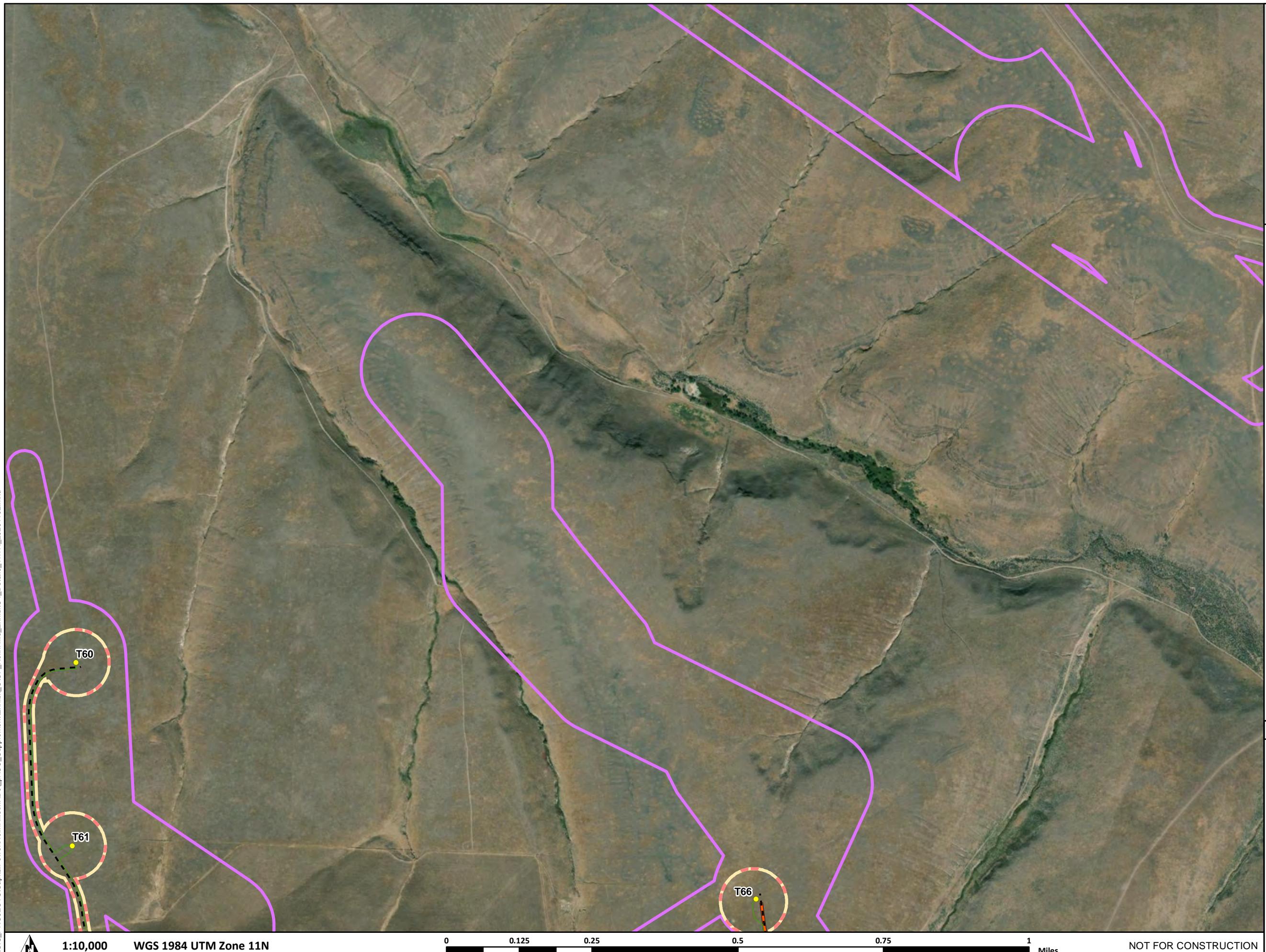


**Nolin Hills
Wind Power Project**

**Figure C-4.26
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- County Boundary



**Nolin Hills
Wind Power Project**

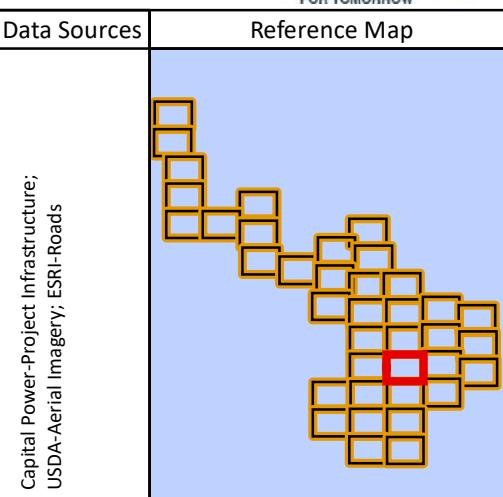
**Figure C-4.27
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Proposed Project Substation
- Connector, 230-kV
- Proposed Laydown Area
- Limits of Temporary Disturbance
- County Boundary

TETRA TECH

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FOR TOMORROW



**Nolin Hills
Wind Power Project**

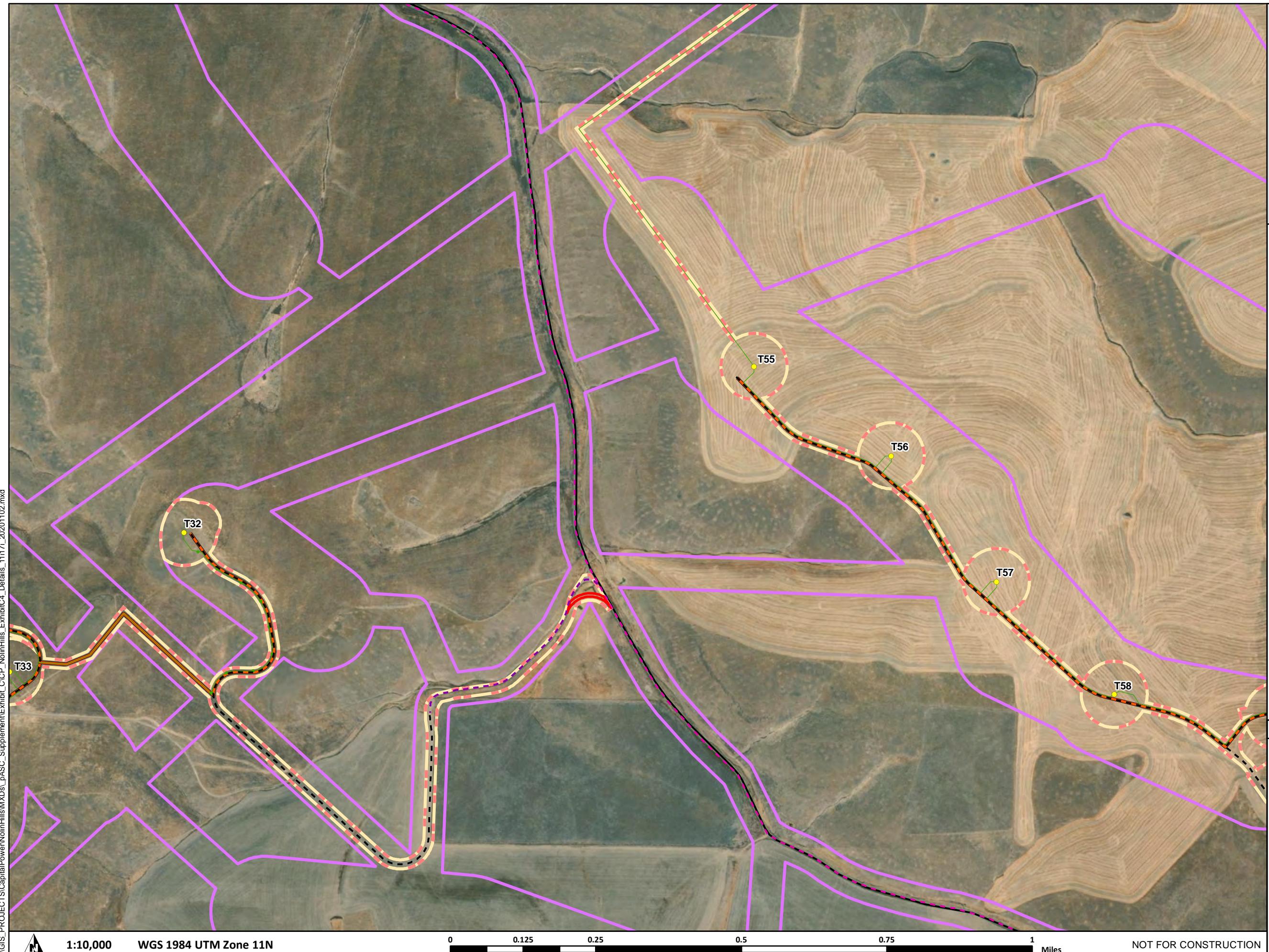
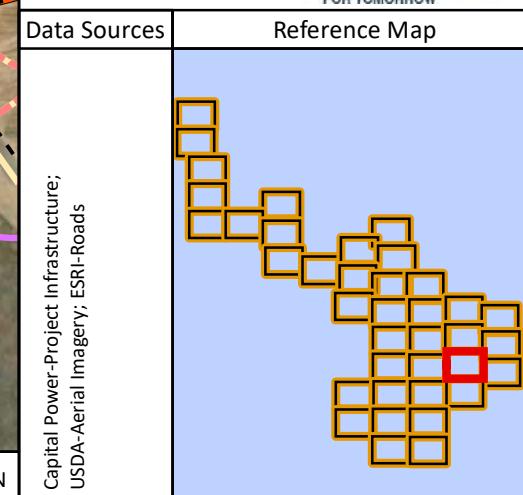
**Figure C-4.28
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- - - Access Road (New)
- - - Access Road (Improve Existing)
- - - Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Proposed Turning Radius
- Improvement
- Limts of Temporary Disturbance
- Secondary Road
- County Boundary

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Capital Power
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FOR TOMORROW

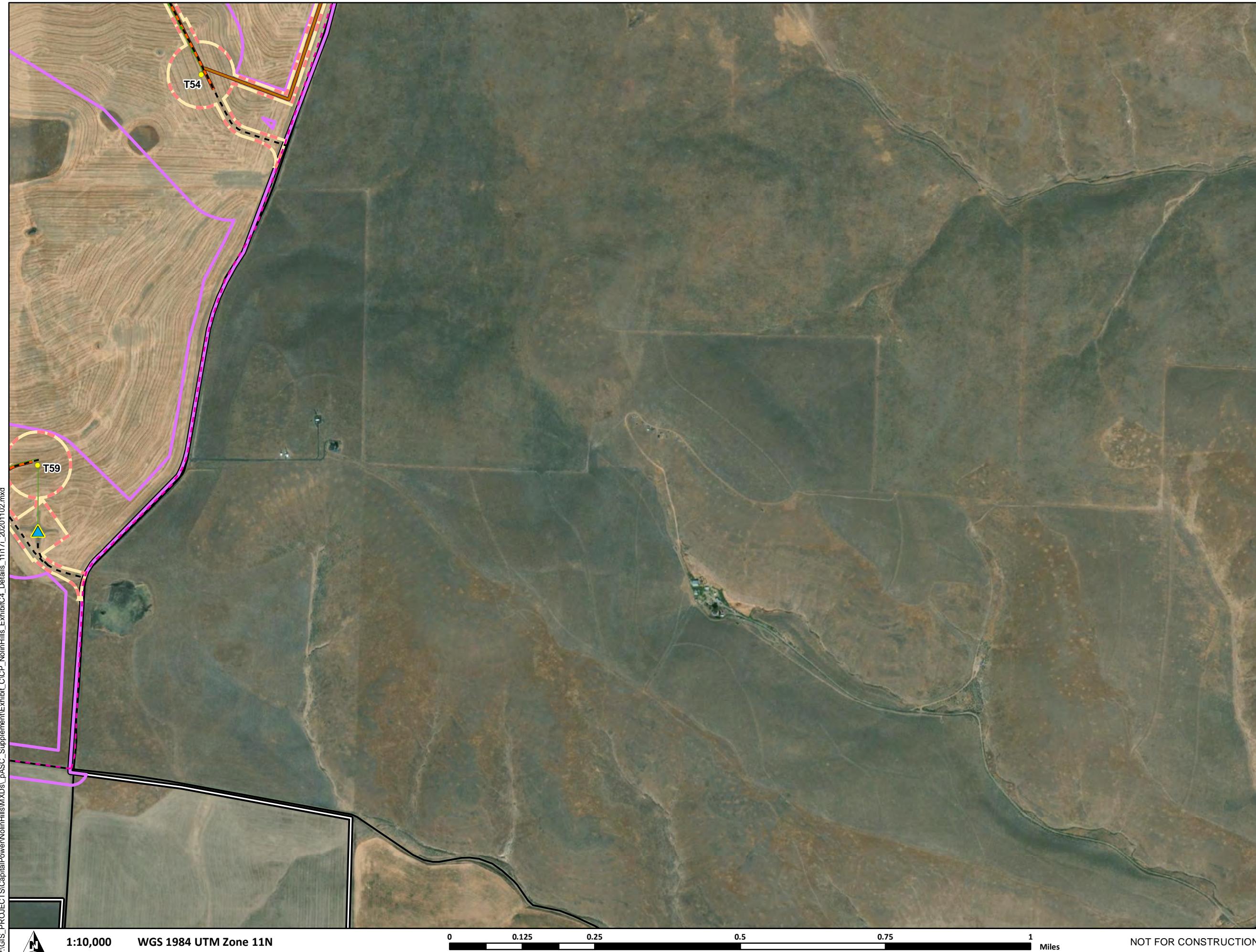
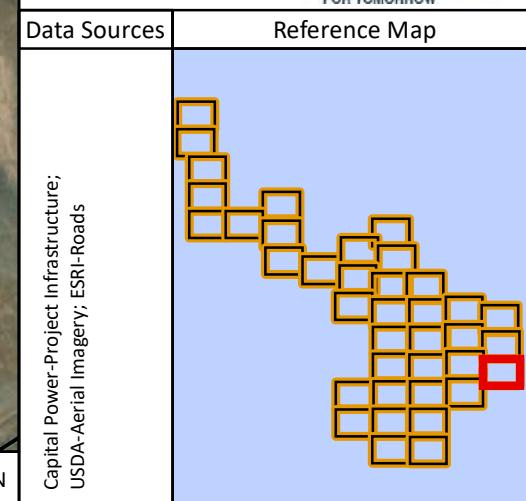


**Nolin Hills
Wind Power Project**

**Figure C-4.29
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- ▲ Met Tower
- - - Access Road (New)
- - - Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary

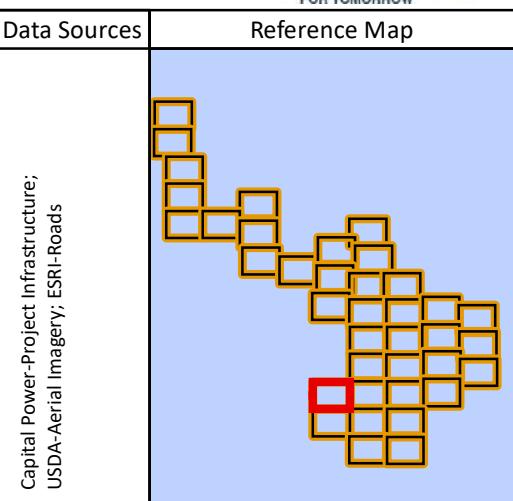


**Nolin Hills
Wind Power Project**

**Figure C-4.30
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Underground Collector Line
- Proposed Crane Path
- Proposed Laydown Area
- Limits of Temporary Disturbance
- County Boundary



**Nolin Hills
Wind Power Project**

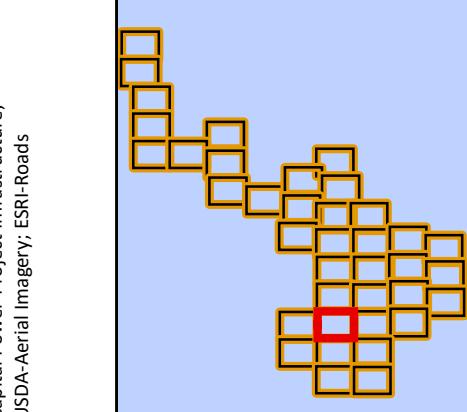
**Figure C-4.31
Project Layout
Detail Mapbook**

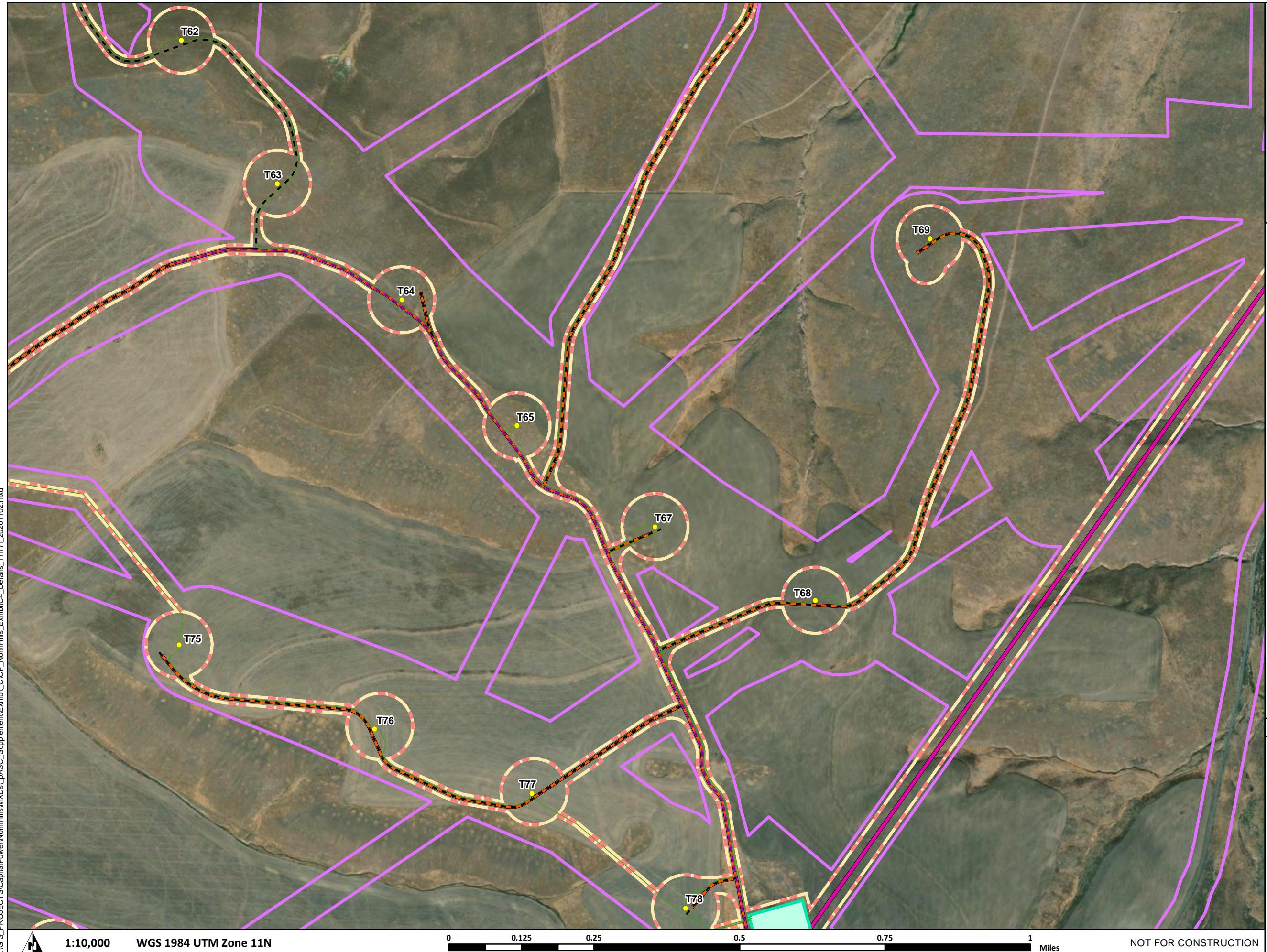
UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Proposed Project Substation
- Connector, 230-kV
- Proposed Substation
- Limits of Temporary Disturbance
- County Boundary

TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	

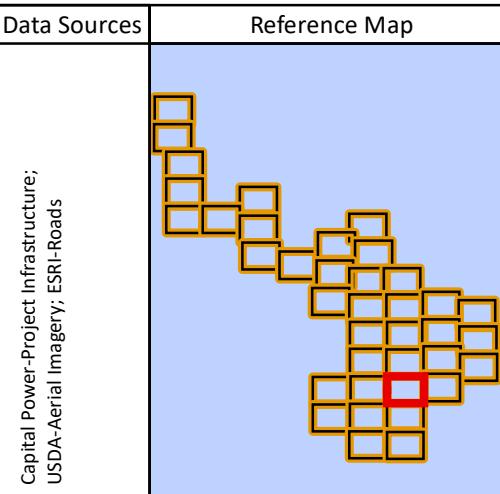
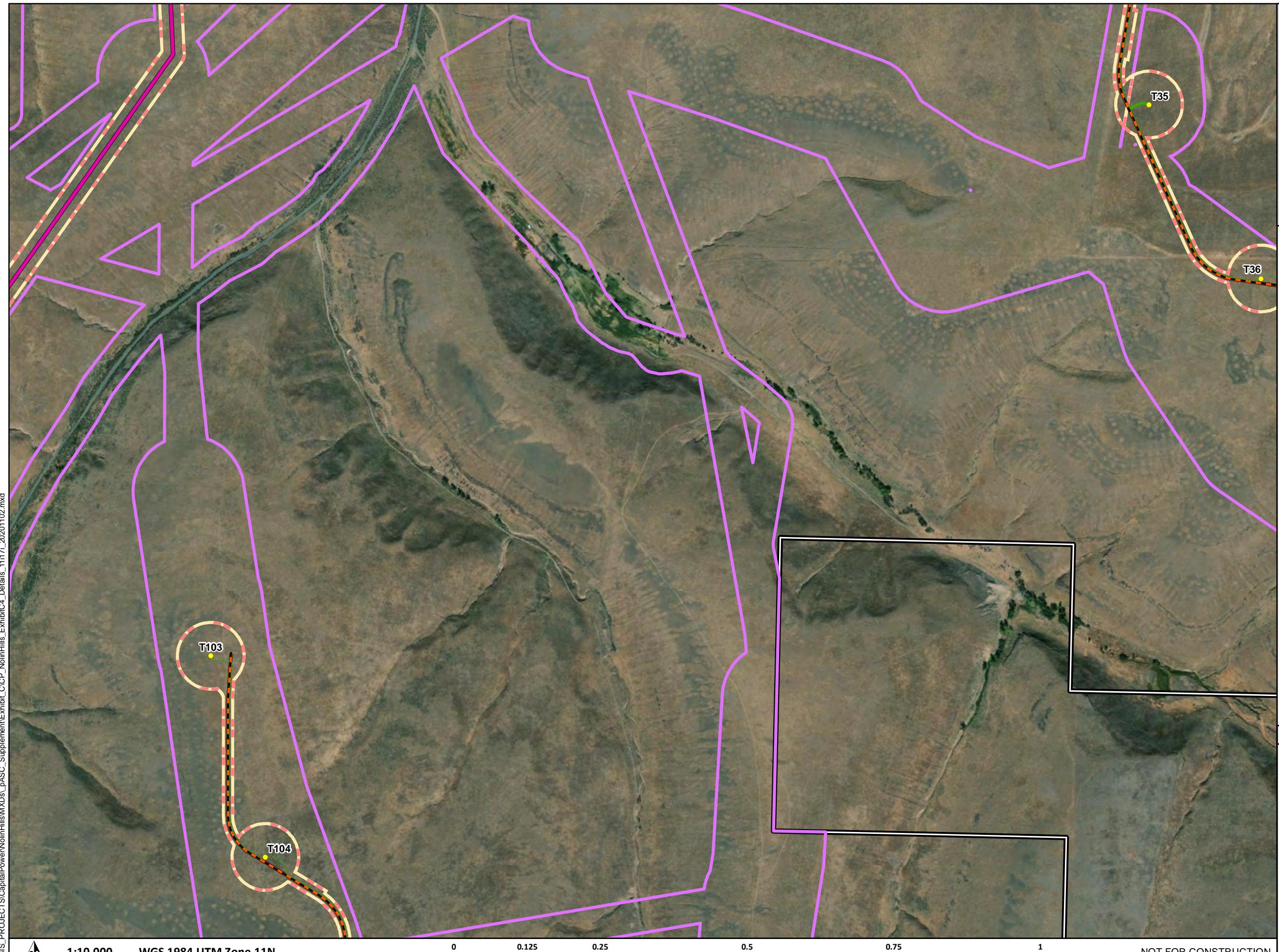


**Nolin Hills
Wind Power Project**

**Figure C-4.32
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Underground Collector Line
- Proposed Crane Path
- Proposed Project Substation
- Connector, 230-kV
- Limits of Temporary Disturbance
- County Boundary



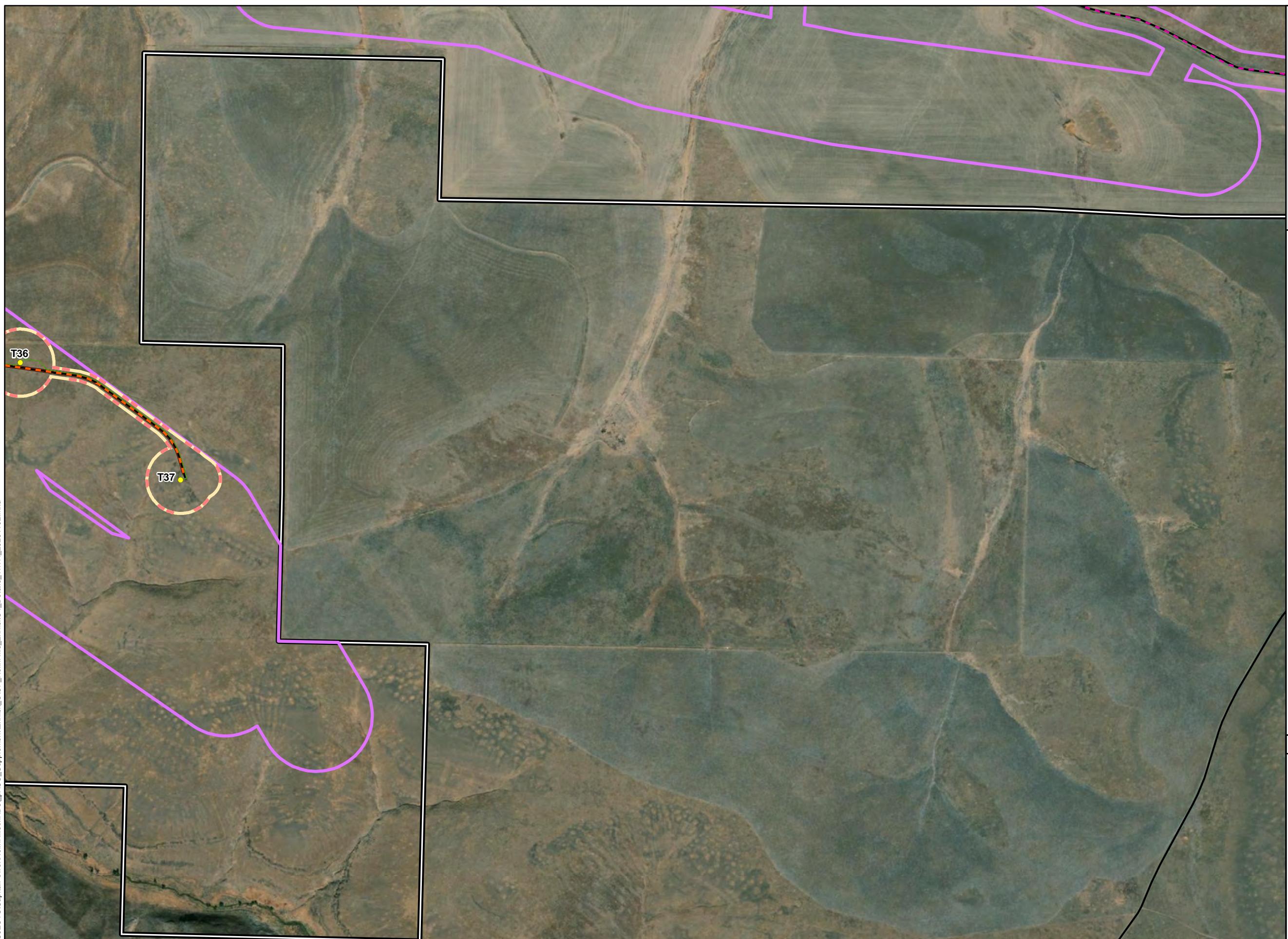
**Nolin Hills
Wind Power Project**

**Figure C-4.33
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- - - Access Road (New)
- - - Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary

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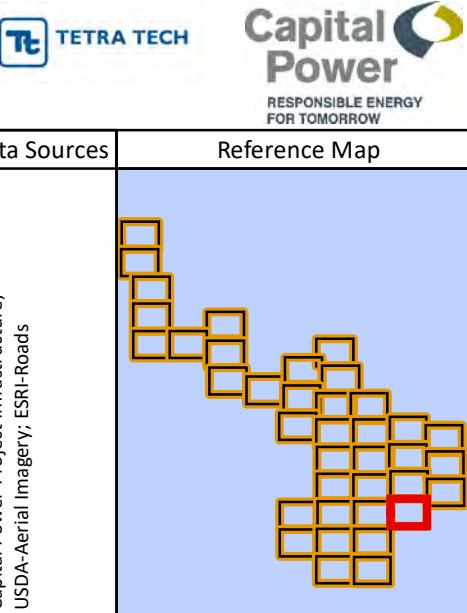


0 0.125 0.25 0.5 0.75 1 Miles



1:10,000 WGS 1984 UTM Zone 11N

NOT FOR CONSTRUCTION



**Nolin Hills
Wind Power Project**

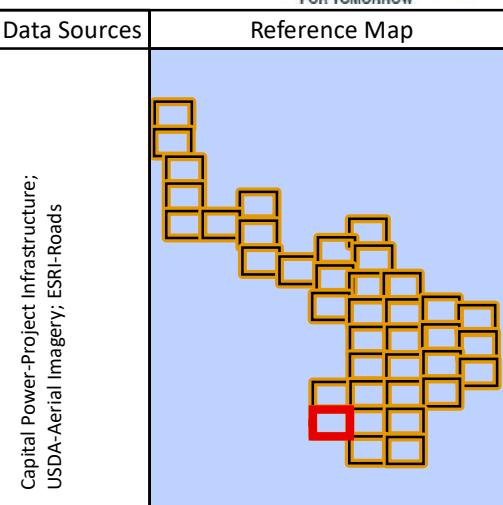
**Figure C-4.34
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- - - Access Road (New)
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- County Boundary

TETRA TECH

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RESPONSIBLE ENERGY
FOR TOMORROW



**Nolin Hills
Wind Power Project**

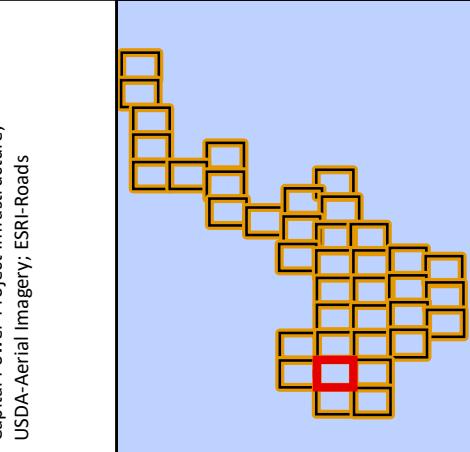
**Figure C-4.35
Project Layout
Detail Mapbook**

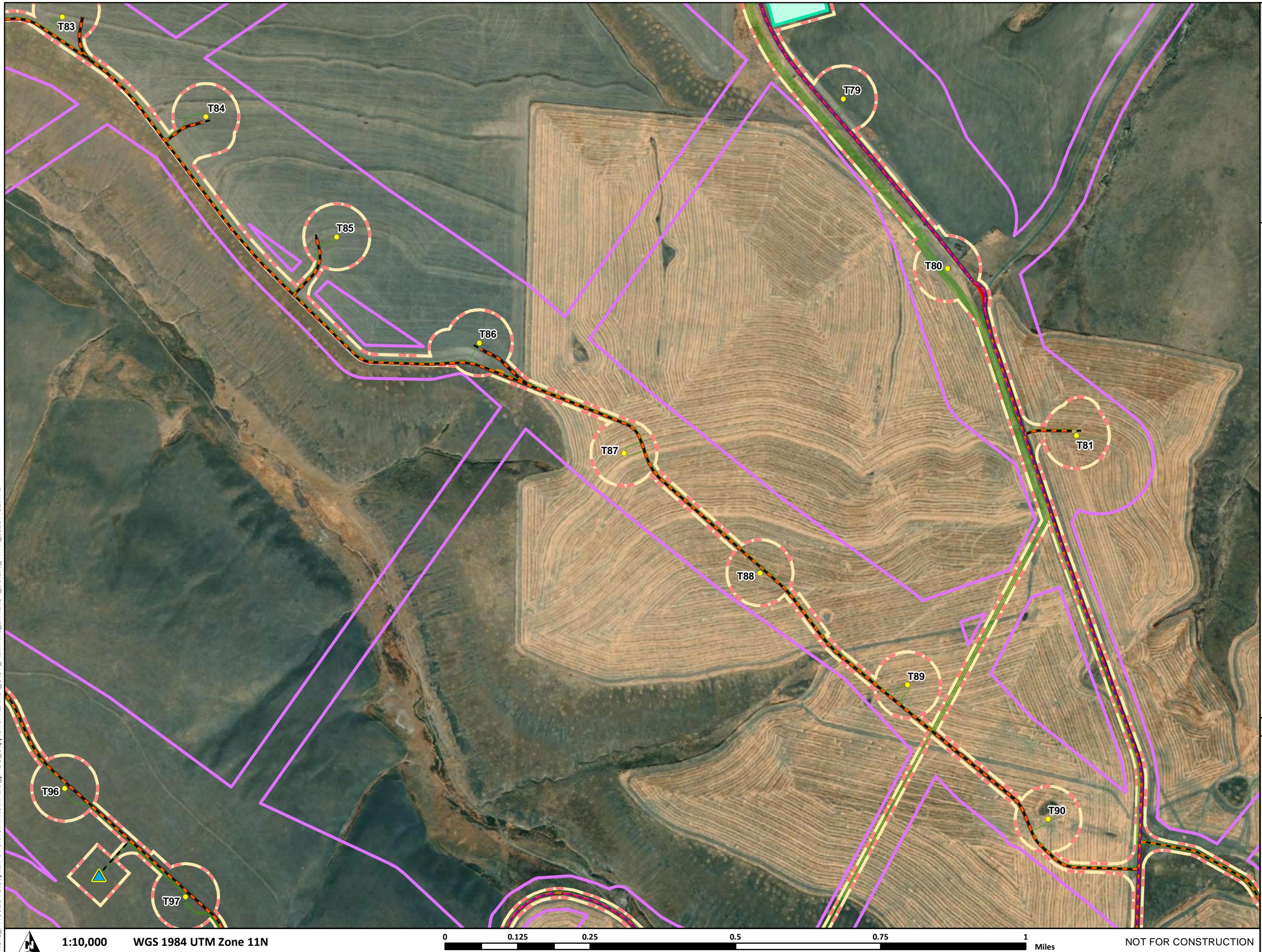
UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Met Tower
- Access Road (New)
- Access Road (Improve Existing)
- Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Proposed Substation
- Proposed Turning Radius
- Improvement
- Proposed Laydown Area
- Limits of Temporary Disturbance
- County Boundary

TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	



**Nolin Hills
Wind Power Project**

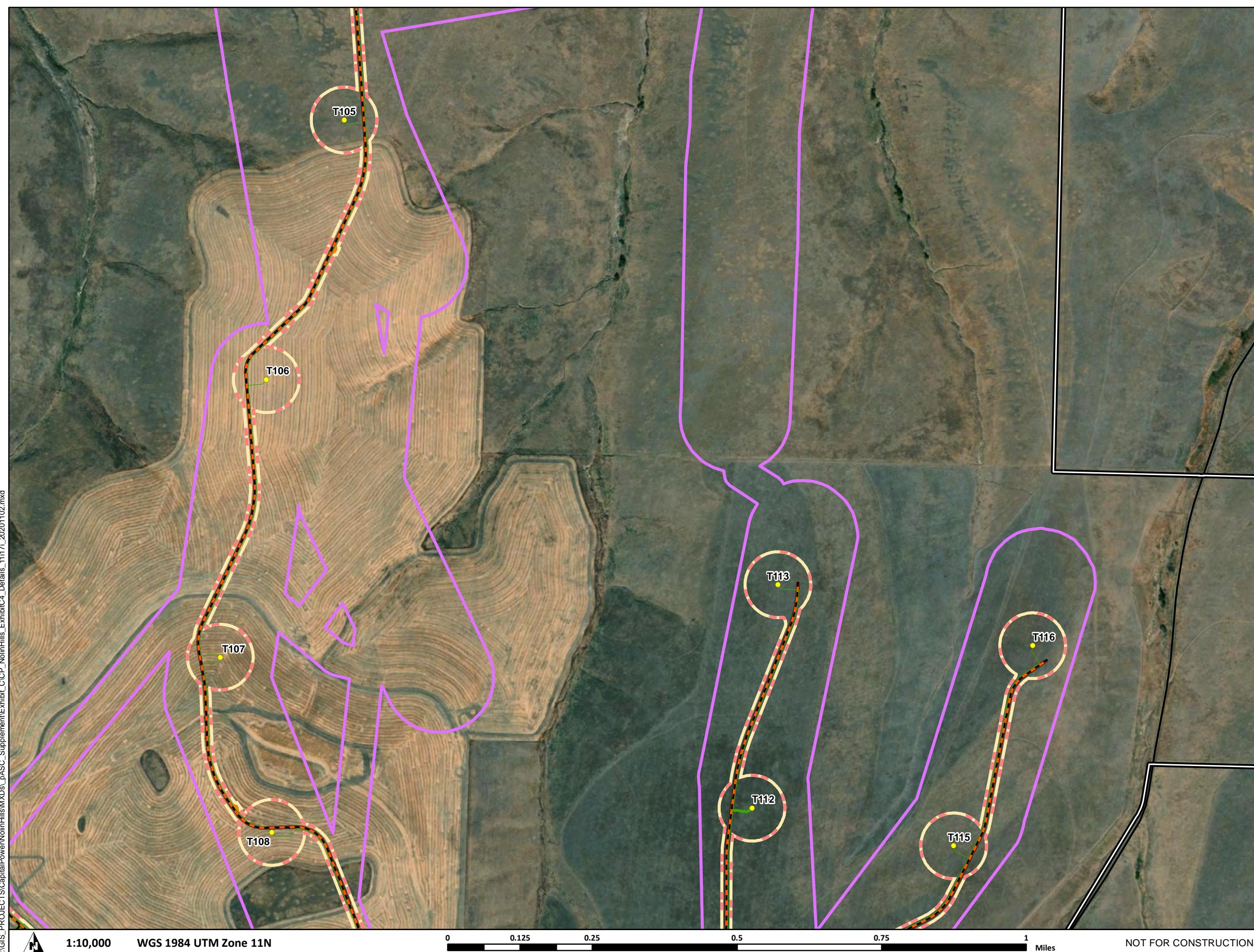
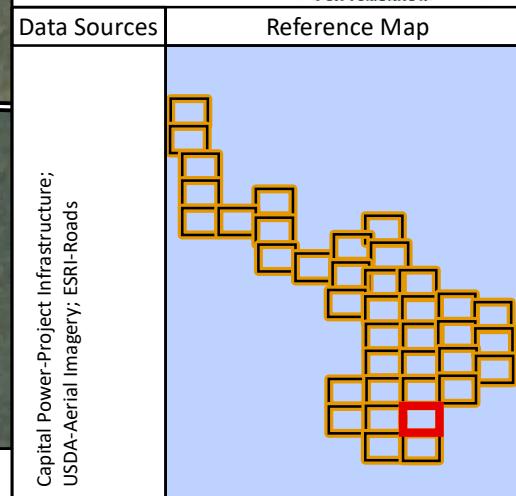
**Figure C-4.36
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Underground Collector Line
- Proposed Crane Path
- Proposed Laydown Area
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary

TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

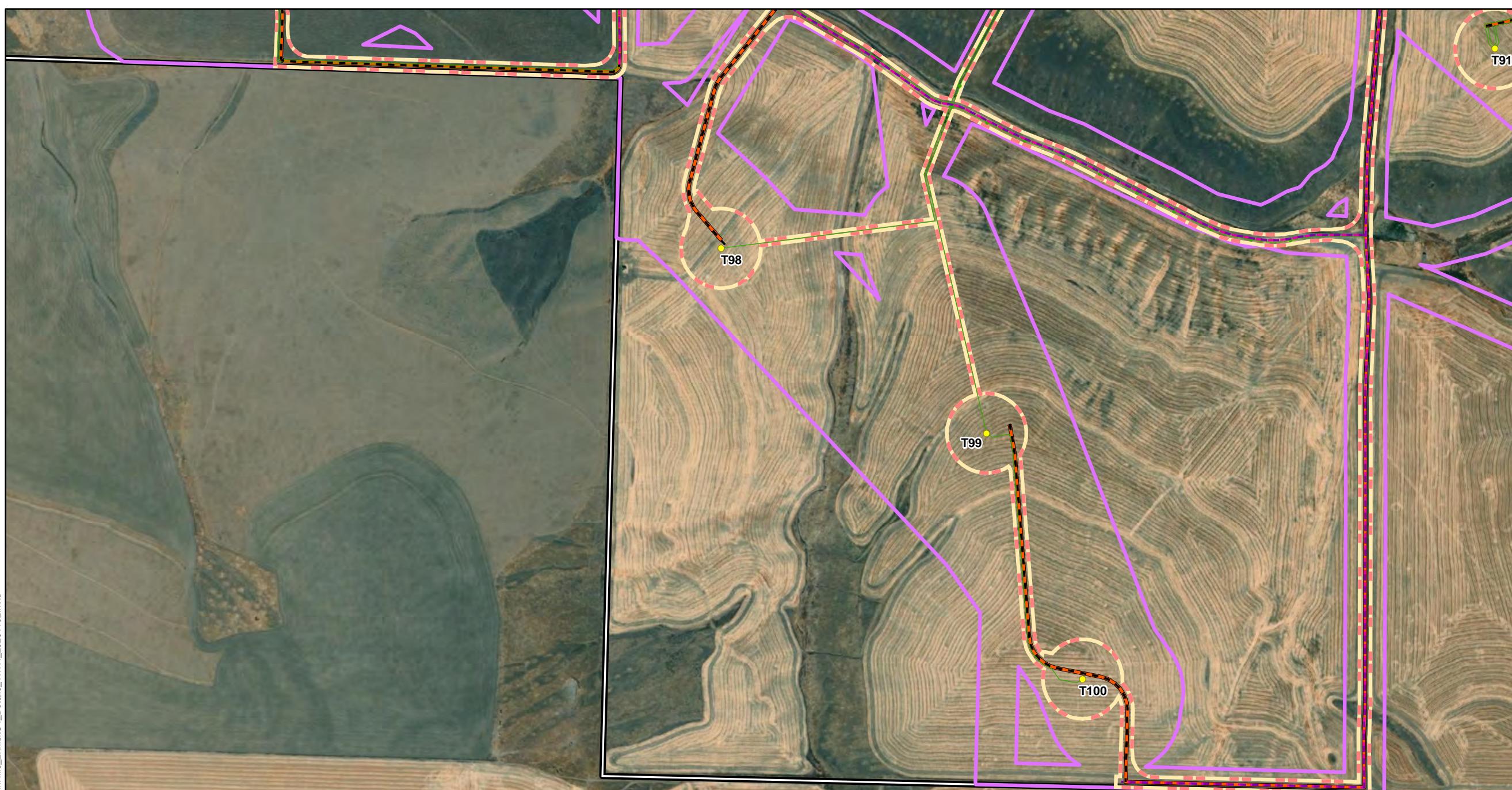


**Nolin Hills
Wind Power Project**

**Figure C-4.37
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- - - Access Road (New)
- - - Access Road (Improve Existing)
- - - Proposed Transportation Route
- Underground Collector Line
- Proposed Crane Path
- Limits of Temporary Disturbance
- County Boundary



TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	



**Nolin Hills
Wind Power Project**

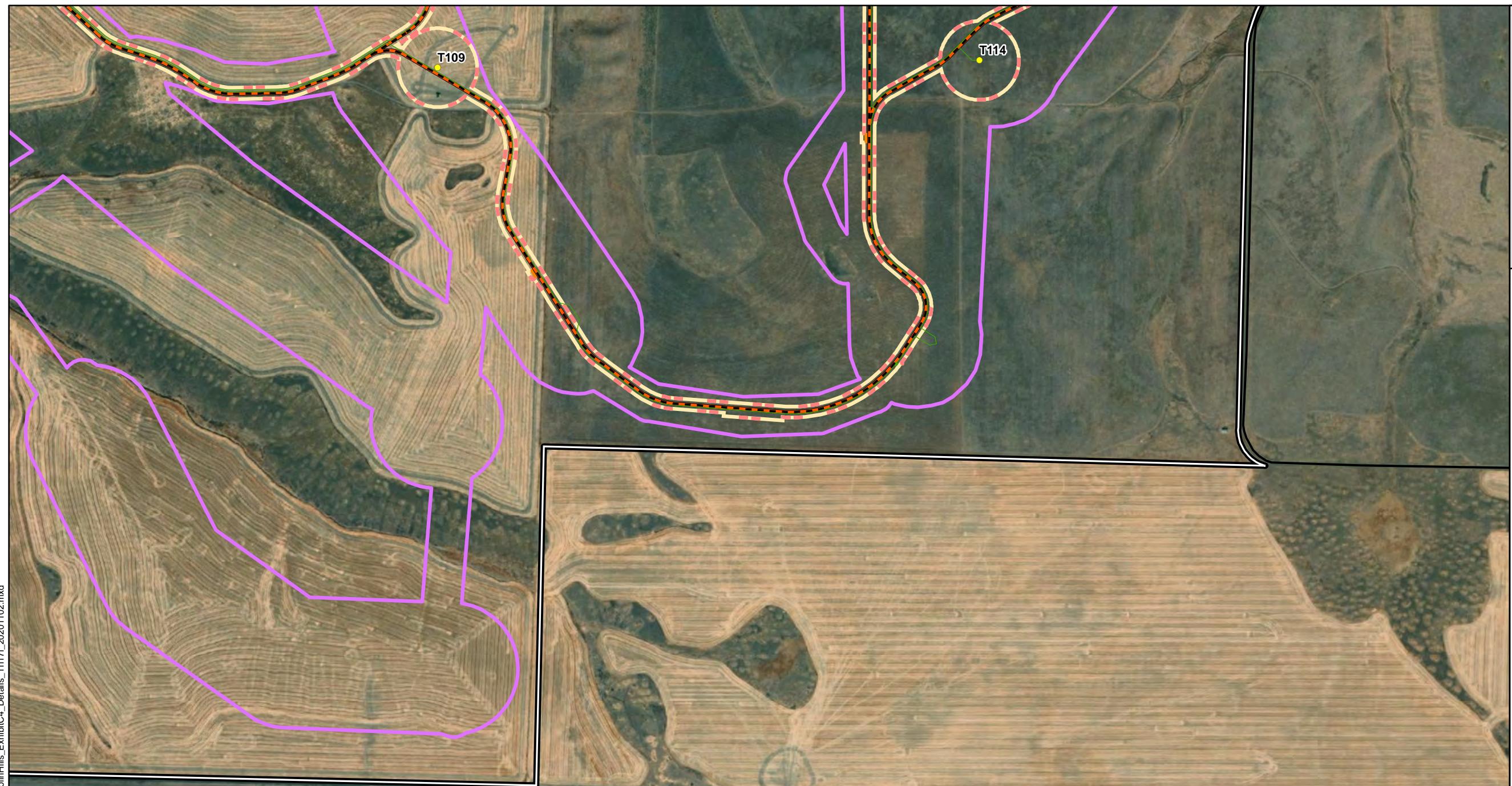
**Figure C-4.38
Project Layout
Detail Mapbook**

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed Turbines
- Access Road (New)
- Underground Collector Line
- Proposed Crane Path
- Proposed Laydown Area
- Limits of Temporary Disturbance
- Secondary Road
- County Boundary



Data Sources	Reference Map
Capital Power-Project Infrastructure; USDA-Aerial Imagery; ESRI-Roads	



Nolin Hills Wind Power Project

Figure C-5
Solar Siting Area Detail

UMATILLA COUNTY, OREGON

- Proposed Site Boundary
- Micrositing Corridor
- Proposed BPA Stanfield
- Transmission Line Route, 230-kV
- Proposed UEC
- Transmission Line Route, 230-kV
- O&M Facility
- Proposed Substation
- Proposed Laydown Area
- Proposed Project Substation
- Connector, 230-kV
- Solar Siting Area Fenceline
- Solar Array
- Solar Access Road
- DC BESS Inverter Block
- BESS Block
- Secondary Road

TETRA TECH

Capital Power
RESPONSIBLE ENERGY
FOR TOMORROW

Data Sources

Reference Map

Canada

WA

OR

ID

MT

CA

NV

Capital Power-Project Infrastructure;
USDA-Aerial Imagery; ESRI-Roads

Capital Power-Project Infrastructure;
USDA-Aerial ImagerV; ESRI-Roads

Supplement Exhibit C5_Solar_11117i_20201102.mxd

1:20,000 WGS 1984 UTM Zone 11

0 0.25 0.5 1 1.5 2 Miles

NOT FOR CONSTRUCTION

Attachment C-1. Temporary and Permanent Impacts (Acres) for Turbine Option 1

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Temporary Impacts for Turbine Option 1—58 Siemens Gamesa 6.0-MW Turbines Project Component	Units	Dimensions per Unit	Number of Units	Temporary Disturbance Acres ¹	Units	Dimensions per Unit	Number of Units	Permanent Disturbance Acres
Wind Turbines	Acres	6.5	58	369.5	Square feet per tower	5,274	58	7.0
Overhead 34.5-kV Collector Lines	Feet of width per linear foot	35	15.6 (mi)	56.0	Square feet per structure	7.1	366	<0.1
Underground 34.5-kV Collector Lines	Feet of width per linear foot	35	59.2 (mi)	153.6	Feet of width per linear foot	—	—	0
230-kV Project Substation Connector Transmission Line	Feet of width per linear foot	108	6.8 (mi)	88.5	Square feet per structure	25.2	60	<0.1
Pulling & Tensioning Areas	Acres	0.75	10	7.5	Acres	—	—	0
230-kV UEC Cottonwood Transmission Line Route ²	Feet of width per linear foot	12	24.9 (mi)	36.2	Square feet per structure	21	283	0.1
230-kV BPA Stanfield Transmission Line Route ²	Feet of width per linear foot	108	4.1 (mi)	53.7	Square feet per structure	25.2	36	<0.1
Meteorological Towers	Square feet	154,750	2	7.6	Square feet per tower	1,764	2	<0.1
Existing Access Roads to Be Improved	Feet of width per linear foot	66	9.2 (mi)	73.6	Feet of width per linear foot	—	—	0
New Access Roads	Feet of width per linear foot	66	28.9 (mi)	231.1	Feet of width per linear foot	16	28.9 (mi)	56.0
Turning Radius Widening	Acres	—	—	6.8	Acres	—	—	0
Crane Paths	Feet of width per linear foot	75	33.2 (mi)	235.1	Feet of width per linear foot	—	—	0
Substations	Acres	3.3 (N)/2.5 (S)	2	5.8	Acres	10.5 (N)/5.9 (S)	2	16.4

Temporary Impacts for Turbine Option 1—58 Siemens Gamesa 6.0-MW Turbines Project Component	Units	Dimensions per Unit	Number of Units	Temporary Disturbance Acres ¹	Units	Dimensions per Unit	Number of Units	Permanent Disturbance Acres
Central Construction Yard	Acres	—	1	27.5	Acres	—	—	0
Distributed Staging Areas	Acres	—	8	0.1	Acres	—	—	0
O&M Building	Acres	—	1	2.9	Acres	—	1	7.63
Total Temporary Impact²				1,011.5	Total Permanent Impact³			
<p>1. Overlapping permanent disturbance area subtracted from temporary impact corridors/areas as described in assumptions Table C-2.</p> <p>2. While only one of the two 230-kV transmission line routes would ultimately be constructed to connect to the regional grid, both are presented to account for all potential impacts.</p> <p>3. Totals were calculated using consolidated data, with areas of overlap eliminated. Therefore, totals are not a sum of the Project component rows.</p>								

**Attachment C-2. Temporary and
Permanent Impacts for Turbine Option 2**

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Temporary and Permanent Impacts for the Project Turbine Option 2 – 116 GE 3.03-MW Turbines

Project Component	Units	Dimensions per Unit	Number of Units	Temporary Disturbance Acres ¹	Units	Dimensions per Unit	Number of Units	Permanent Disturbance Acres
Wind Turbines	Acres	6.5	116112	738.9713.4	Square feet per tower	5,274	116112	14.13.6
Overhead 34.5-kV Collector Lines ²	Feet of width per linear foot	35	9.1 (mi)	28.8	Square feet per structure	7.1	216	<0.1
Underground 34.5-kV Collector Lines ²	Feet of width per linear foot	35	90.289.0 (mi)	253.8250.5	Feet of width per linear foot	--	--	0
230-kV Project Substation Connector Transmission Line ³	Feet of width per linear foot	108200	6.8 (mi)	88.5160.7	Square feet per structure	25.2	60	<0.1
Pulling & Tensioning Areas	Acres	0.75	10	7.5	Acres	--	--	0
230-kV UEC Cottonwood Transmission Line Route ⁴³²	Feet of width per linear foot	12200	24.925.3 (mi)	36.2613.6	Square feet per structure	21	283	0.1
230-kV BPA Stanfield Transmission Line Route ⁴³²	Feet of width per linear foot	108200	4.15.0 (mi)	53.7122.3	Square feet per structure	25.2	3646	<0.1
Meteorological Towers	Square feet	154,750	3	10.5	Square feet per tower	1,764	3	0.1
Existing Access Roads to Be Improved	Feet of width per linear foot	66	19 (mi)	151.6	Feet of width per linear foot	--	--	0
New Access Roads ⁵⁴	Feet of width per linear foot	66	44.42.8 (mi)	351.8342.9	Feet of width per linear foot	16	44.42.8 (mi)	85.182.9
Turning Radius Widening	Acres	--	--	14.613.5	Acres	--	--	0
Crane Paths	Feet of width per linear foot	75	53.350.9 (mi)	385.3368.5	Feet of width per linear foot	--	--	0
Substations ⁶⁵	Acres	3.31.5 (N)/2.5 (S)	2	5.83.9	Acres	10.5 (N)/5.9 (S)	2	16.4

Project Component	Units	Dimensions per Unit	Number of Units	Temporary Disturbance Acres ¹	Units	Dimensions per Unit	Number of Units	Permanent Disturbance Acres
Central Construction Yard ²⁶	Acres	--	1	<u>27.5</u> n/a	Acres	--	--	<u>0</u> 27.5
Distributed Staging Areas	Acres	--	11	0.2	Acres	--	--	0
O&M Building ²⁷	Acres	--	1	<u>2.90</u> .6	Acres	--	1	7.63
<u>Solar Siting Area</u>	<u>Acres</u>	<u>--</u>	<u>1</u>	<u>11.6</u>	<u>Acres</u>	<u>--</u>	<u>1</u>	<u>1,895.7</u>
Total Temporary Impact²⁸				<u>1,532.32,075.</u> <u>4</u>			Total Permanent Impact²⁹	<u>123.22,034.9</u>

1. Overlapping permanent disturbance area subtracted from temporary impact corridors/areas as described in assumptions Table C-2.
2. The collector lines within the solar siting area are not included in this row. Disturbance from the up to 55 miles of collector lines (up to 10 percent overhead) associated with the Project's solar component is included in the total permanent disturbance reported for the solar siting area. As the entire area is considered permanently disturbed, no temporary impact is estimated for collector lines within the solar siting area.
3. In areas of sensitive habitat (shrub-steppe), the temporary impact corridor was narrowed to 50 feet to minimize Project disturbance. This is reflected in the limits of disturbance illustrated on Figure C-4.
4. While only one of the two 230-kV transmission line routes would ultimately be constructed to connect to the regional grid, both are presented to account for all potential impacts. In areas of sensitive habitat (shrub-steppe), the temporary impact corridor was narrowed to 50 feet to minimize Project disturbance. This is reflected in the limits of disturbance illustrated on Figure C-4. Of the two potential corridors for the BPA Stanfield route, the largest potential length and footprint is included for calculating impacts.
5. As for collector lines, disturbance from the up to 18 miles of new access roads associated with the Project's solar component is included in the total permanent disturbance reported for the solar siting area. As the entire area is considered permanently disturbed, no temporary impact is estimated for new access roads within the solar siting area.
6. The northern Project substation is within the solar siting area for purposes of analysis; as such, only temporary disturbance outside the solar siting area fence line is reported. While the permanent acreage of the northern Project substation is provided separately for informational purposes, overlap with the solar siting area is subtracted from the total permanent impact in the last row.
7. The central construction yard is within the fenced solar siting area for purposes of analysis. While it would only be used as a construction yard during the temporary construction period, it is within the permanently disturbed solar siting area, and could be used as needed during operation of the Project. The acreage is provided for informational purposes; overlap with the solar siting area is subtracted from the total permanent impact in the last row.
8. The O&M Building is within the fenced solar siting area for purposes of analysis; as such, only temporary disturbance outside the solar siting area fence line is reported. While the permanent acreage of the O&M Building is provided separately for informational purposes, overlap with the solar siting area is subtracted from the total permanent impact in the last row.
39. Totals were calculated using consolidated data, with areas of overlap eliminated. Therefore, totals are not a sum of the Project component rows.