Horse Heaven Wind Farm	Updated EFSEC Application for Site Certificati	.IOI
APPENDIX I:	WETLAND AND OTHER WATERS DELINEATION REPORT (REVISED AUGUST 2021)	<u>IOI.</u>



# Memo

To:	Amy Moon, EFSEC; Lori White, Ecology
Cc:	Dave Kobus, Scout Clean Energy
From:	Jessica Taylor, Tetra Tech; Linnea Fossum, Tetra Tech
Date:	Thursday, August 12, 2021
Subject:	Amendments to the Wetlands and Other Waters Delineation Report for the Horse Heaven Wind Farm Project

This memo serves as a cover sheet to the amended Wetlands and Other Waters Delineation Report for the Horse Heaven Wind Farm Project and details the changes that have been made as a result of surveys completed in May 2021 where access had not previously been granted. The Washington Department of Ecology requested that the report be amended to include wetland E10, found outside the Project survey area, and the field delineated streamlines for the streams on Washington Department of Natural Resources land that had previously been inaccessible. The following table lists the amendments made to the original Wetlands and Other Waters Delineation Report for the Horse Heaven Wind Farm Project.

Item	Description	Page Number and Location				
1	Added precipitation data for May 2021 site visit	Pages 4 and 5, Section 4.5 and Table 3				
2	Added dates of surveys to Section 5.2 Field Work	Page 6, Section 5.2				
3	Added wetland "E10" descriptions to Section 6, Figure A-4, and data sheets in Appendix B.	Page 7, Section 6.1; Figure A-4 Map 11; Appendix B				
4	Ephemeral drainages EPH900, EPH901, EPH902, EPH904, and EPH905 were originally digitized using orthoimagery due to lack of access to those parcels. These features were surveyed in the field in May when access to those parcels was obtained. The last paragraph in Section 5.2.2 detailing the desktop delineation method has been removed.	Page 7, Section 5.2.2				
5	Desktop delineated streams EPH901 and EPH902 were found to not actually have bed or banks during field surveys. Both features were swale features. These features have been removed from the table of non-wetland features and figures.	Page 7, Table 4; Figure A-4, Maps 3 and 8				
6	Figure A-4 has been updated to show field delineated streamlines for EPH900, EPH904, and EPH905.	EPH900 – Figure A-4, Map 8; EPH904, and EPH905 – Figure A-4, Map 11				

# Wetlands and Other Waters Delineation Report for the Horse Heaven Wind Farm Project

Submitted by Horse Heaven Wind Farm, LLC

Prepared by



December 2020 Amended August 2021

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# **ACRONYMS AND ABBREVIATIONS**

AW Supplement Regional Supplement to the Corps of Engineers Wetland Delineation Manual:

Arid West (Version 2.0)

FAC Facultative

FACU Facultative Upland
FACW Facultative Wetland
LRR Land Resource Region

NHD National Hydrography Dataset

NI No Indicator

NRCS Natural Resources Conservation Service

NWI National Wetlands Inventory

OBL Obligate

Project Horse Heaven Wind Farm Project

SDAM Streamflow Duration Assessment Method for the Pacific Northwest

Tetra Tech, Inc.

the Manual Wetlands Delineation Manual, Technical Report Y-87-1

UPL Upland

USACE U.S. Army Corps of Engineers
USDA U.S. Department of Agriculture

WETS Climate Analysis for Wetlands Tables

# 1 INTRODUCTION

An approximately 21,680-acre area was surveyed for wetlands and other waters as part of the reporting for the proposed Horse Heaven Wind Farm Project (Project) in Benton County. The Project is a commercial wind and solar project with a nominal nameplate energy generating capacity of up to 1,150 megawatts proposed by Scout Clean Energy and located in Benton County, Washington. Tetra Tech, Inc. employed two staff experienced in conducting wetland delineations in the Arid West region of the United States. The surveys were completed in pairs with senior staff supervising junior staff. The staff included:

- Jessica Taylor, Wetland Scientist, who has over 15 years of experience conducting wetland and other waters of the U.S. assessments in the Pacific Northwest; and
- Katie Pyne, Biologist, who has 2 years of experience conducting wetland and other waters of the U.S. assessments in the Pacific Northwest.

# 2 LANDSCAPE SETTING AND LAND USE

## 2.1 Project Study Area

The Project study area encompasses 21,680 acres of mostly dryland agricultural crops and private homes (Figure A-1). This area receives between 6 and 8 inches of precipitation annually and includes no irrigated crops. Agricultural crops are winter wheat followed by a chemical fallow rotation. Grazing does occur on the stubble left behind after wheat harvest and on the lands where cropping is not feasible.

# 2.2 Landscape Setting

The Project is located within the Level III Columbia Plateau Ecoregion, and within the further subdivided Level IV, Yakima Folds Ecoregion (Thorson et al. 2003). In addition, the Project is within U.S. Department of Agriculture (USDA) Land Resource Region (LRR) B, Northwestern Wheat and Range Region (NRCS 2006). LRR B, Northwestern Wheat and Range Region, overlaps within the Project study area with LRR B Columbia/Snake River Plateau Region in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0; U.S. Army Corps of Engineers [USACE] 2008) (AW Supplement).

Plant species names and associated wetland indicator status ratings are from the State of Washington 2016 Wetland Plant List (Lichvar et al. 2016). The following wetland indicator ratings are ordered according to the percent likelihood, from most likely to least likely, of the plant occurring in wetlands: Obligate (OBL), Facultative Wetland (FACW), Facultative (FAC), Facultative Upland (FACU), and Upland (UPL). Species with an indicator of NI (No Indicator) refers to plants that are not listed in the wetland plant list and are thereby considered to be upland plants.

Woody vegetation commonly observed in the Project study area included big sagebrush (*Artemisia tridentata*, UPL), yellow rabbitbrush (*Chrysothamnus viscidiflorus*, UPL), and rubber rabbitbrush (*Ericameria nauseosa*, UPL).

Herbaceous species documented in upland areas included intermediate wheatgrass (*Agropyron intermedium*, UPL), bluebunch wheatgrass (*Pseudoroegneria spicata*, UPL), medusahead grass (*Taeniatherum caput-medusae*, UPL), bulbous bluegrass (*Poa bulbosa*, UPL), Idaho fescue (*Festuca idahoensis*, FACU), common yarrow (*Achillea millefolium*, FACU), tall fescue (*Schedonorus* 

arundinaceus, FAC), lupine (Lupinus sp., UPL), nineleaf biscuit-root (Lomatium triternatum, UPL), and yellow salsify (Tragapogon dubius, UPL).

The Washington State Department of Ecology requests information of priority habitats and species from the Washington Department of Fish and Wildlife. Surveys for specialized habitats and species are being assessed as part of separate reports in support of this Project and can be made available as requested.

# 2.3 National Wetlands Inventory and Natural Resources Conservation Service Soils

Prior to field work, Tetra Tech reviewed the National Wetlands Inventory (NWI), Natural Resource Conservation Service (NRCS) hydric soils data, and aerial photographs to identify potential wetlands and other waters, as described below.

# 2.3.1 National Wetlands Inventory Data

Desktop review of NWI data identified no wetlands within the Project study area. Figure A-2 of Appendix A shows the National Hydrography Dataset (NHD) map layered over the Project study area.

# 2.3.2 NRCS Hydric Soils Data

Nineteen soil map units are mapped in the Project study area (Table 1, and Figure A-3 [NRCS 2020]). The dominant soil in the Project study area is Ritzville silt loam, with 0 to 5 percent slopes covering 85.6 percent of the Project study area. There are no soils in the Project study area that are considered hydric soils.

Table 1. Soils Mapped in the Project Study Area<sup>1</sup>

Map Symbol	Unit Name	Hydric Soil Y/N	Acres	Percent of Project Study Area
BmAB	Burke silt loam, 0 to 5 percent slopes	No	59.1	0.3%
EfB	Ellisforde silt loam, 0 to 5 percent slopes	No	105.5	0.5%
EfE3	Ellisforde silt loam, 15 to 30 percent slopes, severely eroded	No	18	0.1%
EsB	Esquatzel fine sandy loam, 0 to 5 percent slopes	No	10.7	0.0%
EuAB	Esquatzel silt loam, 0 to 5 percent slopes	No	4	0.0%
FeC	Finley fine sandy loam, 0 to 15 percent slopes	No	10	0.0%
KnE	Kiona very stony silt loam, 0 to 30 percent slopes	No	47.3	0.2%
KnF	Kiona very stony silt loam, 30 to 65 percent slopes	No	41.3	0.2%
ReB	Ritzville silt loam, 0 to 5 percent slopes	No	18,547.5	85.6%
ReE3	Ritzville silt loam, 15 to 30 percent slopes, severely eroded	No	1,347.5	6.2%
ReF	Ritzville silt loam, 30 to 65 percent slopes	No	621	2.9%
RfD2	Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded	No	502.4	2.3%
ShAB	Shano silt loam, 0 to 5 percent slopes	No	112.5	0.5%
ShE3	Shano silt loam, 15 to 30 percent slopes, severely eroded	No	66.5	0.3%
ShF	Shano silt loam, 30 to 65 percent slopes	No	31.6	0.1%
SnD2	Shano very fine sandy loam, 0 to 15 percent slopes, eroded	No	20.9	0.1%
WdF	Warden silt loam, 30 to 65 percent slopes	No	26.7	0.1%

Map Symbol	Unit Name	Hydric Soil Y/N	Acres	Percent of Project Study Area
WsB	Willis silt loam, 0 to 5 percent slopes	No	55.8	0.3%
WsE3	Willis silt loam, 15 to 30 percent slopes, severely eroded	No	50.9	0.2%

<sup>&</sup>lt;sup>1</sup> NRCS 2020a

# 3 SITE ALTERATIONS

Site alterations are those activities that directly or indirectly impact wetlands and other waters such that the function or area of the feature changes significantly. A significant alteration would be one that renders the feature non-functioning, or one that changes the boundaries. Land use in the Project study area is generally dominated by agricultural activities including wheat farming and open range grazing. Tillage practices are changing across the region, and the conversion to reduced till and no-till methods of farming has decreased the amount of overland flow and increased the infiltration rates on site. The alterations associated with these practices may have affected the geographic size and/or the hydroperiod of wetlands and other waters. Some waters that were delineated in the study area are likely to have had historically higher flows due to runoff from the farmed fields that would not be present with the new farming practices.

# 4 PRECIPITATION DATA AND ANALYSIS

Average historical monthly precipitation data and daily precipitation data for the periods preceding and during field work were obtained from the National Oceanic and Atmospheric Administration's National Weather Service (NOAA 2020; Table 2). The closest geographical location with an NRCS WETS table is for Kennewick, Washington (NRCS 2020b).

The annual precipitation before the 2020 surveys was 90 percent of normal and the annual precipitation before the 2021 surveys was 65 percent of normal. Based on the precipitation data for the 3 months preceding the site visits in 2020, it was estimated that groundwater was about average for what is usually encountered at that time of year (Table 2). Based on the precipitation data for the 3 months preceding the site visits in 2021, it was estimated that groundwater was below average for what is usually encountered at this time of year (Table 3).

The lower than normal precipitation levels did not affect the delineation of waters as determinations of intermittent versus ephemeral stream were made using indicators described in the Streamflow Duration Assessment Method for the Pacific Northwest (SDAM) (Nadeau 2015). The SDAM relies on multiple indicators independent of the presence/absence of hydrology, in particular, vegetation and the slope of the channel.

# 4.1 February 2020 Site Visits

Field surveys for wetlands and other waters were conducted from February 19<sup>th</sup> to 23<sup>rd</sup>, 2020. There was no measurable precipitation in the 10 days preceding field work, and on the final day of field data collection the month-to-date precipitation for February was 42 percent of normal. Monthly precipitation totals for November and December were well below average while January was just under average.

# 4.2 August 2020 Site Visits

Field surveys for wetlands and other waters were conducted on August 26<sup>th</sup> and 27<sup>th</sup>, 2020. There was 0.01 inch of measurable precipitation within the 10 days preceding field work, and the total amount precipitation for August was 65 percent of normal. Precipitation was lower than normal in July and August; however, May and June were well above normal precipitation rates.

#### 4.3 October 2020 Site Visits

Field surveys for wetlands and other waters were conducted on October 19<sup>th</sup> and 20<sup>th</sup>, 2020. There was 0.19 inches of measurable precipitation within the 10 days preceding field work, and the total amount precipitation for October was only 43 percent of normal. Precipitation was lower than normal in August and September as well.

#### 4.4 November 2020 Site Visit

Field surveys for wetlands and other waters were conducted on November 30<sup>th</sup>, 2020. There was 0.06 inches of measurable precipitation within the 10 days preceding field work, and the total amount of precipitation for November was 143 percent of normal. Precipitation was lower than normal in September and October.

## 4.5 May 2021 Site Visit

Field surveys for wetlands and other waters were conducted on May 11<sup>th</sup>, 2021. There was 0.01 inches of measurable precipitation within the 10 days preceding field work, and the total amount of precipitation for April was 0 percent of normal. December and February had higher than average amounts of rainfall. March was much drier than the average at 17 percent of normal and only a trace of rain fell in April compared to the 0.53 average inches.

Table 2. Precipitation Data – Water Year 2019 to 2020: Current and Historical (Inches)

Precipitation Data Source	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Annual Total to Date (November 2020)
Recorded Monthly Precipitation Totals (inches) (Pasco, WA)	0.48	0.18	0.47	1.00	0.32	0.49	0.19	1.08	0.55	0.04	0.17	0.05	0.27	1.32	7.13
WETS Accumulated Monthly Averages (inches) (Kennewick, WA)	0.60	0.92	1.15	1.07	0.76	0.71	0.53	0.74	0.50	0.18	0.26	0.33	0.60	0.92	7.89
Recorded Precipitation Relative to Average Monthly Precipitation (Kennewick, WA)	80%	20%	41%	93%	42%	69%	36%	146%	110%	22%	65%	15%	43%	143%	90%

Table 3. Precipitation Data – Water Year 2020 to 2021: Current and Historical (Inches)

Precipitation Data Source	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Annual Total to Date (May 2021)
Recorded Monthly Precipitation Totals (inches) (Pasco, WA)	0.48	0.18	1.17	0.54	1.84	0.12	0	0.04	4.24
WETS Accumulated Monthly Averages (inches) (Kennewick, WA)	0.60	0.92	1.15	1.07	0.76	0.71	0.53	0.74	6.49
Recorded Precipitation Relative to Average Monthly Precipitation (Kennewick, WA)	80%	20%	102%	50%	242%	17%	0%	5%	65%

# 5 METHODS

#### 5.1 Pre-field Work

In preparation for the field work, Tetra Tech reviewed NWI, NHD (USGS 2020), hydric soils data, and aerial photographs to identify potential wetlands and other waters, as described in the preceding sections. Tetra Tech prepared digital field maps with these data and uploaded these maps onto a Samsung Android data collection tablet to assist field staff in identifying the locations of probable wetlands and non-wetland waters within or adjacent to the Project study area.

Wetlands and surface water data were obtained from NWI (NWI 2020). Soils data were obtained from the NRCS Web Soil Survey (NRCS 2020a). Tetra Tech used high-resolution Google Earth Pro historical imagery to identify potential wetland areas (Google Earth 2020). Tetra Tech also reviewed the Washington Natural Heritage Program for high-quality wetlands in or near the Project study area (Heritage Program 2018). No high-quality wetlands were present in the Project study area.

The following guidance documents and procedures were reviewed:

- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West (Version 2.0) (USACE 2008);
- Wetlands Delineation Manual, Technical Report Y-87-1 (the Manual) (USACE 1987);
- Streamflow Duration Assessment Method for the Pacific Northwest (Nadeau 2015); and
- Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979).

#### 5.2 Field Work

Field investigations for the delineation of wetlands and other waters included pedestrian surveys within the Project study area. Tetra Tech conducted the field delineation on February 19<sup>th</sup> through February 23<sup>rd</sup>, 2020 with follow-ups on August 26<sup>th</sup> and 27<sup>th</sup>, October 19<sup>th</sup> and 20<sup>th</sup>, and November 30<sup>th</sup>, 2020; and another follow-up visit on May 11<sup>th</sup>, 2021. The desktop wetland data were used to focus the wetland delineations, while the desktop surface water data were used to focus the non-wetlands water evaluation as necessary.

#### 5.2.1 Wetland Delineations

Wetland presence was determined as per methods in the Manual and the AW Supplement. Two sample sites were investigated at representative low elevations within the Project study area (see Appendix B for USACE data sheets for each site). Wetland indicator status for plants was determined using the State of Washington 2016 Wetland Plant List (Lichvar et al. 2016). No wetland indicators were found at any of the low elevation sites on the landscape nor were they found within the ephemeral streambeds.

#### 5.2.2 Non-wetland Waters Evaluations

Non-wetland waters evaluated using the following criteria.

- Flow duration for non-wetland waters was determined using SDAM (Nadeau 2015). Details on mapping methods are presented in Section 8.0.
- The centerline of non-wetland waters less than 6 feet in width was recorded as a line feature and buffered to the stream width determined in the field.

- Photographs were taken to document streams, ditches, and upland conditions at locations that NHD mapped as streams (Appendix C, Photolog).
- As water flows downstream, sites with upland conditions and lack of bed and banks were used to determine that the same conditions exist for sites uphill within the same drainage.

# 6 DESCRIPTION OF WETLANDS AND OTHER WATERS

All wetlands, non-wetland waters, and roadside drainage ditches evaluated in the Project study area are depicted in the Figure A-4 mapbook.

#### 6.1 Wetlands

There are no wetlands within the Project study area, however, one wetland was identified outside of the Project study area. This wetland (E10) was surveyed at the request of the Department of Ecology. It lies approximately 240 feet west of the Project study area boundary. Figure A-4, Map 11 shows the location of the wetland in relation to the Project study area and the USACE data sheets are located in Appendix B. Photos of the site are in the photolog in Appendix C, pages C-98 and C-99.

#### 6.2 Non-Wetland Waters

Thirty-one ephemeral streams and two intermittent streams were delineated within the Project study area. Table 3 below contains the acres of streams delineated within the larger Project area and is not limited to the stream segments that are present within the micrositing corridor. Stream acreage was determined by multiplying the average stream width by the length of the segment within the Project study area.

Table 4. Non-wetland Waters

Feature Name	Feature Type	Acres
EPH100	Ephemeral Stream	0.07
EPH101	Ephemeral Stream	0.00
EPH102	Ephemeral Stream	0.06
EPH104	Ephemeral Stream	0.15
EPH105	Ephemeral Stream	0.03
EPH200	Ephemeral Stream	0.02
EPH202	Ephemeral Stream	0.02
EPH203	Ephemeral Stream	0.03
EPH205	Ephemeral Stream	0.04
EPH206	Ephemeral Stream	0.02
EPH300	Ephemeral Stream	0.05
EPH301	Ephemeral Stream	0.02
EPH302	Ephemeral Stream	0.03
EPH303	Ephemeral Stream	0.04
EPH305	Ephemeral Stream	0.02
EPH306	Ephemeral Stream	0.09
EPH307	Ephemeral Stream	0.11
EPH308	Ephemeral Stream	0.03

Feature Name	Feature Type	Acres
EPH400	Ephemeral Stream	0.08
EPH401	Ephemeral Stream	0.46
EPH411	Ephemeral Stream	0.11
EPH413	Ephemeral Stream	0.07
EPH500	Ephemeral Stream	0.03
EPH501	Ephemeral Stream	0.04
EPH600	Ephemeral Stream	0.04
EPH602	Ephemeral Stream	0.07
EPH700	Ephemeral Stream	0.43
EPH800	Ephemeral Stream	0.15
EPH900	Ephemeral Stream	0.17
EPH904	Ephemeral Stream	0.01
EPH905	Ephemeral Stream	0.00
INT01	Intermittent Stream	0.02
INT02	Intermittent Stream	0.02
Grand Total		2.56

# 7 DEVIATION FROM NWI

The NWI showed no wetlands in the Project study area. Field surveys found one wetland outside of the Project study area.

# 8 MAPPING METHODS

Photograph and sample plot locations were recorded using a Samsung tablet equipped with ArcGIS Field Collector software and the Juniper Geode series GPS unit. This unit streams raw satellite data configured to differentially correct positions in real time using the Satellite Based Augmentation System, which typically results in positional error of less than 1 meter. Photopoints are shown in Figures A-2, A-3, and A-4, and photos are provided in Appendix C.

## 9 RESULTS AND CONCLUSIONS

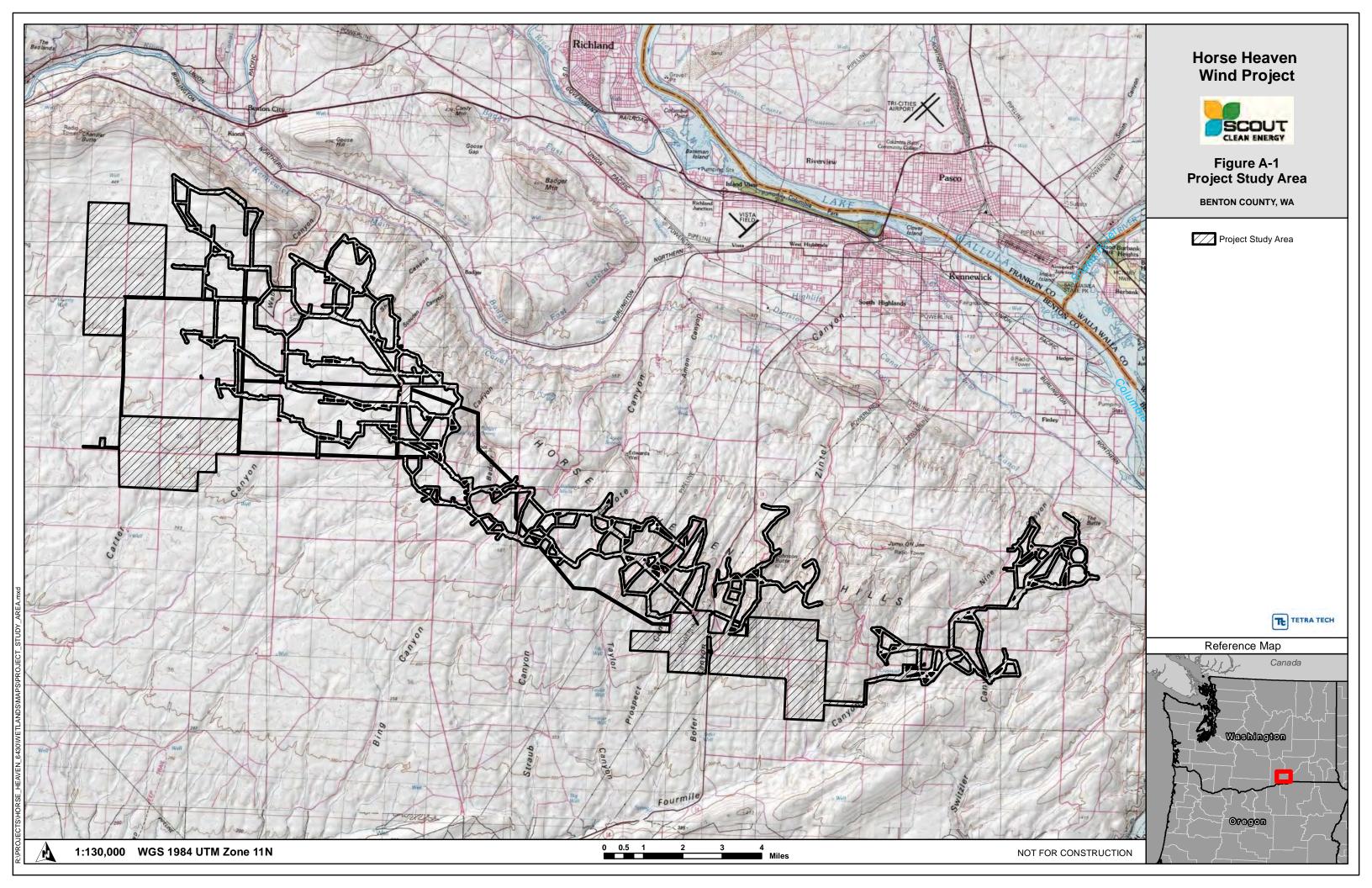
Using methods recommended in the USACE Manual and Arid West Supplement, no wetlands were found in the Project study area and one wetland was found within 300 feet of the Project study area. Two intermittent streams and 31 ephemeral streams were documented within the Project study area.

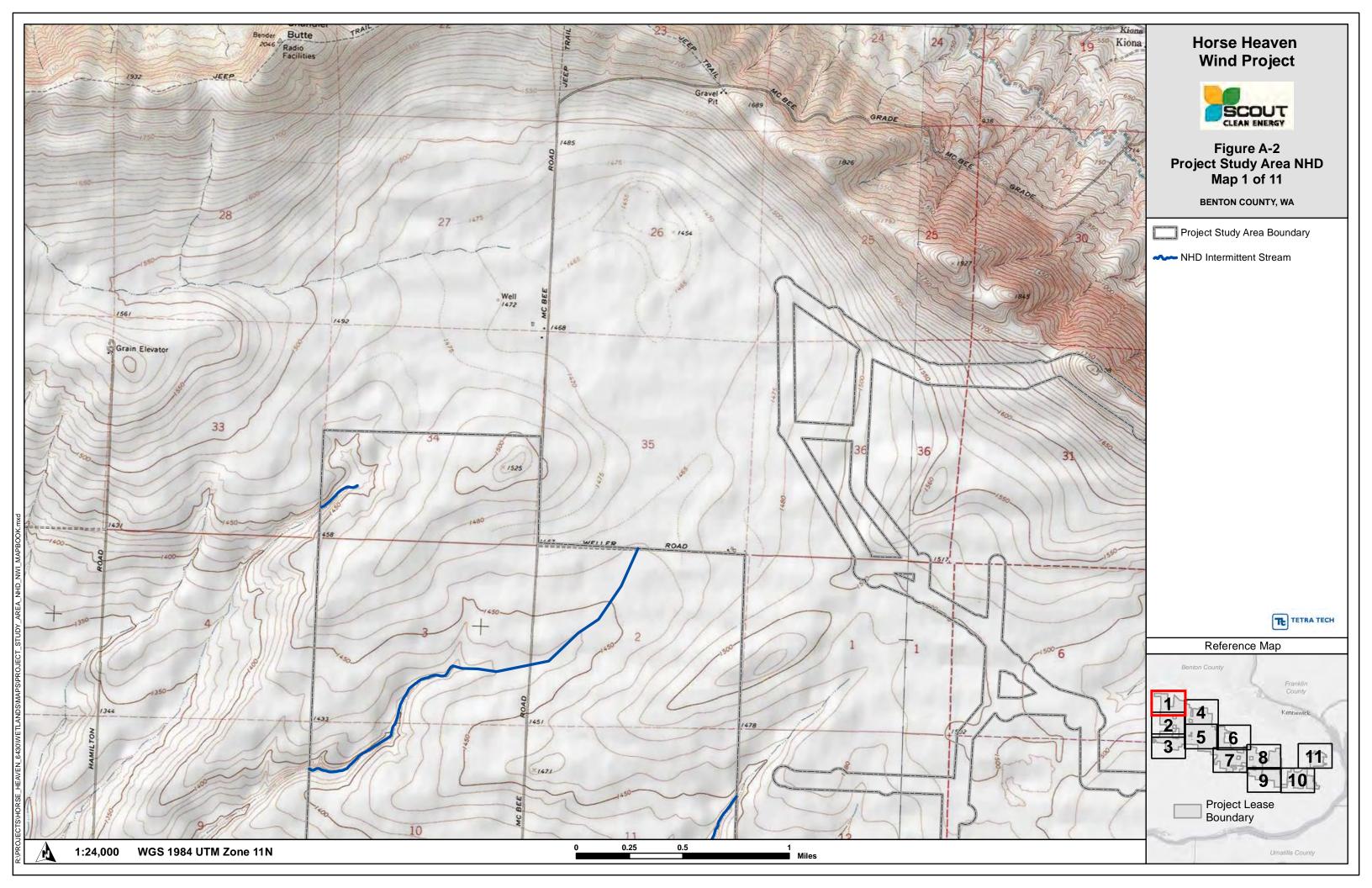
# 10 REFERENCES

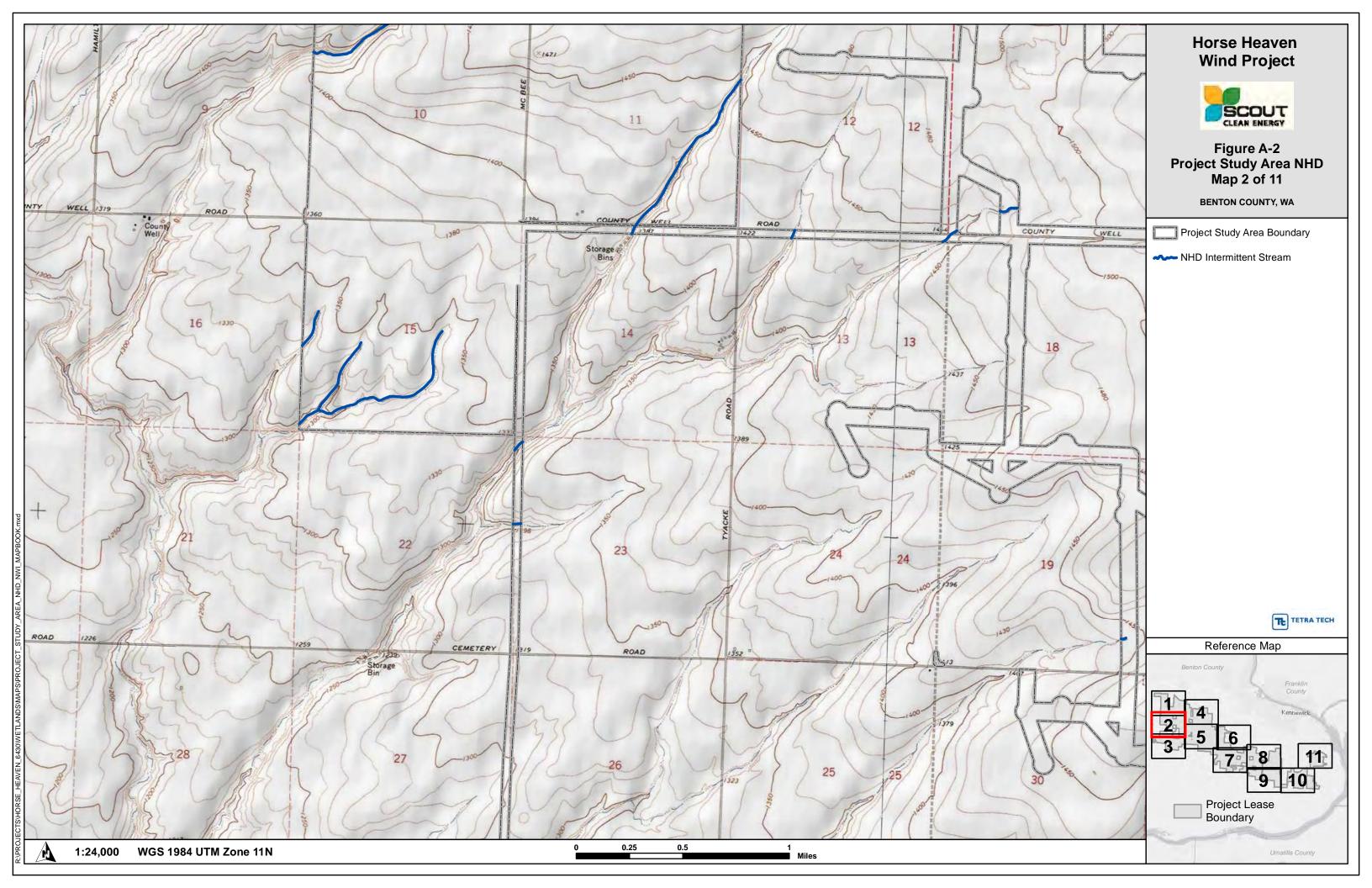
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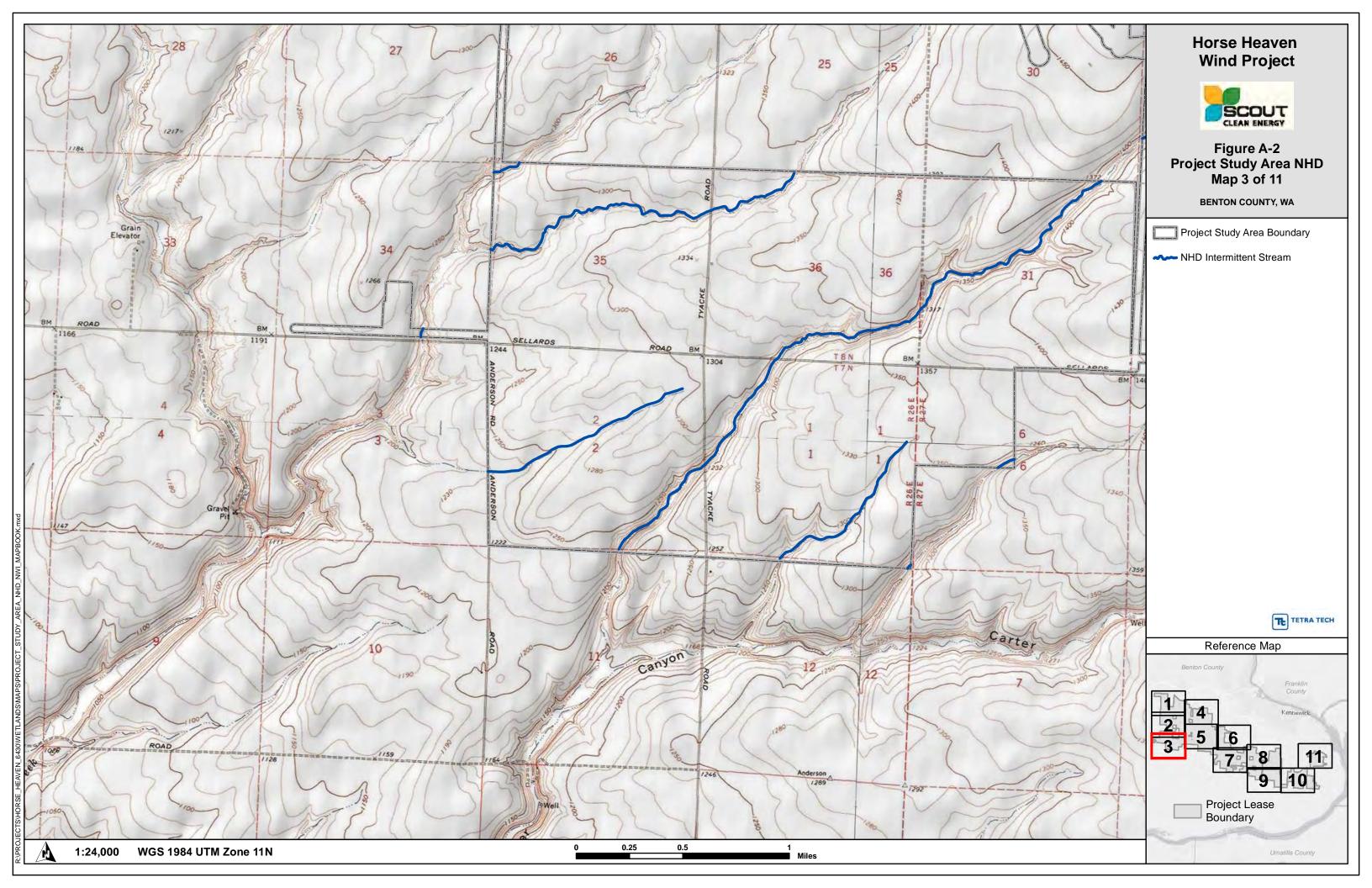
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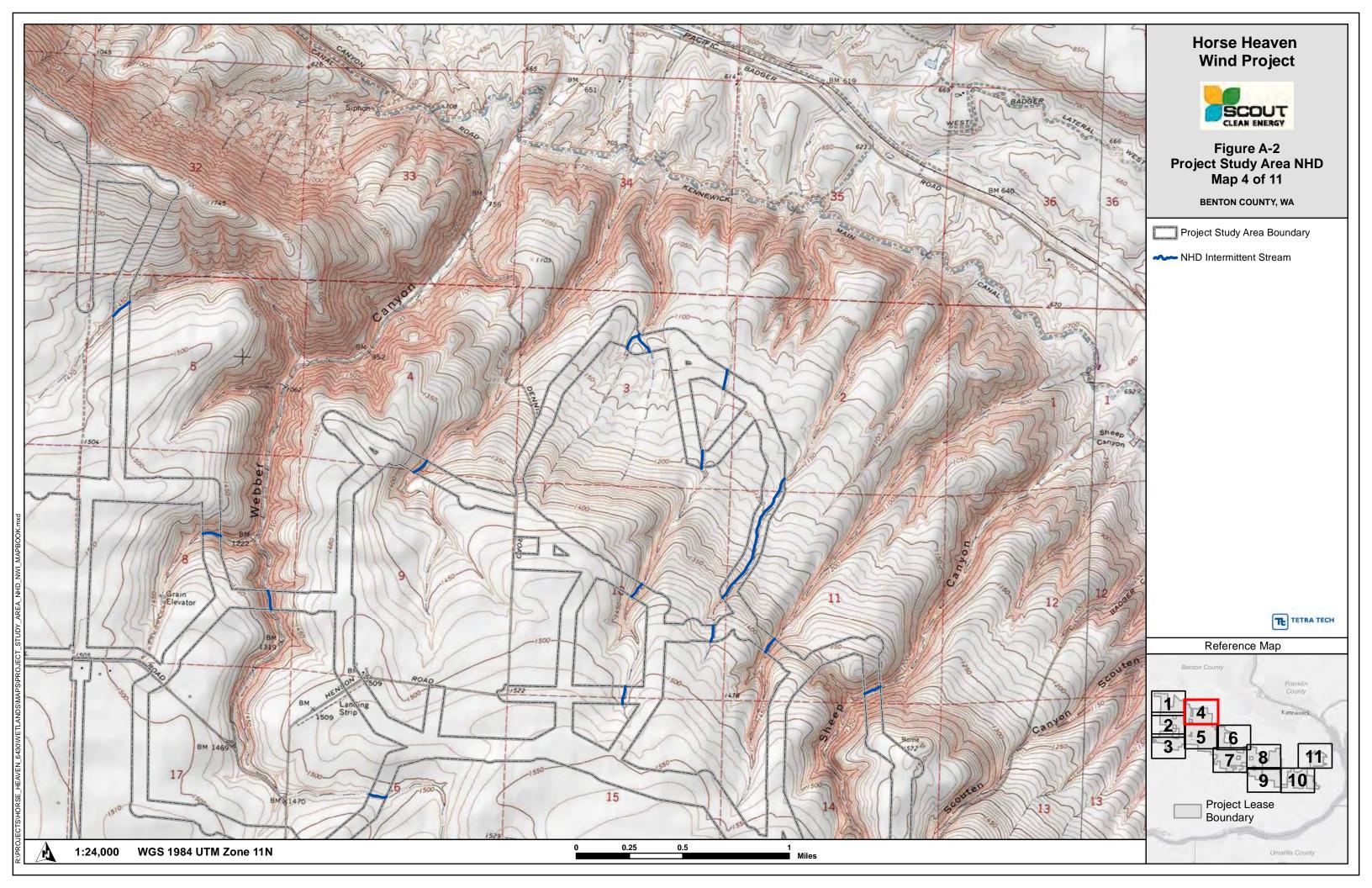
# APPENDIX A FIGURES

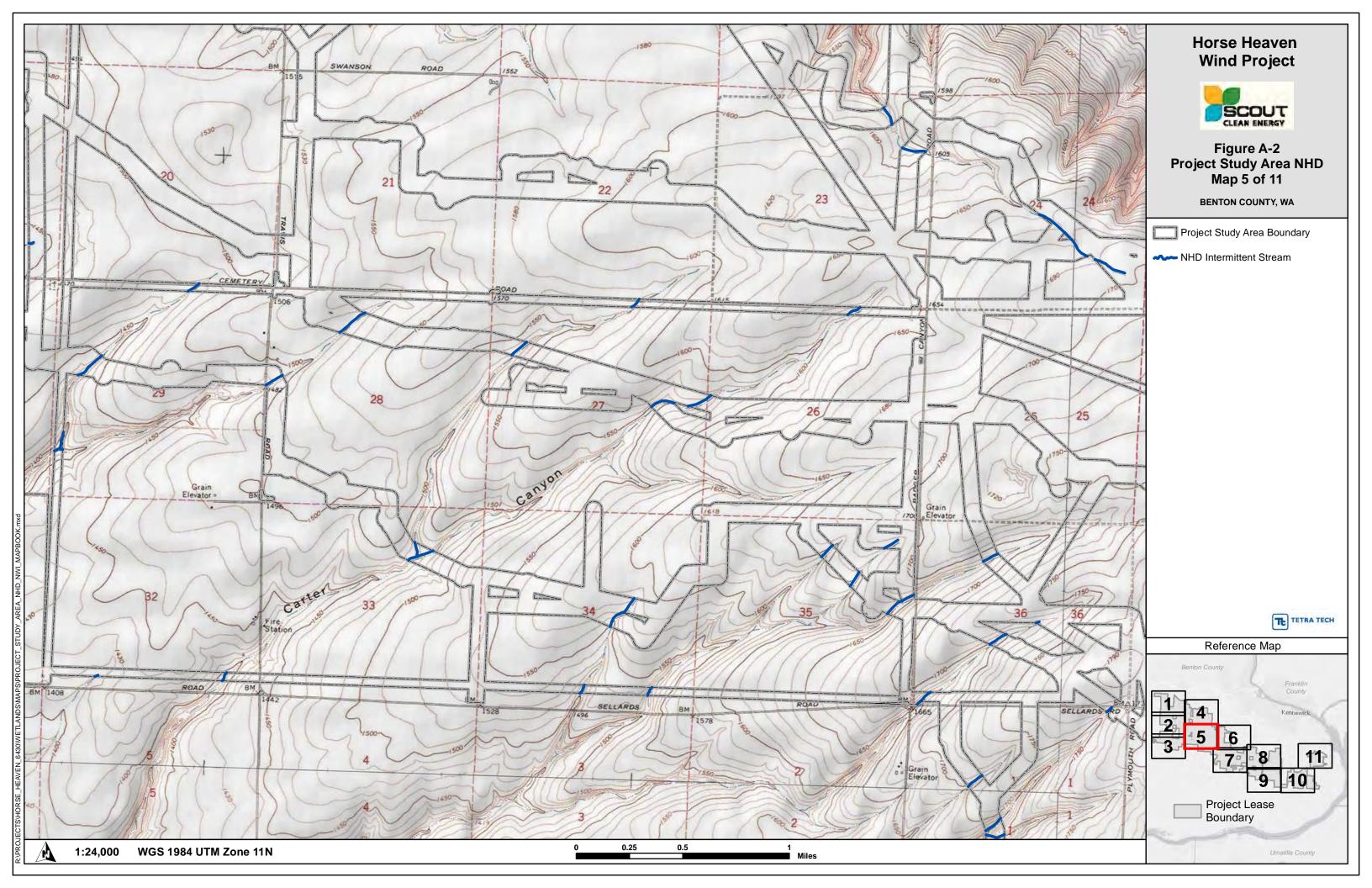


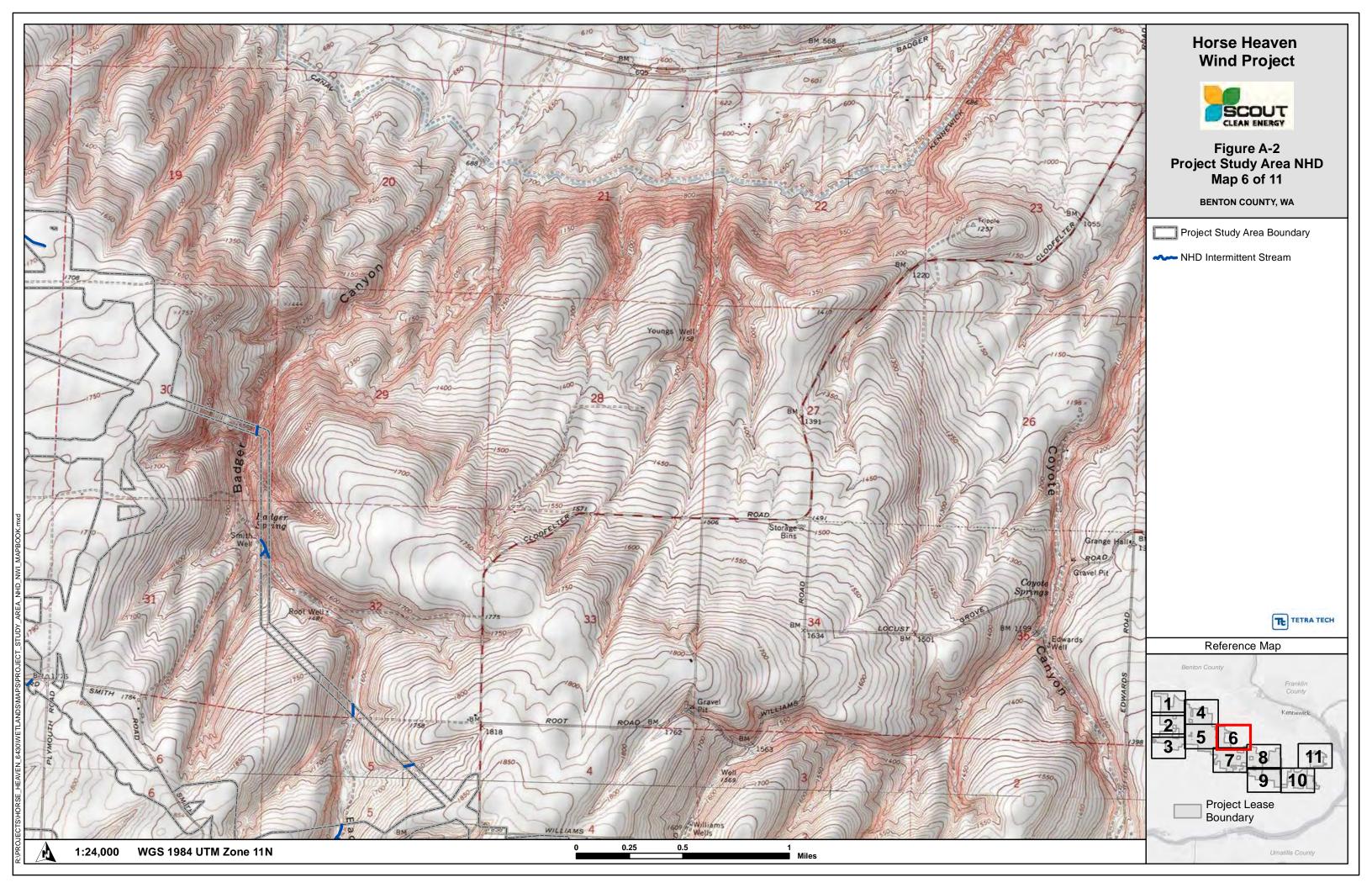


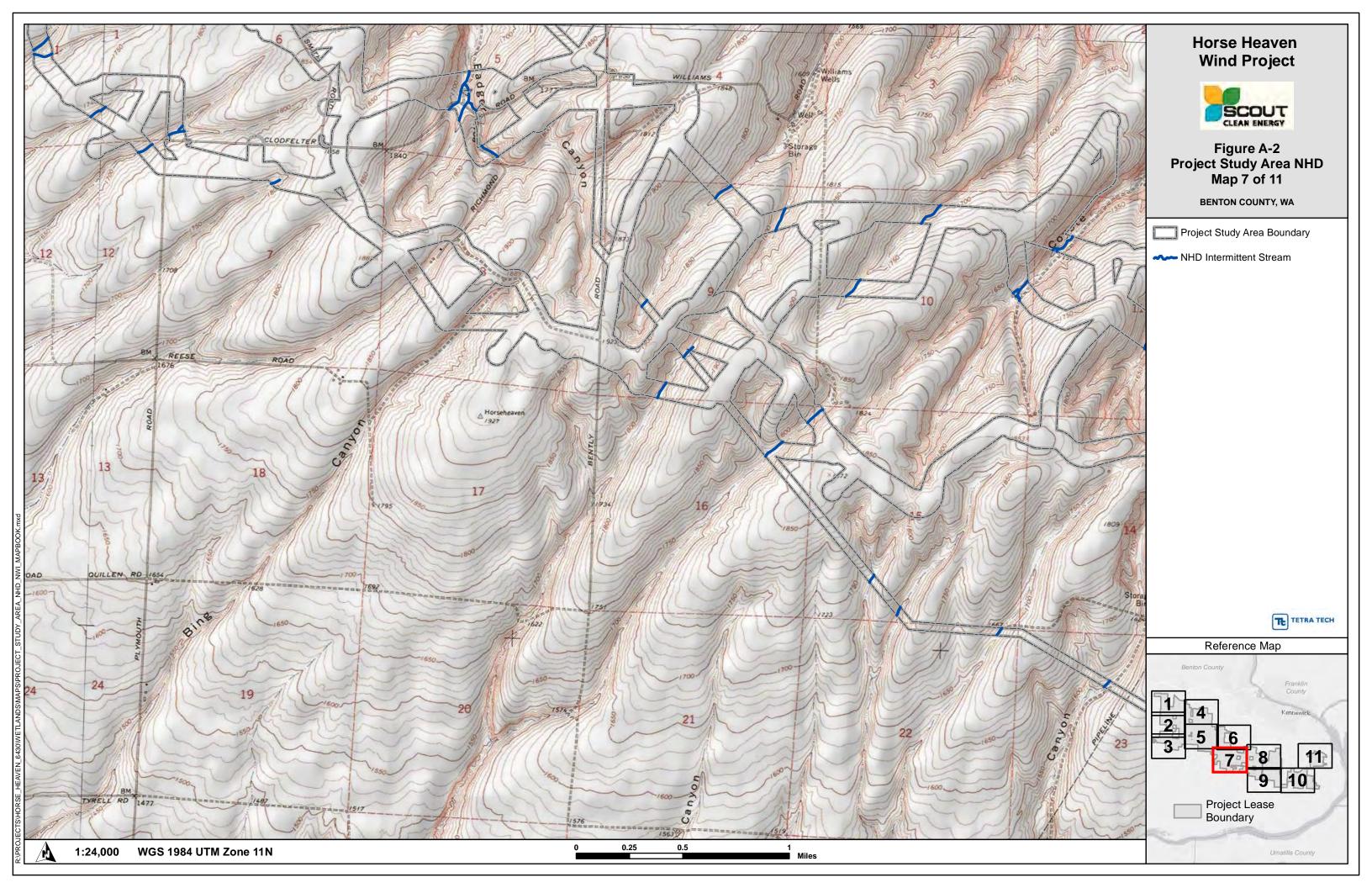


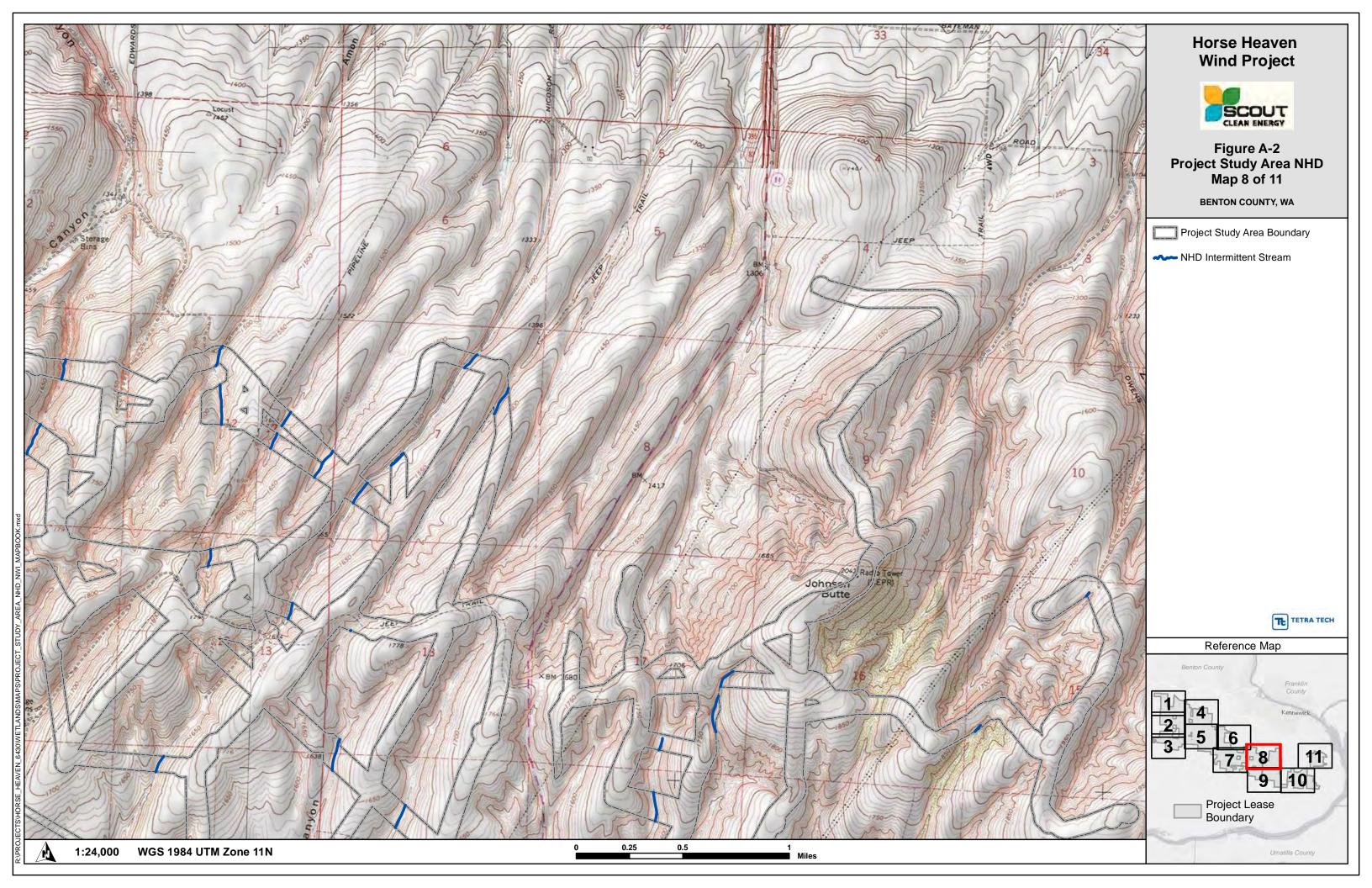


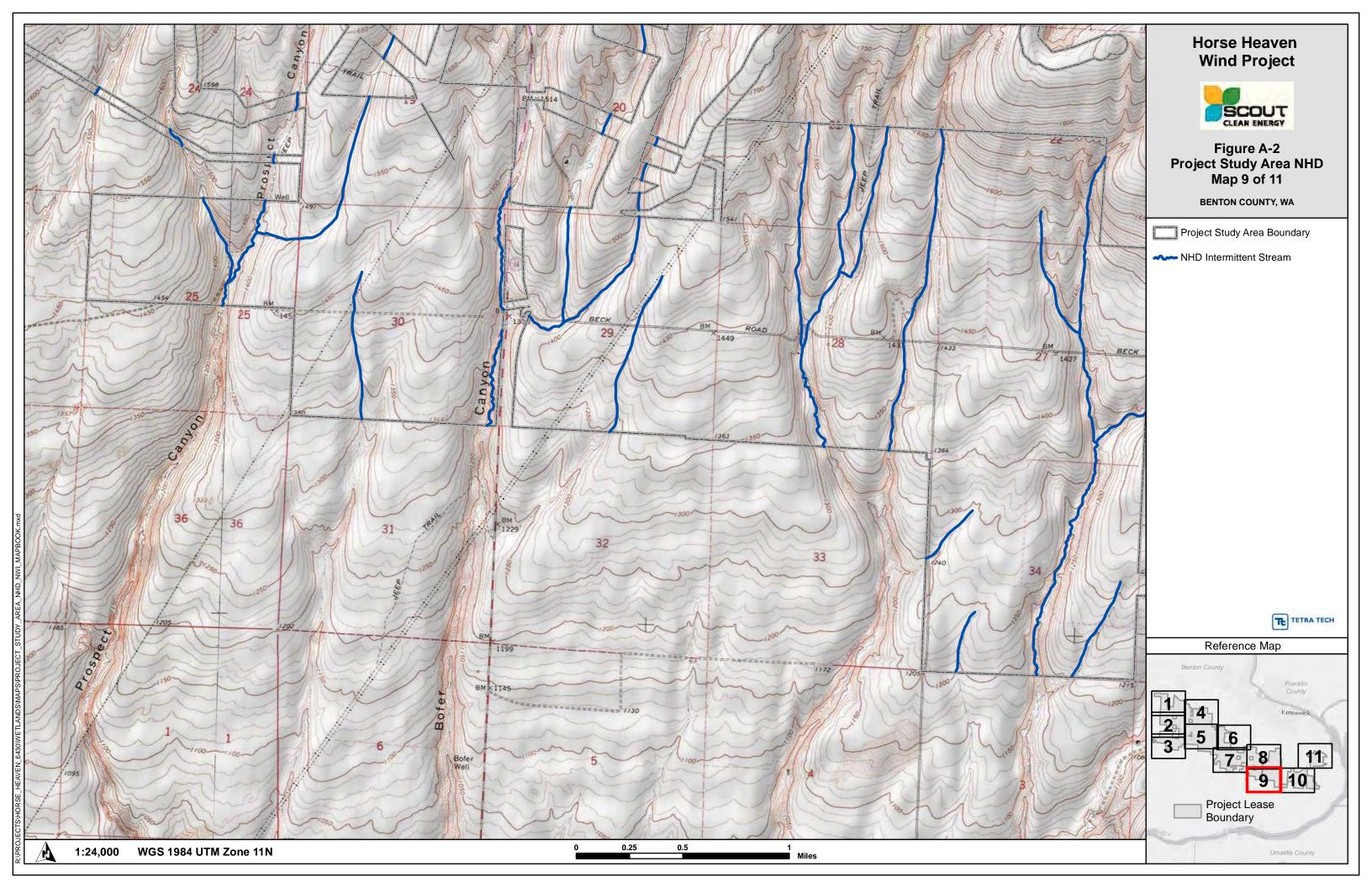


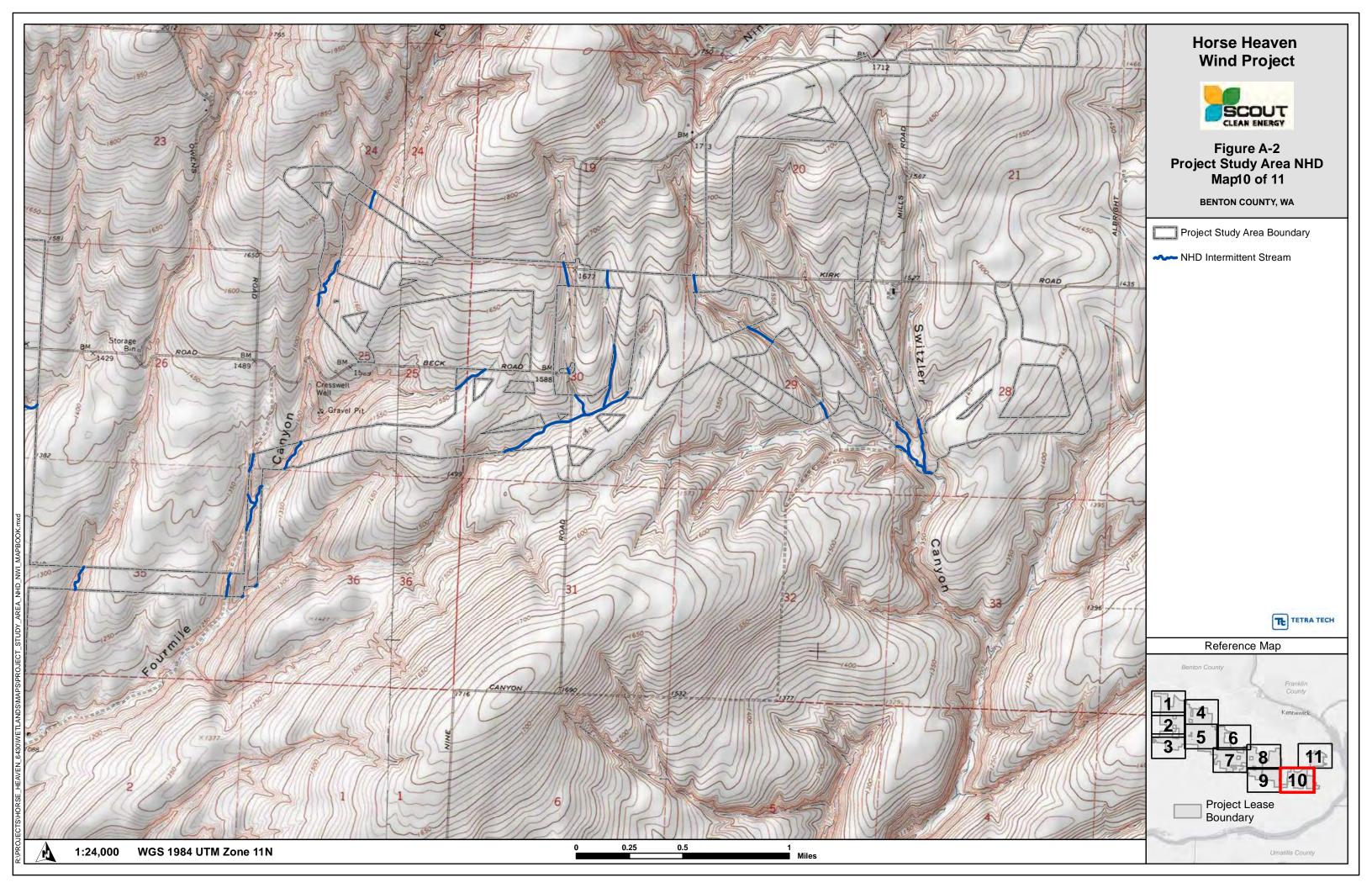


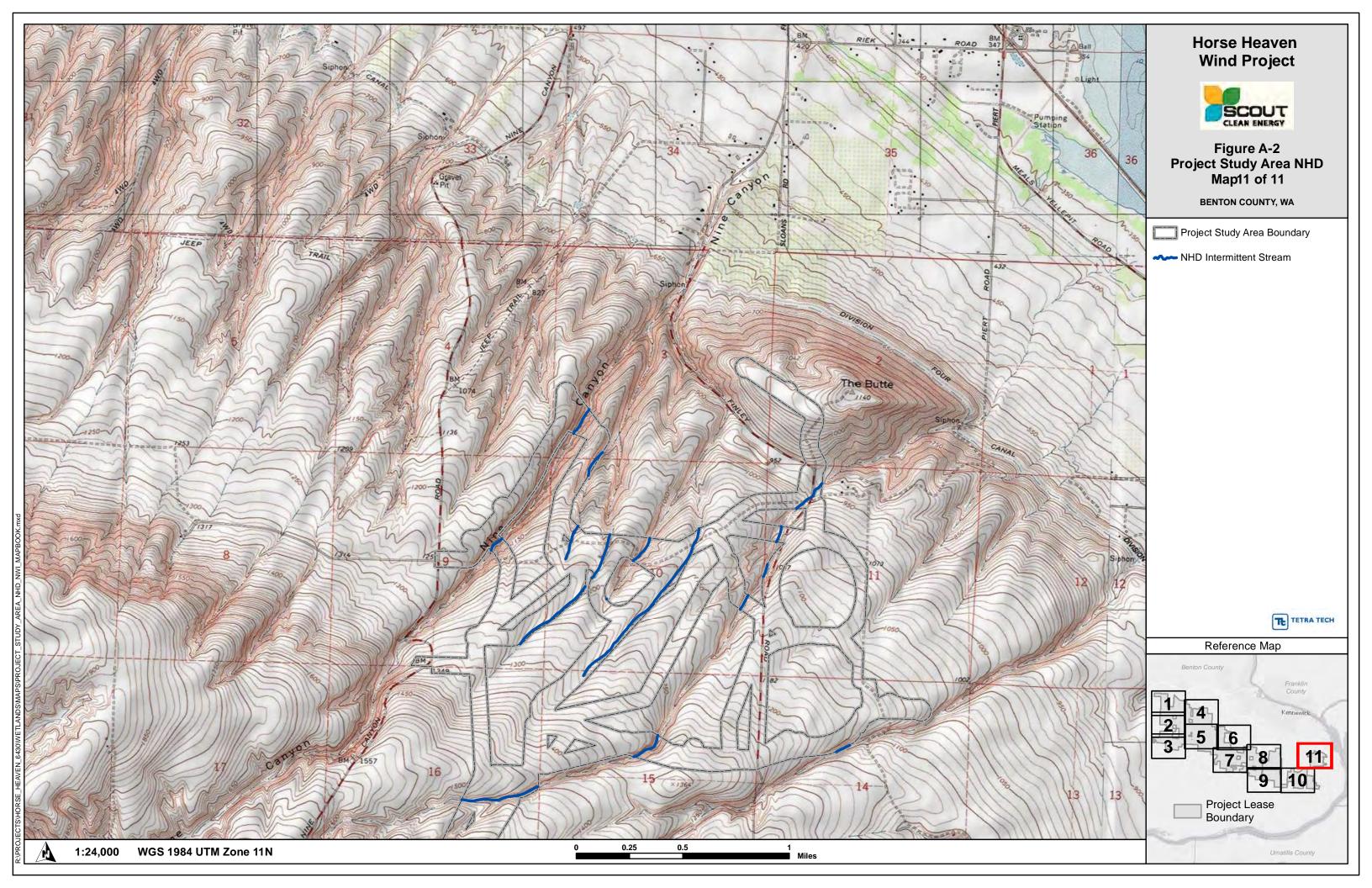


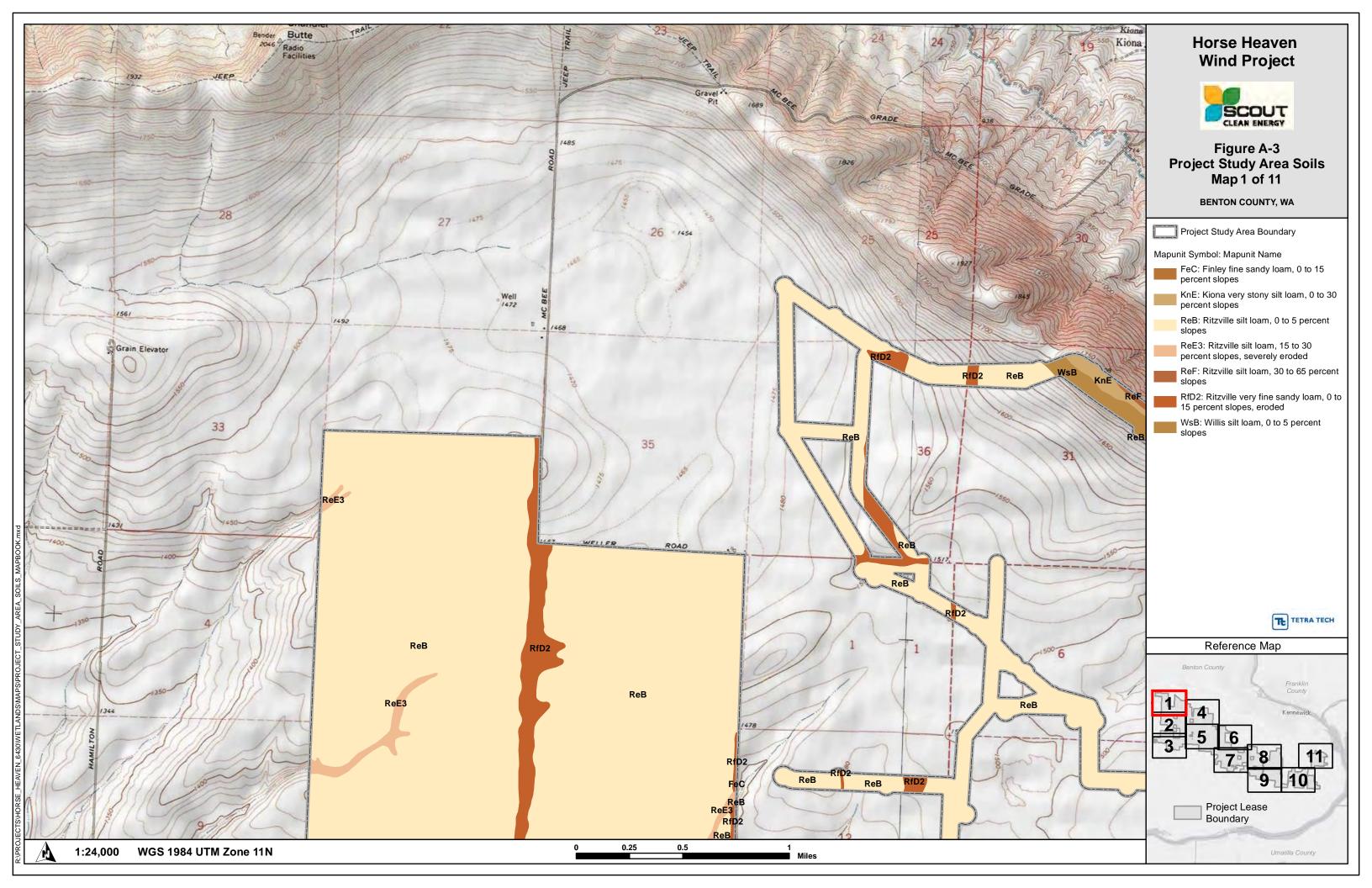


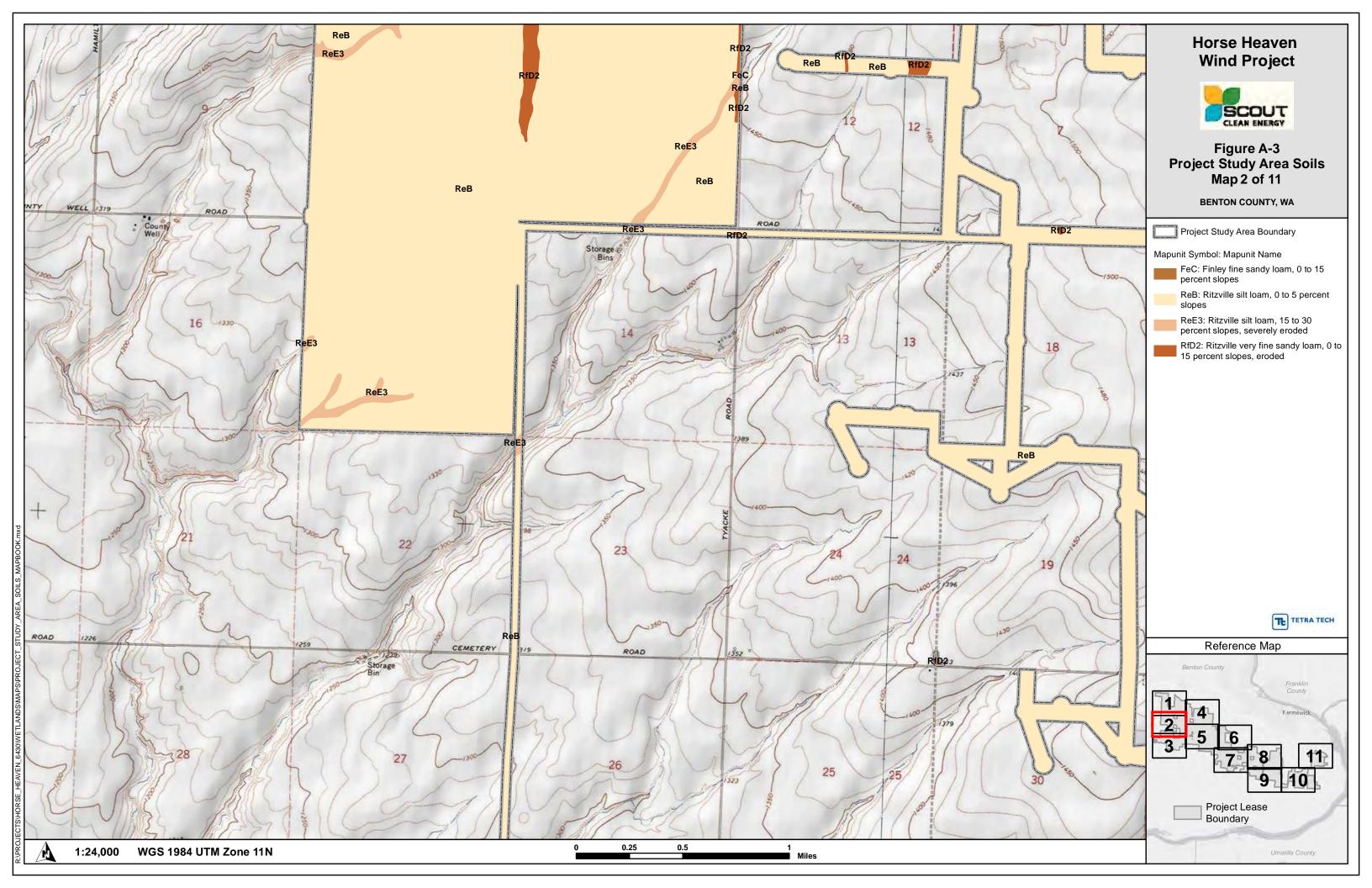


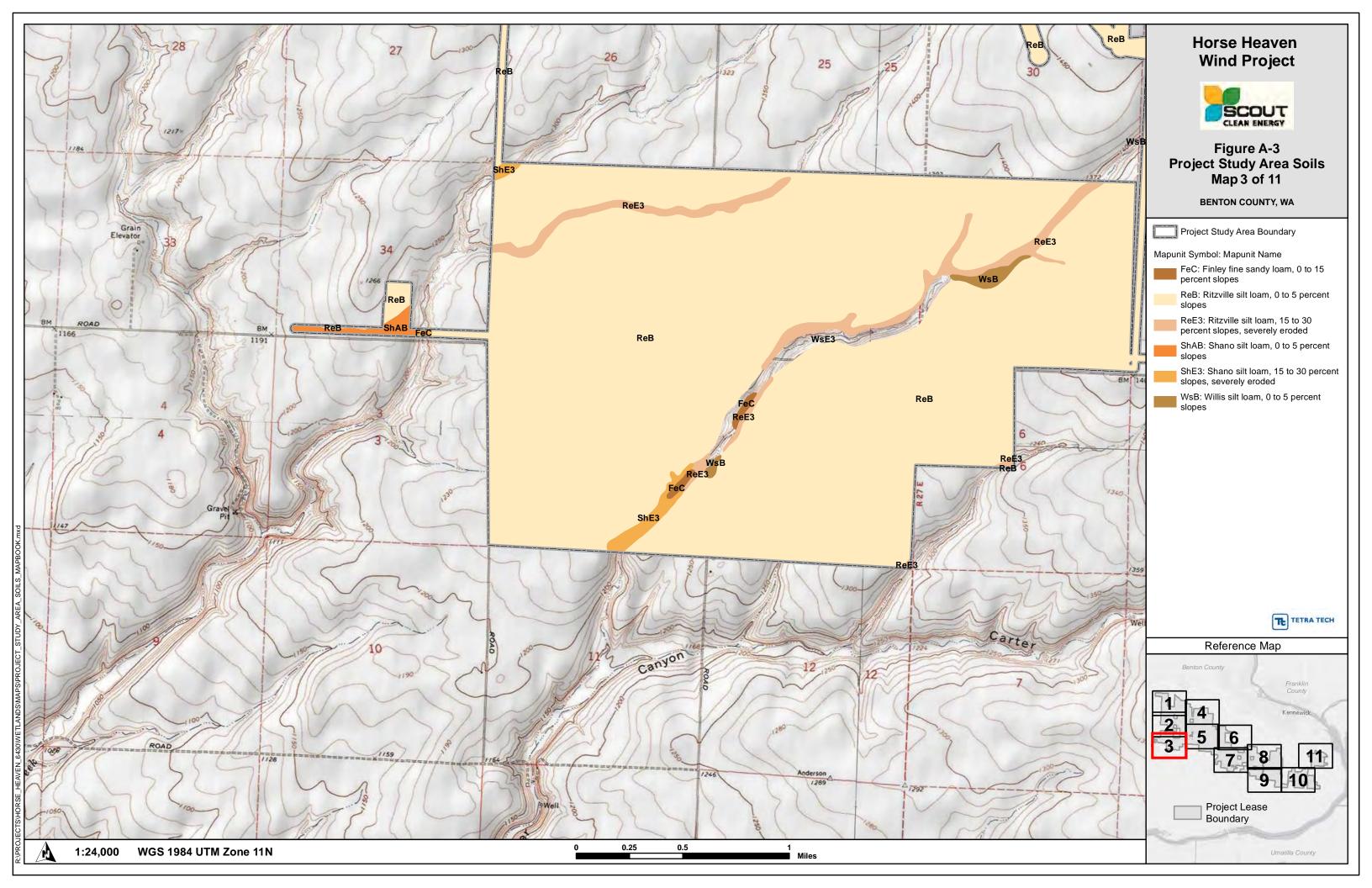


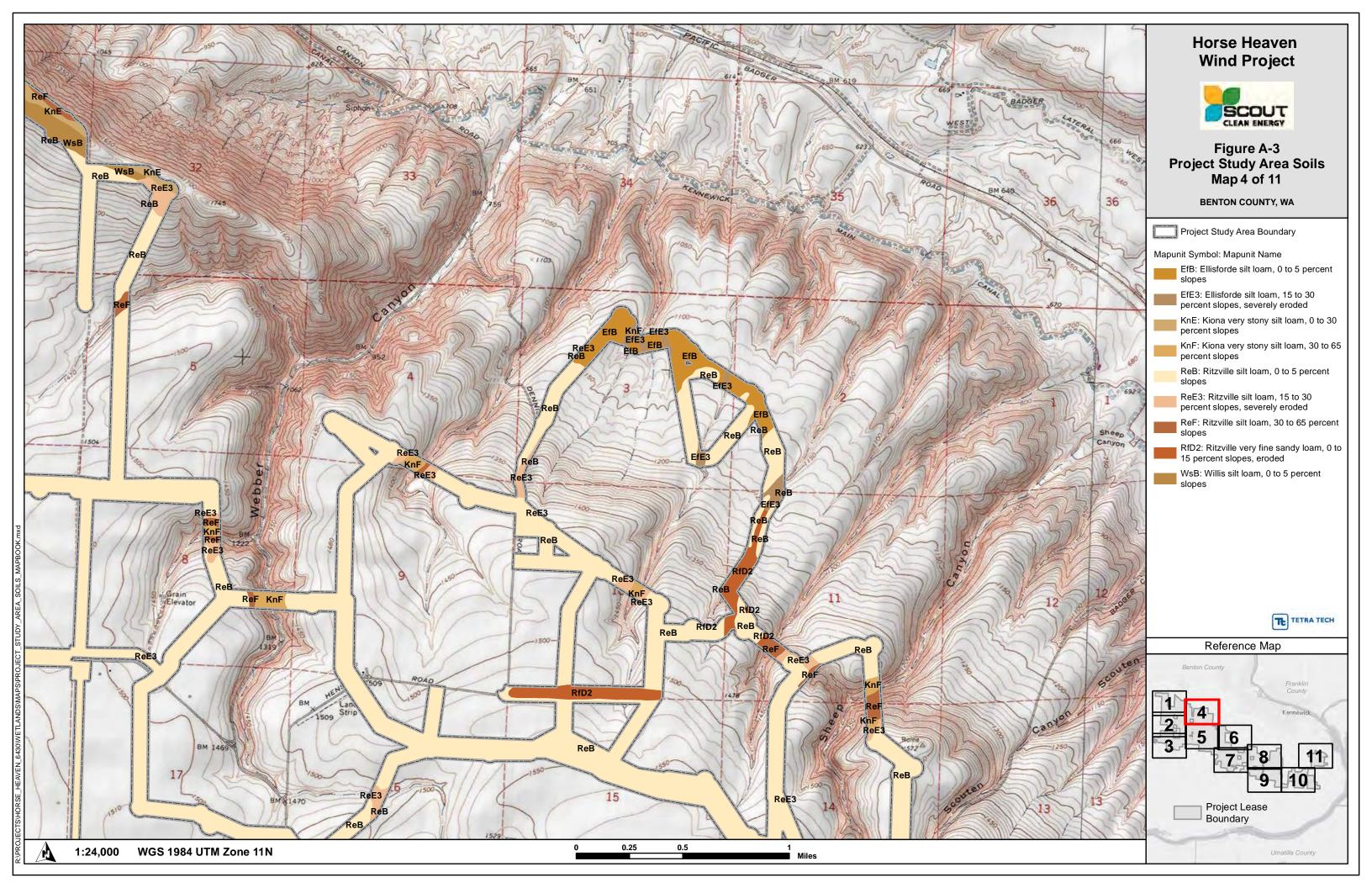


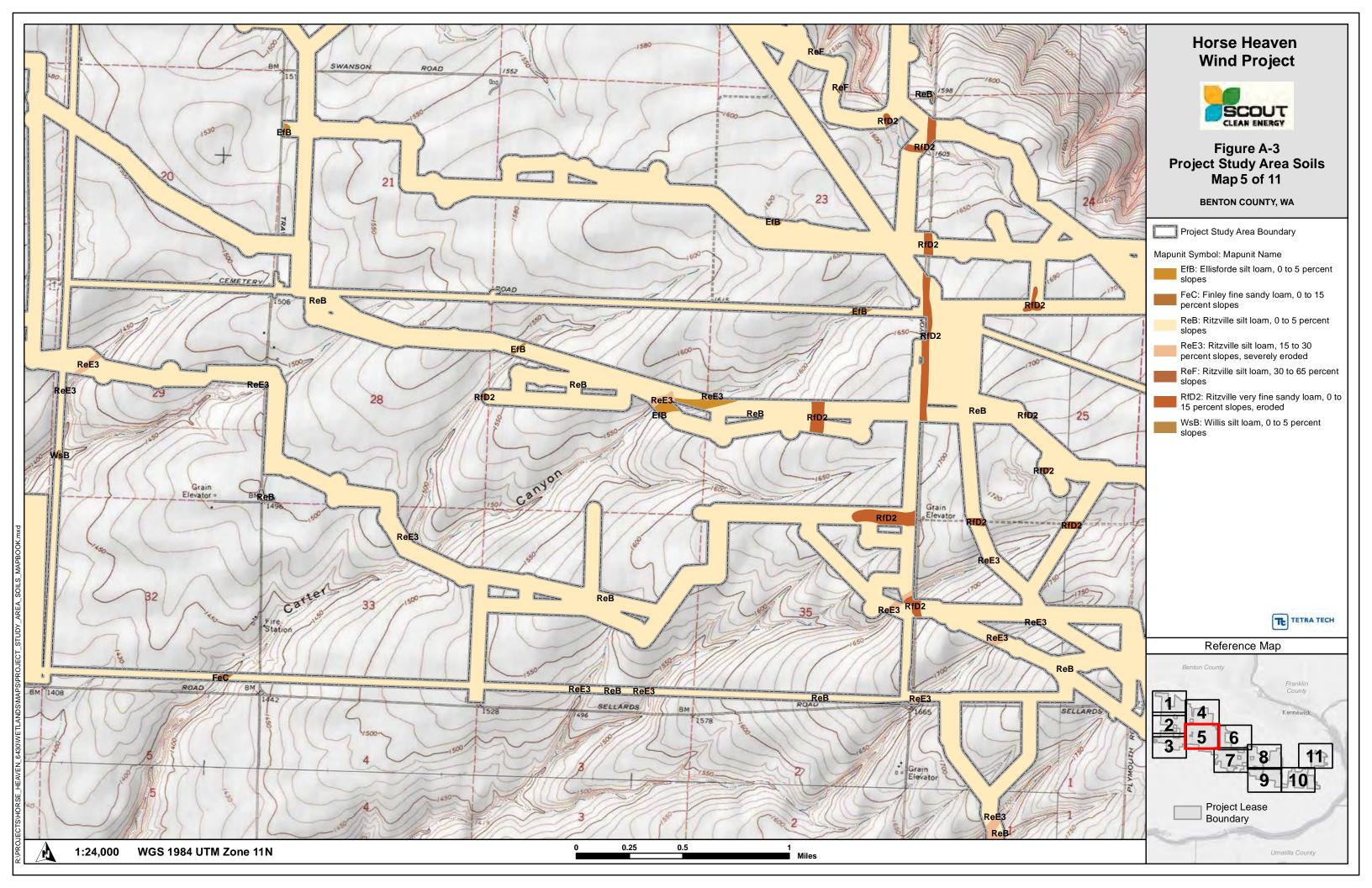


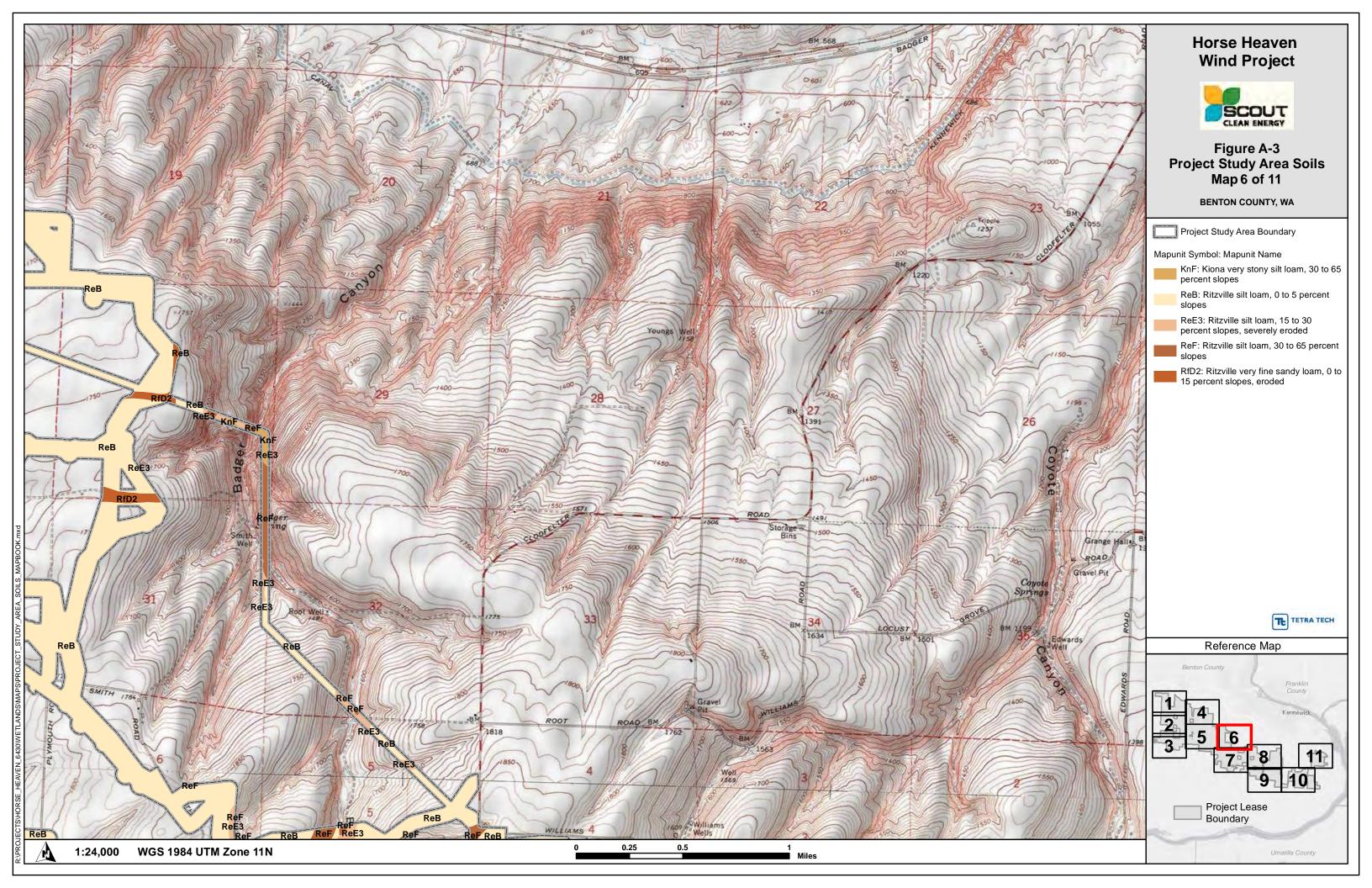


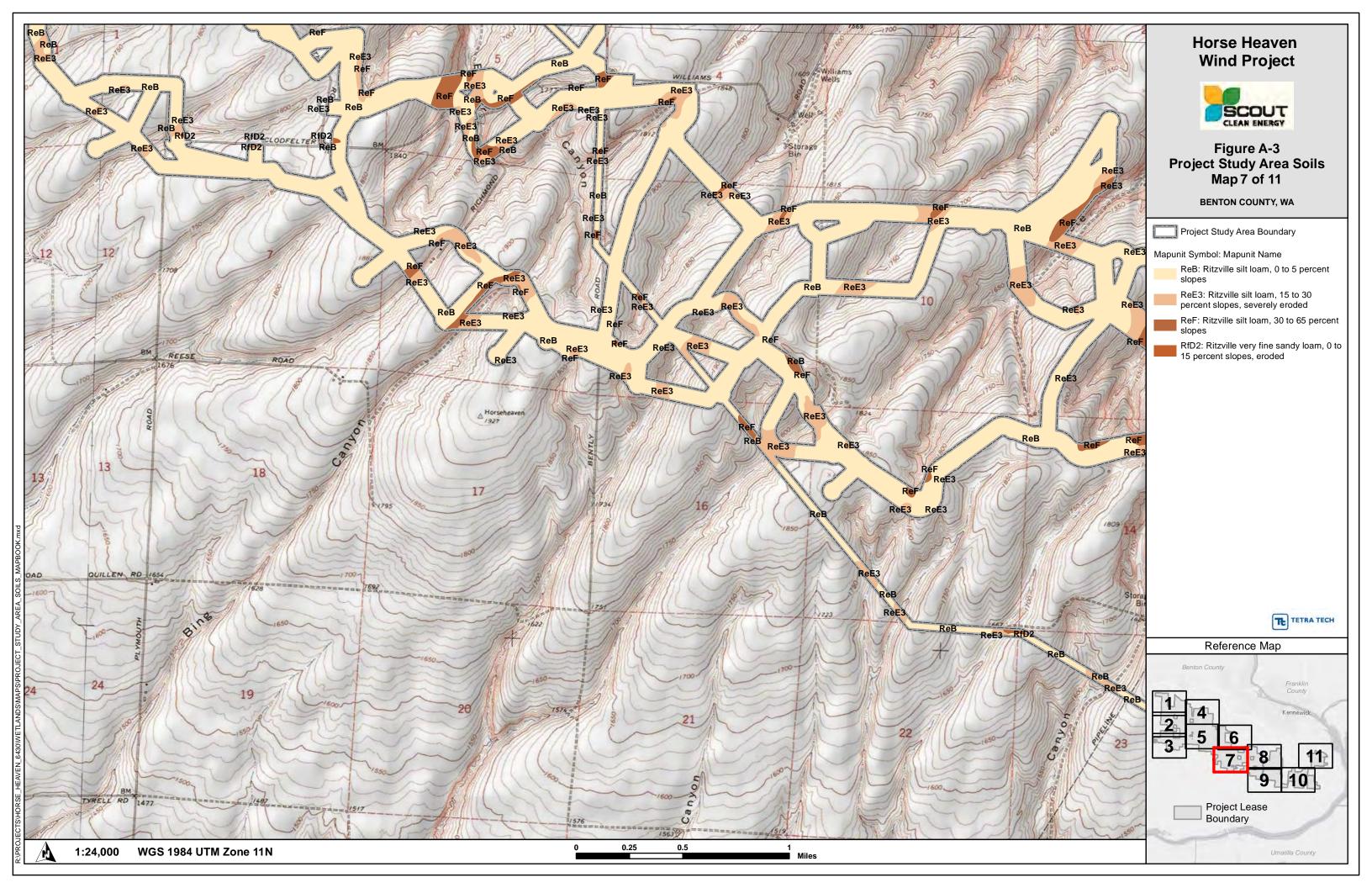


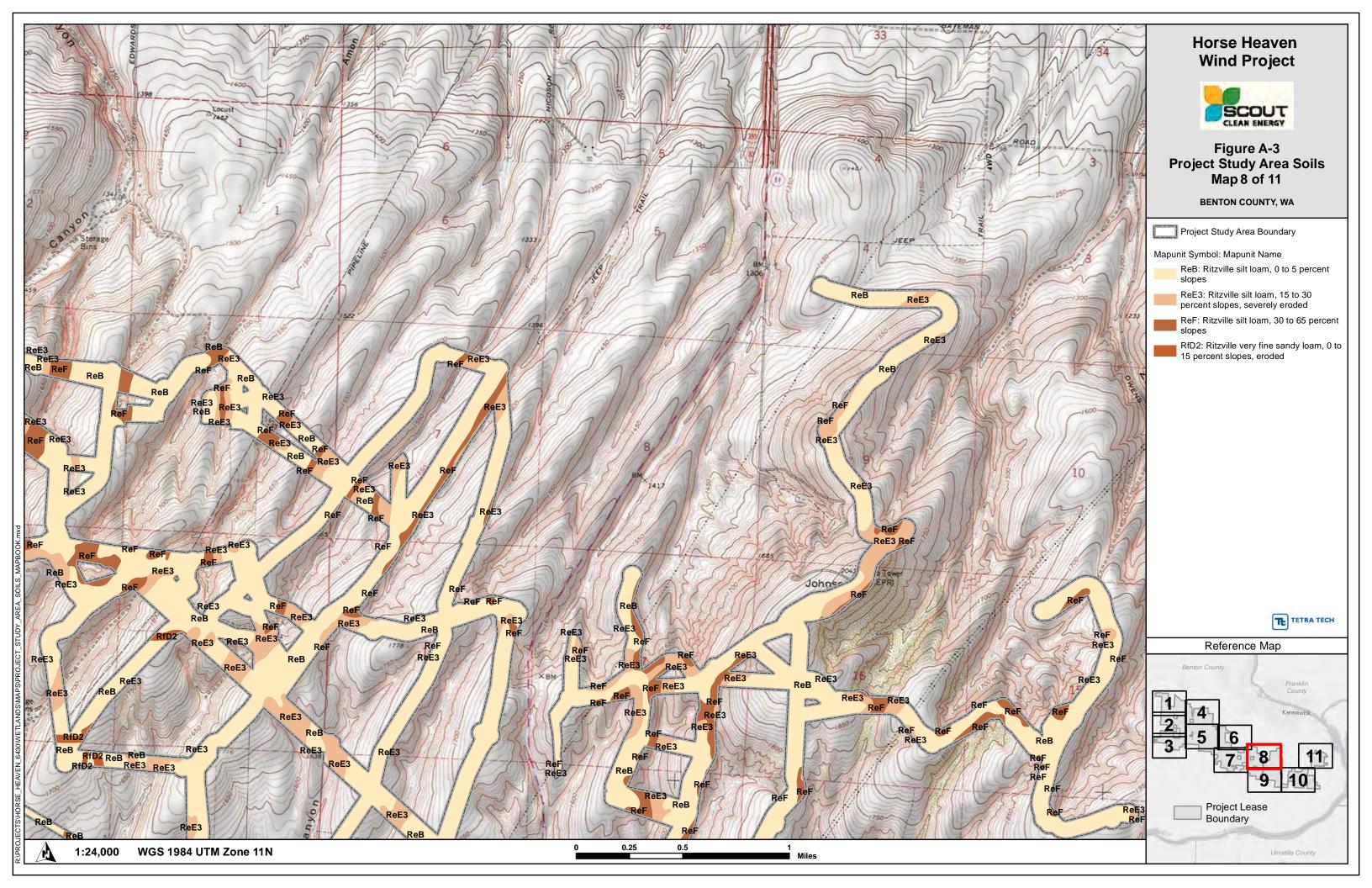


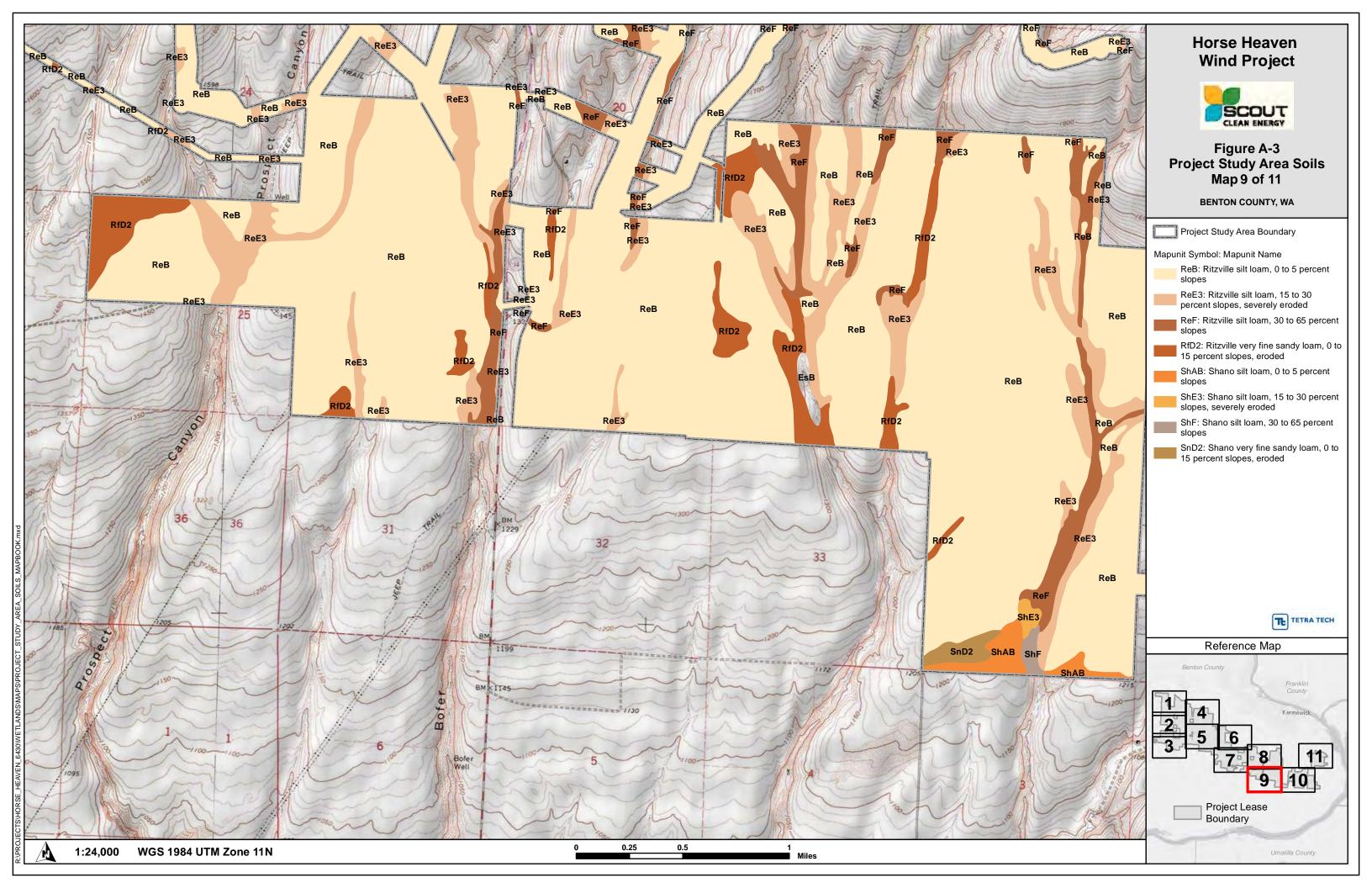


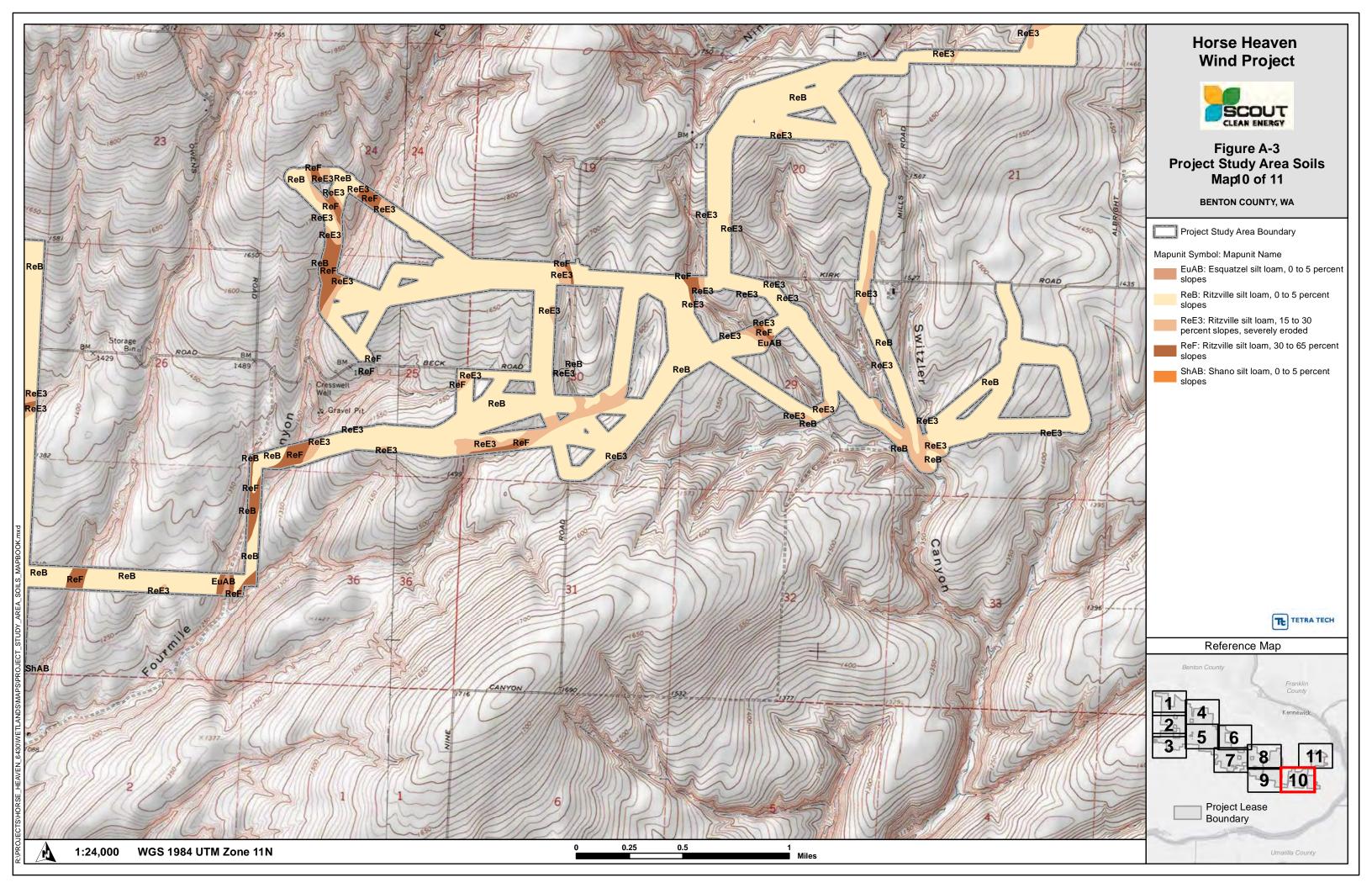


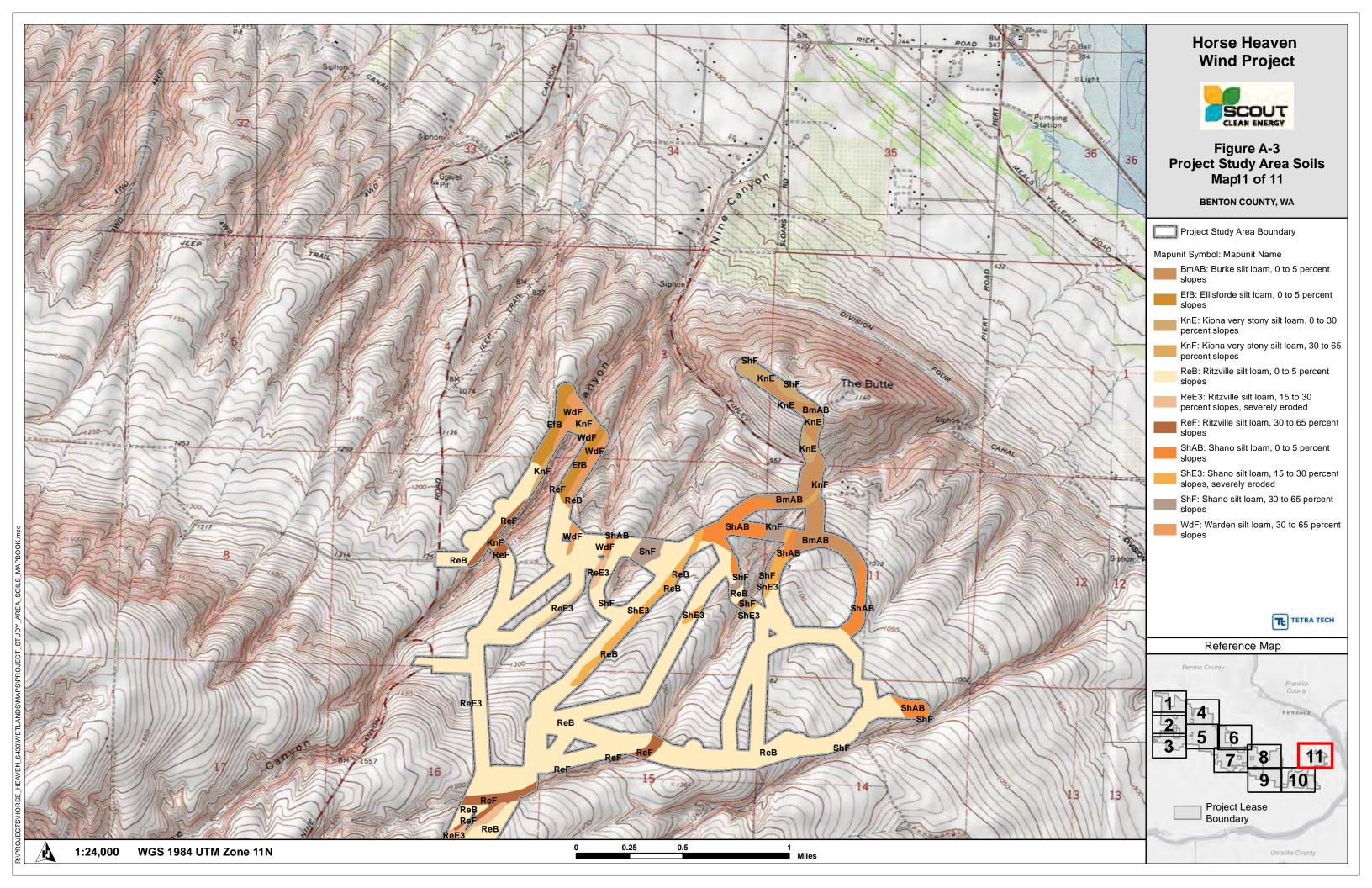


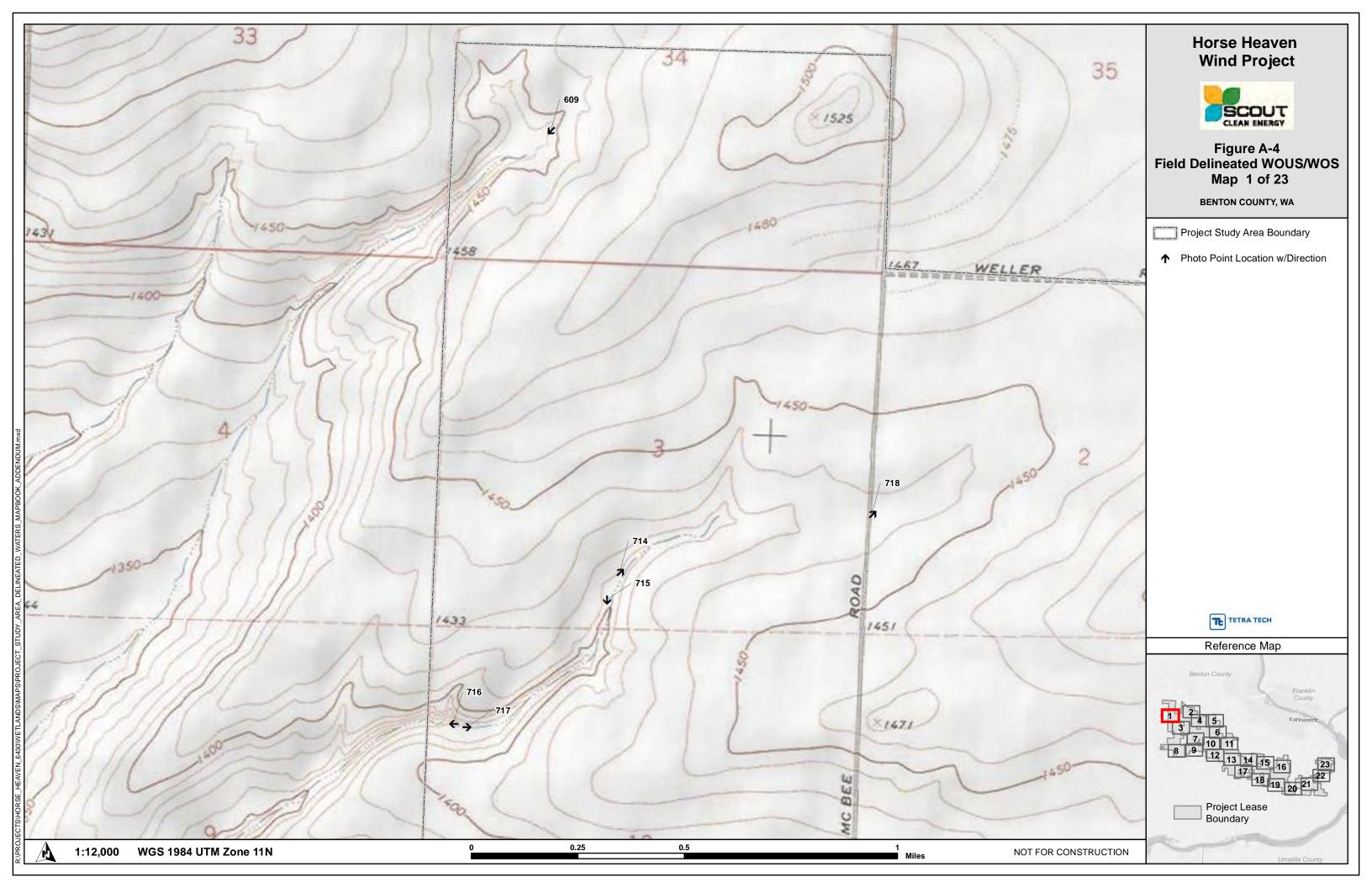


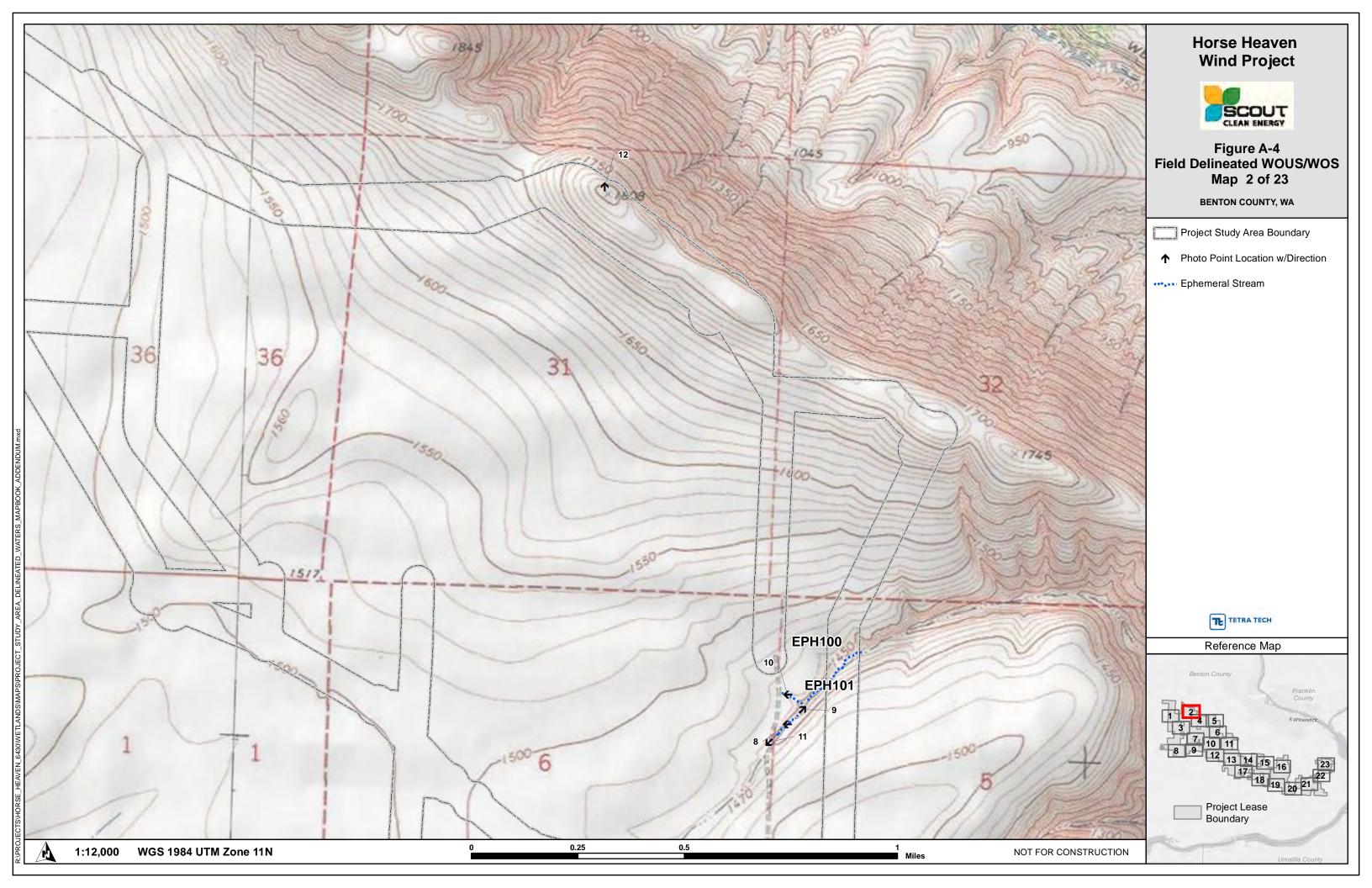


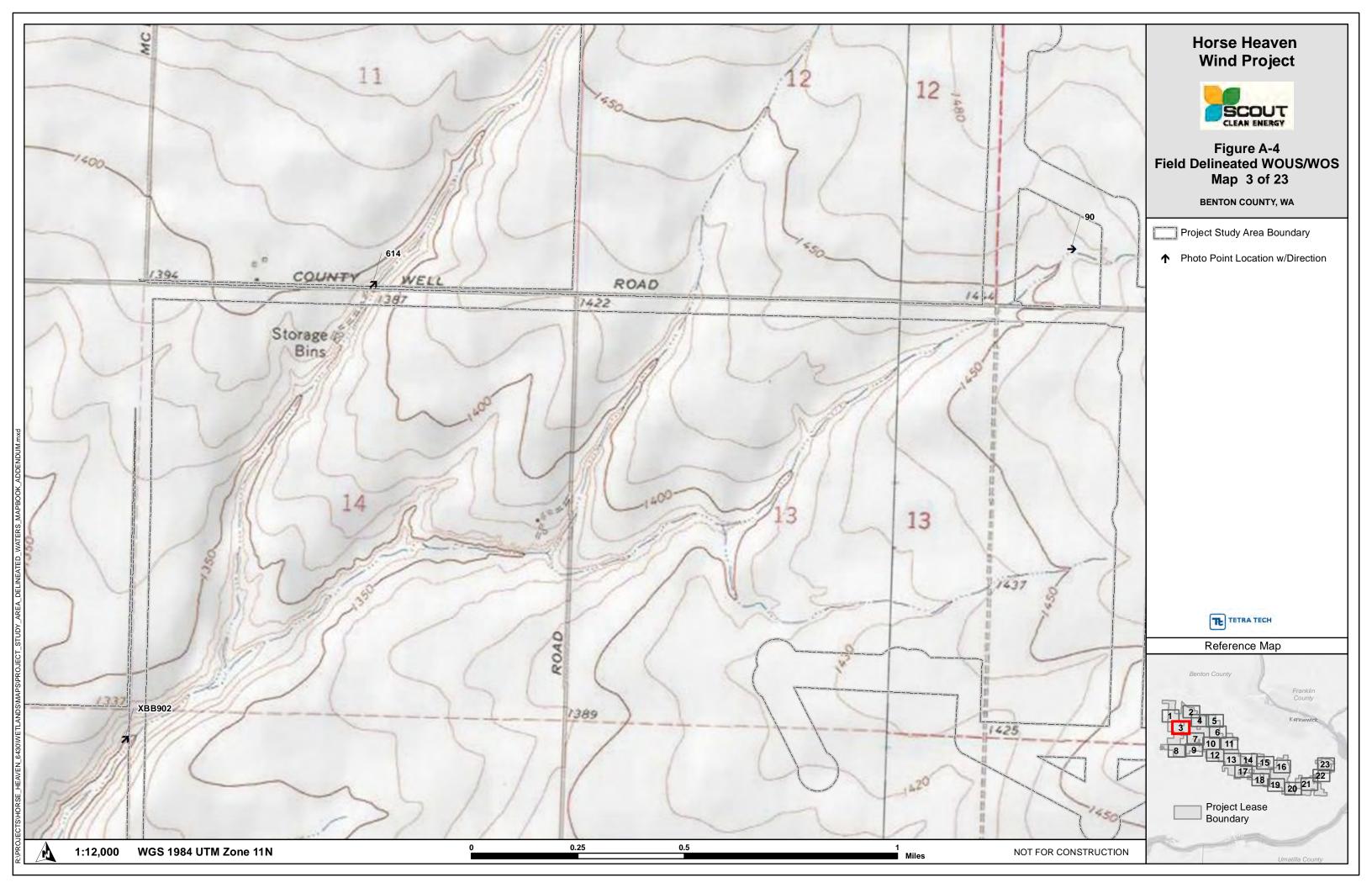


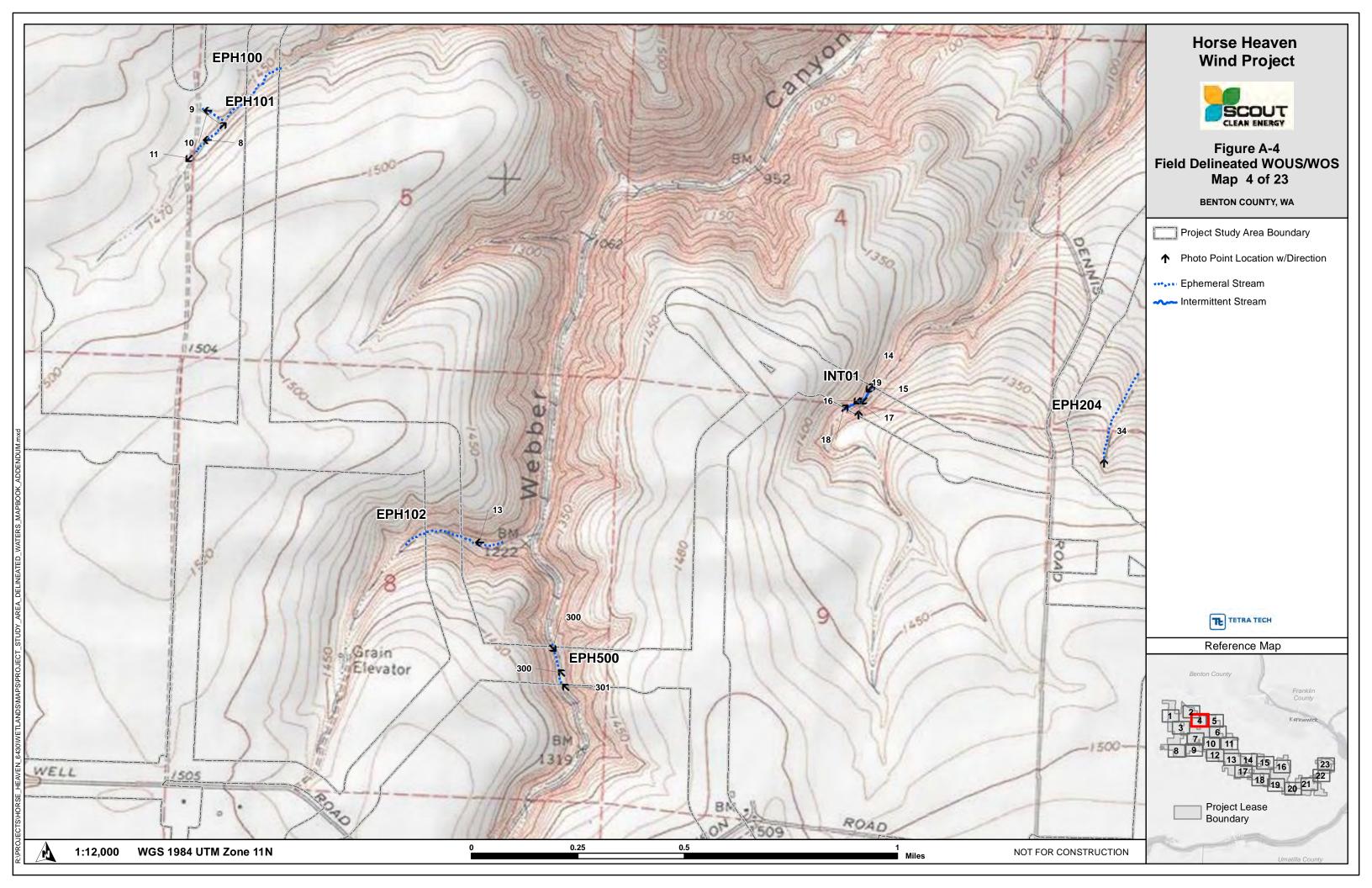


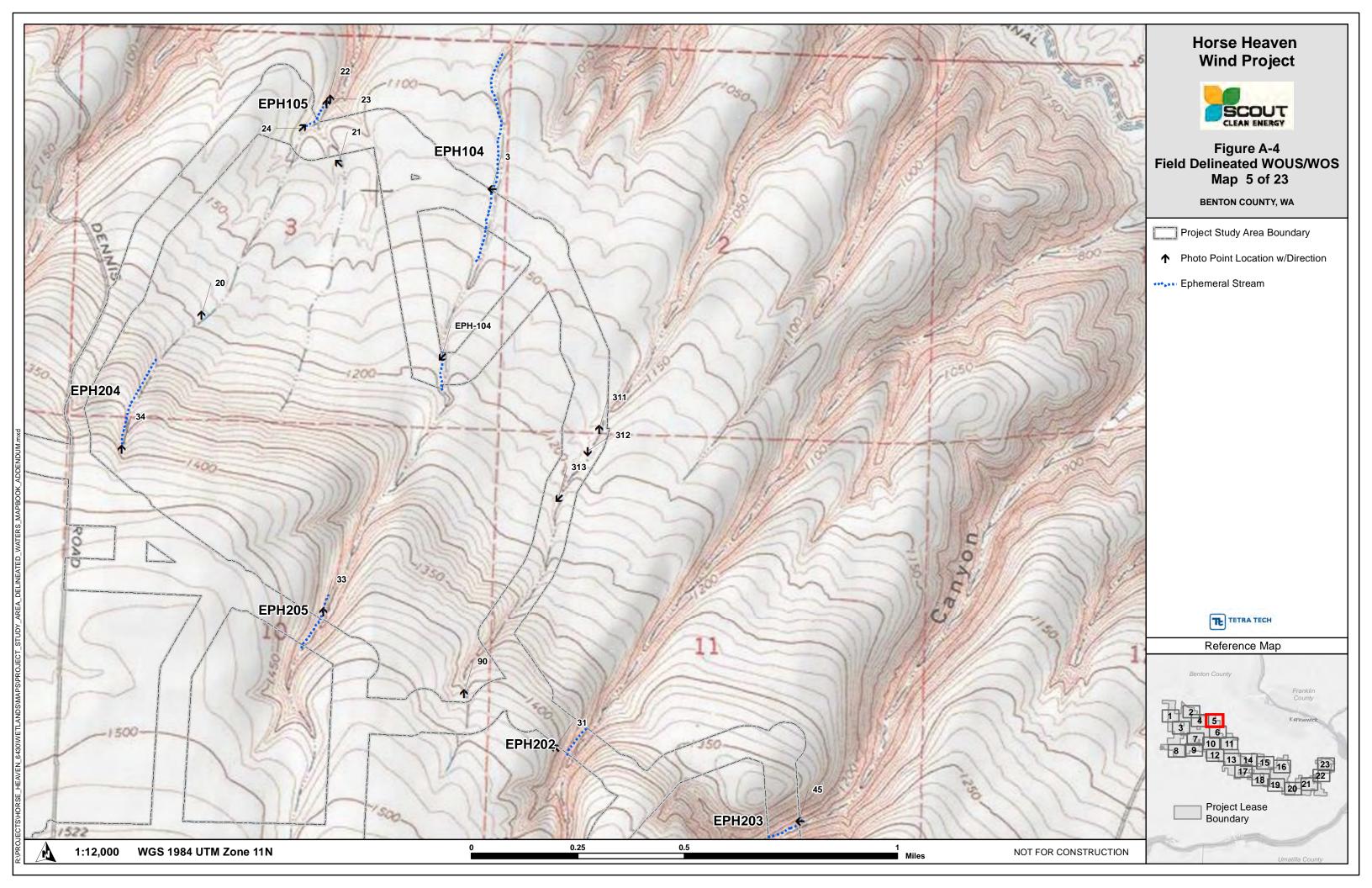


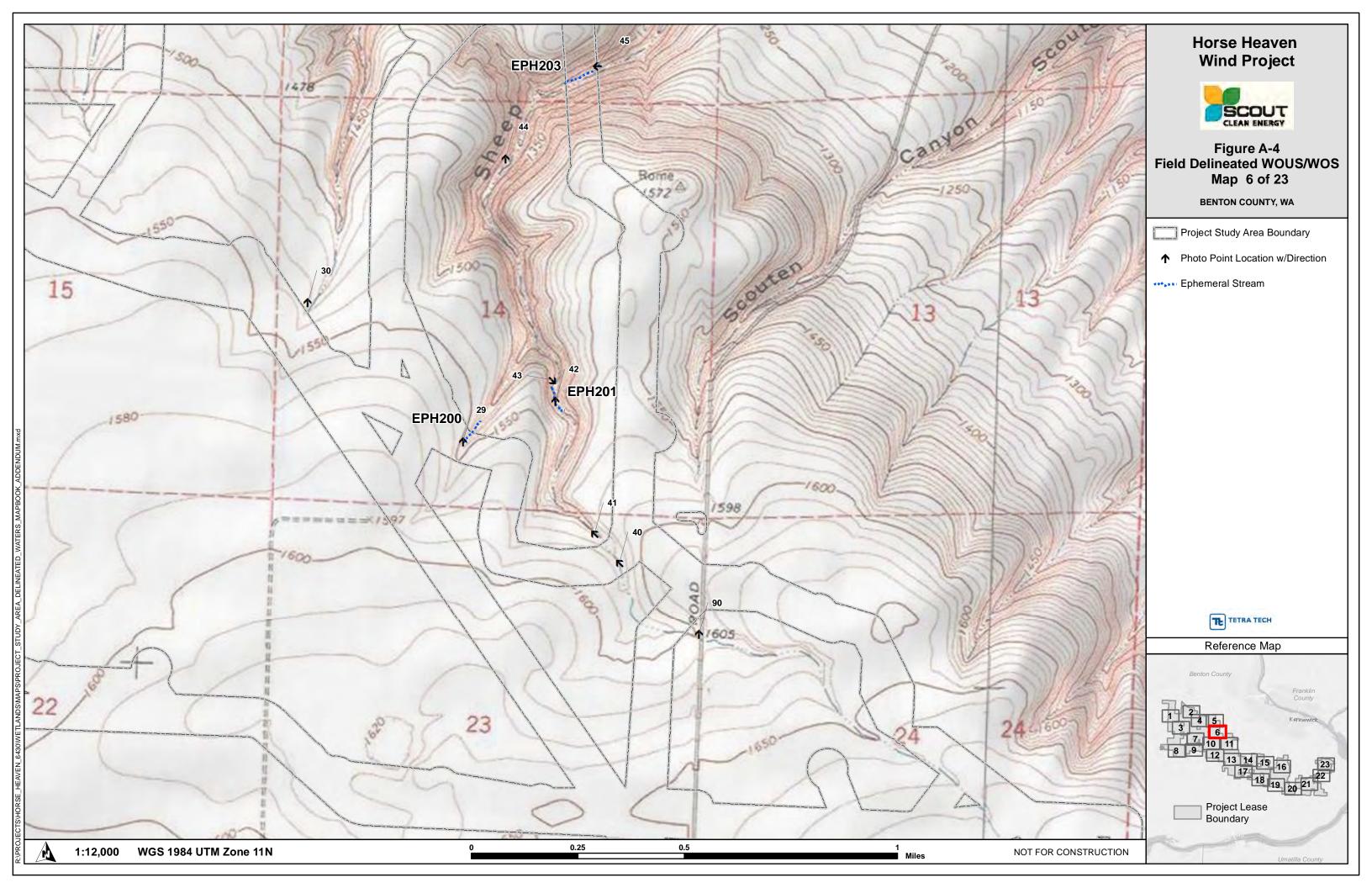


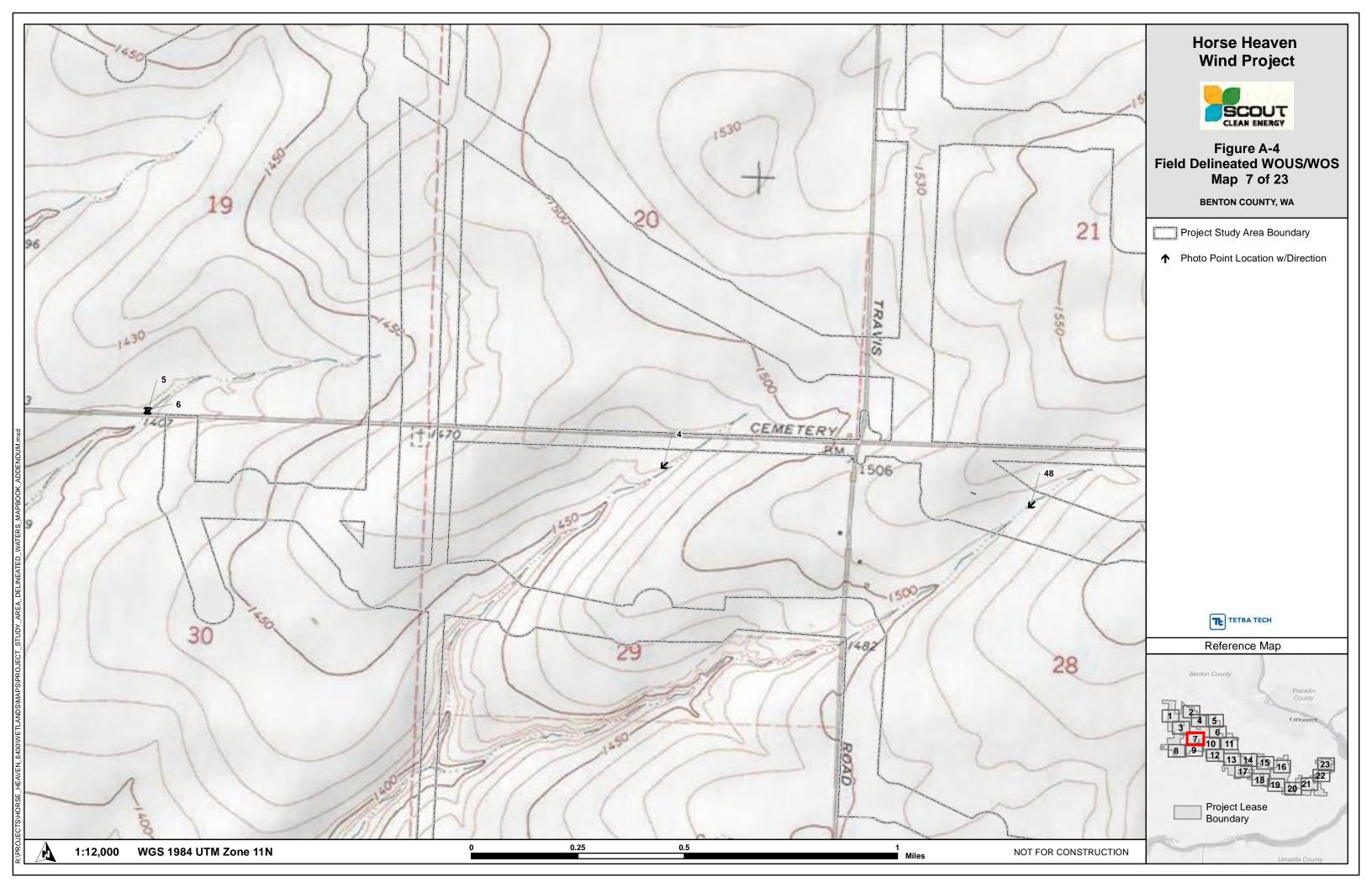


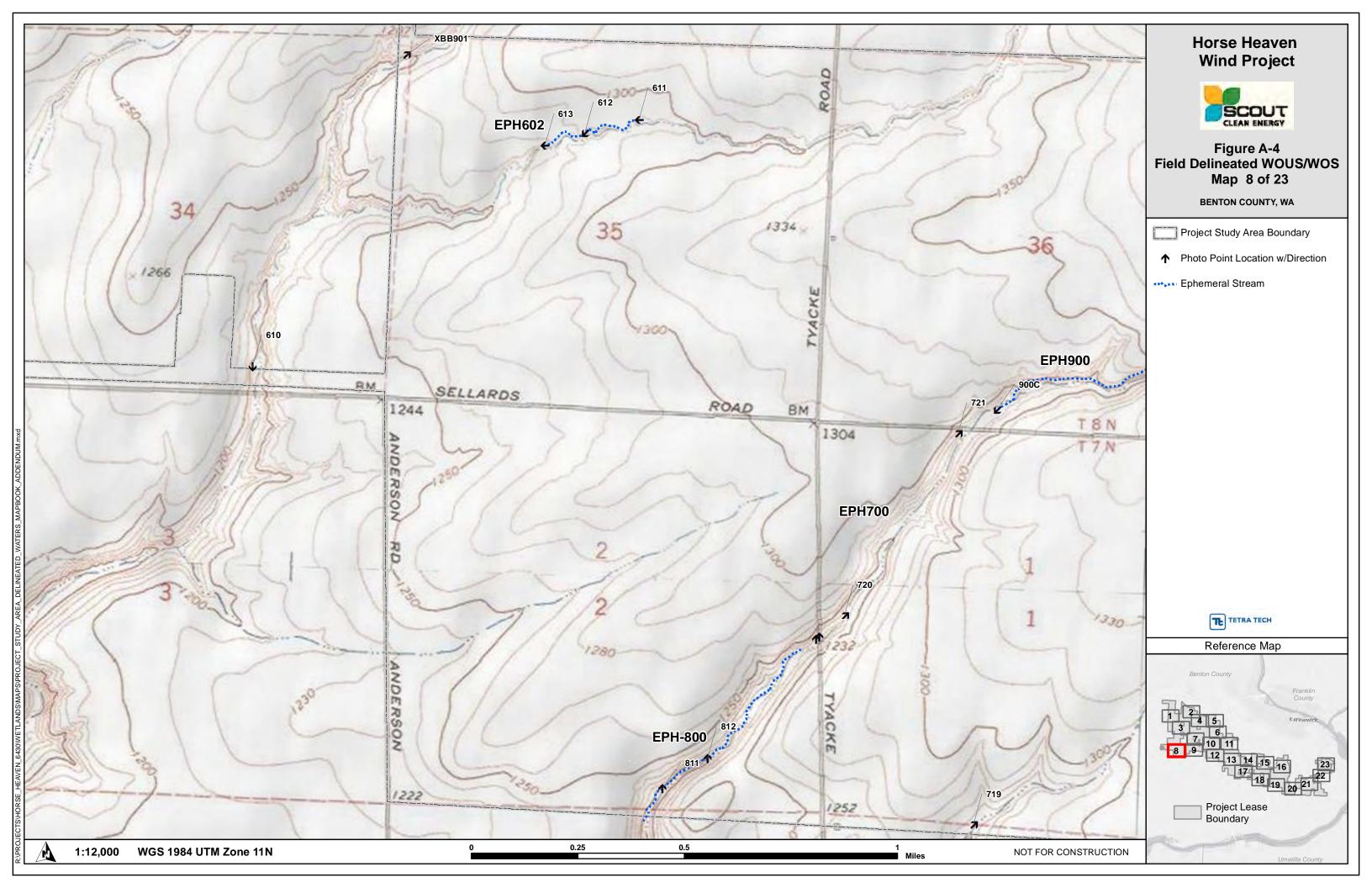


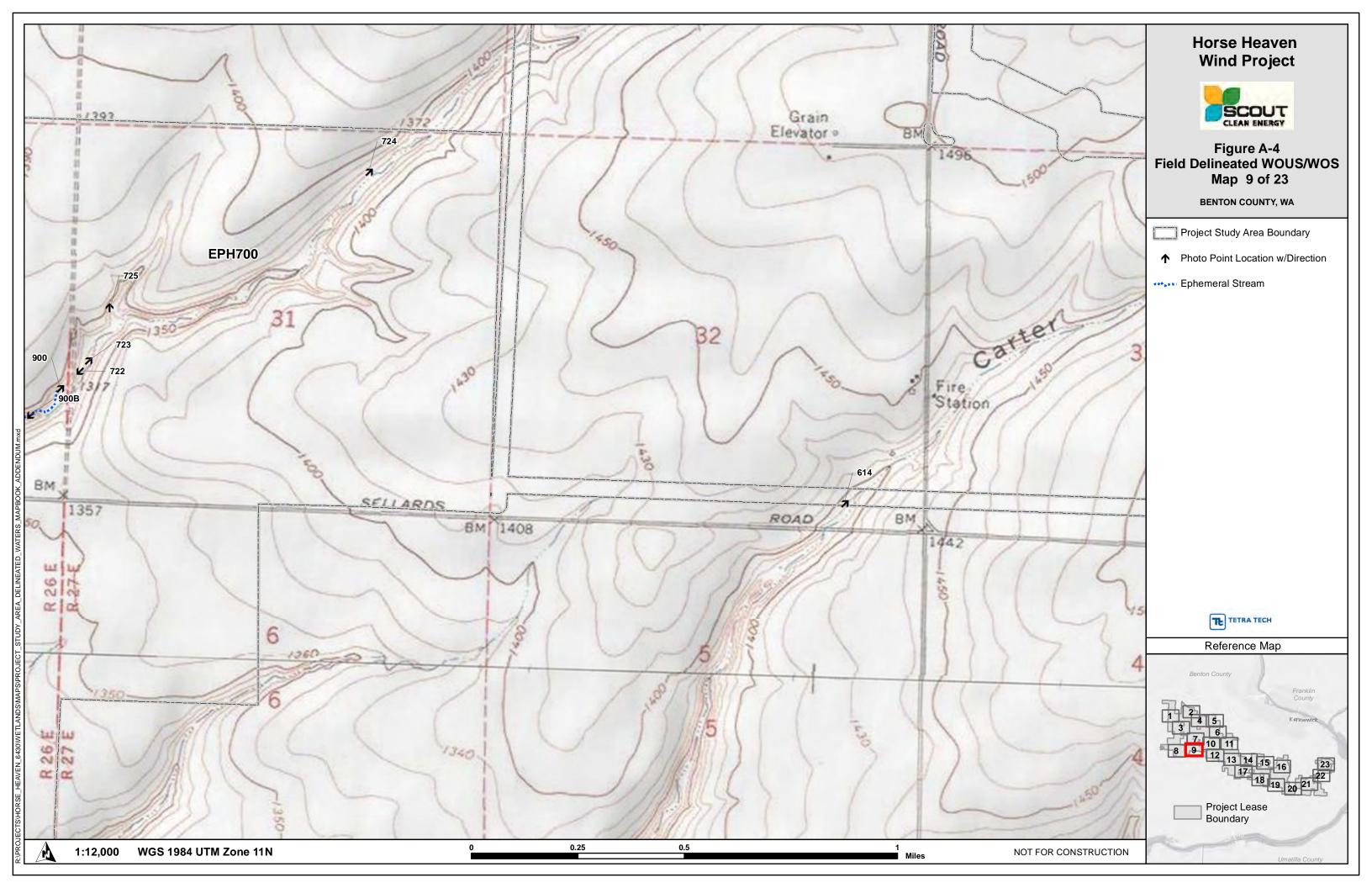


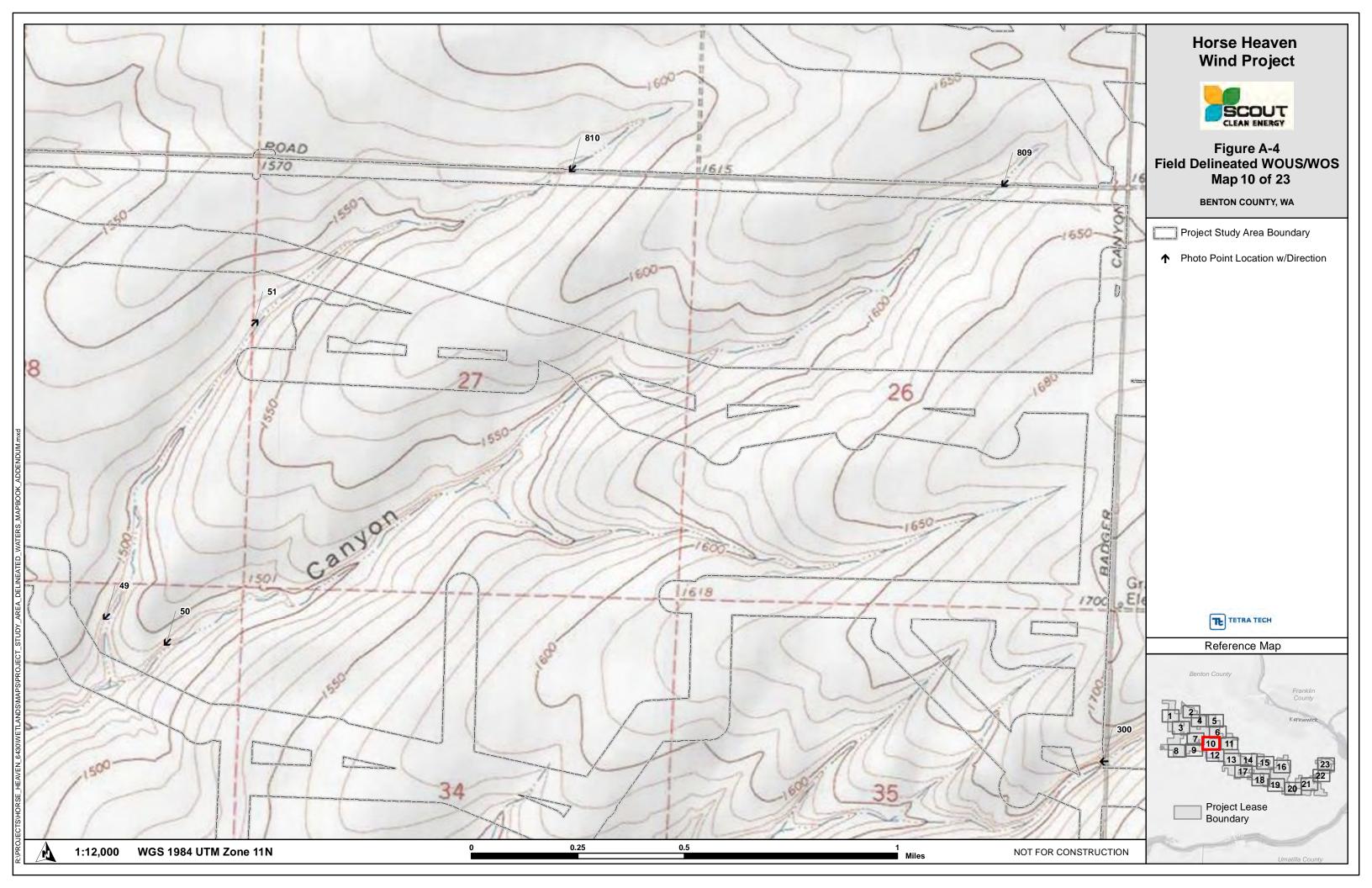


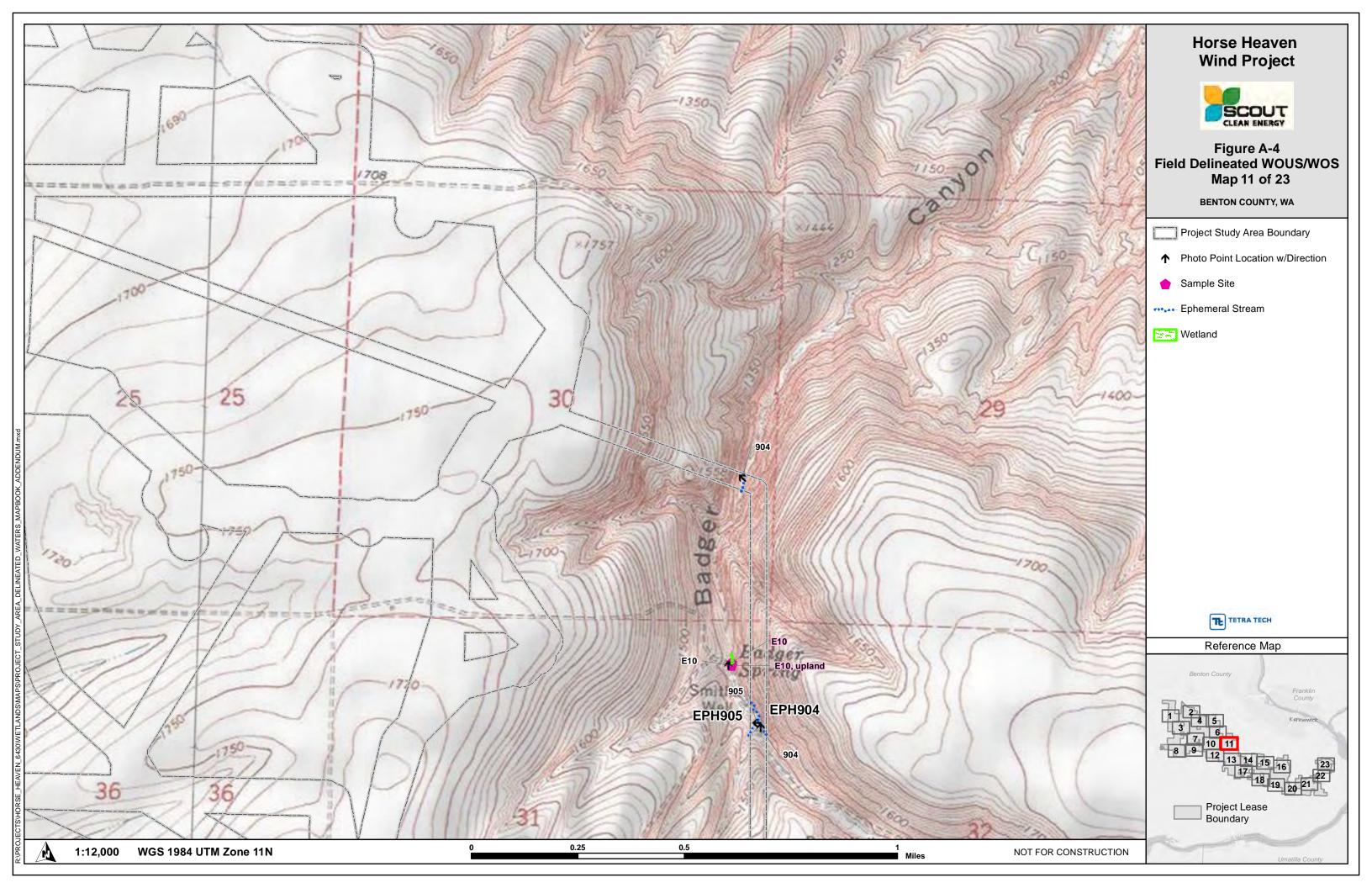


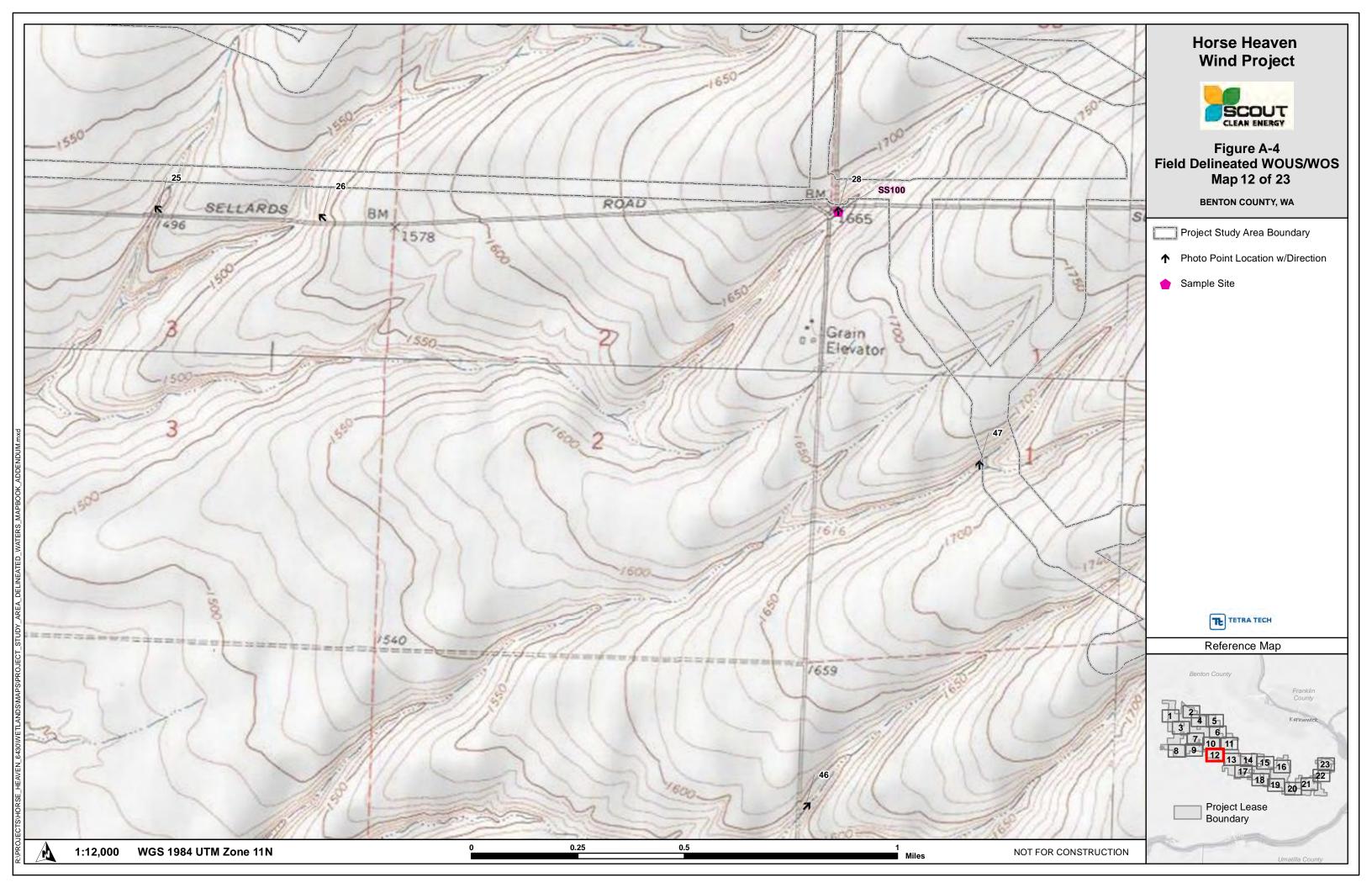


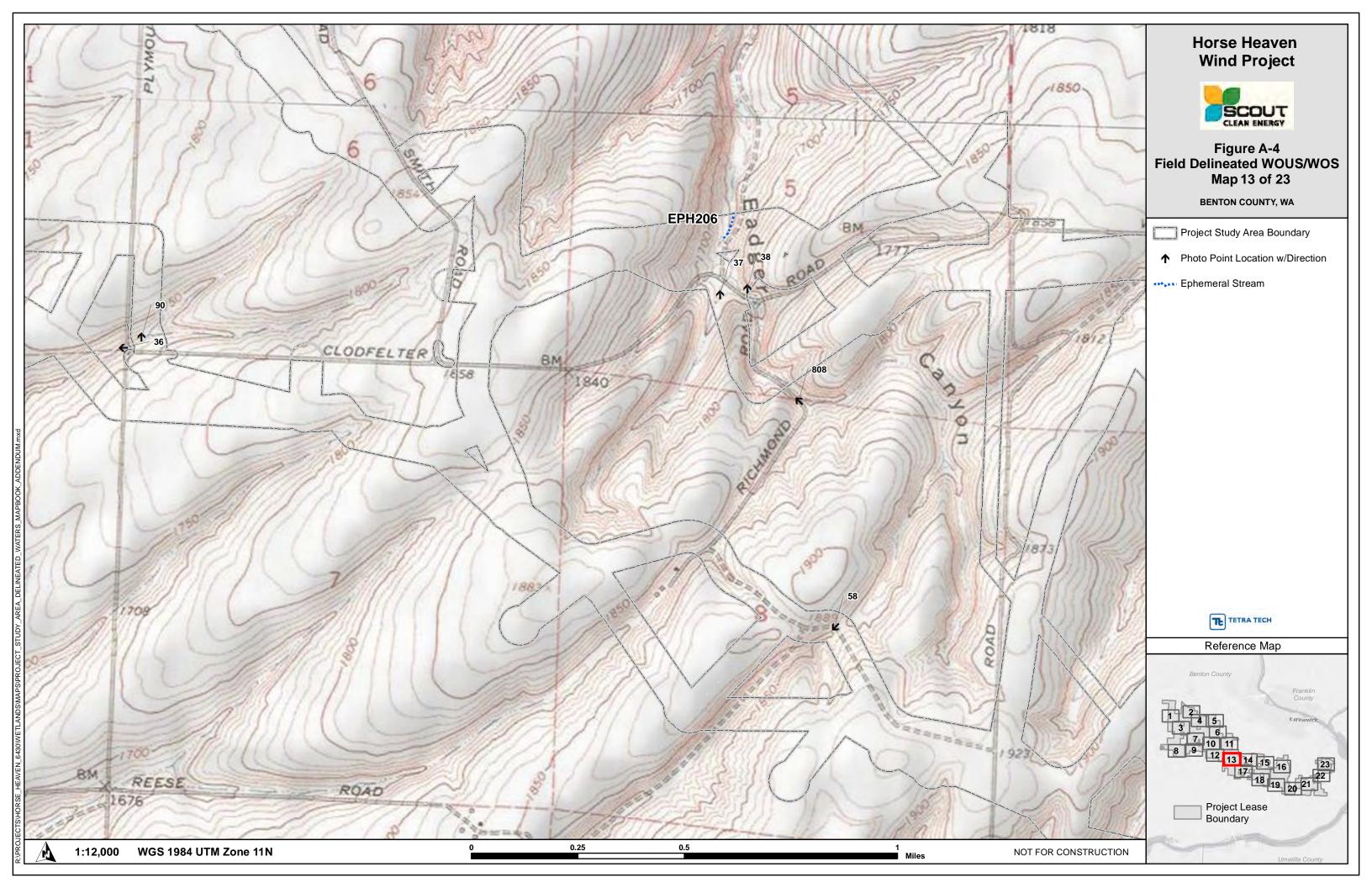


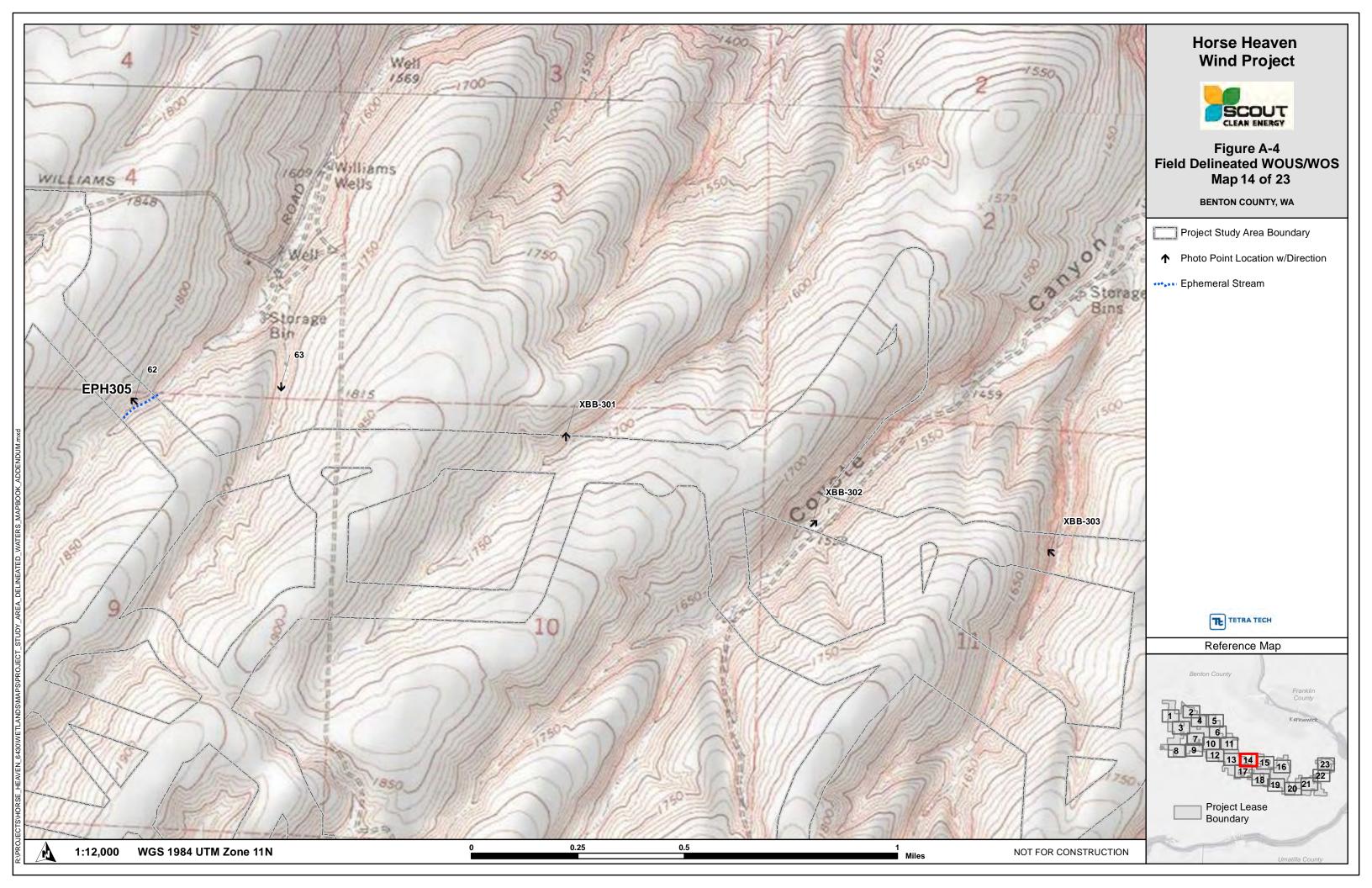


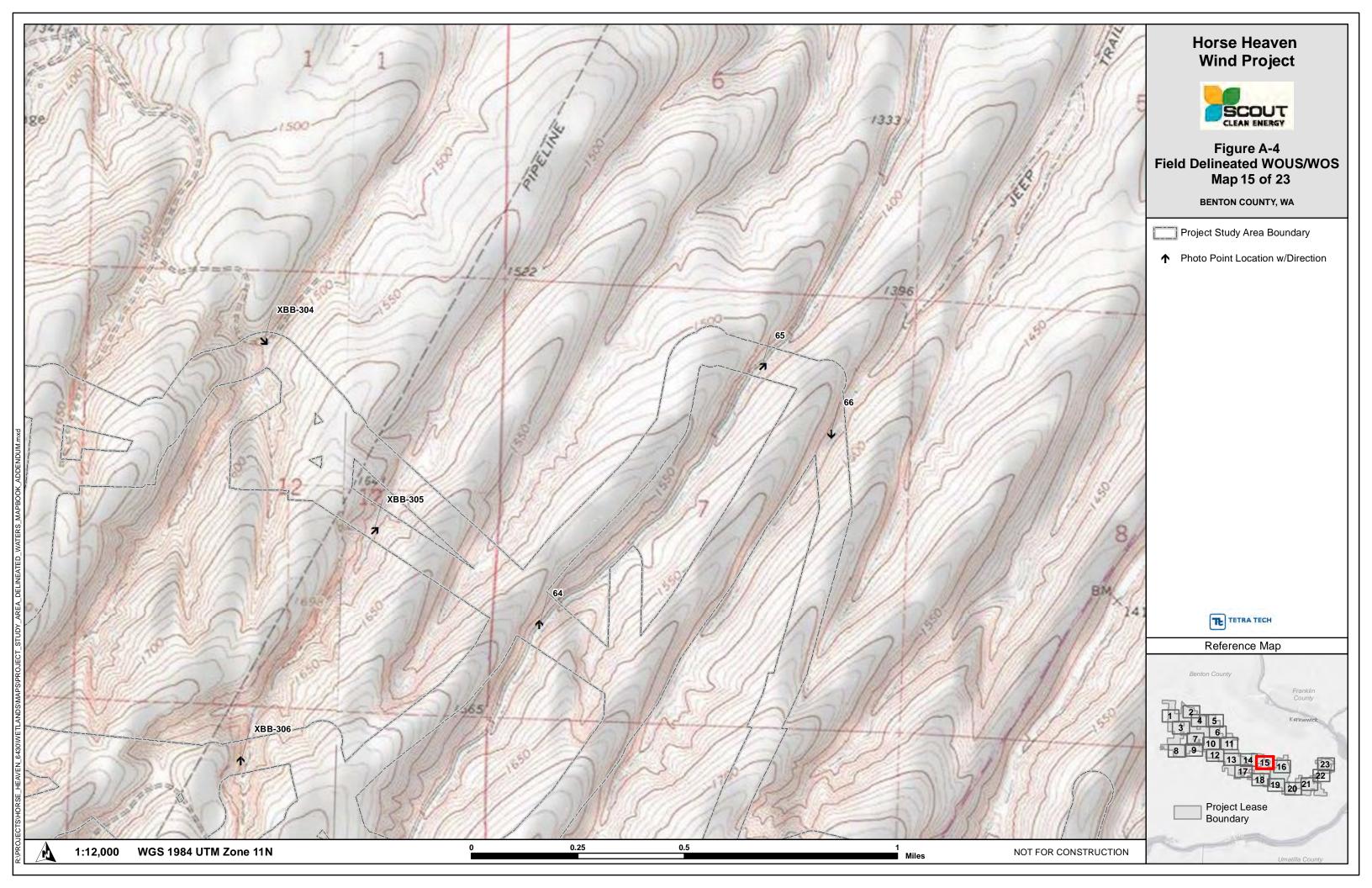


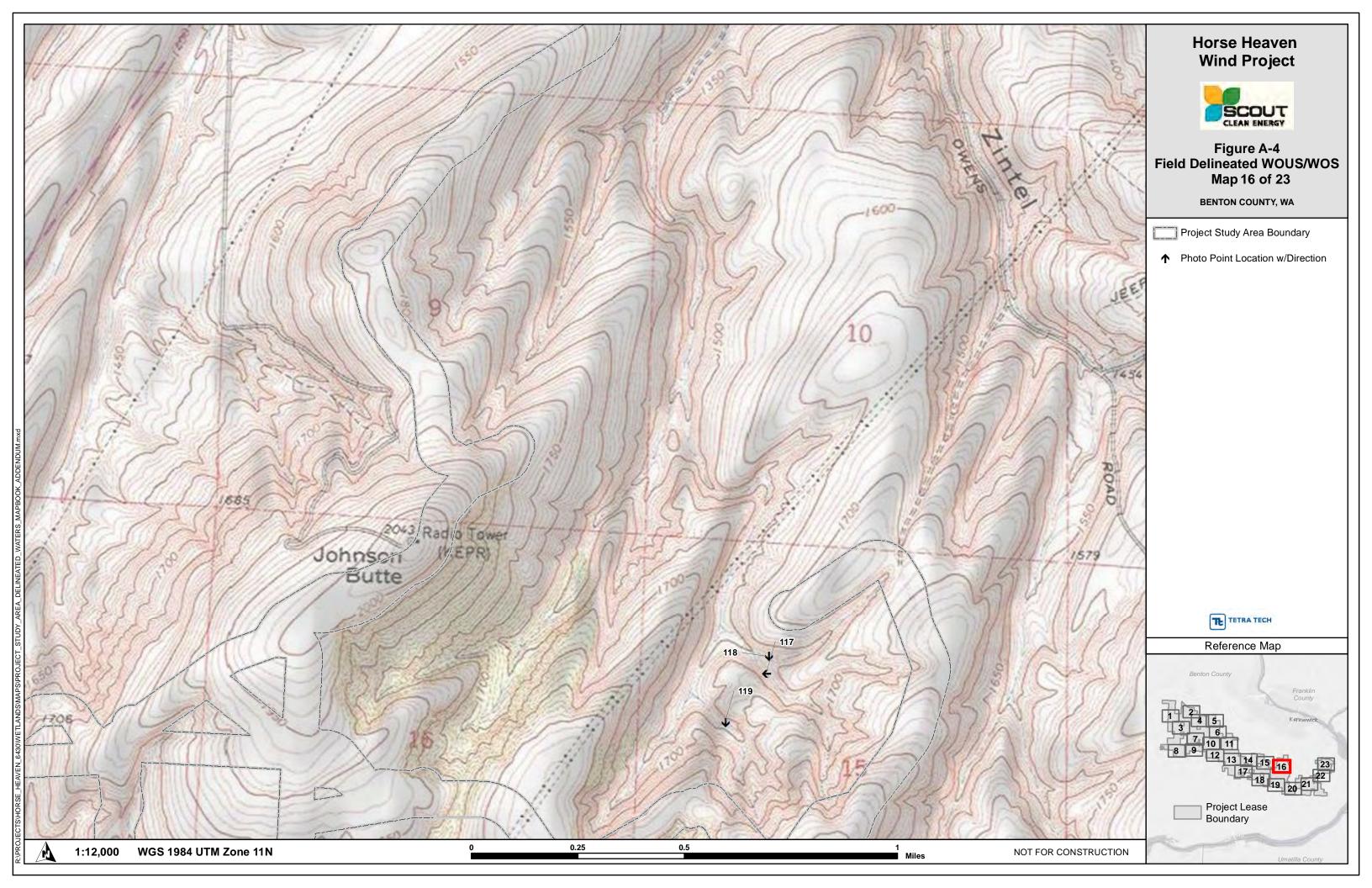


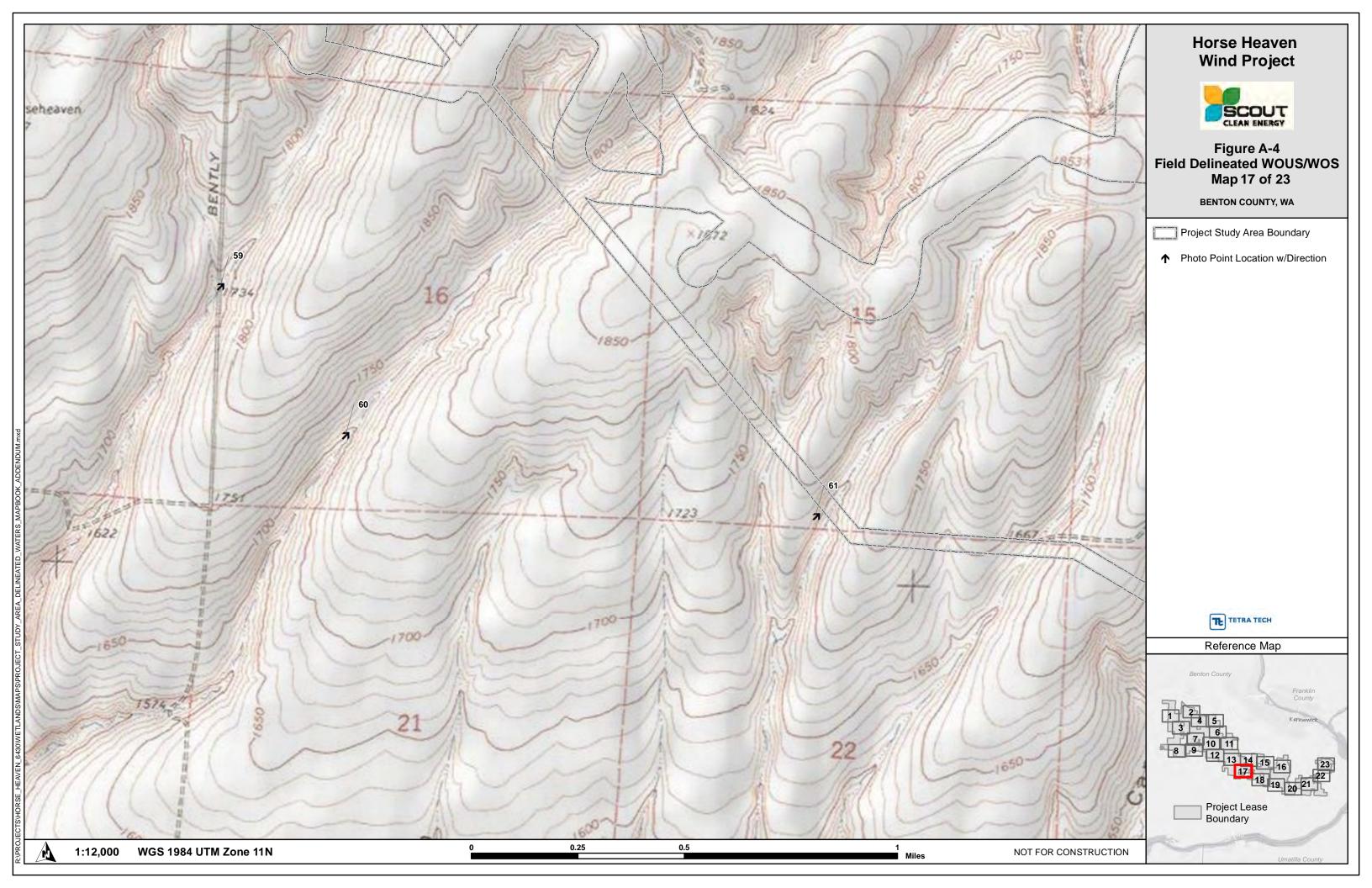


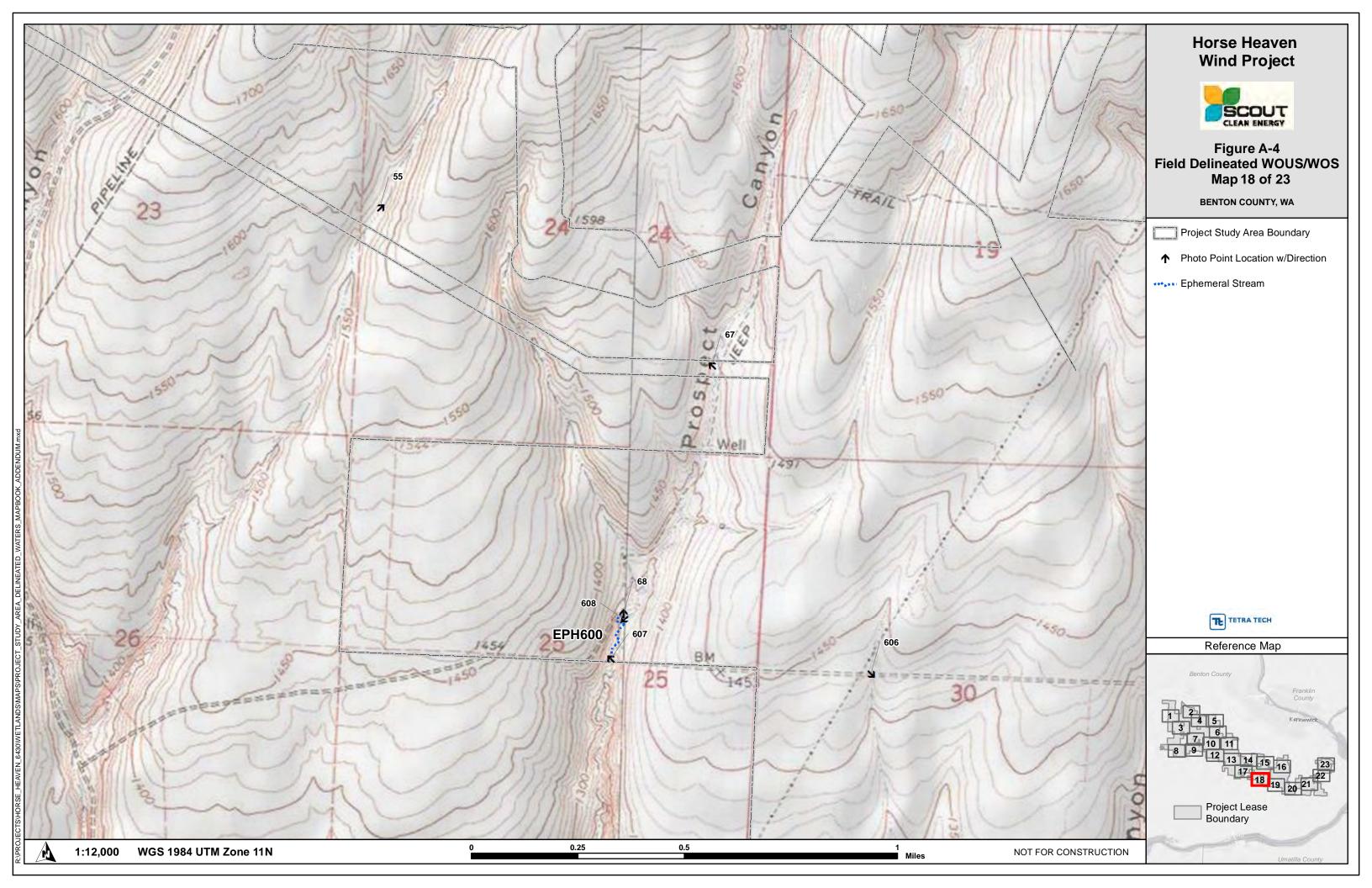


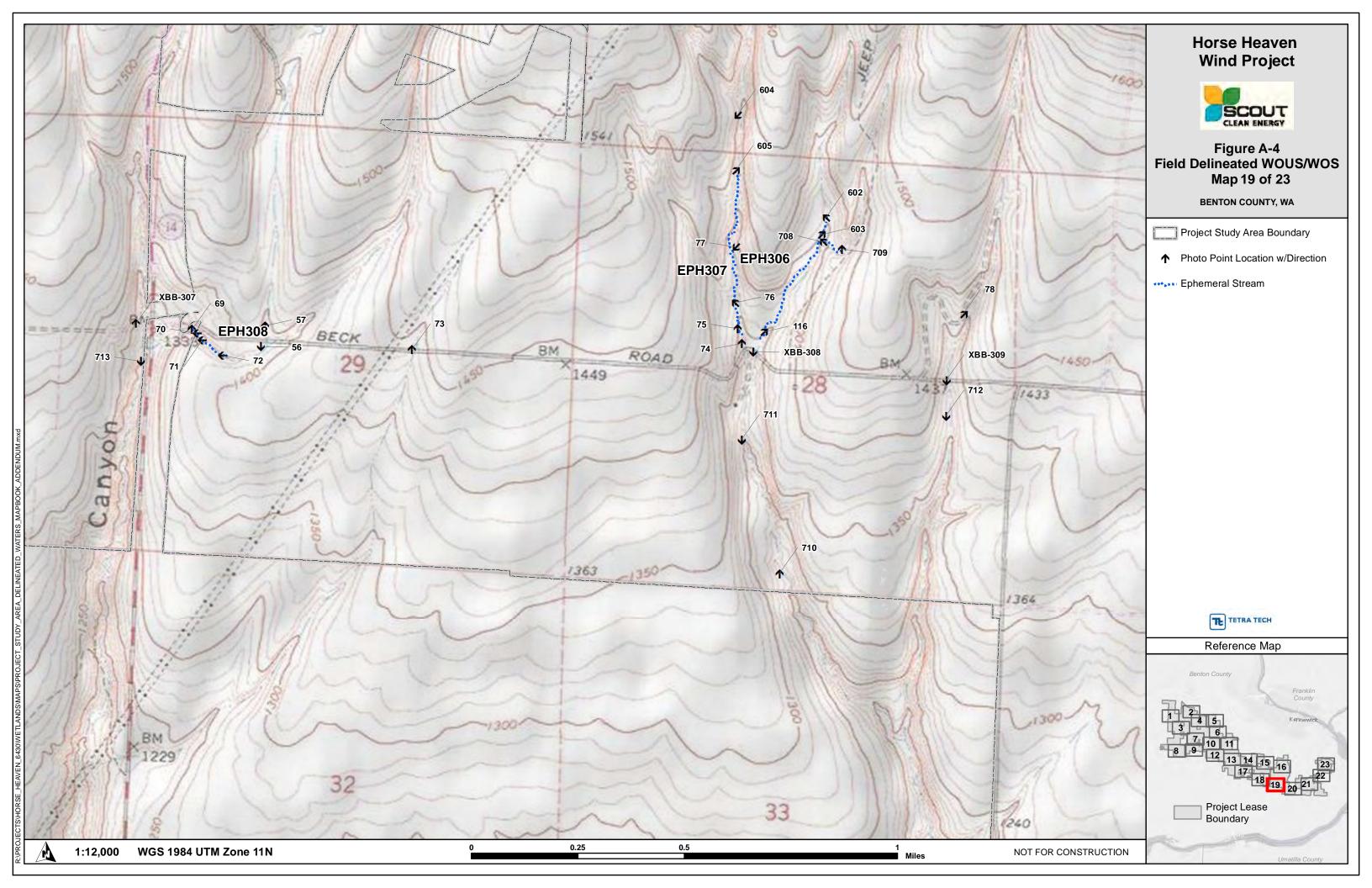


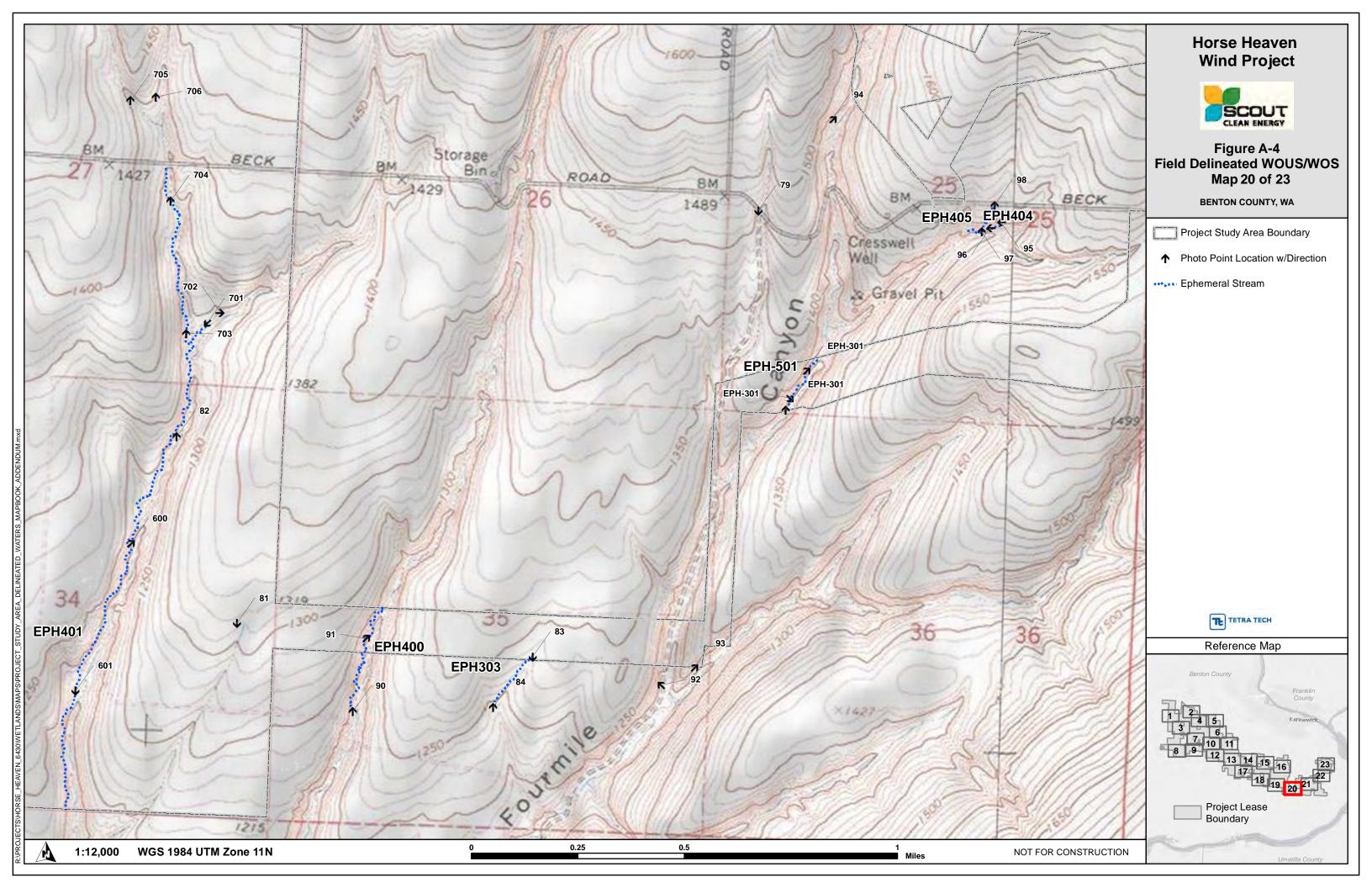


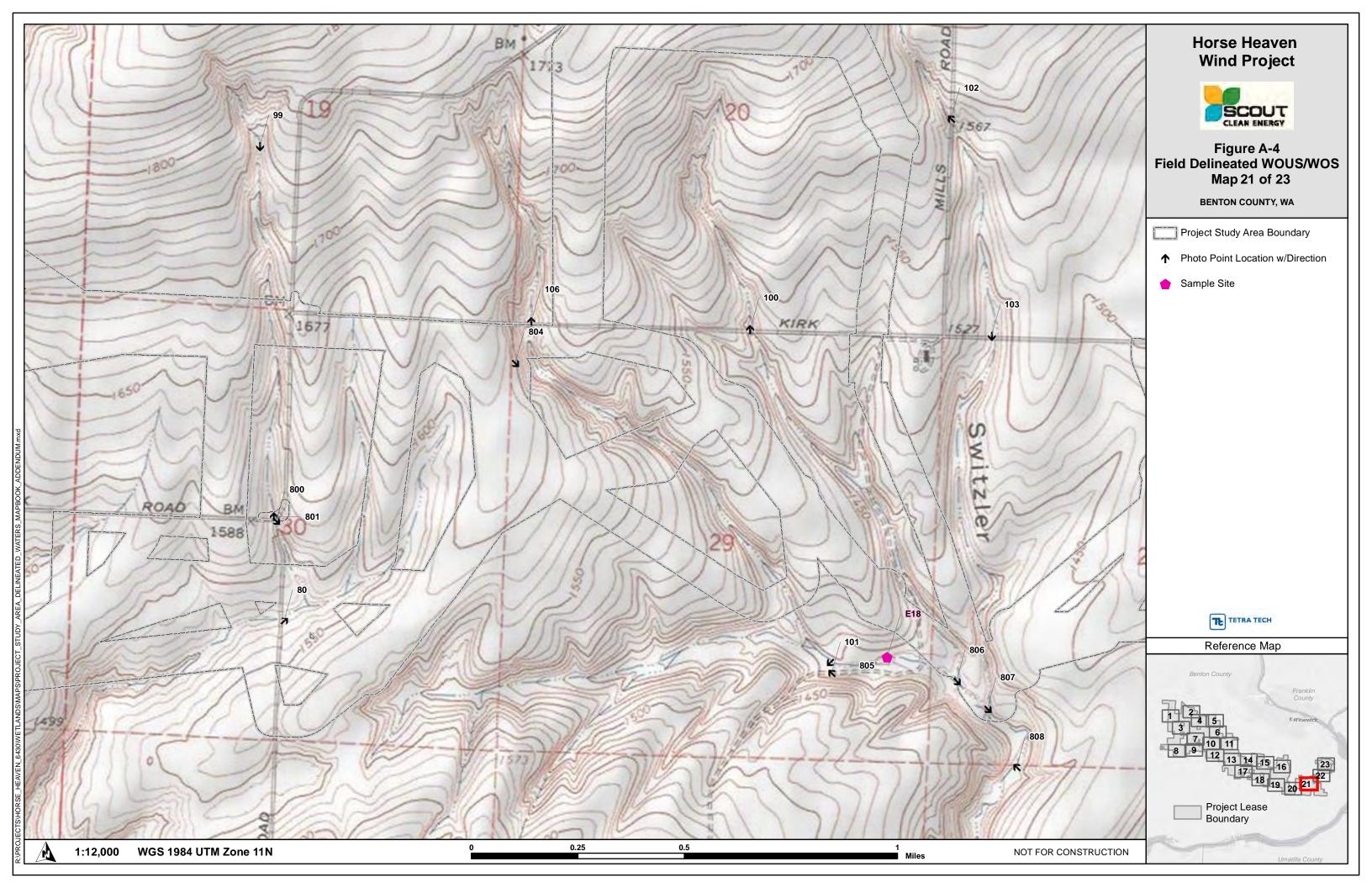


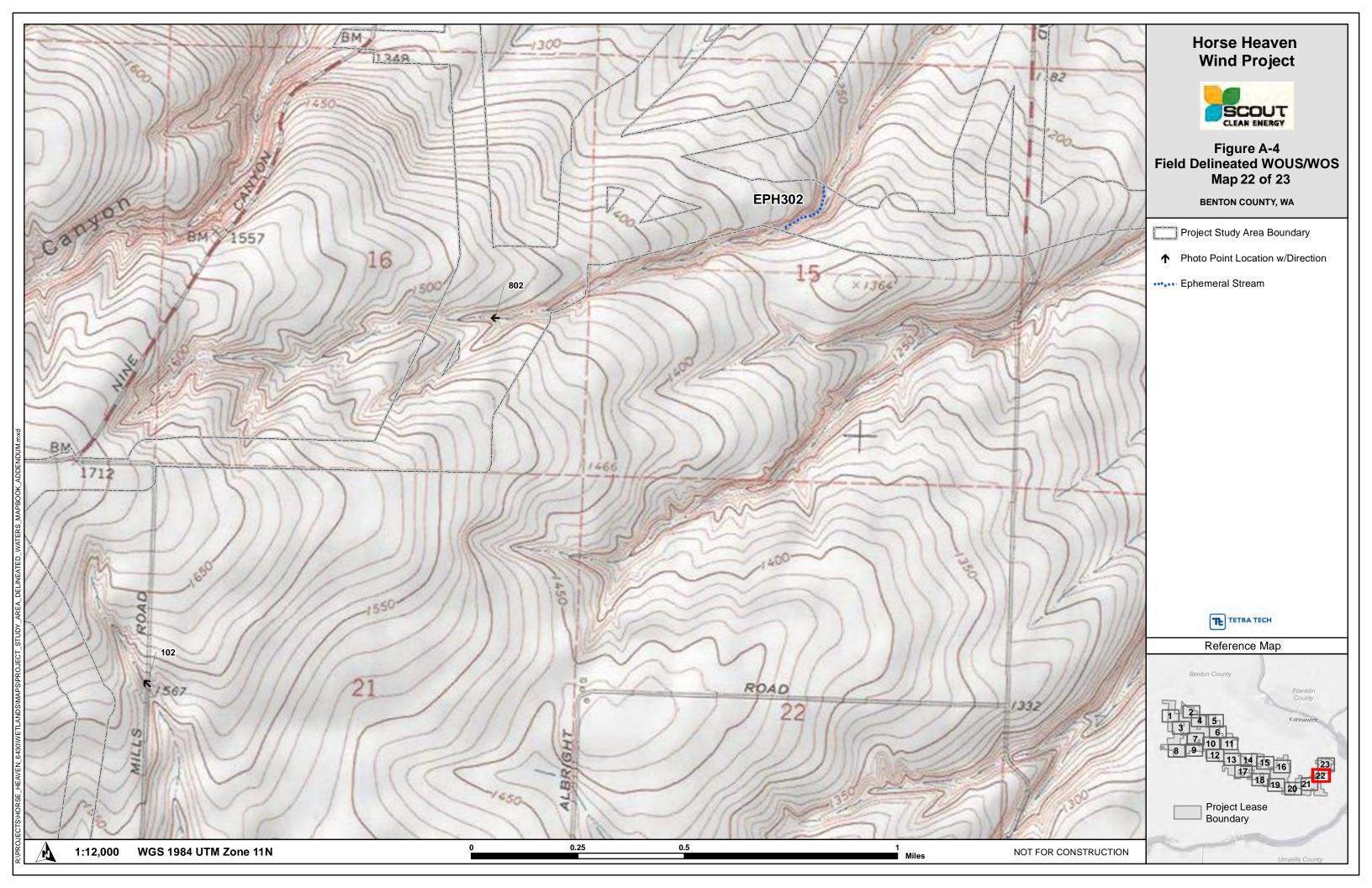


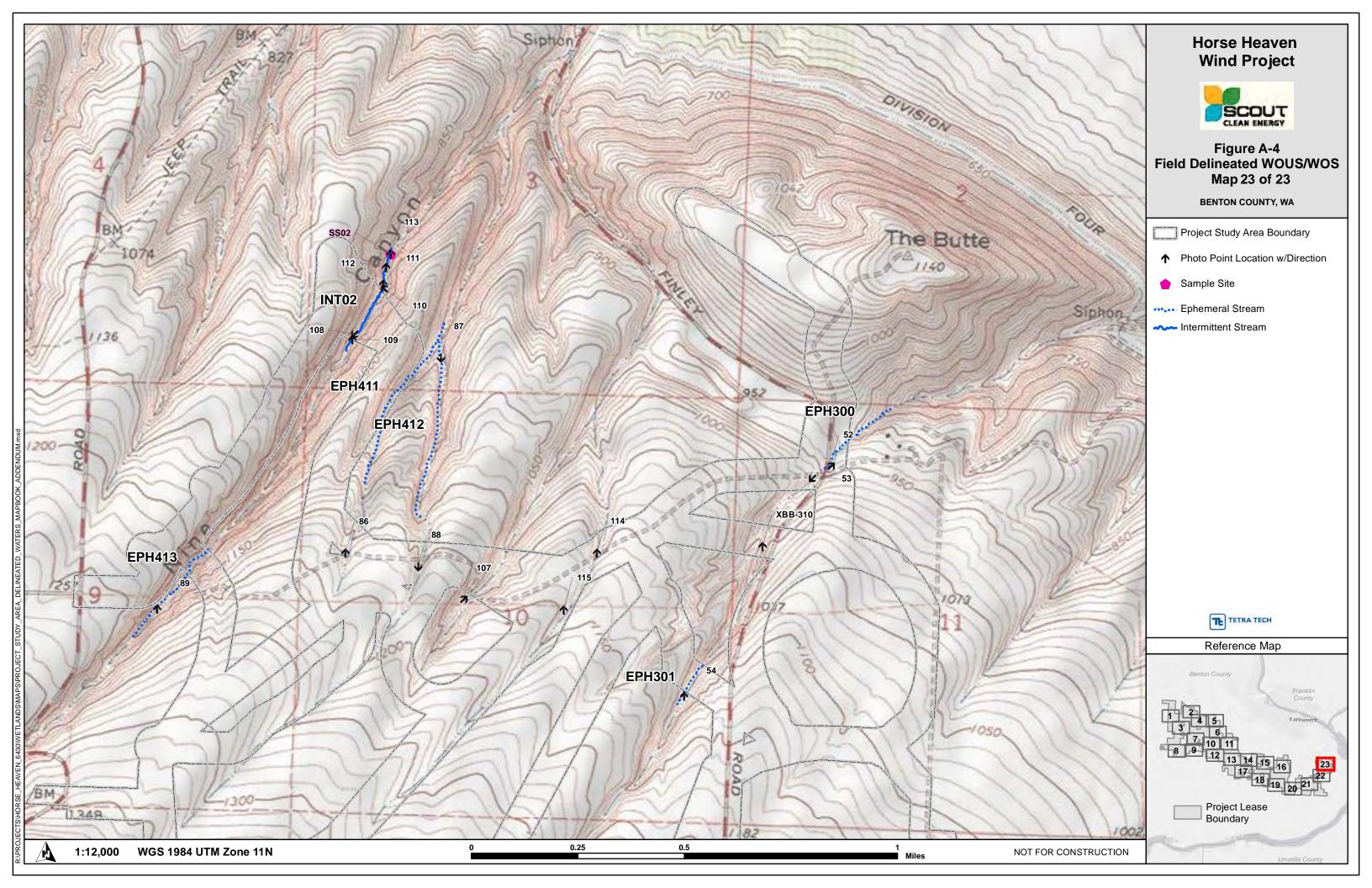












# APPENDIX B USACE DATA SHEETS

See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

Project/Site: Horse He	aven Hills			City/C	County: Bentor	n County		Sampling Dat	te: <u>5/11/21</u>
Applicant/Owner: <u>H</u>	Horse Heaver	า Hills, LLC				State:	OR	Sampling Poir	nt: E10u
Investigator(s): Jessica	a Taylor			Sectio	n, Township, R	Range: Section	1 31, T07N,	, R30E	
Landform (hillside, terr	ace, etc.): va	alley		Local rel	ief (concave, c	onvex, none): S	Slope		Slope (%): 30-65
Subregion (LRR): L	_RR B	Lat: 46.14065	56		Long:	-119.349764		Datur	m: UTM11
Soil Map Unit Name: F	Ritzville Silt L	oam, 30-65 perc	cent slopes			N	WI classif	ication: None	
Are climatic / hydrologi	ic conditions	on the site typic	al for this tim	ne of year?	Yes X	No	(If no, exp	olain in Remarks	;.)
Are Vegetation ,	Soil ,	or Hydrology	significar	ntly disturbed?	Are "Normal	Circumstances	" present?	Yes X	No
Are Vegetation,						explain any ans			
SUMMARY OF FI						ocations, tra	ansects,	important fo	eatures, etc.
Hydrophytic Vegetation Hydric Soil Present? Wetland Hydrology P		Yes X Yes Yes	No X No X		the Sampled a		Yes	No X	
Remarks: This site is in a valley Google Earth imagery						Google Earth c	orthoimager	ry). Historical ph	otos, also on
<b>VEGETATION</b> – U	Jse scient	ific names o	of plants.						
Tree Stratum	(Plot sizo:	)	Absolu % Cov			Dominance	n Tost wor	·kehoot:	
1.	(1 101 3126.		70 COV	opecies	: Status			Species That	
2.						Are OBL, F		•	1 (A)
3.						Total Numb		inant Species	1 (B)
Sapling/Shrub Stratur		t size:	)	=Total Cov	/er	Percent of Are OBL, F		Species That AC:	100.0% (A/B
2.					_	Prevalence	Index wo	rksheet:	
3.						-	% Cover of	<u> </u>	/lultiply by:
4						OBL specie		x 1 =	0
5				=Total Cov		FACW spec			300
Herb Stratum	(Plot size:	15 feet )		=10tal C0V	/ei	FAC specie		00 x 3 = 0 x 4 =	
Leymus cinereus	(1 101 01201	101000	100	Yes	FAC	UPL specie		) x5=	
2.						Column To			300 (B)
3						Prevaler	nce Index	= B/A =3	3.00
5.							_	ion Indicators:	
6. 7.						X Domina	ence Index		
8.					_			aptations <sup>1</sup> (Provi	ide supporting
			100	=Total Cov	/er	data	in Remark	s or on a separa	ate sheet)
Woody Vine Stratum	(Plo	t size:	)			Probler	matic Hydro	ophytic Vegetati	on <sup>1</sup> (Explain)
1								oil and wetland h turbed or proble	
% Bare Ground in He	erb Stratum	30	% Cover of I	=Total Cov		Hydrophyt Vegetation Present?	ı	X No_	
Remarks:	<u> </u>	<del></del>				1	-		<del></del>

SOIL									Sa	mpling Point:	: <u>E10u</u>
Profile Desc	ription: (Describe	to the depth	needed to d	ocument t	he indica	ator or o	confirm the	absence o	of indicators	s.)	<u></u>
Depth	Matrix		Re	edox Featui	res						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Text	ure		Remarks	
0-20	10YR 3/3	100			<u> </u>		Sandy I	Loam			
	-						-				
	-				· ——		-				
							-				
	-						-				
							-				
	oncentration, D=Dep					oated Sa	and Grains.		ation: PL=Po		
_	Indicators: (Applic	able to all LF	•		•				s for Proble	-	c Soils':
Histosol	(A1) Dipedon (A2)			Redox (S5) d Matrix (S					Muck (A9) (I	•	
Black His	. ,			Mucky Min	,				Manganese N	` ,	(I RR D)
	n Sulfide (A4)			Gleyed Ma					iced Vertic (F	` ,	(LIKIT D)
	d Layers (A5) <b>(LRR</b>	C)		ed Matrix (F					Parent Mater		
	ıck (A9) <b>(LRR D)</b>	,		Dark Surfa	,				Shallow Dark		22)
Depleted	d Below Dark Surfac	e (A11)	Deplete	ed Dark Sui	rface (F7	)		Other	r (Explain in I	Remarks)	
Thick Da	ark Surface (A12)		Redox	Depression	ıs (F8)						
	lucky Mineral (S1)	0									
Sandy G	Bleyed Matrix (S4)	<sup>3</sup> Indicators	s of hydrophyti	ic vegetatio	n and we	tland hy	drology mu	st be prese	ent, unless di	sturbed or pr	oblematic.
Restrictive I	Layer (if observed)	:									
Type:			_								
Depth (ir	nches):		_				Hydric Sc	oil Present	:?	Yes	No X
	what has typically be	een found on	this side of the	e project ar	ea in dry	land are	as.				
HYDROLO											
_	drology Indicators: cators (minimum of		nd: chack all th	at apply)				Sacandar	y Indicators	(minimum of	two required)
	Water (A1)	one is require		ust (B11)			<del></del>		r Marks (B1)	•	two required)
	ater Table (A2)			Crust (B12)					nent Deposit	` '	rine)
Saturation	` ,			: Invertebra	tes (B13)	)			Deposits (B3	. , .	,
Water M	larks (B1) (Nonriver	rine)	Hydrog	en Sulfide (	Odor (C1	)			age Patterns		
Sedimen	nt Deposits (B2) (No	nriverine)	Oxidize	d Rhizosph	neres on	Living R	oots (C3)	Dry-S	Season Wate	r Table (C2)	
Drift Dep	oosits (B3) (Nonrive	erine)	Presen	ce of Redu	ced Iron	(C4)			fish Burrows	. ,	
	Soil Cracks (B6)			Iron Reduc		illed Soil	ls (C6)		ation Visible		agery (C9)
	on Visible on Aerial	Imagery (B7)		uck Surface					ow Aquitard		
	tained Leaves (B9)		Other (	Explain in F	remarks)			FAC-	Neutral Test	(D5)	
Field Observ				_			1				
Surface Wate		es	No X		inches):						
Water Table Saturation Programmer		es	No X		inches): _ inches): _		Wetland	d Hydrolog	gy Present?	Yes	No_X
(includes cap		es	140 <u>/</u>	Dopin (i			Trottant	yui 010(	<sub>97</sub> 1 1036111!		

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

Project/Site: Horse Heaven Hills		City/Cour	City/County: Benton County Sampling Date: 5/11/					
Applicant/Owner: Horse Heaven Hills, LLC				State: OR	Sampling Point:	E10w		
Investigator(s): Jessica Taylor		Section, T	Township, Ra	ange: Section 31, T07N	, R30E			
Landform (hillside, terrace, etc.): valley		Local relief (	(concave, co	nvex, none): concave	Slop	oe (%): 30		
Subregion (LRR): <u>LRR B</u> Lat: <u>46.140656</u>			Long: <u>-</u>	119.349764	Datum:	UTM11		
Soil Map Unit Name: Ritzville Silt Loam, 30-65 percent	slopes			NWI classif	ication: None			
Are climatic / hydrologic conditions on the site typical for	or this time of	year?	Yes X	No (If no, exp	olain in Remarks.)			
Are Vegetation, Soil, or Hydrology_X_s	significantly d	listurbed? A	re "Normal (	Circumstances" present?	Yes X No			
Are Vegetation, Soil, or Hydrology	naturally prob	olematic? (I	f needed, ex	xplain any answers in Rei	marks.)			
SUMMARY OF FINDINGS – Attach site ma	ap showin	g samplin	g point lo	cations, transects,	important feat	ures, etc.		
Hydrophytic Vegetation Present? Yes X No	0	Is the	Sampled A	rea				
	0	withir	n a Wetland	? Yes X	No			
Wetland Hydrology Present? Yes X No	o							
Remarks: This site is in a valley bottom. There is a spring with a Google Earth imagery, show the area with a livestock				Google Earth orthoimage	ry). Historical photo	s, also on		
VEGETATION – Use scientific names of p	lants.							
<u>Tree Stratum</u> (Plot size: 15 )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test wor	ksheet:			
Populus balsamifera	45	Yes	FAC	Number of Dominant				
2.				Are OBL, FACW, or F	•	2 (A)		
3.				Total Number of Domi	nant Species			
4				Across All Strata:		2 (B)		
Sapling/Shrub Stratum (Plot size: 30 feet )  1.		=Total Cover		Percent of Dominant S Are OBL, FACW, or F	•	0.0% (A/B)		
2.				Prevalence Index wo	rksheet:			
3.				Total % Cover of	: Multi	ply by:		
4				· —	) x 1 =	0		
5		T-1-1-0		FACW species (		0		
Herb Stratum (Plot size: 15 feet )	=	=Total Cover		FAC species 14 FACU species 0		135 0		
1. Leymus cinereus	10	No	FAC	UPL species (		0		
Equisetum arvense	90	Yes	FAC	Column Totals: 14		135 (B)		
3.				Prevalence Index	= B/A = 3.00			
4								
5				Hydrophytic Vegetat				
6.				X Dominance Test i X Prevalence Index				
7. 8.					aptations¹ (Provide	supporting		
s:	100 =	=Total Cover			s or on a separate			
Woody Vine Stratum (Plot size:	)			Problematic Hydro	ophytic Vegetation <sup>1</sup>	(Explain)		
1.				<sup>1</sup> Indicators of hydric so	oil and wetland hydi	ology must		
2				be present, unless dis	turbed or problema	tic.		
	=	=Total Cover		Hydrophytic				
% Bare Ground in Herb Stratum 0 % C	Cover of Biotic	c Crust 0		Vegetation Present? Yes	X No x			
Remarks:				Troscite. Too	<u> </u>	_		
Vegetation is not currently being grazed by cattle, the	stand of Grea	at Basin Wildr	rye was very	dense around the edges	of the wetland.			
				•				

SOIL									Sam	pling Point:	E10w
Profile Desc	cription: (Describe	to the dept	h needed to doc	ument t	he indica	tor or c	onfirm the a	bsence of	indicators.)	)	
Depth	Matrix			ox Featur							
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Textu	re		Remarks	
0-12	10YR 2/2	100					Sandy Loa	am			
1- 0.0			D				10 :	21			
	oncentration, D=Dep					oated Sa				E Lining, M=	-
Histosol	Indicators: (Applica	ible to all L	Sandy Re		,				uck (A9) <b>(Li</b>	natic Hydric	Solis :
	oipedon (A2)		Stripped N				-		uck (A9) <b>(Li</b> uck (A10) <b>(L</b>	-	
	stic (A3)		Loamy Mu	,	,		-		· , ·	•	(LRR D)
	en Sulfide (A4)		Loamy GI	-			Iron-Manganese Masses (F12) (LRR D) Reduced Vertic (F18)				
	d Layers (A5) (LRR C	<b>c</b> )	Depleted	•	` '		Red Parent Material (F21)				
	1 cm Muck (A9) (LRR D)			ırk Surfac	ce (F6)		-	Very Sh	nallow Dark	Surface (F22	2)
Depleted	d Below Dark Surface	e (A11)	Depleted	Dark Sur	rface (F7)		_	Other (I	Explain in R	emarks)	
Thick Da	ark Surface (A12)		Redox De	pression	ıs (F8)		_				
Sandy M	lucky Mineral (S1)										
Sandy G	Gleyed Matrix (S4)	<sup>3</sup> Indicato	rs of hydrophytic	vegetatio	n and we	tland hy	drology must	be present	, unless dist	urbed or pro	blematic.
Restrictive I	Layer (if observed):										
Type:	bedroc	k									
Depth (ir	nches):	12					Hydric Soi	Present?		Yes X	No
Remarks:											
Soils had a s	slight hydrogen sulfid	e smell and	l felt mucky.								
HADBOLO	NCV										
HYDROLO											
,	drology Indicators:	:						O	l.s.di.s.ata.us. (	-:-:	
	cators (minimum of co	ne is requir	ed, check all that Salt Crust						Marks (B1) <b>(</b>		wo required)
	ater Table (A2)		Biotic Cru				-			(B2) <b>(Riveri</b>	ne)
Saturation	` ,		Aquatic In		tes (B13)		=		posits (B3)	· / •	110)
	larks (B1) <b>(Nonriver</b> i	ine)	X Hydrogen				-		je Patterns (	•	
Sedimer	nt Deposits (B2) (No	nriverine)	Oxidized I		•		oots (C3)		ason Water		
Drift Dep	oosits (B3) (Nonriver	ine)	Presence	of Redu	ced Iron (	(C4)	_	Crayfisl	n Burrows (0	C8)	
Surface	Soil Cracks (B6)		Recent Iro	on Reduc	ction in Ti	lled Soil	s (C6)	Saturat	ion Visible o	n Aerial Ima	gery (C9)
Inundation	on Visible on Aerial I	magery (B7	)Thin Mucl	k Surface	e (C7)		-	Shallow	/ Aquitard (D	03)	
Water-S	tained Leaves (B9)		Other (Ex	plain in F	Remarks)		_	FAC-Ne	eutral Test (	D5)	
Field Obser											
Surface Wat		es	No <u>x</u>	Depth (i	· -						
Water Table			No x	Depth (i	_					<b>v</b> v	
Saturation P		es X	No	Depth (i	inches):	0	Wetland	Hydrology	Present?	Yes X	No
(includes cap	ulliary fringe)		-iti	al abotes	n rovice:	inone	tiona) if aveil	oblo:			

Remarks:

See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

Project/Site: Horse Heaven Hills		City/County: Bento	ounty: Benton County Sampling Date:				
Applicant/Owner: Horse Heaven Hills, LLC			State: OR	Sampling Point:	E18		
Investigator(s): Jessica Taylor	;	Section, Township,	Range: Section 31, T07N,	R30E			
Landform (hillside, terrace, etc.): wide valley bottom	Lo	cal relief (concave,	convex, none): concave	Slope (	(%): 0		
Subregion (LRR): LRR B Lat: 46.055728		Long:	-119.079240	Datum: U	JTM11		
Soil Map Unit Name: Ritzville Silt Loam, 0-5 percent slo	pes		NWI classific	cation: None			
Are climatic / hydrologic conditions on the site typical fo	r this time of yea	r? Yes X	No (If no, expl	ain in Remarks.)			
Are Vegetation, Soil, or Hydrologys	ignificantly distu	rbed? Are "Norma	l Circumstances" present?	Yes X No			
Are Vegetation, Soil, or Hydrologyn	aturally problem	atic? (If needed,	explain any answers in Rem	ıarks.)			
SUMMARY OF FINDINGS – Attach site ma	p showing s	ampling point	ocations, transects,	important featur	es, etc.		
Hydrophytic Vegetation Present? Yes No	X	Is the Sampled	Area				
	X	within a Wetlar		No X			
Wetland Hydrology Present? Yes No	X						
Remarks: This site is at the toe slope of a cropfield. The entire siblonde on orthoimagery.	ite was covered	in cerealy rye, a cor	nmon weed in this region. C	ereal rye shows up a	s a light		
VEGETATION – Use scientific names of pl	ants.						
Tree Stratum (Plot size:)		minant Indicator status	Dominance Test work	sheet:			
1			Number of Dominant S Are OBL, FACW, or FA	•	(A)		
3.			Total Number of Domir		(A)		
4.			Across All Strata:	1	(B)		
Sapling/Shrub Stratum (Plot size:)  1.		al Cover	Percent of Dominant S Are OBL, FACW, or FA	•	6 (A/B)		
2.			Prevalence Index wor	ksheet:			
3.			Total % Cover of:	Multiply	/ by:		
4			·	x 1 =0			
5		-1.0	FACW species 0				
Herb Stratum (Plot size: 15 feet )	=10t	al Cover	FAC species 0 FACU species 0		—		
1. Secale cereale	100	Yes UPL	UPL species 100		)		
2.			Column Totals: 100				
3.			Prevalence Index =	B/A = 5.00	<u> </u>		
4							
5.			Hydrophytic Vegetation  Dominance Test is				
6. 7.			Prevalence Index i				
8.				ptations <sup>1</sup> (Provide sup	porting		
	100 =Tot	al Cover	data in Remarks	or on a separate she	et)		
Woody Vine Stratum (Plot size:)			Problematic Hydro	phytic Vegetation <sup>1</sup> (E	xplain)		
1 2.			<ul> <li><sup>1</sup>Indicators of hydric so be present, unless dist</li> </ul>				
	=Tot	al Cover	Hydrophytic				
% Bare Ground in Herb Stratum 0 % C	over of Biotic Cr	ust 0	Vegetation Present? Yes	No_X			
Remarks:			1	<u> </u>			

SOIL									Sa	ampling Poin	ıt:	E18
Profile Desc	cription: (Describe to the	ne depth r	needed to doc	ument th	ne indica	ator or c	onfirm the	absence of	indicator	s.)	1	
Depth	Matrix			x Featur						- ,		
(inches)		% 0	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Tex	ture		Remarks	;	
0-16		100	, ,				Silt L	nam				
	101111070						O.I.C E					
	·						-					
	. <u> </u>											
¹Type: C=C	oncentration, D=Depletio	n RM-Re	duced Matrix (	CS=Cove	ered or C	oated Sa	and Grains	<sup>2</sup> l ocati	on: PI =Po	ore Lining, M	1-Matı	riy
	Indicators: (Applicable					oated Ot	and Oranis			ematic Hydr		
Histosol	٠	to an En	Sandy Re		•				1uck (A9) <b>(</b>	-		
	pipedon (A2)		Stripped N							-		
	istic (A3)	Loamy Mu					2 cm Muck (A10) (LRR B) Iron-Manganese Masses (F12) (LRR D)					
	en Sulfide (A4)	Loamy Gl	,	` ,				ed Vertic (I		-, (	,	
Stratified Layers (A5) (LRR C) Depleted Matrix (F3)									arent Mate	,		
1 cm Muck (A9) (LRR D) Redox Dark Surface				,					k Surface (F	22)		
Depleted Below Dark Surface (A11)  Depleted Dark Surface (F7)				)			Explain in		,			
	ark Surface (A12)	•	Redox De							,		
Sandy M	Mucky Mineral (S1)											
Sandy G	Gleyed Matrix (S4) 3I	ndicators o	of hydrophytic v	egetatio/	n and we	tland hy	drology mu	ust be presen	t, unless d	isturbed or p	robler	matic.
Restrictive	Layer (if observed):											
Type:												
Depth (ii	nches):		'				Hydric S	oil Present?		Yes	1	No X
Remarks:			•									
	what has typically been f	ound on th	is side of the p	roject ar	ea in dry	land area	as.					
HYDROLO	OGY											
Wetland Hy	drology Indicators:											
-	cators (minimum of one i	s required:	check all that	apply)				Secondary	Indicators	(minimum o	of two	required)
Surface	Water (A1)	-	Salt Crust	(B11)				Water	Marks (B1	(Riverine)		
	ater Table (A2)		Biotic Cru	` ,						ts (B2) <b>(Rive</b>	erine)	
Saturation	on (A3)		Aquatic In	vertebrat	tes (B13)	)		Drift De	eposits (B3	B) (Riverine)	)	
Water M	Marks (B1) (Nonriverine)		Hydrogen						ge Pattern			
Sedimer	nt Deposits (B2) (Nonrive	erine)	Oxidized F	Rhizosph	eres on l	Living Ro	oots (C3)	Dry-Se	ason Wate	er Table (C2)	)	
Drift Dep	posits (B3) (Nonriverine)	)	Presence	of Reduc	ced Iron	(C4)		Crayfis	h Burrows	(C8)		
	Soil Cracks (B6)		Recent Iro	n Reduc	tion in Ti	lled Soil	s (C6)	Satura	tion Visible	on Aerial In	nagery	y (C9)
Inundati	on Visible on Aerial Imag	ery (B7)	Thin Muck	Surface	e (C7)			Shallov	w Aquitard	(D3)		
Water-S	Stained Leaves (B9)		Other (Exp	olain in R	Remarks)			FAC-N	eutral Test	t (D5)		
Field Obser	vations:											

Depth (inches):

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Depth (inches):

Depth (inches):

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Remarks:

Surface Water Present?

Water Table Present?

Saturation Present? (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_ No \_X

See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

Project/Site: Horse Heaven Hills		City/County: Benton County Sampling Date:						
Applicant/Owner: Horse Heaven Hills, LLC				State: OR	Sampling Point:	01		
Investigator(s): Jessica Taylor/Katie Pyne		Section, T	Township, Ra	nge: Section 01, T07N,	R27E			
Landform (hillside, terrace, etc.): swale		Local relief (	concave, cor	nvex, none): concave	Slop	e (%): 20		
Subregion (LRR): LRR B Lat: 46.130370			Long: -1	16.390489	Datum:	NAD83		
Soil Map Unit Name: Ritzville Silt Loam				NWI classifi	cation: None			
Are climatic / hydrologic conditions on the site typical fo	or this time of	year?	Yes_x_	No (If no, exp	lain in Remarks.)			
Are Vegetation x , Soil , or Hydrology s	significantly o			ircumstances" present?	Yes No	)		
Are Vegetation, Soil, or Hydrologyr				olain any answers in Ren	· <u></u>			
SUMMARY OF FINDINGS – Attach site ma				-		ures, etc.		
Hydrophytic Vegetation Present? Yes No	о X	Is the	Sampled A	'ea				
	o X		n a Wetland?		No X			
Wetland Hydrology Present? Yes X No	<u> </u>							
Remarks:								
Site is in a low spot adjacent to an intersection. Two combined wheat that was part of a larger crop.	ulverts are pr	esent and the	soil surface	was cracked. The only v	egetation was spar	se winter		
VEGETATION – Use scientific names of p	lants.							
	Absolute	Dominant	Indicator					
Tree Stratum (Plot size:)	% Cover	Species?	Status	Dominance Test worl				
1 2				Number of Dominant S Are OBL, FACW, or FA		0 (A)		
3.				Total Number of Domi		`` ′		
4.				Across All Strata:	·	1 (B)		
	· ——-	=Total Cover		Percent of Dominant S	•			
Sapling/Shrub Stratum (Plot size:)	)			Are OBL, FACW, or FA	AC: <u>0.</u>	.0% (A/B)		
1. 2.				Prevalence Index wo				
3.				Total % Cover of:		ply by:		
4.				OBL species 0	x 1 =	0		
5				FACW species 0	x 2 =	0		
	=	=Total Cover			<del></del>	0		
Herb Stratum (Plot size: 30 feet )	20	V	LIDI	FACU species 0		0		
1. Triticum aestivum 2.	20	Yes	UPL	UPL species 20 Column Totals: 20		00 00 (B)		
3.			<del></del>	Prevalence Index =				
4.								
5.				Hydrophytic Vegetati	on Indicators:			
6				Dominance Test is				
7				Prevalence Index				
8		T-1-1 0			aptations <sup>1</sup> (Provide s s or on a separate s			
Woody Vine Stratum (Plot size: )	20 =	=Total Cover			phytic Vegetation <sup>1</sup>	,		
1	)			<sup>1</sup> Indicators of hydric so				
2.				be present, unless dist				
		=Total Cover		Hydrophytic				
		<u> </u>		Vegetation				
	Cover of Biotic	c Crust 0		Present? Yes_	No X	_		
Remarks:								

SOIL Sampling Point: 01

Profile Desc Depth	cription: (Describe Matrix	to the dept		ment the in Features	dicator or	confirm the absence of	of indicators.)	
(inches)	Color (moist)	%	Color (moist)	% Typ	pe <sup>1</sup> Loc <sup>2</sup>	Texture	Remarks	
0-15	10YR 3/4	100	( , , ,			Loamy/Clayey	Silt Loam	
¹Type: C=Co	oncentration, D=Dep	letion, RM=I	Reduced Matrix, C	S=Covered o	or Coated S	and Grains. <sup>2</sup> Loca	tion: PL=Pore Lining, M=Mat	trix.
Hydric Soil I	Indicators: (Applica	ble to all L	RRs, unless othe	rwise noted	.)	Indicator	s for Problematic Hydric So	oils³:
Histosol	(A1)		Sandy Red	lox (S5)		1 cm	Muck (A9) (LRR C)	
Histic Ep	pipedon (A2)		Stripped M	atrix (S6)		2 cm	Muck (A10) (LRR B)	
Black Hi	stic (A3)		Loamy Mu	cky Mineral (	F1)	Iron-N	Manganese Masses (F12) (LR	RR D)
Hydroge	n Sulfide (A4)		Loamy Gle	yed Matrix (F	2)	Redu	ced Vertic (F18)	
Stratified	d Layers (A5) <b>(LRR C</b>	;)	Depleted N	fatrix (F3)		Red F	Parent Material (F21)	
1 cm Mu	ick (A9) (LRR D)		Redox Dar	k Surface (F	5)	Very	Shallow Dark Surface (F22)	
	d Below Dark Surface	e (A11)	Depleted D	ark Surface	(F7)	Other	(Explain in Remarks)	
Thick Da	ark Surface (A12)		Redox Dep	ressions (F8	)			
Sandy M	lucky Mineral (S1)							
Sandy G	ileyed Matrix (S4)	<sup>3</sup> Indicator	s of hydrophytic ve	egetation and	d wetland h	ydrology must be prese	nt, unless disturbed or proble	matic.
Restrictive I	Layer (if observed):							
Type:								
Depth (ir	nches):					Hydric Soil Present	? Yes	No X
HYDROLO	GY							
-	drology Indicators:							
•	cators (minimum of o	ne is require					y Indicators (minimum of two	required)
	Water (A1)		Salt Crust				r Marks (B1) (Riverine)	
	iter Table (A2)		Biotic Crus		140)		nent Deposits (B2) (Riverine)	)
Saturatio		1		ertebrates (E	•		Deposits (B3) (Riverine)	
	arks (B1) (Nonriveri	-		Sulfide Odor			age Patterns (B10)	
	nt Deposits (B2) <b>(Nor</b> posits (B3) <b>(Nonriver</b>	-		hizospheres of Reduced I	_		season Water Table (C2) ish Burrows (C8)	
	Soil Cracks (B6)	iiie)		n Reduction i			ation Visible on Aerial Imager	rv (Ca)
	on Visible on Aerial I	magery (R7)		Surface (C7)			ow Aquitard (D3)	iy (C9)
	tained Leaves (B9)	magery (Dr)	<i></i>	lain in Rema			Neutral Test (D5)	
Field Observ					,			
Surface Wat		s	No x	Depth (inche	s):			
Water Table				Depth (inche	· <del></del>			
Saturation P	resent? Ye	s		Depth (inche	· <del></del>	Wetland Hydrolog	y Present? Yes X	No
(includes cap	oillary fringe)							
Describe Rec	corded Data (stream	gauge, mor	nitoring well, aerial	photos, prev	rious inspe	ctions), if available:		
Remarks:								
l								

See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

Project/Site: Horse Heaven Hills		City/Cou	nty: Benton	Sampling Date:	2/22/2020	
Applicant/Owner: Horse Heaven Hills, LLC				State: OR	Sampling Point:	02
Investigator(s): Jessica Taylor/Katie Pyne		Section,	Township, Ra	ange: Section 11, T07N,	, R30E	
Landform (hillside, terrace, etc.): valley		Local relief	(concave, co	nvex, none): concave	Slop	oe (%): 30-65
Subregion (LRR): LRR B Lat: 46.114251			Long: -1	119.052036	Datum:	NAD83
Soil Map Unit Name: Warden Silt Loam, 30-65 percent	slopes			NWI classifi	ication: None	
Are climatic / hydrologic conditions on the site typical for	or this time o	f year?	Yes X	No (If no, exp	olain in Remarks.)	
Are Vegetation, Soil, or Hydrologys	significantly	disturbed? A	Are "Normal C	Circumstances" present?		)
Are Vegetation, Soil, or Hydrology				plain any answers in Rer		
SUMMARY OF FINDINGS – Attach site ma					,	ures, etc.
Hydrophytic Vegetation Present? Yes No	х с	Is the	Sampled A	rea		
	X	withi	n a Wetland	? Yes	No X	
Wetland Hydrology Present? Yes No	о <u>X</u>					
Remarks:  Bottom of steep canyon in a thin channel with very obtained the potential herbaceous species were not up yet. T  VEGETATION – Use scientific names of p	here had be		•	•		looming but
T 0	Absolute	Dominant	Indicator			
Tree Stratum (Plot size:) 1.	% Cover	Species?	Status	Dominance Test wor		
2.				Number of Dominant S Are OBL, FACW, or FA	•	0 (A)
3.				Total Number of Domi		
4		T-1-1 O		Across All Strata:		2 (B)
Sapling/Shrub Stratum (Plot size: 30 feet )		=Total Cover		Percent of Dominant S Are OBL, FACW, or FA	•	.0% (A/B)
1. Artemisia tridentata	, 75	Yes	UPL	7110 002, 171000, 0117		(70)
2.				Prevalence Index wo	rksheet:	
3.				Total % Cover of:	: Multi	iply by:
4				OBL species 0	x 1 =	0
5				FACW species 0	) x 2 =	0
	75	=Total Cover		FAC species 0		0
Herb Stratum (Plot size: 15 feet )				FACU species 0		0
1. Lomatium triternatum	5	No No	UPL	UPL species 80		100
2. Moss	90	Yes		Column Totals: 80	`` /	100 (B)
3. 4.				Prevalence Index =	= B/A =5.00	<u> </u>
				Hydrophytic Vegetati	ion Indicators:	
6				Dominance Test is		
7		· · · · · · · · · · · · · · · · · · ·		Prevalence Index		
•					aptations <sup>1</sup> (Provide :	supportina
o		=Total Cover			s or on a separate	
Woody Vine Stratum (Plot size:				Problematic Hydro	ophytic Vegetation <sup>1</sup>	(Explain)
1.				<sup>1</sup> Indicators of hydric so	oil and wetland hydr	rology must
2.				be present, unless dist		
		=Total Cover		Hydrophytic		
				Vegetation		
	Cover of Biot	ic Crust 0	_	Present? Yes	No <u>x</u>	_
Remarks:						
Potential for more vegetation later in the season.						

SOIL Sampling Point: 02 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Redox Features Loc<sup>2</sup> Color (moist) % Color (moist) Type<sup>1</sup> (inches) Texture Remarks 0-4 10YR 4/4 100 Sandy Sandy Loam <sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils<sup>3</sup>: Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) 1 cm Muck (A9) (LRR C) Sandy Redox (S5) Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Iron-Manganese Masses (F12) (LRR D) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Reduced Vertic (F18) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Red Parent Material (F21) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Very Shallow Dark Surface (F22) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Other (Explain in Remarks) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) <sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Sandy Gleyed Matrix (S4) Restrictive Layer (if observed): bedrock Type: Depth (inches): **Hydric Soil Present?** Yes No Remarks: **HYDROLOGY** 

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required	d; check all that apply)	Secondary Indicators (minimum of two required)
Surface Water (A1)	Salt Crust (B11)	Water Marks (B1) (Riverine)
High Water Table (A2)	Biotic Crust (B12)	Sediment Deposits (B2) (Riverine)
Saturation (A3)	Aquatic Invertebrates (B13)	Drift Deposits (B3) (Riverine)
Water Marks (B1) (Nonriverine)	Hydrogen Sulfide Odor (C1)	x Drainage Patterns (B10)
Sediment Deposits (B2) (Nonriverine)	Oxidized Rhizospheres on Living Ro	ots (C3) Dry-Season Water Table (C2)
Drift Deposits (B3) (Nonriverine)	Presence of Reduced Iron (C4)	Crayfish Burrows (C8)
Surface Soil Cracks (B6)	Recent Iron Reduction in Tilled Soils	
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Other (Explain in Remarks)	FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes	No x Depth (inches):	
Water Table Present? Yes	No x Depth (inches):	
Saturation Present? Yes	No x Depth (inches):	Wetland Hydrology Present? Yes No X
(includes capillary fringe)	<u> </u>	
Describe Recorded Data (stream gauge, moni	toring well, aerial photos, previous inspect	ons), if available:
Remarks:		

# **RATING SUMMARY – Eastern Washington**

Name of wetland (or ID #): E-10	Date of site visit: <u>5/11/</u> 21
Rated by Jessica Taylor	_Trained by Ecology? YesX No Date of training
HGM Class used for rating Depressional	Wetland has multiple HGM classes?YX_N
•	the figures requested (figures can be combined).
OVERALL WETLAND CATEGORY _	IV (based on functions <u>X</u> or special characteristics)

#### 1. Category of wetland based on FUNCTIONS

	_Category I — Total score = 22-27
	_Category II — Total score = 19-21
	_Category III - Total score = 16-18
X	Category IV – Total score = 9-15

FUNCTION		mprov ter Q	ving uality	Ну	/drol	ogic		Habit	at	
			Circle	the a	prop	riate ro	atings	S		
Site Potential	Н	М		Н	М	L	Н	М	Ш	
Landscape Potential	Н	М	L	Н	М	L	Н	M	L	
Value	Н	М	L	Н	М		Н	(VI)	L	TOTAL
Score Based on Ratings		4			5			5		14

#### Score for each function based on three ratings (order of ratings is not *important)* 9 = H,H,H8 = H,H,M7 = H,H,L 7 = H, M, M6 = H,M,L6 = M,M,M5 = H,L,L 5 = M,M,L4 = M,L,L3 = L,L,L

### 2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY Circle the appropriate category
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	Not Applicable

#### Maps and figures required to answer questions correctly for Eastern Washington

<u>Depressional Wetlands</u> 0.03 acre depressional wetland in riverine system

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	N/A
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	N/A
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	N/A
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	1
Map of the contributing basin	D 5.3	3
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	5

#### **Riverine Wetlands**

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream (can be added to another figure)	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

#### Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

#### Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of <b>dense</b> trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of area within 150 ft of the wetland (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

## **HGM Classification of Wetland in Eastern Washington**

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1.	Does the entire unit <b>meet both</b> of the following criteria? The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size At least 30% of the open water area is deeper than 10 ft (3 m)
	NO- go to 2 YES - The wetland class is Lake Fringe (Lacustrine Fringe)
2.	Does the entire wetland unit <b>meet all</b> of the following criteria?  X The wetland is on a slope (slope can be very gradual),  X The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;  X The water leaves the wetland without being impounded.
	NO - go to 3  YES – The wetland class is <b>Slope</b> NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).
3.	Does the entire wetland unit <b>meet all</b> of the following criteria?  The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;  The overbank flooding occurs at least once every 10 years.
	NO go to 4 YES – The wetland class is <b>Riverine NOTE:</b> The Riverine wetland can contain depressions that are filled with water when the river is not flooding.
4.	Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. <i>This means that any outlet, if present, is higher than the interior of the wetland.</i>
	NO – go to 5
5.	Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland name or number E10

**NOTE:** Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within	Depressional
the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

	Points	
Water Quality Functions - Indicators that the site functions to improve water quality	(only 1 score per box)	
D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland:		
	nts = 5	
	nts = 3 3	
	nts = 3	
	nts = 1	
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions of soils)  YES = 3 N	NO = 0	
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes)		
	nts = 5	
	nts = 3	
	nts = 1	
	nts = 0	
D 1.4. Characteristics of seasonal ponding or inundation:  Area is grazed and has livestock watering for the seasonal ponding or inundation.	acility adjacent to w	etlands
This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.		
Area seasonally ponded is > ½ total area of wetland poi	nts = 3	
Area seasonally ponded is ¼ - ½ total area of wetland poi	nts = 1 0	
Area seasonally ponded is < 1/4 total area of wetland poi	nts = 0	
Total for D 1 Add the points in the boxes	above 3	
ating of Site Potential If score is: 12-16 = H 6-11 = M X 0-5 = L Record the rati	ng on the first pag	e
D 2.0. Does the landscape have the potential to support the water quality function of the site?		
	No = 0 0	
D 2.1. Does the wetland receive stormwater discharges?  Yes = 1		ıri <b>c</b> ultu
D 2.1. Does the wetland receive stormwater discharges?  Yes = 1  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  Yes = 1	No = 0 1 - ag	ıricultu
D 2.1. Does the wetland receive stormwater discharges?  Yes = 1  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  Yes = 1  D 2.3. Are there septic systems within 250 ft of the wetland?  Yes = 1	No = 0 1 - ag	gri¢ultu
D 2.1. Does the wetland receive stormwater discharges?  Yes = 1  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  Yes = 1  D 2.3. Are there septic systems within 250 ft of the wetland?  Yes = 1	No = 0 1 - ag No = 0 0	gricultu
D 2.1. Does the wetland receive stormwater discharges?  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  Yes = 1  D 2.3. Are there septic systems within 250 ft of the wetland?  Yes = 1  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1- D 2.3? Source  Yes = 1	No = 0 1 - ag No = 0 0 No = 0 0	<mark>ıri</mark> cultu
D 2.1. Does the wetland receive stormwater discharges?  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  Yes = 1  D 2.3. Are there septic systems within 250 ft of the wetland?  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1-D 2.3? Source  Yes = 1  Total for D 2  Add the points in the boxes	No = 0 1 - ag No = 0 0 No = 0 0	
D 2.1. Does the wetland receive stormwater discharges?  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  D 2.3. Are there septic systems within 250 ft of the wetland?  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1- D 2.3? Source  Yes = 1  Total for D 2  Add the points in the boxes  ating of Landscape Potential  If score is:  3 or 4 = H  X 1 or 2 = M  0 = L  Record the rational states are not listed in questions  Yes = 1  Total for D 2  Add the points in the boxes	No = 0	
D 2.1. Does the wetland receive stormwater discharges?  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  D 2.3. Are there septic systems within 250 ft of the wetland?  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1-D 2.3? Source  Yes = 1  Total for D 2  Add the points in the boxes  ating of Landscape Potential  If score is:3 or 4 = HX1 or 2 = M0 = L  Record the rational contents are not listed in questions.  Yes = 1  Total for D 2  Add the points in the boxes  ating of Landscape Potential  D 3.0. Is the water quality improvement provided by the site valuable to society?	No = 0	
D 2.1. Does the wetland receive stormwater discharges?  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  D 2.3. Are there septic systems within 250 ft of the wetland?  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1-D 2.3? Source  Yes = 1  Total for D 2  Add the points in the boxes  ating of Landscape Potential  If score is:3 or 4 = HX1 or 2 = M0 = L  Record the rational contents are not listed in questions and the points in the boxes are not listed in questions.  Yes = 1  Total for D 2  Add the points in the boxes are not listed in questions are not listed in questions.  Yes = 1  Total for D 2  Add the points in the boxes are not listed in questions are not listed in questions.  Yes = 1  Total for D 2  Add the points in the boxes are not listed in questions.	No = 0	
D 2.1. Does the wetland receive stormwater discharges?  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  Yes = 1  D 2.3. Are there septic systems within 250 ft of the wetland?  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1- D 2.3? Source  Yes = 1  Total for D 2  Add the points in the boxes  ating of Landscape Potential  If score is:  3 or 4 = H  1 or 2 = M  0 = L  Record the ration of the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list and the points in the 303(d) list and the stream of the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list and the points in the 303(d) list and the stream of the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list and the points in the 303(d) list and the stream of the strea	No = 0	
D 2.1. Does the wetland receive stormwater discharges?  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  Yes = 1  D 2.3. Are there septic systems within 250 ft of the wetland?  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1-D 2.3? Source  Yes = 1  Total for D 2  Add the points in the boxes  ating of Landscape Potential  If score is: 3 or 4 = H X 1 or 2 = M 0 = L  Record the ration of the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) listed the second of the stream of the source is a stream of the stream of t	No = 0	
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  D 2.3. Are there septic systems within 250 ft of the wetland?  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1-D 2.3? Source  Yes = 1  Total for D 2  Add the points in the boxes  ating of Landscape Potential  If score is:  3 or 4 = H  X 1 or 2 = M  D 3.0. Is the water quality improvement provided by the site valuable to society?  D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list?  Yes = 1  D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list?	No = 0	
D 2.1. Does the wetland receive stormwater discharges?  D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?  Yes = 1  D 2.3. Are there septic systems within 250 ft of the wetland?  D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions  D 2.1- D 2.3? Source  Yes = 1  Total for D 2  Add the points in the boxes  ating of Landscape Potential  If score is:  3 or 4 = H  1 or 2 = M  0 = L  Record the ration of the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) listed the points in the source of the ration of the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) listed the points in the source of the ration of the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) listed the points in the 303(d) listed the 303 (d) listed the	No = 0	

DEPRESSIONAL WETLANDS  Hydrologic Functions - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland:  Wetland has no surface water outlet  Wetland has an intermittently flowing outlet  Wetland has a highly constricted permanently flowing outlet  Wetland has a permanently flowing unconstricted surface outlet  (If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")	4 4
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).  Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding points = Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent pondingpoints = The wetland is a headwater wetland  Seasonal ponding: 1 ft - < 2 ft  Seasonal ponding: 6 in - < 1 ft  Seasonal ponding: < 6 in or wetland has only saturated soils	6 4 4 2
Total for D 4 Add the points in the boxes above	e 6

Rating of Site Potential If score is: 12-16 = H X 6-11 = M 0-5 = L

Record the rating on the first page

D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0	
D 5.2. Is $> 10\%$ of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 No = 0	0 -ephemera	ıl stream
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses?	1 - agricu	ltural
Yes = 1 No = 0	i agricul	iturui
Total for D 5 Add the points in the boxes above	1	

Rating of Landscape Potential If score is: 3 = H 1 or 2 = M 0 = L

Record the rating on the first page

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems.	
Choose the description that best matches conditions around the wetland being rated. Do not add points.  Choose the highest score if more than one condition is met.	
The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND	
Flooding occurs in sub-basin that is immediately down-gradient of wetland points = 2	
Surface flooding problems are in a sub-basin farther down-gradient points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood.	
Explain why points = 0	
There are no problems with flooding downstream of the wetland Area is very dry, no flooding points = 0	0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan?  Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	0

Rating of Value If score is: 2-4 = H 1 = M X 0 = L

Record the rating on the first page

These questions apply to wetlands of all HGM classes.	(only 1
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	<del></del>
H 1.1. Structure of the plant community:  Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.	
Aquatic bedEmergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% coverEmergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% coverEmergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover	
Scrub-shrub (areas where shrubs have >30% cover)  4 or more checks: points = 3  The property of the property o	0
1 check: points = 0 H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	
1.1.2 Curfoco wotor	0
H 1.3. Surface water  H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac OR  10% of its area during the March to early June OR in August to the end of September? Answer YES  for Lake Fringe wetlands.  Yes = 3 points & go to H 1.4 No = go to H 1.3.2  H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries,  or along one side, over at least ¼ ac or 10% of its area? Answer yes only if H 1.3.1 is No.  Yes = 3 No = 0	0
1.4. <u>Richness of plant species</u> Count the number of plant species in the wetland that cover at least 10 ft <sup>2</sup> . Different patches of the same species can be combined to meet the size threshold. You do not have to name the species.  Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)	
# of species 3 Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	0
Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none.  Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.	Figure
	1
None = 0 points Low = 1 point Moderate = 2 points	
All three diagrams in this row are High = 3 points	
o open water, only one emergent plant species.  Riparian braided channels with 2 classes	

H 1.6. Special habitat features	
Check the habitat features that are present in the wetland. The number of checks is the number of points.  Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream.  Cattails or bulrushes are present within the wetland.  Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge.  Emergent or shrub vegetation in areas that are permanently inundated/ponded.  Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity  Invasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)	1
Total for H 1 Add the points in the boxes above	2
Poting of the Potential If aggresia, 15 10 - 11 7 14 - M. V.O.C. I. Decoud the uniting on the first aggre	

Rating of Site Potential If score is: 15-18 = H 7-14 = M 7-14 = M Record the rating on the first page

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is:	
Calculate: % undisturbed habitat $\frac{0}{1}$ + [(% moderate and low intensity land uses)/2] $\frac{25}{1}$ = $\frac{25}{1}$ %	
$> \frac{1}{3}$ (33.3%) of 1 km Polygon points = 3	2
20-33% of 1km Polygon points = 2	2
10-19% of 1km Polygon points = 1	
<10% of 1km Polygon Cattle have free access to this wetland and have watering trough adjacent. points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around wetland.	
Calculate: % undisturbed habitat $\frac{0}{100}$ + [(% moderate and low intensity land uses)/2] $\frac{50}{100}$ = $$	
Undisturbed habitat > 50% of Polygon points = 3	2
Undisturbed habitat 10 - 50% and in 1-3 patches Cattle have free range of site but stick close to wetland/troughpoints = 2	
Undisturbed habitat 10 - 50% and > 3 patches points = 1	
Undisturbed habitat < 10% of Polygon points = 0	
H 2.3. Land use intensity in 1 km Polygon:	-2
> 50% of Polygon is high intensity land use Wheat crop is majority of polygon points = (-2)	_
Does not meet criterion above points = 0	
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by	0
irrigation practices, dams, or water control structures. Generally, this means outside boundaries of	
reclamation areas, irrigation districts, or reservoirs  Yes = 3 No = 0	
Total for H 2 Wetland is uphill from floodplain for dammed Columbia River and irrigation canal Add the points in the boxes above	2

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose the highest score	
that applies to the wetland being rated	
Site meets ANY of the following criteria: points = 2	
<ul> <li>— It has 3 or more priority habitats within 100 m (see Appendix B)</li> </ul>	
<ul> <li>— It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists)</li> </ul>	
<ul> <li>— It is mapped as a location for an individual WDFW species</li> </ul>	
<ul> <li>— It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</li> </ul>	1
<ul> <li>It has been categorized as an important habitat site in a local or regional comprehensive plan, in a</li> </ul>	
Shoreline Master Plan, or in a watershed plan	
x Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1	
Site does not meet any of the criteria above points = 0	

Rating of Value If score is: 2 = H x 1 = M 0 = L Record the rating on the first page

#### **CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.	
SC 1.0. Vernal pools	
Is the wetland less than 4000 ft <sup>2</sup> , and does it meet at least two of the following criteria?	
— Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater	
input.	
— Wetland plants are typically present only in the spring; the summer vegetation is typically upland	
annuals. If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool.	
— The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as	
basalt or clay.	No
— Surface water is present for less than 120 days during the wet season.	
Yes – Go to SC 1.1 No = Not a vernal pool	
SC 1.1. Is the vernal pool relatively undisturbed in February and March?	
Yes – Go to SC 1.2 No = Not a vernal pool with special characteristics	
103 00 to 30 112 110 - 1100 a vernal pool with special characteristics	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other	Cat. II
wetlands, rivers, lakes etc.)? Yes = Category II No : Category III	
	Cat. III
SC 2.0. Alkali wetlands	
Does the wetland meet <b>one</b> of the following criteria?	
— The wetland has a conductivity > 3.0 mS/cm.	
— The wetland has a conductivity > 3.0 mJycin.  — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the	
wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems).	
— If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of	
	NIa
salt.	No
OR does the wetland unit meet two of the following three sub-criteria?	
— Salt encrustations around more than 75% of the edge of the wetland	
— More than ¾ of the plant cover consists of species listed on Table 4	
— A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands	Cat. I
may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands.	Cat. I
Yes = Category I No: Not an alkali wetland	
SC 3.0. Wetlands of High Conservation Value (WHCV)	
SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High	No
Conservation Value? Yes – Go to SC 3.2 No – Go to SC 3.3	
SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?	
Yes = Category I No = Not a WHCV	Cat. I
SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?	
http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf	
Yes – Contact WNHP/WDNR and go to SC 3.4 No = Not a WHCV	
SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed	
on their website? Yes = Category I No Not a WHCV	

SC 4.0 Bogs and Calcareous Fens	
Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or	
calcareous fens? Use the key below to identify if the wetland is a bog or calcareous fen. <b>If you answer yes</b>	
you will still need to rate the wetland based on its functions.	
SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or	
mucks, that compose 16 in or more of the first 32 in of the soil profile? See Appendix C for a field key to	
identify organic soils. Yes – Go to SC 4.3 No - Go to SC 4.2	
SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over	
bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or	
pond? Yes – Go to SC 4.3 No = Is not a bog for rating	
SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of	
the total plant cover consists of species in Table 5? Yes = Category I bog No-Go to SC 4.4	
<b>NOTE:</b> If you are uncertain about the extent of mosses in the understory, you may substitute that criterion	
by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0	
and the plant species in Table 5 are present, the wetland is a bog.	
SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western	
hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species	
(or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy?	Cat. I
Yes = Category I bog No – Go to SC 4.5	
SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and	
mucks? Yes = Is a Calcareous Fen for purpose of rating No - Go to SC 4.6	
SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks,	
AND one of the two following conditions is met:	
<ul> <li>— Marl deposits [calcium carbonate (CaCO₃) precipitate] occur on the soil surface or plant stems</li> </ul>	Cat. I
<ul> <li>The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the</li> </ul>	

SC 5.0. Forested Wetlands	
Does the wetland have an area of forest rooted within its boundary that meets at least one of	
the following three criteria? (Continue only if you have identified that a forested class is present	
in question H 1.1)	
<ul> <li>The wetland is within the 100 year floodplain of a river or stream</li> </ul>	
<ul> <li>Aspen (Populus tremuloides) represents at least 20% of the total cover of woody species</li> </ul>	
— There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or	
"old-growth" according to the definitions for these priority habitats developed by WDFW	
(see definitions in question H3.1)	
Yes – Go to SC 5.1 No Not a forested wetland with special characteristics	1
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow	Cat. I
growing native trees (see Table 7)? Yes = Category I No-Go to SC 5.2	
SC 5.2. Does the wetland have areas where aspen ( <i>Populus tremuloides</i> ) represents at least 20% of the total cover	Cat. I
of woody species? Yes = Category I No - Go to SC 5.3	
SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (see Table 7)?  Yes = Category II No – Go to SC 5.4	Cat. II
SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream?	
Yes = Category II No Not a forested wetland with special characteristics	Cat. II
Category of wetland based on Special Characteristics	
Choose the highest rating if wetland falls into several categories	
If you answered No for all types, enter "Not Applicable" on Summary Form	

## Appendix B: WDFW Priority Habitats in Eastern Washington

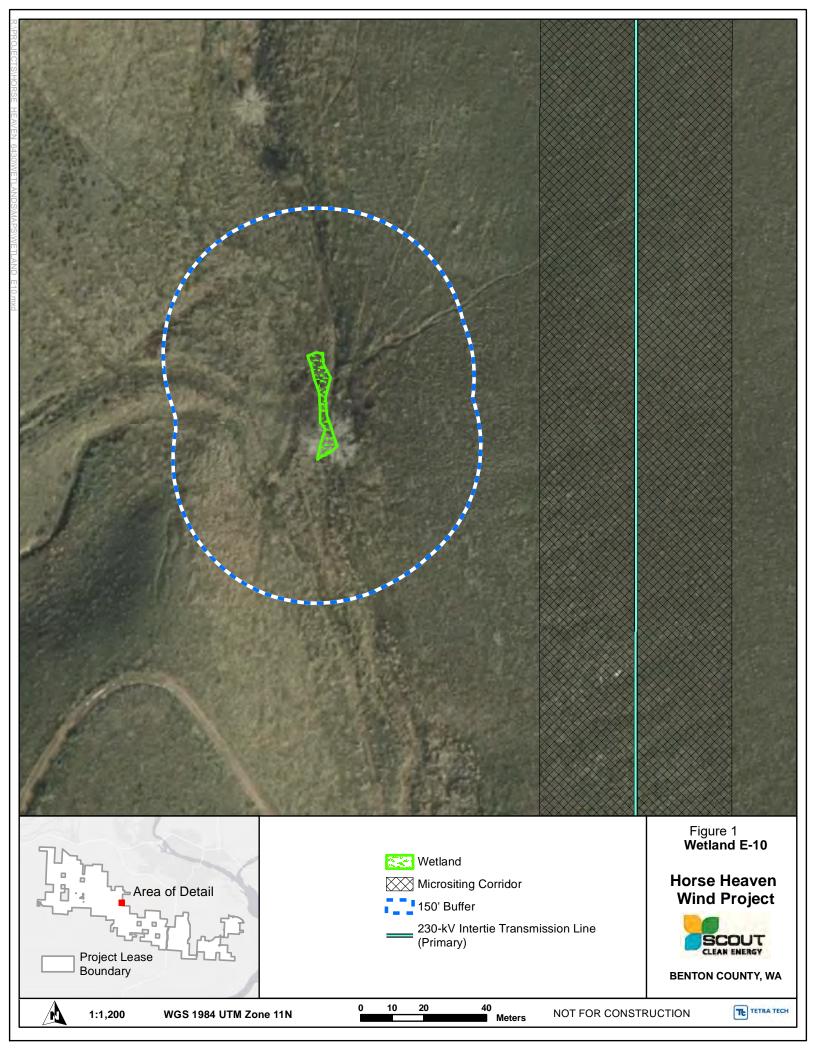
<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. <a href="http://wdfw.wa.gov/publications/00165/wdfw00165.pdf">http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</a> or access the list from here: <a href="http://wdfw.wa.gov/conservation/phs/list/">http://wdfw.wa.gov/conservation/phs/list/</a>)

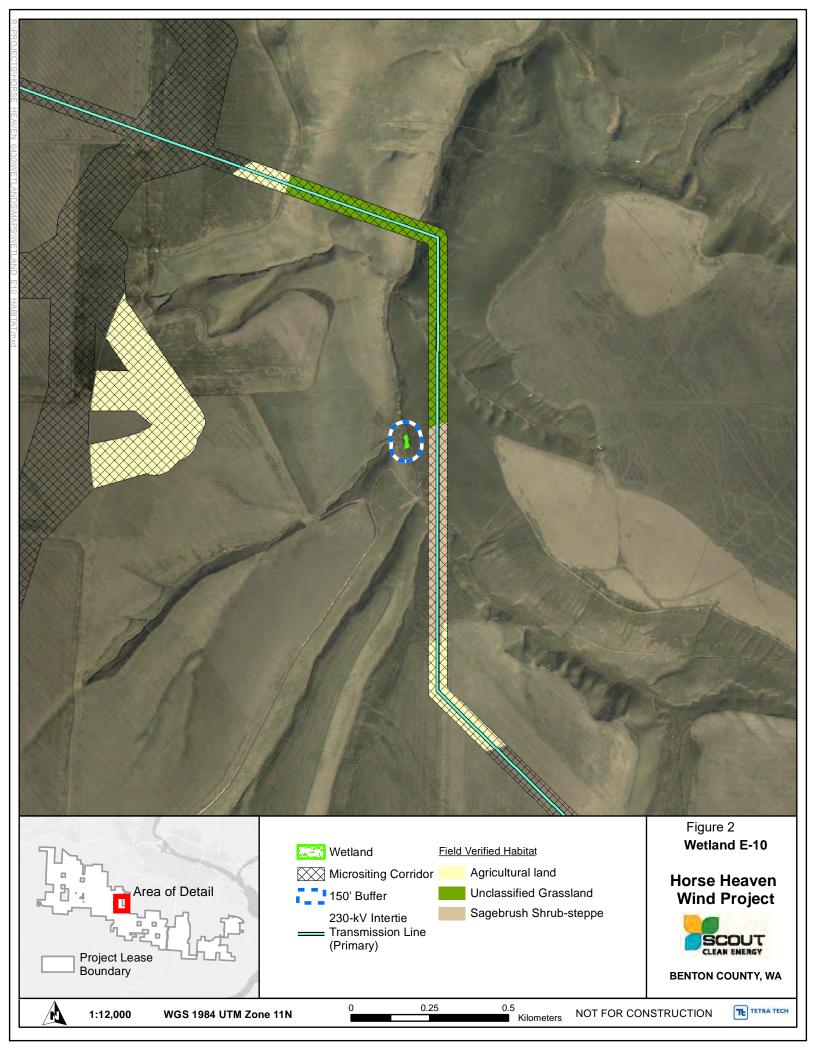
Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: *NOTE:* This question is independent of the land use between the wetland and the priority habitat.

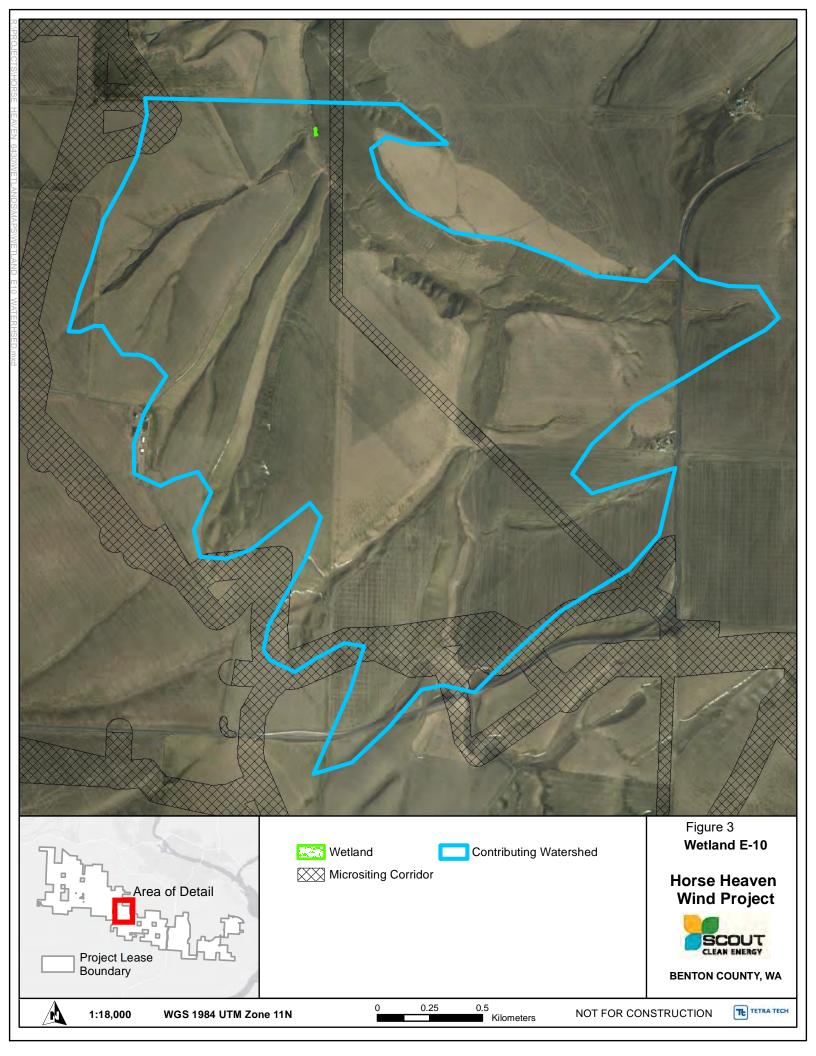
- **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- Old-growth/Mature forests: Old-growth east of Cascade crest \_ Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests \_ Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.
- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 see web link above*).
- **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).
- **Juniper Savannah:** All juniper woodlands.

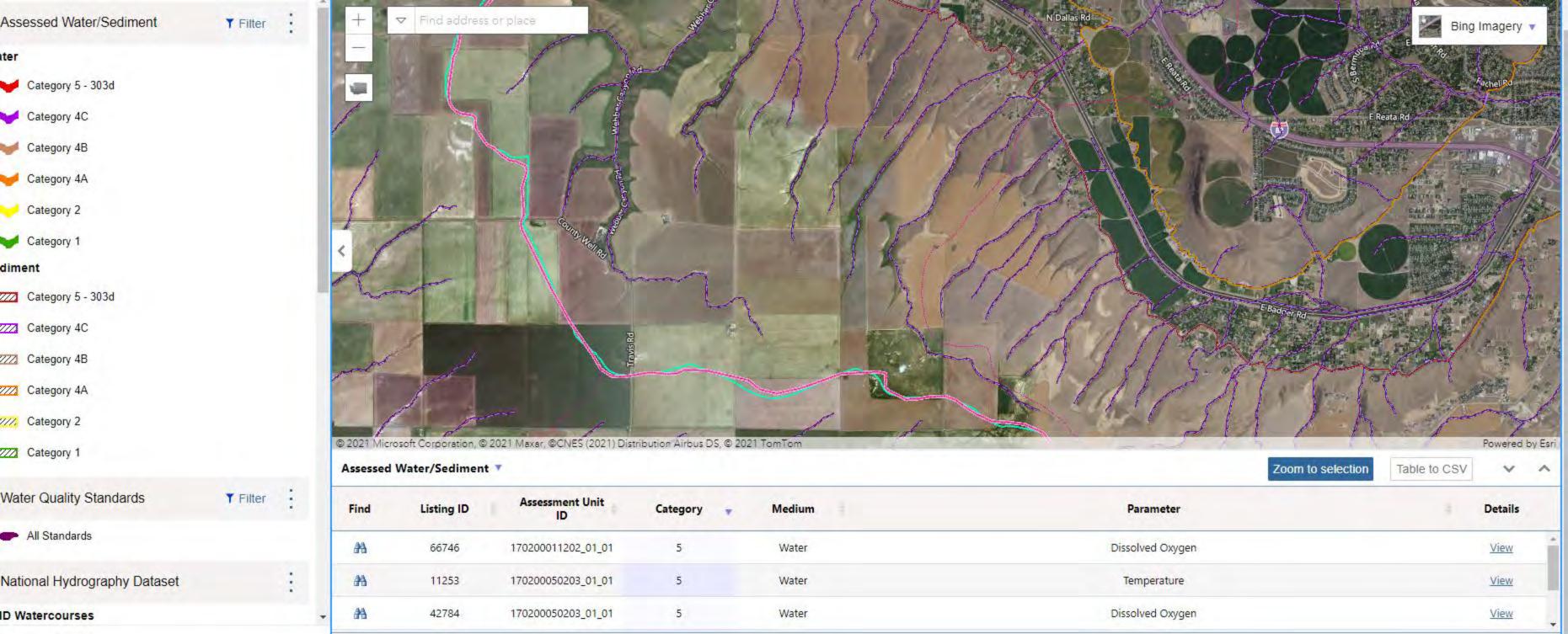
**Note:** All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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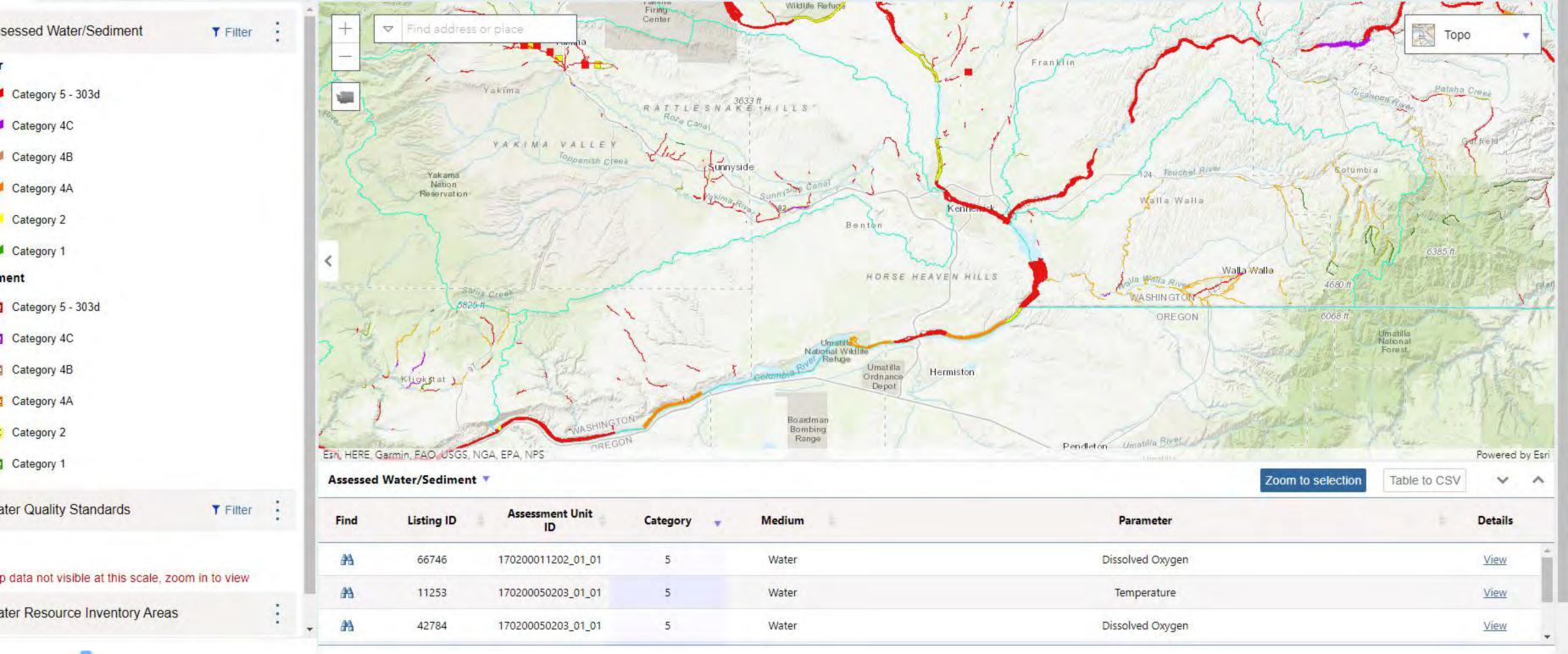




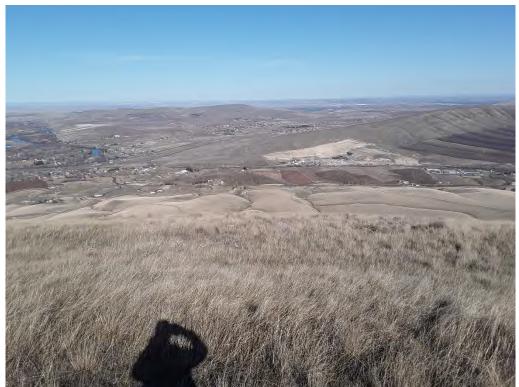




diment



# APPENDIX C PHOTOLOG



Photopoint 1. Overview of Slope



Photopoint 2. No beds, no banks, no stream present on NHD line.



Photopoint 3. Ephemeral drainage, upland vegetation with no sign of water. EPH100.



Photopoint 4. Ephemeral drainage, upland vegetation with no sign of water. EPH100.



Photopoint 5. Erosional feature. EPH101.



Photopoint 6. Erosional feature. EPH102.



Photopoint 7. No beds, no banks, no stream present on NHD line.



Photopoint 8. Streambed with watermarks on rocks, and water in pools due to recent rainfall. INT01.



Photopoint 9. Streambed with watermarks on rocks, and water in pools due to recent rainfall. INT01.



Photopoint 10. Streambed with watermarks on rocks, and water in pools due to recent rainfall. INT01.



Photopoint 11. Water in pools due to recent rainfall. INT01.



Photopoint 12. Waterline on rocks. INT01.



Photopoint 14. No beds, no banks, no stream present on NHD line.



Photopoint 15. Ephemeral drainage, upland vegetation with no sign of water. EPH105.



Photopoint 16. Ephemeral drainage, upland vegetation with no sign of water. Yarrow in channel. EPH105.



Photopoint 18. Ephemeral drainage, upland vegetation with no sign of water. EPH104.



Photopoint 19. Ephemeral drainage, upland vegetation with no sign of water. EPH105.



**Photopoint 20.** Ephemeral drainage, upland vegetation with no sign of water. EPH205.



Photopoint 21. No beds, no banks, no stream present on NHD line.



Photopoint 22. Ephemeral drainage, upland vegetation with no sign of water. EPH202.



Photopoint 23. Ephemeral drainage, upland vegetation with no sign of water. EPH203.



Photopoint 24. Well in bedrock in stream bottom.



Photopoint 25. No beds, no banks, no stream present on NHD line.



Photopoint 26. No beds, no banks, no stream present on NHD line.



Photopoint 27. No beds, no banks, no stream present on NHD line.



Photopoint 28. No beds, no banks, no stream present on NHD line.



Photopoint 29. No beds, no banks, no stream present on NHD line.



Photopoint 30. No beds, no banks, no stream present on NHD line.



Photopoint 31. No beds, no banks, no stream present on NHD line.



Photopoint 32. No beds, no banks, no stream present on NHD line.



Photopoint 33. No beds, no banks, no stream present on NHD line.



Photopoint 35. Garbage dump.



Photopoint 36. Ephemeral drainage, upland vegetation with no sign of water. EPH200.



Photopoint 38. No beds, no banks, no stream present on NHD line.



Photopoint 39. No beds, no banks, no stream present on NHD line.



Photopoint 41. Soil sample site. SS01.



Photopoint 42. No beds, no banks, no stream present on NHD line.



Photopoint 43. No beds, no banks, no stream present on NHD line.



Photopoint 44. No beds, no banks, no stream present on NHD line.



Photopoint 45. No beds, no banks, no stream present on NHD line.



Photopoint 46. No beds, no banks, no stream present on NHD line.



Photopoint 47. No beds, no banks, no stream present on NHD line.



Photopoint 48. No beds, no banks, no stream present on NHD line.



Photopoint 49. No beds, no banks, no stream present on NHD line.



Photopoint 50. Erosional Feature. EPH305.



Photopoint 51. No beds, no banks, no stream present on NHD line.



Photopoint 52. No beds, no banks, no stream present on NHD line.



Photopoint 53. No beds, no banks, no stream present on NHD line.



Photopoint 54. No beds, no banks, no stream present on NHD line.



Photopoint 55. No beds, no banks, no stream present on NHD line.



Photopoint 56. No beds, no banks, no stream present on NHD line.



Photopoint 57. No beds, no banks, no stream present on NHD line.



Photopoint 58. No beds, no banks, no stream present on NHD line.



Photopoint 59. Soil Sample Site. SS02.



Photopoint 60. Streambed with damp soils. INT02.



Photopoint 61. Streambed with damp soils. INT02.



Photopoint 62. Streambed with damp soils. INT02.



Photopoint 63. Streambed with damp soils. INT02.



Photopoint 64. Streambed with damp soils. INT02.



Photopoint 65. Ephemeral drainage, upland vegetation with no sign of water. EPH412.



Photopoint 67. No beds, no banks, no stream present on NHD line.



Photopoint 68. No beds, no banks, no stream present on NHD line.



Photopoint 69. No beds, no banks, no stream present on NHD line.



Photopoint 70. No beds, no banks, no stream present on NHD line.



Photopoint 71. No beds, no banks, no stream present on NHD line.



Photopoint 72. Ephemeral drainage, upland vegetation with no sign of water. EPH301.



Photopoint 73. No beds, no banks, no stream present on NHD line.



Photopoint 74. Ephemeral drainage, upland vegetation with no sign of water. EPH300.



Photopoint 75. No beds, no banks, no stream present on NHD line.



Photopoint 76. No beds, no banks, no stream present on NHD line.



Photopoint 77. No beds, no banks, no stream present on NHD line.



Photopoint 78. Ephemeral drainage, upland vegetation with no sign of water. EPH308.



Photopoint 79. Ephemeral drainage, upland vegetation with no sign of water. EPH308.



Photopoint 80. No beds, no banks, no stream present on NHD line.



Photopoint 81. Ephemeral drainage, upland vegetation with no sign of water. EPH308.



Photopoint 82. No beds, no banks, no stream present on NHD line.



Photopoint 83. Ephemeral drainage, upland vegetation with no sign of water. EPH307.



Photopoint 84. No beds, no banks, no stream present on NHD line.



Photopoint 85. Ephemeral drainage, upland vegetation with no sign of water. EPH307.



Photopoint 86. No beds, no banks, no stream present on NHD line.



Photopoint 87. Ephemeral drainage, upland vegetation with no water. EPH307.



Photopoint 88. Ephemeral drainage, upland vegetation with no sign of water. EPH306.



Photopoint 89. No beds, no banks, no stream present on NHD line.



Photopoint 90. Ephemeral drainage, upland vegetation with no sign of water. EPH401.



Photopoint 91. No beds, no banks, no stream present on NHD line.



Photopoint 93. Streambed with watermarks on rocks, and water in pools due to recent rainfall. INT01.



**Photopoint 94.** Ephemeral drainage, upland vegetation with no sign of water. EPH400.



Photopoint 95. Ephemeral drainage, upland vegetation with no sign of water. EPH400.



Photopoint 96. Ephemeral drainage, upland vegetation with no sign of water. EPH303.



**Photopoint 97.** Ephemeral drainage, upland vegetation with no sign of water. EPH303.



Photopoint 98. No beds, no banks, no stream present on NHD line.



Photopoint 99. No beds, no banks, no stream present on NHD line. Road present in valley bottom.



Photopoint 100. No beds, no banks, no stream present on NHD line.



Photopoint 101. No beds, no banks, no stream present on NHD line.



Photopoint 102. Ephemeral drainage, upland vegetation with no sign of water. EPH405.



Photopoint 103. Ephemeral drainage, upland vegetation with no sign of water. EPH404.



Photopoint 104. Ephemeral drainage, upland vegetation with no sign of water. EPH405.



Photopoint 105. Ephemeral drainage, upland vegetation with no sign of water. EPH404.



Photopoint 107. No beds, no banks, no stream present on NHD line.



Photopoint 108. No beds, no banks, no stream present on NHD line.



Photopoint 109. No beds, no banks, no stream present on NHD line.



Photopoint 110. No beds, no banks, no stream present on NHD line.



Photopoint 111. No beds, no banks, no stream present on NHD line.



Photopoint 114. No beds, no banks, no stream present on NHD line.



Photopoint 115. No beds, no banks, no stream present on NHD line.



Photopoint 209. No beds, no banks, no stream present on NHD line.



Photopoint EPH104. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH104. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH500 levee 1. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH500 N. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH500 NE1. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH501 NW1. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH501 SE. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH501 SE1. Ephemeral drainage, upland vegetation with no sign of water.



**Photopoint EPH500 levee 2.** Ephemeral drainage, upland vegetation with no sign of water.



Photopoint XBB 310. No beds, no banks, no stream present on NHD line.



Photopoint XBB 300. No beds, no banks, no stream present on NHD line.



Photopoint XBB 301. No beds, no banks, no stream present on NHD line.



Photopoint XBB 302. No beds, no banks, no stream present on NHD line.



Photopoint XBB 303. No beds, no banks, no stream present on NHD line.



Photopoint XBB 304. No beds, no banks, no stream present on NHD line.



Photopoint XBB 305. No beds, no banks, no stream present on NHD line.



Photopoint XBB 306. No beds, no banks, no stream present on NHD line.



Photopoint XBB 307. No beds, no banks, no stream present on NHD line.



Photopoint XBB 308. No beds, no banks, no stream present on NHD line.



Photopoint XBB 309. No beds, no banks, no stream present on NHD line.



Photopoint XBB 310. No beds, no banks, no stream present on NHD line.



Photopoint XBB 311. No beds, no banks, no stream present on NHD line.



Photopoint XBB 312. No beds, no banks, no stream present on NHD line.



Photopoint XBB 313. No beds, no banks, no stream present on NHD line.



Photopoint 600. Ephemeral drainage, upland vegetation with no sign of water. Overview of drainage, EPH401.



Photopoint 601. Ephemeral drainage, upland vegetation with no sign of water Ephemeral drainage, EPH401.



**Photopoint 602.** Ephemeral drainage, upland vegetation with no sign of water Ephemeral stream does not extend uphill. EPH306.



**Photopoint 603.** Ephemeral drainage, upland vegetation with no sign of water Ephemeral drainage, less than one foot wide. EPH306.



Photopoint 604. No beds, no banks, no stream present on NHD line. Cattle trail.



Photopoint 605. No beds, no banks, no stream present on NHD line. Ephemeral stream does not extend beyond this point.



Photopoint 606. No beds, no banks, no stream present on NHD line.



Photopoint 607. Ephemeral drainage, upland vegetation with no sign of water. Narrow ephemeral drainage, EPH600.



Photopoint 608. Ephemeral drainage, upland vegetation with no sign of water. Overview of EPH600.



Photopoint 609. No beds, no banks, no stream present on NHD line.



Photopoint 610. No beds, no banks, no stream present on NHD line. Culvert under road.



**Photopoint 611.** Ephemeral drainage, upland vegetation with no sign of water. Ephemeral drainage begins at this point, EPH602.



Photopoint 612. Ephemeral drainage, upland vegetation with no sign of water. EPH602.



Photopoint 613. End of EPH602.



Photopoint 614. No beds, no banks, no stream present on NHD line.



Photopoint 701. Ephemeral drainage, upland vegetation with no sign of water. EPH401.



Photopoint 702. No beds, no banks, no stream present on NHD line. Upstream end of EPH401.



Photopoint 703. Ephemeral drainage, upland vegetation with no sign of water. EPH401.



Photopoint 704. Ephemeral drainage, upland vegetation with no sign of water. EPH401.



Photopoint 705. No beds, no banks, no stream present on NHD line. Hillside between plowed fields.



Photopoint 706. No beds, no banks, no stream present on NHD line.



Photopoint 708. Ephemeral drainage, upland vegetation with no sign of water Ephemeral drainage, with trash pile. EPH306.



Photopoint 709. No beds, no banks, no stream present on NHD line.



Photopoint 710. No beds, no banks, no stream present on NHD line.



Photopoint 711. No beds, no banks, no stream present on NHD line.



Photopoint 712. No beds, no banks, no stream present on NHD line.



Photopoint 713. No beds, no banks, no stream present on NHD line. Bottom between two hills next to freeway.



Photopoint 714. No beds, no banks, no stream present on NHD line.



Photopoint 715. No beds, no banks, no stream present on NHD line.



Photopoint 716. No beds, no banks, no stream present on NHD line.



Photopoint 717. No beds, no banks, no stream present on NHD line.



Photopoint 718. No beds, no banks, no stream present on NHD line.



Photopoint 719. No beds, no banks, no stream present on NHD line.



Photopoint 720. Ephemeral drainage, upland vegetation with no sign of water. EPH700.



Photopoint 721. Ephemeral drainage, upland vegetation with no sign of water. EPH700, leading up to culvert under road.



Photopoint 722. No beds, no banks, no stream present on NHD line.



Photopoint 723. Ephemeral drainage, upland vegetation with no sign of water. EPH700.



**Photopoint 724.** Ephemeral drainage, upland vegetation with no sign of water. Upstream end of EPH700, begins to lose bed and banks.



Photopoint 725. No beds, no banks, no stream present on NHD line.



Photopoint 800. No beds, no banks, no stream present on NHD line. Water retention pond, with no culvert.



Photopoint 801. No beds, no banks, no stream present on NHD line.



Photopoint 802. No beds, no banks, no stream present on NHD line.



Photopoint 803. No beds, no banks, no stream present on NHD line.



Photopoint 804. No beds, no banks, no stream present on NHD line.



Photopoint 805. No beds, no banks, no stream present on NHD line.



Photopoint 806. No beds, no banks, no stream present on NHD line.



Photopoint 807. No beds, no banks, no stream present on NHD line.



Photopoint 808. No beds, no banks, no stream present on NHD line.



Photopoint 809. No beds, no banks, no stream present on NHD line.



Photopoint 810. No beds, no banks, no stream present on NHD line.



Photopoint 811. Ephemeral drainage, upland vegetation with no sign of water, EPH800.



Photopoint 812. Ephemeral drainage, upland vegetation with no sign of water, EPH800.



Photopoint 813. No beds, no banks, no stream present on NHD line. No culvert alongside road.



Photopoint 814. No beds, no banks, no stream present on NHD line.



Photopoint 900. No beds, no banks, no stream present on NHD line.



Photopoint 900b. Ephemeral drainage, typical conditions. EPH-900. Facing southwest.



Photopoint 900c. Ephemeral drainage. EPH-900. No bed or banks southwest of here.



Photopoint 904. Ephemeral drainage, typical conditions. EPH-904. Facing northwest.



Photopoint 904a. Ephemeral drainage, typical conditions. EPH-904A. Facing north.



Photopoint 905. Ephemeral drainage, typical conditions. EPH-904. Facing west.



Photopoint E10. Sample site. No water, horsetail, well pump in background.



Photopoint E10a. Overview.





Photopoint E18. Sample site. Upland, cereal rye and non-hydric soils.



Photopoint 901. No beds, no banks, no stream present on NHD line. Facing northeast.



Photopoint 902. No beds, no banks, no stream present on NHD line. Facing northeast.