APPENDIX G. VISUAL SIMULATIONS AND VIEWSHEDS

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Photo 1. MT-02b Before

Photo 2. MT-02b After

NORTH PLAINS CONNECTOR
A Grid United Project

VISUAL CONTRAST RATING WORKSHEET

Field Observations: August 6, 2024
District/Field Office: Miles City, MT
Resource Area: NA
Activity (program): 500kV DC transmission line

Project Name: North Plains Connector	**Location:** Township: 05 N Range: 44 E Section: 01	**Location Sketch:** 
Key Observation Point: MT-02b		
VRM Class: Adjacent to Class III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	bold, jagged, wide, softer rolling hills	complex, irregular, accenting terrain	vertical
Line	hard, jagged, converging, strongly horizontal in badland formations	broken, horizontal, profile of terrain	NA
Color	red, yellow, brown, green contrast visible in erosion features	brown, blue greens, dark green	NA
Texture	coarse, layered, directional in badland features	sparse, scattered	patterned, orderly

Proposed Activity Description (Facility)

Distance Zones: FG - Foreground, MG - Middleground, BG - Background

	Landform/Water	Vegetation	Structures
Form	NA	NA	vertical, geometric, prominent
Line	NA	NA	horizontal, thin, ordered
Color	NA	NA	dark brown, gray
Texture	NA	NA	fine, matte, even

Degree of Contrast

Degree of Contrast		Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X		X		
	Line				X				X		X		
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?

Evaluator Name(s):
North Plains Connector LLC

Photo 3. MT-03 Before

Photo 4. MT-03 After

NORTH PLAINS CONNECTOR
A Grid United Project

VISUAL CONTRAST RATING WORKSHEET

Field Observations: August 7, 2024
District/Field Office: Miles City, MT
Resource Area: NA
Activity (program): 500kV DC transmission line

Project Name: North Plains Connector	**Location:** Township: 06 N Range: 52 E Section: 06	**Location Sketch:** 
Key Observation Point: MT-03		
VRM Class: Adjacent to Class III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	rugged, rolling, complex	definite, irregular	distinct, contrasting, rectangular
Line	band, digitate edge,	butt edge, horizontal,	perpendicular
Color	contrasting, dull, dark brown, green blue, red, yellow	high contrast green along river	glare, contrasting
Texture	coarse, striped	coarse, dense, clumped	

Proposed Activity Description (Facility)

Distance Zones: FG - Foreground, MG - Middleground, BG - Background

	Landform/Water	Vegetation	Structures
Form	NA	No longer continuous	vertical, geometric
Line	NA	hard edge in perpendicular direction	horizontal, thin, ordered
Color	NA		dark brown, gray
Texture	NA		fine, matte, even

Degree of Contrast

	Degree of Contrast	Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X		X				X		
	Line				X		X				X		
	Color				X			X				X	
	Texture				X			X				X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?

Evaluator Name(s):
North Plains Connector LLC

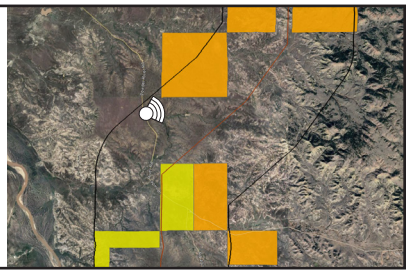
Photo 5. MT-04 Before

Photo 6. MT-04 After

NORTH PLAINS CONNECTOR
A Grid United Project

VISUAL CONTRAST RATING WORKSHEET

Field Observations: August 7, 2024
District/Field Office: Miles City, MT
Resource Area: NA
Activity (program): 500kV DC transmission line

Project Name: North Plains Connector	**Location:** Township: 07 N Range: 52 E Section: 18	**Location Sketch:** 
Key Observation Point: MT-04		
VRM Class: Adjacent to Class II		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	rolling hills, flat, wide open	solid, uniform	angular, weak, orderly
Line	jagged horizon	simple, indistinct	linear, vertical
Color	light tan, gold, darker horizon	light tan, gold	dull, weak brown
Texture	continuous	smooth, continuous	fine, scattered

Proposed Activity Description (Facility)

Distance Zones: FG - Foreground, MG - Middleground, BG - Background

	Landform/Water	Vegetation	Structures
Form	NA	NA	vertical, geometric
Line	NA	NA	horizontal, thin, ordered
Color	NA	NA	dark brown, gray
Texture	NA	NA	fine, matte, even

Degree of Contrast

	Degree of Contrast	Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X			X	
	Line				X				X			X	
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?

Evaluator Name(s):
North Plains Connector LLC

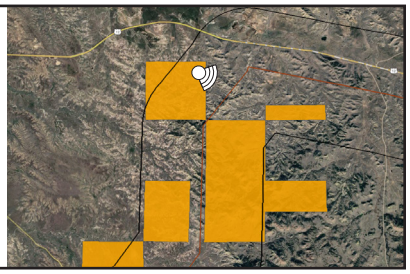
Photo 7. MT-05a Before

Photo 8. MT-05a After

NORTH PLAINS CONNECTOR
A Grid United Project

VISUAL CONTRAST RATING WORKSHEET

Field Observations: August 5, 2024
District/Field Office: Miles City, MT
Resource Area: NA
Activity (program): 500kV DC transmission line

Project Name: North Plains Connector	**Location:** Township: 08 N Range: 52 E Section: 28	**Location Sketch:** 
Key Observation Point: MT-05a		
VRM Class: Class II		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	steep, complex, prominent	angular pattern, irregular, jagged	vertical
Line	bold butt edges, complex, horizontal badland pattern, diagonal erosion line	diffuse edge on hills	slim, linear
Color	muted browns, gray, dark green	dark green	dark gray
Texture	random, coarse, dense	dense to medium, follows landscape erosion	ordered, even

Proposed Activity Description (Facility)

Distance Zones: FG - Foreground, MG - Middleground, BG - Background

	Landform/Water	Vegetation	Structures
Form	NA	break in continuity with terrain	vertical, geometric
Line	NA	break in continuity with terrain	horizontal, thin, ordered
Color	NA		dark brown, gray
Texture	NA		fine, matte, even

Degree of Contrast

	Degree of Contrast	Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X			X			X		
	Line				X			X			X		
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
No

Additional mitigating measures recommended?

Evaluator Name(s):
North Plains Connector LLC

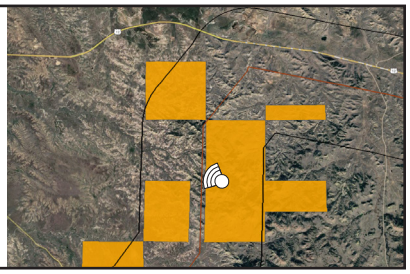
Photo 9. MT-05bNW Before

Photo 10. MT-05bNW After

NORTH PLAINS CONNECTOR
A Grid United Project

VISUAL CONTRAST RATING WORKSHEET

Field Observations: August 5, 2024
District/Field Office: Miles City, MT
Resource Area: NA
Activity (program): 500kV DC transmission line

Project Name: North Plains Connector	**Location:** Township: 08 N Range: 52 E Section: 34	**Location Sketch:** 
Key Observation Point: MT-05b		
VRM Class: Class II		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	steep, complex, prominent, bold	irregular, patchy, following terrain	NA
Line	jagged, layered, varied	diffuse edge, irregular, following terrain	NA
Color	tans and yellow, red highlights	dark green	NA
Texture	coarse, uneven	dense, coarse	NA

Proposed Activity Description (Facility)

Distance Zones: FG - Foreground, MG - Middleground, BG - Background

	Landform/Water	Vegetation	Structures
Form	NA	break in continuity with terrain	vertical, geometric
Line	NA	break in continuity with terrain	horizontal, thin, ordered
Color	NA		dark brown, gray
Texture	NA	solid, continuous	fine, matte, even

Degree of Contrast

	Degree of Contrast	Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form						X				X		
	Line						X				X		
	Color								X			X	
	Texture							X				X	

Does project design meet visual resource management objectives?
No

Additional mitigating measures recommended?

Evaluator Name(s):
North Plains Connector LLC

Photo 11. MT-05bSW Before

Photo 12. MT-05bSW After

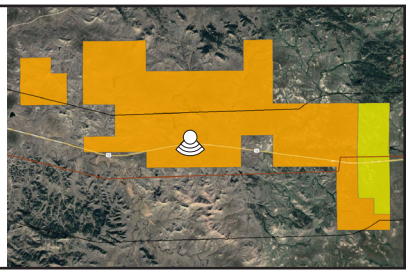
Photo 13. MT-06 Before

Photo 14. MT-06 After

NORTH PLAINS CONNECTOR
A Grid United Project

VISUAL CONTRAST RATING WORKSHEET

Field Observations: March 27, 2025
District/Field Office: Miles City, MT
Resource Area: NA
Activity (program): 500kV DC transmission line

Project Name: North Plains Connector	**Location:** Township: 08 N Range: 53 E Section: 27	**Location Sketch:** 
Key Observation Point: MT-06		
VRM Class: Class II		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	prominent ridge, rolling hills	irregular, patchy	angular, prominent
Line	jagged horizon	irregular, broken,	perpendicular, parallel, geometric
Color	muted browns	dull, green	brown, tan
Texture	varied, fine	fine, sparse	smooth, artificial

Proposed Activity Description (Facility)

Distance Zones: FG - Foreground, MG - Middleground, BG - Background

	Landform/Water	Vegetation	Structures
Form	NA	NA	vertical, geometric
Line	NA	NA	horizontal, thin, ordered
Color	NA	NA	dark brown, gray
Texture	NA	NA	fine, matte, even

Degree of Contrast

	Degree of Contrast	Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X			X	
	Line				X				X			X	
	Color				X				X			X	
	Texture				X				X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?

Evaluator Name(s):
North Plains Connector LLC

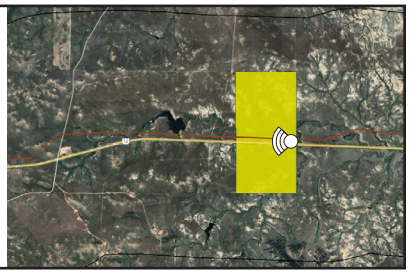
Photo 15. MT-07 Before

Photo 16. MT-07 After

NORTH PLAINS CONNECTOR
A Grid United Project

VISUAL CONTRAST RATING WORKSHEET

Field Observations: August 7, 2024
District/Field Office: Miles City, MT
Resource Area: NA
Activity (program): 500kV DC transmission line

Project Name: North Plains Connector	**Location:** Township: 08 N Range: 54 E Section: 26	**Location Sketch:** 
Key Observation Point: MT-07		
VRM Class: Class III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	rolling, rugged, smooth	sparse, continuous	angular, bold, straight
Line	jagged horizon, continuous	rolling, irregular	parallel, patterned
Color	dull, tan, brown	dull, green, brown	gray
Texture	medium, dense, ordered	smooth, continuous	smooth, continuous, even

Proposed Activity Description (Facility)

Distance Zones: FG - Foreground, MG - Middleground, BG - Background

	Landform/Water	Vegetation	Structures
Form	NA	NA	vertical, geometric
Line	NA	NA	horizontal, thin, ordered
Color	NA	NA	dark brown, gray
Texture	NA	NA	fine, matte, even

Degree of Contrast

	Degree of Contrast	Features											
		Landform/Water Body				Vegetation				Structures			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form				X				X	X			
	Line				X				X		X		
	Color				X				X		X		
	Texture				X				X			X	

Does project design meet visual resource management objectives?
No

Additional mitigating measures recommended?

Evaluator Name(s):
North Plains Connector LLC

Photo 17. MT-08 Before

Photo 18. MT-08 After

Photo 19. MT-09 Before

Photo 20. MT-09 After

Photo 21. ND-02b Before

Photo 22. ND-02b After

Photo 23. ND-03 Before

Photo 24. ND-03 After

Photo 25. ND-04 Before

Photo 26. ND-04 After

Photo 27. ND-05 Before

Photo 28. ND-05 After

Photo 29. ND-06 Before

Photo 30. ND-06 After

Charles M. Russell National Wildlife Refuge
Sidney
Badlands
Fort Berthold Reservation
Du Coteau Du Missouri
Circle
Glendive
3596 ft
Montana
North Dakota
94
Theodore Roosevelt National Park
Dickinson
Bismarck
83
85
Badlands
9308 ft
Miles City
Forsyth
2
12
3884 ft
4812 ft
3590 ft
2854 ft
North Dakota
South Dakota
3619 ft
2713 ft
Standing Rock Reservation
4195 ft
Blue Mud Hills
Montana
South Dakota
3141 ft
Northern Cheyenne Indian Reservation
212

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For Environmental Review Purposes Only

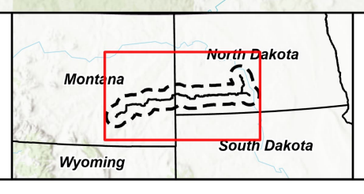

Figure G-1
Viewshed Analysis
North Plains Connector
Grid United

Proposed Route
Visibility Study Area (20-mi Buffer)
Project Visibility

Source: Z:\Clients\E_H\GRID\North_Plains\ArcGIS\Visual_Assessment\001_ArcPro\GRID_NPC_VisualAssessment.aprx
Date: (6/16/2025)

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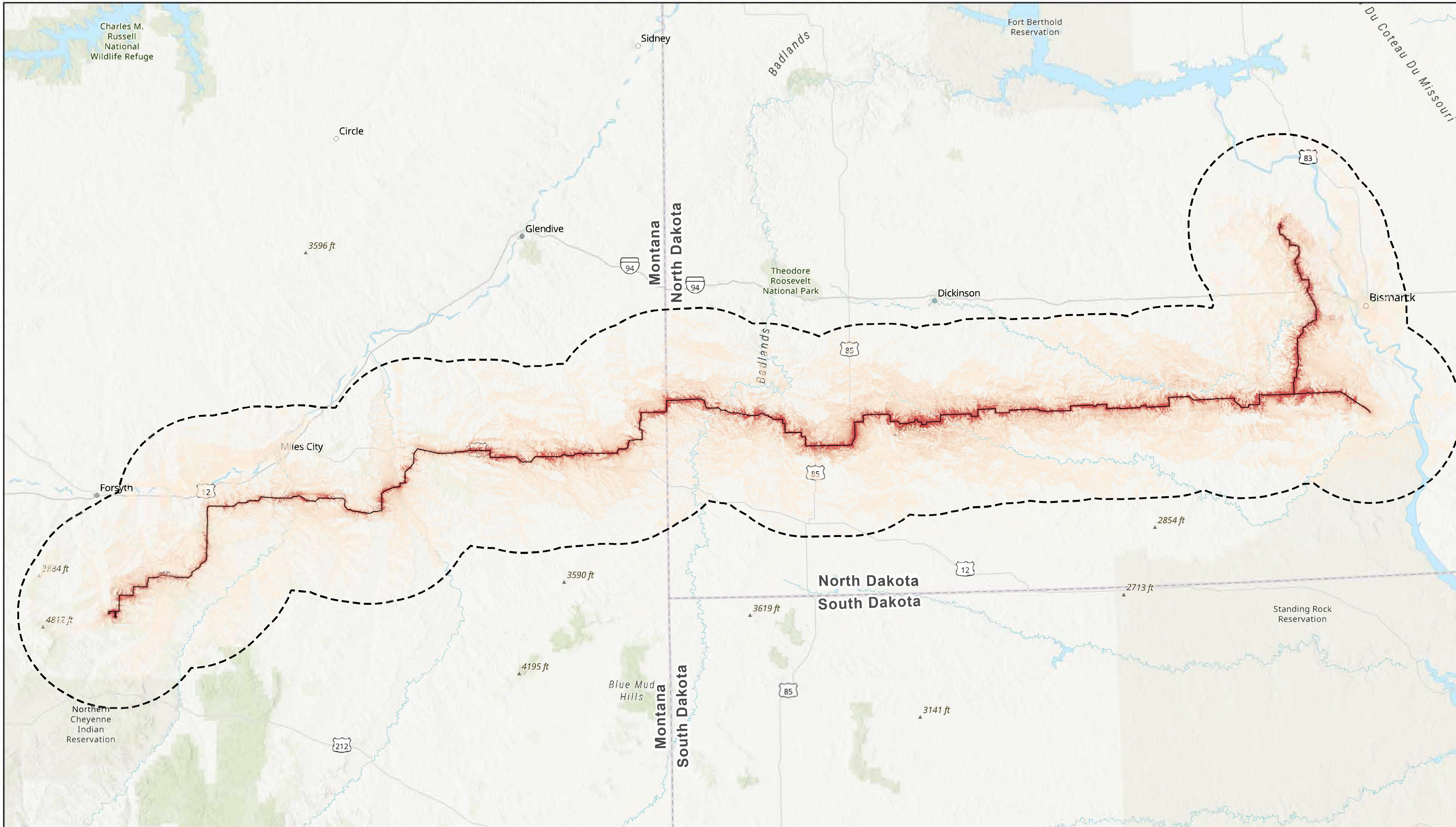

0 10 20 Miles

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For Environmental Review Purposes Only

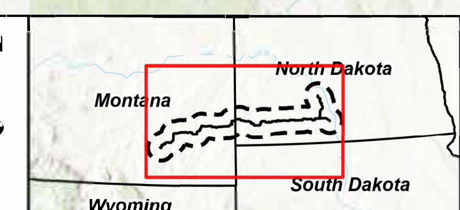

Figure G-2

Viewshed Analysis with Weighted Visibility
North Plains Connector
Grid United

Proposed Route

Visibility Study Area (20-mi Buffer)

Weighted Visibility*

More Visible

Less Visible

Weighted visibility accounts for the change in perceived size of structures in relation to the viewer's distance from the Project. The vertical degrees of an observer's angle of view that a single structure would obstruct is calculated with the formula: y=2(arctan(59.436/2x))*(180/3.14) where "x" is the distance in meters between the observer and the nearest structure and "y" is the degrees of an observer's view occupied by the structure. This value is multiplied by the number of structures visible at the location to create a value representing total degrees of visual obstruction of the Project.

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