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Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
133.063	133.066	0.002	OW		KS	135
133.402	133.408	0.006	OW		KS	136
134.420	134.436	0.015	PEM		KS	137
134.436	134.438	0.002	OW		KS	
134.438	134.458	0.021	PEM		KS	
134.494	134.511	0.016	PEM		KS	138
136.180	136.186	0.006	PEM		KS	139
136.186	136.188	0.002	OW		KS	
136.188	136.196	0.008	PEM		KS	
136.263	136.267	0.004	PEM		KS	140
136.267	136.269	0.002	OW		KS	
136.269	136.285	0.015	PEM		KS	
136.285	136.288	0.004	OW		KS	
136.288	136.300	0.012	PEM		KS	
136.313	136.328	0.015	PEM		KS	141
136.328	136.330	0.002	OW		KS	
136.330	136.338	0.008	PEM		KS	
136.777	136.782	0.005	PEM		KS	142
137.579	137.605	0.027	PEM		KS	143
140.116	140.117	0.002	OW		KS	144
140.203	140.219	0.016	OW		KS	145
142.530	142.532	0.002	OW		KS	146
144.043	144.055	0.012	OW		KS	147
144.964	144.966	0.002	OW		KS	148
147.481	147.545	0.064	PEM		KS	149
148.481	148.490	0.010	PEM		KS	150
148.717	148.720	0.002	OW		KS	151
148.897	148.907	0.011	PEM		KS	152
148.997	149.004	0.006	PEM		KS	153
149.004	149.006	0.002	OW		KS	
149.006	149.041	0.035	PEM		KS	
151.581	151.596	0.015	PSS		KS	154
151.596	151.598	0.002	OW		KS	
151.598	151.619	0.022	PSS		KS	
152.337	152.406	0.069	PEM		KS	155
153.524	153.550	0.026	PEM		KS	156
154.824	154.955	0.131	PFO		KS	157
154.955	154.957	0.002	OW		KS	
154.957	154.982	0.024	PFO		KS	
155.885	155.891	0.006	OW		KS	158
155.912	155.923	0.011	OW		KS	159
155.930	155.934	0.004	OW		KS	160
156.010	156.034	0.024	PFO		KS	161
156.034	156.042	0.008	OW		KS	
156.042	156.091	0.049	PFO		KS	
156.312	156.324	0.011	PEM		KS	162

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Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
158.226	158.235	0.009	PFO		KS	163
158.235	158.250	0.015	OW	Whitewater River	KS	
158.250	158.265	0.015	PFO		KS	
159.066	159.090	0.024	PFO		KS	164
159.090	159.092	0.002	OW		KS	
159.092	159.109	0.018	PFO		KS	
159.928	159.939	0.011	PFO		KS	165
159.939	159.941	0.002	OW		KS	
159.941	159.978	0.037	PFO		KS	
160.600	160.603	0.003	OW		KS	166
164.050	164.063	0.013	PFO		KS	167
164.063	164.065	0.002	OW		KS	
167.295	167.367	0.072	PEM		KS	168
167.614	167.619	0.005	OW		KS	169
167.987	168.001	0.014	PFO		KS	170
168.001	168.004	0.003	OW	Fourmile Creek	KS	
168.004	168.019	0.015	PFO		KS	
169.524	169.589	0.066	PFO		KS	171
170.873	170.892	0.019	PEM		KS	172
170.892	170.894	0.002	OW		KS	
170.894	170.950	0.057	PEM		KS	
171.100	171.114	0.013	PEM		KS	173
171.469	171.497	0.029	PEM		KS	174
172.465	172.594	0.129	PFO		KS	175
173.135	173.170	0.034	PEM		KS	176
173.232	173.235	0.003	PEM		KS	177
174.827	174.842	0.015	PFO		KS	178
174.842	174.844	0.002	OW		KS	
174.844	174.879	0.035	PFO		KS	
175.744	175.752	0.009	PFO		KS	179
175.752	175.754	0.002	OW		KS	
175.754	175.762	0.008	PFO		KS	
176.421	176.433	0.013	PEM		KS	180
177.506	177.514	0.009	PFO		KS	181
177.522	177.524	0.002	PFO		KS	182
177.524	177.528	0.004	OW		KS	
177.528	177.545	0.018	PFO		KS	
178.120	178.122	0.002	OW		KS	183
178.782	178.785	0.003	PEM		KS	184
178.848	178.862	0.014	PFO		KS	185
178.862	178.865	0.003	OW		KS	
178.865	178.888	0.023	PFO		KS	
180.903	180.917	0.014	PFO		KS	186
180.917	180.919	0.002	OW	Polecat Creek	KS	
180.919	180.941	0.022	PFO		KS	
185.377	185.386	0.009	PFO		KS	187

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Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
185.386	185.388	0.002	OW		KS	188
185.388	185.407	0.019	PFO		KS	
185.465	185.470	0.005	PFO		KS	
185.470	185.472	0.002	OW		KS	
185.472	185.566	0.094	PFO		KS	
185.566	185.568	0.002	OW		KS	
185.568	185.588	0.021	PFO		KS	
186.961	186.966	0.005	OW		KS	
186.976	186.980	0.003	OW		KS	190
186.990	186.992	0.002	OW		KS	191
187.007	187.010	0.003	OW		KS	192
187.021	187.023	0.002	OW		KS	193
188.116	188.136	0.019	PFO		KS	194
188.136	188.141	0.005	OW		KS	
188.141	188.181	0.041	PFO		KS	
188.269	188.273	0.004	PFO		KS	195
188.273	188.275	0.002	OW		KS	
188.275	188.304	0.029	PFO		KS	
188.399	188.415	0.015	PFO		KS	196
188.415	188.417	0.002	OW		KS	
188.417	188.434	0.017	PFO		KS	
188.461	188.465	0.004	PFO		KS	197
190.211	190.228	0.017	PEM		KS	198
191.603	191.640	0.037	PEM		KS	199
192.277	192.338	0.061	PEM		KS	200
192.947	192.981	0.034	PFO		KS	201
193.288	193.319	0.030	PEM		KS	202
195.163	195.185	0.022	PEM		KS	203
196.122	196.152	0.030	PEM		KS	204
198.268	198.291	0.023	PEM		KS	205
202.951	202.967	0.016	PEM		KS	206
203.188	203.207	0.019	PEM		KS	207
205.059	205.104	0.045	PFO		KS	208
205.590	205.630	0.040	PFO		KS	209
205.630	205.740	0.110	OW	Arkansas River	KS	
205.740	205.818	0.078	PFO		KS	
206.897	206.911	0.015	PEM		KS	210
207.086	207.099	0.013	PEM		KS	211
209.666	209.689	0.023	PEM		KS	212
209.769	209.820	0.051	PEM		KS	213
210.197	210.265	0.067	PEM		KS	214

¹Analysis based on review of high resolution photography, topographic maps, and NWI polygons.

Locations requiring on-site verification/delineation were grouped for the purpose of tracking field survey progress.

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Appendix B

**Wetlands Identified and Delineated To-Date Along the Cushing
Extension (Nebraska, Kansas, Oklahoma)**

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Table B-1 Wetlands Identified and Field Delineated To-Date along the Cushing Extension (Nebraska, Kansas, Oklahoma)

Enter MP	Exit MP	Distance Crossed (miles)	Wetland Type	State
1.166	1.176	0.011	OW	NE
7.452	7.467	0.015	PEM	KS
7.601	7.613	0.012	PEM	KS
7.758	7.771	0.013	PEM	KS
7.793	7.808	0.015	PEM	KS
7.985	8.029	0.043	PEM	KS
16.855	16.858	0.003	PEM	KS
17.408	17.426	0.018	PEM	KS
18.353	18.384	0.031	PEM	KS
18.518	18.536	0.018	PEM	KS
23.620	23.636	0.016	PEM	KS
51.130	51.142	0.012	PFO	KS
51.182	51.233	0.051	PFO	KS
51.247	51.293	0.046	PEM	KS
53.989	54.028	0.038	PEM	KS
54.030	54.050	0.020	PEM	KS
54.114	54.253	0.139	PEM	KS
69.921	69.925	0.004	PFO	KS
69.925	69.932	0.007	PEM	KS
69.932	69.943	0.011	PFO	KS
69.950	69.961	0.010	PFO	KS
69.961	69.972	0.011	PEM	KS
69.972	69.981	0.009	PFO	KS
70.234	70.255	0.022	PFO	KS
70.260	70.261	0.002	PFO	KS
76.080	76.253	0.174	PFO	KS
78.920	78.944	0.024	PEM	KS
85.816	85.836	0.020	PEM	KS
86.206	86.217	0.012	PEM	KS
86.219	86.233	0.014	PEM	KS
87.654	87.672	0.018	OW	KS
105.117	105.201	0.084	PEM	KS
105.212	105.227	0.015	PEM	KS
105.234	105.260	0.026	PEM	KS
105.262	105.272	0.010	PEM	KS
108.704	108.718	0.013	PEM	KS
116.919	116.930	0.011	PEM	KS
136.777	136.782	0.005	PEM	KS
140.148	140.151	0.003	PEM	KS
140.184	140.186	0.003	PEM	KS

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Table B-1 Wetlands Identified and Field Delineated To-Date along the Cushing Extension (Nebraska, Kansas, Oklahoma)

Enter MP	Exit MP	Distance Crossed (miles)	Wetland Type	State
147.509	147.518	0.010	PEM	KS
151.581	151.600	0.019	PSS	KS
151.603	151.619	0.016	PSS	KS
154.824	154.912	0.088	PFO	KS
154.928	154.982	0.053	PFO	KS
156.010	156.034	0.024	PFO	KS
156.042	156.091	0.049	PFO	KS
156.312	156.324	0.011	PEM	KS
158.226	158.235	0.009	PFO	KS
158.250	158.265	0.015	PFO	KS
159.066	159.090	0.024	PFO	KS
159.092	159.109	0.018	PFO	KS
159.928	159.939	0.011	PFO	KS
159.941	159.978	0.037	PFO	KS
167.295	167.367	0.072	PEM	KS
170.912	170.914	0.002	PEM	KS
171.107	171.113	0.006	PEM	KS
171.469	171.497	0.029	PEM	KS
172.495	172.497	0.002	OW	KS
173.135	173.170	0.034	PEM	KS
173.232	173.235	0.003	PEM	KS
174.825	174.847	0.022	PFO	KS
176.401	176.469	0.068	PEM	KS
178.778	178.779	0.001	OW	KS
185.377	185.386	0.009	PFO	KS
185.388	185.407	0.019	PFO	KS
185.465	185.470	0.005	PFO	KS
185.472	185.566	0.094	PFO	KS
185.568	185.588	0.021	PFO	KS
190.211	190.228	0.017	PEM	KS
191.603	191.640	0.037	PEM	KS
192.326	192.333	0.007	PEM	KS
192.947	192.981	0.034	PFO	KS
198.267	198.282	0.015	PEM	KS
202.951	202.967	0.016	PEM	KS
203.188	203.207	0.019	PEM	KS
205.059	205.104	0.045	PFO	KS
205.590	205.630	0.040	PFO	KS
205.740	205.818	0.078	PFO	KS
206.897	206.911	0.015	PEM	KS
207.086	207.099	0.013	PEM	KS
210.197	210.265	0.067	PEM	KS

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Table B-1 Wetlands Identified and Field Delineated To-Date along the Cushing Extension (Nebraska, Kansas, Oklahoma)

Enter MP	Exit MP	Distance Crossed (miles)	Wetland Type	State
215.730	215.758	0.029	PEM	OK
216.503	216.511	0.007	PEM	OK
218.515	218.528	0.013	PEM	OK
218.932	218.941	0.010	PEM	OK
219.236	219.240	0.004	PEM	OK
220.038	220.041	0.003	PEM	OK
220.528	220.534	0.006	PEM	OK
221.285	221.304	0.019	OW	OK
222.997	223.012	0.015	PEM	OK
227.110	227.127	0.017	PEM	OK
228.087	228.110	0.024	PEM	OK
228.207	228.218	0.011	PEM	OK
228.522	228.549	0.027	PEM	OK
228.791	228.802	0.011	PEM	OK
230.650	230.672	0.022	PEM	OK
231.446	231.577	0.130	PEM	OK
232.575	232.578	0.003	PFO	OK
233.350	233.410	0.060	PEM	OK
233.583	233.606	0.023	PEM	OK
233.783	233.795	0.012	PEM	OK
235.645	235.677	0.032	PEM	OK
236.080	236.111	0.031	PEM	OK
236.195	236.228	0.033	PEM	OK
241.950	241.962	0.012	PEM	OK
243.188	243.198	0.010	PEM	OK
243.234	243.240	0.006	PEM	OK
243.813	243.818	0.005	PEM	OK
244.568	244.589	0.021	PEM	OK
245.540	245.661	0.121	PEM	OK
245.894	245.926	0.032	PEM	OK
248.311	248.322	0.011	PFO	OK
248.582	248.671	0.089	PFO	OK
248.744	248.887	0.143	PFO	OK
250.173	250.198	0.025	OW	OK
254.293	254.382	0.090	PEM	OK
254.680	254.709	0.029	PFO	OK
254.716	254.796	0.080	PFO	OK
255.087	255.307	0.220	PFO	OK
255.476	255.481	0.005	PEM	OK
255.913	256.013	0.100	PEM	OK
257.713	257.795	0.082	PEM	OK
257.797	257.861	0.063	PEM	OK

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Table B-1 Wetlands Identified and Field Delineated To-Date along the Cushing Extension (Nebraska, Kansas, Oklahoma)

Enter MP	Exit MP	Distance Crossed (miles)	Wetland Type	State
259.596	259.627	0.030	PEM	OK
260.268	260.296	0.028	PEM	OK
260.298	260.323	0.026	PEM	OK
264.184	264.196	0.012	PFO	OK
264.199	264.219	0.020	PFO	OK
266.392	266.406	0.014	PFO	OK
268.358	268.369	0.011	OW	OK
269.426	269.451	0.025	PEM	OK
270.226	270.234	0.008	PEM	OK
270.304	270.328	0.024	PEM	OK
271.095	271.312	0.217	PFO	OK
271.312	271.323	0.011	PEM	OK
271.323	271.345	0.022	PFO	OK
272.399	272.425	0.026	PFO	OK
275.364	275.365	0.002	PEM	OK
283.450	283.455	0.004	PEM	OK
287.888	287.898	0.010	OW	OK
288.621	288.629	0.008	PEM	OK
288.640	288.664	0.024	PEM	OK
289.201	289.207	0.006	PEM	OK
289.882	289.926	0.045	OW	OK



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MAC

Metcalf Archaeological Consultants, Inc.

January 19, 2006

Ms. Paige Hoskinson, Historical Archaeologist
South Dakota State Historical Society
900 Governors Drive
Pierre, South Dakota 57501-2217

RE: Keystone Pipeline Project Survey Report

Dear Ms. Hoskinson,

Enclosed is a copy of the final survey report for fieldwork conducted during 2006 for the Keystone Pipeline Project.

After you have had the opportunity to review, please contact the MAC Bismarck office, as well as the client, with your comments:

Ms. Kim Munson, Anthropologist
ENSR International
1601 Prospect Parkway
Fort Collins, Colorado 80525

If you should you have any questions please contact the MAC Bismarck office.

Sincerely,

Amy Bleier
Staff Archaeologist

cc: Ms. Kim Munson

enclosure

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MAC

Metcalf Archaeological Consultants, Inc.

January 19, 2006

Ms. Jane Watts
South Dakota Archaeological Research Center
P.O. Box 1257
Rapid City, South Dakota 57709-1257

RE: Keystone Pipeline Project Site Forms

Dear Ms. Watts:

Enclosed are final copies of 15 site forms (five railroad sites, two foundation/depression sites, two rock cairn sites, one farmstead site, one foundation site, one artifact scatter site and two isolated find locales) that were encountered and recorded during fieldwork conducted in 2006 within the corridor surveyed for the proposed Keystone Pipeline.

Should you have any comments or questions in regards to these site forms, please contact the MAC Bismarck office.

Sincerely,

Amy Bleier
Staff Archaeologist

cc: Ms. Kim Munson

enclosure:	39BE2072 (Update)	39YK77
	39CK50	39YK78
	39DA70	39YK79
	39DA71	39YK2003 (Update)
	39DA2000 (Update)	
	39HT133	
	39HT134	
	39KB2003 (Update)	
	39ML2000 (Update)	
	39YK75	
	39YK76	



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Metcalf Archaeological Consultants, Inc.

March 7, 2007

Mr. Albert M. LeBeau III
Tribal Historic Preservation Officer
Cheyenne River Sioux Tribe Cultural Preservation Office
P.O. Box 590
Eagle Butte, South Dakota 57625

RE: Keystone Pipeline Project Cultural Resource Investigation Survey Reports

Dear Mr. LeBeau III,

In response to your request at the February 21, 2007, Corps of Engineers meeting in Pierre, South Dakota, Kim Munson with ENSR International requested that our office send the enclosed copies of the final drafts of the survey reports prepared for TransCanada's Keystone Pipeline Project (*Keystone Pipeline Project: Class I, II, and III Cultural Resource Investigations in Eastern North Dakota* and *Keystone Pipeline Project: Level I and II Cultural Resource Investigations in Eastern South Dakota*).

Metcalf Archaeological Consultants, Inc., the subcontractor who conducted the investigations, is sending these reports on behalf of the Department of State which is conducting the government-to-government consultation with respect to this matter. If you have any comments or concerns regarding the survey reports please contact the Department of State. The contact information is:

Elizabeth A. Orlando, Esq.
US Department of State
OES/ENV
Foreign Affairs Officer
Multilateral Team
Telephone: 202-647-4284
Fax: 202-647-1052
Cell: 240-723-3157
orlandoea2@state.gov

Sincerely,

Suzanne Nelsen
Office Manager

cc: Kim Munson

enclosures

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Metcalf Archaeological Consultants, Inc.

February 7, 2007

Mr. James Whitted
Tribal Historic Preservation Officer
Sisseton-Wahpeton Oyate Planning and Development
Old Agency
P.O. Box 509
Sisseton, South Dakota 57262-0509

RE: Keystone Pipeline Project Cultural Resource Investigation Survey Reports

Dear Mr. Whitted,

Upon review we noticed that the cover letter with the reports we sent out January 22, 2007, was inadvertently addressed to Mr. Frankly and Mr. CrowsBreast. We apologize for the oversight and do hope that no harm has been caused by the error. It is our hope that you received the copies of the final drafts of the survey reports prepared for TransCanada's Keystone Pipeline Project (*Keystone Pipeline Project: Class I, II, and III Cultural Resource Investigations in Eastern North Dakota* and *Keystone Pipeline Project: Level I and II Cultural Resource Investigations in Eastern South Dakota*).

Metcalf Archaeological Consultants, Inc., the subcontractor who conducted the investigations, has sent these reports on behalf of the Department of State which is conducting the government-to-government consultation with respect to this matter. If you have any comments or concerns regarding the survey reports please contact the Department of State. The contact information is:

Elizabeth A. Orlando, Esq.
US Department of State
OES/ENV
Foreign Affairs Officer
Multilateral Team
Telephone: 202-647-4284
Fax: 202-647-1052
Cell: 240-723-3157
orlandoea2@state.gov

Sincerely,

Ed Stine
Staff Archaeologist

cc: Kim Munson
enclosures

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P.O. Box 2154
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Metcalf Archaeological Consultants, Inc.

January 22, 2007

Mr. Franky Jackson
Tribal Historic Preservation Officer
Sisseton-Wahpeton Oyate Planning and Development
Old Agency
P.O. Box 509
Sisseton, South Dakota 57262-0509

RE: Keystone Pipeline Project Cultural Resource Investigation Survey Reports

Dear Mr. Crows Breast,

Enclosed are copies of the final drafts of the survey reports prepared for TransCanada's Keystone Pipeline Project (*Keystone Pipeline Project: Class I, II, and III Cultural Resource Investigations in Eastern North Dakota* and *Keystone Pipeline Project: Level I and II Cultural Resource Investigations in Eastern South Dakota*).

Metcalf Archaeological Consultants, Inc., the subcontractor who conducted the investigations, has sent these reports on behalf of the Department of State which is conducting the government-to-government consultation with respect to this matter. If you have any comments or concerns regarding the survey reports please contact the Department of State. The contact information is:

Elizabeth A. Orlando, Esq.
US Department of State
OES/ENV
Foreign Affairs Officer
Multilateral Team
Telephone: 202-647-4284
Fax: 202-647-1052
Cell: 240-723-3157
orlandoa2@state.gov

Sincerely,

Amy Bleier
Staff Archaeologist

cc: Kim Munson

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MAC

Metcalf Archaeological Consultants, Inc.

January 22, 2007

Mr. Calvin Grinnell
Tribal Historian
Mandan, Hidatsa, Arikara Nation
220 8th Avenue North
New Town, North Dakota 58673

RE: Keystone Pipeline Project Cultural Resource Investigation Survey Reports

Dear Mr. Grinnell,

Enclosed are copies of the final drafts of the survey reports prepared for TransCanada's Keystone Pipeline Project (*Keystone Pipeline Project: Class I, II, and III Cultural Resource Investigations in Eastern North Dakota and Keystone Pipeline Project: Level I and II Cultural Resource Investigations in Eastern South Dakota*).

Metcalf Archaeological Consultants, Inc., the subcontractor who conducted the investigations, has sent these reports on behalf of the Department of State which is conducting the government-to-government consultation with respect to this matter. If you have any comments or concerns regarding the survey reports please contact the Department of State. The contact information is:

Elizabeth A. Orlando, Esq.
US Department of State
OES/ENV
Foreign Affairs Officer
Multilateral Team
Telephone: 202-647-4284
Fax: 202-647-1052
Cell: 240-723-3157
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Sincerely,

Amy Bleier
Staff Archaeologist

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MAC

Metcalf Archaeological Consultants, Inc.

January 22, 2007

Mr. Elgin Crows Breast
Cultural Resource Program Director
Mandan, Hidatsa, Arikara Nation
P.O. Box 673
New Town, North Dakota 58673

RE: Keystone Pipeline Project Cultural Resource Investigation Survey Reports

Dear Mr. Crows Breast,

Enclosed are copies of the final drafts of the survey reports prepared for TransCanada's Keystone Pipeline Project (*Keystone Pipeline Project: Class I, II, and III Cultural Resource Investigations in Eastern North Dakota* and *Keystone Pipeline Project: Level I and II Cultural Resource Investigations in Eastern South Dakota*).

Metcalf Archaeological Consultants, Inc., the subcontractor who conducted the investigations, has sent these reports on behalf of the Department of State which is conducting the government-to-government consultation with respect to this matter. If you have any comments or concerns regarding the survey reports please contact the Department of State. The contact information is:

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US Department of State
OES/ENV
Foreign Affairs Officer
Multilateral Team
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Fax: 202-647-1052
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Sincerely,

A handwritten signature in cursive script that reads "Amy C. Bleier".

Amy Bleier
Staff Archaeologist

cc: Kim Munson

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Overview – Keystone Pipeline Project Cultural Resource Surveys and Reports

March 2007

Cultural Resource Surveys and Reports

Construction and operation of the Keystone Pipeline Project (Keystone) may affect cultural resources protected under the National Historic Preservation Act (NHPA), and by individual State legislation. During 2006, Keystone initiated contact with the State Historic Preservation Officer (SHPO) in each state to identify known cultural resource sites, and to develop survey plans. Keystone submitted records searches and research designs to each state for review and approval. Agency coordination documentation and survey protocols were filed by Keystone with the Department of State (DOS) on September 15, 2006.

Cultural resource field surveys along the proposed Keystone Mainline pipeline right-of-way were initiated in the spring and summer of 2006, and were completed in the fall of 2006. These surveys were conducted along the pipeline route alignment that was filed with the DOS on September 15, 2006. Additional field surveys will be conducted during the spring and summer of 2007 to survey pipeline reroutes, pump stations, certain pipe storage yards and contractor yards, access roads, and pipeline segments where access was not previously available. Field surveys will be conducted along the Cushing Extension and on pump station sites, pipe storage yards and contractor yards associated with the extension in 2007.

Keystone reached an agreement with Kinder Morgan to purchase the cultural resources survey reports for the proposed Rockies Express Pipeline (REX) segment that will be located parallel to the Keystone pipeline route in Nebraska, Kansas, and Missouri. The REX reports and concurrence letters received from the SHPO in each state were included in the November 17, 2006, supplemental filing. Site testing along the REX corridor is ongoing and results will be provided when available.

Keystone initiated discussions with the Nebraska, Kansas, and Missouri SHPOs to define a process for incorporating the REX survey results into the Keystone Pipeline project. Keystone prepared maps of its proposed construction surface disturbance footprint in relation to the REX cultural resources survey corridor. These maps documented the portion of the REX survey corridor that includes the proposed Keystone surface disturbance. The SHPOs reviewed this submittal and provided concurrence letters for the portion of the Keystone Project located within the REX survey corridor. The concurrence letters were included in the January 2007 supplemental filing.

Keystone documented proposed surface disturbance located outside the REX survey corridor and began field surveys of these areas in January 2007. The status of surveys conducted to date along deviations from the REX corridor will be submitted to the SHPOs in a separate Keystone report and are included in this filing.

Results of the pedestrian survey along the Mainline pipeline right-of-way in North/South Dakota, Nebraska, Missouri, and Illinois were submitted to the North/South Dakota, Nebraska, and Missouri SHPOs. As directed by the Illinois SHPO, the survey report will not be submitted to the SHPO until survey is completed along the Illinois segment of the Mainline. The Nebraska and North Dakota SHPOs have concurred with the findings in the cultural resources survey reports. The North Dakota SHPO will not provide NRHP determinations until requested in writing by the DOS. Copies of the letters from the North Dakota and Nebraska SHPOs are included in this filing. Concurrence from the South Dakota and Missouri SHPOs is pending and will be submitted in a supplemental filing.

Site testing to determine National Register eligibility was conducted in North Dakota, Missouri, and Illinois. The results of site testing in Missouri and Illinois can be found in the testing reports included in January 2007 supplemental filing. Two sites were tested in North Dakota, and both sites were recommended as ineligible. Results of testing in North Dakota will be included in this filing. Site testing

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has not yet been conducted at two sites in Missouri due to lack of access. All potentially eligible sites in South Dakota and Nebraska were avoided by reroutes; therefore, no site testing was conducted in these states. With the exception of Illinois, the site testing reports were submitted to SHPOs for review and concurrence. A copy of the North Dakota SHPO letter is included in this filing. Concurrence on the Missouri site testing report is pending and will be included in a supplemental filing.

Cushing Extension

Pedestrian survey along the Cushing Extension in Nebraska, Kansas, and Oklahoma began in January 2007. To date, survey of the Nebraska segment is complete; surveys in Kansas and Oklahoma are ongoing and scheduled for completion in summer 2007. The status reports for survey conducted to date are included in this filing and will be submitted to the Nebraska, Kansas, and Oklahoma SHPOs. Keystone will file cultural resource status reports for remaining segments of the Cushing Extension, as well as addendum reports for Mainline reroutes, ancillary facilities, and any additional site testing (if required) in the next supplemental filing.

Table 1 outlines the process for the collection and submission of cultural resource data.

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Table 1. Keystone Pipeline Project - Cultural Resources Field Surveys and Report Completion Plan – March 2007

State	Survey Status	September 2006 DOS Filing	November 2006 DOS Filing	January 2007 DOS Filing	March 2007 DOS Filing	Supplemental Reports
North Dakota	<p>Field Survey Completion Status as of March 2007:</p> <ul style="list-style-type: none"> • Pedestrian Survey – 88% • Site Testing – 100% <p>Spring 2007 – follow up surveys as needed for reroutes and ancillary sites.</p>	Cultural resources record search; Survey protocols and survey areas.	Keystone Cultural Resources Status Report (pedestrian survey results and site forms, site testing methodology).	Compilation of 2006 surveys (pedestrian and geomorphological surveys).	<p>SHPO Concurrence, 2 sites.</p> <p>Site testing report, 2 sites, February 2007.</p> <p>SHPO Concurrence on Class I-III report submitted to DOS January 2007.</p> <p>Site Forms Errata submitted to DOS January 2007.</p> <p>Transmittal Letters to Tribes</p>	<p>May or June 2007</p> <p>Reports will include survey results for pipeline reroutes and ancillary facilities, and site testing (if required).</p>
South Dakota	<p>Completion Status as of March 2007:</p> <ul style="list-style-type: none"> • Pedestrian Survey – 86% • Site Testing – no sites <p>Spring 2007 –follow up surveys as needed for reroutes and ancillary sites.</p>	Cultural resources record search; Survey protocols and survey areas.	Keystone Cultural Resources Status Report (pedestrian survey results and site forms, site testing methodology).	Compilation of 2006 surveys (pedestrian and geomorphological surveys).	<p>Transmittal Letter for 2006 Survey Reports</p> <p>Transmittal Letter - 15 site forms recorded in 2006 survey reports</p> <p>Transmittal Letters to Tribes</p>	<p>May or June 2007</p> <p>Reports will include survey results for pipeline reroutes and ancillary facilities, and site testing (if required).</p>

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Table 1. Keystone Pipeline Project - Cultural Resources Field Surveys and Report Completion Plan – March 2007

State	Survey Status	September 2006 DOS Filing	November 2006 DOS Filing	January 2007 DOS Filing	March 2007 DOS Filing	Supplemental Reports
Nebraska	<p>Mainline Completion Status as of March 2007:</p> <ul style="list-style-type: none"> • Pedestrian Survey – 97% • Site Testing – no sites • Cushing Extension 100% <p>Spring 2007 – Mainline follow up surveys; Cushing Extension.</p>	Cultural resources record search; Survey protocols and survey areas.	<p>Keystone Cultural Resources Status Report (pedestrian survey results and site forms).</p> <p>Rockies Express (REX) Cultural Surveys in NE (pedestrian survey results and SHPO concurrence for segments where REX and Keystone are co-located).</p>	<p>Compilation of 2006 surveys (pedestrian and geomorphological surveys).</p> <p>Map documentation of Keystone proposed construction ROW overlap with REX cultural resource survey areas and SHPO concurrence.</p>	Cushing Extension field surveys – status report.	<p>May or June 2007</p> <p>Reports will include Keystone Mainline survey results for pipeline reroutes and ancillary facilities, and site testing (if required).</p> <p>Cushing Extension – Pedestrian survey results; site testing (if required).</p>
Kansas	<p>Field Survey Completion Status as of March 2007:</p> <ul style="list-style-type: none"> • Mainline Pedestrian Survey – 99% • Mainline Site Testing – 0% • Cushing Extension – 100% <p>2007 Spring – Mainline Follow up surveys; Cushing Extension.</p>	Cultural resources record search; Survey protocols and survey areas.	<p>REX Cultural Surveys in KS (pedestrian survey results and SHPO concurrence for segments where REX and Keystone are co-located).</p>	<p>Map documentation of Keystone proposed construction ROW overlap with REX cultural resource survey areas and SHPO concurrence.</p> <p>Cushing Extension Revised research design (maps included) and SHPO concurrence.</p>	<p>Mainline field survey status report for any areas outside REX survey area.</p> <p>Cushing Extension field surveys – status report.</p> <p>Cushing Extension Tribal Letters.</p>	<p>May or June 2007-</p> <p>Reports will include Keystone Mainline survey results for pipeline reroutes and ancillary facilities, and site testing (if required).</p> <p>Cushing Extension – Pedestrian survey results; site testing (if required).</p>

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Table 1. Keystone Pipeline Project - Cultural Resources Field Surveys and Report Completion Plan – March 2007

State	Survey Status	September 2006 DOS Filing	November 2006 DOS Filing	January 2007 DOS Filing	March 2007 DOS Filing	Supplemental Reports
Missouri	<p>Field Survey Completion Status as of March 2007:</p> <ul style="list-style-type: none"> • Mainline Pedestrian Survey – 79% • Mainline Site Testing – 44% <p>Spring 2007 – Follow up surveys for reroutes and ancillary sites.</p>	Cultural resources record search; Survey protocols and survey areas.	<p>Keystone Cultural Resources Status Report (pedestrian and geomorphological survey results and site forms)</p> <p>REX Cultural Surveys in MO (pedestrian survey results and SHPO concurrence for segments where REX and Keystone are co-located).</p>	<p>Compilation of 2006 surveys (pedestrian and geomorphological surveys and site testing).</p> <p>Map documentation of Keystone proposed construction ROW overlap with REX cultural resource survey areas and SHPO concurrence.</p>	<p>SHPO Concurrence on 2006 Phase II (11 Sites) Report</p> <p>REX Deviations Phase I Cultural Survey status report.</p>	<p>May or June 2007</p> <p>Reports will include Keystone Mainline survey results for pipeline reroutes and ancillary facilities, and site testing (if required).</p>
Illinois	<p>Field Survey Completion Status as of March 2007:</p> <ul style="list-style-type: none"> • Pedestrian Survey – 89% • Site Testing – 33% <p>Spring 2007 – Follow up surveys for reroutes and ancillary sites.</p>	Cultural resources record search; Survey protocols and survey areas.	Keystone Cultural Resources Status Report (pedestrian survey results and site forms).	Compilation of 2006 surveys (pedestrian and geomorphological surveys, and site testing).	Wood River Terminal Pump Station survey status report.	<p>May or June 2007</p> <p>Keystone Mainline survey results for pipeline reroutes and ancillary facilities, and site testing (if required).</p>

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Table 1. Keystone Pipeline Project - Cultural Resources Field Surveys and Report Completion Plan – March 2007

State	Survey Status	September 2006 DOS Filing	November 2006 DOS Filing	January 2007 DOS Filing	March 2007 DOS Filing	Supplemental Reports
Oklahoma	Spring 2007 Pedestrian and geomorphological surveys; site testing, if required. • Cushing Extension – 81%	Cultural resources record search; Survey protocols and survey areas.	No information filed.	No information filed.	Cushing Extension field surveys – status report. Cushing Extension Revised research design (maps included) and SHPO concurrence. Cushing Extension Tribal Letters	May or June 2007 Cushing Extension survey results for pipeline reroutes, ancillary facilities; site testing, if required.



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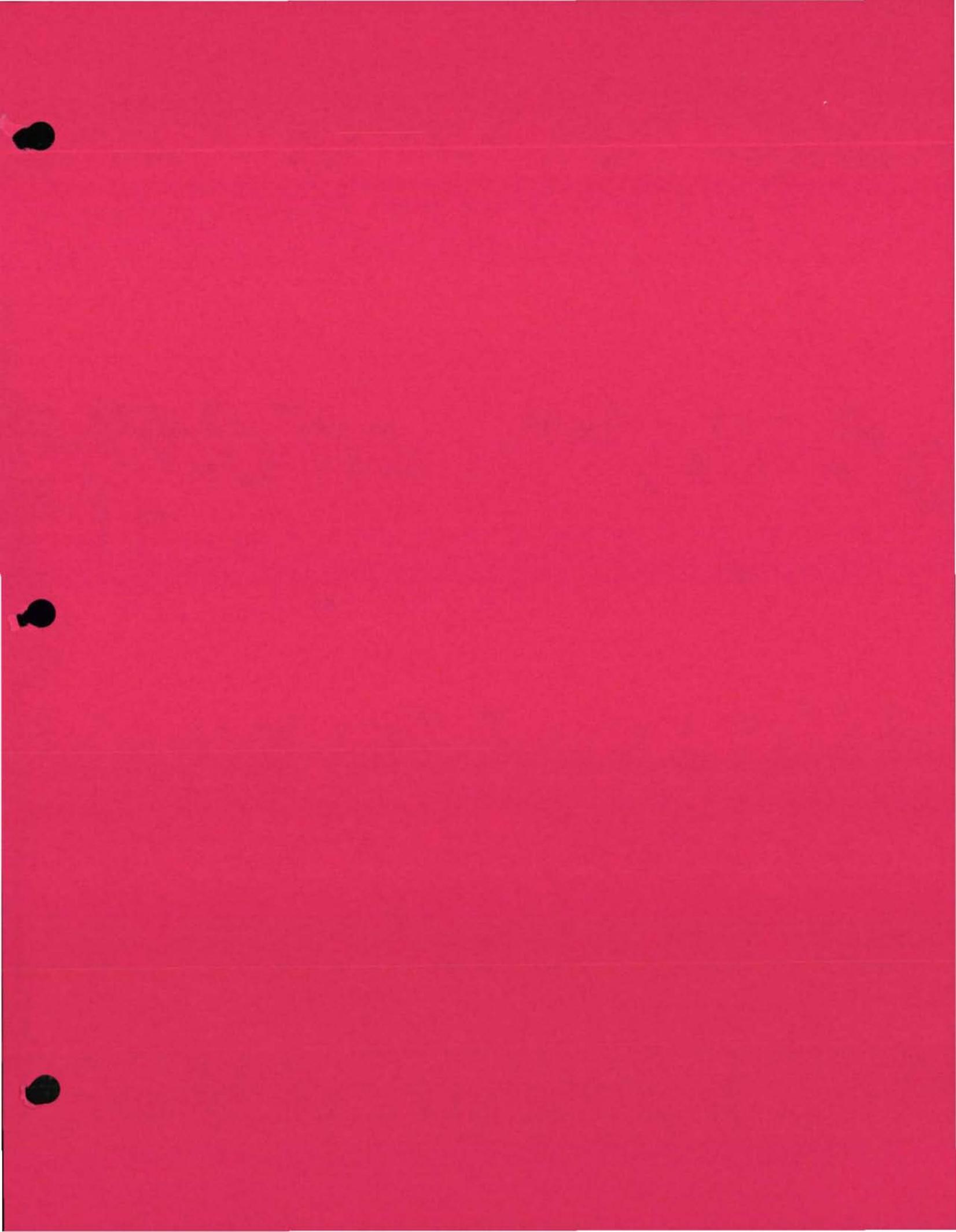
- **NORTH DAKOTA**
 - Metcalf report transmittal letter sites 32RM160 and 32RMx89 February 2007
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 - Testing Report for sites 32RM160 and 32RMx89, February 2007
 - SHPO Concurrence on Class I-III Report submitted to DOS January 2007
 - Metcalf letter to SHPO forwarding site form updates on above testing report
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Prepared for:
Keystone Pipeline Project



A Field Survey of the Keystone Pipeline Project Construction Corridor in North and South Dakota for Dakota Skipper (*Hesperia dacotae*) Habitat, Western Prairie Fringed Orchid (*Platanthera praeclara*) Habitat, and for Native Grassland

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Executive Summary

A field survey was conducted along the proposed Keystone Pipeline Project construction right-of-way for native grassland habitat and for native grassland species. The target native grassland species were western prairie fringed orchid (*Platanthera praeclara*) and Dakota skipper butterfly (*Hesperia dacotae*). The survey was conducted by a two person team from September 11 to September 16, 2006. Survey sites were determined from aerial photograph and topographic map analysis along the proposed project route, and through consultation with federal and state agencies. A total of 38 sites were visited during the field survey. Of the 38 survey sites, four of the sites were determined not to be grassland. Of the remaining 34 survey areas, 10 were determined to be high quality grasslands, seven were determined to be medium quality grasslands, and 17 were determined to be low quality grasslands. Eight survey sites were identified as potential habitat for the Dakota skipper and eight were identified as potential habitat for the western prairie fringed orchid. It is recommended that these sites be surveyed in 2007 for the presence or absence of the target species. Photographs, detailed survey site summaries, survey location maps, and a species list can be found in the appendices of this report.

1.0 Introduction

The proposed Keystone Mainline enters Cavalier County, North Dakota, from Canada and continues south along the eastern portions of North Dakota, South Dakota, and Nebraska. The proposed pipeline route then turns east crossing Kansas and Missouri, and terminates in Marion County, Illinois. The Mainline objectives of this survey were as follows:

Objective 1. To determine areas along the corridor that are potential habitat for Dakota skipper (*Hesperia dacotae*), a butterfly that is designated as a federal candidate species.

Objective 2. To determine areas along the corridor that are potential habitat for western prairie fringed orchid (*Platanthera praeclara*), a plant that is federally listed as a threatened species.

Objective 3. To identify sections of the corridor with intact or partially intact native grassland.

The western prairie fringed orchid and Dakota skipper butterfly, hereafter referred to as the target species, both occur on native grassland areas. However, they occupy different types of grassland habitat. Therefore, any area designated as potential habitat for either target species also constitutes intact or partially native grassland. In contrast, there may be intact or partially intact native grassland areas that are not potential habitat for either of these two target species. In order to identify which native grassland areas are best suited for the two target species the following, background information on grassland and target species habitats was obtained.

Habitat Requirements for Dakota Skipper (*Hesperia dacotae*)

The literature consulted to determine Dakota skipper habitat included reports or articles by Vaughan and Shepherd (2005), Royer (1996), Schlicht (1997), and Dakota Skipper Conservation Guidelines from the U.S. Fish and Wildlife Service (USFWS 2005) in Bloomington, Minnesota. From these articles the following habitat summary was developed.

Dakota skipper habitat is native tall and mixed-grass prairie or prairie remnants where there are abundant larval and adult food-sources present. The two grassland habitats where this species is known to occur are: 1) low (wet) grassland dominated by bluestem grasses, wood lily, harebell, and smooth camas, and 2) upland (dry) grassland on ridges and hillsides dominated by bluestem grasses, needlegrass, pale purple and upright coneflowers and blanketflower. Since nectar provides the nutrients and carbohydrates for Dakota skippers to meet the energetic demands of flight, one of the best indicators for Dakota skipper habitat is the presence of Dakota skipper food plants for larva and nectar plants for adults. The Dakota skipper larva prefers little blue stem (*Schizachyrium scoparium*) roots as a nutrient source, but the larvae do not use this grass exclusively.

Preferred nectar plants for the adult Dakota skipper are purple coneflowers or black Sampson plants: *Echinacea angustifolia*. Other preferred nectar sources include a vetch (*Astragalus adsurgens*), hoary vervain (*Verbena stricta*), leadplant (*Amorpha canescens*), white prairie clover (*Dalea candida*), fleabane (*Erigeron* spp.), blanketflower (*Gaillardia*), black-eyed Susans (*Rudbeckia* sp.), yellow sundrops (*Calylophus serrulatus*) and purple locoweed (*Oxytropis lambertii*.) The Dakota skipper also is a generalist in regards to pollen collection, and it also is believed that the larvae can live on roots other than those of the little blue stem. Therefore, if a grassland site had both a diverse mix of native forbs, and only one or two of the known larvae or pollen plants, it was considered Dakota skipper habitat. Another important factor in determining suitable habitat is the proximity of other native grassland areas.

Habitat Requirements for Western Prairie fringed Orchid (*Platanthera praeclara*)

The western prairie fringed orchid occurs on tall-grass calcareous silt loam or sub-irrigated sandy grasslands. The largest known population of this orchid occurs on the Sheyenne National Grasslands in Ransom County, North Dakota. Therefore, all grassland wetland areas in Ransom County were considered to be potential habitat for this orchid. To obtain a better search image for the habitat where this orchid occurs, an area on the Sheyenne National Grassland where this orchid was known to occur about two months prior to this survey was visited. The following photos were taken on September 12, 2006, of the habitat where western prairie fringed orchid (*Platanthera praeclara*) was seen in July 2006. Note the mowing and baling that has occurred since July.



Photo 1: Search image for western prairie fringed orchid habitat obtained at the Sheyenne National Grassland, Ransom County, North Dakota



Photo 2: Shyenenne National Grassland western prairie fringed orchid habitat located along roadside ditch



Photo 3: Baling had occurred along the roadside ditch where the western prairie fringed orchid had been sighted in July 2006

Native Grassland Habitat in the Dakotas

Ecologists often divide the Great Plains grasslands into short, mid, and tallgrass prairie regions. These three grasslands are named on the basis of the average height of the dominant, native grass cover. The differences among these three grassland types also correspond to both the amount and seasonal distribution of annual precipitation. The shortgrass steppe area usually receives less than 30 centimeters (cm) of precipitation per year, most of which occurs in summer thunderstorm events. The mixed or mid-grass prairie regions usually receive more than 30 cm of precipitation per year (up to 50 or more), but compared to the shortgrass prairie, the mid-grass prairie receives more annual precipitation during the spring. This early season precipitation encourages more of the "cool-season" or C-3 photosynthetic pathway grass species (*Stipa*, *Agropyron*, *Kohleria*). Finally, the tallgrass prairie, sometimes referred to as "true prairie," occurs further east and typically receives over 50 cm of precipitation per year.

The grasslands of interest in this survey are mid-grass prairie and tallgrass prairie areas along the proposed Keystone Pipeline Project construction right-of-way (ROW) in eastern North and South Dakota. The mixed or mid-grass grasslands were once dominated by cool-season grasses such as needle-and-thread (*Stipa*), junegrass (*Kohleria macrantha*), western wheat grass (*Agropyron smithii*) and others. The tallgrass areas have taller species such as Indian grass (*Sorghastrum nutans*), and big blue stem (*Andropogon gerardii*). There is a transition region between mid- and tallgrass prairie that is sometimes evident in the few remaining grasslands in the eastern Dakotas.

The significance of conserving the remaining grassland areas becomes evident when a few statistics are cited regarding the extent to which our native grasslands have been converted to other land uses, especially to cropland and pastures. Sampson and Knoph (1994) reported that over 99 percent of the original tallgrass prairie in Iowa, Minnesota, and North Dakota has been destroyed by settlement and agriculture. It was not indicated how much mixed or mid-grass prairie remains in North Dakota, but it was estimated that in South Dakota, about 85 percent of the original 3 million acres of mixed-grass prairie has been converted to non-grassland uses. Jones and Cushman (2004) site that only 0.3 percent of the original tallgrass prairie and 1.8 percent of the original mixed-grass prairie remains in central North America.

2.0 Methods

Prior to field work, aerial photographs of the entire Keystone Pipeline Project route in North Dakota and South Dakota were studied to identify potential native grassland areas. Survey sites were selected with varying size, geographic location, and hypothesized habitat quality, to capture a wide array of grassland habitat that would be encountered along the pipeline route. Based on the aerial photograph analysis these sites were further categorized as low, medium, or high quality grasslands; categories that were to be verified in the field. Sites identified as high quality grasslands typically were areas that appeared to have native vegetation, steep slopes or hills, or were fairly large, or that were adjacent to larger areas of grassland outside of the pipeline corridor. Sites identified as medium quality grasslands were areas of moderate size, or appeared to be lightly or moderately grazed pastures, or have a mixture of planted and native vegetation. Low quality grasslands were areas of smaller size, or sites that appeared to have a majority of planted grass species, or heavily grazed pastures. This designation helped assure that a large variety of sites would be visited in the field, and that no major grassland areas would be missed during the field survey.

Seventeen sites were pre-selected for ground surveys. A ground survey consisted of walking a majority of the survey site, taking detailed field notes of the site, completing a data sheet outlining the dominant vegetation types, native plant species, invasive plant species, disturbance, and potential threatened and endangered species habitat, taking representative photos of the site, and collecting voucher specimens for further identification. Drive-by reconnaissance was conducted at the remaining grassland sites identified from the aerial photograph exercise. Drive-by reconnaissance also consisted of taking field notes of the site, and completing a data sheet, taking photographs and global positioning system coordinates from the roadside. All sites were analyzed for native grassland habitat quality, and potential target species habitat.

3.0 Results

Field surveys were conducted by Sara Stribley (ENSR biologist) and Don Hazlett (ENSR botanist) from September 11 to September 16, 2006. A total of 38 sites were surveyed during this timeframe. Of the 38 sites visited, detailed documentation was completed for 30 of the sites. A data sheet for each of these 30 sites was completed, which includes a plant species list and other notes that are unique to the site. Photographs were taken of each location that was identified as a "feature" and a unique feature number was assigned to each of 30 these sites. The eight sites that were not recorded as features were either non-grassland areas, or were very low quality grassland sites, similar to previous survey sites visited. Notes were taken on these eight sites, but detailed documentation for these areas was not necessary. Global positioning system (GPS) coordinates also were taken at a majority of the sites to ensure that the surveys were being conducted within the pipeline construction ROW.

A ground survey was conducted at 12 sites. Initially, 17 sites were selected for ground surveys. However, in the field, some of the original 17 sites turned out to be agriculture fields or very low quality pastures, that did not warrant a thorough ground examination.

A summary table was made for the sites that were visited during the field survey (**Table 1**). This table contains information on the feature number, survey date, start and end milepost, county, state, survey type (visit or drive-by), habitat quality designation, target species designation (or not), and a brief description of the site.

Color photographs (one or more for each feature), detailed site summaries, and survey location maps can be found in Appendix I.

A list of over 150 plant species that were identified during this field survey, including several noxious weed species can be found in Appendix II.

For each of the 38 locations, a determination was made if the site consisted of native grassland. If the site contained some or all native grassland, the next determination was made in regards to the quality of the grassland. The following summarizes the determinants used in the field to classify grassland quality at each site:

High Quality Grassland. This category was assigned only to large areas dominated by native grass, with special attention given to corridor areas that were adjacent to large tracts of native grassland. Further criteria required to obtain a high quality status was the presence of a relatively high diversity of native grasses (three or more) and of native forbs (four or more that were relatively common). Also, there must be few exotic, weedy plants to be ranked as high. Only 10 of the 38 sites that were viewed or visited obtained the rank of high quality grassland (**Table 1**).

Medium Quality Grassland. This rank was given to grassland that had a matrix vegetation of native plants, but that also had significant disturbance, such as moderate to high grazing or pockets of exotic weeds or pasture grass invasion. Of the 38 sites that were viewed or visited, 7 obtained the rank of medium quality grassland (**Table 1**).

Low Quality Grassland. Plowed cropland was not considered grassland. In addition, unplowed pastures that have been heavily grazed for a long period of time, or that have been planted with exotic pasture grasses to the extent that no native grasses can be found, were not considered grassland, even though some of these sites contained several weedy, native forbs (ex: *Grindelia*). The low quality grassland rank was given to sites with a few upland or sometimes ridge top areas with recognizable areas of native grasses and forbs. An area could be considered low quality grassland despite the dominance in some areas of the corridor by smooth brome or by other pasture grasses. Of the 38 areas that were viewed, 17 (nearly half) were given a rank of low quality grassland (**Table 1**).

None. In the field it was discovered that 4 of the 38 areas designated from the aerial photographs as grassland were actually grass-filled wetlands or croplands (grazed hayfield, etc.).

Dakota skipper habitat. After an area was categorized as a high, medium, or low quality grassland, it was then determined if this area also was suitable habitat for the Dakota skipper butterfly. Factors that were considered in this determination were: 1) if there was little blue stem present, a known larval food for the Dakota skipper; 2) if at least two of the known pollen source plants for the Dakota skipper were present; 3) if there was a diverse mix of native grasses and forbs; 4) if there was a large area of native prairie adjacent to the pipeline corridor; and 5) if the site was in the range of where this species could potentially occur.

Based on the above criteria 8 of the 34 grassland areas were designated as potential Dakota skipper habitat sites (**Table 2**). Seven of these potential Dakota skipper habitat locations were on areas designated as high quality prairie, and one was on an area designated as medium quality grassland.

Western prairie fringed orchid habitat. After an area was categorized as a high, medium, or low quality grassland, it was then determined if this area also was habitat for the western prairie fringed orchid. Factors that were considered in this determination were: 1) if it was possible for a grassland (of any quality) to be subirrigated, 2) subirrigation meant that there needed to be a wetland area nearby, 3) if the wetland area had upland inclusions, and 4) if the site was in the range of where this orchid could potentially occur.

Based on these criteria, 8 of the 34 grassland areas were potential habitat for this orchid (**Table 2**). Of these selected locations, one was high quality grassland, three were medium quality grassland, and two were low quality grassland.

4.0 Discussion

Dakota skipper (*Hesperia dacotae*)

Most of the locations designated as potential habitat for the Dakota skipper were located on ridges or hilly areas containing native prairie with at least one Dakota skipper pollen plant, and little blue stem, the preferred food for Dakota skipper larvae.

The threats to Dakota skipper habitat identified by the USFWS Guidelines include burning, haying, grazing, pesticide use, and invasion by non-native plants, including exotic pasture grasses. During this survey there were few signs of burning or pesticide use, but grazing and exotic plants were present. The most severe threat to the few remaining sections of high and moderate quality grassland (potential Dakota skipper sites) was grazing coupled with exotic pasture grass invasion and/or planting. On several occasions, especially at the only site in Kingsbury County, there was clear evidence that grazing facilitated the invasion of exotic pasture grasses.

Pipeline construction reduces native grassland areas by destroying the prairie sod. Once disturbed, this sod is extremely slow (over 100 years) at redeveloping. A second threat is that disturbing soil along the construction ROW encourages the establishment of exotic pasture grasses, especially smooth brome (*Bromus inermis*) and the establishment of noxious weeds. The most aggressive weeds in this area are the plumeless thistle (*Carduus ancanthoides*) toward the south, Canadian thistle (*Cirsium arvense*) and wormwood (*Artemisia absinthium*) in wetlands and mesic pastures, and in some areas the invasion of sweet clover (*Melilotus*), bindweed (*Convolvulus arvensis*), and leafy spurge (*Euphorbia esula*).

Table 1 Summary of the 38 Sites Along the Keystone Pipeline Route in North and South Dakota that were Surveyed from September 11 to September 16, 2006 for: 1) Potential Habitat for the Prairie Fringed Orchid (*Platanthera praeclara*), 2) Potential Habitat for the Dakota Skipper Butterfly (*Hesperia dacotae*), and 3) for the Presence of Quality Native Grassland

	Feature Number	Survey Date	Start MP	End MP	County	State	Survey Type	Quality of Grassland Habitat	Suitable Dakota Skipper or Western Prairie Fringed Orchid Habitat?	Site Summary
1	None Designated	9/12/2006	200.4	202.0	Sargent	ND	Drive-by	None	No	Agriculture.
2	TDH1NDSA003	9/12/2006	202.0	202.5	Sargent	ND	Drive-by	Low	No	Wet lowland, few prairie plants, BRIN dominated.
3	None Designated	9/12/2006	202.4	203.6	Sargent	ND	Drive-by	None	No	Agriculture.
4	TDH1NDSA002	9/12/2006	203.6	203.9	Sargent	ND	Drive-by	High	Yes, Dakota skipper	Appears to be high quality native prairie from road.
5	TDH1NDSA001	9/12/2006	204.1	205.0	Sargent	ND	Site Visit	High	Yes, Dakota skipper	Very high quality, Government land.
6	None Designated	9/12/2006	205.0	205.6	Sargent	ND	Drive-by	Low	No	BRIN Pasture and wetland mosaic.
7	TDH1NDDI003	9/12/2006	207.8	208.3	Dickey	ND	Drive-by	Medium	Yes, prairie fringed orchid	Wetland meadow with upland inclusions.
8	TDH1NDDI002	9/12/2006	210.8	211.9	Dickey	ND	Site Visit	High	Yes, prairie fringed orchid	Grazed, wetland meadow with upland inclusions.
9	None Designated	9/12/2006	211.9	212.4	Dickey	ND	Drive-by	None	No	Agriculture.
10	TDH1NDDI001	9/12/2006	212.9	214.0	Dickey	ND	Drive-by	None	Yes, prairie fringed orchid	Large, high quality wetland with few upland areas.
11	TDH1SDMA001	9/13/2006	228.5	228.9	Marshall	SD	Site Visit	None	No	Large, wetland meadow on State land.
12	None Designated	9/11/2006	258.6	258.8	Day	SD	Drive-by	Low	Yes, prairie fringed orchid	Appeared to be heavily grazed from the road.
13	TDH1SDDA005	9/11/2006	260.0	260.8	Day	SD	Drive-by	Low	No	Heavily grazed, with only a few native grasses and forbs.
14	TDH1SDDA004	9/11/2006	261.4	262.6	Day	SD	Drive-by	Low	No	Wheatgrass pasture with few native grasses and forbs.
15	TDH1SDDA003	9/11/2006	264.5	264.8	Day	SD	Site Visit	Low	No	Heavily grazed BRIN ridge near a meandering creek.
16	TDH1SDDA002	9/11/2006	265.2	266.2	Day	SD	Site Visit	High	Yes, Dakota skipper	Native prairie adjacent to a hilly, high quality prairie.

Table 1 Summary of the 38 Sites Along the Keystone Pipeline Route in North and South Dakota that were Surveyed from September 11 to September 16, 2006 for: 1) Potential Habitat for the Prairie Fringed Orchid (*Platanthera praeclara*), 2) Potential Habitat for the Dakota Skipper Butterfly (*Hesperia dacotae*), and 3) for the Presence of Quality Native Grassland

	Feature Number	Survey Date	Start MP	End MP	County	State	Survey Type	Quality of Grassland Habitat	Suitable Dakota Skipper or Western Prairie Fringed Orchid Habitat?	Site Summary
17	None Designated	9/11/2006	267.2	267.7	Day	SD	Drive-by	Low	No	Pasture with introduced grasses.
18	TDH1SDDA001	9/11/2006	270.6	271.6	Day	SD	Drive-by	Low	No	Heavily grazed riparian area in corridor.
19	None Designated	9/11/2006	272.3	273.3	Clark	SD	Drive-by	Low	No	Pasture with introduced grasses.
20	TDH1SDCL005	9/13/2006	277.2	277.9	Clark	SD	Drive-by	Medium	Yes, prairie fringed orchid	A mosaic of pasture/wetland and grassland.
21	TDH1SDCL006	9/13/2006	278.4	279.2	Clark	SD	Drive-by	Medium	Yes, prairie fringed orchid	A mosaic of pasture/wetland and grassland.
22	TDH1SDCL004	9/11/2006	280.1	280.5	Clark	SD	Drive-by	Low	No	BRIN dominated alkaline pasture.
23	None Designated	9/11/2006	280.8	281.1	Clark	SD	Drive-by	Low	No	Pasture with introduced grasses.
24	TDH1SDCL003	9/11/2006	285.3	285.7	Clark	SD	Drive-by	Low	No	Heavily grazed, BRIN dominated riparian/meadow.
25	TDH1SDCL002	9/11/2006	293.7	294.1	Clark	SD	Drive-by	Low	No	Heavily grazed, BRIN dominated riparian/meadow.
26	TDH1SDCL001	9/11/2006	296.9	297.9	Clark	SD	Site Visit	Medium	Yes, Dakota skipper	Wetland swale with upland (blue grama) inclusions.
27	TDH1SDKI001	9/16/2006	325.1	326.4	Kingsbury	SD	Drive-by	High/North Medium/ South	No	Road dissects High (N) and Medium (S) quality grasslands.
28	TDH1SDMI001	9/16/2006	342.9	344.0	Miner	SD	Drive-by	Low	No	Redstone Creek with BRIN, <i>Poa</i> and AGCR pasture grasses.
29	TDH1SDMI002	9/16/2006	358.5	359.9	Miner	SD	Drive-by	Low	No	BRIN pasture with wetland spots.
30	TDH1SDMC001	9/16/2006	383.9	384.5	McCook	SD	Drive-by	Medium to High	Yes, prairie fringed orchid	BRIN pasture with wetlands and native grassland on hills.

Table 1 Summary of the 38 Sites Along the Keystone Pipeline Route in North and South Dakota that were Surveyed from September 11 to September 16, 2006 for: 1) Potential Habitat for the Prairie Fringed Orchid (*Platanthera praeclara*), 2) Potential Habitat for the Dakota Skipper Butterfly (*Hesperia dacotae*), and 3) for the Presence of Quality Native Grassland

	Feature Number	Survey Date	Start MP	End MP	County	State	Survey Type	Quality of Grassland Habitat	Suitable Dakota Skipper or Western Prairie Fringed Orchid Habitat?	Site Summary
31	TDH1SDHU001	9/16/2006	389.7	390.6	Hutchinson	SD	Drive-by	Low	No	BRIN / <i>Poa</i> dominated pasture.
32	TDH1SDHU002	9/16/2006	390.9	391.7	Hutchinson	SD	Site Visit	High	Yes, Dakota skipper, prairie fringed orchid	By Wolf Creek, rolling, native prairie hills.
33	TDH1SDYA006	9/15/2006	418.7	419.2	Yankton	SD	Site Visit	Medium	No	Grassland on ridges. BRIN / <i>Poa</i> pasture & weeds in wet spots.
34	TDH1SDYA005	9/15/2006	419.6	420	Yankton	SD	Site Visit	High	Yes, Dakota Skipper	Mosaic of BRIN pasture with quality BOGR prairie spots.
35	TDH1SDYA004	9/15/2006	420.6	420.8	Yankton	SD	Drive-by	High	Yes, Dakota Skipper	Moderately grazed hills with native grassland.
36	TDH1SDYA003	9/15/2006	421.8	422.1	Yankton	SD	Site Visit	High	Yes, Dakota Skipper	By James River, native prairie ridges between cedar/broadleaf tree-filled ravines.
37	TDH1SDYA002	9/15/2006	423.5	423.8	Yankton	SD	Site Visit	Medium	No	Heavily grazed, but BOGR dominated.
38	TDH1SDYA001	9/14/2006	426.7	428.9	Yankton	SD	Site Visit	Low	No	BRIN and <i>Carduus acanthoides</i> in swales: few native plants.

ND – North Dakota

SD – South Dakota

BRIN – *Bromus inermis*

AGCR – *Agropyron cristatum*

BOGR – *Bouteloua gracilis*

Table 2 Summary Sites that Contain Suitable Dakota Skipper and Western Prairie Fringed Orchid Habitat

Feature Number	Start MP	End MP	County	State	Quality of Grassland Habitat	Survey Type	Site Summary
TDH1NDSA002	203.6	203.9	Sargent	ND	High	Dakota skipper	Appears to be high quality native prairie from road.
TDH1NDSA001	204.1	205.0	Sargent	ND	High	Dakota skipper	Very high quality, Government land.
TDH1NDDI003	207.8	208.3	Dickey	ND	Medium	western prairie fringed orchid	Wetland meadow with upland inclusions.
TDH1NDDI002	210.8	211.9	Dickey	ND	High	western prairie fringed orchid	Grazed, wetland meadow with upland inclusions.
TDH1NDDI001	212.9	214.0	Dickey	ND	None	western prairie fringed orchid	Large, high quality wetland with few upland areas.
None Designated	258.6	258.8	Day	SD	Low	western prairie fringed orchid	Appeared to be heavily grazed from the road.
TDH1SDDA002	265.2	266.2	Day	SD	High	Dakota skipper	Native prairie adjacent to a hilly, high quality prairie.
TDH1SDCL005	277.2	277.9	Clark	SD	Medium	western prairie fringed orchid	Mosaic of pasture/wetland and grassland.
TDH1SDCL006	278.4	279.2	Clark	SD	Medium	western prairie fringed orchid	Mosaic of pasture/wetland and grassland.
TDH1SDCL001	296.9	297.9	Clark	SD	Medium	Dakota skipper	Wetland swale with upland (blue grama) inclusions.
TDH1SDMC001	383.9	384.5	McCook	SD	Medium to High	western prairie fringed orchid	BRIN pasture with wetlands and native grassland on hills.
TDH1SDHU002	390.9	391.7	Hutchinson	SD	High	Dakota skipper, western prairie fringed orchid	By Wolf Creek, rolling, native prairie hills.
TDH1SDYA005	419.6	420	Yankton	SD	High	Dakota skipper	Mosaic of BRIN pasture with quality BOGR prairie spots.

Table 2 Summary Sites that Contain Suitable Dakota Skipper and Western Prairie Fringed Orchid Habitat

Feature Number	Start MP	End MP	County	State	Quality of Grassland Habitat	Survey Type	Site Summary
TDH1SDYA004	420.6	420.8	Yankton	SD	High	Dakota skipper	Moderately grazed hills with native grassland.
TDH1SDYA003	421.8	422.1	Yankton	SD	High	Dakota skipper	By James River, native prairie ridges between cedar/broadleaf tree-filled ravines.

ND – North Dakota

SD – South Dakota

BRIN – *Bromus inermis*

AGCR – *Agropyron cristatum*

BOGR – *Bouteloua gracilis*

Western prairie fringed orchid (*Plantanthera praeclara*)

Declines in the western prairie fringed orchid populations, as identified by the USFWS Guidelines, have been caused by the drainage and conversion of its habitats to agricultural production, channelization, siltation, road and bridge construction, grazing, haying, and the application of herbicides. The most apparent threats to the orchid along the proposed Keystone Pipeline Project construction ROW include conversion of its habitat to agriculture, haying, and heavy grazing.

5.0 Grassland Survey Sites in Nebraska

The Nebraska Game and Park Commission (NGPC) indicated that it has identified and mapped remnant native grasslands in Nebraska. To date, Keystone has not received the NGPC data to determine whether any of these remnant grasslands would be crossed by the project.

ENSR identified as potential native grassland or high quality grassland areas from aerial photograph interpretation. These areas are very limited in number, and therefore, all of these areas should be included in the 2007 surveys for native grassland species. **Table 3** details the locality information for these additional survey areas in Nebraska. Aerial photographs of these survey areas are presented in Appendix III.

Table 3 Additional Grassland Survey Sites in Nebraska for the 2007 Grassland Species Surveys

Start MP	End MP	County	Grassland Species
436.0	436.1	Cedar	Western prairie fringed orchid, small white lady's slipper
503.4	503.5	Stanton	Western prairie fringed orchid, small white lady's slipper
540.9	541.2	Colfax	Western prairie fringed orchid, small white lady's slipper
548.1	548.2	Butler	Western prairie fringed orchid, small white lady's slipper
564.4	564.7	Butler	Western prairie fringed orchid, small white lady's slipper
594.8	595.1	Saline	Western prairie fringed orchid, small white lady's slipper
606.4	606.5	Saline	Western prairie fringed orchid, small white lady's slipper
622.2	622.4	Jefferson	Western prairie fringed orchid, small white lady's slipper
635.1	636.8	Jefferson	Western prairie fringed orchid, small white lady's slipper
637.0	637.4	Jefferson	Western prairie fringed orchid, small white lady's slipper

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Appendix I

Photos, Site Summaries, and Survey Location Maps

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Grassland Habitat Quality	Suitable T&E Habitat?
TDH1NDSA003	9/12/2006	202.0	202.5	Sargent	ND	Drive By	Low	No

Site Summary: Over 90% smooth brome (*Bromus inermis*) pasture with weedy wormwood (*Artemisia absinthium*) in spots. A railroad dissects this pasture (to the left of this photograph). This pasture area is not suitable habitat for any of the target species.



Feature TDH1SDSA003: Overview of this smooth brome (*Bromus inermis*) dominated pasture.

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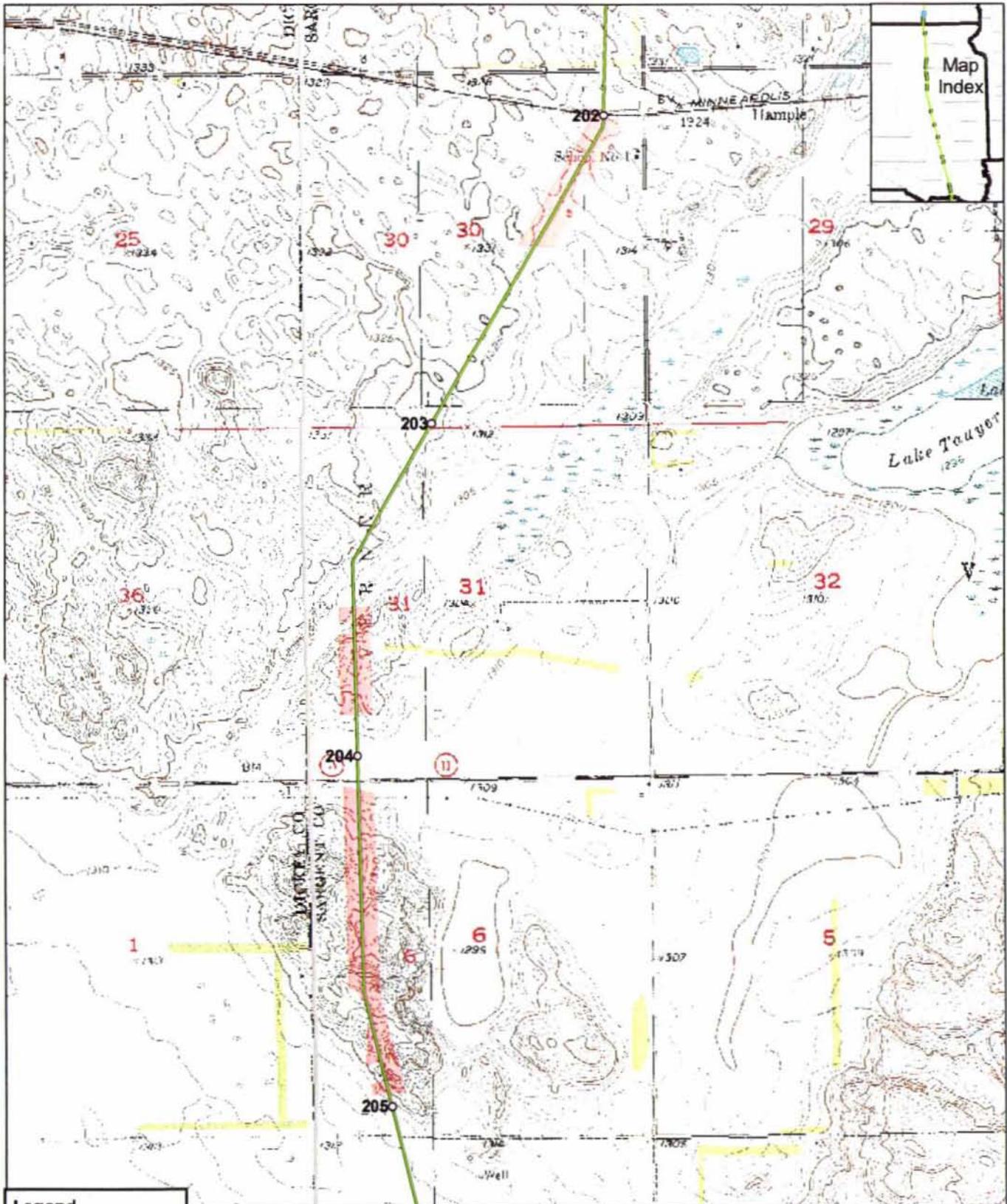
Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1NDSA002	9/12/2006	203.6	203.9	Sargent	ND	Drive By	High	Yes, Dakota skipper

Site Summary: This agriculture field is by a paved road. However, on the hills in the background of this photograph is grassland ca. 0.25 mile north that was ranked as high quality (we had no access). This grassland is similar to feature TDH1NDSA001 and is designated as Dakota skipper habitat.



Feature TDH1NDSA002: This high quality grassland is in the distance, past the agriculture field.

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Legend

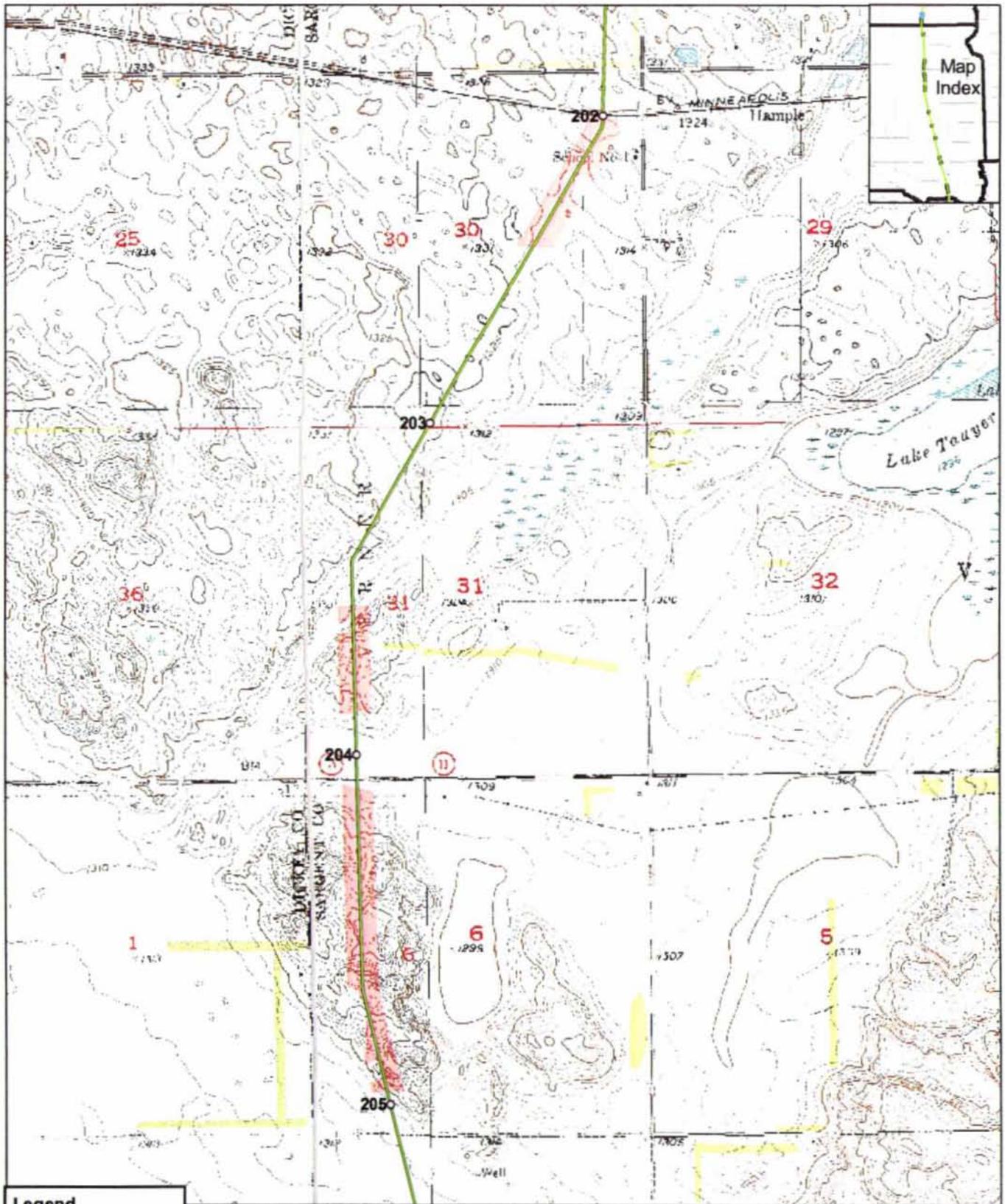
- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project



Map 1 of 21
Surveyed
Grasslands

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

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0 1,000 2,000 Feet

Map 1 of 21
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Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1NDSA001	9/12/2006	204.1	205.0	Sargent	ND	Site Visit	High	Yes, Dakota skipper

Site Summary: This is a very high quality grassland site. The site contains rolling hills of rock grass (*Kohleria macrantha*), little blue stem (*Schizachyrium scoparium*), and big blue stem (*Andropogon gerardii*). Native forbs include white sage (*Artemisia ludoviciana*) on rocky hillsides, and Dakota skipper pollen plants such as black Sampson (*Echinacea*) and leadplant (*Amorpha*). Other pollen plants for the Dakota skipper, such as fleabane (*Erigeron*), are likely to be present, but were not seen in mid-September. This site also has animal burrows and access to water for wildlife. A re-route to the west of this high quality area (along a road) deserves consideration.



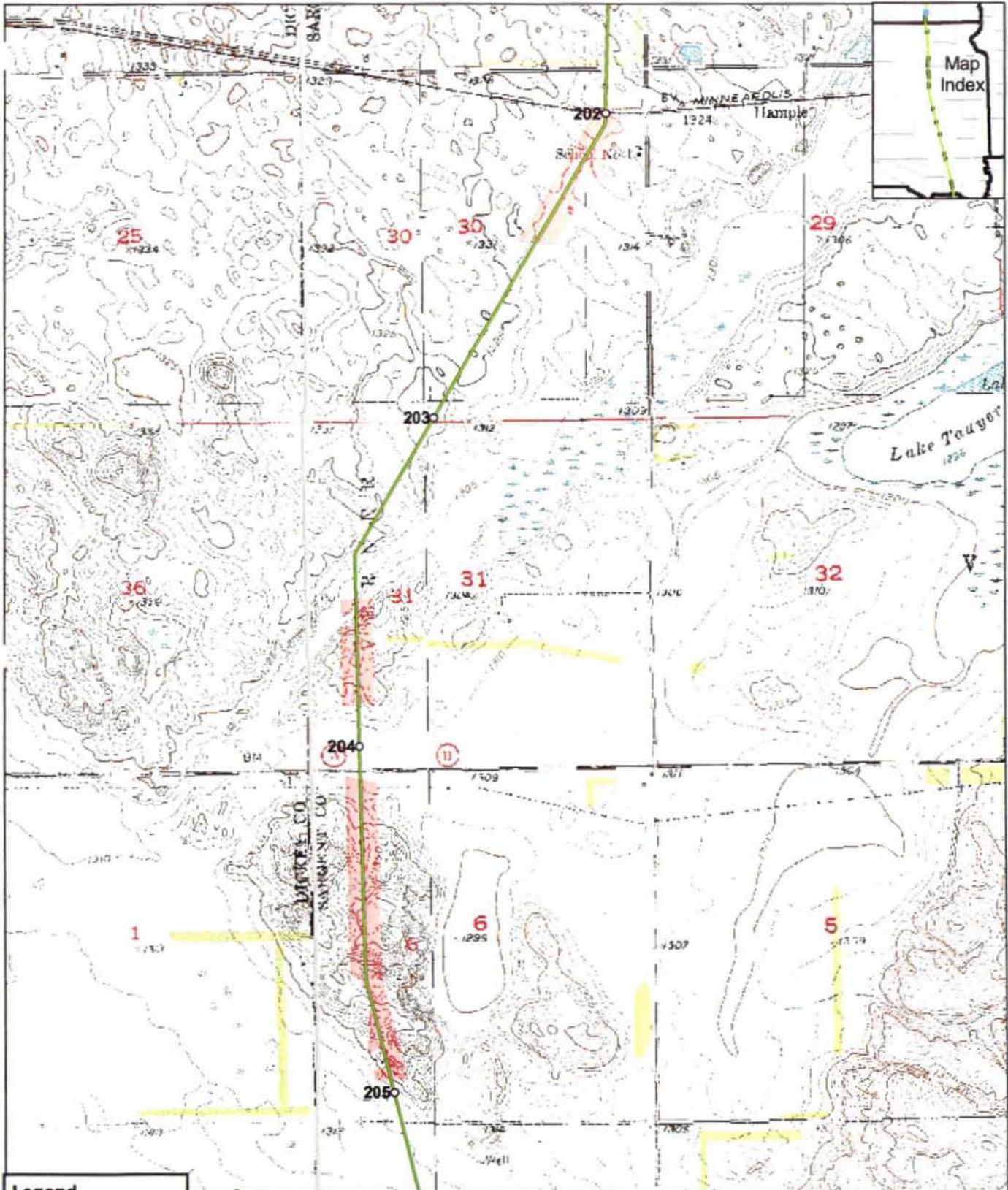
Feature:TDH1NDSA001: View to the east of this high quality grassland area.

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Feature TDH1NDSA001: Overview of this very high quality grassland area. This is the largest tract of native grassland seen during this survey.

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

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Feet

Map 1 of 21
Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1NDDI003	9/12/2006	207.8	208.3	Dickey	ND	Drive By	Medium	Yes, prairie fringed orchid

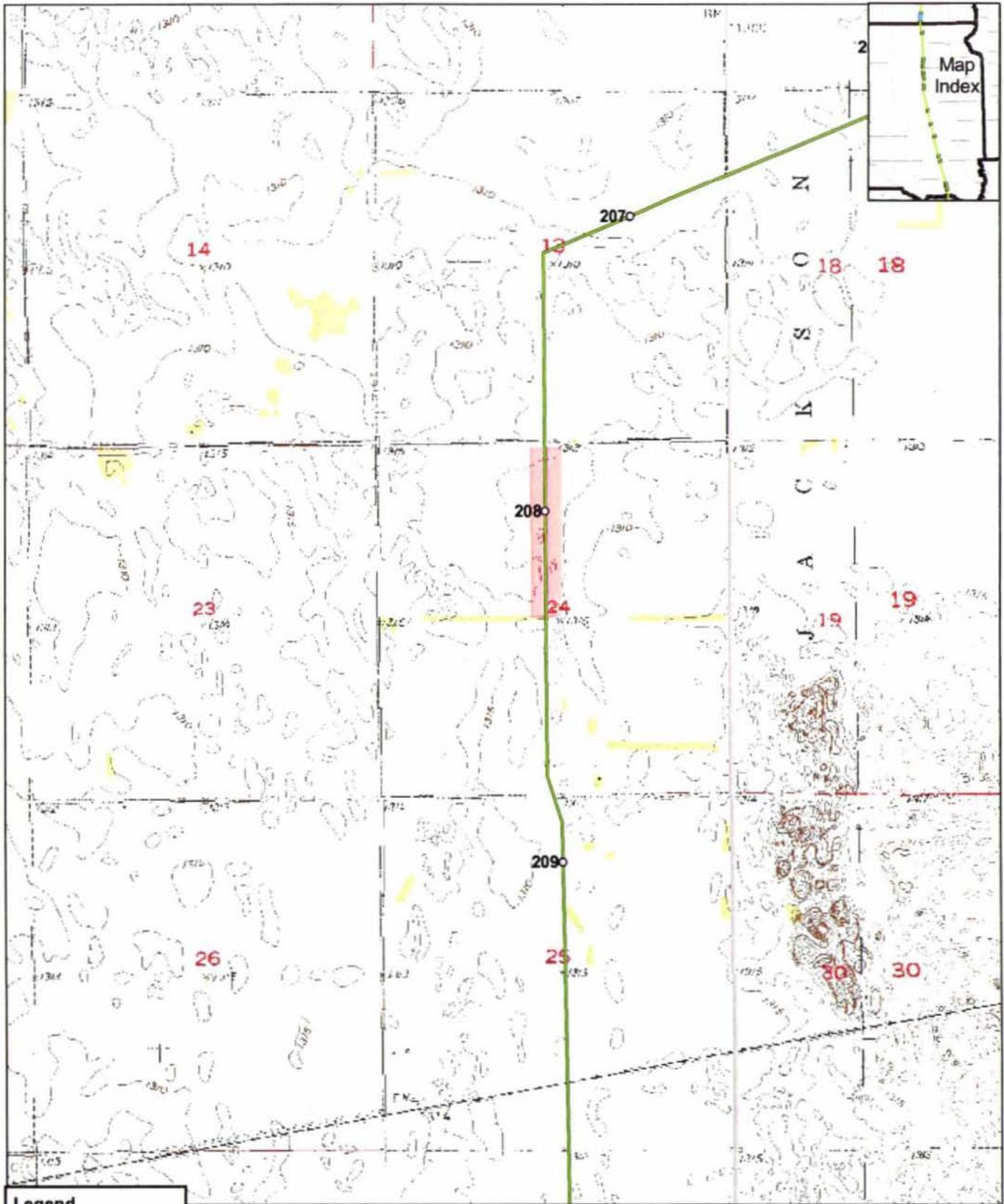
Site Summary: This lowland meadow has a mosaic of wetlands (*Typha*, *Scholenopectus*, *Hordeum jubatum*, *Spartina pectinata*, etc.), with upland inclusions. Despite weeds and grazing this is potential habitat for the prairie fringed orchid. This location is visually similar to TDH1NDDI002.



Feature TDH1NDDI003: Overview of wet meadow with upland inclusions.



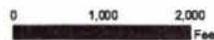
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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

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Map 2 of 21
Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1NDDI002	9/12/2006	210.8	211.9	Dickey	ND	Site Visit	High	Yes, prairie fringed orchid

Site Summary: This lowland meadow has a mosaic of wetlands (*Typha*, *Scholenopectus*, *Hordeum jubatum*, *Spartina pectinata*, etc.), with upland inclusions. Despite weeds and grazing this grassland is potential habitat for the prairie fringed orchid. The Great Plains lady's tresses orchid (*Spiranthes cf. magnicamphorum*) occurs at this location (see photo below).



Feature TDH1NDDI002: Overview of mosaic area with uplands and wetlands.

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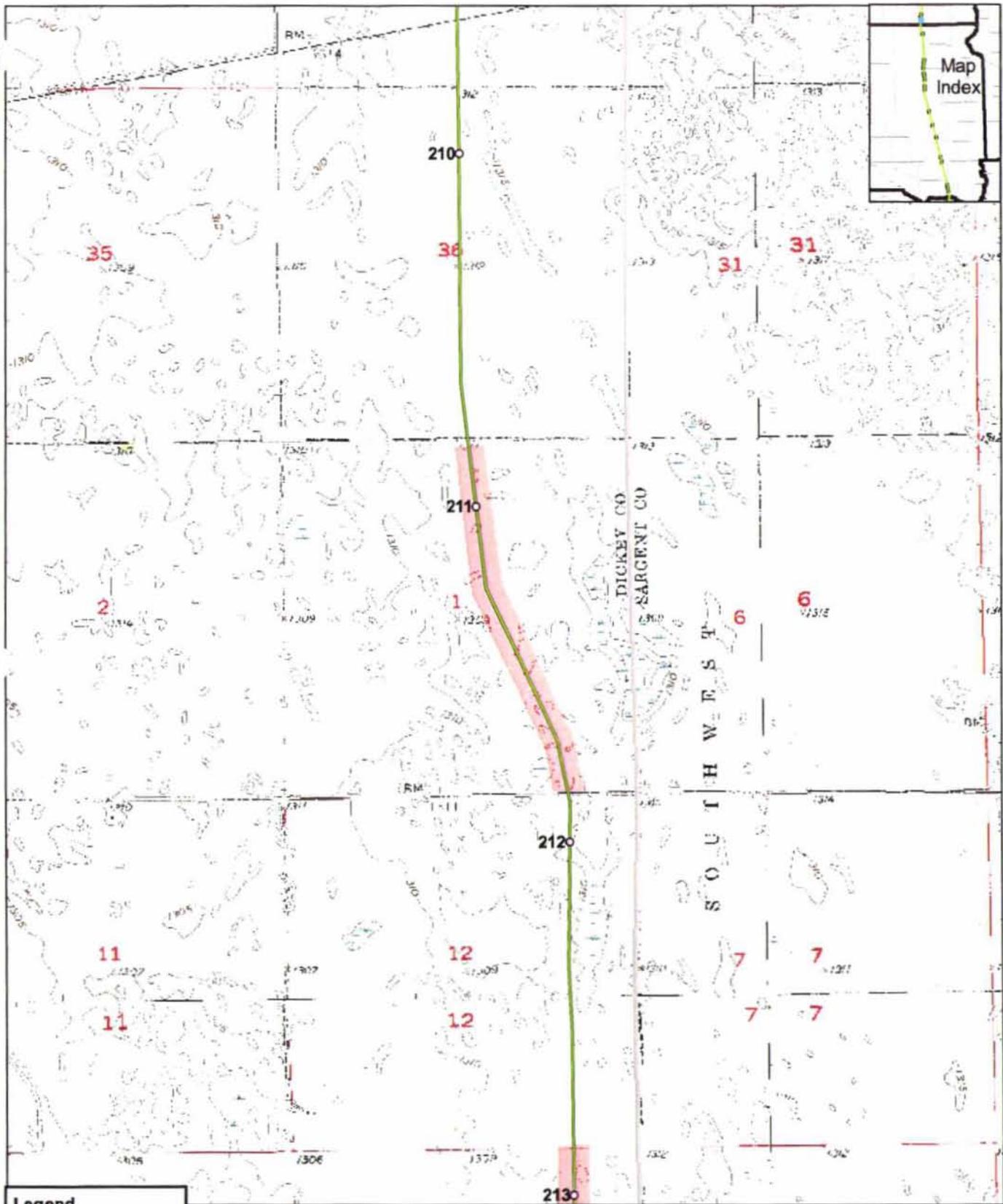


Feature TDH1NDDI002: Great Plains Lady's tresses orchid (*Spiranthes cf. magnicamphorum*)



Feature TDH1NDDI002: Overview of the *Spiranthes* habitat. Note the distance between the white orchid (to the right) and the wetland (to the left).

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

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Map 3 of 21
Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1NDDI001	9/12/2006	212.9	214.0	Dickey	ND	Drive By	None	Yes, prairie fringed orchid

Site Summary: This is a large wetland with willow (*Salix spp.*) and cottonwood (*Populus deltoides*) trees scattered among *Typha* (cattails) and prairie cordgrass (*Spartina pectinata*). Some areas are dense with willows while others are 100% cattails. This large wetland meadow also has wooden water-fowl hunting blinds as towers (ca. 15 feet tall) that occur at or near center line (in the distance of the second photograph). This is a high quality wetland with perhaps a few upland, grassy areas where the prairie fringed orchid could occur.



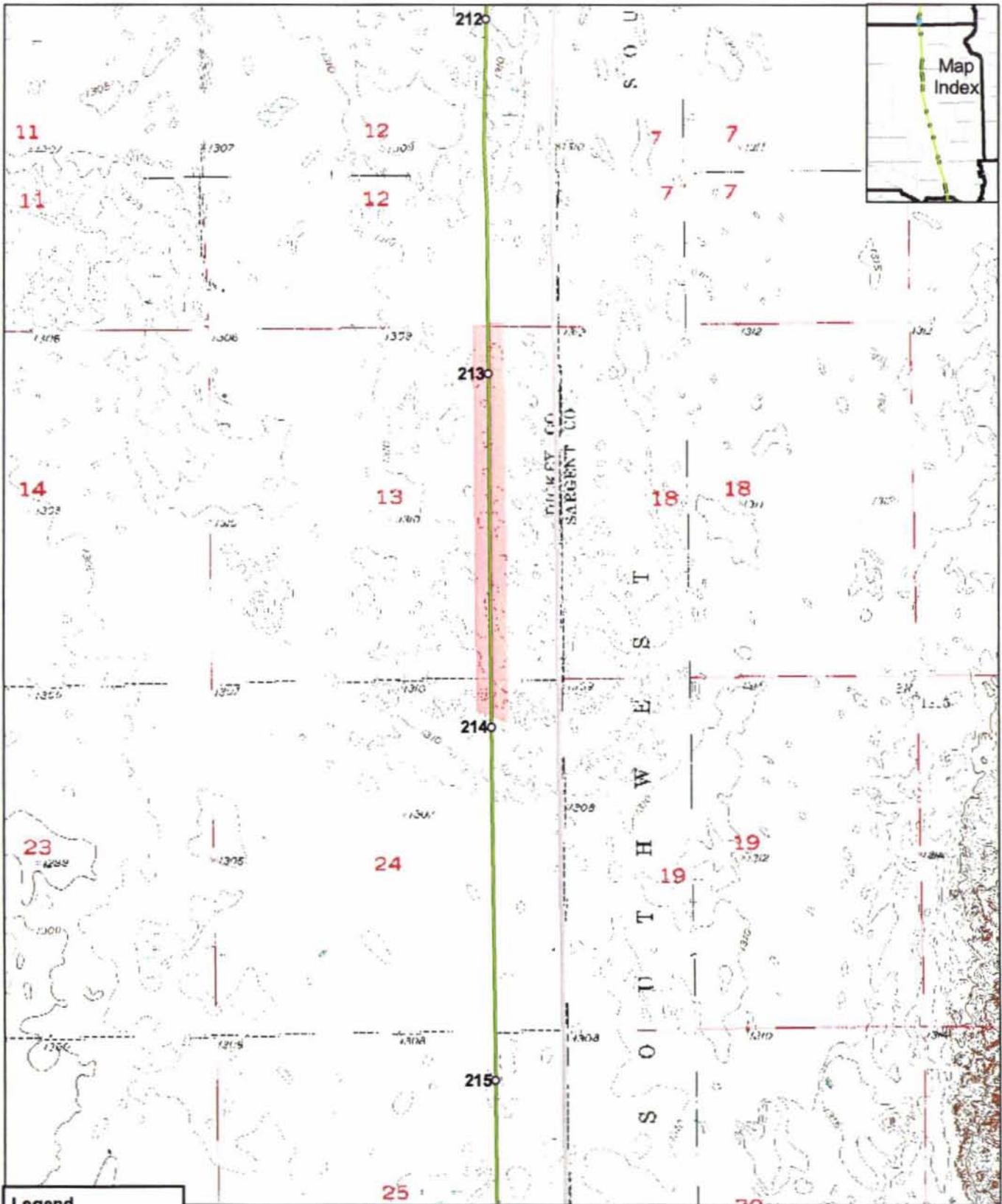
Feature TDH1NDDI001: Large wetland with willows (*Salix sp*), cattails (*Typha sp*) and a few cottonwood trees (*Populus deltoides*).

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Feature TDH1NDDI001: Large wetland with several wooden hunting towers (blinds) near the center.

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project



Map 4 of 21
Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDMA001	9/13/2006	228.5	228.9	Marshall	SD	Site Visit	None	No

Site Summary: This area appeared as grassland on the aerial photographs. However, it is dominated by reed canary grass (*Phalaris arundinacea*) and a strip of common reed grass (*Phragmites australis*) along the ditch to the north. This is a game production area (note the sign in the third photograph) with patches of smooth brome (*Bromus inermis*). This is a high quality wetland site with minimal grazing, but no grassland inclusions were seen.



Feature TDH1SDMA001: Southern exposure along center line of this large wetland, dominated by reed canary grass (*Phalaris arundinacea*) and common reed grass (*Phragmites australis*).

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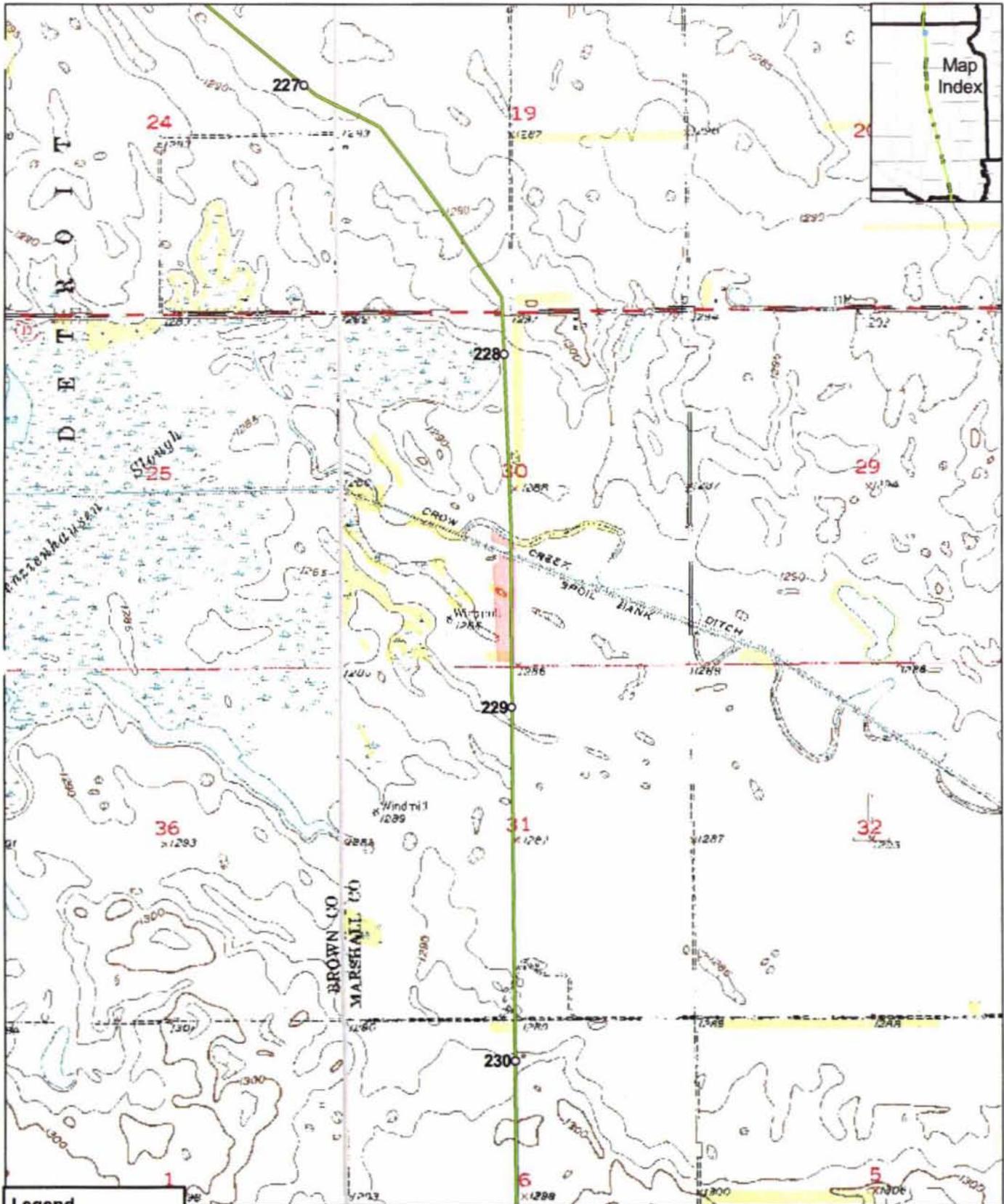


Feature TDH1SDMA001: View along center line that crosses this canal.



Feature TDH1SDMA001: Sign at the border of this large wetland that is on state land.

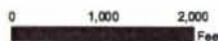
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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project



Map 5 of 21
Surveyed
Grasslands

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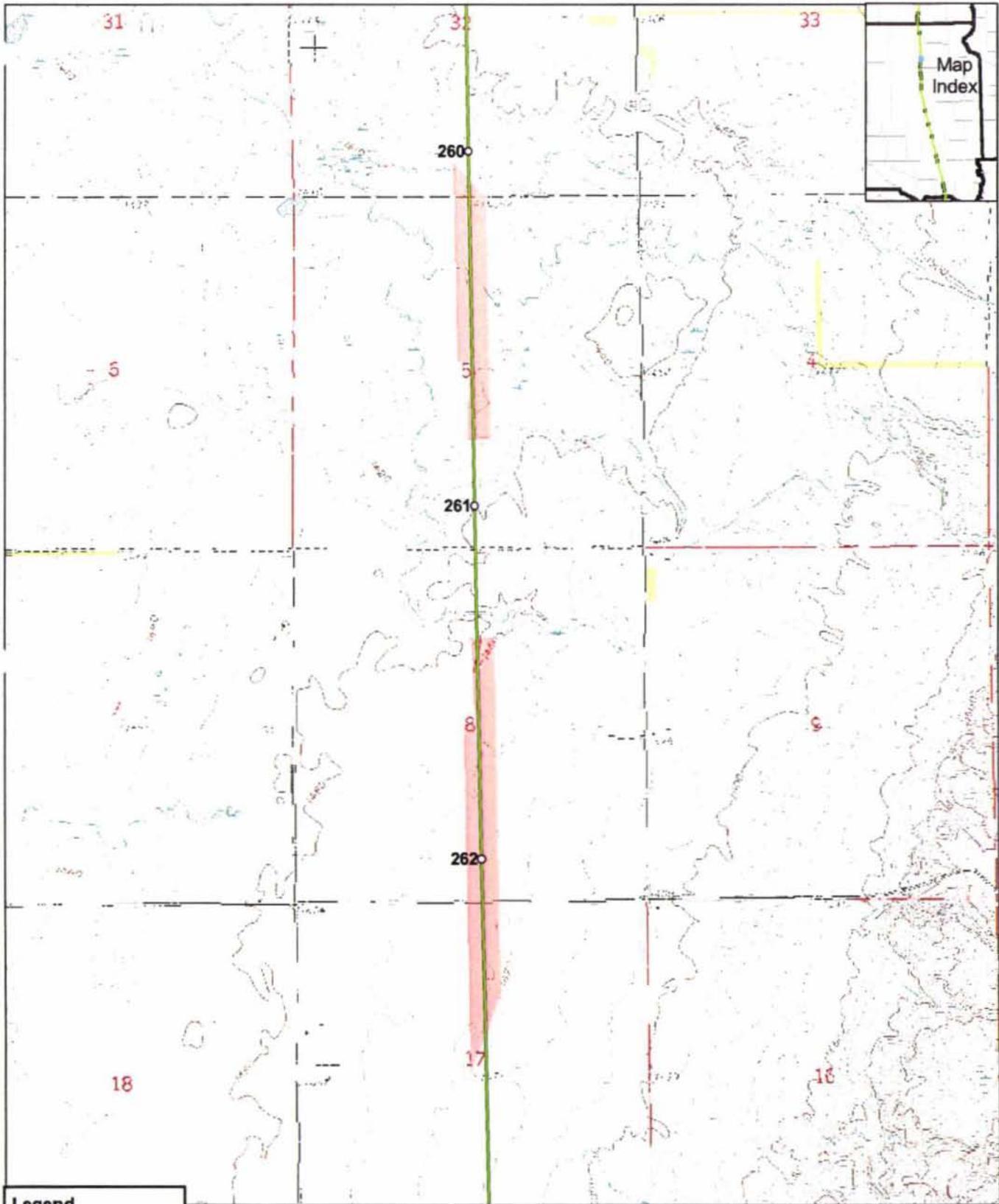
Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDHISDDA005	9/11/2006	260.0	260.8	Day	SD	Drive By	Low	No

Site Summary: This site was seen only from a distance (drive-by), but appeared heavily grazed. It is a low quality grassland area.



Feature TDH1SDDA005: Overview of this heavily grazed pasture.

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project

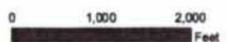


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Map 6 of 21
Surveyed
Grasslands

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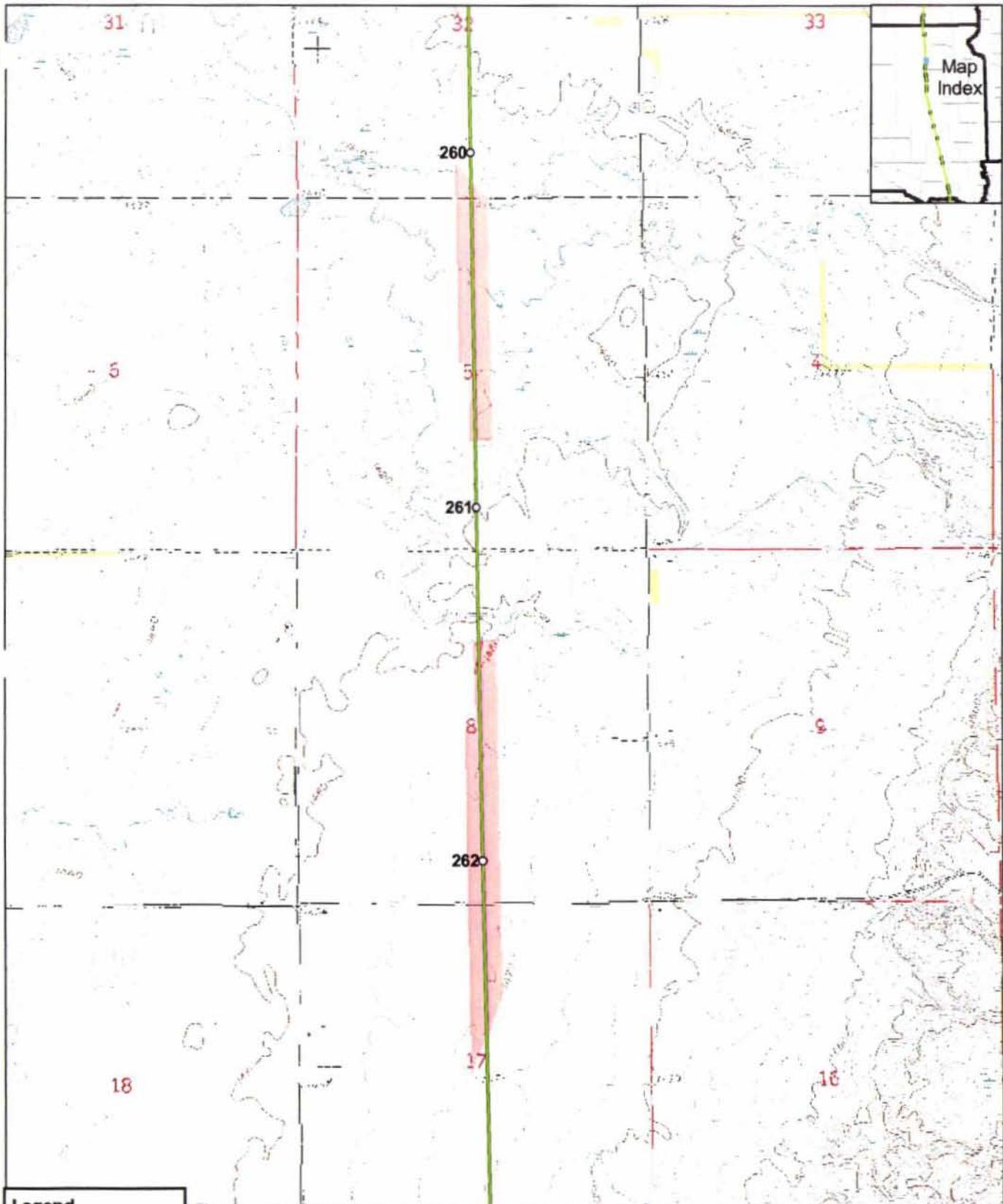
Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDDA004	9/11/2006	261.4	262.6	Day	SD	Drive By	Low	No

Site Summary: A pasture dominated by introduced wheat grasses such as tall and intermediate wheat grass (*Agropyron spp.*) and perhaps other *Agropyron* species. There may be a few native grasses and forbs in spots, but the overall grassland quality is low.



Feature TDH1SDDA004: Pasture planted with wheatgrass (*Agropyron spp.*).

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- State Boundary
- - - County Boundary

Keystone Pipeline Project



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Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDDA003	9/11/2006	264.5	264.8	Day	SD	Site Visit	Low	No

Site Summary: This is a heavily grazed hillside with an ox-bow by a stream. It is mostly all smooth brome (*Bromus inermis*), but it also has dense spots of Canadian thistle (*Cirsium arvense*) near the stream, patches of wormwood (*Artemisia absinthium*) on the hillsides, and wet spots with prairie cordgrass (*Spartina pectinata*). A few native forbs such as silver scurf pea (*Pedimelum argophyllum*) also occur, but the grassland quality is low.



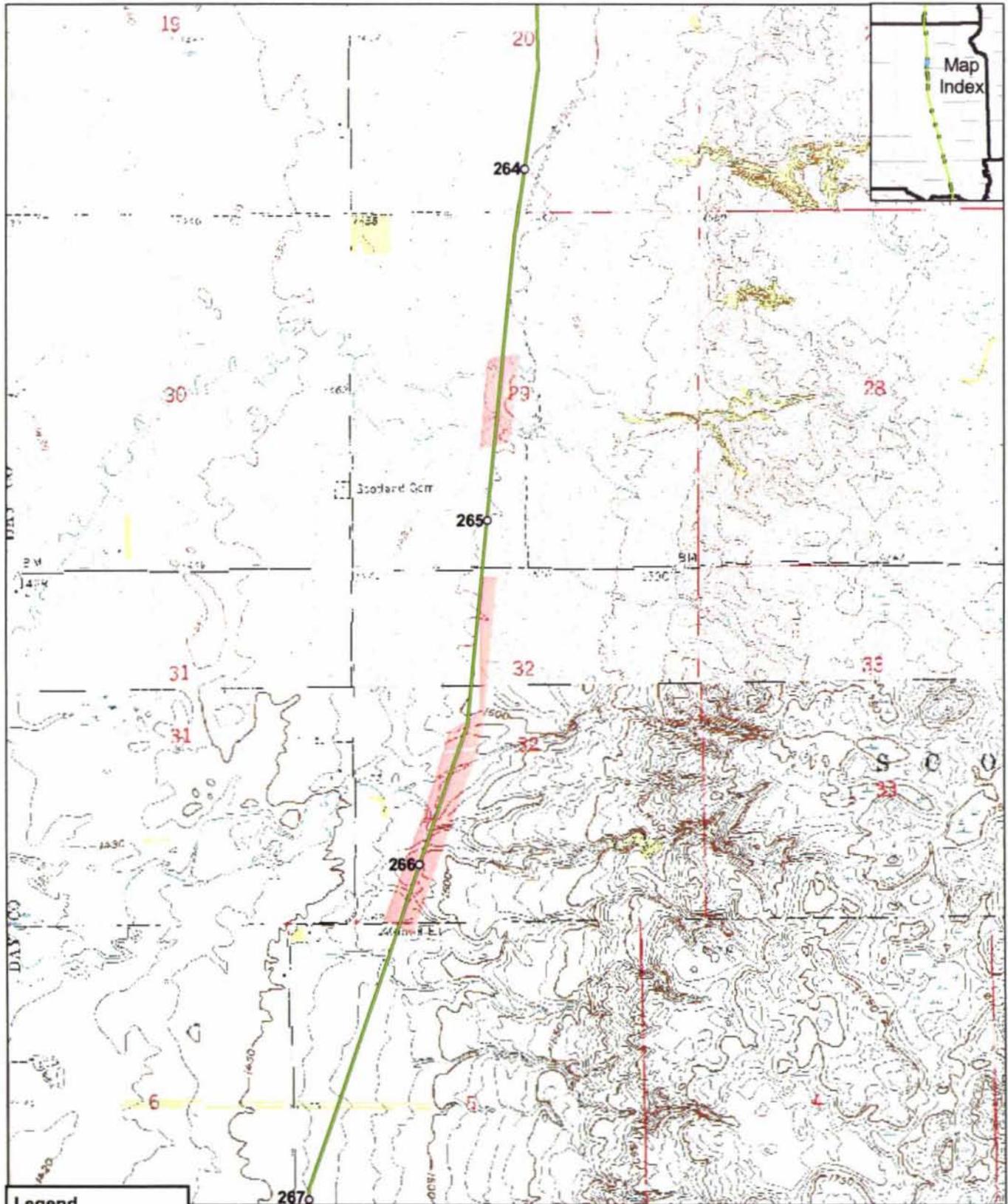
Feature TDH1SDDA003: Overview of large wetland located at site.

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Feature TDH1SDDA003: Close-up of prairie cordgrass (*Spartina pectinata*)

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- State Boundary
- County Boundary

Keystone Pipeline Project



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Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDDA002	9/11/2006	265.2	266.2	Day	SD	Site Visit	High	Yes, Dakota skipper

Site Summary : This is high quality prairie area. The northern section is adjacent (toward the east) to a high quality, rolling hill prairie. To the west is a plowed field (photograph 1). In the middle section of this tract the corridor crosses a disturbed area of a farm. However, in the southern portion the center line actually crosses quality rolling hills with high quality prairie. The southern section of the site contained Dakota skipper pollen plants such as black Sampson (*Echinacea*) and leadplant (*Amorpha*). On the rocky slopes were side-oats grama (*Bouteloua curtipendula*), little blue stem (*Schicachyrium scoparium*), and big blue stem (*Andropogon gerardii*). This was the only site where the clonal variety of pincushion cactus (*Coryphantha vivipara*) was seen. Rerouting the pipeline a bit to the west to avoid this high quality prairie should be considered.



Feature TDH1SDDA002: Agricultural field in background.

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Feature TDH1SDDA002: Hills with red-brown little blue stem (*Schizachyrium scoparium*)



Feature TDH1SDDA002: A close-up of leadplant (*Amorpha canescens*)

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Feature TDH1SDDA002: Close-up of Big Blue Stem (*Andropogon gerardii*)

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Feature TDH1SDDA002: Fruiting heads of black Sampson (*Echinacea angustifolia*)



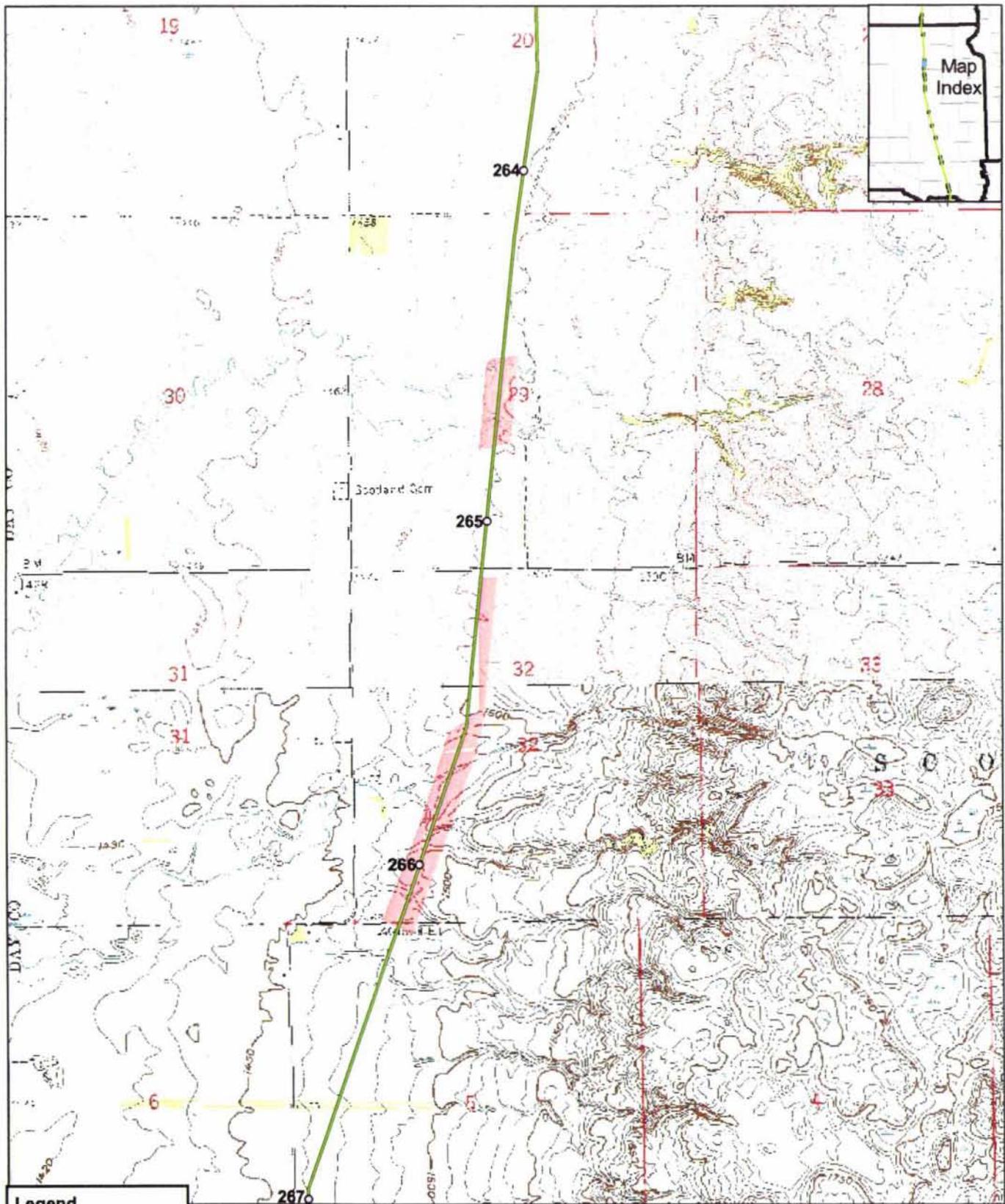
Feature TDH1SDDA002: Close-up of silky aster (*Aster sericeus*)

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Feature TDH1SDDA002: Close-up of the clonal variety of pincushion cactus (*Coryphantha vivipara*).

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- Legend**
- Mileposts
 - Proposed Centerline
 - Surveyed Grasslands
 - ▭ State Boundary
 - ▭ County Boundary

Keystone Pipeline Project



0 1,000 2,000 Feet

Map 7 of 21
Surveyed
Grasslands

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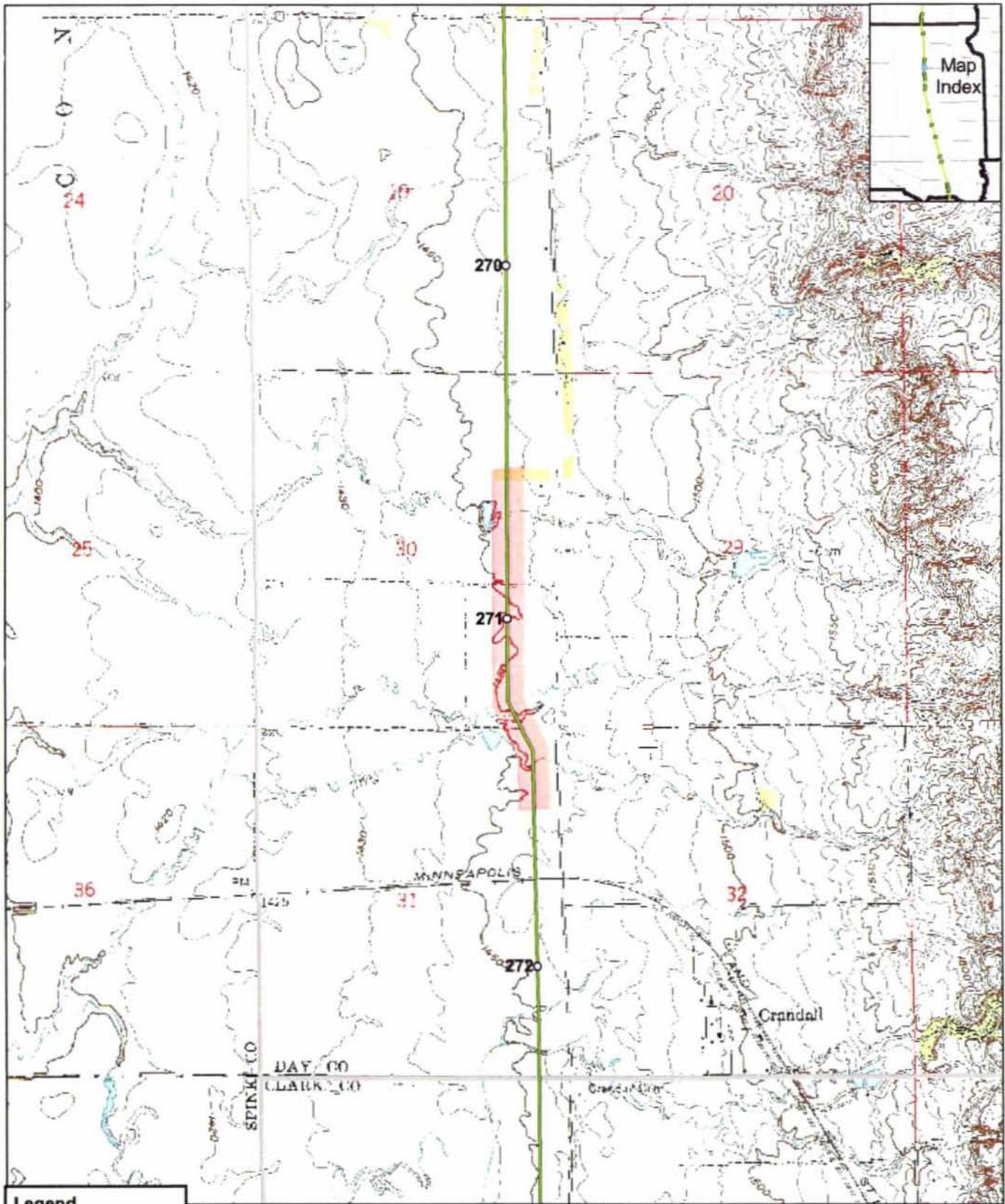
Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDDA001	9/11/2006	270.6	271.6	Day	SD	Drive By	Low	No

Site Summary: This is an alkaline pasture / wetland with prairie cordgrass (*Spartina pectinata*) and saltgrass (*Distichlis spicata*). There are a few native forbs here such as blazing star (*Liatris ligulistylis*), but exotic plants such as Russian olive (*Elaeagnus angustifolia*), Canadian thistle (*Cirsium arvense*), and wormwood (*Artemisia absinthium*) are also present at this low quality grassland site.



Feature TDH1SDDA001: A Russian olive tree (*Elaeagnus angustifolia*) by an alkaline, heavily grazed pasture.

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

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Grasslands



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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDCL005	9/13/2006	277.2	277.9	Clark	SD	Drive By	Medium	Yes, prairie fringed orchid

Site Summary: This is an area with exotic pasture grasses, such as crested wheat grass (*Agropyron cristatum*), and with exotic forage legumes such as alfalfa (*Medicago sativa*), yellow sweet clover (*Melilotus officinalis*), and clover (*Trifolium*). There are upland spots with native plants that include hoary vervain (*Verbena stricta*), prairie cone flower (*Ratibida columnifera*), and silver scurf pea (*Pedimelum argophyllum*). This is potential prairie fringed orchid habitat.



Feature TDH1SDCL005: Close-up of wetland vegetation that is potential prairie orchid habitat.

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Feature TDH1SDCL005: Overview of pasture area included on site.



Feature TDH1SDCL005: Prairie cone flower (*Ratibida columnifera*)

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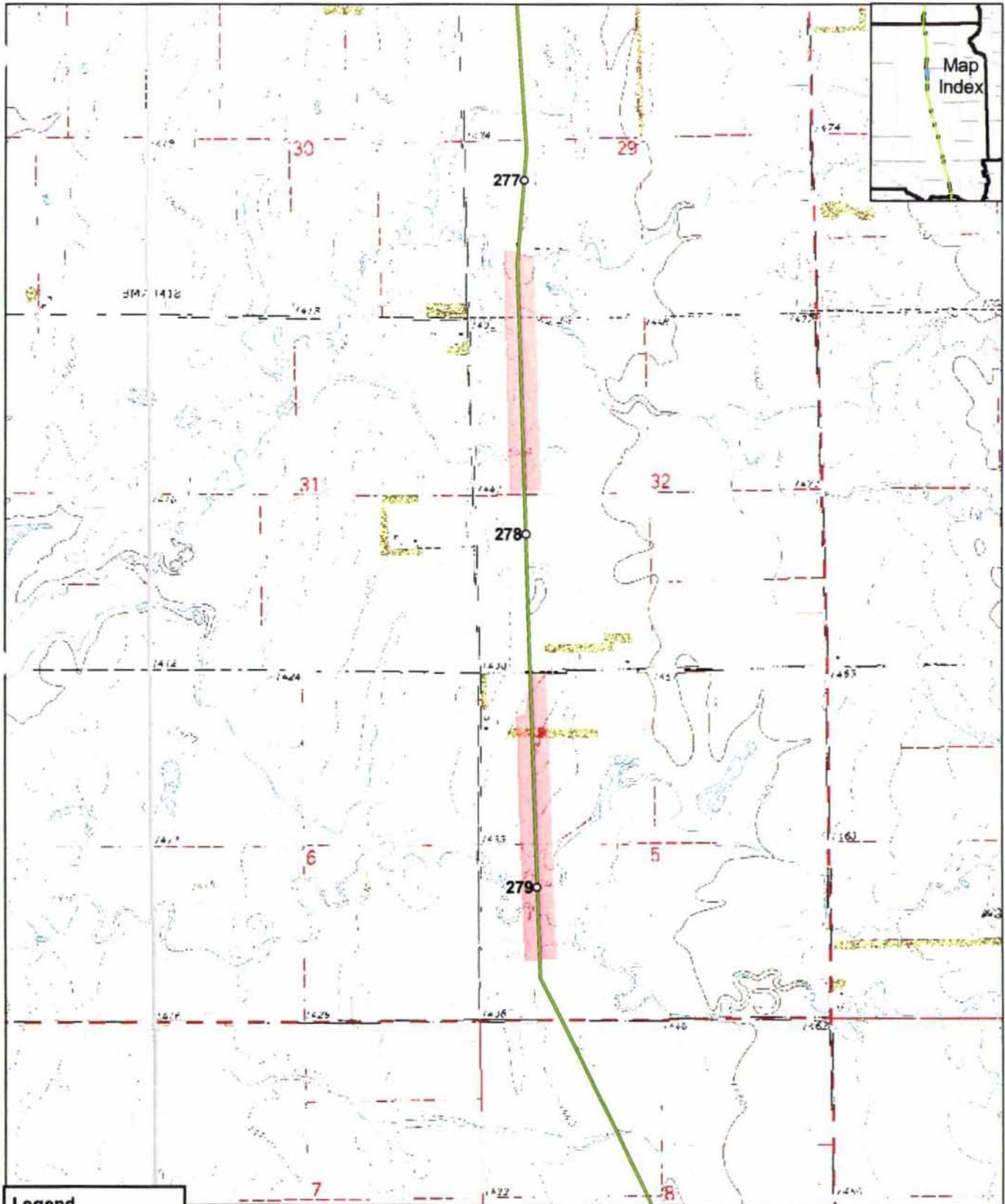


Feature TDH1SDCL005: Butterfly on a white frost flower (*Aster falcatus*)



Feature TDH1SDCL005: Bird nest in wetland vegetation.

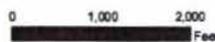
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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project



Map 9 of 21
Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDCL006	9/13/2006	278.4	279.2	Clark	SD	Drive By	Medium	Yes, prairie fringed orchid

Site Summary: This is an area with exotic pasture grasses, such as crested wheat grass (*Agropyron cristatum*), and with exotic forage legumes such as alfalfa (*Medicago sativa*), yellow sweet clover (*Melilotus officinalis*), and clover (*Trifolium*). In this area of pasture and wetlands are upland spots with native plants that include hoary vervain (*Verbena stricta*), prairie cone flower (*Ratibida columnifera*), and silver scurf pea (*Pedimelum argophyllum*). This is potential prairie fringed orchid habitat.



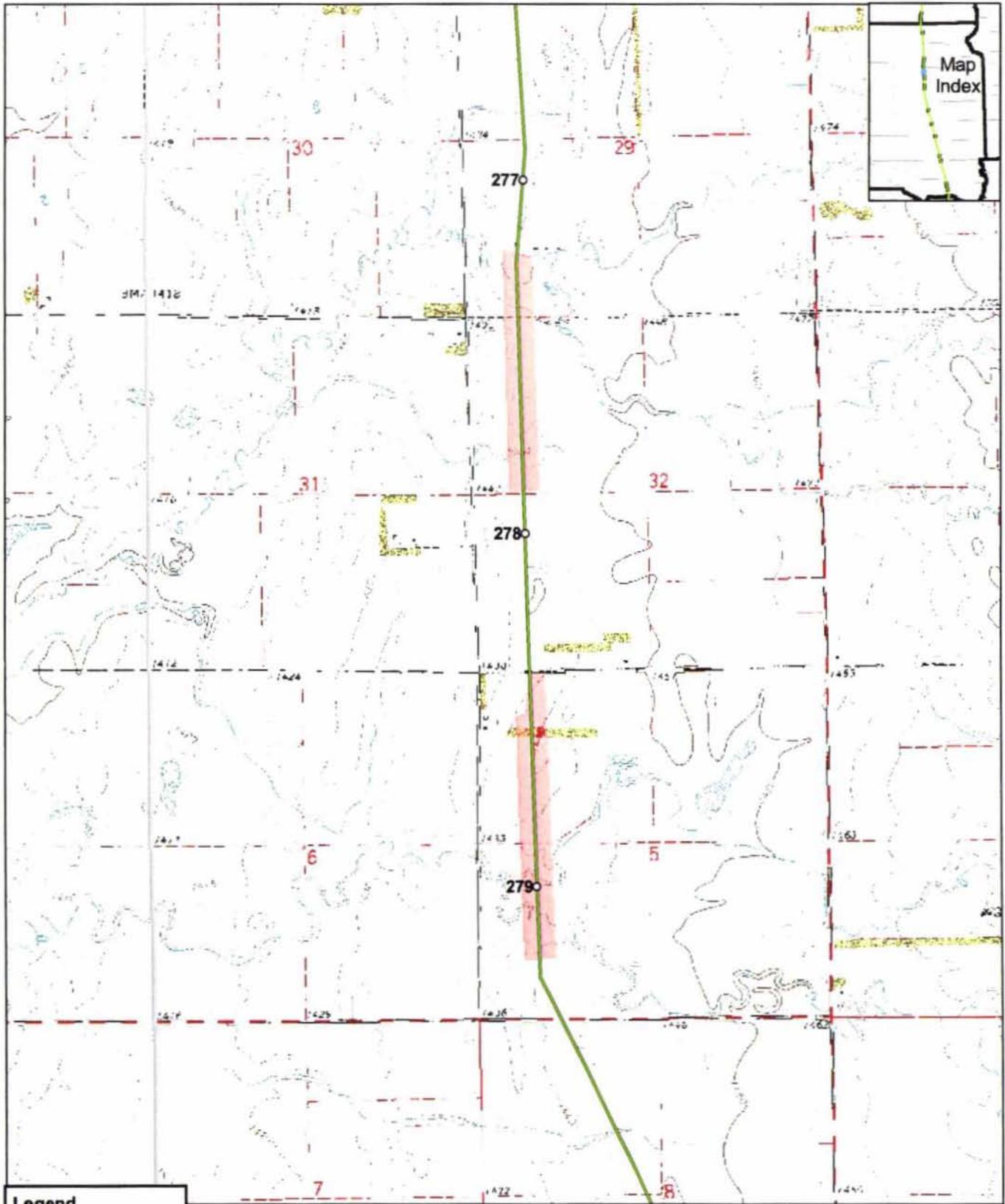
Feature TDH1SDCL006: View of pasture (with several wetland spots) from the road.

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Feature TDH1SDCL006: Overview of pasture away from the wetland spots.

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project



Map 9 of 21
Surveyed
Grasslands

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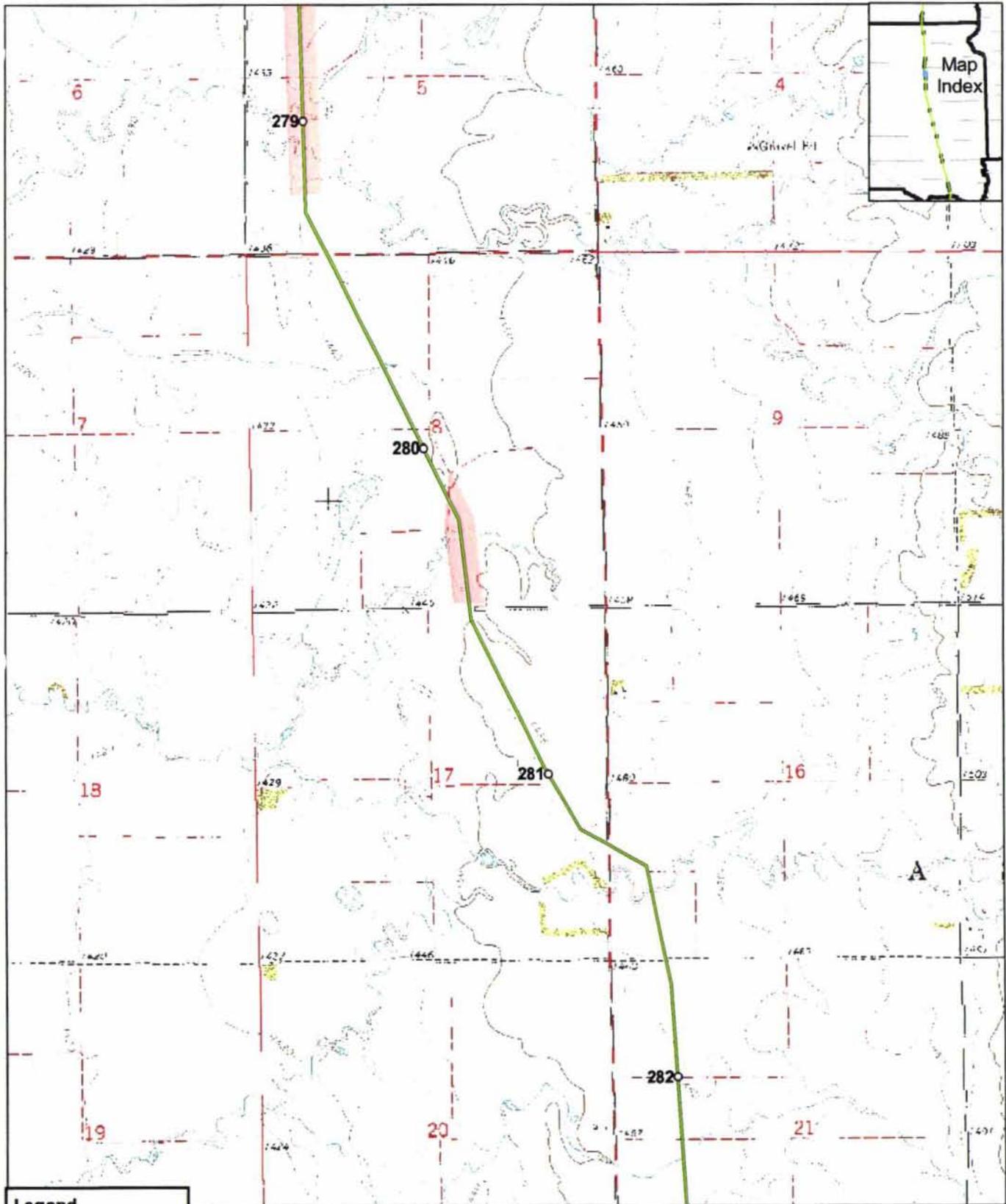
Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDCL004	9/11/2006	280.1	280.5	Clark	SD	Drive By	Low	No

Site Summary. This is a smooth brome (*Bromus inermis*) dominated pasture with an abundance of western ragweed (*Ambrosia psilostachya*). This is apparently an alkaline area due to the presence of saltgrass (*Distichlis spicata*) and gumweed (*Grindelia squarrosa*).



Feature TDH1SDCL004: General overview of site.

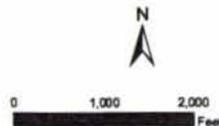
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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project



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Grasslands

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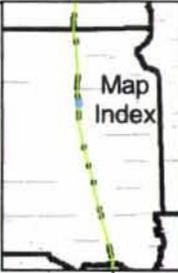
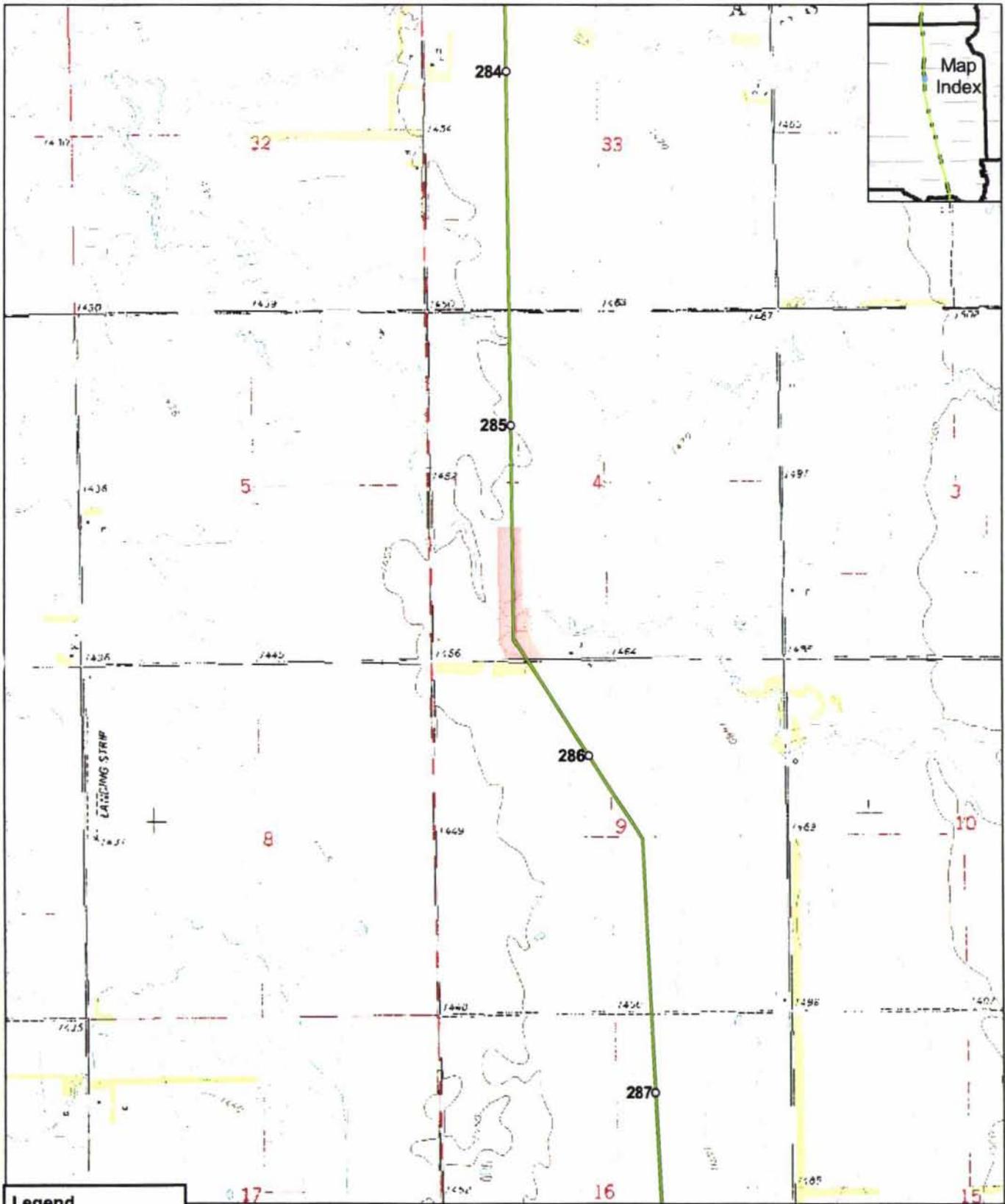
Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDCL003	9/11/2006	285.3	285.7	Clark	SD	Drive By	Low	No

Site Summary: This is a smooth brome (*Bromus inermis*) dominated pasture with lots of western ragweed (*Ambrosia psilostachya*). A heavily grazed creek in the corridor has a few peach-leaf willows (*Salix amygdaloides*) and wormwood (*Artemisia absinthium*) is common in the floodplain pasture.



Feature TDH1SDCL003: View of weedy, smooth brome (*Bromus inermis*) pasture from the road.

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project



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Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDCL002	9/11/2006	293.7	294.1	Clark	SD	Drive By	Low	No

Site Summary: This is a heavily grazed wetland/upland inclusion area where ironweed (*Vernonia* spp.) and cocklebur (*Xanthium canadense*) are common. There are a few peach-leaf willows (*Salix amygdaloides*) and wormwood (*Artemisia absinthium*) is common in the floodplain pasture.



Feature TDH1SDCL002: The tree is a peach-leaf willow (*Salix amygdaloides*) that is near center line.

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Feature TDH1SDCL002: Just east of the corridor by the road the same stream that also crosses center line has an abundance of Canadian thistle (*Cirsium arvense*).



Feature TDH1SDCL002: Wormwood (*Artemisia absinthium*) in smooth brome (*Bromus inermis*) pasture

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDCL001	9/11/2006	296.9	297.9	Clark	SD	Site Visit	Medium	Yes, Dakota skipper

Site Summary: This is a medium quality grassland. It has a stream with rolling hills with native grasses present to the west of the stream. There are pasture grasses such as crested wheat (*Agropyron cristatum*), but there are also large areas with native grasses such as blue grama (*Bouteloua gracilis*) and little blue stem (*Schizachyrium scoparium*). There are also native forbs, including pollen plants for the Dakota skipper butterfly.



Feature TDH1SDCL001: Overview of site.

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Feature TDH1SDCL001: Over view of this area looking south from the road.



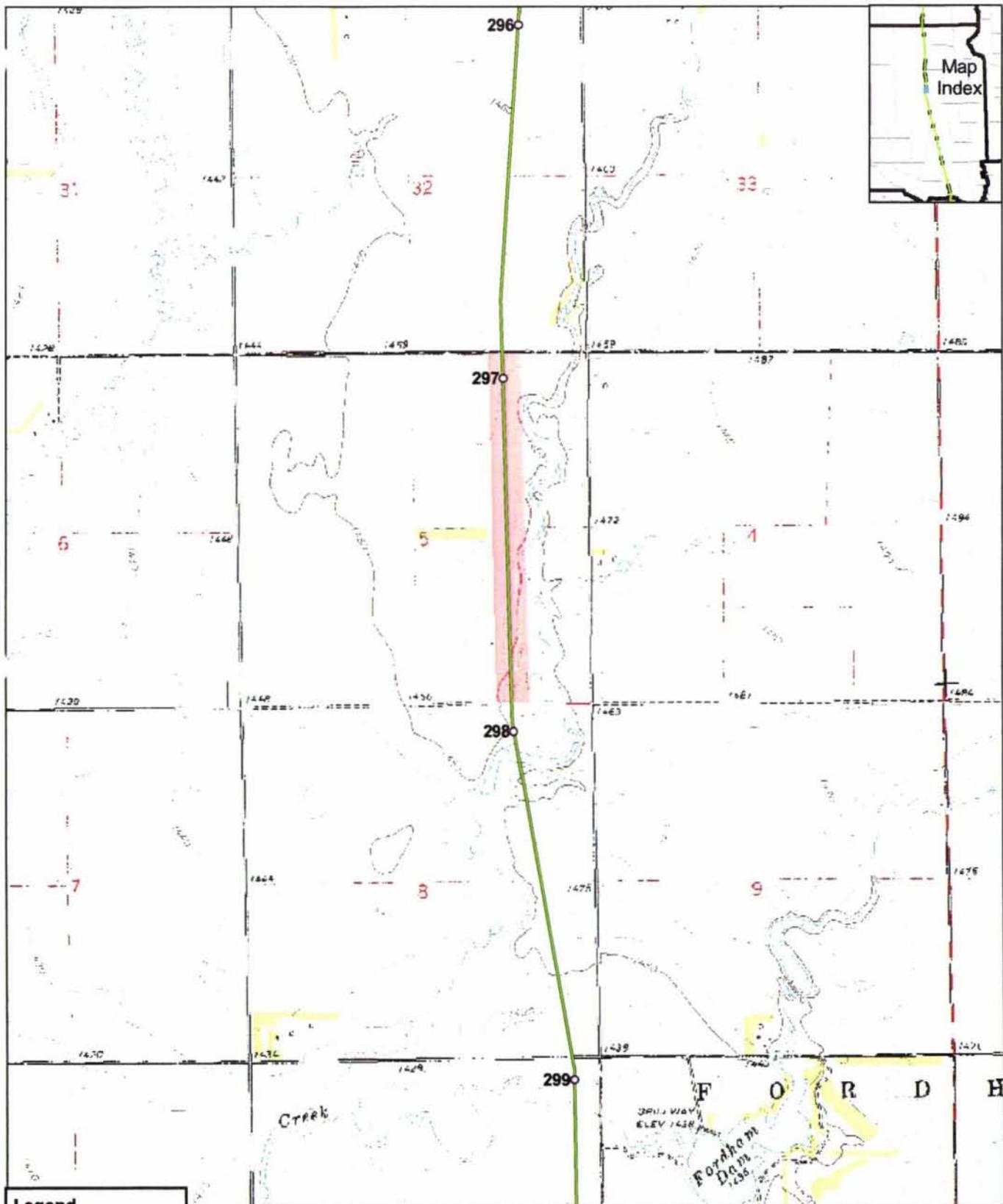
Feature TDH1SDCL001: Hillside with an abundance of glodenrrod (*Solidago* spp.).

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Feature TDH1SDCL001: Yellow flowers of gumweed (*Grindelia squarosa*) and spikes of hoary vervain (*Verbena stricta*).

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Legend

- Mileposts
- Proposed Centerline
- Surveyed Grasslands
- ▭ State Boundary
- ▭ County Boundary

Keystone Pipeline Project



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Surveyed
Grasslands

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Feature ID	Survey Date	Start MP	End MP	County	State	Survey Type	Habitat Quality	Suitable T&E Habitat?
TDH1SDKI001	9/16/2006	325.1	326.4	Kingsbury	SD	Drive By	High/North Medium/South	No

Site Summary: A road dissects a high quality grassland to the north and a medium quality grassland to the south. This is a good example of the impact that grazing can have in terms of allowing exotic plants to invade and to become more common in grazed areas. This is the only area where the noxious leafy spurge (*Euphorbia esula*) was seen. The high quality pasture includes large, flowering stands of blue grama (*Bouteloua gracilis*) and patches of little blue stem (*Schizachyrium scoparium*). Since there was no adjacent prairie, and essentially no pollen plants, this site was not considered to be Dakota skipper habitat.



Feature TDH1SDKI001: High quality prairie to the north of the road.