





AERIAL PHOTOGRAPHY MAP

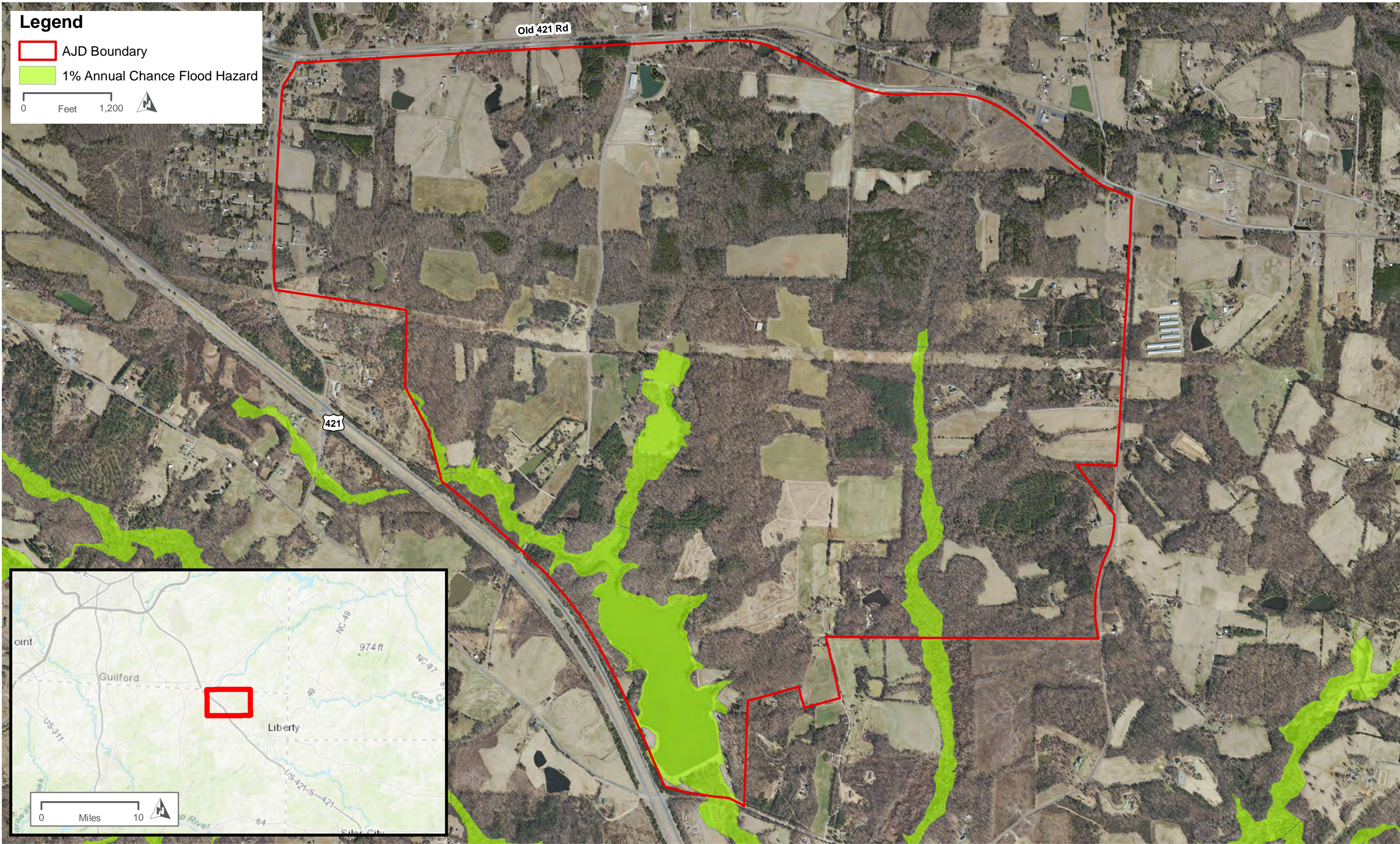


FIGURE 2







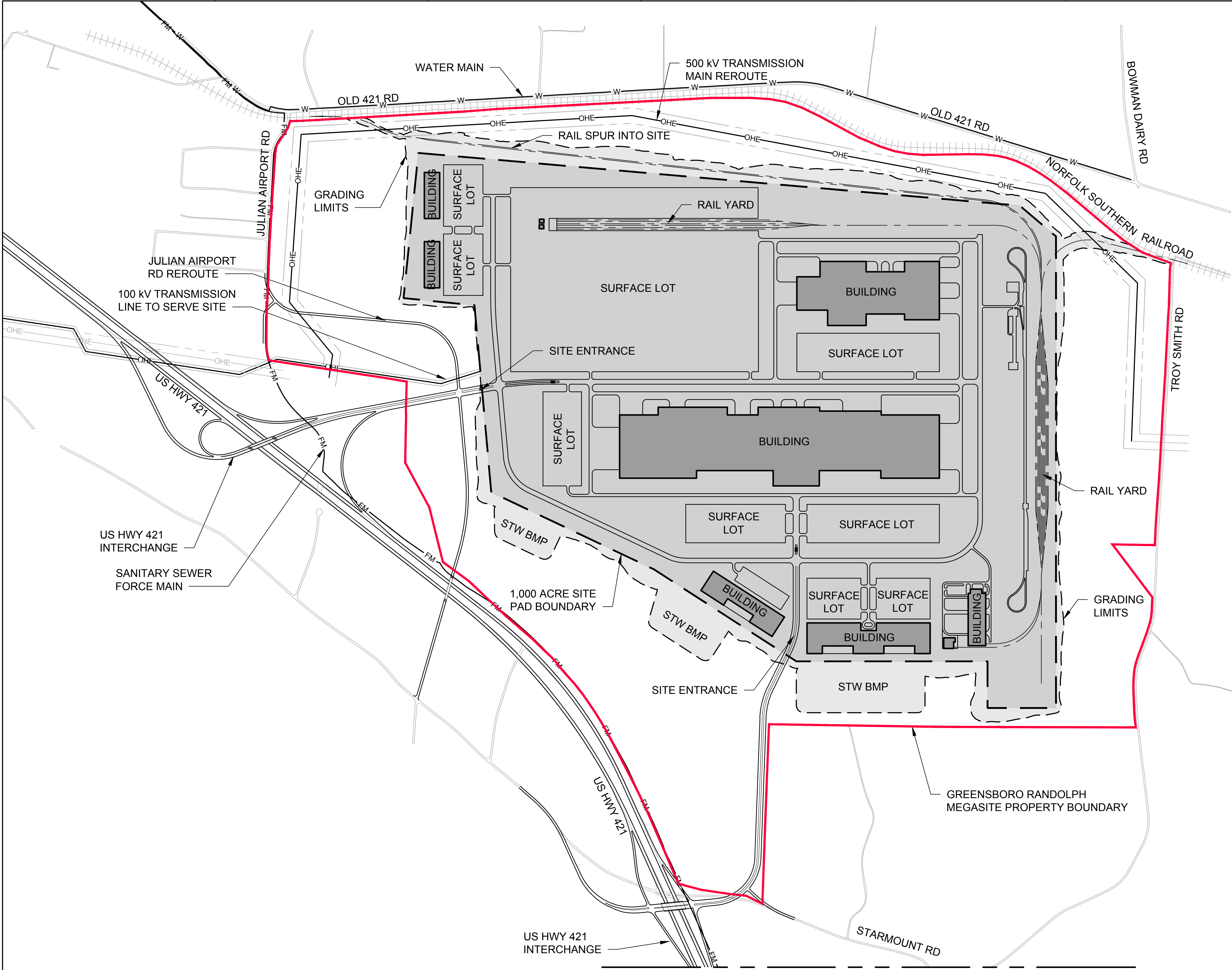


FEMA FLOODPLAIN MAP



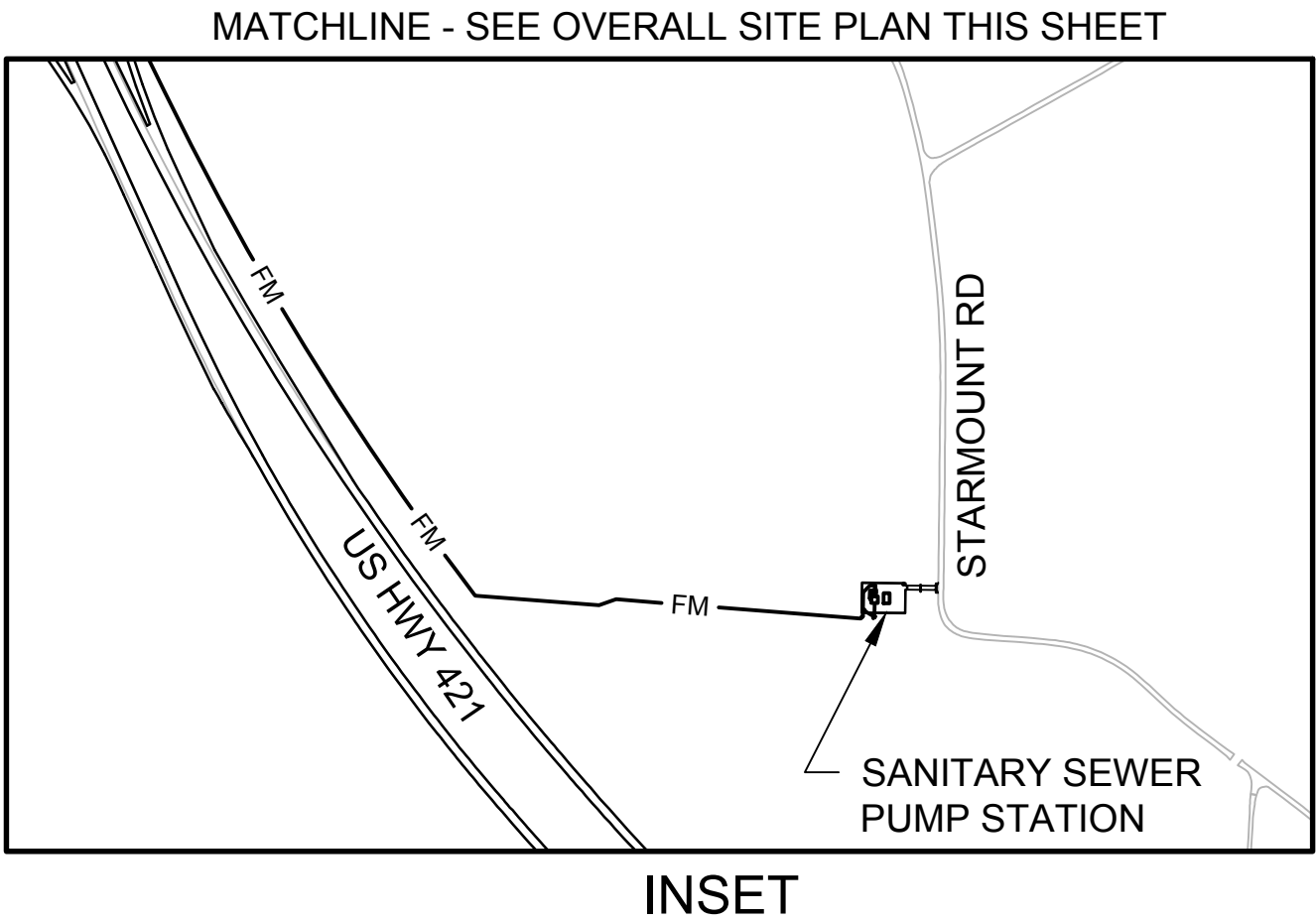
FIGURE 7





\*SITE PLAN REPRESENTS 6,000,000 SF OF BUILDING SPACE.

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SUBJECT TO NON-DISCLOSURE AGREEMENTS**



HDR Engineering Inc.  
of the Carolinas

440 S. Church Street, Suite 1000  
Charlotte, NC 28202  
704.338.6700

N.C.B.E.L.S. License Number: F-0116

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	VICKIE M. MILLER, AICP, PWS
PROJECT PRINCIPAL	PAUL MEEHAN, PE
PROJECT ENGINEER	DAVID BAKER, PE
DESIGN ENGINEER	
DRAWN BY	
CHECKED BY	
PROJECT NUMBER	10068163

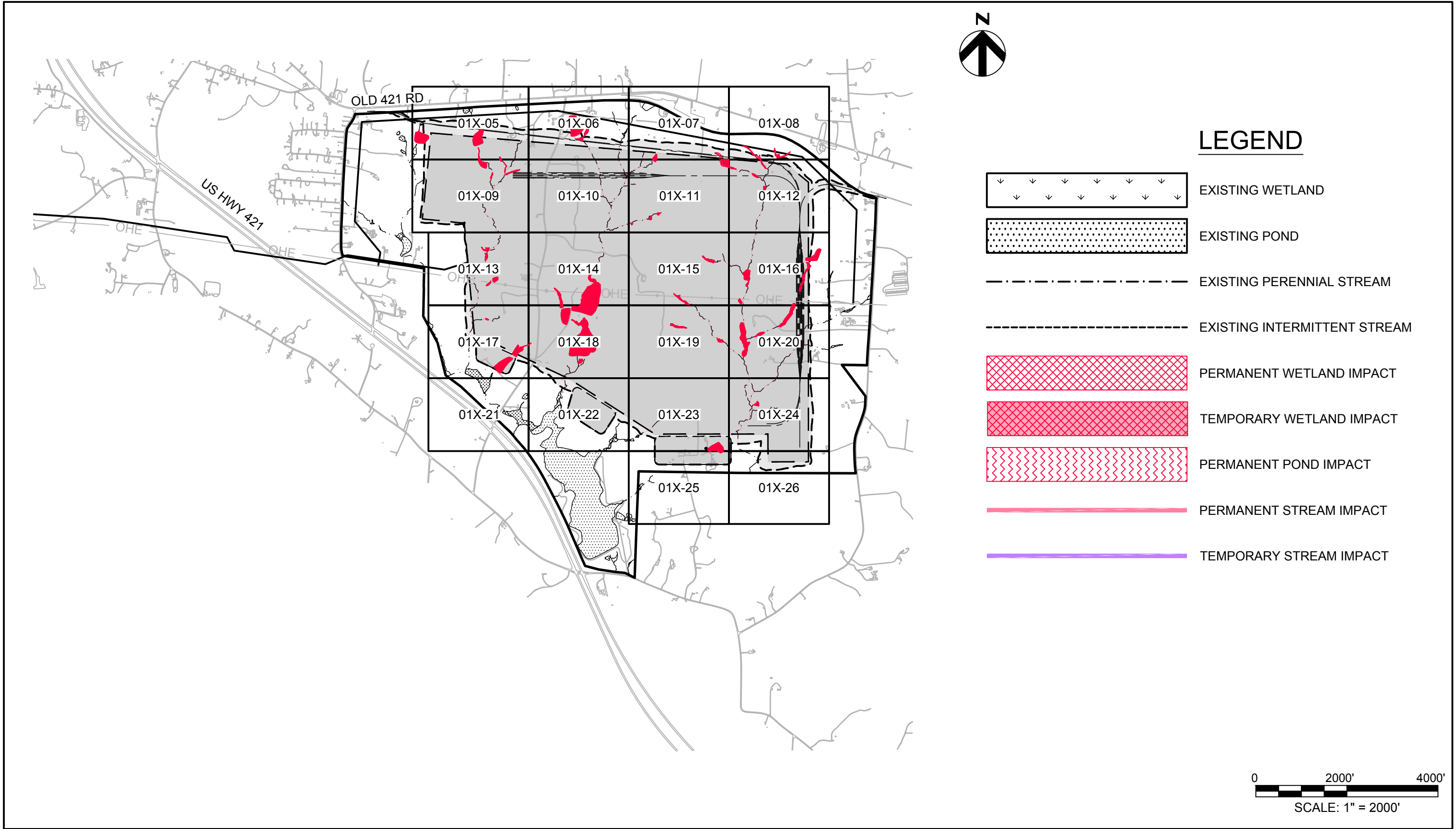
NORTH CAROLINA RAILROAD COMPANY

GREENSBORO RANDOLPH MEGASITE  
RANDOLPH COUNTY, NORTH CAROLINA

CONCEPTUAL  
OVERALL SITE PLAN

FILENAME	01X-01.dwg	SHEET <b>01X-01</b>
SCALE	1" = 700'	





HDR Engineering Inc.  
of the Carolinas  
  
555 Fayetteville Street, Suite 900  
Raleigh, NC 27601  
919.232.6600  
  
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS**

DATE  
05/25/2018  
  
SHEET  
01X-01



Wetland Impacts

Impact Number	Sheet Number	Wetland ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Type of Wetland (Cowardin)	Area of Permanent Impact (acres)	Area of Temporary Impact (acres)
W5.1	5	W38	35.899726	-79.639533	Fill	PFO	0.03	0
W5.2	5	W40A	35.899484	-79.637939	Fill	PFO	0.04	0
W6.1	6	W5	35.900708	-79.631982	Fill	PFO	0.13	0
W6.2	6	W5	35.90116	-79.631542	Fill	PFO	0.19	0
W7.1	7	W22	35.899693	-79.621614	Fill	PFO	0.15	0
W8.1	8	W21	35.899757	-79.617328	Fill	PFO	0.24	0
W8.2	9	W23	35.899944	-79.619257	Fill	PFO	0.25	0
W9.1	9	W40A	35.899385	-79.637886	Fill	PFO	0.02	0
W9.2	9	W40B	35.89895	-79.637536	Fill	PFO	0.02	0
W9.3	9	W37	35.898692	-79.637031	Fill	PFO	0.14	0
W9.4	9	W43	35.898455	-79.638564	Fill	PFO	0.05	0
W9.5	9	W45	35.897286	-79.638822	Fill	PFO	0.01	0
W11.1	11	W6	35.895595	-79.628154	Fill	PFO	0.02	0
W11.2	11	W7	35.895927	-79.626777	Fill	PFO	0.06	0
W11.3	11	W8	35.896215	-79.626185	Fill	PFO	0.05	0
W11.4	11	W22	35.899311	-79.621553	Fill	PFO	0.16	0
W12.1	12	W22	35.899009	-79.620748	Fill	PFO	0.07	0
W12.2	12	W20	35.898556	-79.619025	Fill	PFO	0.10	0
W12.3	12	W21	35.899209	-79.618469	Fill	PFO	0.09	0
W12.4	12	W24	35.897575	-79.618322	Fill	PFO	0.22	0
W13.1	13	W18A	35.893583	-79.638916	Fill	PFO	0.13	0
W13.2	13	W19	35.893997	-79.63887	Fill	PFO	0.14	0
W13.3	13	WB	35.891922	-79.638696	Fill	PFO	0.07	0
W14.1	14	W9	35.891063	-79.63342	Fill	PFO	0.34	0
W14.2	14	W12	35.892202	-79.631077	Fill	PFO	0.26	0

Wetland Impacts

Impact Number	Sheet Number	Wetland ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Type of Wetland (Cowardin)	Area of Permanent Impact (acres)	Area of Temporary Impact (acres)
W15.1	15	W35	35.891018	-79.624455	Fill	PEM	0.25	0
W15.2	15	W25	35.893418	-79.622393	Fill	PFO	0.24	0
W16.1	16	W28	35.890797	-79.616121	Fill	PFO	0.05	0
W16.2	16	W31	35.892481	-79.615397	Fill	PFO	0.54	0
W16.3	16	HDR WG	35.890983	-79.620098	Fill	PEM	0.11	0
W16.4	16	HDR WH	35.892429	-79.619589	Fill	PFO	0.67	0
W17.1	17	W44	35.889785	-79.638849	Fill	PFO	0.03	0
W17.2	17	W3	35.888035	-79.636276	Fill	PFO	0.26	0
W18.1	18	W9	35.890581	-79.633293	Fill	PFO	0.07	0
W18.2	18	W10	35.889553	-79.63211	Fill	PFO	0.16	0
W18.3	18	W13	35.887305	-79.6319	Fill	PFO	0.14	0
W18.4	18	W3	35.888035	-79.636276	Fill	PFO	0.00	0
W19.1	19	W34	35.889395	-79.624701	Fill	PFO	0.24	0
W19.2	19	W14	35.888443	-79.625216	Fill	PFO	0.12	0
W19.3	19	HDR WF	35.888548	-79.621506	Fill	PFO	0.15	0
W20.1	20	W28	35.8901	-79.616452	Fill	PFO	0.78	0
W20.2	20	W32	35.88899	-79.618632	Fill	PFO	0.19	0
W20.3	20	HDR WE	35.888498	-79.619415	Fill	PFO	1.60	0
W23.1	23	WW	35.88402	-79.625738	Fill	PEM	0.15	0
W23.2	23	HDR WD	35.88281	-79.627641	Fill	PEM	0.02	0
W24.1	24	HDR WB	35.884777	-79.61877	Fill	PFO/PEM	0.12	0
Total							8.85	0



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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-02



Open Water Impacts

Impact Number	Sheet Number	Name of Waterbody	Lat. (decimal degrees)	Long. (decimal degrees)	Permanent (P) or Temporary (T)	Type of Impact	Waterbody Type	Impact Area (acres)
P5.1	5	P6	35.901573	-79.639568	P	Fill	Pond	0.17
P5.2	5	P7	35.900787	-79.639578	P	Fill	Pond	1.39
P5.3	5	P8	35.899457	-79.639504	P	Fill	Pond	0.02
P5.4	5	P2	35.9007	-79.643849	P	Fill	Pond	1.35
P6.1	6	P10	35.9015	-79.632445	P	Fill	Pond	2.02
P7.1	7	P11	35.899604	-79.626451	P	Fill	Pond	0.17
P9.1	9	P8	35.899102	-79.639228	P	Fill	Pond	0.42
P11.1	11	P11	35.899425	-79.626452	P	Fill	Pond	0.05
P13.1	13	P9	35.892186	-79.638263	P	Fill	Pond	0.20
P14.1	14	P13	35.891276	-79.631086	P	Fill	Pond	3.77
P16.1	16	PC	35.893643	-79.614573	P	Fill	Pond	0.81
P17.1	17	P16	35.887874	-79.636668	P	Fill	Pond	0.39
P17.2	17	P17	35.887099	-79.637608	P	Fill	Pond	1.37
P18.1	18	P13	35.890413	-79.631492	P	Fill	Pond	1.88
P18.2	18	P15	35.888409	-79.631574	P	Fill	Pond	6.32
P18.3	18	P14	35.890026	-79.633032	P	Fill	Pond	1.21
P23.1	23	PB	35.882145	-79.621717	P	Fill	Pond	0.98
P25.1	25	PB	35.881874	-79.621472	P	Fill	Pond	0.08
							Total	22.60



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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-03



Stream Impacts

Impact Number	Sheet Number	Stream ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Perennial (P) or Intermittent (I)	Average Stream Width (feet)	Permanent Impact Length (linear feet)	Temporary Impact Length (linear feet)	Impact Area (square feet)
S5.1	5	SK	35.900393	-79.636643	Fill	P	2	25	0	50
S5.2	5	S45	35.899868	-79.636795	Fill	P	4	518	0	2072
S5.3	6	S15	35.901476	-79.643903	Fill	P	5	34	39	195
S6.1	6	S7	35.899976	-79.631308	Fill	P	3	633	0	1899
S6.2	6	S1	35.900243	-79.629132	Fill	P	4	452	61	244
S7.1	7	S5	35.899765	-79.627353	Fill	I	4	203	0	812
S8.1	8	S22	35.899567	-79.617489	Fill	P	3	79	0	237
S9.1	9	S43/S43B	35.898866	-79.63863	Fill	P	4	768	0	3072
S9.2	9	S45	35.898184	-79.63787	Fill	P	4	2363	0	9452
S9.3	9	S51	35.899288	-79.63773	Fill	I	3	81	0	243
S9.4	9	S48	35.898246	-79.643552	Fill	P	3	45	55	165
S10.1	10	S1	35.8963	-79.629804	Fill	P	4	2188	0	8752
S10.2	10	S7	35.898253	-79.630498	Fill	P	3	1092	0	3276
S10.3	10	S4	35.89849	-79.628489	Fill	P	4	65	0	260
S10.4	10	SA	35.897881	-79.628559	Fill	P	3	116	0	348
S10.5	10	S9	35.89546	-79.629054	Fill	P	4	601	0	2404
S10.6	10	S8	35.897307	-79.631058	Fill	I	3	588	0	1764
S11.1	11	S4	35.898854	-79.62792	Fill	P	4	775	0	3100
S11.2	11	SA	35.897975	-79.628114	Fill	P	3	175	0	525
S11.3	11	S9	35.895803	-79.627567	Fill	P	4	758	0	3032
S11.4	11	S20	35.89911	-79.621146	Fill	P	3	124	0	372
S11.5	11	S5	35.899273	-79.62751	Fill	I	4	163	0	652
S12.1	12	S20	35.898865	-79.619771	Fill	P	3	949	0	2847
S12.2	12	S22	35.899087	-79.618008	Fill	P	3	607	0	1821
S12.3	12	S21	35.896637	-79.618448	Fill	P	4	1364	0	5456
S12.4	12	S23	35.897961	-79.618066	Fill	I	3	76	0	228
S13.1	13	S45	35.892807	-79.639112	Fill	P	4	2140	0	8560
S13.2	13	SY	35.893981	-79.638491	Fill	I	3	107	0	321
S14.1	14	S1	35.893918	-79.630228	Fill	P	4	1421	0	5684
S15.1	15	S25	35.893404	-79.621706	Fill	P	3	420	0	1260
S15.2	15	S26	35.893629	-79.621324	Fill	P	3	163	0	489
S15.3	15	HDR S9	35.890773	-79.623656	Fill	I	3	105	0	315

Stream Impacts

Impact Number	Sheet Number	Stream ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Perennial (P) or Intermittent (I)	Average Stream Width (feet)	Permanent Impact Length (linear feet)	Temporary Impact Length (linear feet)	Impact Area (square feet)
S16.1	16	S25/S25R	35.893092	-79.620224	Fill	P	3	541	0	1623
S16.2	16	S35	35.891276	-79.615761	Fill	P	4	483	0	1932
S16.3	16	S21	35.892261	-79.619717	Fill	P	4	174	0	696
S16.4	16	S21	35.89137	-79.619773	Fill	P	4	592	0	2368
S16.5	16	S21	35.894088	-79.619231	Fill	P	4	1152	0	4608
S17.1	17	S45	35.889256	-79.639931	Fill	P	4	861	65	260
S17.2	17	S44	35.889771	-79.639514	Fill	P	3	756	0	2268
S18.1	18	S12B	35.8868	-79.632719	Fill	P	3	193	0	579
S18.2	18	S1	35.886749	-79.63223	Fill	P	4	755	0	3020
S18.3	18	S11	35.887125	-79.631796	Fill	P	3	232	0	696
S19.1	19	HDR S9	35.888223	-79.624394	Fill	I	3	276	0	828
S19.1	19	HDR S9	35.888223	-79.624394	Fill	P	3	1151	0	3453
S20.1	20	S35	35.889298	-79.617801	Fill	P	4	1469	0	5876
S20.2	20	S21	35.890149	-79.619916	Fill	P	4	1264	0	5056
S20.3	20	HDR S9	35.88684	-79.619587	Fill	P	3	875	0	2625
S20.4	20	S30	35.887667	-79.616619	Fill	P	3	1670	45	135
S20.5	20	S31	35.888347	-79.614963	Fill	P	3	216	54	162
S22.1	22	S1	35.885936	-79.633011	Fill	P	4	405	41	164
S23.1	23	S17	35.883641	-79.626236	Fill	P	3	192	31	93
S24.1	24	S21	35.885824	-79.619151	Fill	P	4	344	0	1376
S24.2	24	S30	35.884555	-79.619164	Fill	P	3	2240	40	120
S24.3	24	HDR S4	35.885421	-79.619586	Fill	I	4	450	0	1800
S24.4	24	HDR S3	35.884454	-79.618546	Fill	P	3	834	0	2502
S24.4	24	HDR S3	35.884454	-79.618546	Fill	I	3	834	0	2502
S24.5	24	HDR S5	35.884665	-79.619115	Fill	I	3	71	0	213
S26.1	26	HDR S2	35.881433	-79.618688	Fill	P	3	68	47	141
						Perennial Total		34,342	478	105,325
						Intermittent Total		2,954	0	9,678
						Stream Impact Total		37,296	478	115,003



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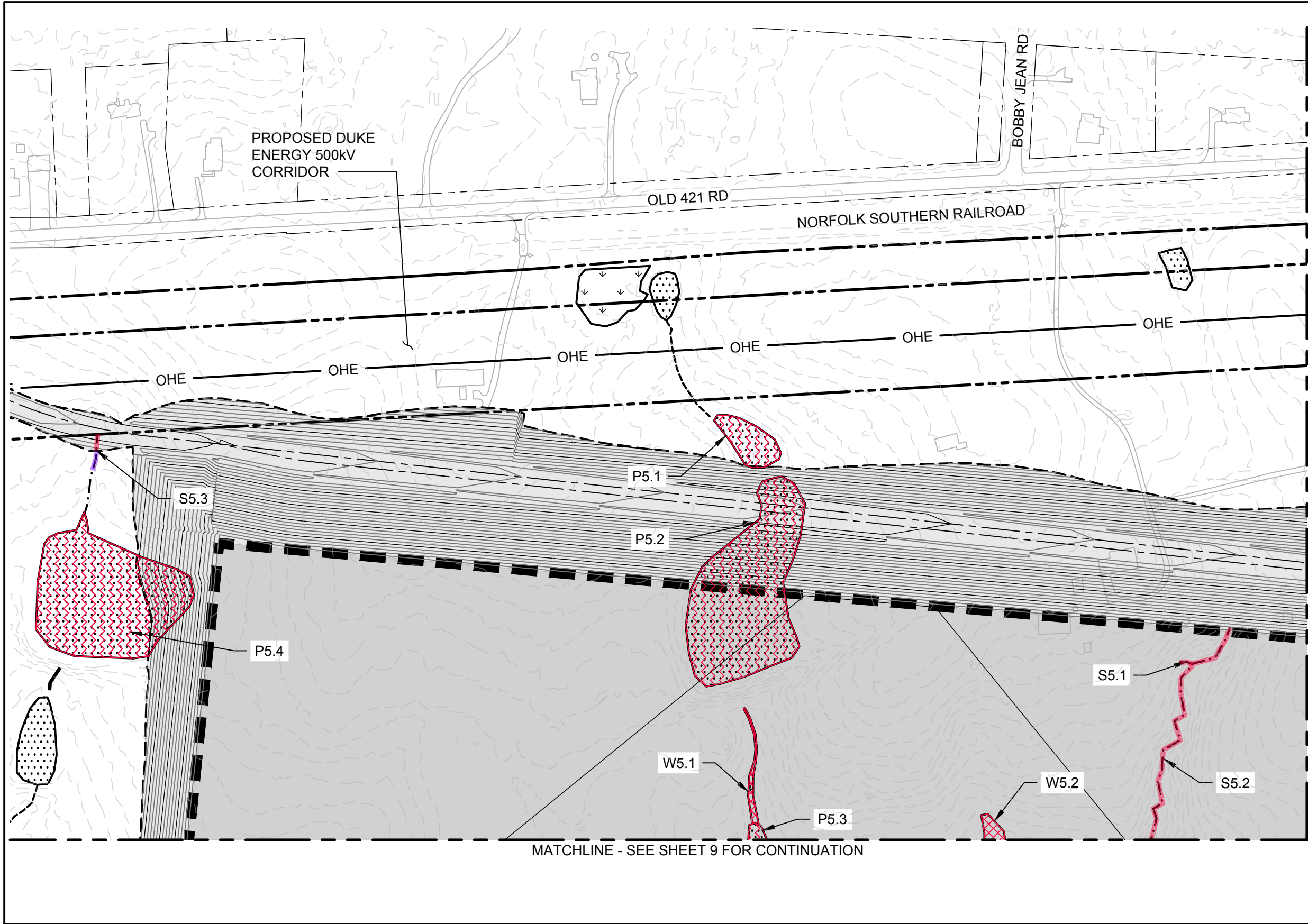
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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-04





GENERAL NOTES:  
1) SEE SHEET 1 FOR LEGEND AND KEY MAP

Wetland Impacts

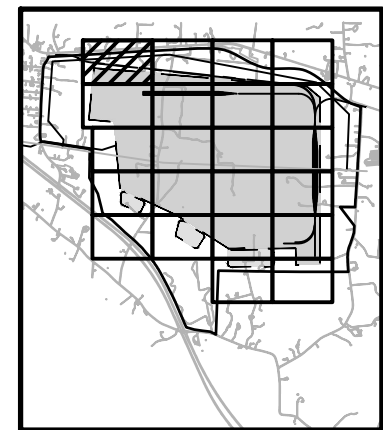
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
W5.1	W38	Fill	0.03	0
W5.2	W40A	Fill	0.04	0
Total			0.07	0

Pond Impacts

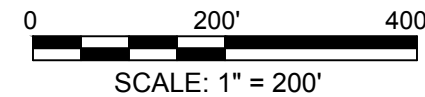
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)
P5.1	P6	Fill	0.17
P5.2	P7	Fill	1.39
P5.3	P8	Fill	0.02
P5.4	P2	Fill	1.35
Total			2.93

Perennial Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S5.1	SK	Fill	25	0
S5.2	S45	Fill	518	0
S5.3	S15	Fill	34	39
Total			543	0



KEY MAP  
NOT TO SCALE



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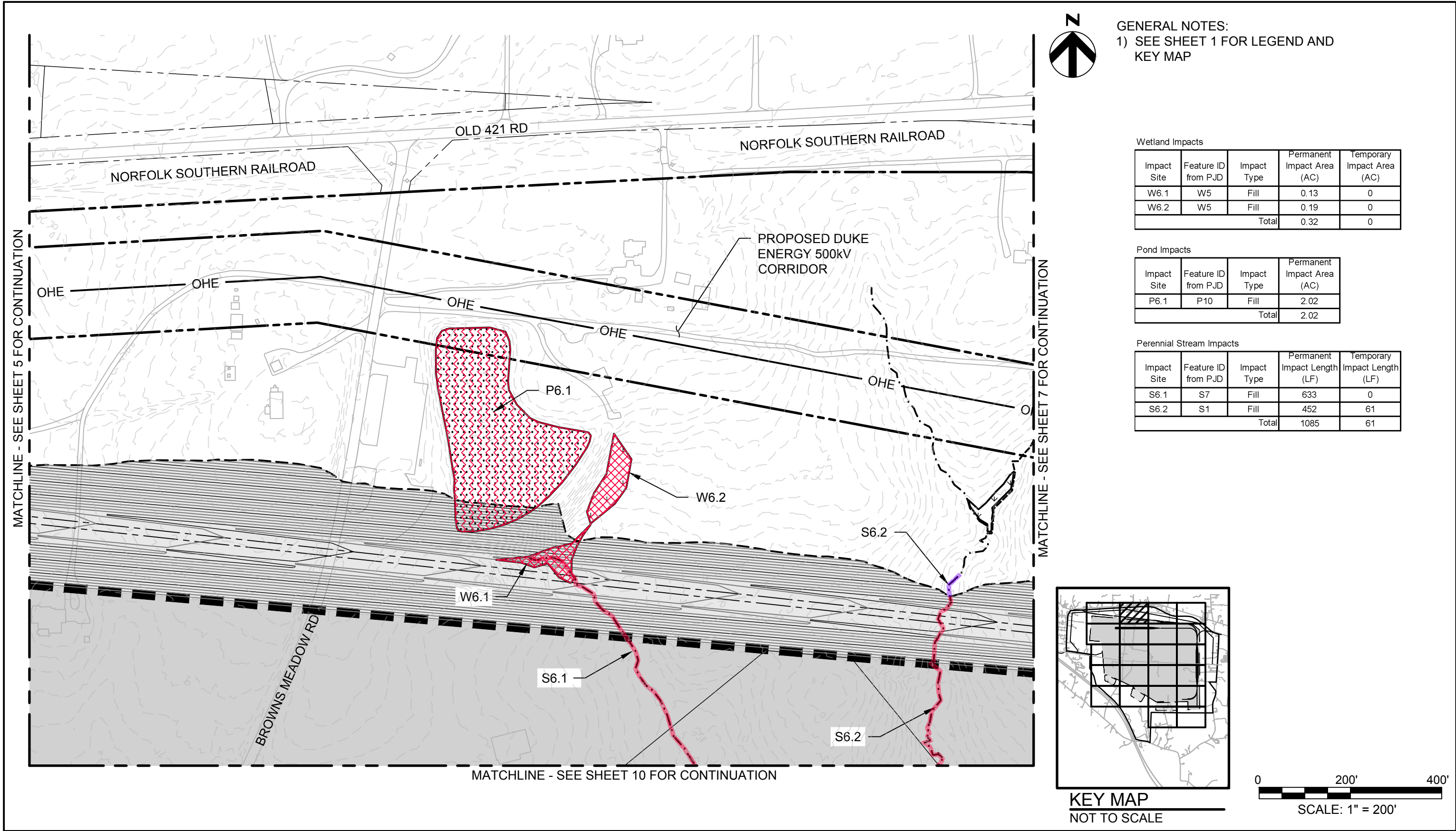
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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
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SHEET  
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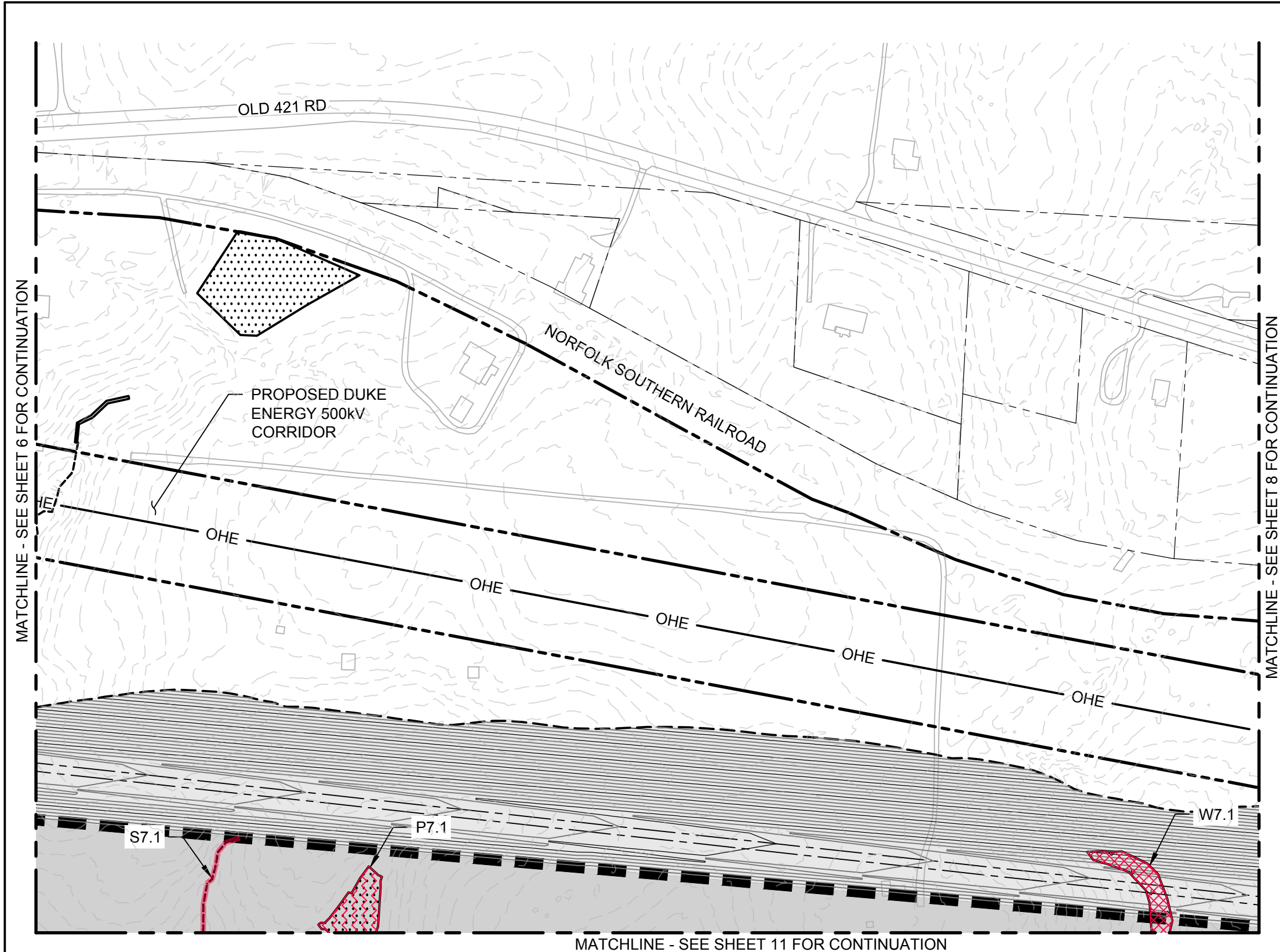
N.C.B.E.L.S. License Number: F-0116

PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-06



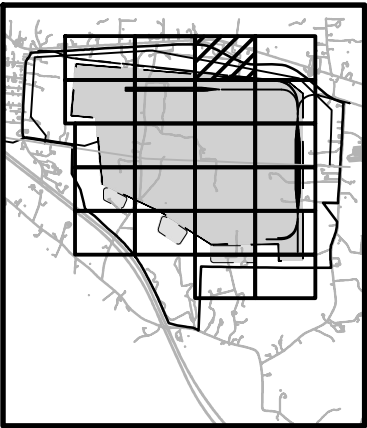


GENERAL NOTES:  
1) SEE SHEET 1 FOR LEGEND AND KEY MAP

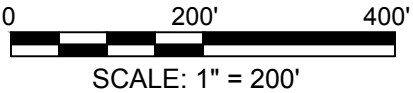
Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
W7.1	W22	Fill	0.15	0
Total			0.15	0

Pond Impacts			
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)
P7.1	P11	Fill	0.17
Total			0.17

Intermittent Stream Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S7.1	S5	Fill	203	0
Total			203	



KEY MAP  
NOT TO SCALE



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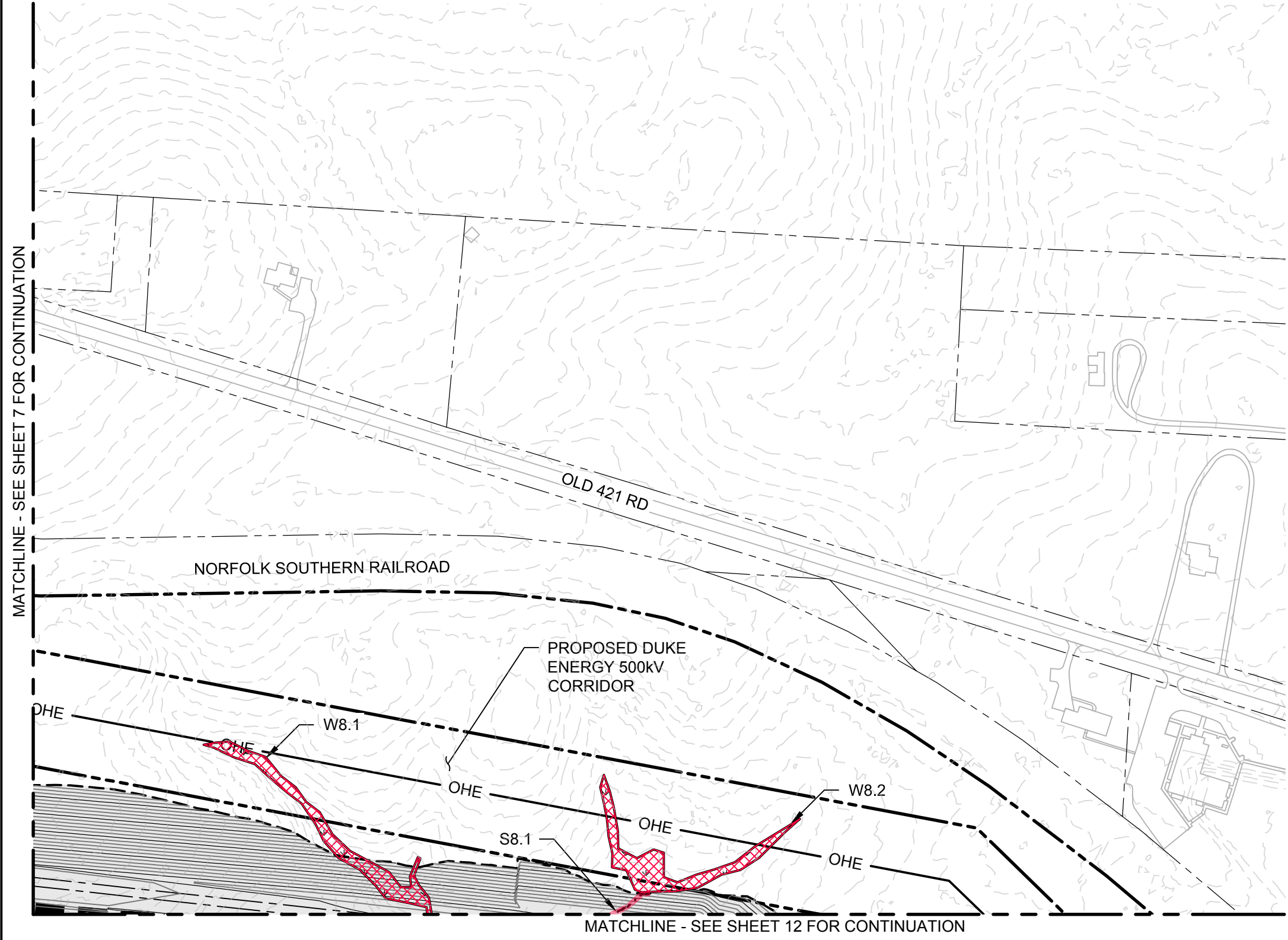
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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-07





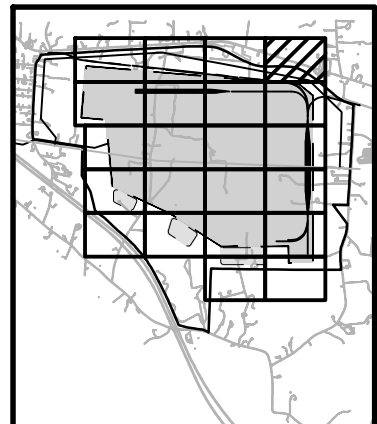
GENERAL NOTES:  
1) SEE SHEET 1 FOR LEGEND AND KEY MAP

Wetland Impacts

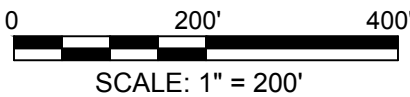
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
W8.1	W21	Fill	0.24	0
W8.2	W23	Fill	0.25	0
Total			0.49	0

Perennial Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S8.1	S22	Fill	79	0
Total			79	0



KEY MAP  
NOT TO SCALE



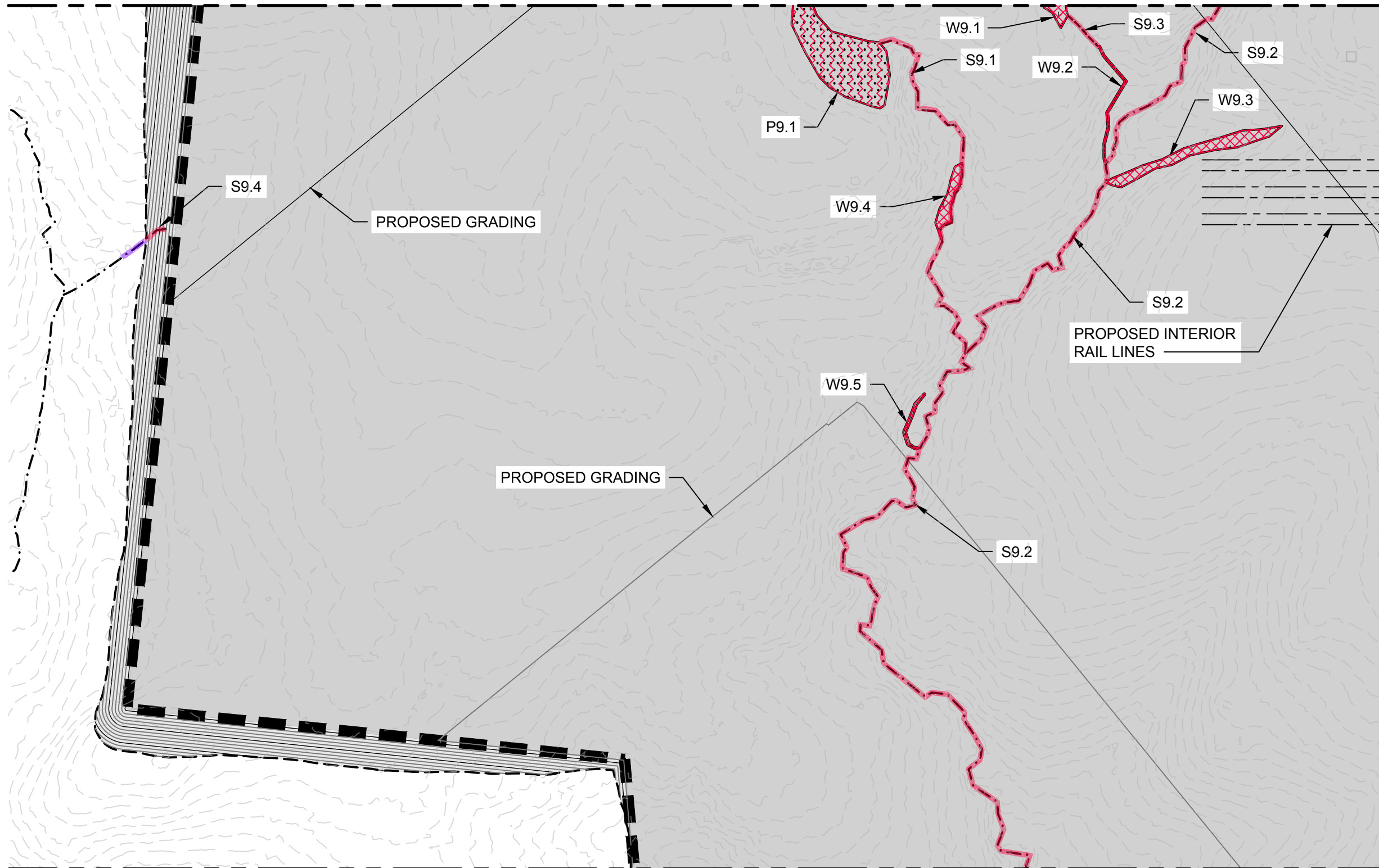
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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
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SHEET  
01X-08



MATCHLINE - SEE SHEET 5 FOR CONTINUATION



MATCHLINE - SEE SHEET 13 FOR CONTINUATION

GENERAL NOTES:  
1) SEE SHEET 1 FOR LEGEND AND KEY MAP

Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
W9.1	W40A	Fill	0.02	0
W9.2	W40B	Fill	0.02	0
W9.3	W37	Fill	0.14	0
W9.4	W43	Fill	0.05	0
W9.5	W45	Fill	0.01	0
Total			0.24	0

Pond Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)
P9.1	P8	Fill	0.42
Total			0.42

Perennial Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S9.1	S43/S43B	Fill	768	0
S9.2	S45	Fill	2363	0
S9.4	S48	Fill	45	55
Total			3176	55

Intermittent Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S9.3	S51	Fill	81	0
Total			81	0



KEY MAP  
NOT TO SCALE



SCALE: 1" = 200'



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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

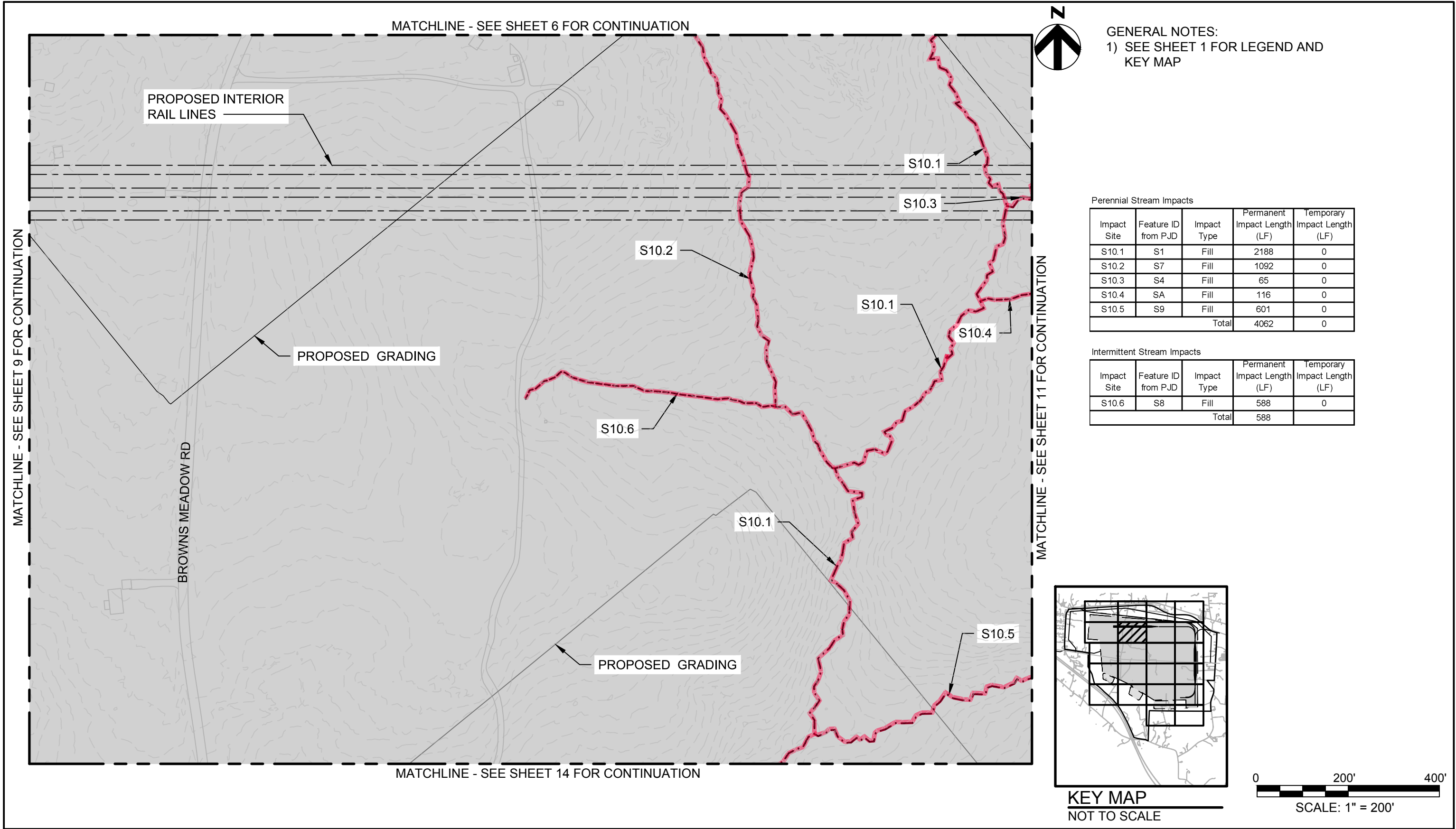
DATE

05/25/2018

SHEET

01X-09





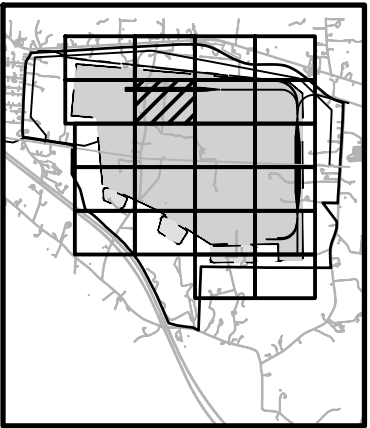
GENERAL NOTES:  
1) SEE SHEET 1 FOR LEGEND AND  
KEY MAP

Perennial Stream Impacts

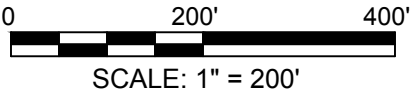
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S10.1	S1	Fill	2188	0
S10.2	S7	Fill	1092	0
S10.3	S4	Fill	65	0
S10.4	SA	Fill	116	0
S10.5	S9	Fill	601	0
Total			4062	0

Intermittent Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S10.6	S8	Fill	588	0
Total			588	



KEY MAP  
NOT TO SCALE



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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018  
  
SHEET  
01X-10





1) SEE SHEET 1 FOR LEGEND AND  
KEY MAP

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
W11.1	W6	Fill	0.02	0
W11.2	W7	Fill	0.06	0
W11.3	W8	Fill	0.05	0
W11.4	W22	Fill	0.16	0
Total			0.29	0

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)
P11.1	P11	Fill	0.05
Total			0.05

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S11.1	S4	Fill	775	0
S11.2	SA	Fill	175	0
S11.3	S9	Fill	758	0
S11.4	S20	Fill	124	0
Total			1832	0

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S11.5	S5	Fill	163	0
Total			163	0



-----  
MATCHLINE - SEE SHEET 12 FOR CONTINUATION  
-----

MATCHLINE - SEE SHEET 15 FOR CONTINUATION

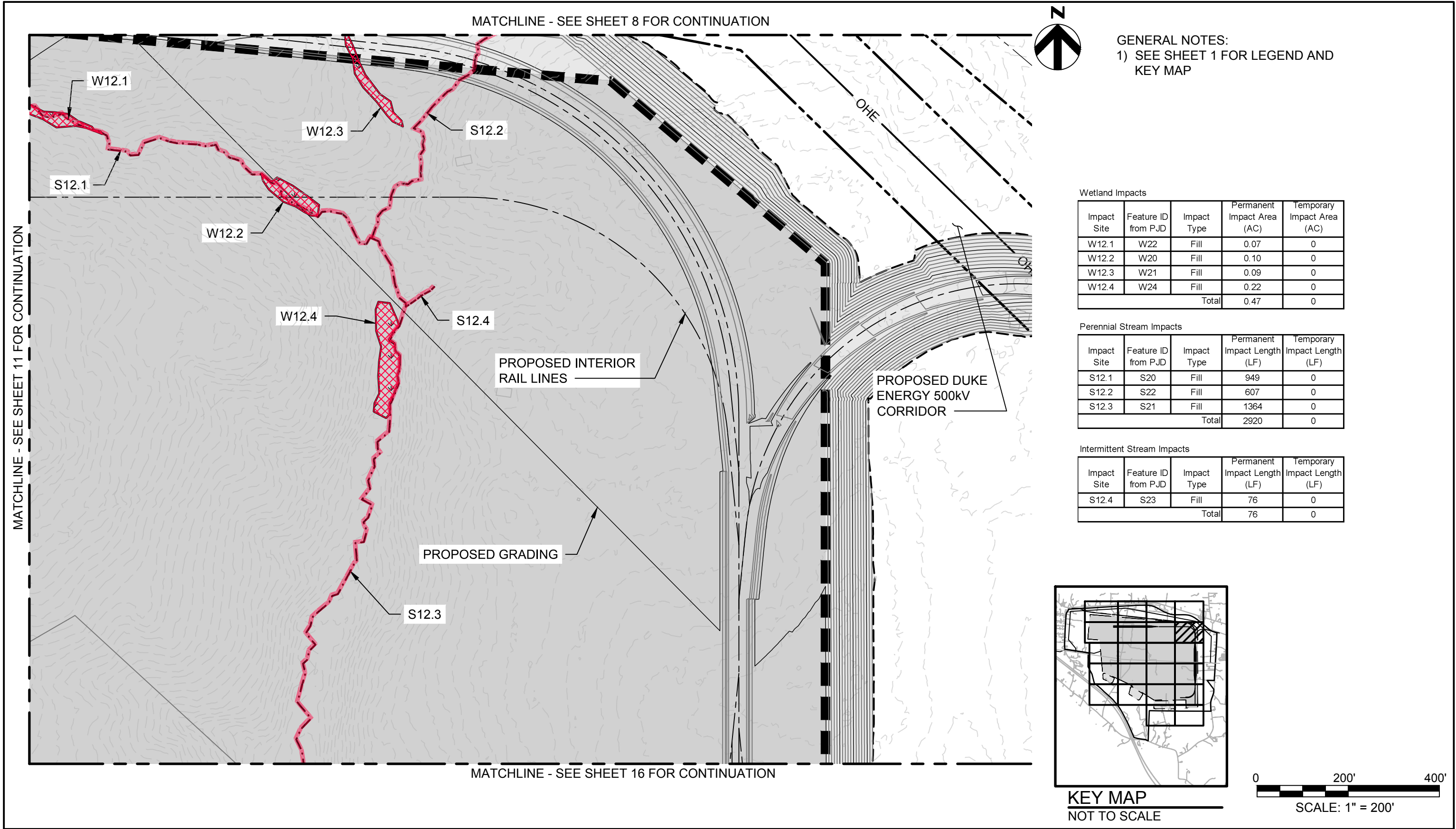


# PROJECT GRMS SITE PLAN JURISDICTIONAL IMPACTS

SHEET

01X-11





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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-12









1) SEE SHEET 1 FOR LEGEND AND  
KEY MAP

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
W14.1	W9	Fill	0.34	0
W14.2	W12	Fill	0.26	0
Total			0.60	0

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)
P14.1	P13	Fill	3.77
Total			3.77

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S14.1	S1	Fill	1421	0
Total			1421	0

**MATCHLINE - SEE SHEET 15 FOR CONTINUATION**

BROWNS MEADOW RD

- PROPOSED GRADING

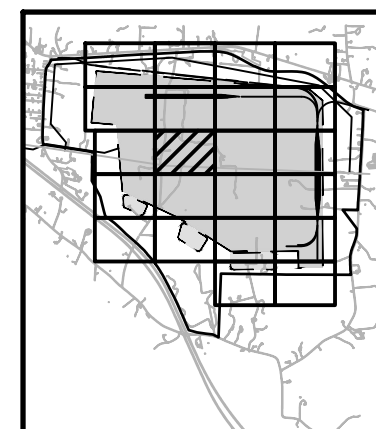
S14.1

W14.2

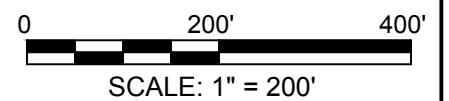
P14.1

- W14.1

MATCHLINE - SEE SHEET 18 FOR CONTINUATION



**KEY MAP**  
NOT TO SCALE



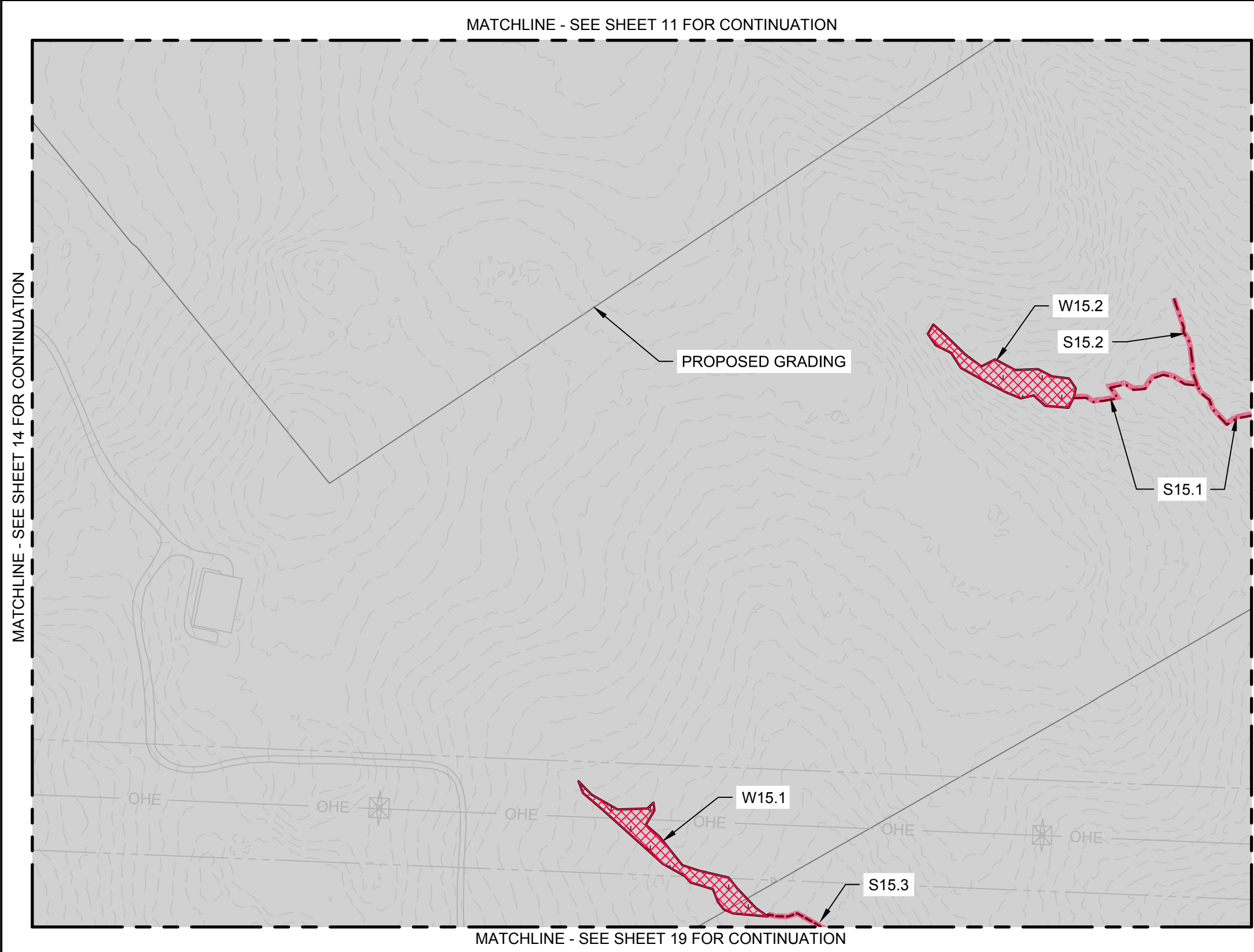
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# PROJECT GRMS SITE PLAN JURISDICTIONAL IMPACTS

SHEET

01X-14





GENERAL NOTES:  
1) SEE SHEET 1 FOR LEGEND AND KEY MAP

Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
W15.1	W35	Fill	0.25	0
W15.2	W25	Fill	0.24	0
Total			0.50	0

Perennial Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S15.1	S25	Fill	420	0
S15.2	S26	Fill	163	0
Total			583	0

Intermittent Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S15.3	HDR S9	Fill	105	0
Total			105	

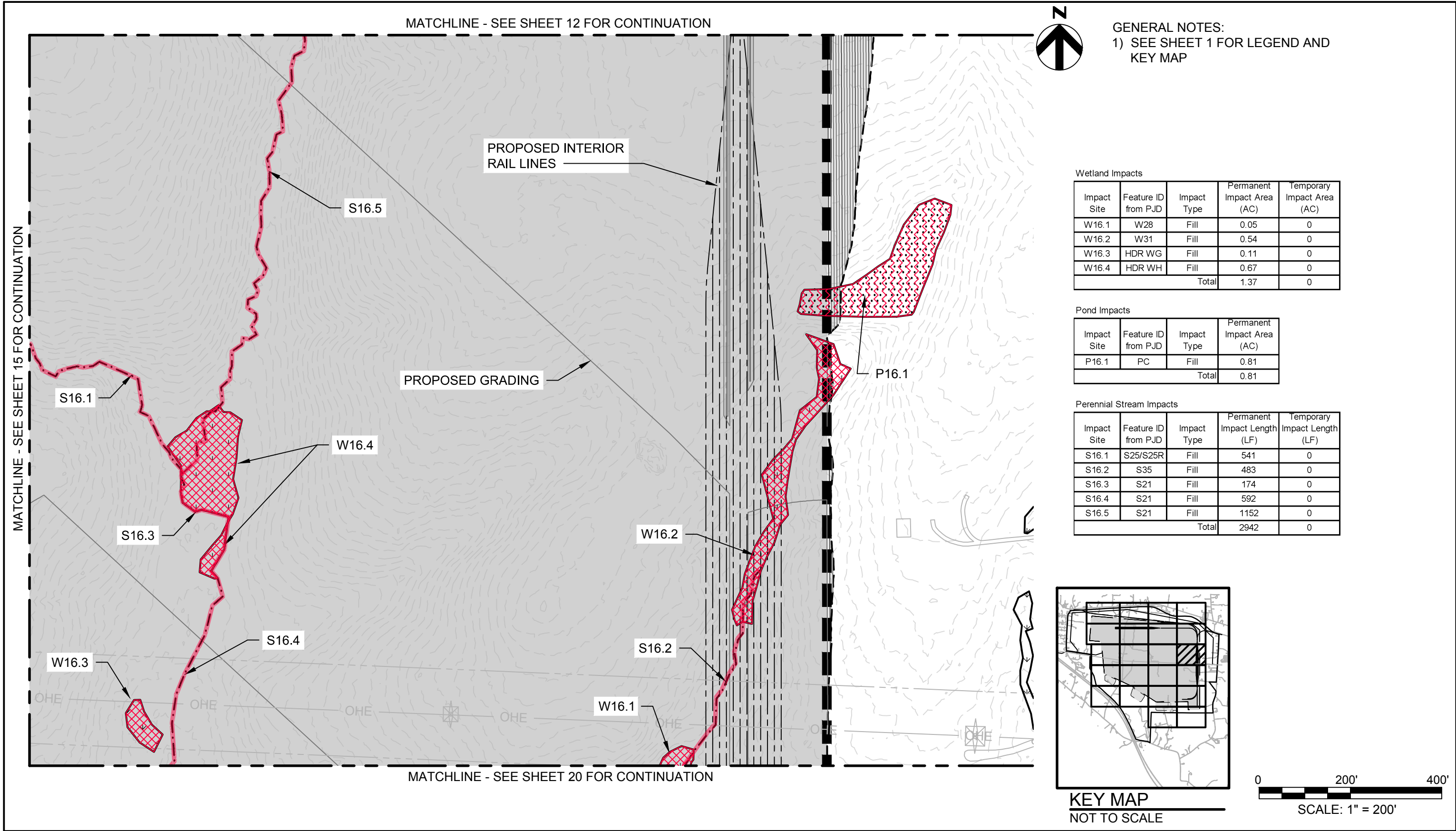


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**PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS**

DATE  
05/25/2018  
  
SHEET  
01X-15





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JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-16

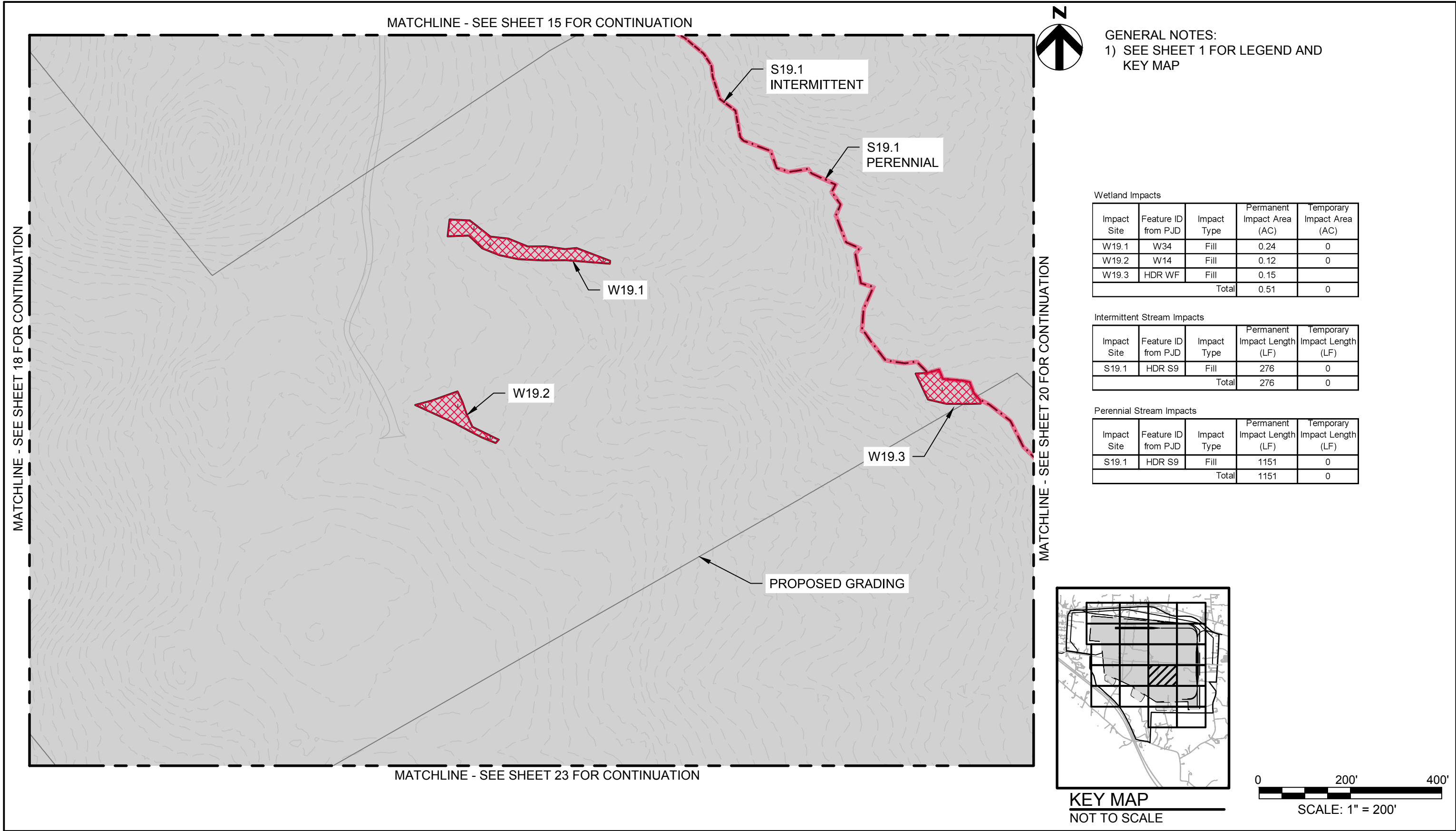












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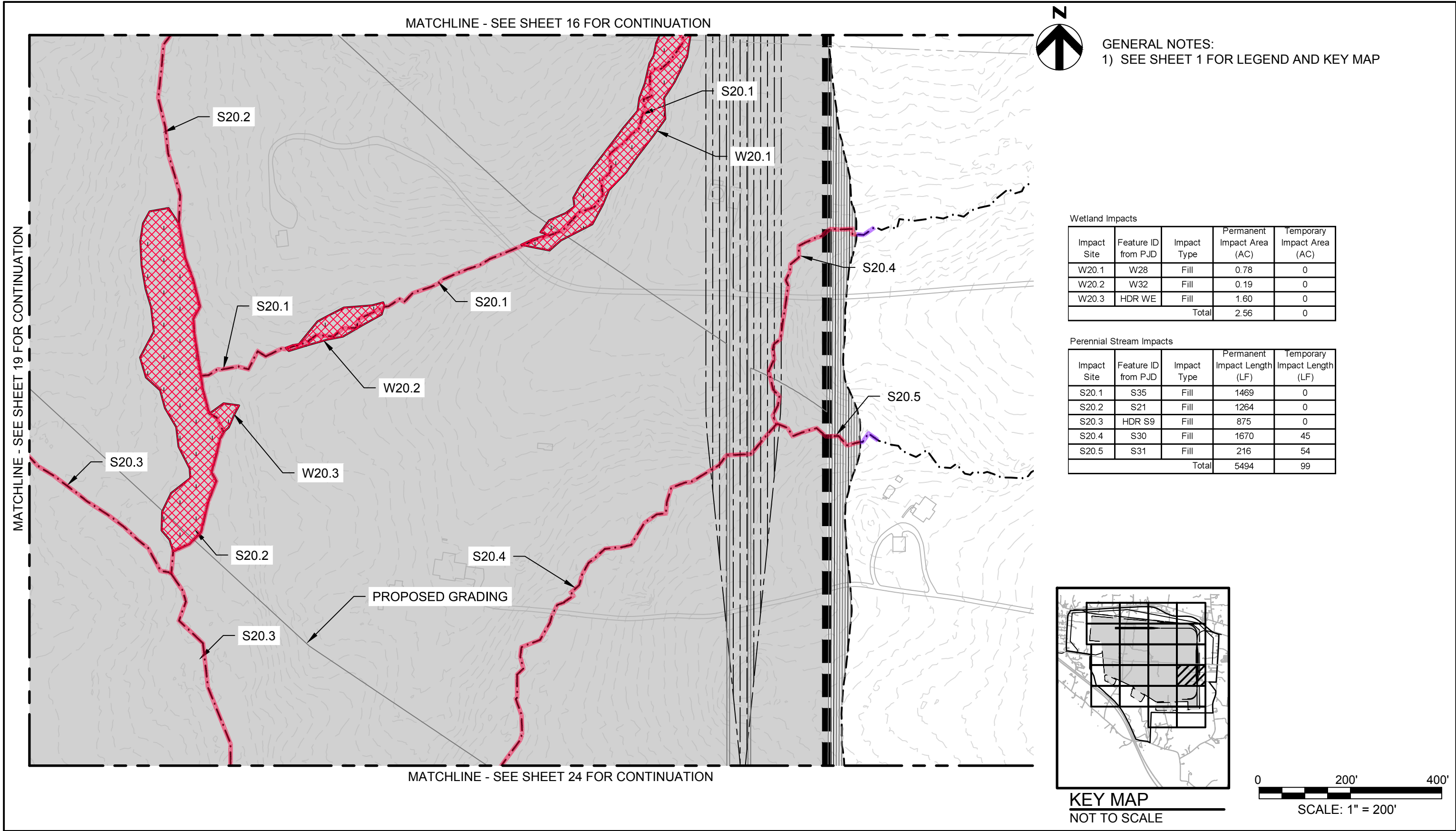
N.C.B.E.L.S. License Number: F-0116

PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

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05/25/2018

SHEET  
01X-19





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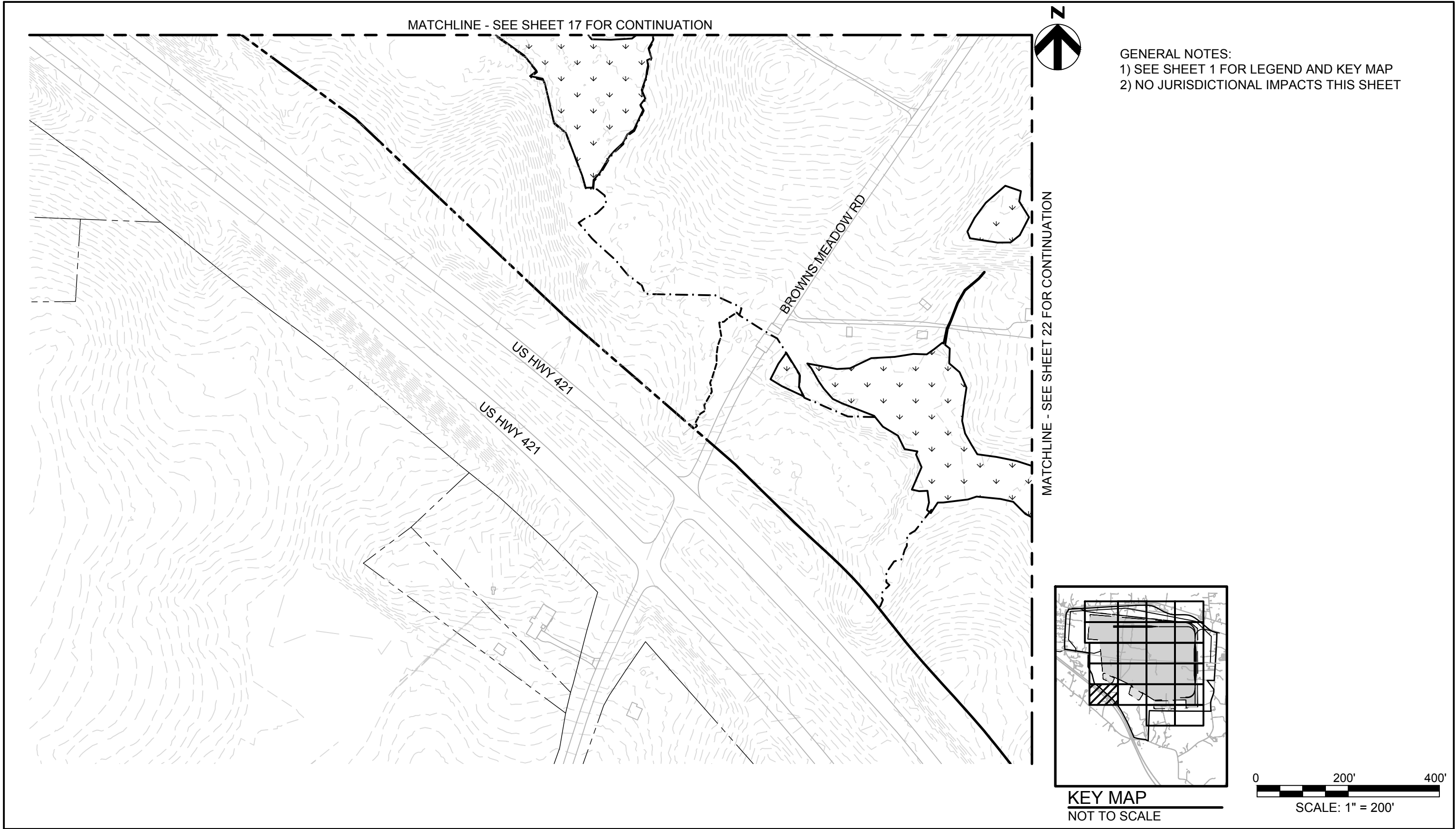
N.C.B.E.L.S. License Number: F-0116

## PROJECT GRMS SITE PLAN JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-20





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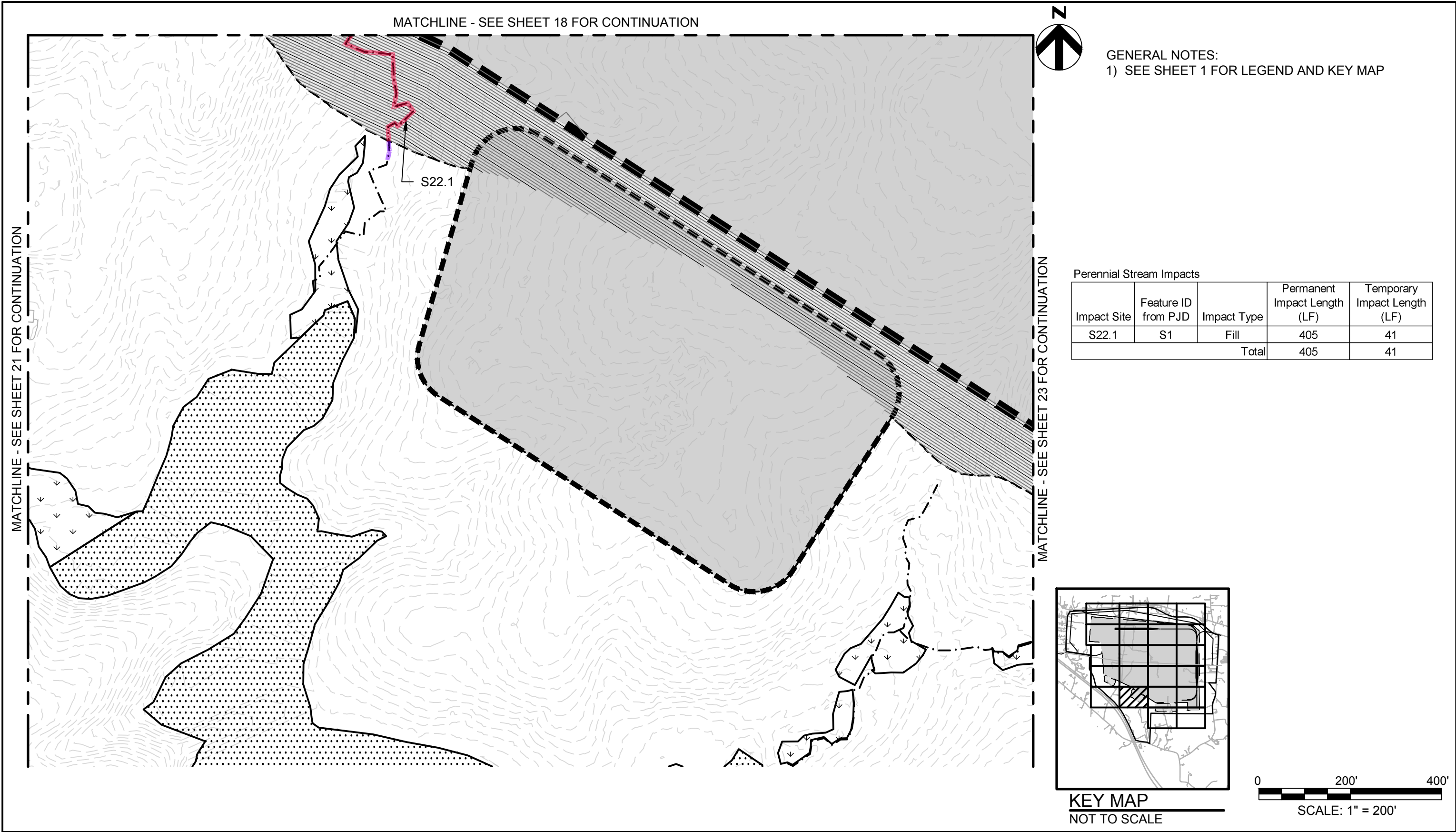
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS**

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05/25/2018

SHEET  
01X-21





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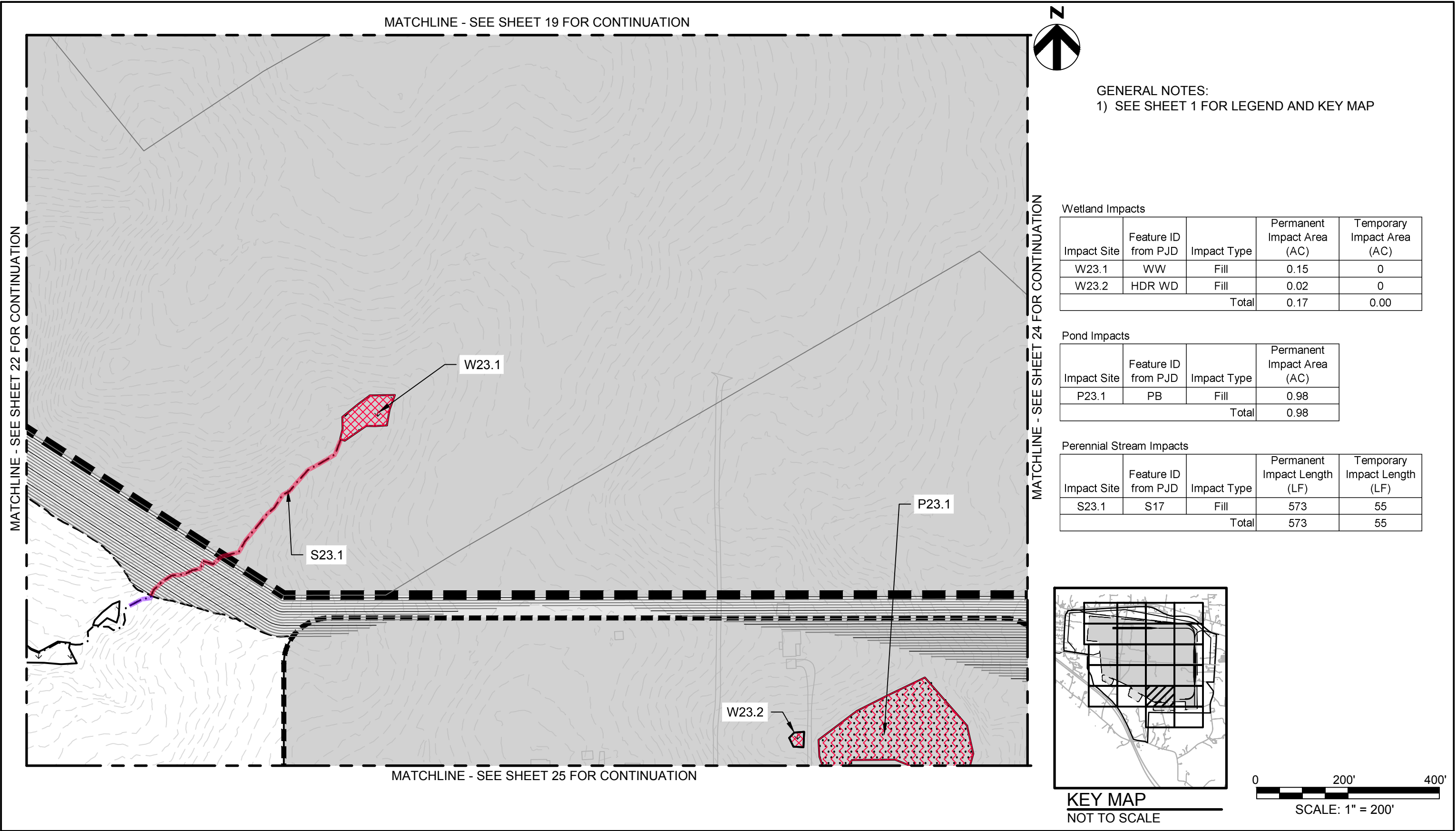
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS**

DATE  
05/25/2018

SHEET  
01X-22





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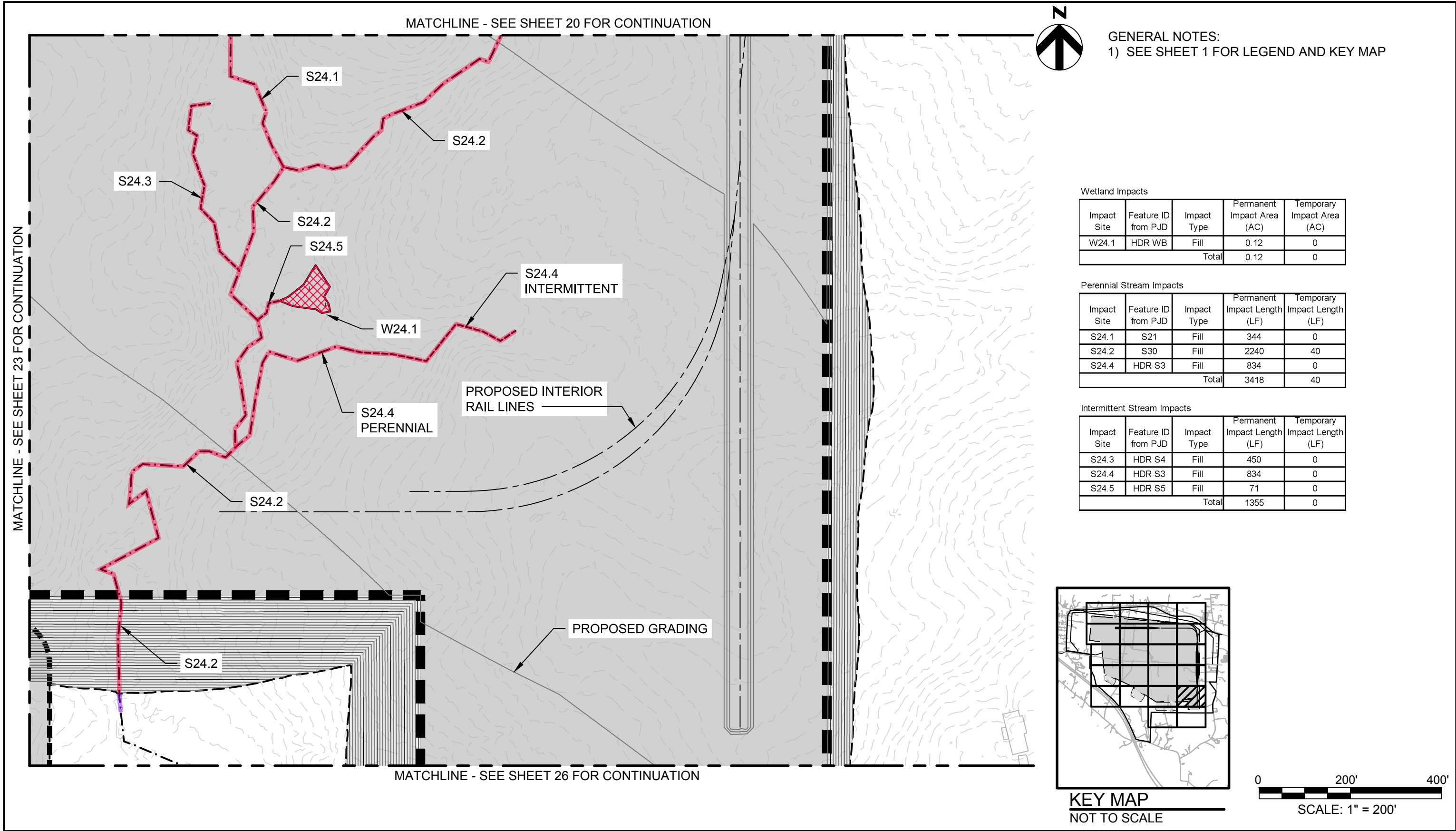
N.C.B.E.L.S. License Number: F-0116

PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
01X-23





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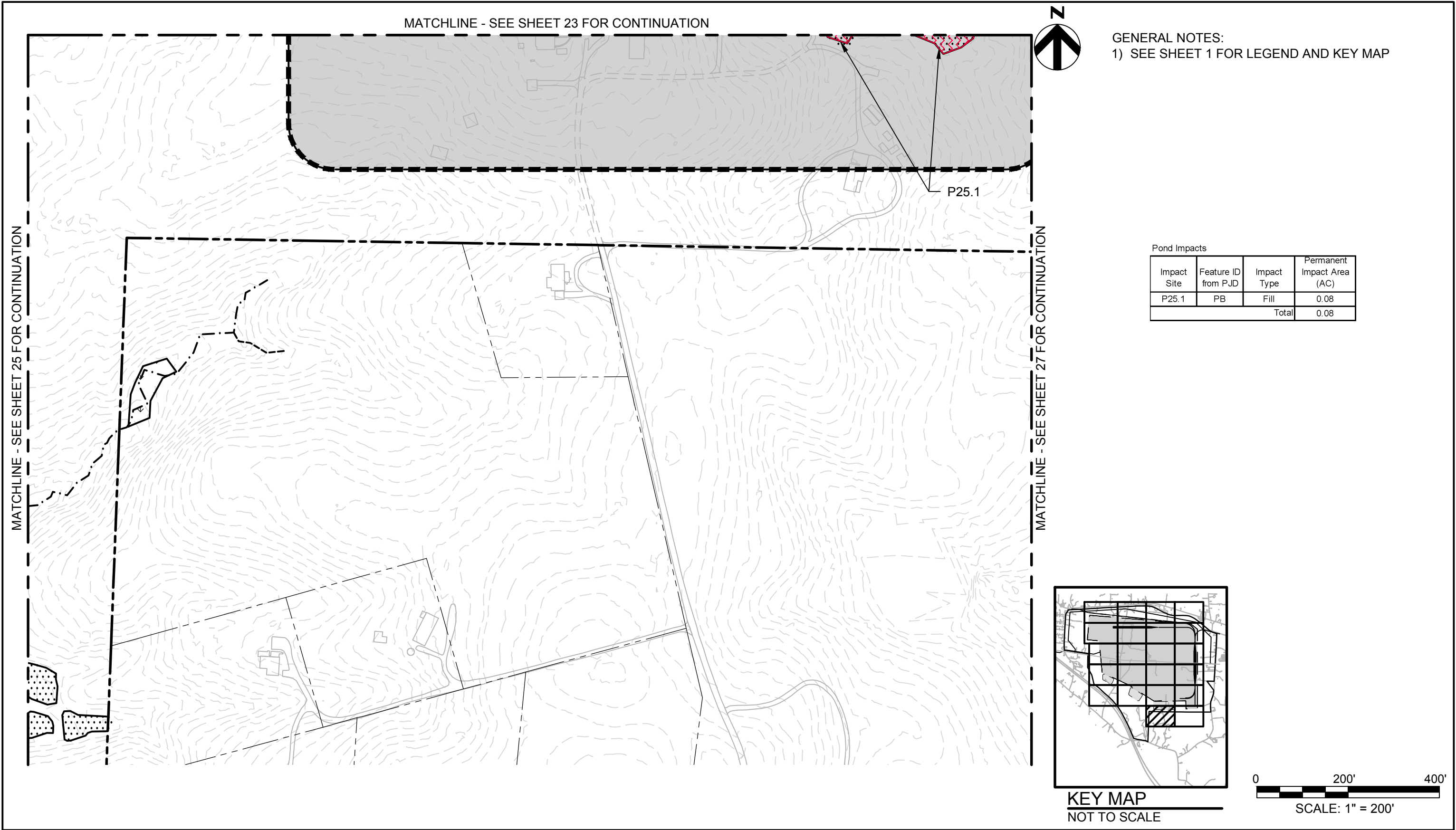
N.C.B.E.L.S. License Number: F-0116

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SITE PLAN  
JURISDICTIONAL IMPACTS

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05/25/2018

SHEET  
01X-24





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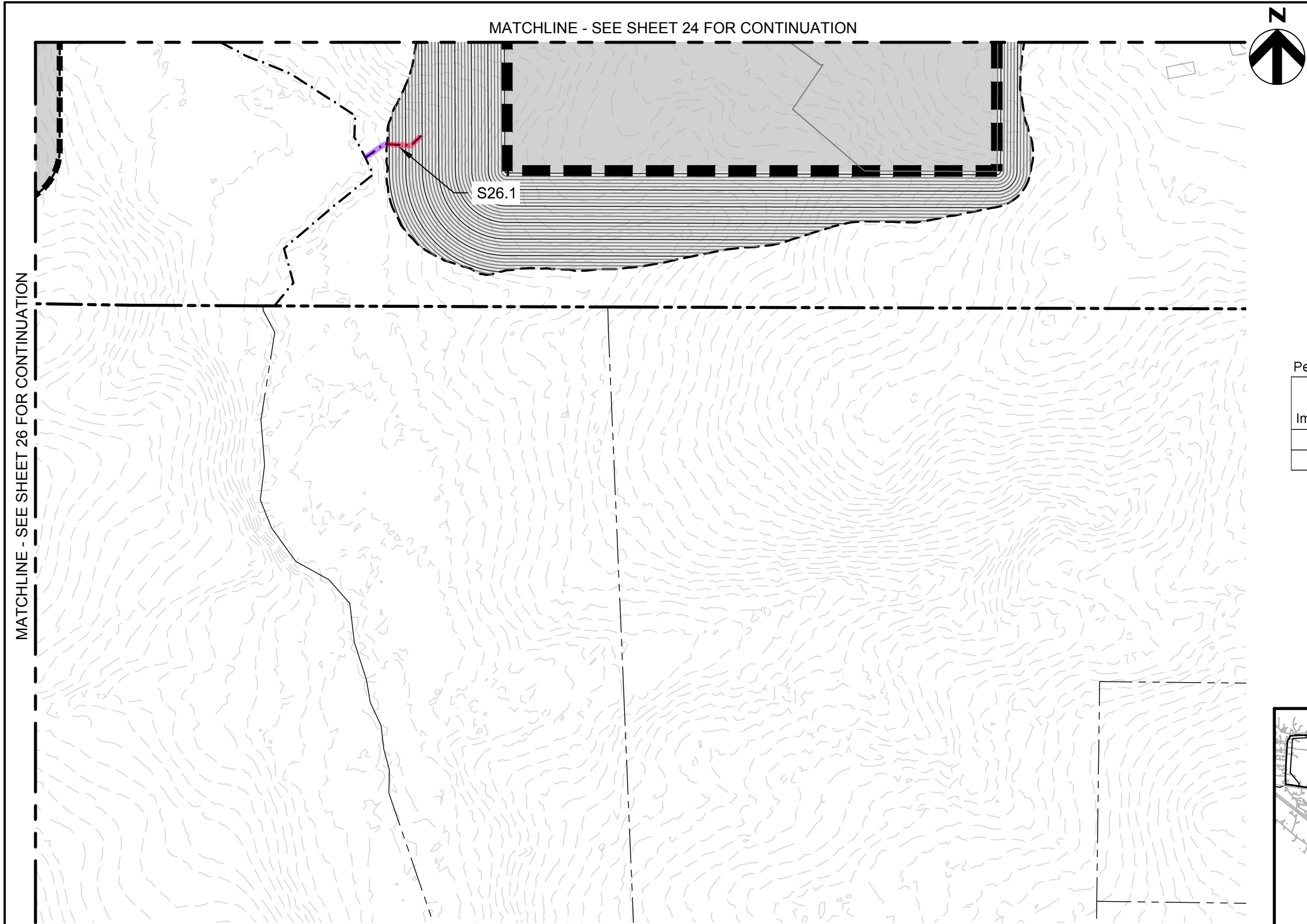
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS**

DATE  
05/25/2018

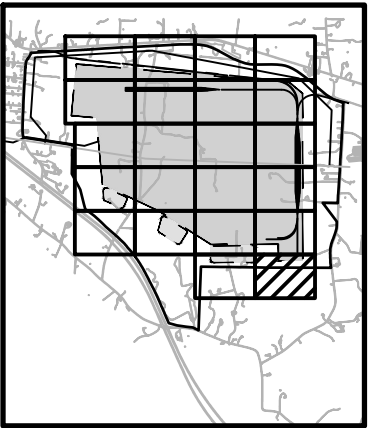
SHEET  
01X-25



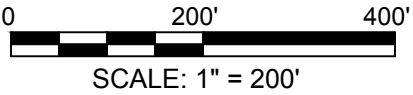


GENERAL NOTES:  
1) SEE SHEET 1 FOR LEGEND AND KEY MAP  
2) NO JURISDICTIONAL IMPACTS THIS SHEET

Perennial Stream Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
S26.1	HDR S2	Fill	68	47
Total			68	47



KEY MAP  
NOT TO SCALE

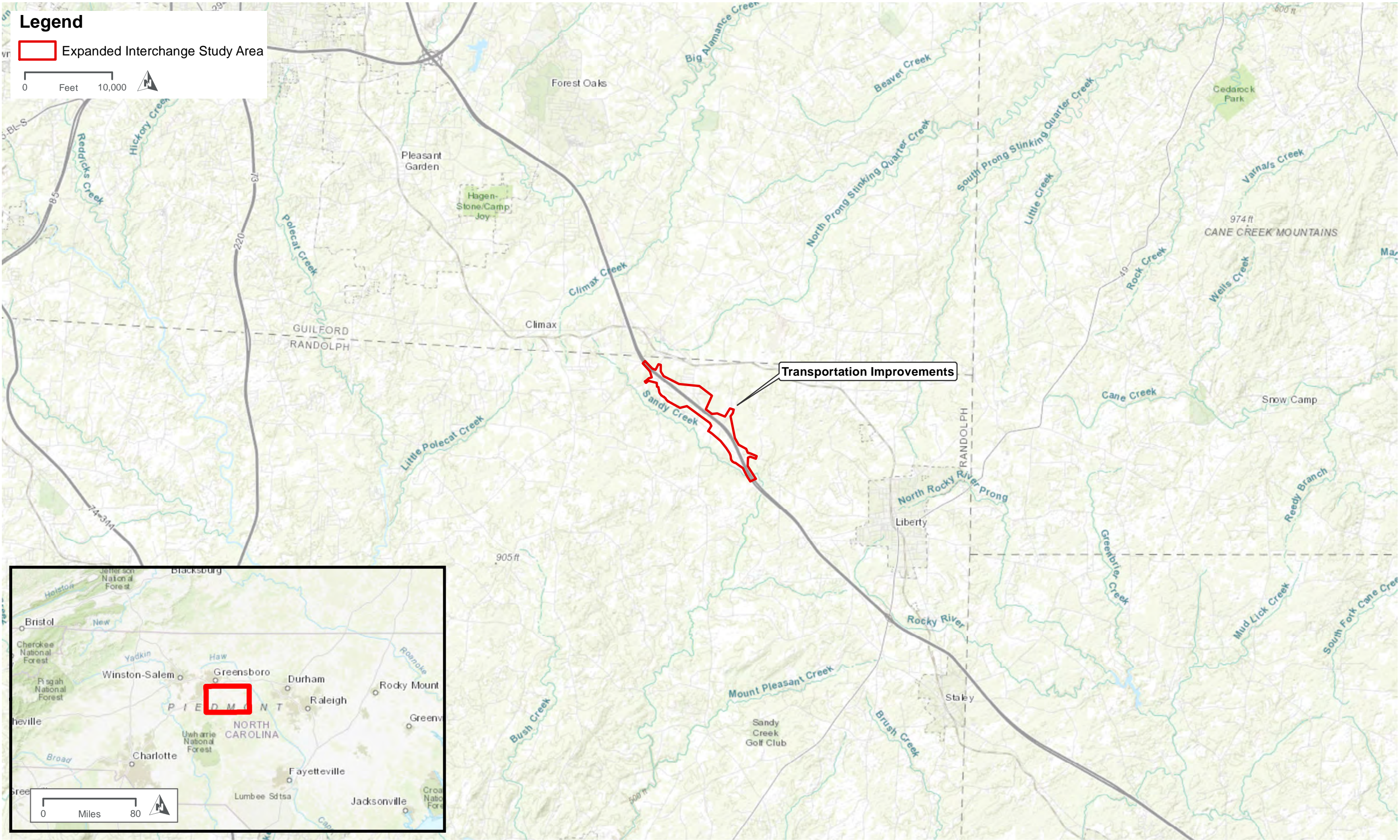


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PROJECT GRMS  
SITE PLAN  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018  
  
SHEET  
01X-26





VICINITY MAP

FIGURE 1





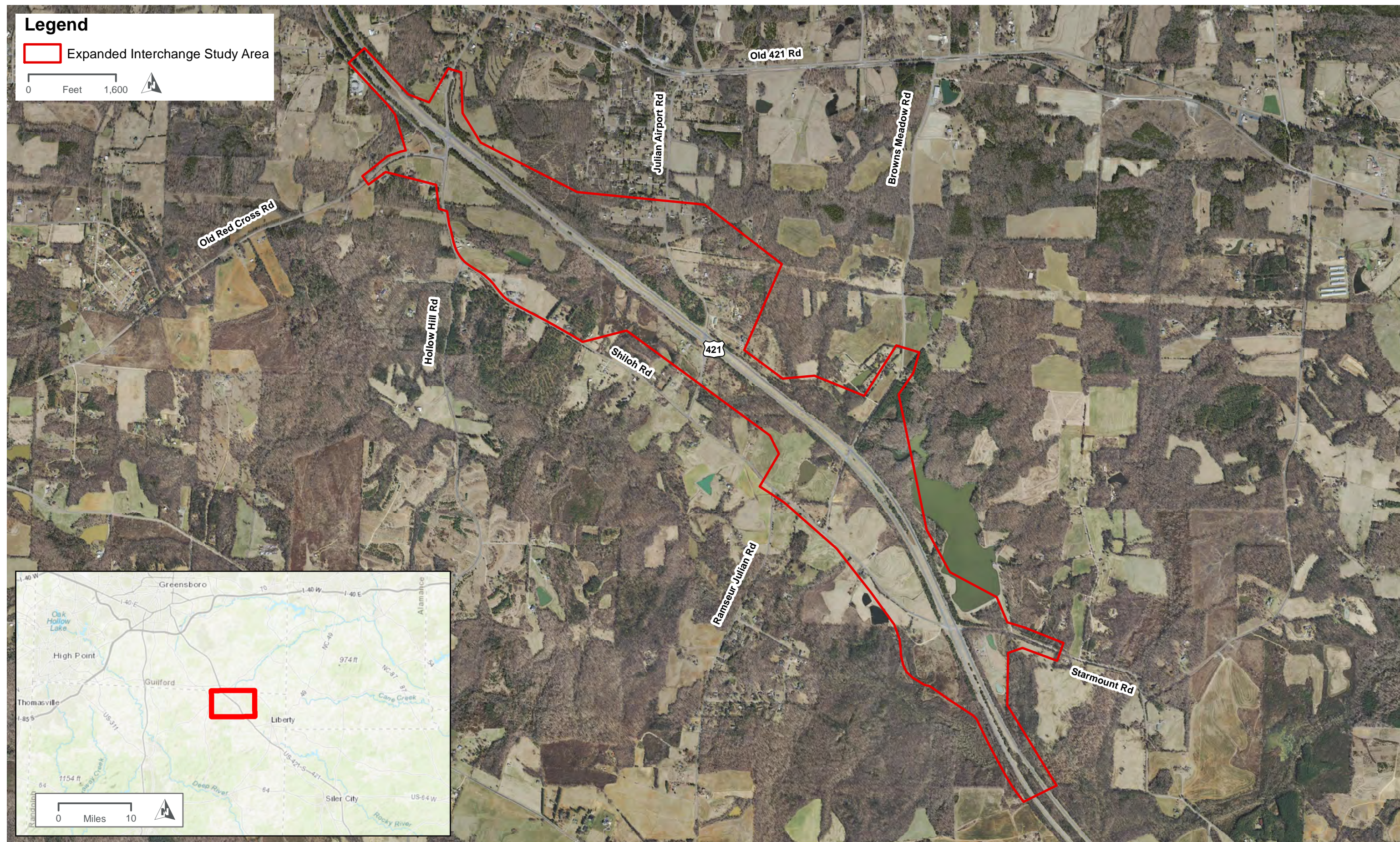


ROADWAY PLAN MAP

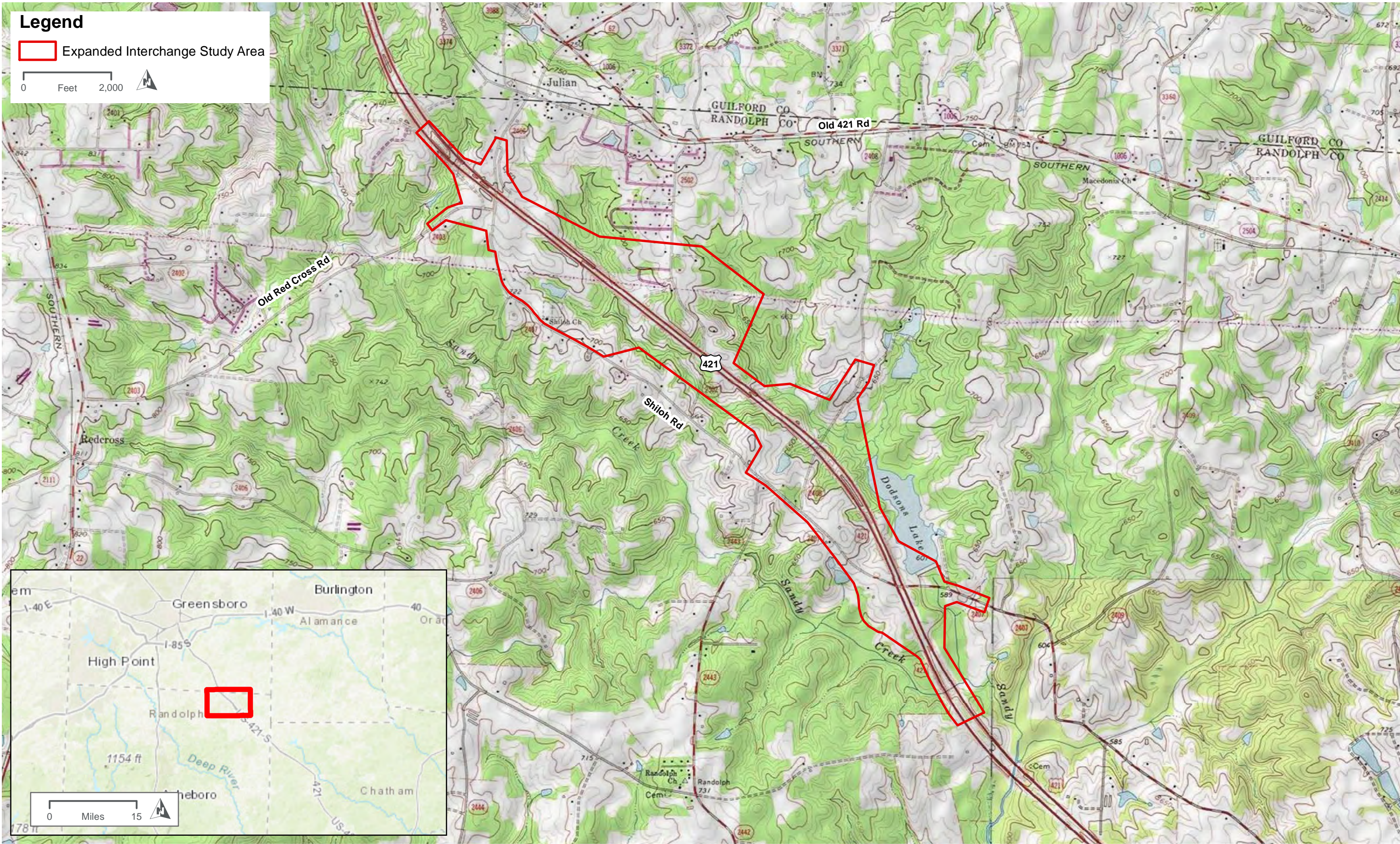


FIGURE 2

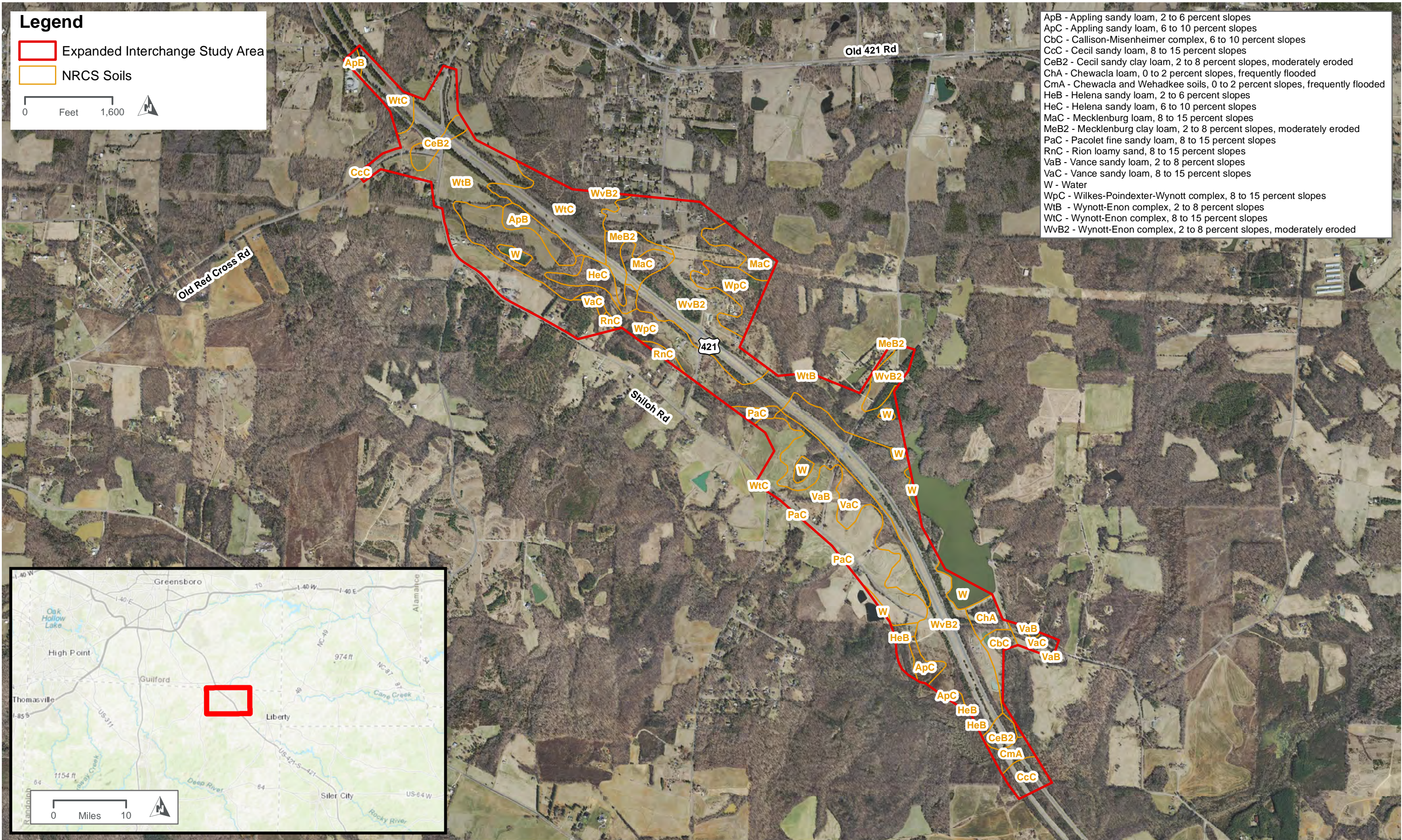










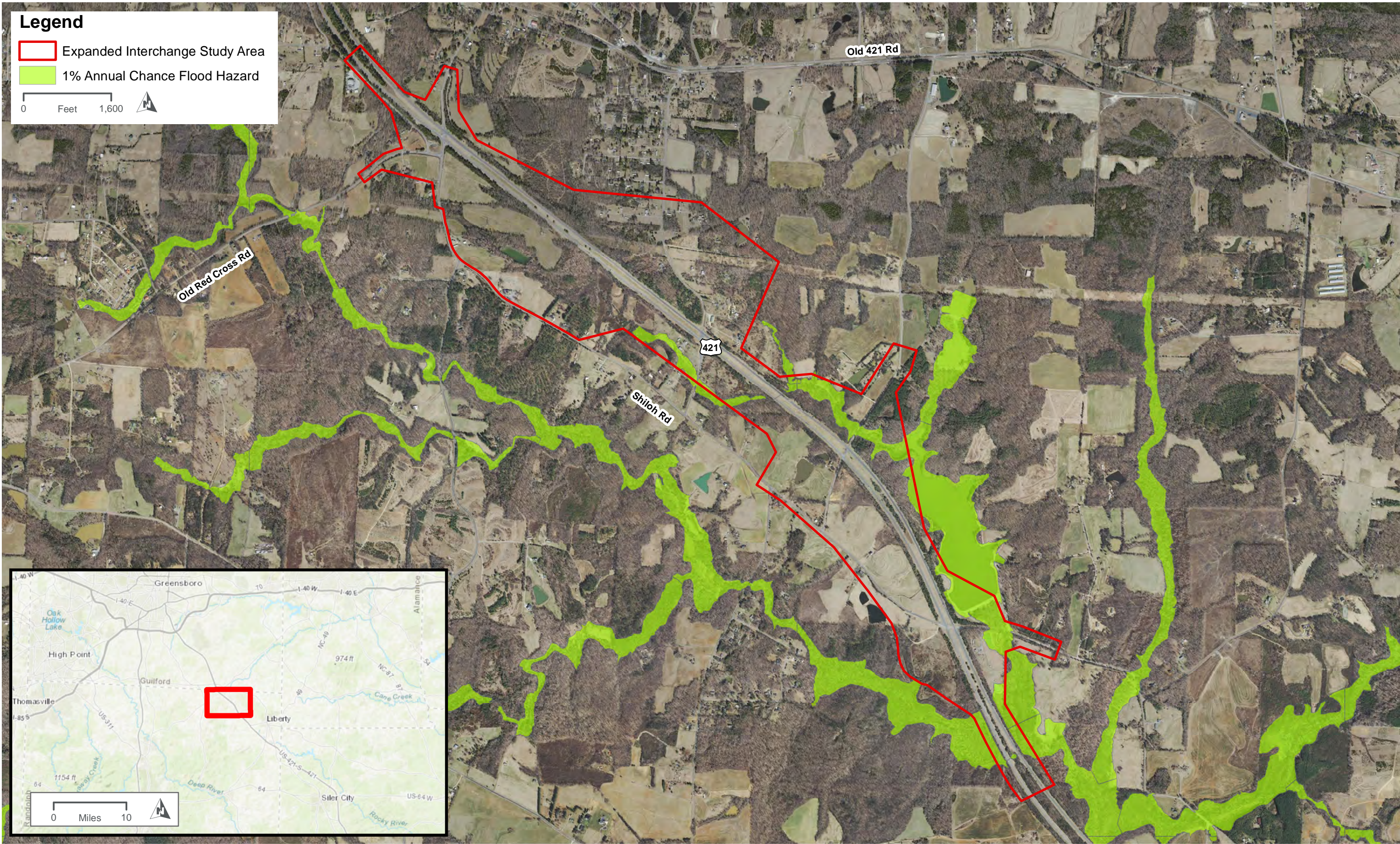


NRCS SOILS MAP



FIGURE 7





**Legend**

Expanded Interchange Study Area

1% Annual Chance Flood Hazard

0      Feet      1,600



FEMA FLOODPLAIN MAP

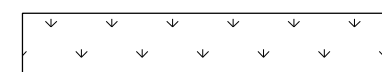


FIGURE 8





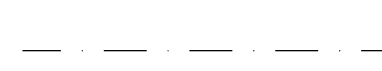
## LEGEND



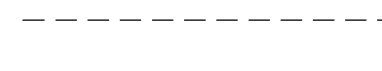
EXISTING WETLAND



EXISTING POND



EXISTING PERENNIAL  
STREAM



EXISTING INTERMITTENT  
STREAM



PERMANENT WETLAND  
IMPACT



TEMPORARY WETLAND  
IMPACT



PERMANENT POND  
IMPACT



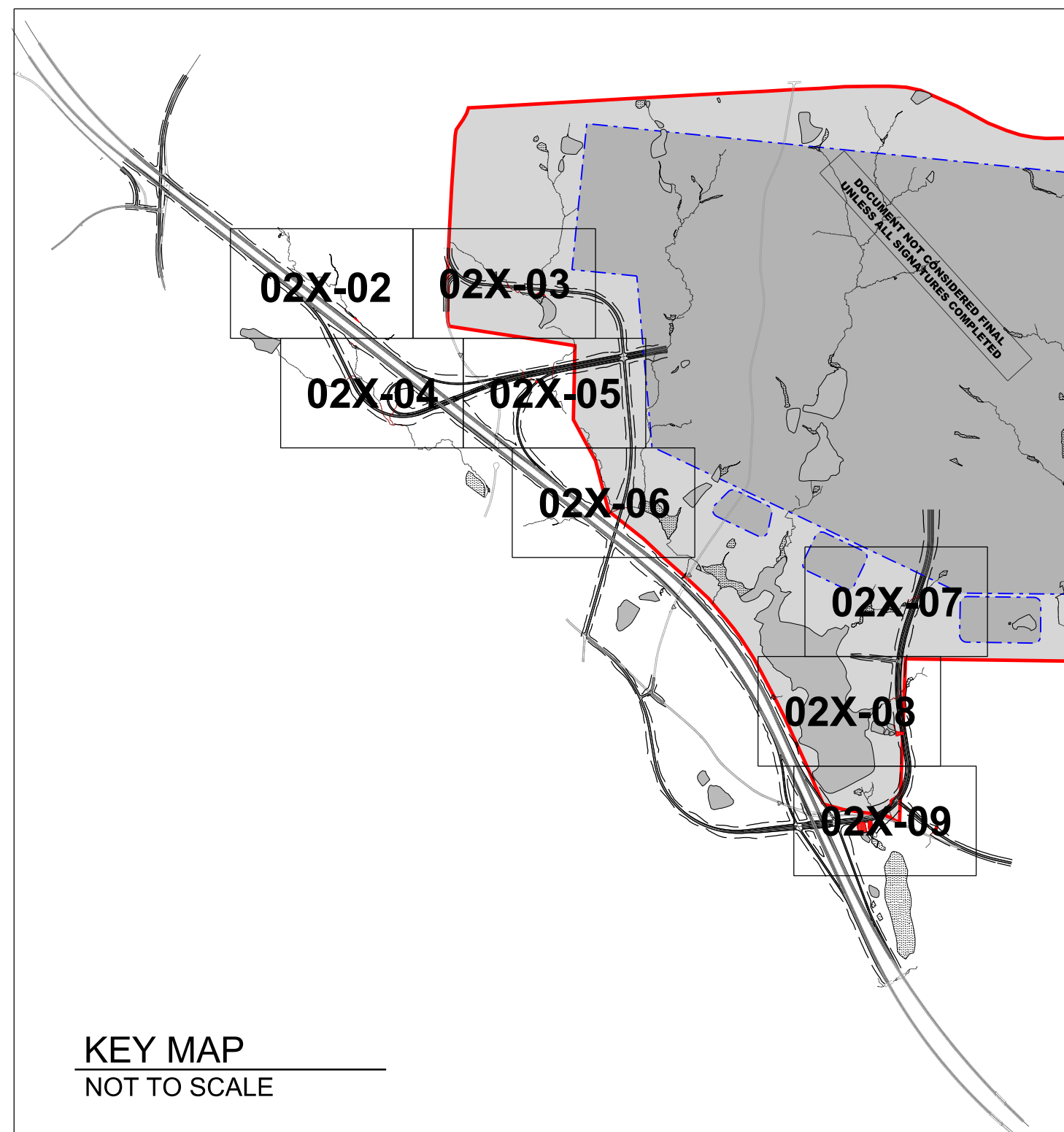
PERMANENT STREAM  
IMPACT



TEMPORARY STREAM  
IMPACT



TRANSPORTATION  
CORRIDOR BOUNDARY



KEY MAP

NOT TO SCALE



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## PROJECT GRMS TRANSPORTATION FACILITIES JURISDICTIONAL IMPACTS

DATE

06/12/2018

SHEET

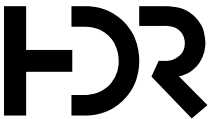
02X-01



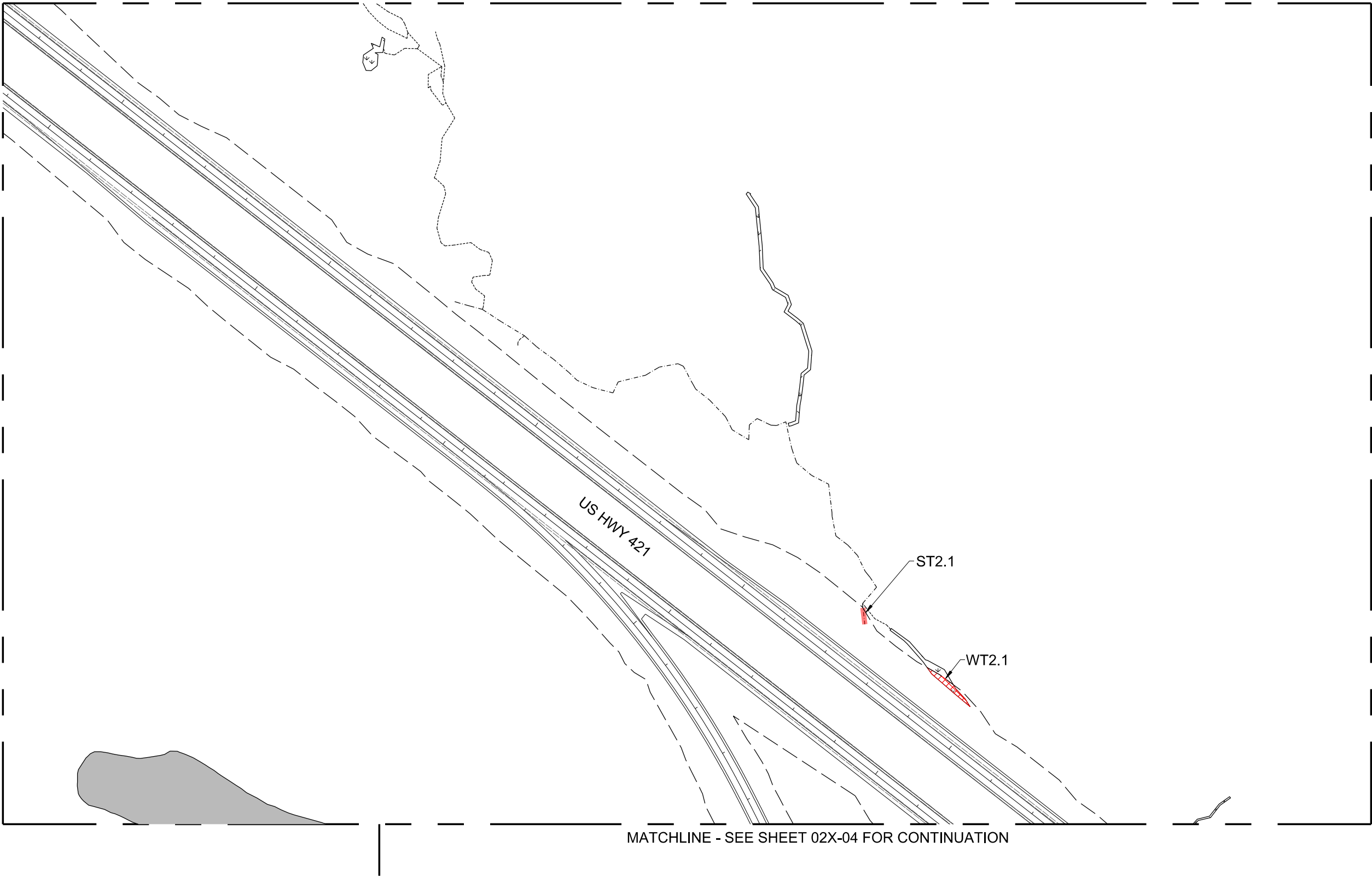
Wetland Impacts								
Impact Number	Sheet Number	Wetland ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Type of Wetland (Cowardin)	Area of Permanent Impact (acres)	Area of Temporary Impact (acres)
WT2.1	2	WB	35.89383	-79.6541203	Fill	PFO	0.018	0
WT3.1	3	W50	35.89489	-79.6452399	Fill	PFO	0.099	0
WT4.1	4	WO	35.89289	-79.6543259	Fill	PFO	0.0004	0
WT8.1	8	WH	35.87717	-79.6327779	Fill	PFO	0.0004	0
WT8.2	8	HDR WC	35.87958	-79.6275104	Fill	PEM	0.003	0
WT9.1	9	WSA	35.8751	-79.6281868	Fill	PEM	0.035	0
WT9.2	9	WS	35.87448	-79.6284527	Fill	PFO	0.014	0
WT9.3	9	WK	35.8741	-79.6292021	Fill	PEM	0.168	0
WT9.4	9	WN	35.87394	-79.6260799	Fill	PFO	0.066	0
						Total	0.404	0

Open Water Impacts							
Impact Number	Sheet Number	Open Water ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Waterbody Type	Area of Impact (acres)
PT8.1	8	P18	35.8777355	-79.6078387	Fill	Pond	0.1101
PT8.2	8	P19	35.8780052	-79.6280614	Fill	Pond	0.0066
PT9.1	9	PB	35.8740277	-79.6296036	Fill	Pond	0.38
						Total	0.50

Stream Impacts										
Impact Number	Sheet Number	Stream ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Perennial (PER) or Intermittent (INT)	Average Stream Width (feet)	Permanent Impact Length (linear feet)	Temporary Impact Length (linear feet)	Impact Area (square feet)
ST2.1	2	SE	35.894183	-79.6546671	Culvert	PER	6	32	0	190
ST3.1	3	S49/SI	35.895054	-79.6466289	Culvert	PER	3	383	0	1,148
ST3.2	3	S47	35.895162	-79.6452019	Culvert	PER	4	172	0	689
ST4.1	4	SE	35.892565	-79.6541181	Culvert	PER	10	584	0	5,845
ST4.2	4	SE1	35.891597	-79.6543983	Culvert	PER	5	170	0	850
ST4.3	4	SW	35.890681	-79.6520941	Culvert	INT	4	727	0	2,908
ST5.1	5	SJ	35.891874	-79.6446361	Culvert	PER	3	210	0	629
ST5.2	5	SK	35.891585	-79.6460359	Culvert	INT	3	395	0	1,185
ST6.1	6	SJ	35.886516	-79.6415857	Culvert	PER	3	95	0	286
ST6.2	6	SE	35.886469	-79.6414069	Culvert	PER	10	419	0	4,188
ST6.3	6	SE	35.886031	-79.6434009	Culvert	PER	10	8	0	83
ST7.1	7	S17	35.883069	-79.6270705	Culvert	PER	3	309	0	927
ST8.1	8	HDR S6	35.879249	-79.6278092	Culvert	PER	3	469	0	1,406
ST9.1	9	SX	35.875076	-79.6281908	Culvert	PER	3	416	0	1,247
ST9.2	9	SQ	35.874564	-79.6288686	Culvert	PER	5	391	0	1,957
ST9.3	9	SS	35.874564	-79.6288686	Culvert	INT	3	168	0	505
					Perennial	Sub-Total		3,657		19442.73
					Intermittent	Sub-Total		1,290		4598.00
						Grand-Total		4,948	0	24,041





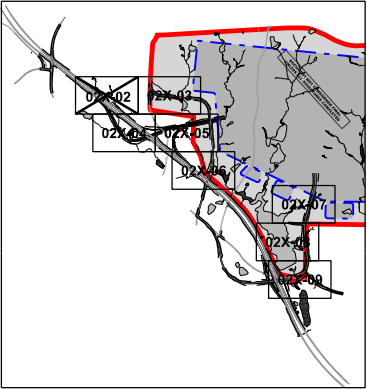


Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WT2.1	WB	Fill	0.018	0
				0
				0
Total			0.018	0

Perennial Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
ST2.1	SE	Culvert	32	0
Total			32	0



KEY MAP  
NOT TO SCALE



SCALE: 1" = 200'



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PROJECT GRMS  
TRANSPORTATION FACILITIES  
JURISDICTIONAL IMPACTS

DATE  
06/12/2018  
  
SHEET  
02X-02



MATCHLINE - SEE SHEET 02X-02 FOR CONTINUATION

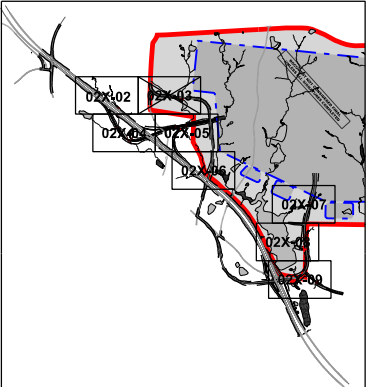
MATCHLINE - SEE SHEET 02X-04 FOR CONTINUATION

MATCHLINE - SEE SHEET 02X-05 FOR CONTINUATION

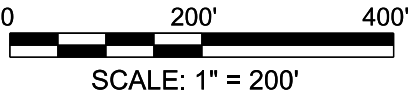


Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WT3.1	W50	Fill	0.10	0
Total			0.10	0

Perennial Stream Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
ST3.1	S49/SI	Culvert	383	0
ST3.2	S47	Culvert	172	0
Total			555	0



KEY MAP  
NOT TO SCALE

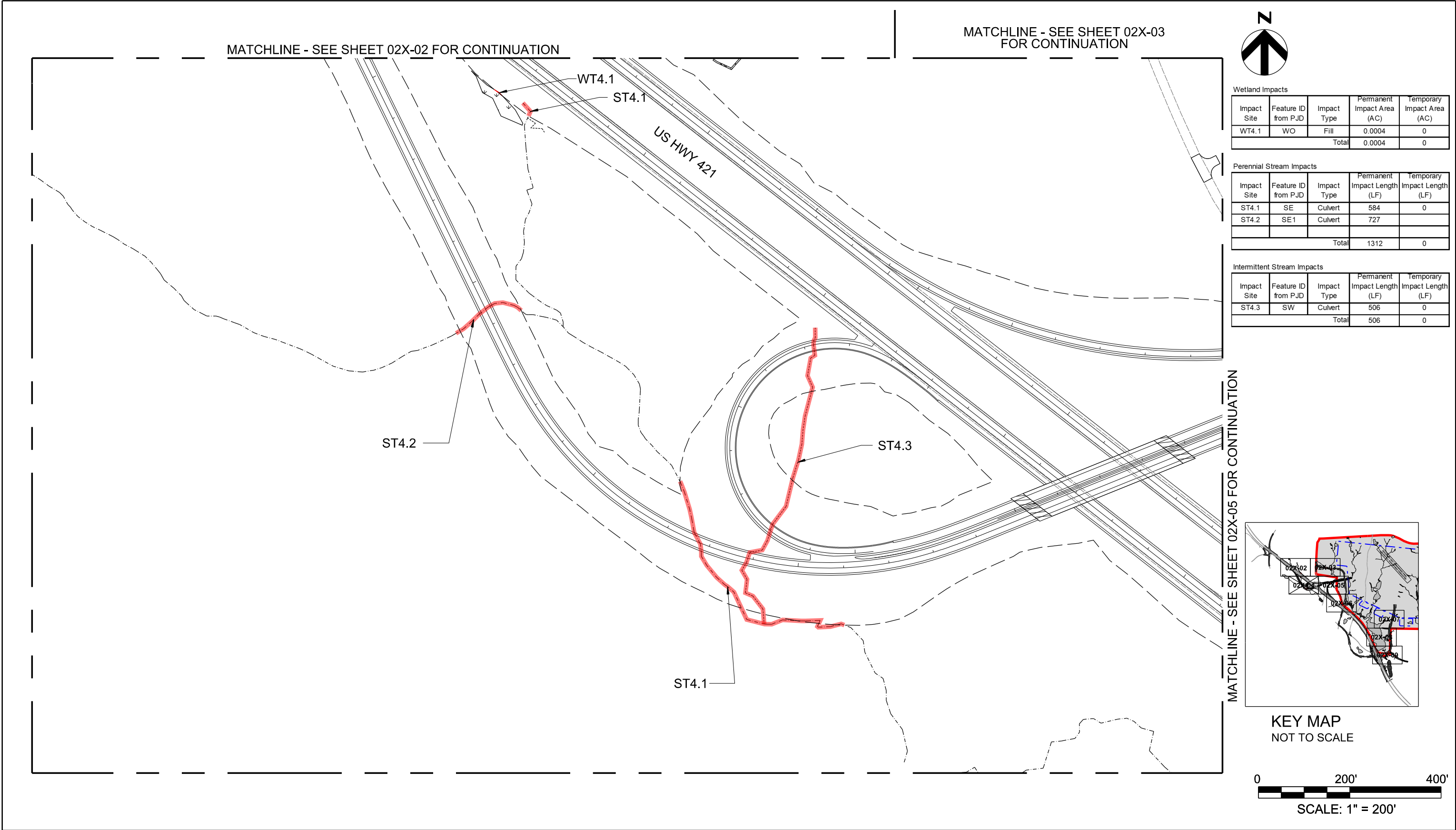


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**PROJECT GRMS  
TRANSPORTATION FACILITIES  
JURISDICTIONAL IMPACTS**

DATE  
06/12/2018  
  
SHEET  
02X-03

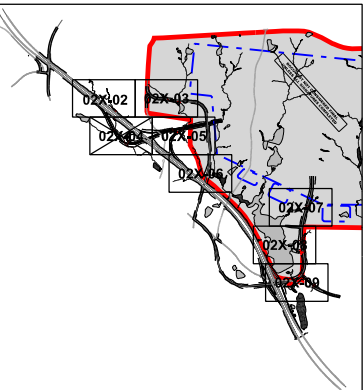




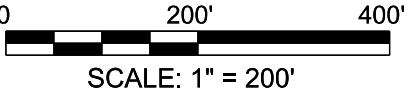
Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WT4.1	WO	Fill	0.0004	0
Total			0.0004	0

Perennial Stream Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
ST4.1	SE	Culvert	584	0
ST4.2	SE1	Culvert	727	0
Total			1312	0

Intermittent Stream Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
ST4.3	SW	Culvert	506	0
Total			506	0



KEY MAP  
NOT TO SCALE



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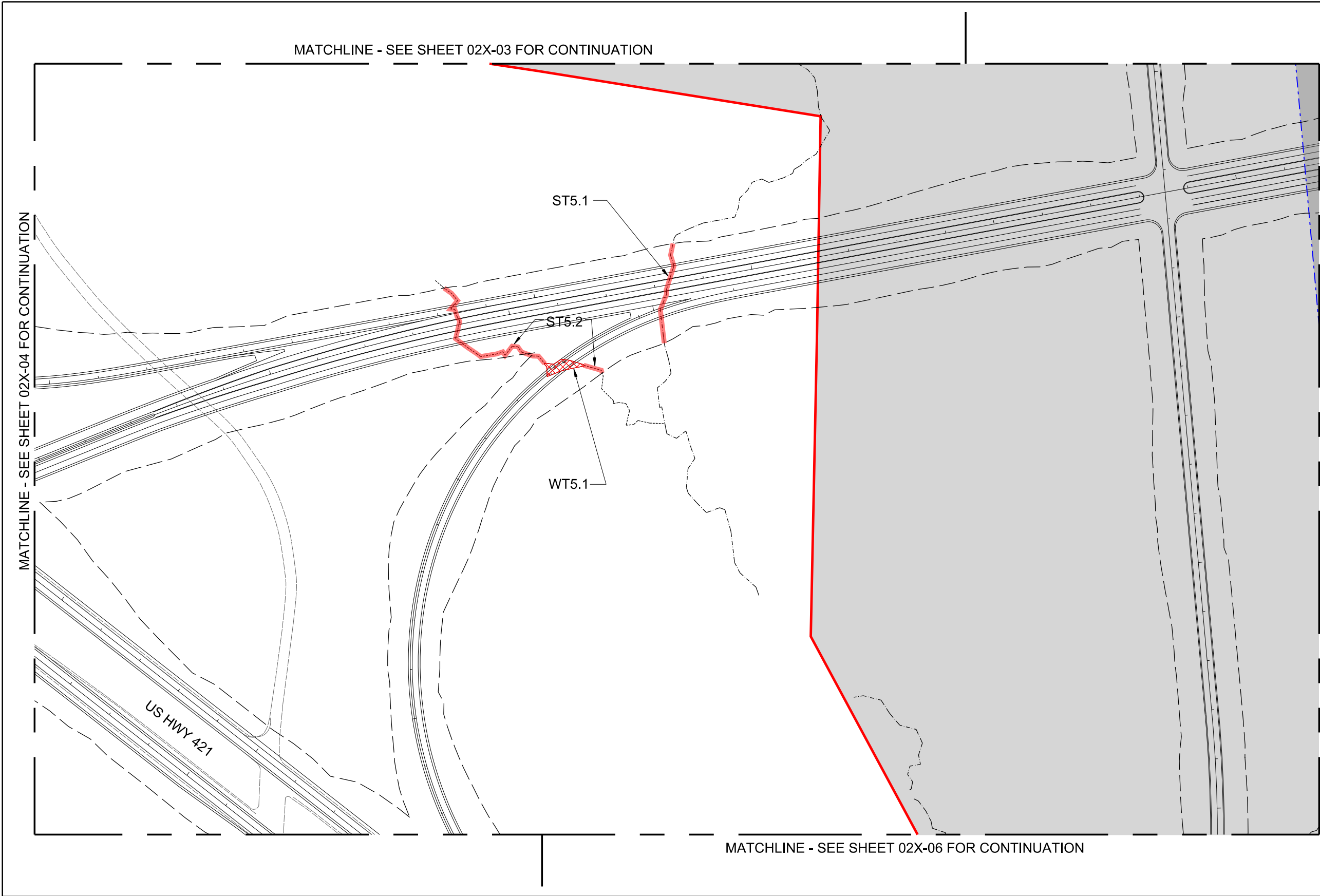
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
TRANSPORTATION FACILITIES  
JURISDICTIONAL IMPACTS**

DATE  
06/12/2018

SHEET  
02X-04





Wetland Impacts

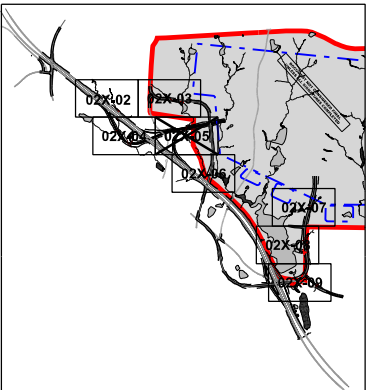
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WT5.1	WD	Fill	0.03	0
Total			0.03	0

Perennial Stream Impacts

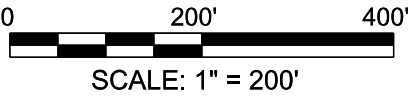
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
ST5.1	SJ	Culvert	210	0
Total			210	0

Intermittent Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
ST5.2	SK	Culvert	395	0
Total			395	0



KEY MAP  
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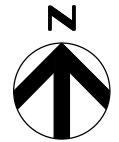
**PROJECT GRMS  
TRANSPORTATION FACILITIES  
JURISDICTIONAL IMPACTS**

DATE  
06/12/2018

SHEET  
02X-05

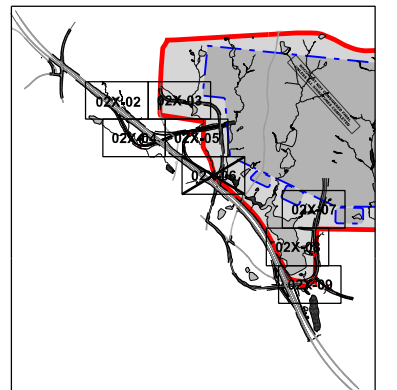
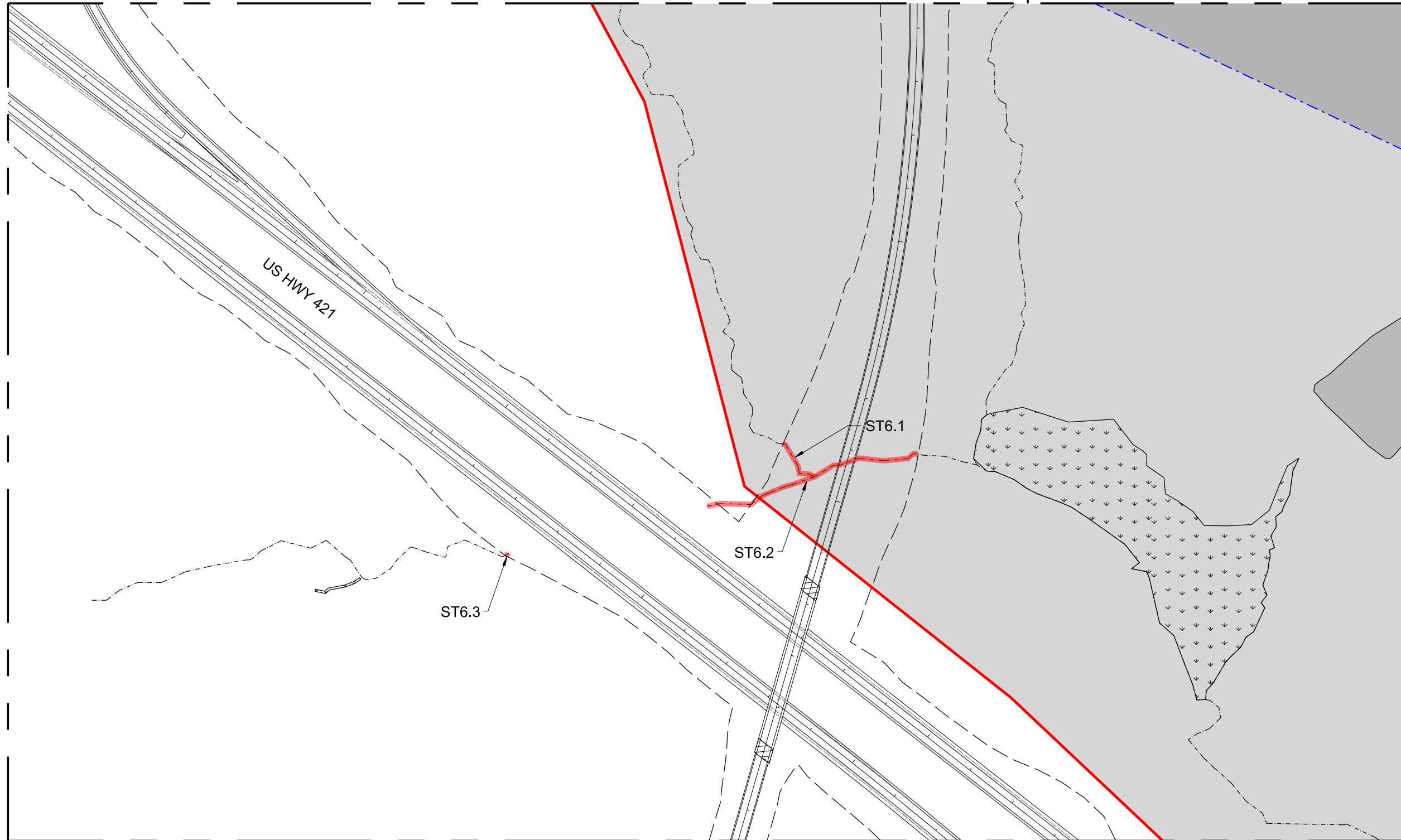


MATCHLINE - SEE SHEET 02X-05 FOR CONTINUATION



Perennial Stream Impacts

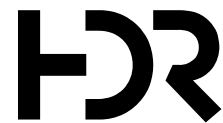
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
ST6.1	SJ	Culvert	95	0
ST6.2	SE	Culvert	419	
ST6.3	SE	Culvert	8	
Total			522	0



KEY MAP  
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SCALE: 1" = 200'



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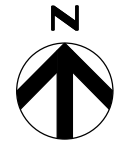
N.C.B.E.L.S. License Number: F-0116

## PROJECT GRMS TRANSPORTATION FACILITIES JURISDICTIONAL IMPACTS

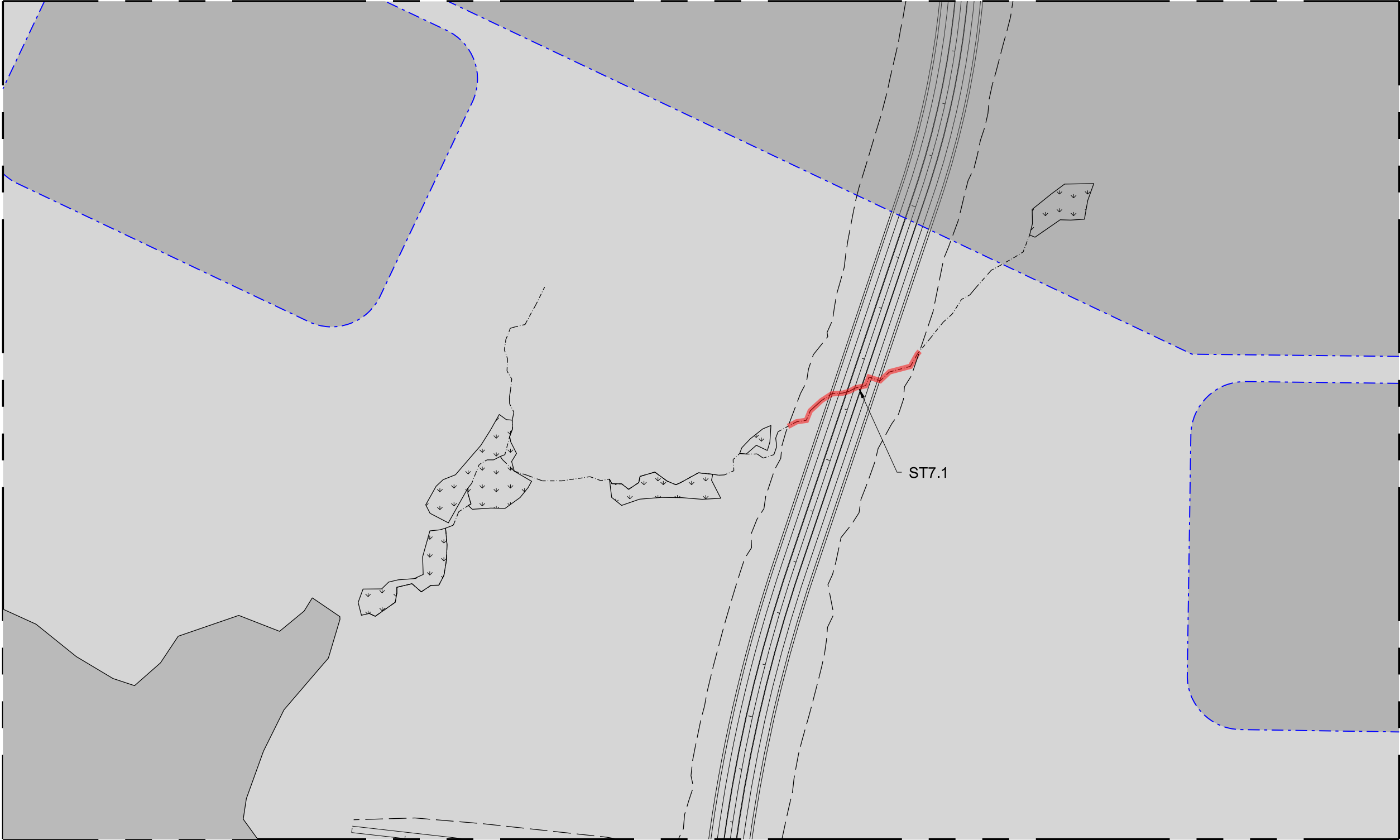
DATE  
06/12/2018

SHEET  
02X-06

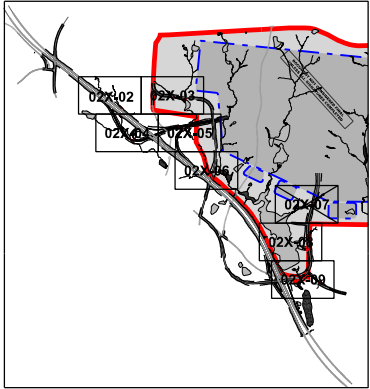




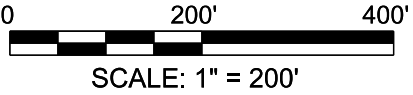
Perennial Stream Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
ST7.1	S17	Culvert	309	0
Total			309	0



MATCHLINE - SEE SHEET 02X-08 FOR CONTINUATION



KEY MAP  
NOT TO SCALE

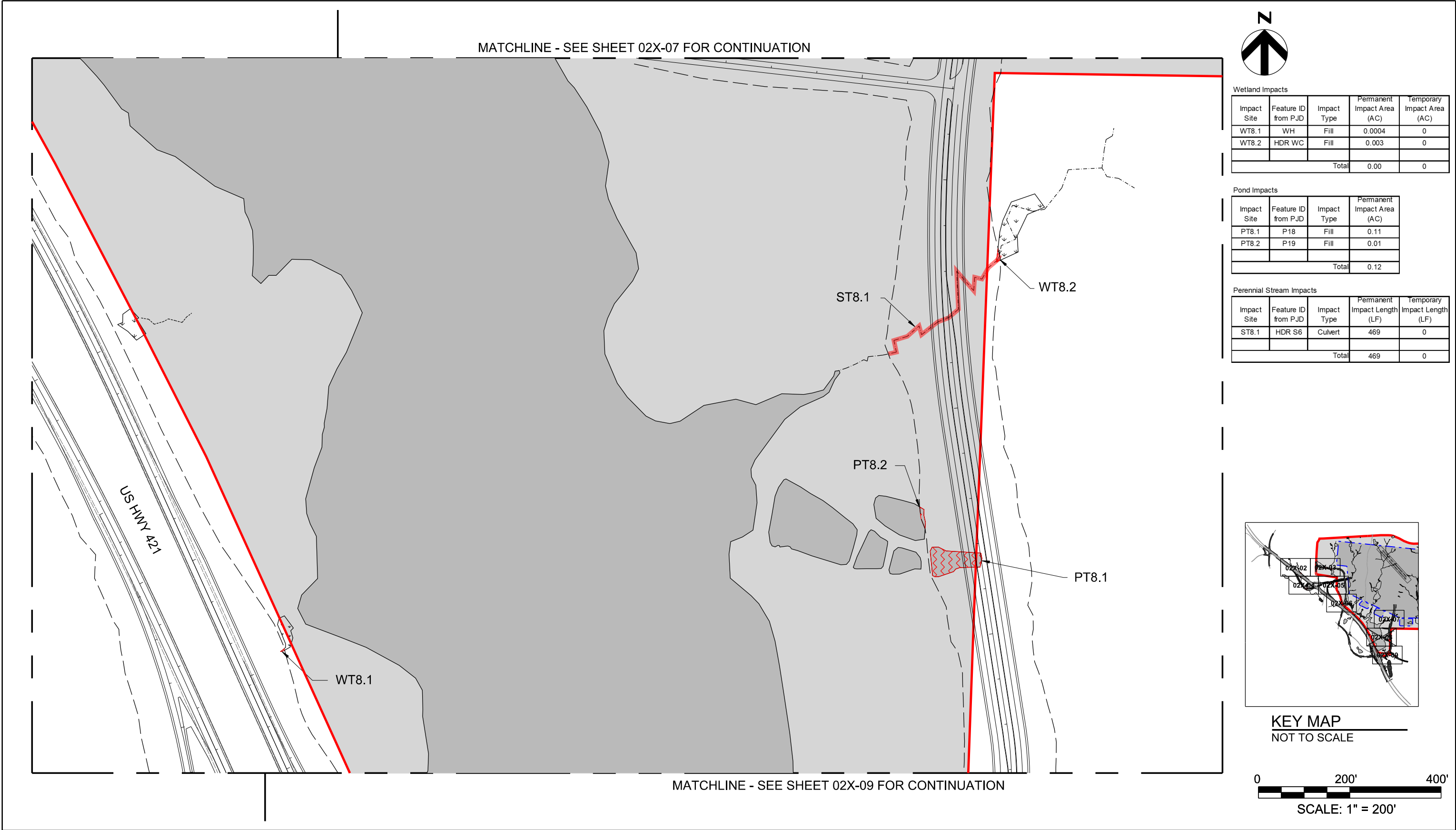


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**PROJECT GRMS  
TRANSPORTATION FACILITIES  
JURISDICTIONAL IMPACTS**

DATE  
06/12/2018  
  
SHEET  
02X-07





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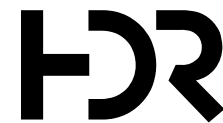
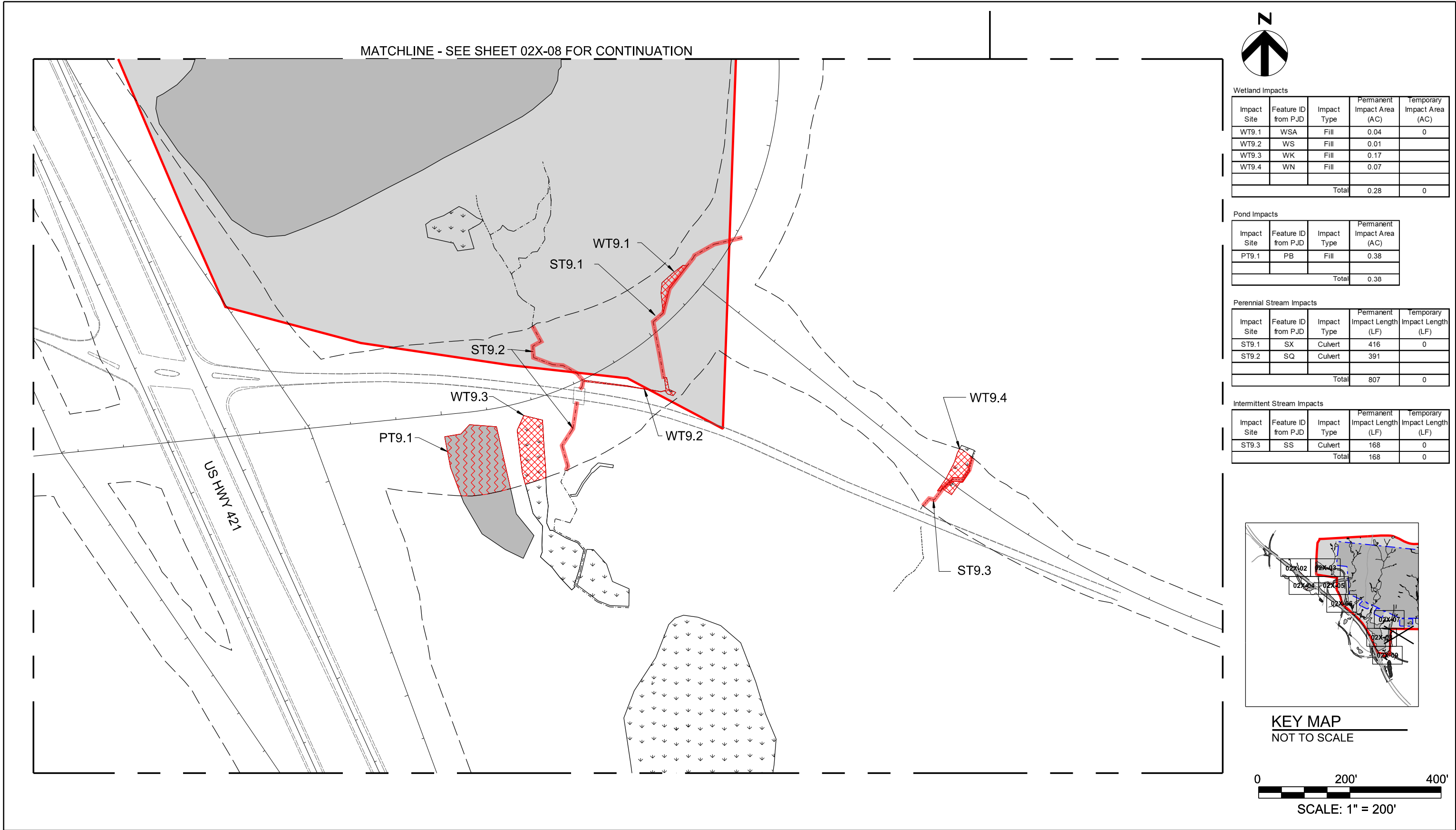
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**PROJECT GRMS  
TRANSPORTATION FACILITIES  
JURISDICTIONAL IMPACTS**

DATE  
06/12/2018

SHEET  
02X-08





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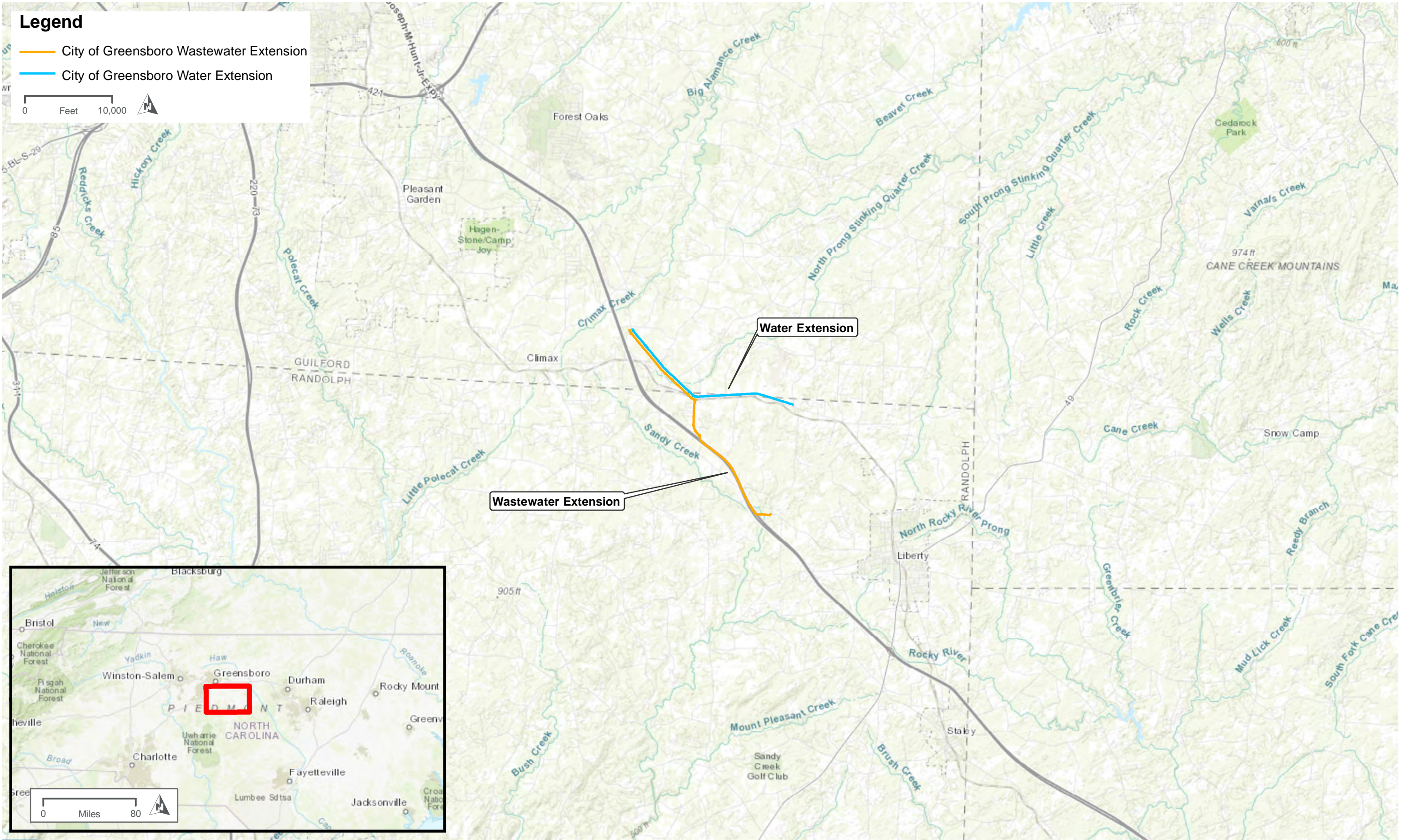
N.C.B.E.L.S. License Number: F-0116

## PROJECT GRMS TRANSPORTATION FACILITIES JURISDICTIONAL IMPACTS

DATE  
06/12/2018

SHEET  
02X-09

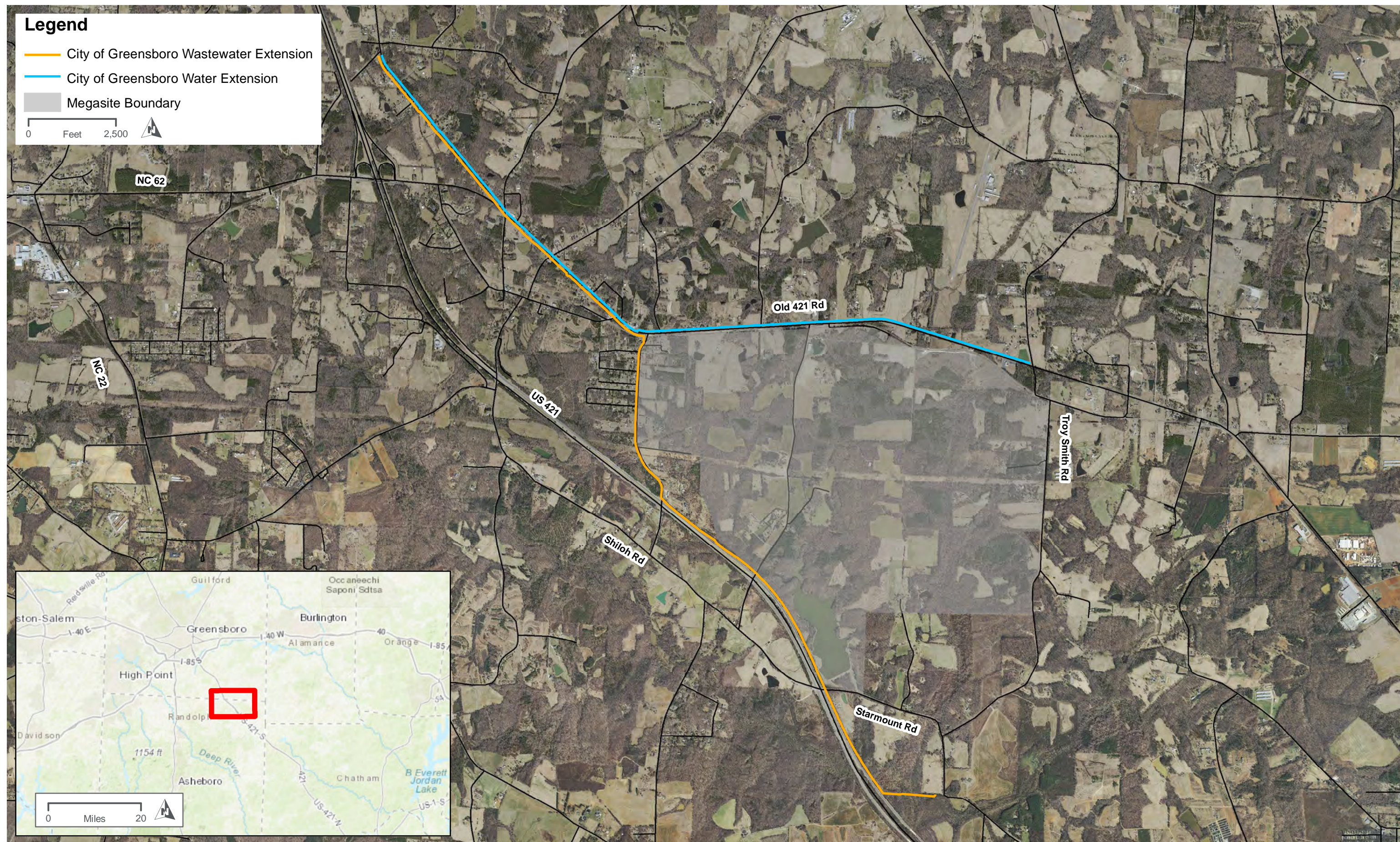




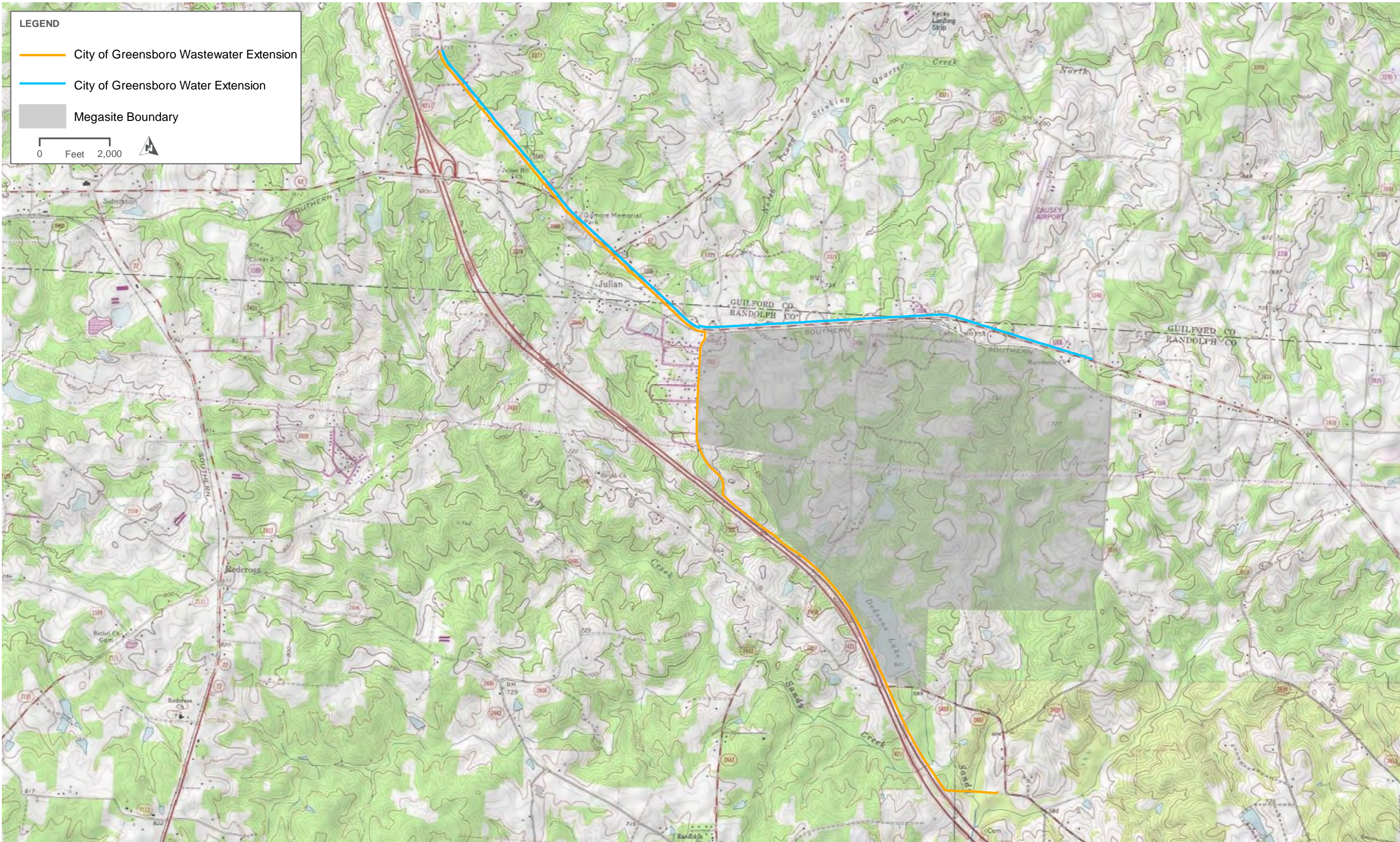
VICINITY MAP  
PROPOSED WATER MAIN AND FORCE MAIN SEWER  
FIGURE 1











**USGS QUADRANGLES: CLIMAX, KIMESVILLE, GRAY'S CHAPEL AND LIBERTY**  
**PROPOSED WATER MAIN AND FORCE MAIN SEWER**

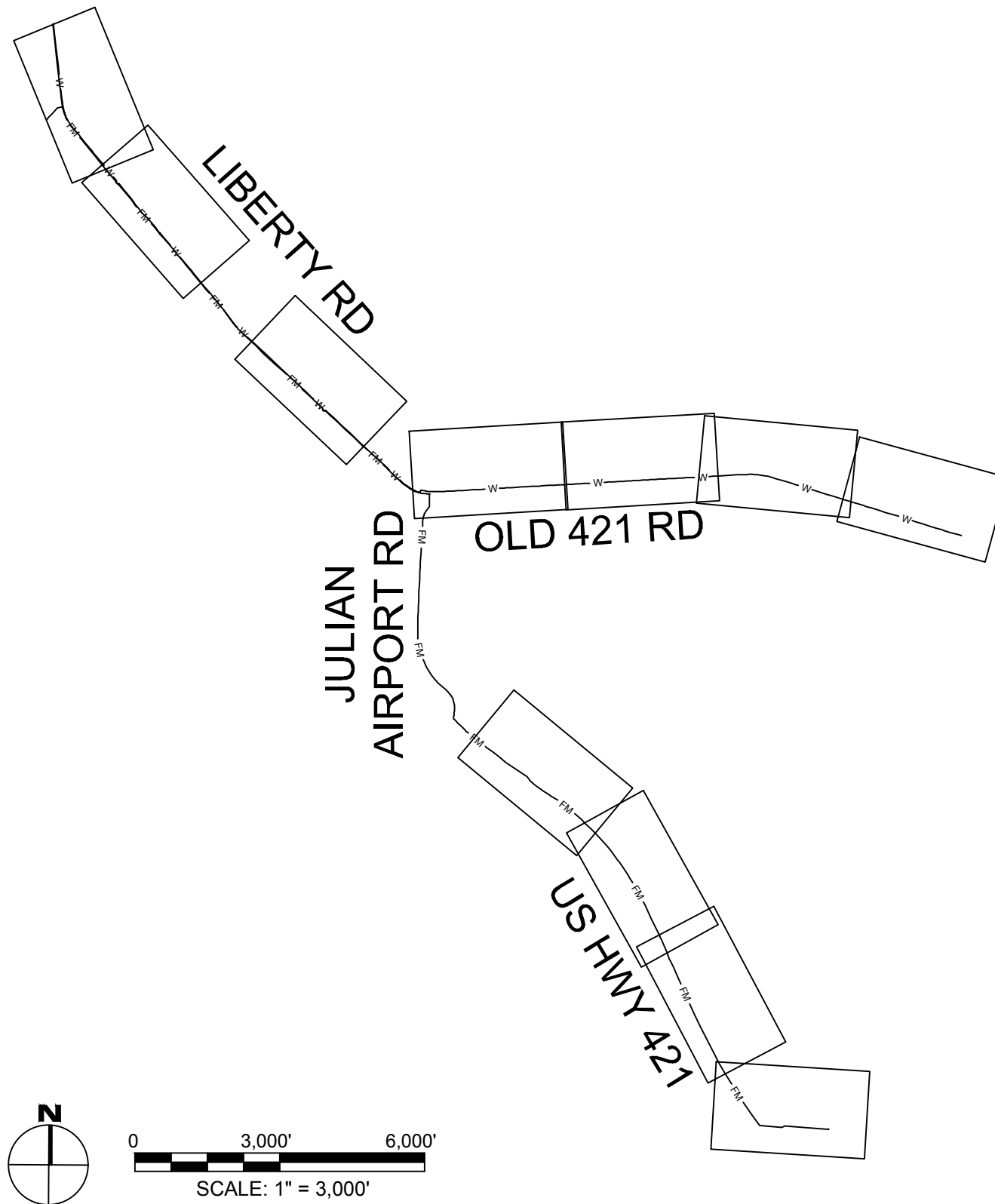
**FIGURE 3**











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## PROJECT NE ☐ ORLD JURISDICTIONAL IMPACTS

DATE  
05/31/2018  
SHEET  
03X-00



Wetland Impacts

Impact Number	Sheet Number	Wetland ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Type of Wetland (Cowardin)	Area of Permanent Impact (acres)	Area of Temporary Impact (acres)
WS5.1	5	W-A-190-1	35.869143	-79.627752	CLEARING	PFO	0.11	0.00
WS6.1	6	W-B-181-6	35.870524	-79.628747	CLEARING	PEM	0.00	0.07
WS6.2	6	W-B-181-6	35.870986	-79.629054	CLEARING	PEM	0.00	0.05
WS8.1	8	W-C-183-3	35.883935	-79.638183	CLEARING	PSS	0.00	0.01
WS9.1	9	W-D-182-2	35.902671	-79.649545	CLEARING	PSS	0.00	0.07
WS9.2	9	W-E-182-3	35.902626	-79.646441	CLEARING	PEM/PSS	0.00	0.08
WS9.3	9	W-B-183-1	35.902961	-79.639914	CLEARING	PEM	0.00	0.01
WS10.1	10	W-B-183-2	35.903147	-79.636891	CLEARING	PEM	0.00	0.01
WS10.2	10	W-D-183-2	35.90319	-79.635919	CLEARING	PEM	0.00	0.01
WS11.1	11	W-D-182-4	35.902781	-79.622182	CLEARING	PSS	0.00	0.01
WS12.1	12	W-A-182-5	35.901815	-79.618279	CLEARING	PEM	0.00	0.01
WS12.2	12	W-A-182-2	35.900386	-79.612446	CLEARING	PFO/PEM	0.01	0.00
WS13.1	13	W-C-182-2	35.905386	-79.654074	CLEARING	PFO	0.01	0.00
WS14.1	14	W-E-182-2	35.917792	-79.668686	CLEARING	PFO	0.02	0.00
WS15.1	15	W-E-182-1	35.923044	-79.674129	CLEARING	PFO	0.04	0.00
Total							0.19	0.33



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PROJECT NE ☐ ORLD  
JURISDICTIONAL IMPACTS

DATE  
05/31/2018  
  
SHEET  
03X-01



Stream Impacts										
Impact Number	Sheet Number	Stream ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Perennial (P) or Intermittent (I)	Average Stream Width (feet)	Permanent Impact Length (linear feet)	Temporary Impact Length (linear feet)	Impact Area (square feet)
SS5.1	5	S-A-190-4	35.866464	-79.622251	STABILIZATION	I	6	20	20	240
SS5.2	5	S-A-190-4	35.866488	-79.622650	STABILIZATION	I	6	20	20	240
SS5.3	5	S-A-190-2	35.866531	-79.623971	STABILIZATION	P	15	21	21	630
SS5.4	5	S-A-190-1	35.868492	-79.627243	STABILIZATION	P	15	20	20	600
SS7.1	7	S-A-183-2	35.789130	-79.633727	STABILIZATION	I	4	32	21	212
SS7.2	7	S-A-183-3	35.882835	-79.636832	STABILIZATION	P	4	21	25	184
SS8.1	8	S-C-183-1	35.883935	-79.638183	STABILIZATION	I	4	0	41	164
SS8.2	8	S-D-183-4	35.886291	-79.641971	STABILIZATION	P	7	21	22	301
SS10.1	10	S-D-183-2	35.903195	-79.635911	STABILIZATION	I	3	13	0	39
SS13.1	13	S-B-182-4	35.907172	-79.656435	STABILIZATION	I	4	0	43	172
SS13.2	13	S-E-182-3	35.910407	-79.660758	STABILIZATION	I	4	25	20	180
SS14.1	14	S-E-182-1	35.919983	-79.670978	STABILIZATION	P	6	0	38	228
							Total	193	291	3,190



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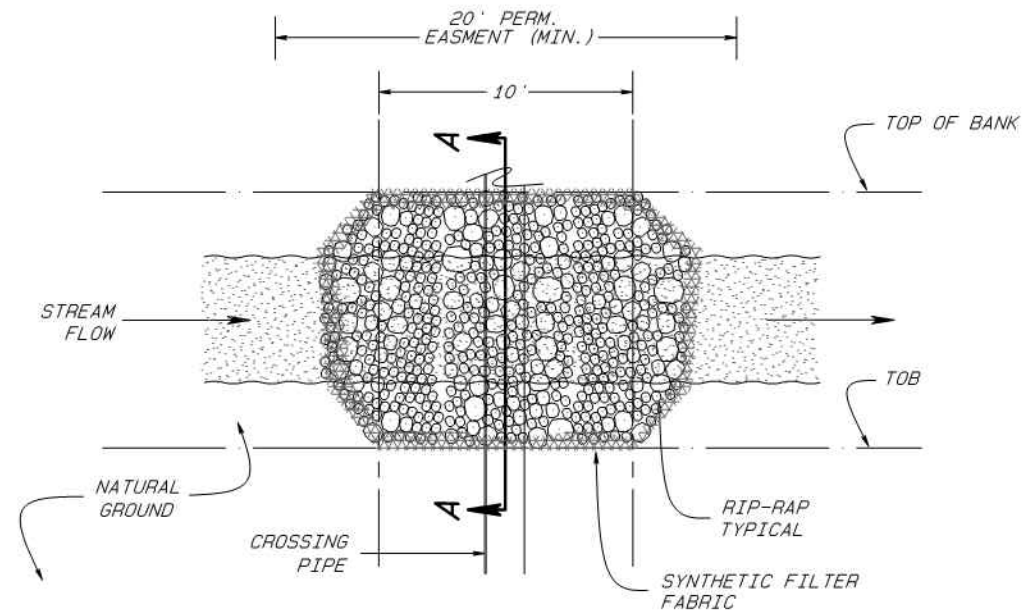
PROJECT NE ☐ ORLD ☐  
JURISDICTIONAL IMPACTS

DATE  
05/31/2018  
  
SHEET  
03X-02

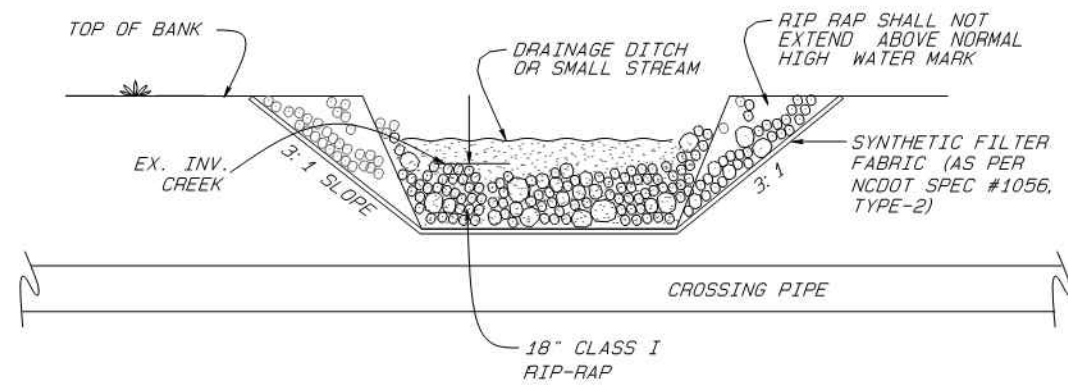


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**PLAN**



**SECTION A-A**

**NOTES:**

- 1) PERMANENT CROSSING FOR VEHICLE MAINTENANCE EQUIPMENT.
- 2) CLASS I RIP-RAP TO BE LAID MIN. 18 INCHES THICK OVER ENTIRE AREA OF DISTURBANCE (AS DIRECTED BY ENGINEER).
- 3) CLASS II RIP-RAP USED IN LARGER STREAMS (AS DIRECTED BY ENGINEER).
- 4) AS PROJECT IS STABILIZED PLACE SYNTHETIC FILTER FABRIC & SPREAD ALL EXISTING EROSION STONE INTO PERMANENT LINER AS SHOWN. ADD STONE AS NEEDED.
- 5) ANY REQUIRED ARMORING ABOVE NORMAL HIGH WATER MARK SHALL CONSIST OF MATTING OR APPROVED VEGETATIVE COVER.

**CITY OF GREENSBORO**

**STANDARD PERMANENT CREEK STABILIZATION  
WITH MAINTENANCE CROSSING**

STD. NO.	REV.
214	01-91 06-05 03-97 03-05



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**PROJECT NE ☐ ORLD  
JURISDICTIONAL IMPACTS**

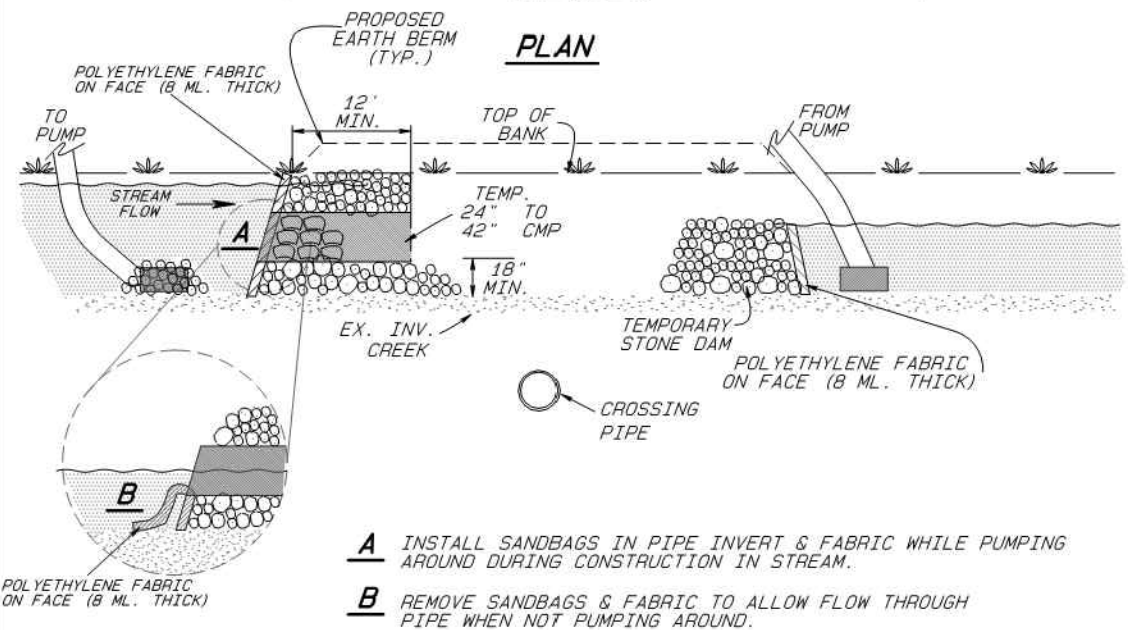
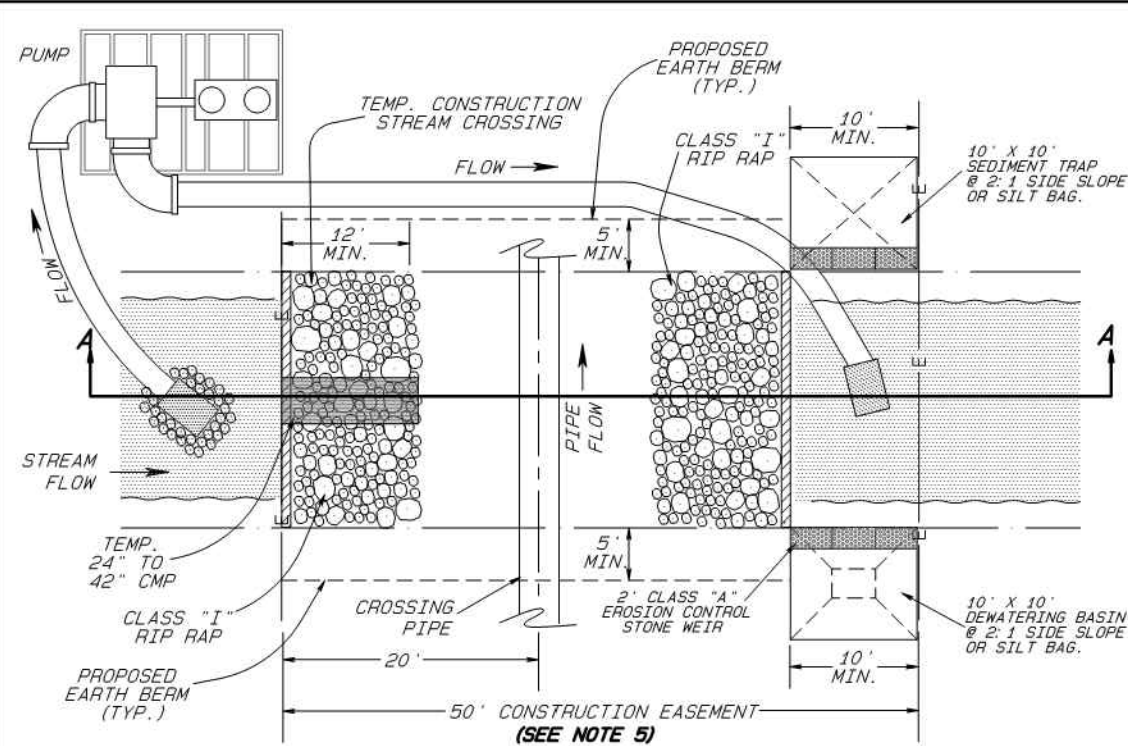
DATE  
05/31/2018

SHEET  
03X-03



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- A** INSTALL SANDBAGS IN PIPE INVERT & FABRIC WHILE PUMPING AROUND DURING CONSTRUCTION IN STREAM.
- B** REMOVE SANDBAGS & FABRIC TO ALLOW FLOW THROUGH PIPE WHEN NOT PUMPING AROUND.

**SECTION A-A**

1 OF 2

**CITY OF GREENSBORO**

**STANDARD TEMPORARY CREEK  
CROSSING DURING CONSTRUCTION**

STD. NO.	REV.
213	01-91 06-05 03-97 09-05 03-05

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**NOTES:**

- 1) EROSION STONE TO BE "CLASS I" RIP-RAP UNLESS DESIGNATED DIFFERENTLY ON CONSTRUCTION PLAN.
- 2) PIPE SIZE AND AMOUNT NEEDED TO BE DETERMINED BY ENGINEER ON CONSTRUCTION PLAN.
- 3) TEMPORARY STREAM CROSSING TO BE CONVERTED TO COG #214 UPON PROJECT CONSTRUCTION COMPLETION IF CALLED FOR ON THE CONSTRUCTION PLANS.
- 4) PUMP AND LINE SIZE TO BE DETERMINED BY THE CONTRACTOR USING THE BASE FLOW SHOWN ON THE CONSTRUCTION PLANS.
- 5) WIDTH OF CONSTRUCTION EASEMENT SHALL BE MINIMIZED BASED UPON FIELD CONDITIONS. ANY DISTURBANCE(S) EXCEEDING 40' MAY REQUIRE ADDITIONAL WATER QUALITY PERMITTING OR MITIGATION.

**CONSTRUCTION SEQUENCE FOR STREAM CROSSING**

- 1) INSTALL PUMP AND LINE TO PUMP FLOW FROM AREA UPSTREAM OF TEMPORARY STREAM CROSSING TO AREA DOWNSTREAM OF CONSTRUCTION AREA. BEGIN PUMPING AND CONTINUING PUMPING WHILE WORKING WITHIN THE STREAM.
- 2) INSTALL UPSTREAM DAM, FILTER FABRIC, AND TEMPORARY CMP. COVER PIPE INLET WITH FABRIC AND SAND BAGS AS SHOWN IN INSET "A" WHILE WORKING IN THE STREAM. ALLOW STREAM FLOW THROUGH CMP AS SHOWN IN INSET "B" WHEN NOT WORKING WITHIN THE STREAM.
- 3) INSTALL DOWNSTREAM TEMPORARY STONE DAM AND FILTER FABRIC TO PREVENT BACK FLOW INTO CONSTRUCTION AREA.
- 4) INSTALL PROPOSED EARTH BERMS ALONG TOP OF BANK ON EACH SIDE OF THE CONSTRUCTION AREA.
- 5) INSTALL DEWATERING BASIN OR SILT BAG AT TOP OF BANK. DEWATER CONSTRUCTION AREA BETWEEN TEMPORARY DAM USING THIS BASIN.
- 6) INSTALL THE 10' X 10' SEDIMENT TRAP OR SILT BAG.
- 7) UPON CONSTRUCTION COMPLETION, REMOVE TEMPORARY DAMS, FILTER FABRIC, AND TEMPORARY CMP. DEPRESS TEMPORARY DAM BOTTOMS INTO STREAM BED UNTIL TOP OF RIP RAP IS LEVEL WITH STREAM BOTTOM. CONVERT TO COG STANDARD #214 IF CALLED FOR IN THE CONSTRUCTION PLANS.
- 8) UPON STABILIZATION OF CLEARED AREAS, REMOVE TEMPORARY EARTH BERM, SEDIMENT TRAP, AND DEWATERING BASIN.

2 OF 2

**CITY OF GREENSBORO**

**STANDARD TEMPORARY CREEK  
CROSSING DURING CONSTRUCTION**

STD. NO.	REV.
213	01-91 06-05 03-97 09-05 03-05



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**PROJECT NE ☐ ORLD  
JURISDICTIONAL IMPACTS**

DATE  
05/31/2018

SHEET  
03X-04



MATCHLINE - SEE SHEET 03X-06 FOR CONTINUATION

MATCHLINE - SEE SHEET 03X-06 FOR CONTINUATION

LEGEND

EXISTING WETLAND

EXISTING POND

EXISTING PERENNIAL STREAM

EXISTING INTERMITTENT STREAM

PERMANENT WETLAND IMPACT

TEMPORARY WETLAND IMPACT

PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)

TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)

PROPOSED SEWER MAIN

PROPOSED WATER MAIN

Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS5.1	W-A-190-1	CLEARING	0.11	0.00
Total			0.11	0.00

Perennial Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS5.3	S-A-190-2	STABILIZATION	21	21
SS5.4	S-A-190-1	STABILIZATION	20	20
Total			41	41

Intermittent Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS5.1	S-A-190-4	STABILIZATION	20	20
SS5.2	S-A-190-4	STABILIZATION	20	20
Total			40	40

KEYMAP


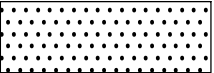

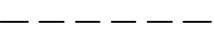
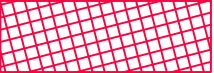




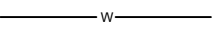
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PROJECT NE ORLD  
JURISDICTIONAL IMPACTS

DATE  
05/31/2018  
  
SHEET  
03X-05



LEGEND

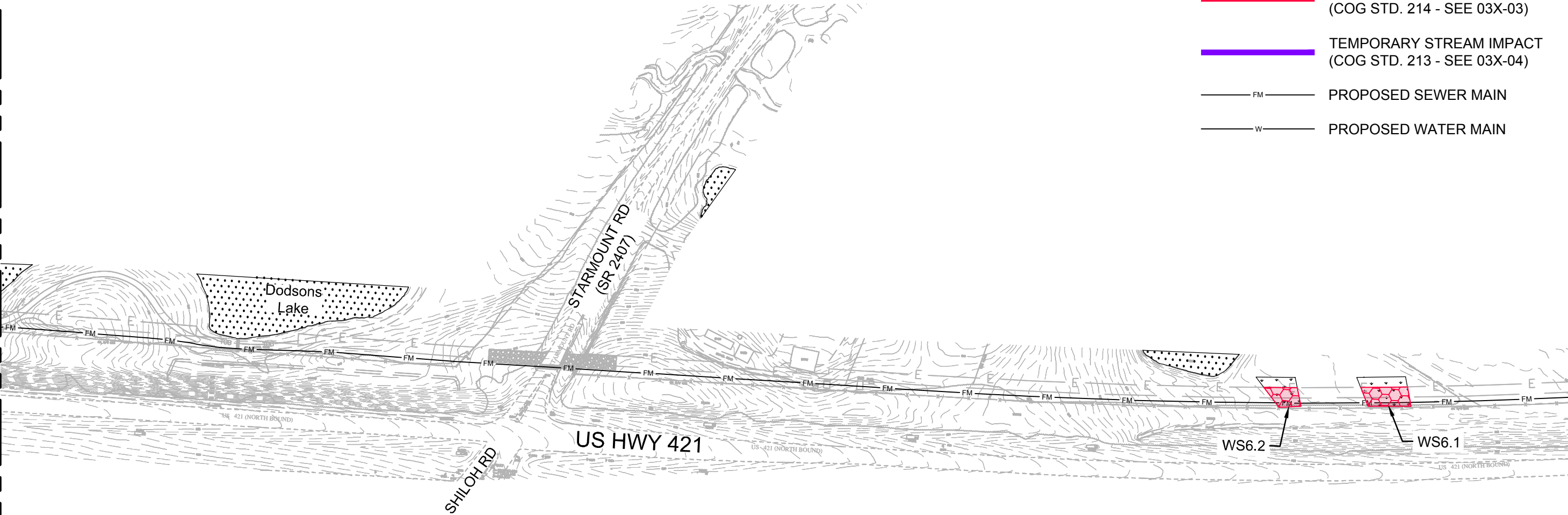
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-  EXISTING POND
-  EXISTING PERENNIAL STREAM
-  EXISTING INTERMITTENT STREAM
-  PERMANENT WETLAND IMPACT
-  TEMPORARY WETLAND IMPACT
-  PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)
-  TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)
-  PROPOSED SEWER MAIN
-  PROPOSED WATER MAIN

Wetland Impacts

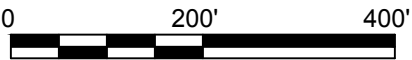
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS6.1	W-B-181-6	CLEARING	0.00	0.07
WS6.2	W-B-181-6	CLEARING	0.00	0.05
Total			0.00	0.12

KEYMAP

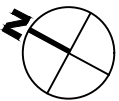
MATCHLINE - SEE SHEET 03X-07 FOR CONTINUATION



MATCHLINE - SEE SHEET 03X-05 FOR CONTINUATION



SCALE: 1" = 200'



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PROJECT NE ☐ ORLD  
JURISDICTIONAL IMPACTS

DATE  
05/31/2018  
  
SHEET  
03X-06



LEGEND

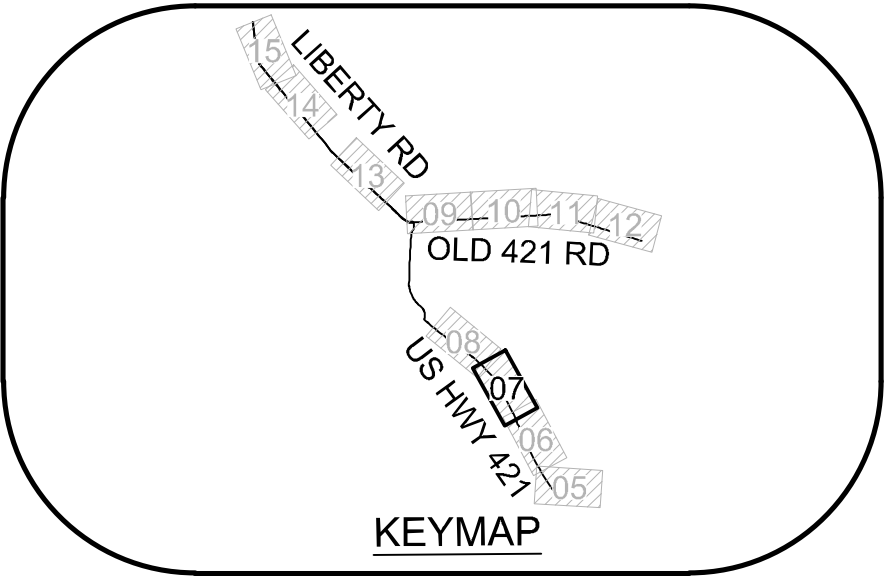
- EXISTING WETLAND
- EXISTING POND
- EXISTING PERENNIAL STREAM
- EXISTING INTERMITTENT STREAM
- PERMANENT WETLAND IMPACT
- TEMPORARY WETLAND IMPACT
- PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)
- TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)
- PROPOSED SEWER MAIN
- PROPOSED WATER MAIN

Perennial Stream Impacts

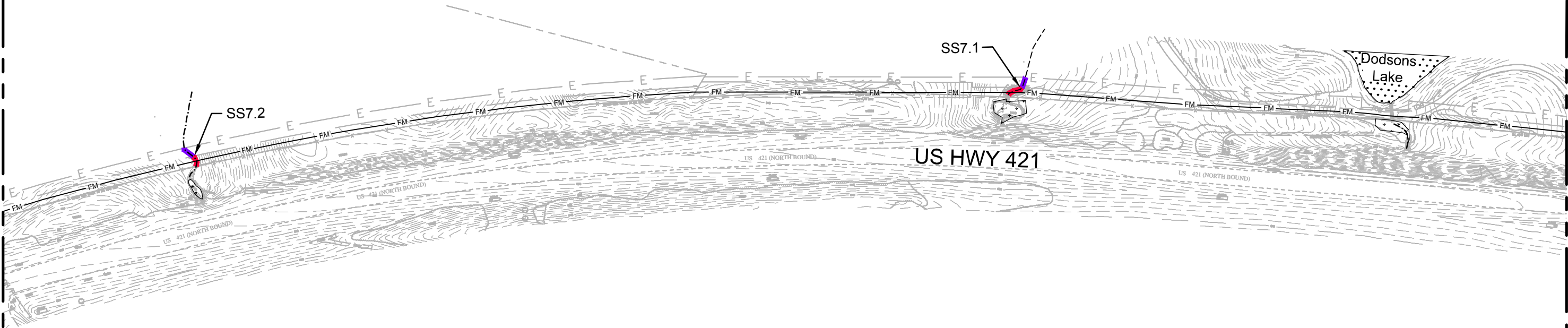
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS7.2	S-A-183-3	STABILIZATION	21	25
Total			21	25

Intermittent Stream Impacts

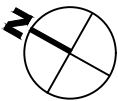
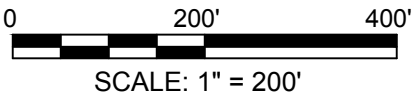
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS7.1	S-A-183-2	STABILIZATION	32	21
Total			32	21



MATCHLINE - SEE SHEET 03X-08 FOR CONTINUATION



MATCHLINE - SEE SHEET 03X-06 FOR CONTINUATION

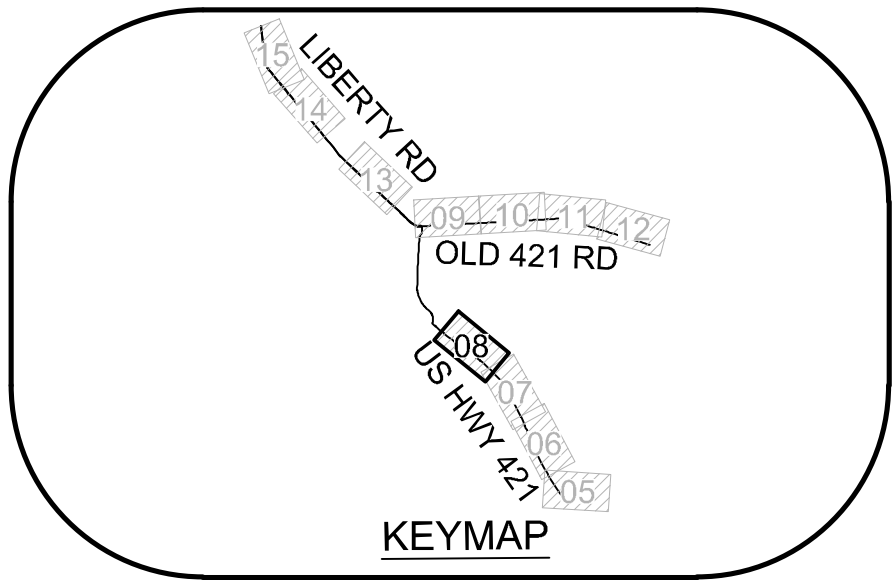


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DATE  
05/31/2018  
  
SHEET  
03X-07





Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS8.1	W-C-183-3	CLEARING	0.00	0.01
Total			0.00	0.01

Perennial Stream Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS8.2	S-D-183-4	STABILIZATION	21	22
Total			21	22

Intermittent Stream Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS8.1	S-C-183-1	STABILIZATION	0	41
Total			0	41

LEGEND

↓ ↓ ↓

↓ ↓ ↓

EXISTING WETLAND

•••••

EXISTING POND

- · - · - · - · -

EXISTING PERENNIAL STREAM

- - - - -

EXISTING INTERMITTENT STREAM

▨

PERMANENT WETLAND IMPACT

▩

TEMPORARY WETLAND IMPACT

—

PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)

—

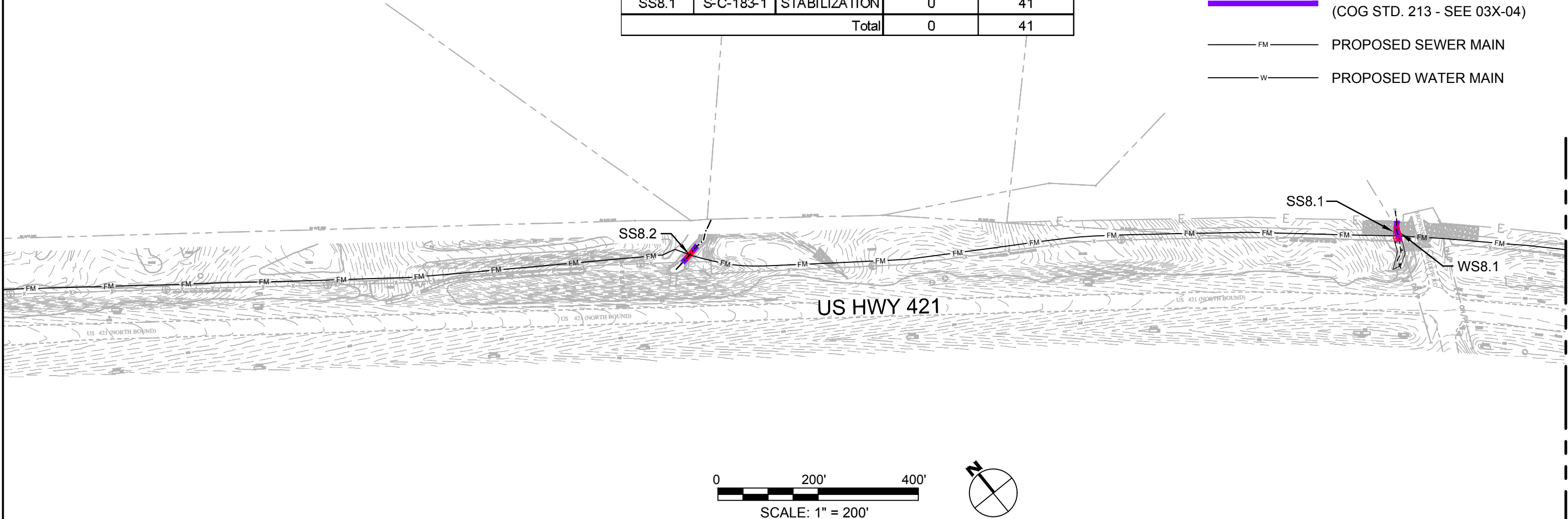
TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)

— FM —

PROPOSED SEWER MAIN

— W —

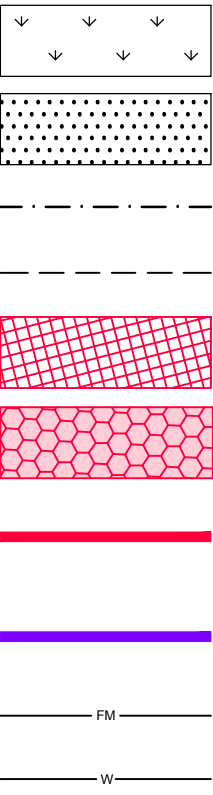
PROPOSED WATER MAIN





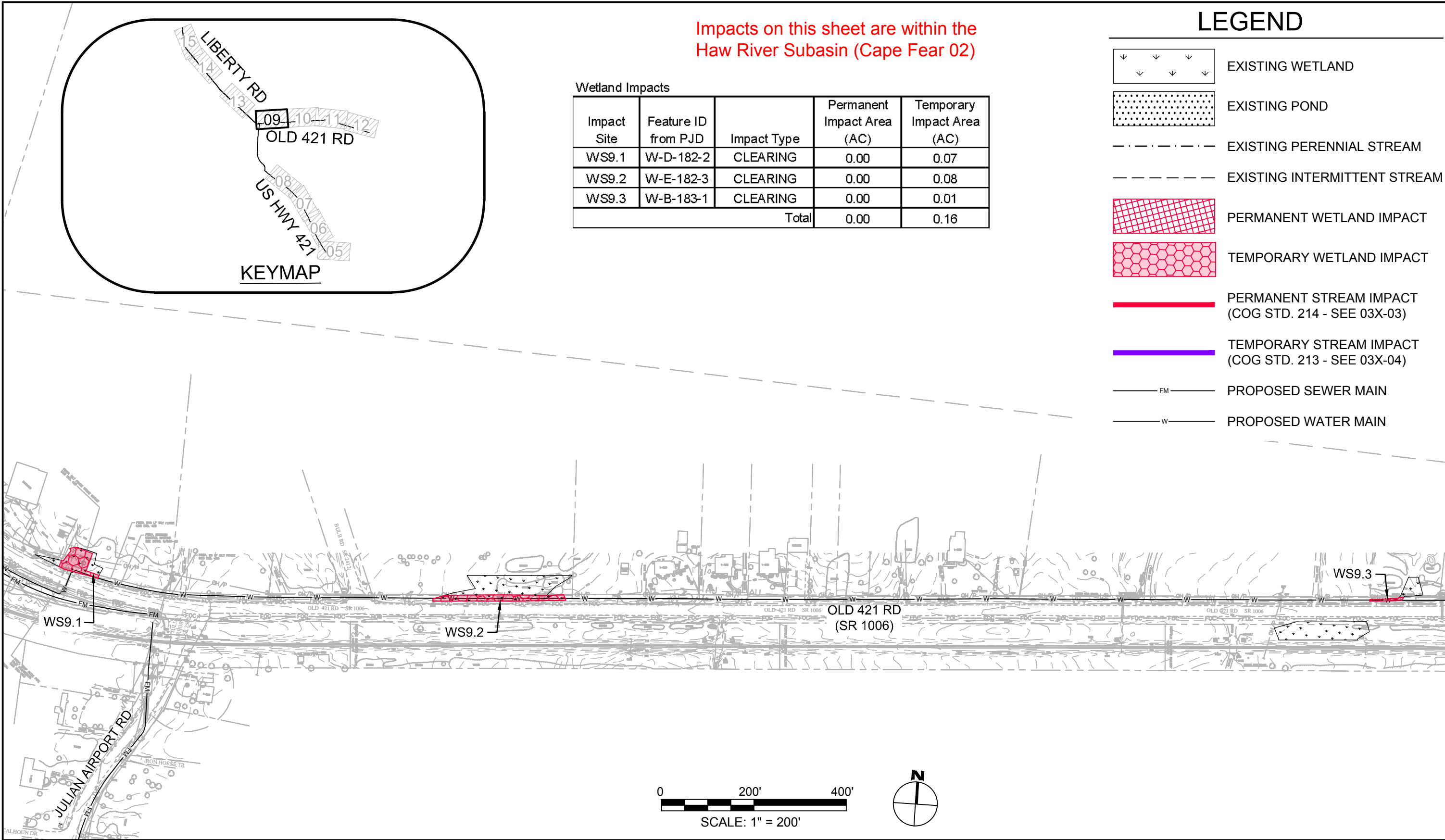
Impacts on this sheet are within the  
Haw River Subasin (Cape Fear 02)

LEGEND

- 
  - EXISTING WETLAND
  - EXISTING POND
  - EXISTING PERENNIAL STREAM
  - EXISTING INTERMITTENT STREAM
  - PERMANENT WETLAND IMPACT
  - TEMPORARY WETLAND IMPACT
  - PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)
  - TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)
  - PROPOSED SEWER MAIN
  - PROPOSED WATER MAIN

Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS9.1	W-D-182-2	CLEARING	0.00	0.07
WS9.2	W-E-182-3	CLEARING	0.00	0.08
WS9.3	W-B-183-1	CLEARING	0.00	0.01
Total			0.00	0.16



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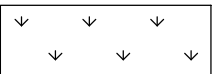
DATE  
05/31/2018

SHEET  
03X-0 ☐

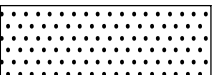


Impacts on this sheet are within the  
Haw River Subbasin (Cape Fear 02)

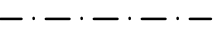
LEGEND



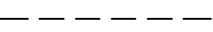
EXISTING WETLAND



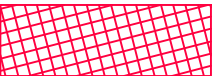
EXISTING POND



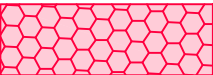
EXISTING PERENNIAL STREAM



EXISTING INTERMITTENT STREAM



PERMANENT WETLAND IMPACT



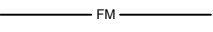
TEMPORARY WETLAND IMPACT



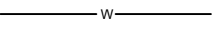
PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)



TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)



PROPOSED SEWER MAIN



PROPOSED WATER MAIN

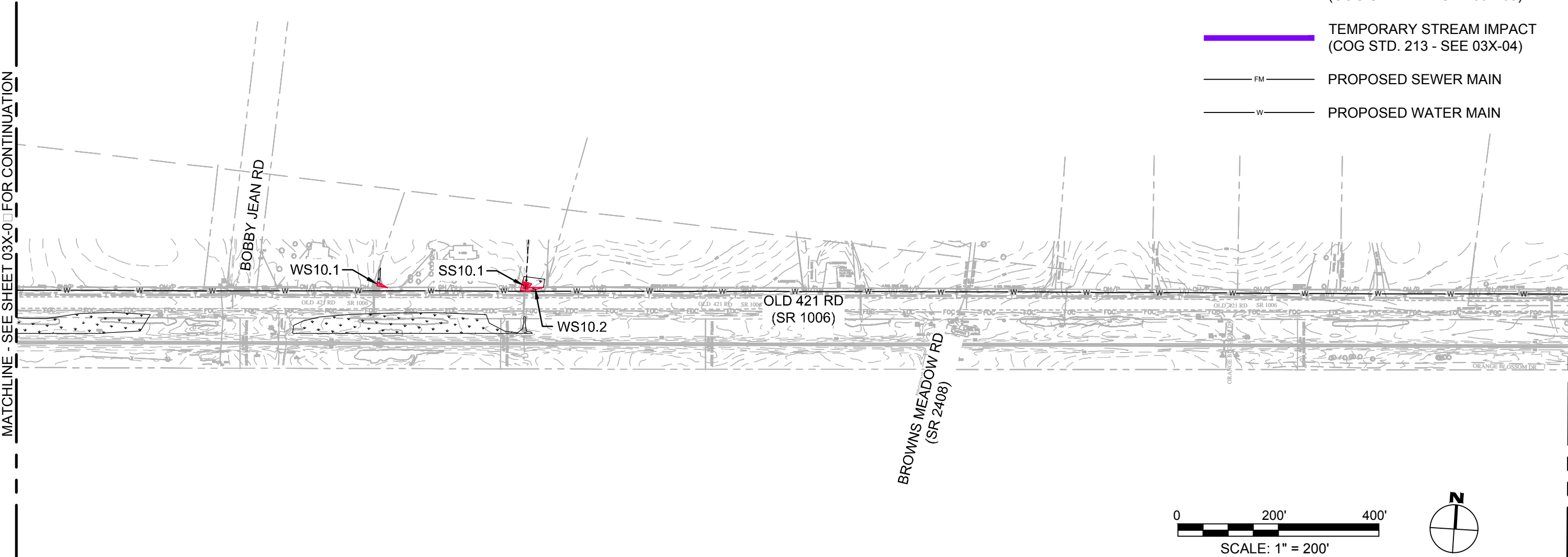
Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS10.1	W-B-183-2	CLEARING	0.00	0.01
WS10.2	W-D-183-2	CLEARING	0.00	0.01
Total			0.00	0.02

Intermittent Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS10.1	S-D-183-2	STABILIZATION	13	0
Total			13	0

KEYMAP




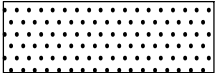








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SHEET  
03X-10



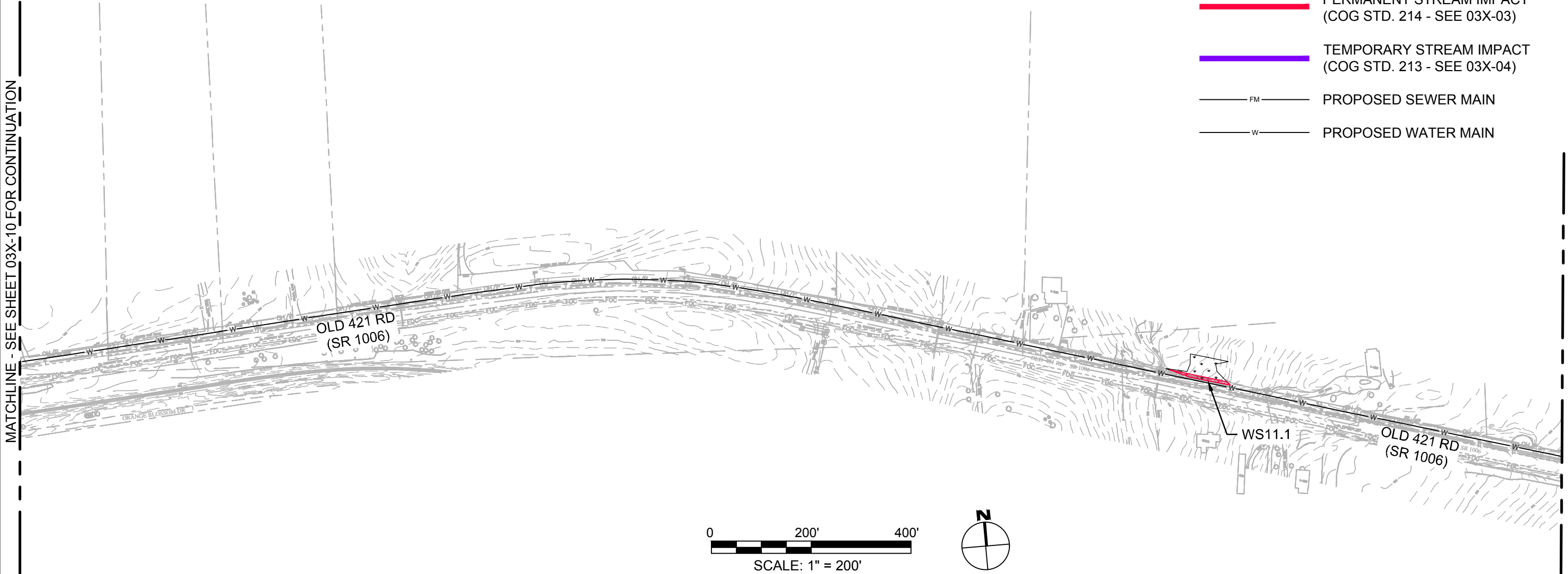
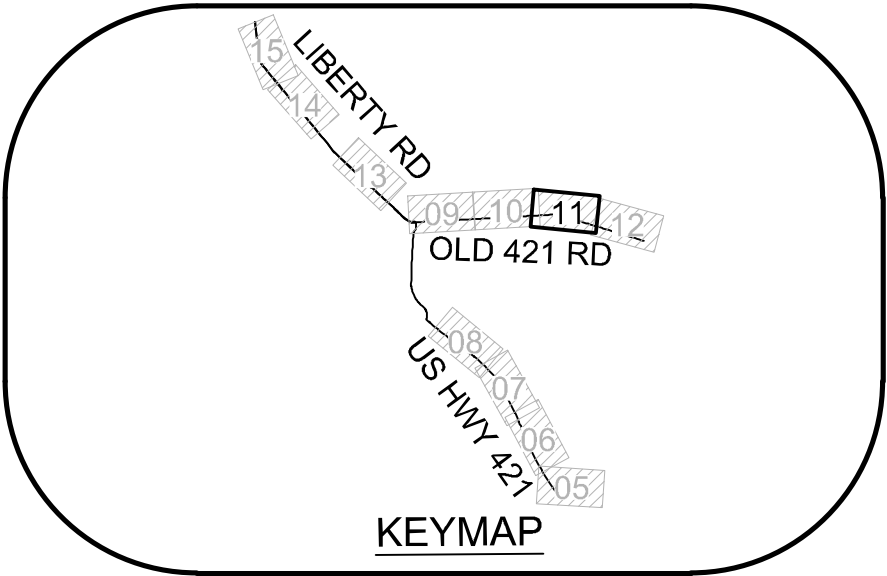
LEGEND

-  EXISTING WETLAND
-  EXISTING POND
-  EXISTING PERENNIAL STREAM
-  EXISTING INTERMITTENT STREAM
-  PERMANENT WETLAND IMPACT
-  TEMPORARY WETLAND IMPACT
-  PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)
-  TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)
-  PROPOSED SEWER MAIN
-  PROPOSED WATER MAIN

Impacts on this sheet are within the  
Haw River Subasin (Cape Fear 02)

Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS11.1	W-D-182-4	CLEARING	0.00	0.01
Total			0.00	0.01



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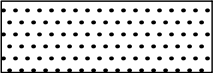
DATE  
05/31/2018


SHEET  
03X-11




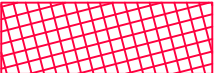
LEGEND

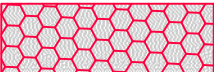
- 


EXISTING WETLAND
- 


EXISTING POND
- 


EXISTING PERENNIAL STREAM
- 

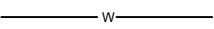
EXISTING INTERMITTENT STREAM
- 

PERMANENT WETLAND IMPACT
- 

TEMPORARY WETLAND IMPACT
- 

PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)
- 

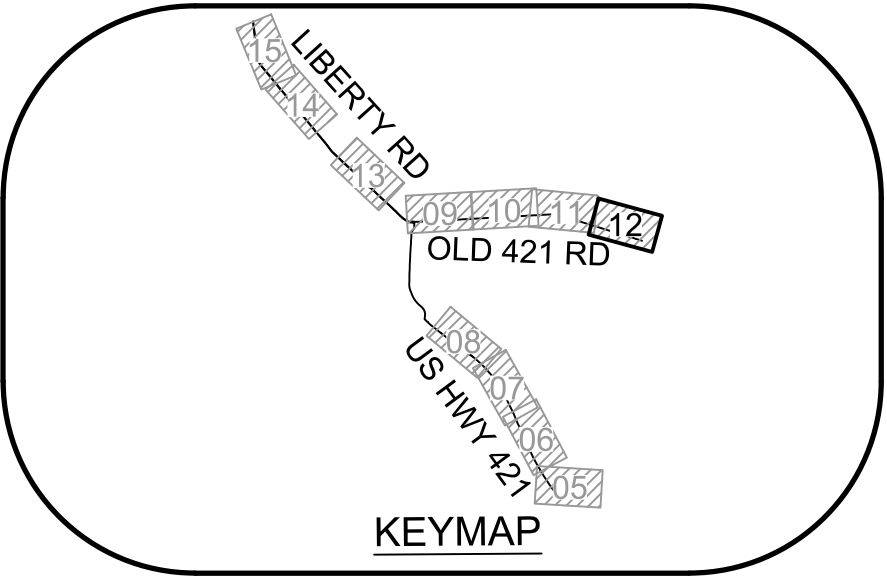
TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)
- 

PROPOSED SEWER MAIN
- 

PROPOSED WATER MAIN

Impacts on this sheet are within the  
Haw River Subbasin (Cape Fear 02)

Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS12.1	W-A-182-5	CLEARING	0.00	0.01
WS12.2	W-A-182-2	CLEARING	0.01	0.00
Total			0.01	0.01



MATCHLINE - SEE SHEET 03X-11 FOR CONTINUATION




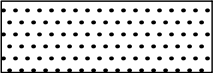


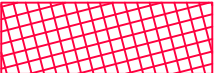
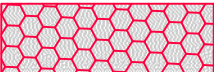




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DATE  
05/31/2018  
  
SHEET  
03X-12



LEGEND

-  EXISTING WETLAND
-  EXISTING POND
-  EXISTING PERENNIAL STREAM
-  EXISTING INTERMITTENT STREAM
-  PERMANENT WETLAND IMPACT
-  TEMPORARY WETLAND IMPACT
-  PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)
-  TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)
-  PROPOSED SEWER MAIN
-  PROPOSED WATER MAIN

Impacts on this sheet are within the  
Haw River Subbasin (Cape Fear 02)

Wetland Impacts

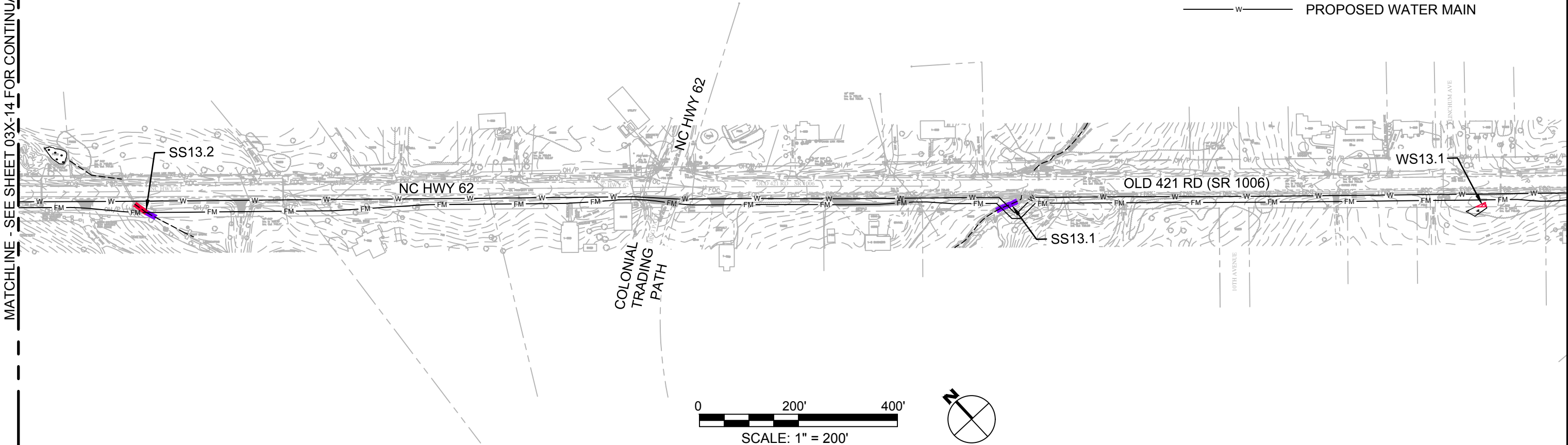
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS13.1	W-C-182-2	CLEARING	0.01	0.00
Total			0.01	0.00

Intermittent Stream Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS13.1	S-B-182-4	STABILIZATION	0	43
SS13.2	S-E-182-3	STABILIZATION	25	20
Total			25	63

KEYMAP

MATCHLINE - SEE SHEET 03X-14 FOR CONTINUATION



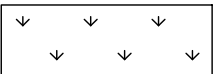
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JURISDICTIONAL IMPACTS

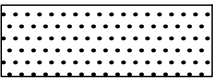
DATE  
05/31/2018  
  
SHEET  
03X-13



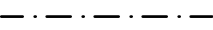
LEGEND



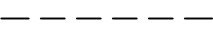
EXISTING WETLAND



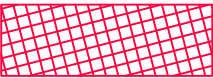
EXISTING POND



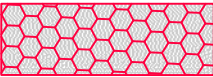
EXISTING PERENNIAL STREAM



EXISTING INTERMITTENT STREAM



PERMANENT WETLAND IMPACT



TEMPORARY WETLAND IMPACT



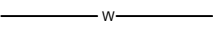
PERMANENT STREAM IMPACT  
(COG STD. 214 - SEE 03X-03)



TEMPORARY STREAM IMPACT  
(COG STD. 213 - SEE 03X-04)



PROPOSED SEWER MAIN



PROPOSED WATER MAIN

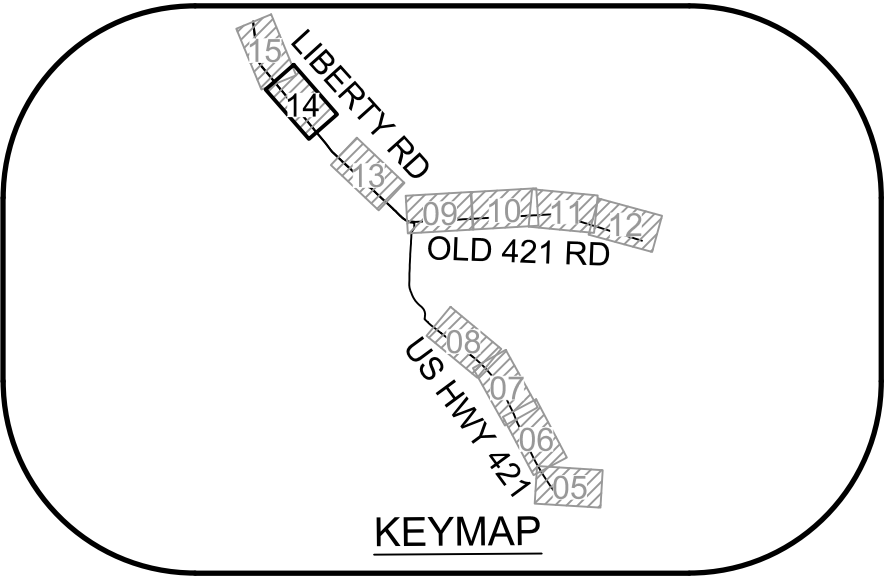
Impacts on this sheet are within the  
Haw River Subasin (Cape Fear 02)

Wetland Impacts

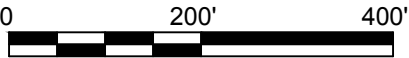
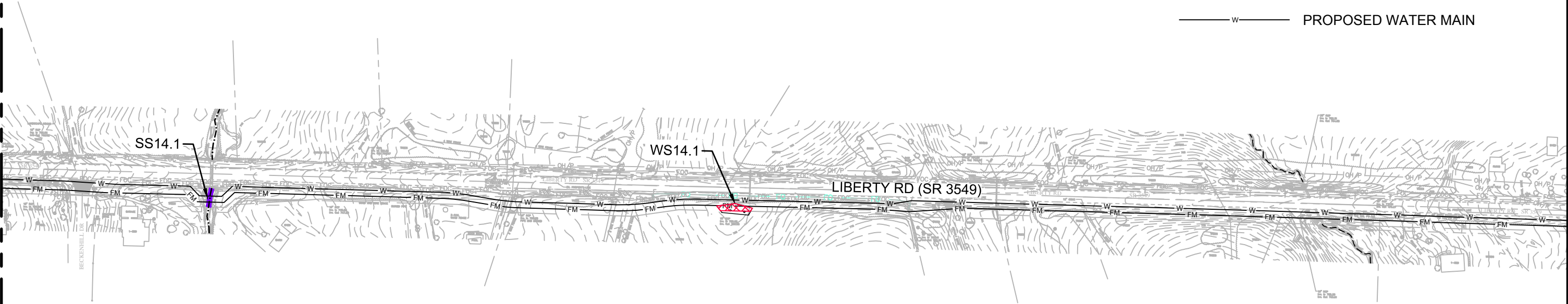
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS14.1	W-E-182-2	CLEARING	0.02	0.00
Total			0.02	0.00

Perennial Stream Impacts

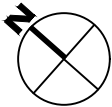
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Length (LF)	Temporary Impact Length (LF)
SS14.1	S-E-182-1	STABILIZATION	0	38
Total			0	38



MATCHLINE - SEE SHEET 03X-15 FOR CONTINUATION



SCALE: 1" = 200'



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DATE


05/31/2018

SHEET

03X-14



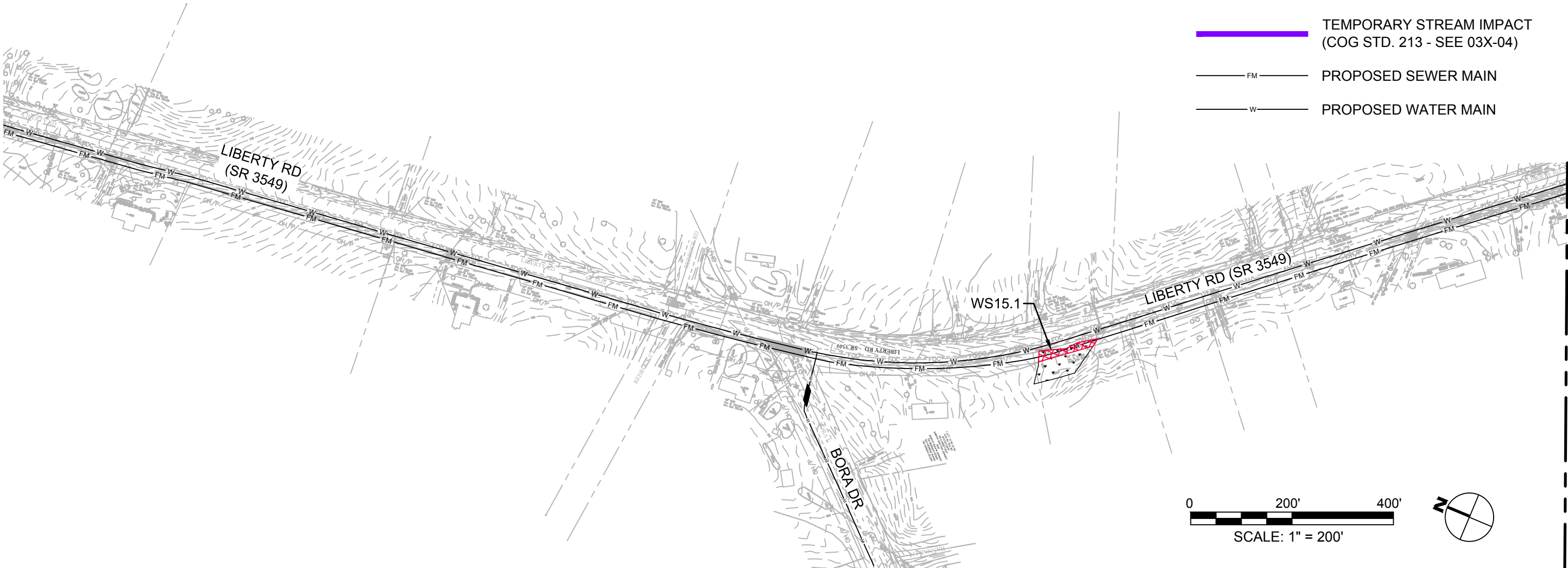
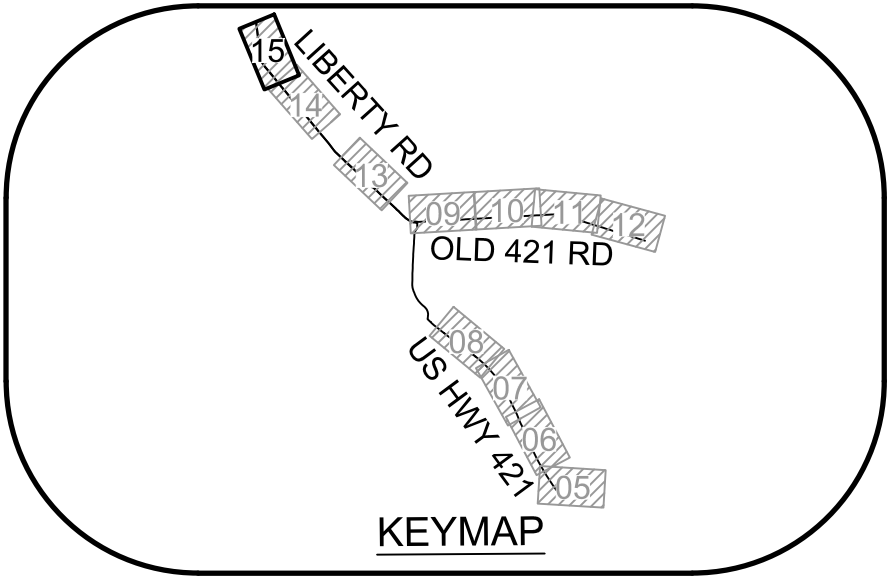
LEGEND

- 
  - EXISTING WETLAND
  - EXISTING POND
  - EXISTING PERENNIAL STREAM
  - EXISTING INTERMITTENT STREAM
  - PERMANENT WETLAND IMPACT
  - TEMPORARY WETLAND IMPACT
  - PERMANENT STREAM IMPACT (COG STD. 214 - SEE 03X-03)
  - TEMPORARY STREAM IMPACT (COG STD. 213 - SEE 03X-04)
  - PROPOSED SEWER MAIN
  - PROPOSED WATER MAIN

Impacts on this sheet are within the  
Haw River Subasin (Cape Fear 02)

Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WS15.1	W-E-182-1	CLEARING	0.04	0.00
Total			0.04	0.00



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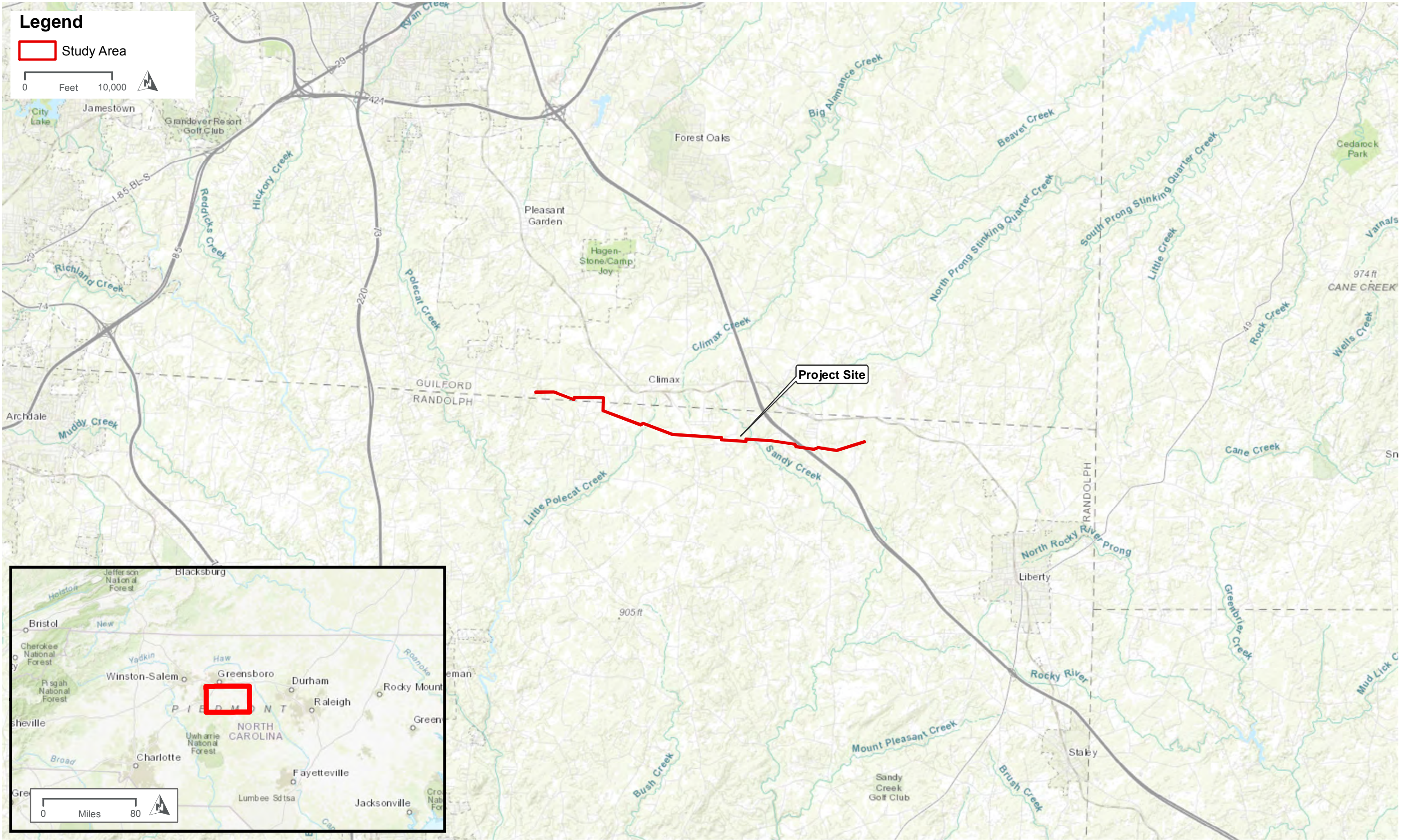
PROJECT NE ☐ ORLD  
JURISDICTIONAL IMPACTS

DATE  
05/31/2018

SHEET  
03X-15

MATCHLINE - SEE SHEET 03X-14 FOR CONTINUATION

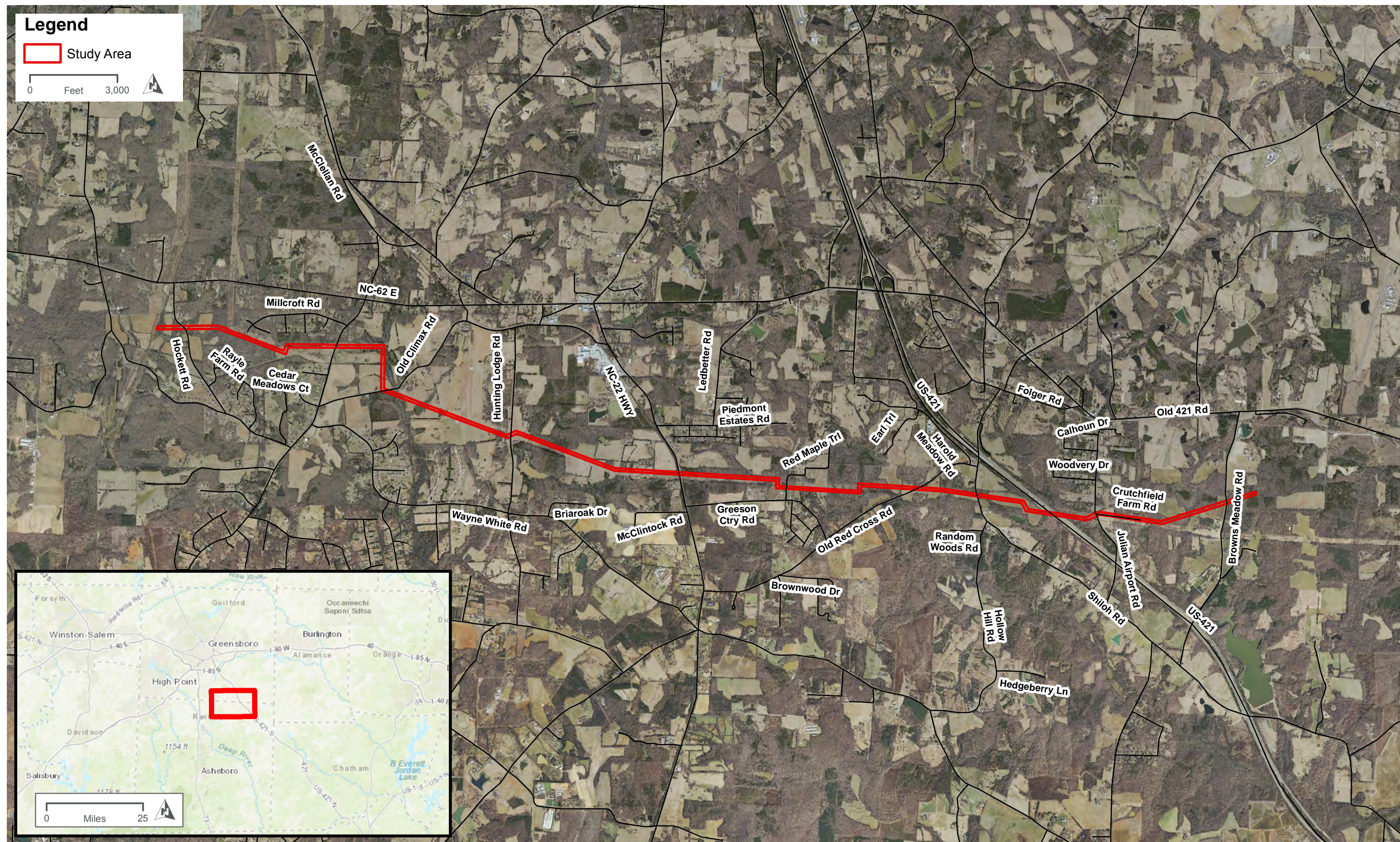




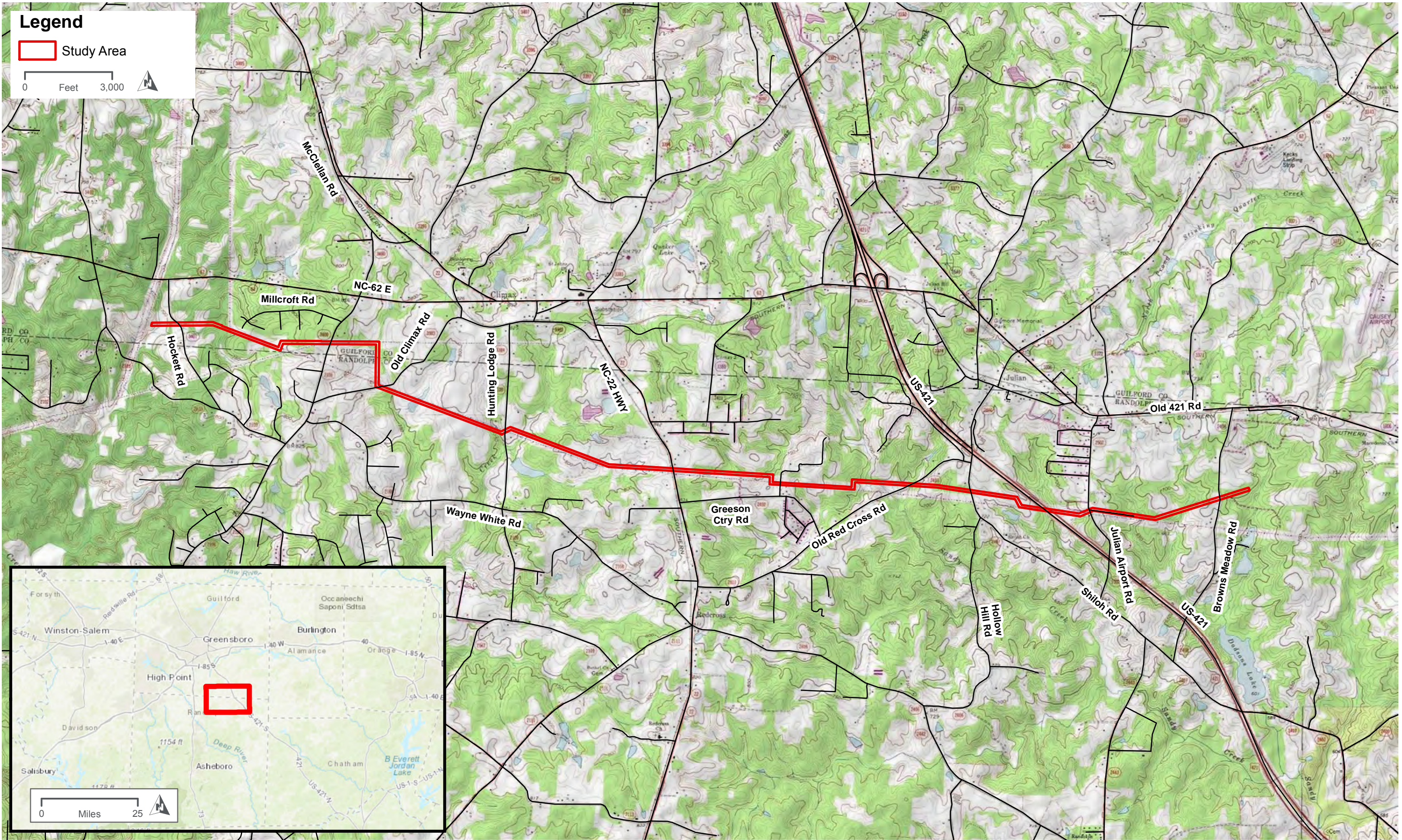
VICINITY MAP  
DUKE ENERGY 100KV TRANSMISSION LINE STUDY AREA  
FIGURE 1







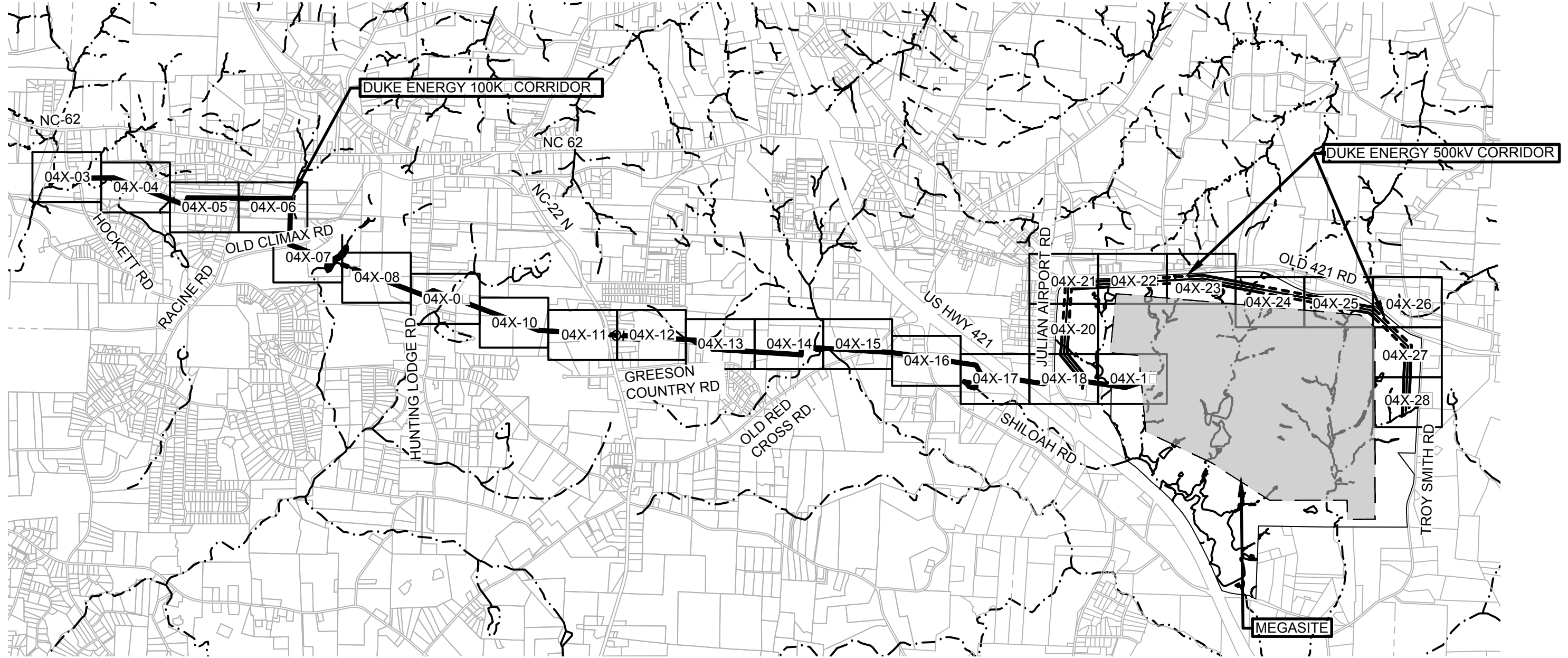




USGS TOPOGRAPHIC MAP  
DUKE ENERGY 100KV TRANSMISSION LINE STUDY AREA  
FIGURE 3







KEY MAP  
NOT TO SCALE



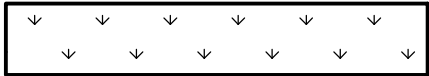
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N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

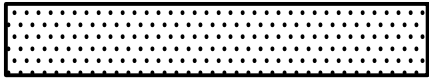
DATE  
05/25/2018  
  
SHEET  
04X-01



LEGEND



EXISTING WETLAND



EXISTING POND



EXISTING PERENNIAL STREAM



EXISTING INTERMITTENT STREAM



PERMANENT WETLAND IMPACT



TEMPORARY WETLAND IMPACT



PERMANENT POND IMPACT



PERMANENT STREAM IMPACT



TEMPORARY STREAM IMPACT

Wetland Impacts

Impact Number	Sheet Number	Wetland ID	Lat. (decimal degrees)	Long. (decimal degrees)	Type of Impact	Type of Wetland (Cowardin)	Area of Permanent Impact (acres)	Area of Temporary Impact (acres)
WP6.1	6	WA	35.9088	-79.7334	Clearing	PEM1E	0.00	0.04
WP9.1	9	WB	35.9005	-79.7184	Clearing	PEM1E/PSS1E	0.00	0.02
WP10.1	10	WG	35.8974	-79.7048	Clearing	PEM1E	0.00	0.02
WP11.1	11	WF	35.8972	-79.7035	Clearing	PEM1E	0.00	0.01
WP11.2	11	WC	35.8971	-79.7003	Clearing	PSS	0.00	0.01
WP12.1	12	WH	35.8967	-79.6916	Clearing	PEM1E/PSS1B	0.00	0.01
WP13.1	13	WI	35.8957	-79.6835	Clearing	PEM1E	0.00	0.01
WP22.1	22	W39	35.9023	-79.6405	Clearing	PFO	0.08	0.00
Total							0.08	0.12

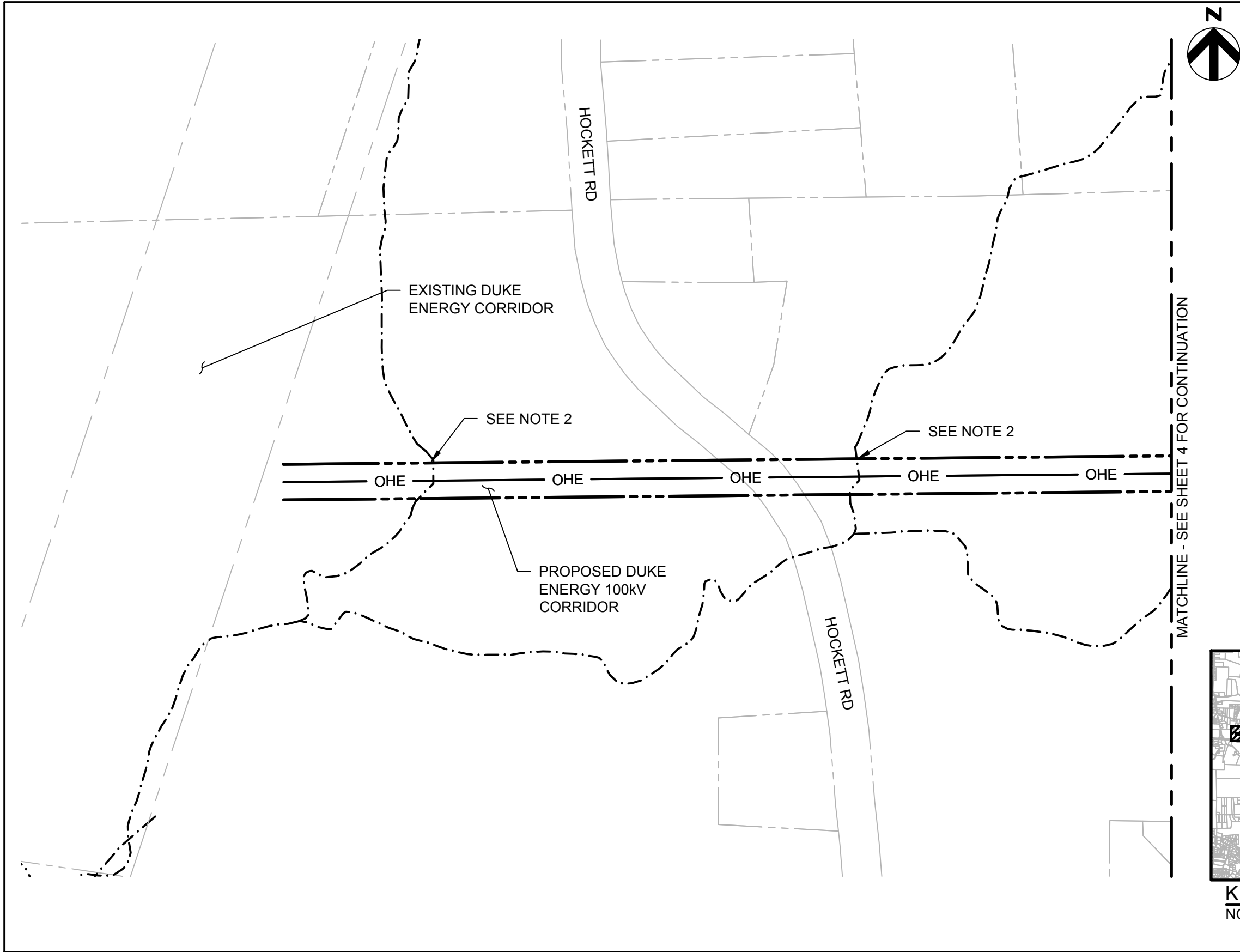


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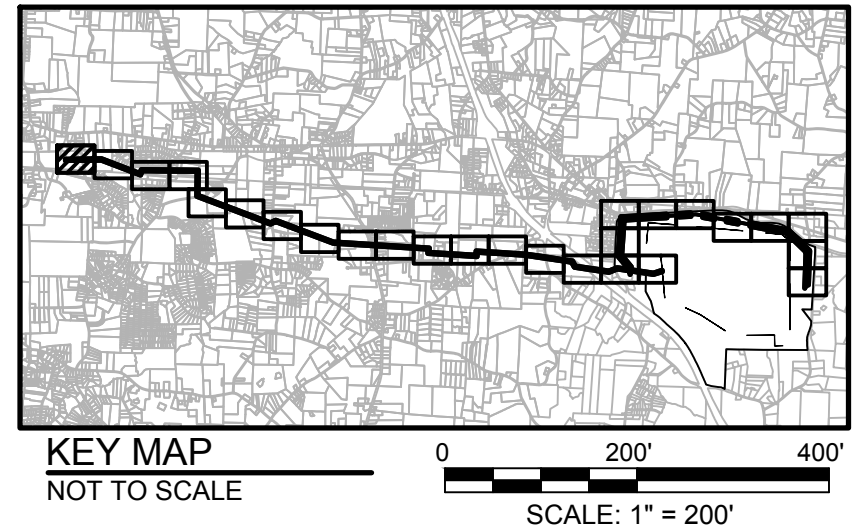
PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018  
  
SHEET  
04X-02





- GENERAL NOTES:**
1. SEE SHEET 04X-02 FOR LEGEND.
  2. NO IMPACTS TO JURISDICTIONAL RESOURCES ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.



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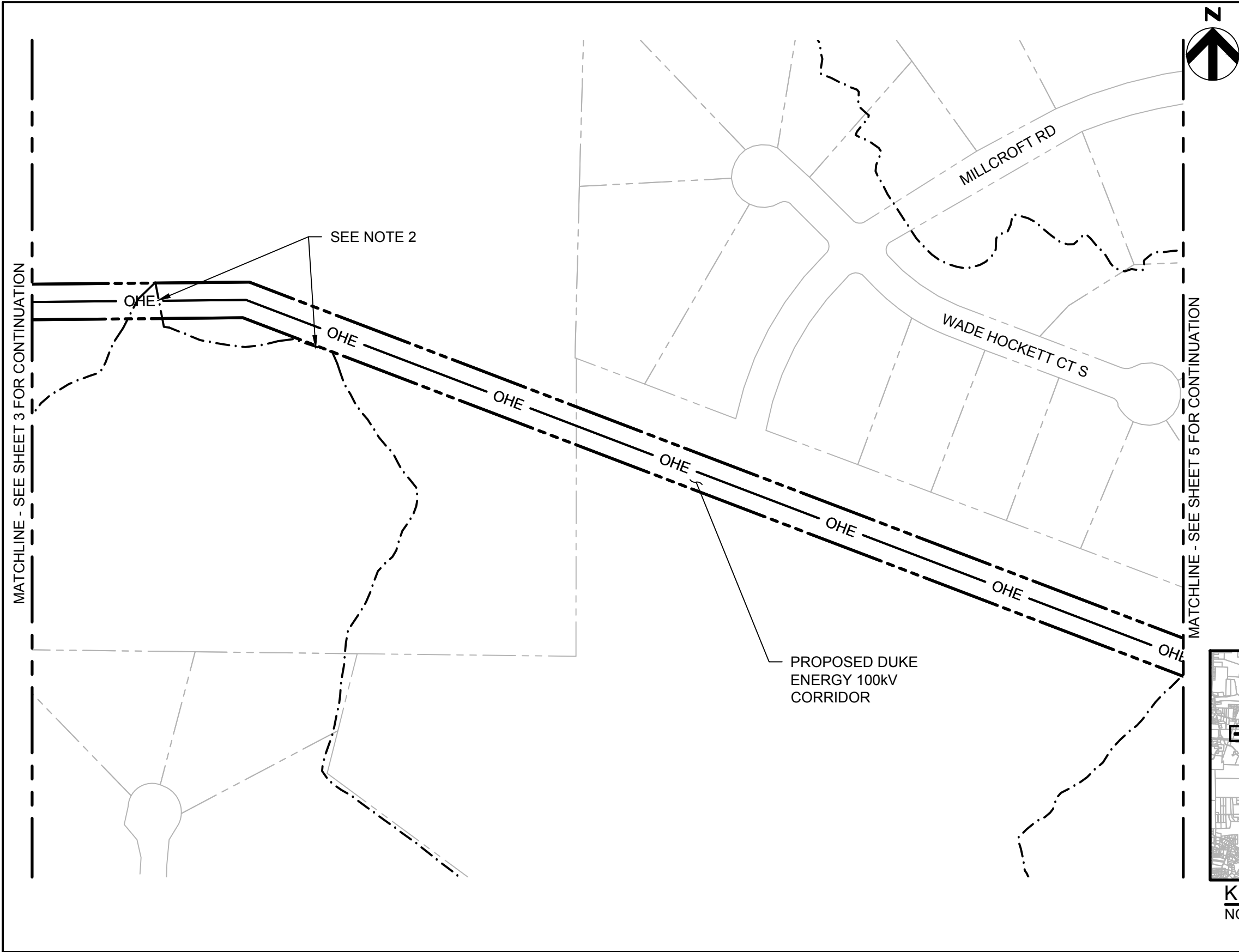
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

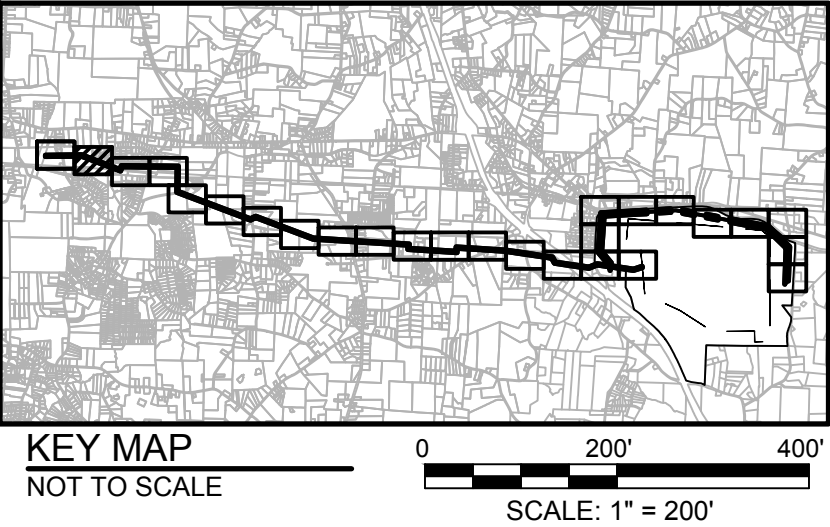
DATE  
05/25/2018

SHEET  
04X-03





- GENERAL NOTES:
1. SEE SHEET 04X-02 FOR LEGEND.
  2. NO IMPACTS TO JURISDICTIONAL RESOURCES ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.

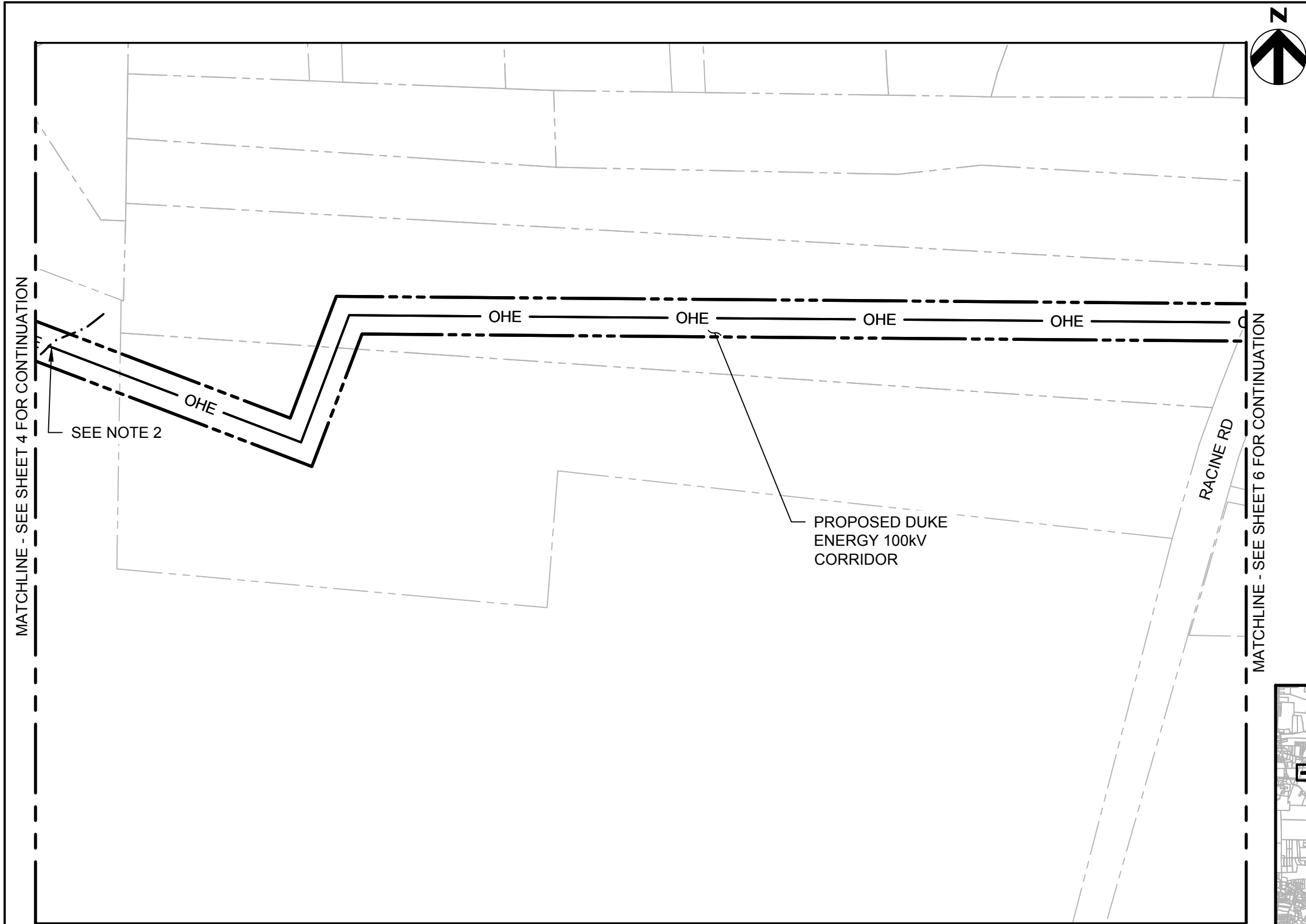


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**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

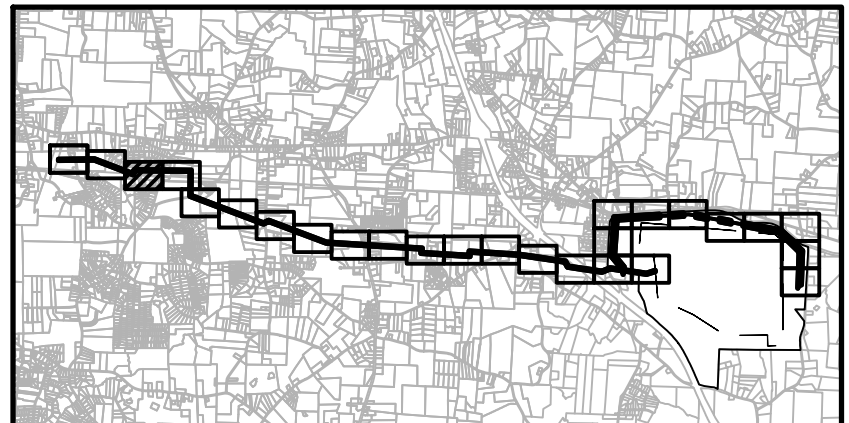
DATE  
05/25/2018  
  
SHEET  
04X-04





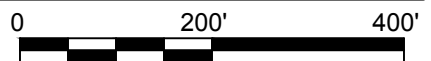
GENERAL NOTES:

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL RESOURCES ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.



**KEY MAP**

NOT TO SCALE



SCALE: 1" = 200'



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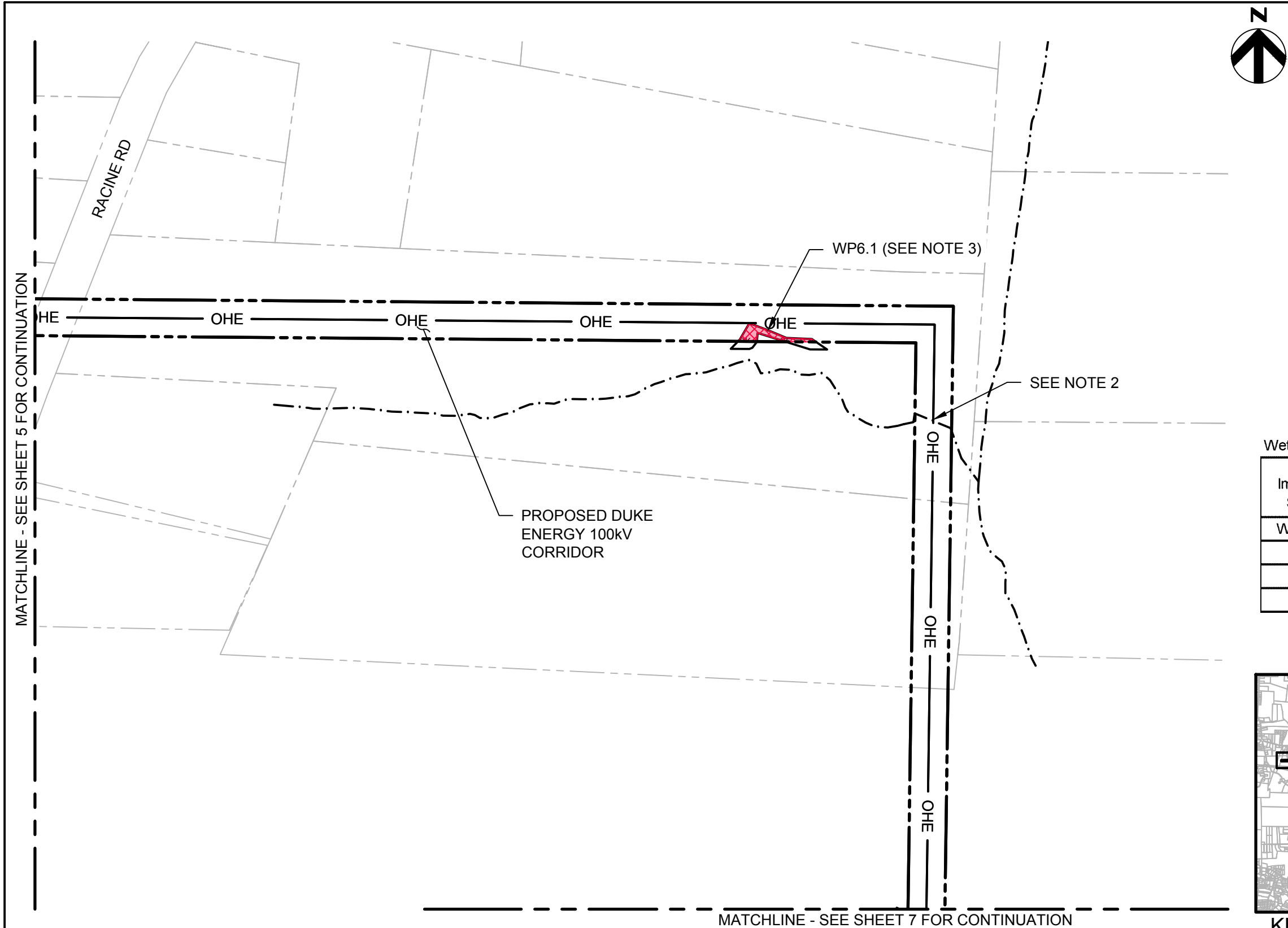
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS**  
**DUKE ENERGY CORRIDORS**  
**JURISDICTIONAL IMPACTS**

DATE  
05/25/2018

SHEET  
04X-05

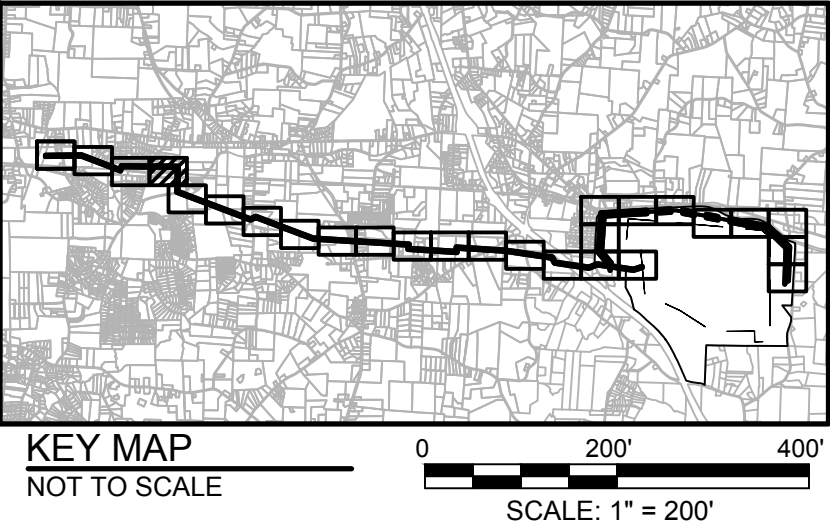




- GENERAL NOTES:**
- SEE SHEET 04X-02 FOR LEGEND.
  - NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.
  - WETLANDS IN THE PROPOSED DUKE ENERGY CORRIDOR WILL BE HAND CLEARED.

Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WP6.1	WA	CLEARING	0.00	0.04
Total			0.00	0.04



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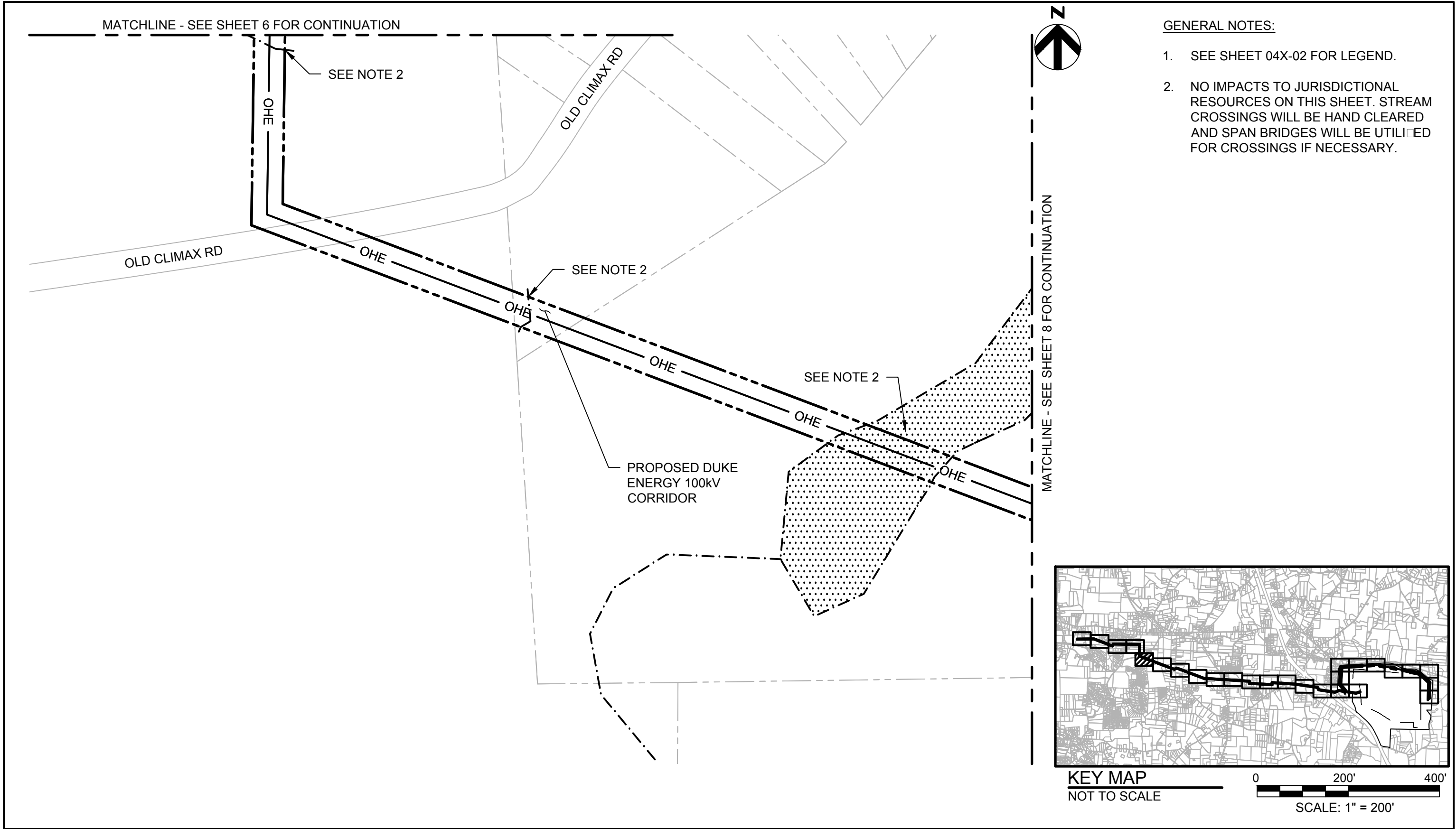
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

DATE  
05/25/2018

SHEET  
04X-06





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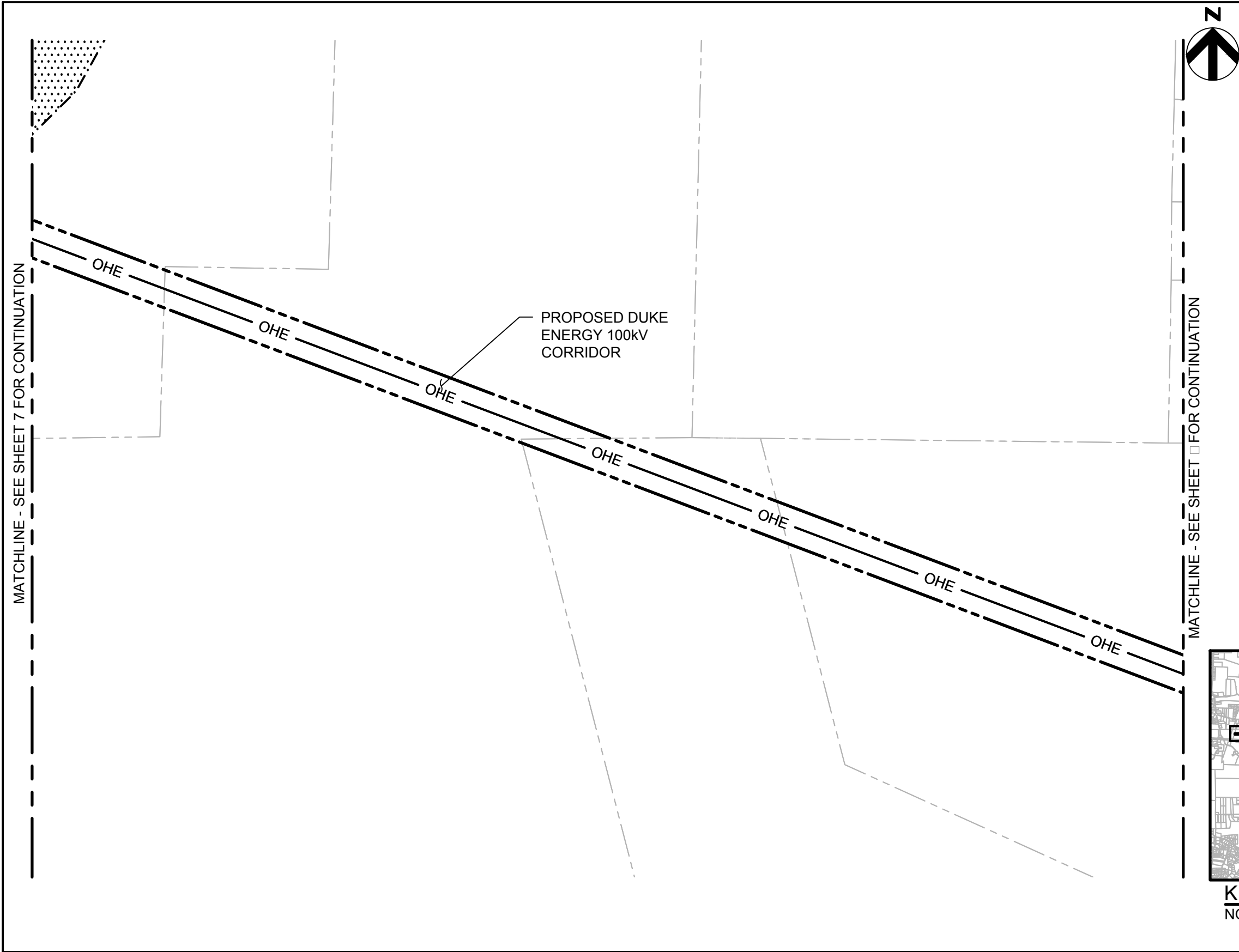
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

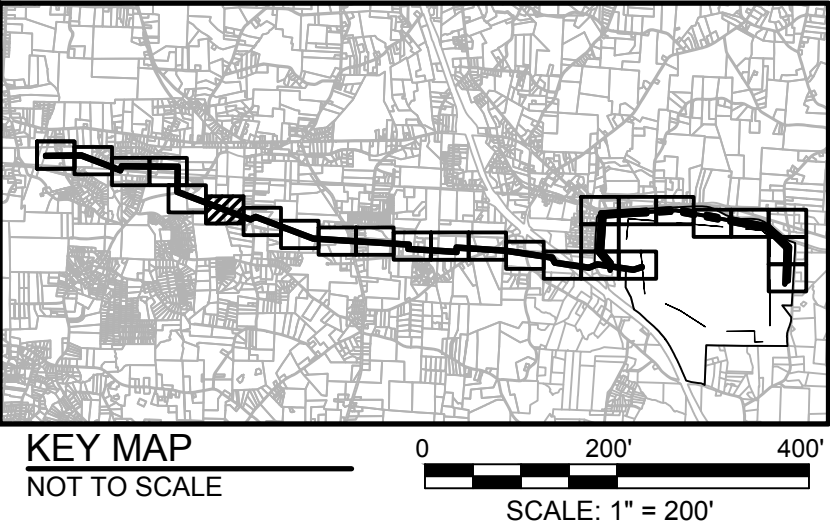
DATE  
05/25/2018

SHEET  
04X-07





- GENERAL NOTES:
1. SEE SHEET 04X-02 FOR LEGEND.
  2. NO IMPACTS TO JURISDICTIONAL RESOURCES ON THIS SHEET.

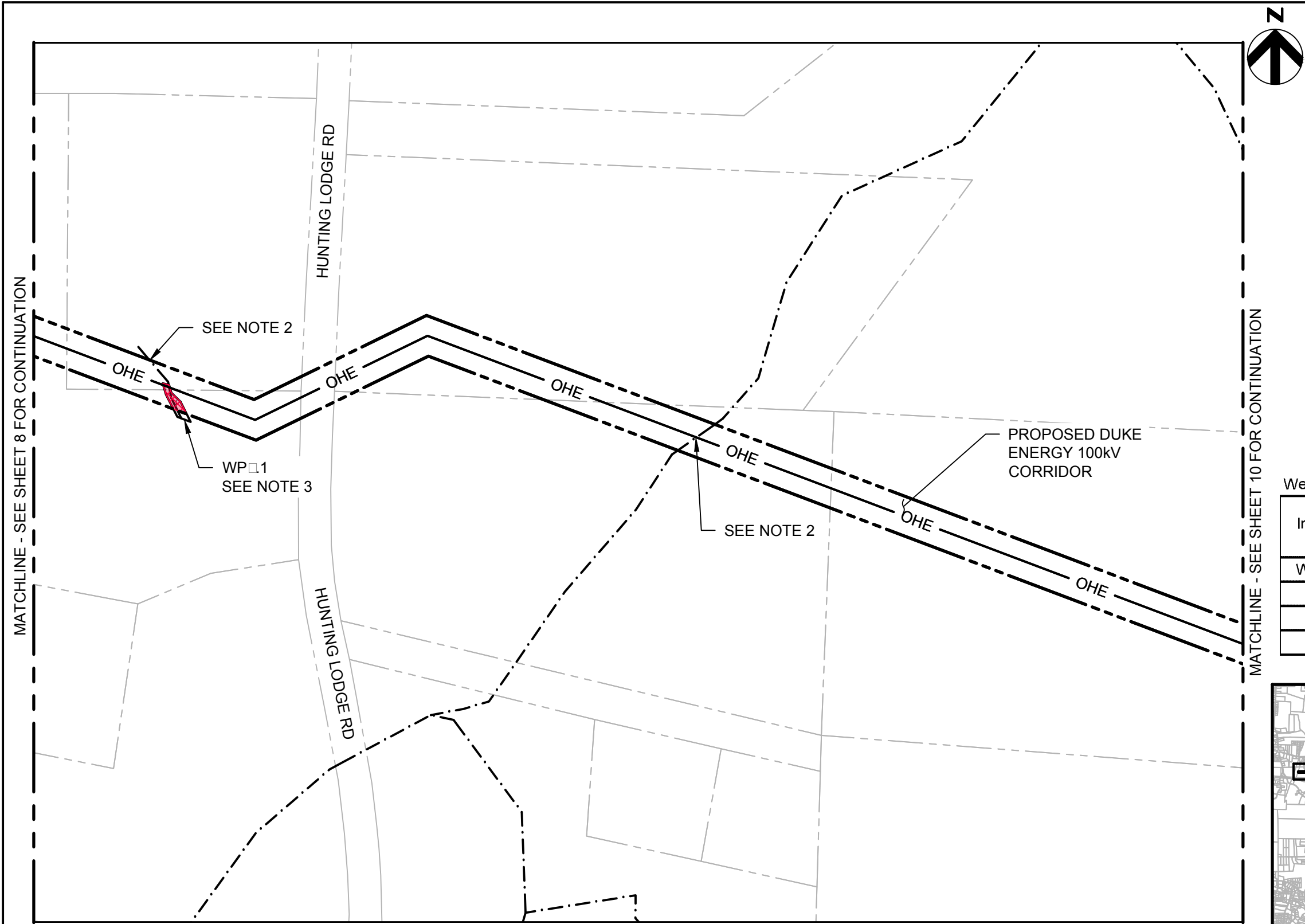


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**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

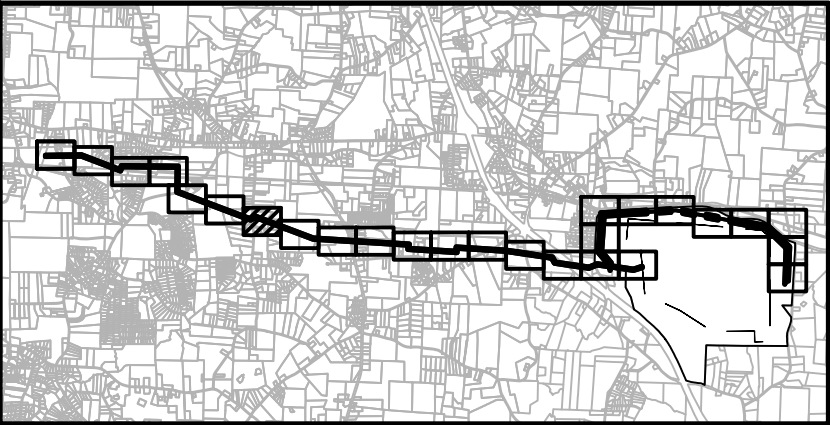
DATE  
05/25/2018  
  
SHEET  
04X-08





- GENERAL NOTES:
1. SEE SHEET 04X-02 FOR LEGEND.
  2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.
  3. WETLANDS IN THE PROPOSED DUKE ENERGY CORRIDOR WILL BE HAND CLEARED.

Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WP9.1	WB	CLEARING	0.00	0.02
Total			0.00	0.02

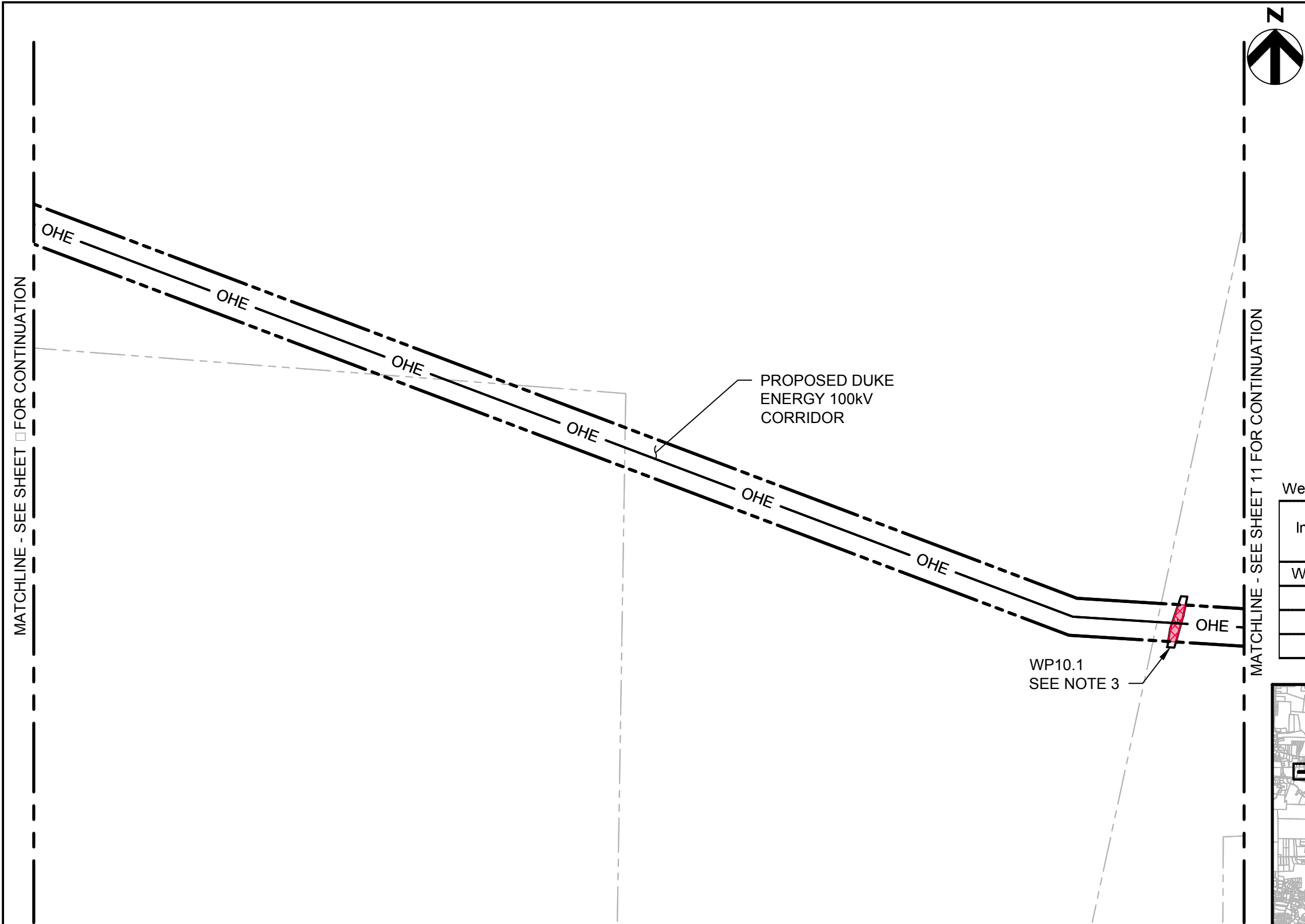


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PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS

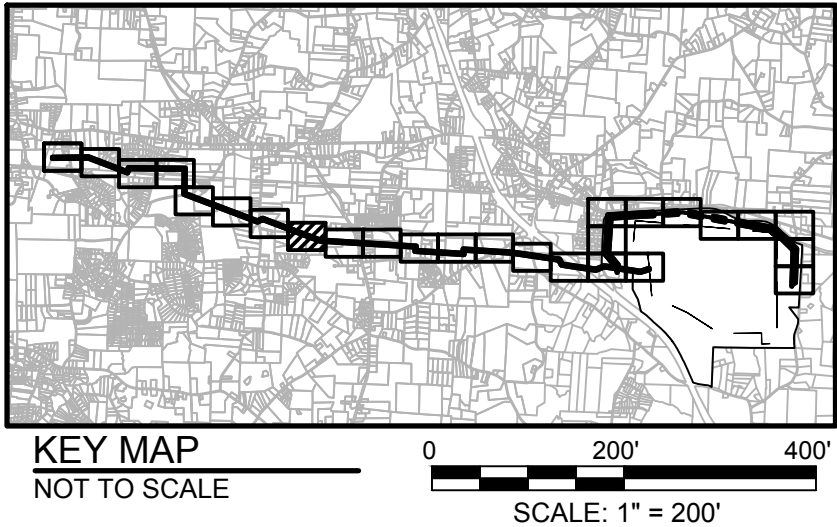
DATE  
05/25/2018  
  
SHEET  
04X-01





- GENERAL NOTES:
1. SEE SHEET 04X-02 FOR LEGEND.
  2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.
  3. WETLANDS IN THE PROPOSED DUKE ENERGY CORRIDOR WILL BE HAND CLEARED.

Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WP10.1	WG	CLEARING	0.00	0.02
Total			0.00	0.02

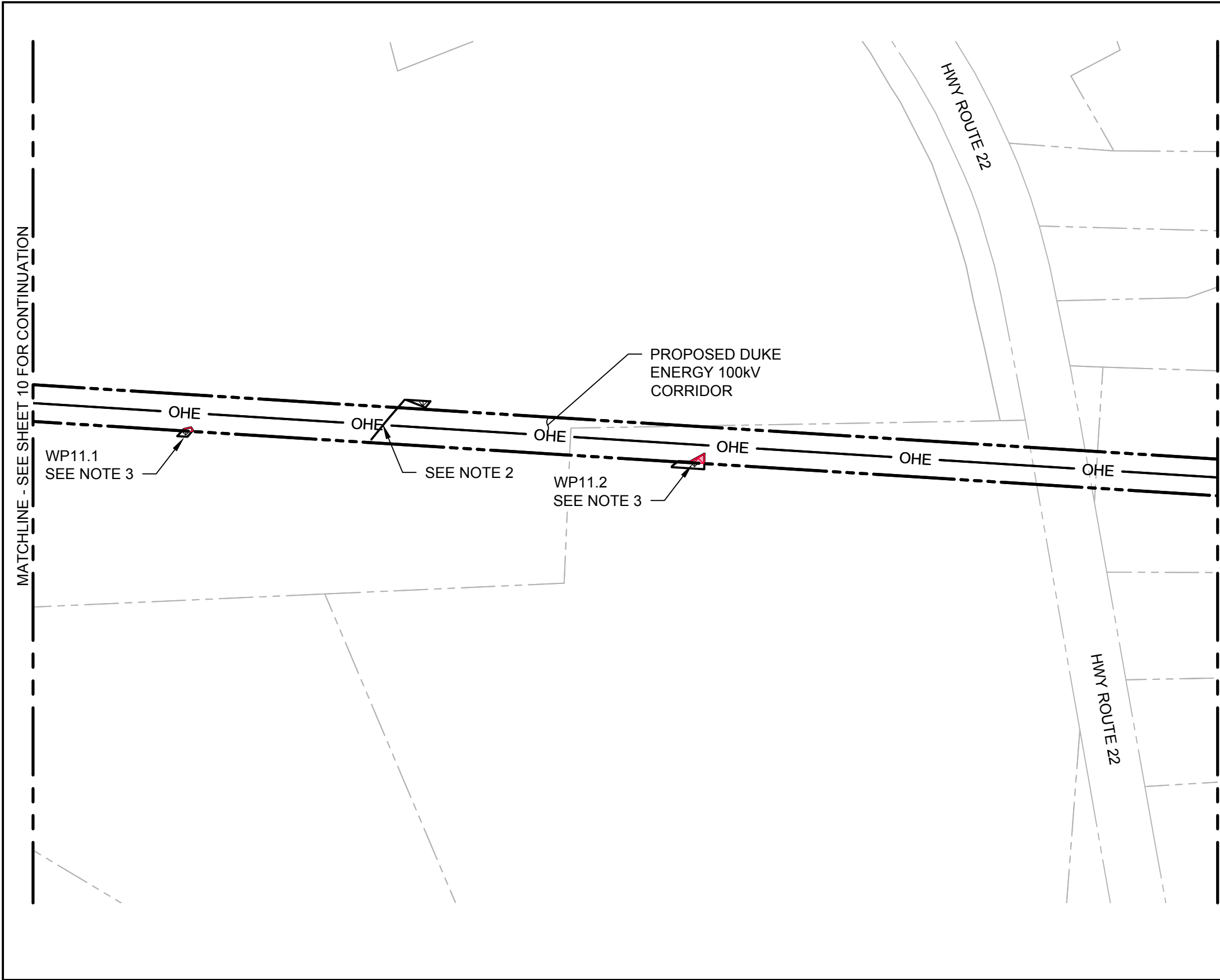


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PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018  
  
SHEET  
04X-10

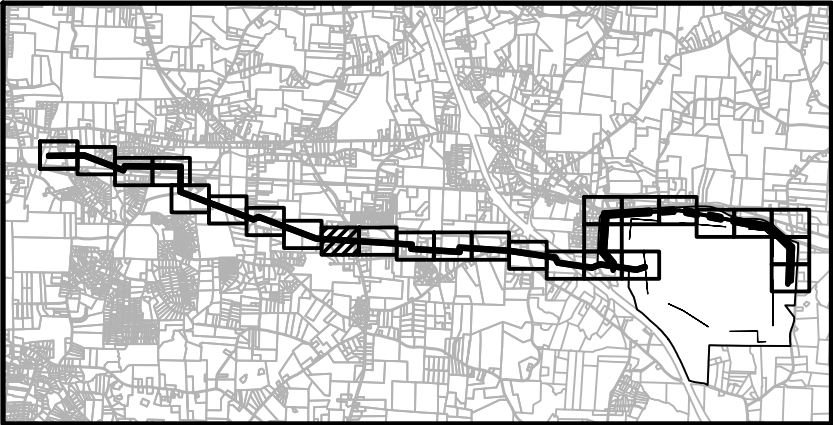




- GENERAL NOTES:**
- SEE SHEET 04X-02 FOR LEGEND.
  - NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.
  - WETLANDS IN THE PROPOSED DUKE ENERGY CORRIDOR WILL BE HAND CLEARED.

Wetland Impacts

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WP11.1	WF	CLEARING	0.00	0.01
WP11.2	WC	CLEARING	0.00	0.01
Total			0.00	0.02



**KEY MAP**  
NOT TO SCALE

0 200' 400'

SCALE: 1" = 200'



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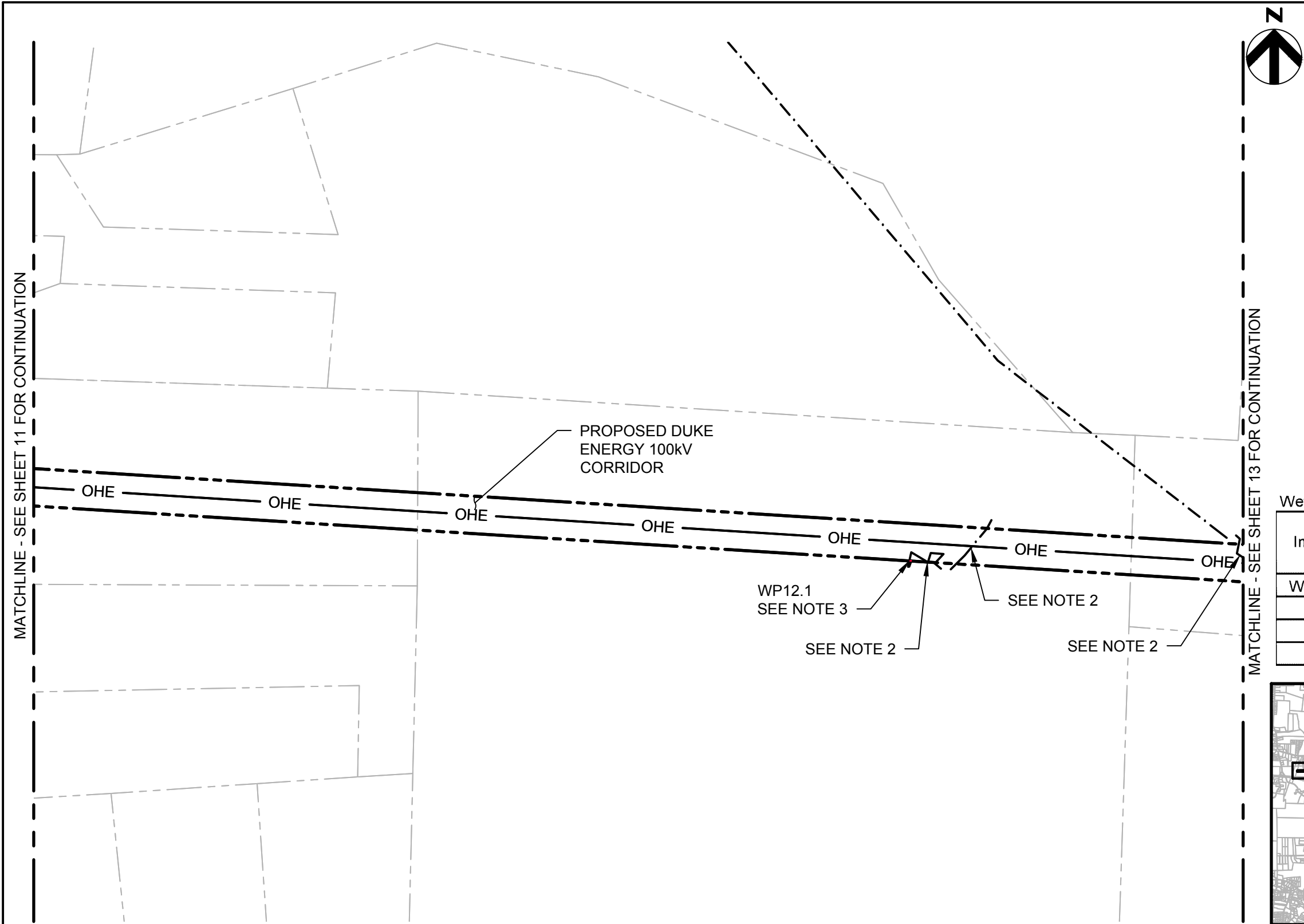
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**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

DATE  
05/25/2018

SHEET  
04X-11





- GENERAL NOTES:
- 1. SEE SHEET 04X-02 FOR LEGEND.
  - 2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.
  - 3. WETLANDS IN THE PROPOSED DUKE ENERGY CORRIDOR WILL BE HAND CLEARED

Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WP12.1	WH	CLEARING	0.00	0.01
Total			0.00	0.01



KEY MAP  
NOT TO SCALE

0 200' 400'

SCALE: 1" = 200'



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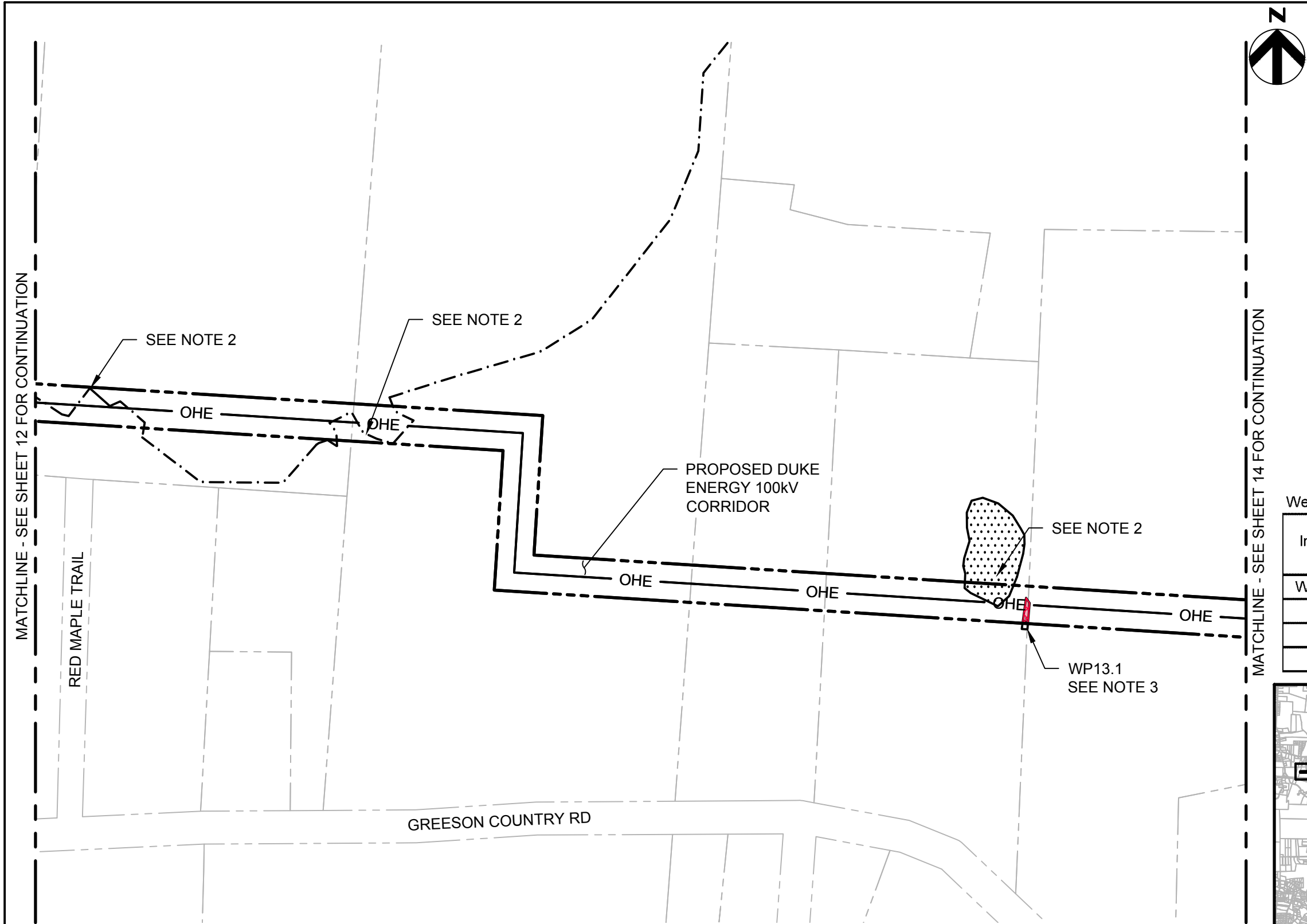
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PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

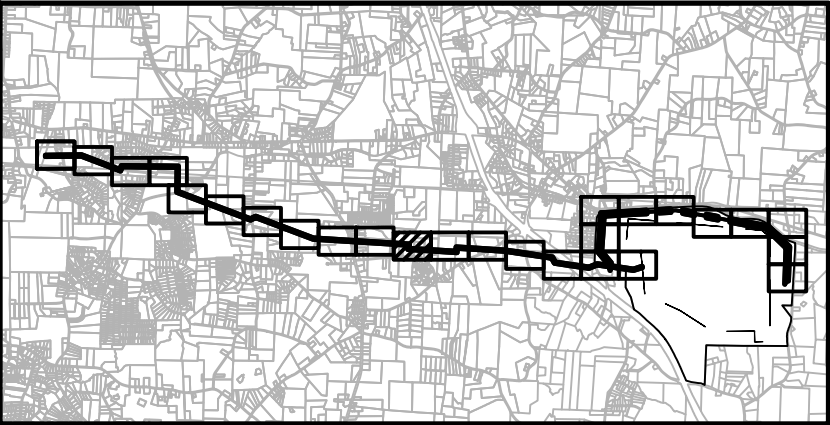
SHEET  
04X-12





- GENERAL NOTES:
1. SEE SHEET 04X-02 FOR LEGEND.
  2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY. PONDS WILL BE SPANNED.
  3. WETLANDS IN THE PROPOSED DUKE ENERGY CORRIDOR WILL BE HAND CLEARED.

Wetland Impacts				
Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WP13.1	WI	CLEARING	0.00	0.01
Total			0.00	0.01



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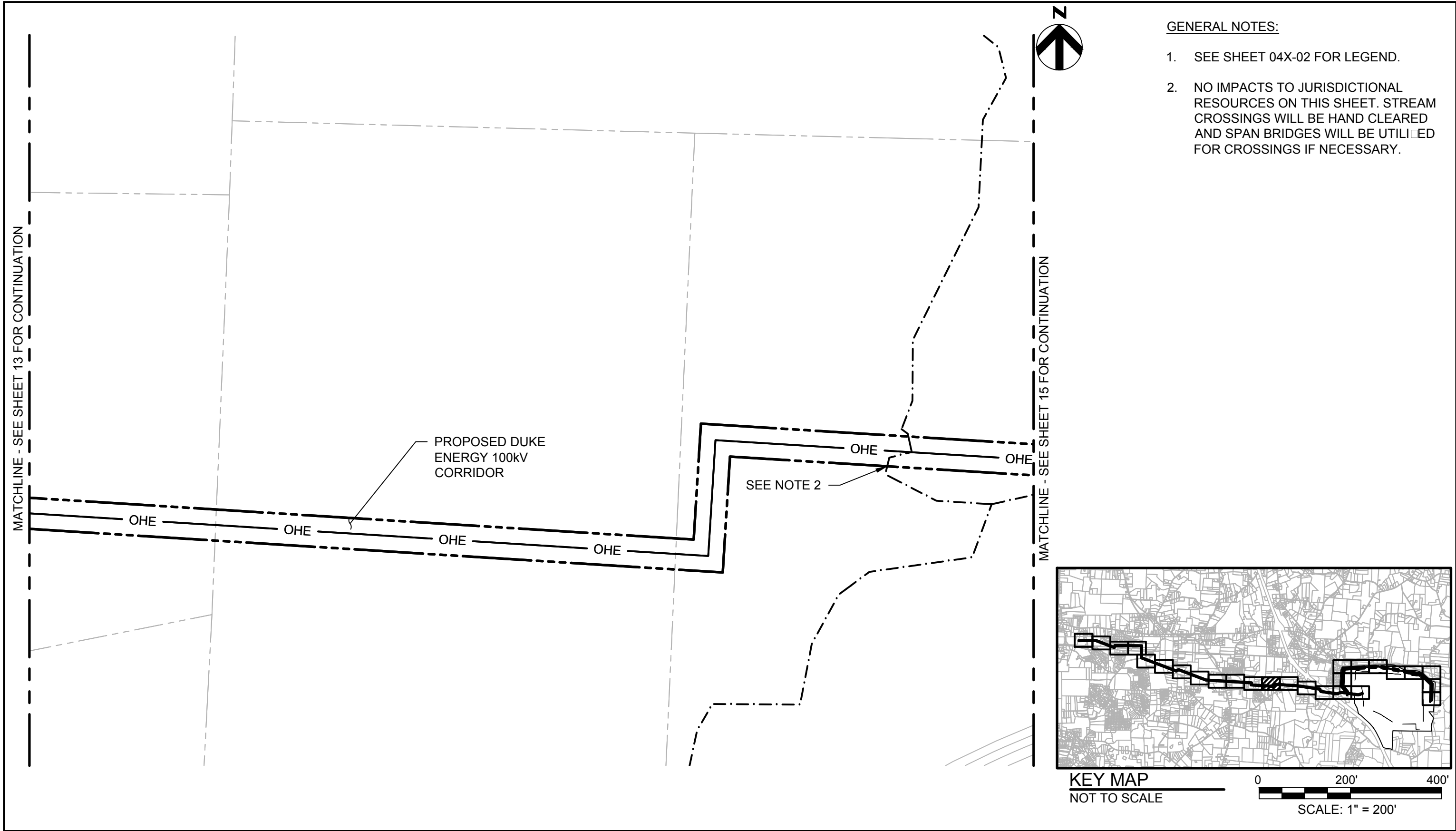
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PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
04X-13





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PROJECT GRMS  
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JURISDICTIONAL IMPACTS

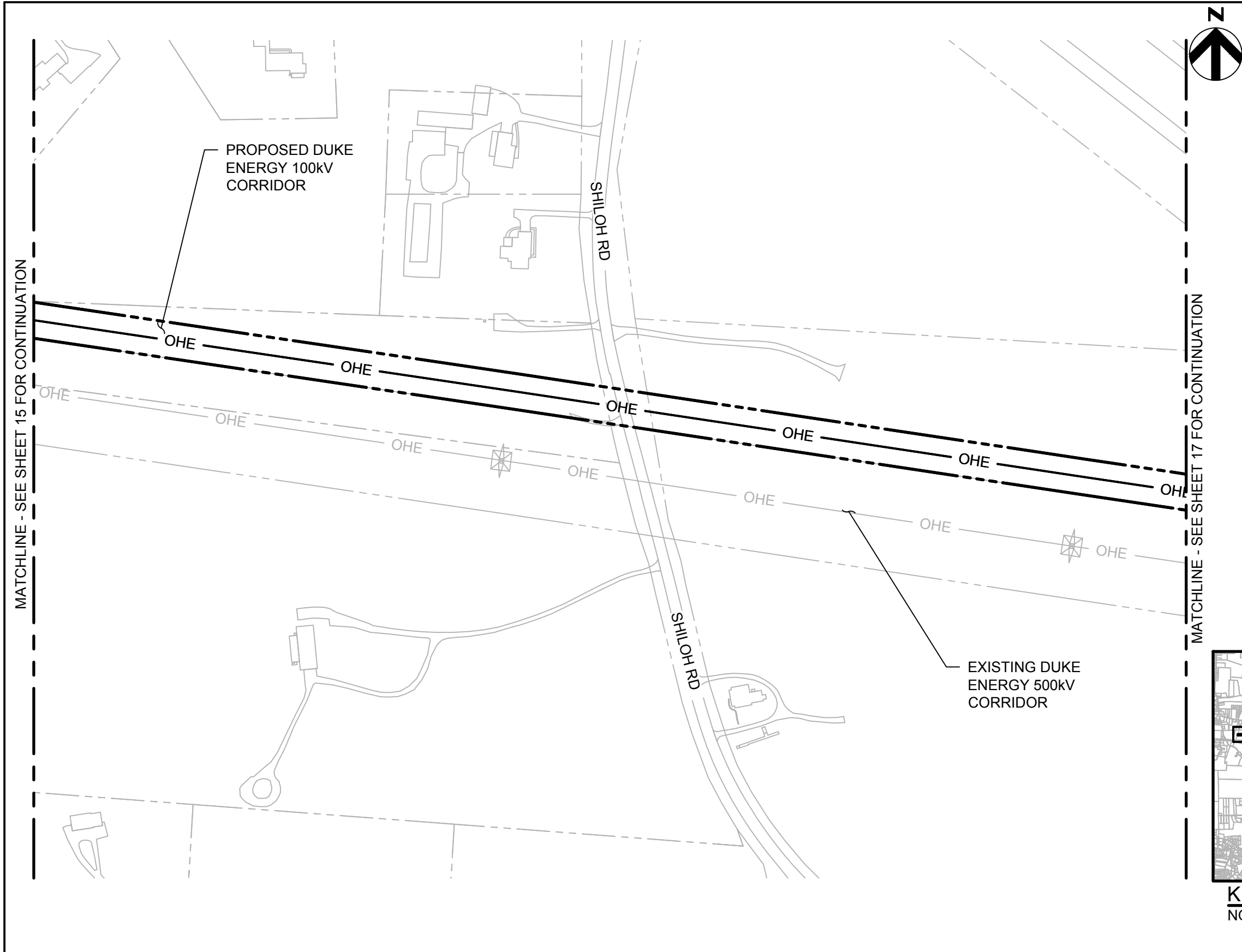
DATE  
05/25/2018

SHEET  
04X-14



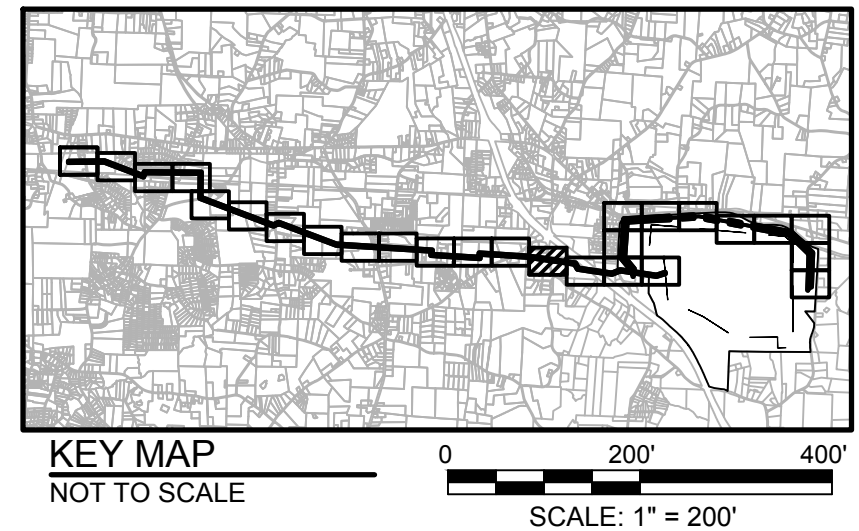






GENERAL NOTES:

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL RESOURCES ON THIS SHEET.



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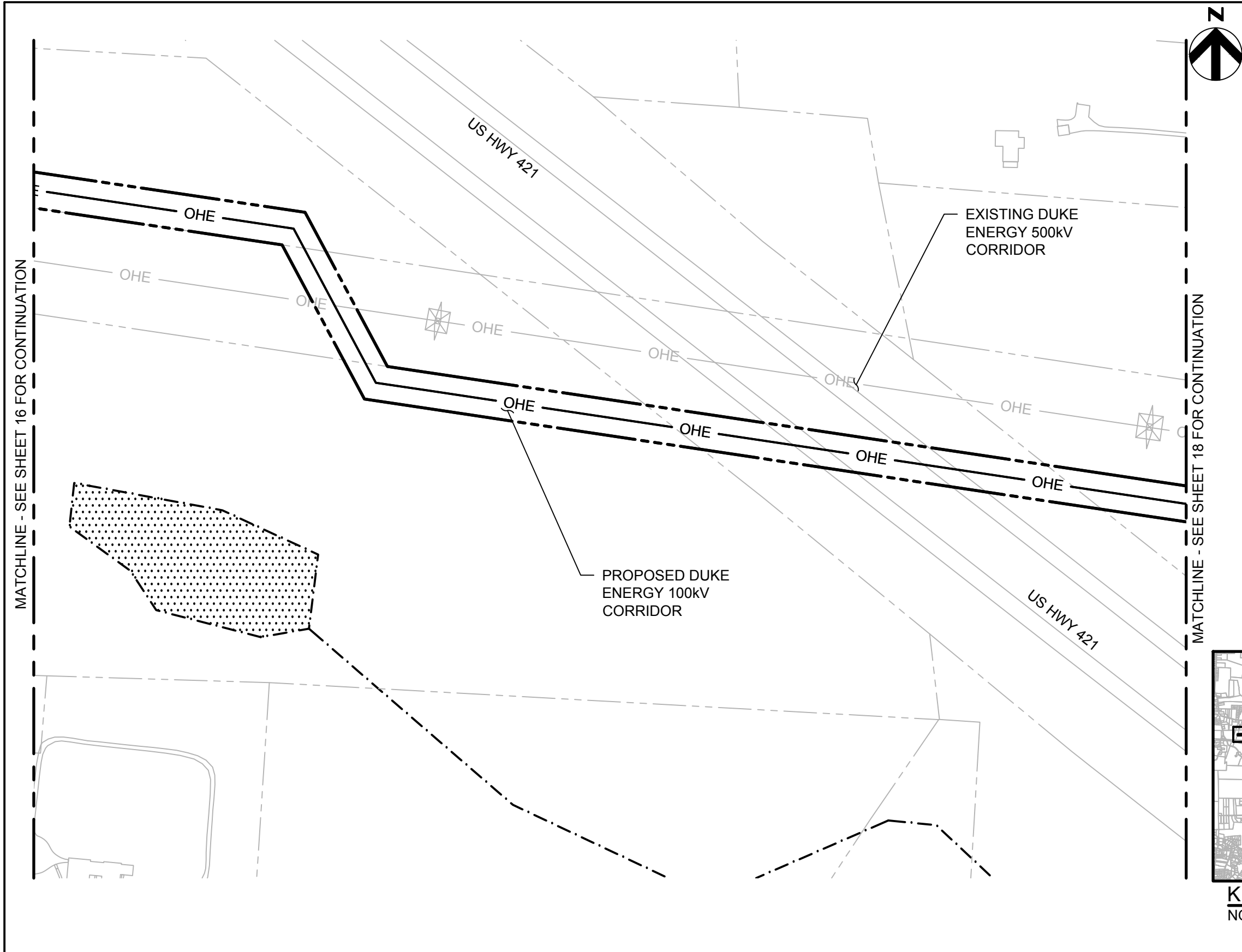
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N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

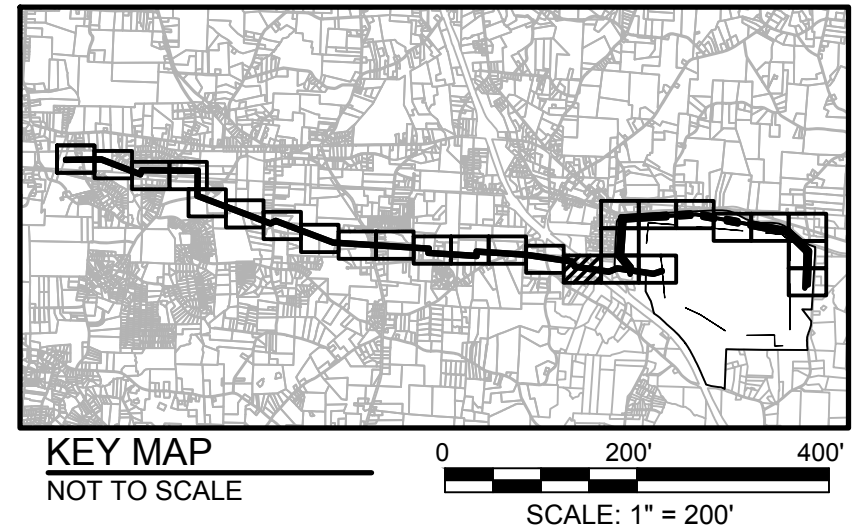
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05/25/2018  
  
SHEET  
04X-16





GENERAL NOTES:

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL RESOURCES ON THIS SHEET.



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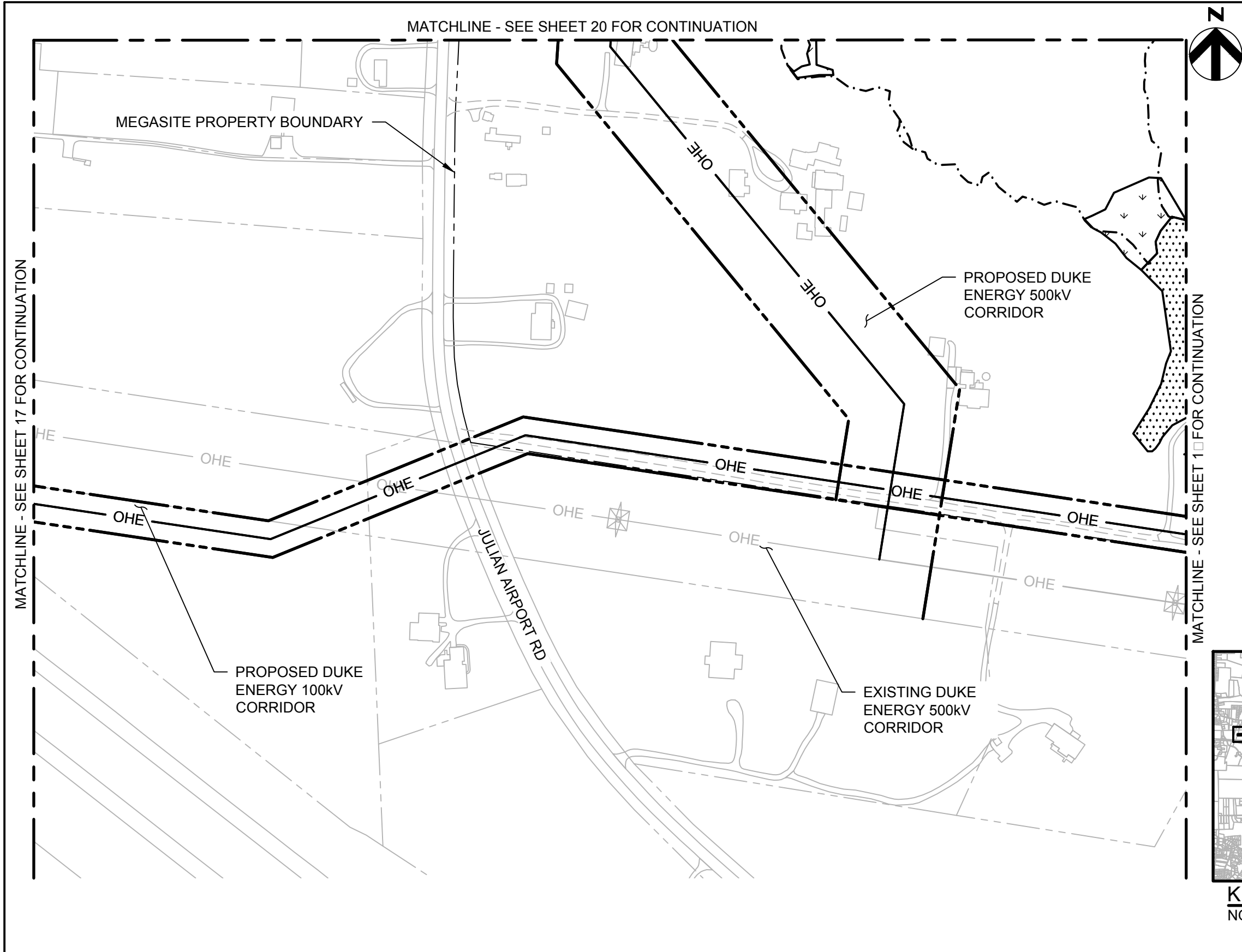
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**PROJECT GRMS**  
**DUKE ENERGY CORRIDORS**  
**JURISDICTIONAL IMPACTS**

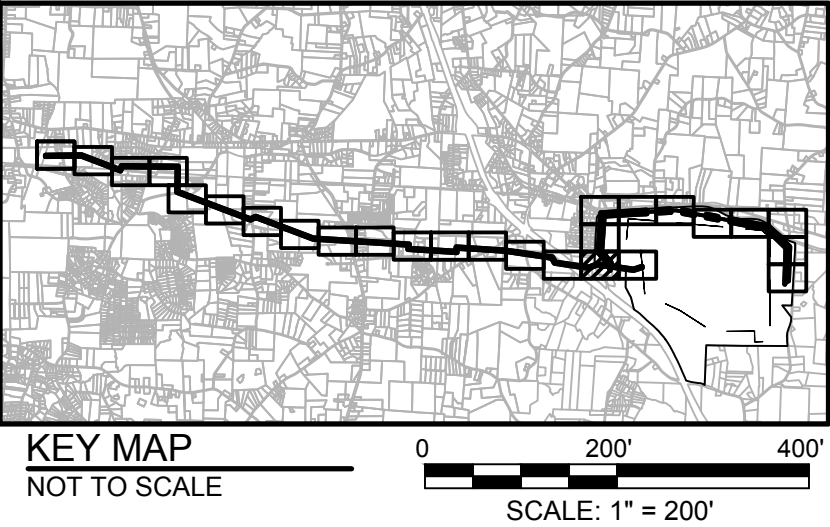
DATE  
05/25/2018

SHEET  
04X-17





- GENERAL NOTES:
1. SEE SHEET 04X-02 FOR LEGEND.
  2. NO IMPACTS TO JURISDICTIONAL RESOURCES ON THIS SHEET.



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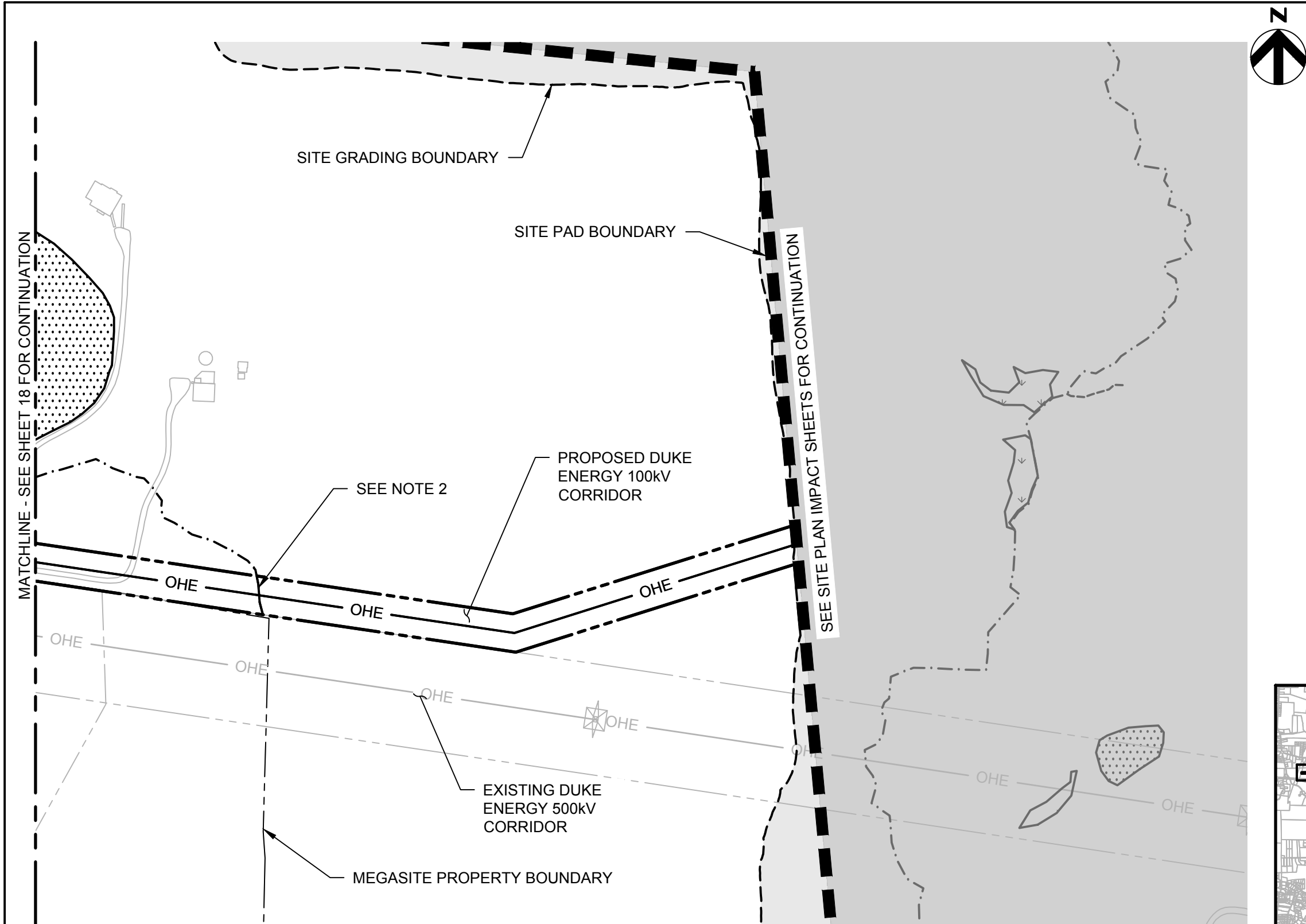
N.C.B.E.L.S. License Number: F-0116

PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS

DATE  
05/25/2018

SHEET  
04X-18





**GENERAL NOTES:**

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.



**KEY MAP**

NOT TO SCALE

0 200' 400'

SCALE: 1" = 200'



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**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

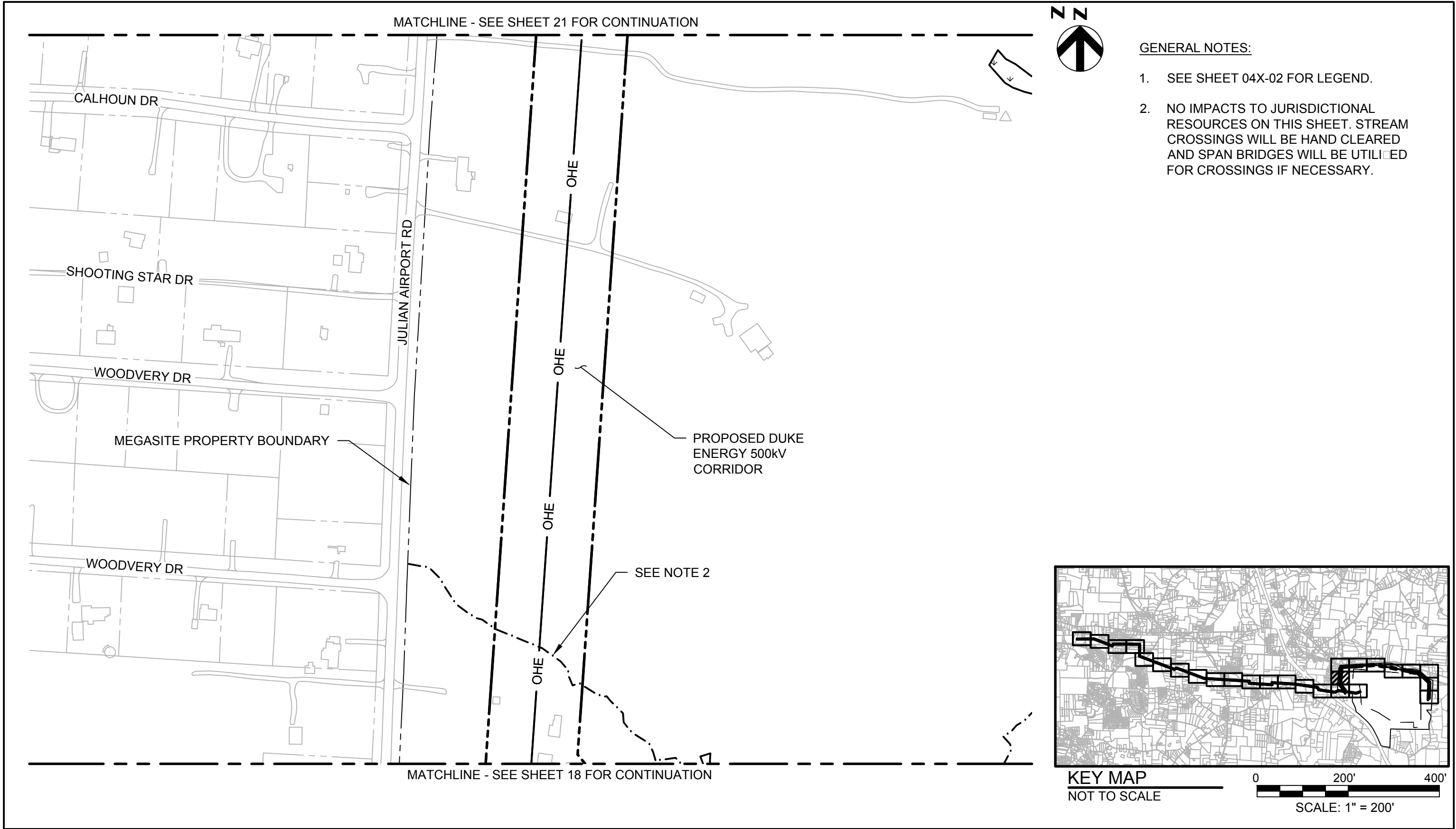
DATE

05/25/2018

SHEET

04X-1





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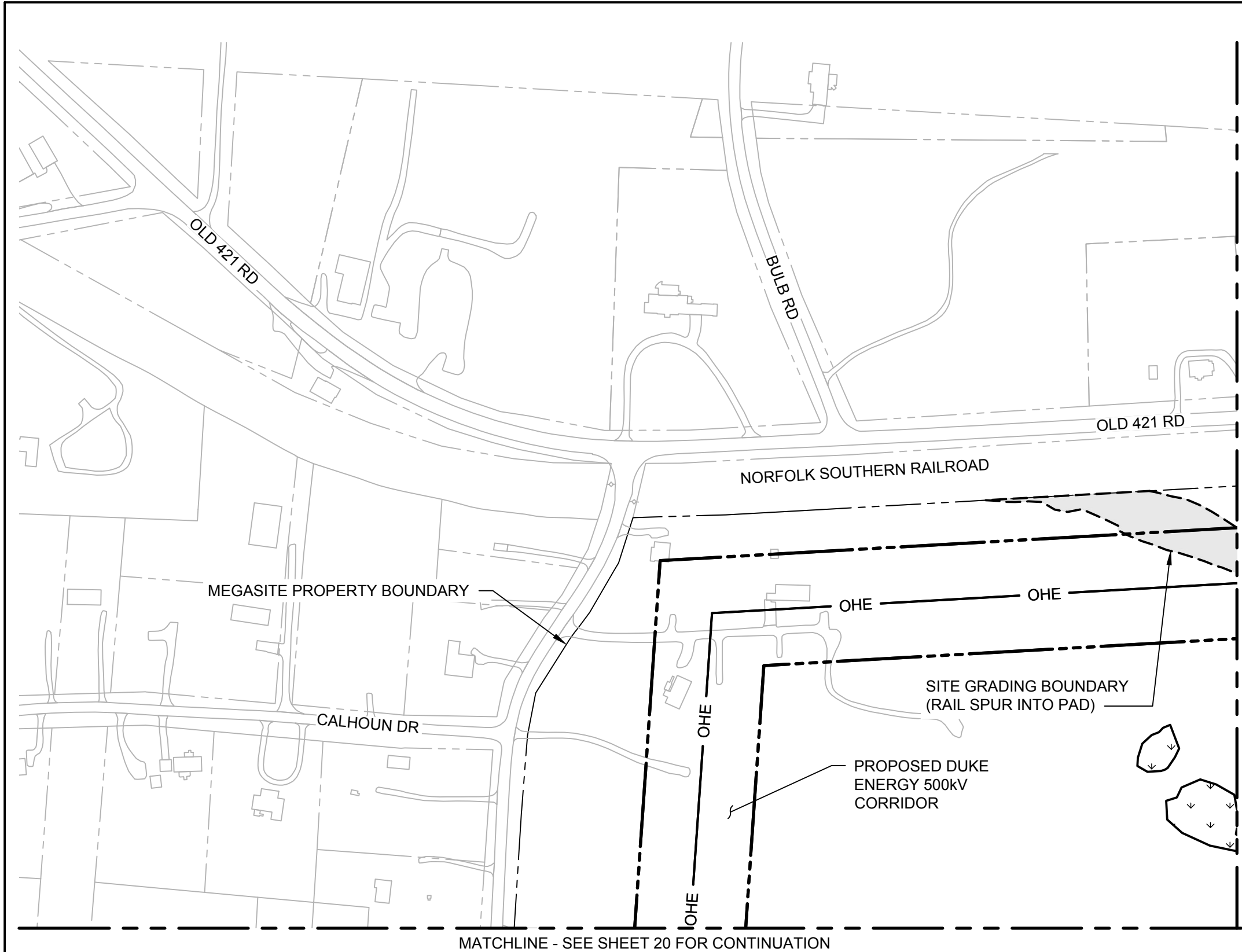
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**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

DATE  
05/25/2018

SHEET  
04X-20



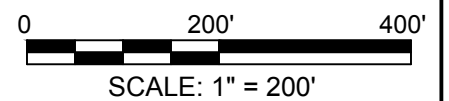


GENERAL NOTES:

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL RESOURCES ON THIS SHEET.



**KEY MAP**  
NOT TO SCALE



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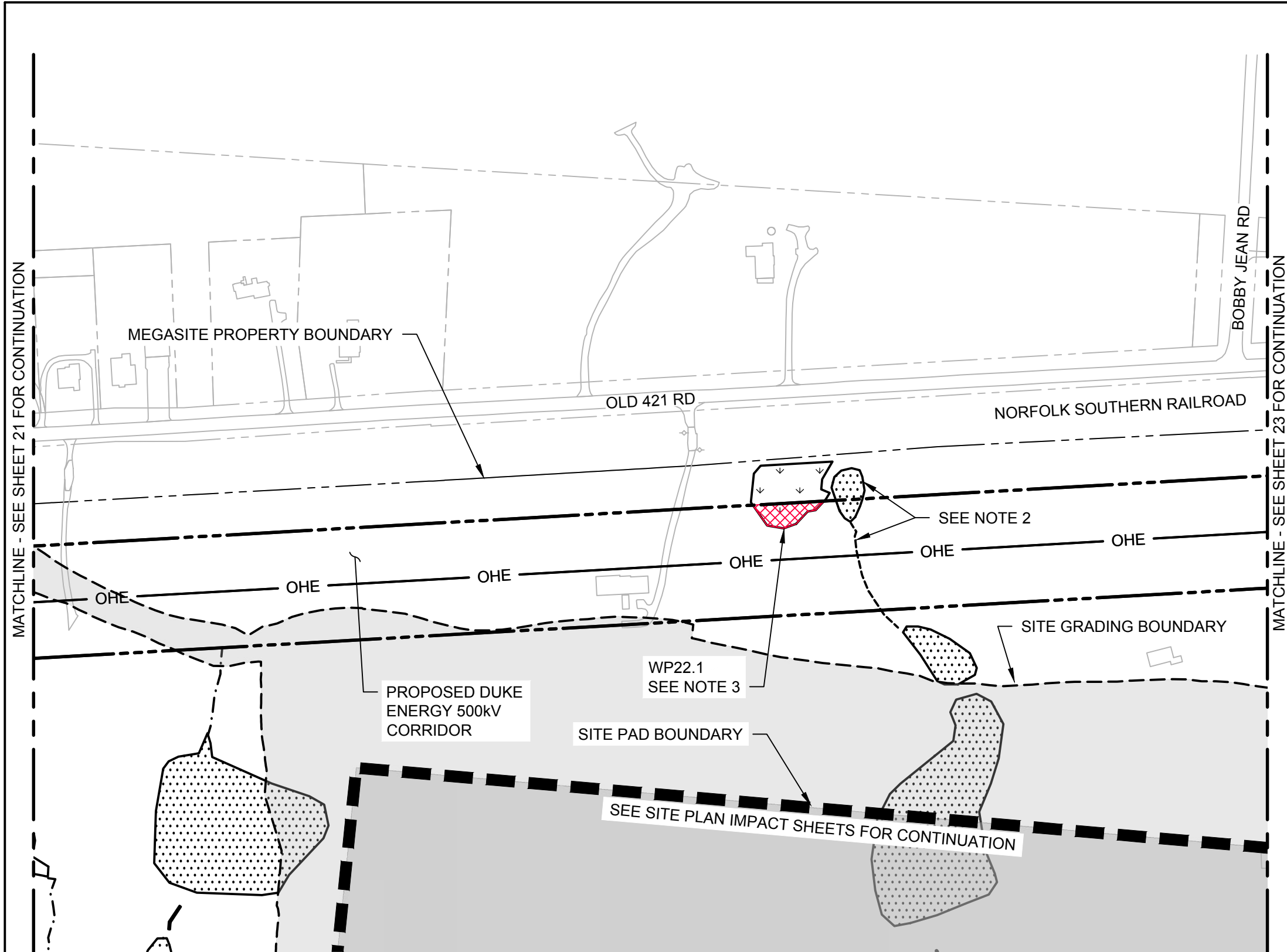
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919.232.6600

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**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

DATE	05/25/2018
SHEET	04X-21





**GENERAL NOTES:**

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY. PONDS WILL BE SPANNED.
3. WETLANDS IN THE PROPOSED DUKE ENERGY CORRIDOR WILL BE HAND CLEARED.

**Wetland Impacts**

Impact Site	Feature ID from PJD	Impact Type	Permanent Impact Area (AC)	Temporary Impact Area (AC)
WP22.1	W39	CLEARING	0.08	0.00
Total			0.08	0.00



**KEY MAP**

NOT TO SCALE

0 200' 400'

SCALE: 1" = 200'



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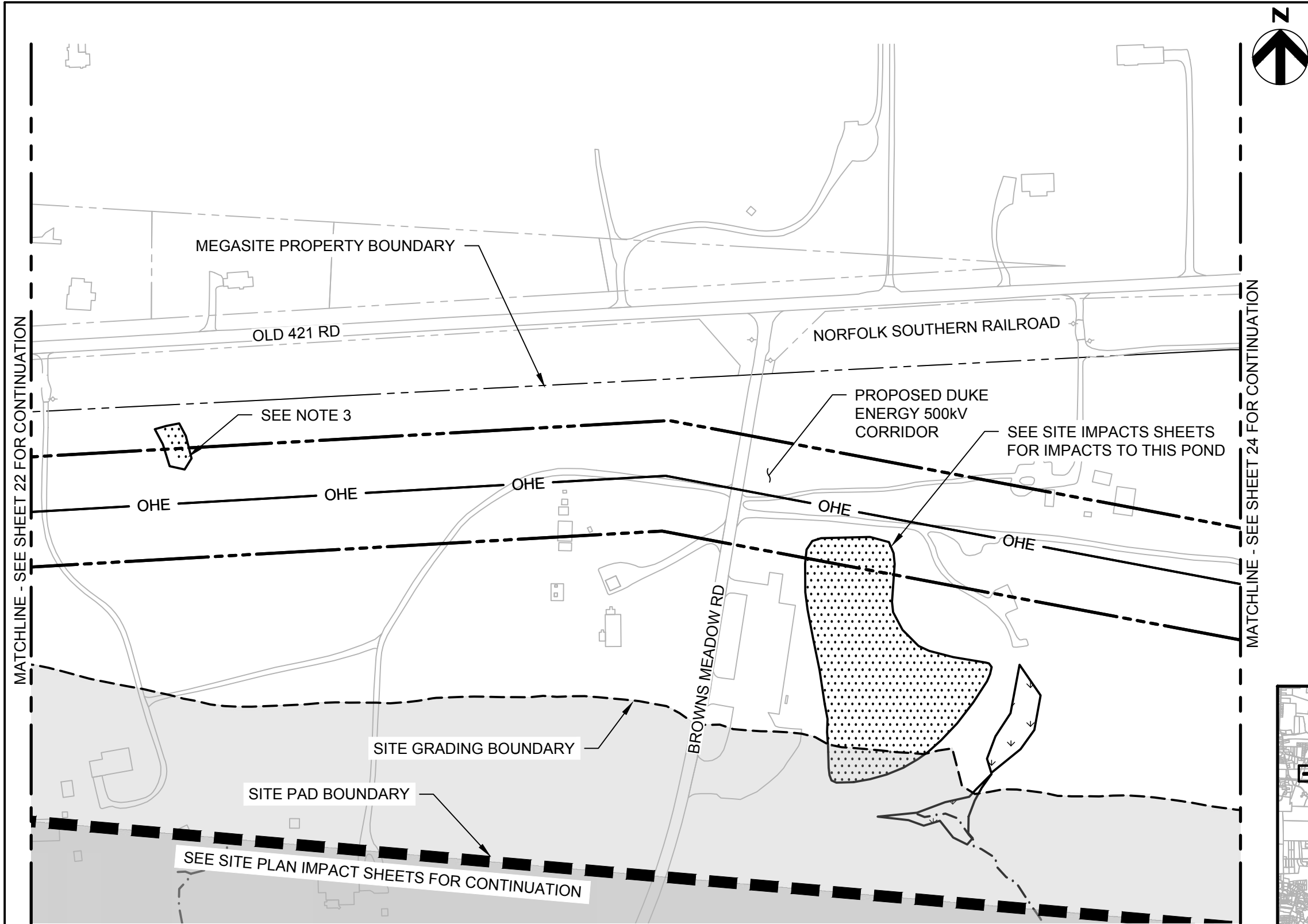
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**PROJECT GRMS**  
**DUKE ENERGY CORRIDORS**  
**JURISDICTIONAL IMPACTS**

DATE  
05/25/2018

SHEET  
04X-22





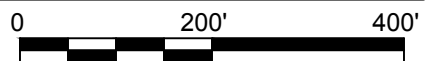
GENERAL NOTES:

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET.
3. POND IS NON-JURISDICTIONAL.



**KEY MAP**

NOT TO SCALE



SCALE: 1" = 200'



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**PROJECT GRMS**  
**DUKE ENERGY CORRIDORS**  
**JURISDICTIONAL IMPACTS**

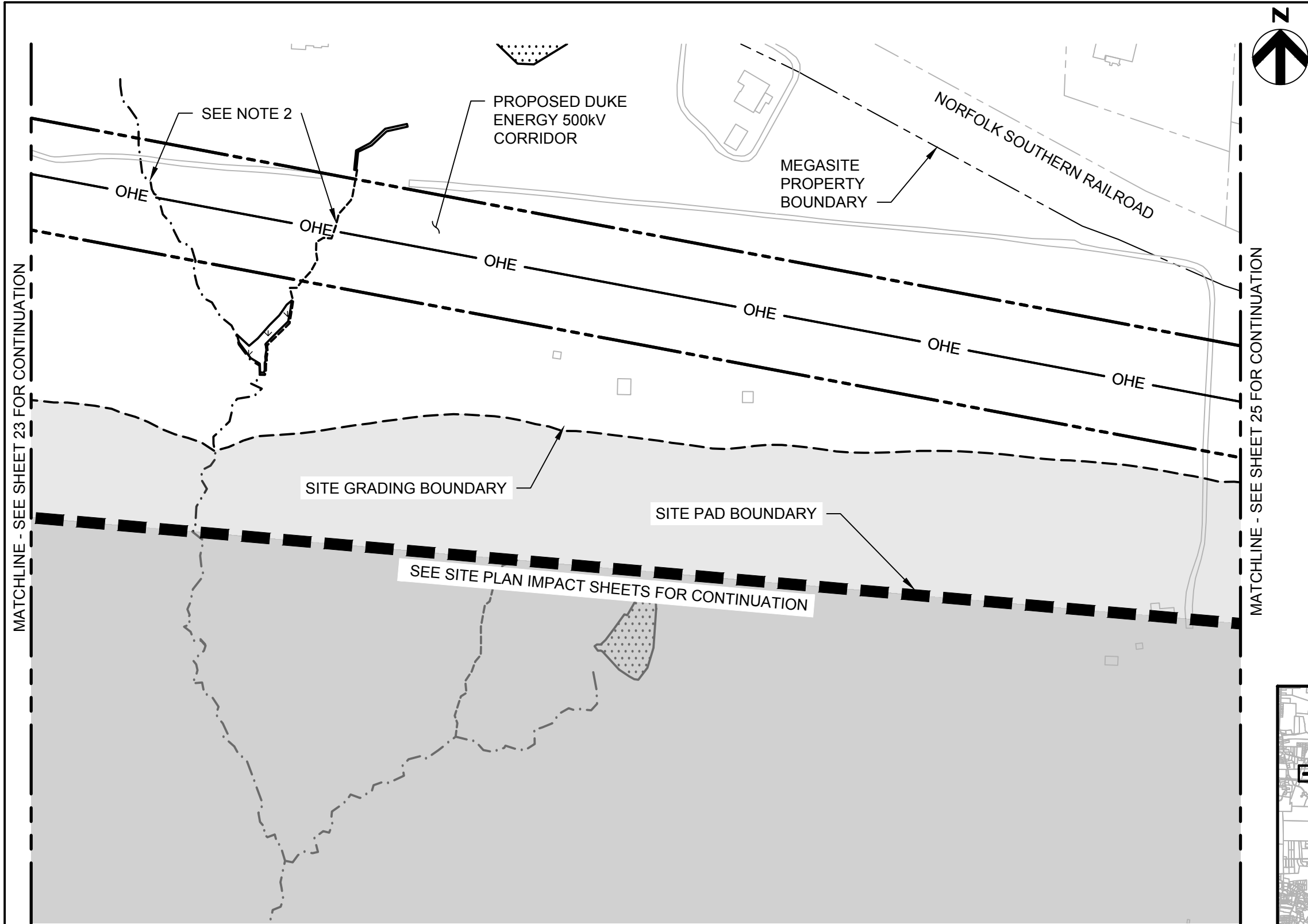
DATE

05/25/2018

SHEET

04X-23





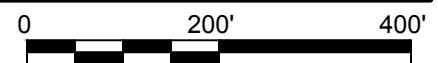
**GENERAL NOTES:**

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET. STREAM CROSSINGS WILL BE HAND CLEARED AND SPAN BRIDGES WILL BE UTILIZED FOR CROSSINGS IF NECESSARY.



**KEY MAP**

NOT TO SCALE



SCALE: 1" = 200'



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**PROJECT GRMS**  
**DUKE ENERGY CORRIDORS**  
**JURISDICTIONAL IMPACTS**

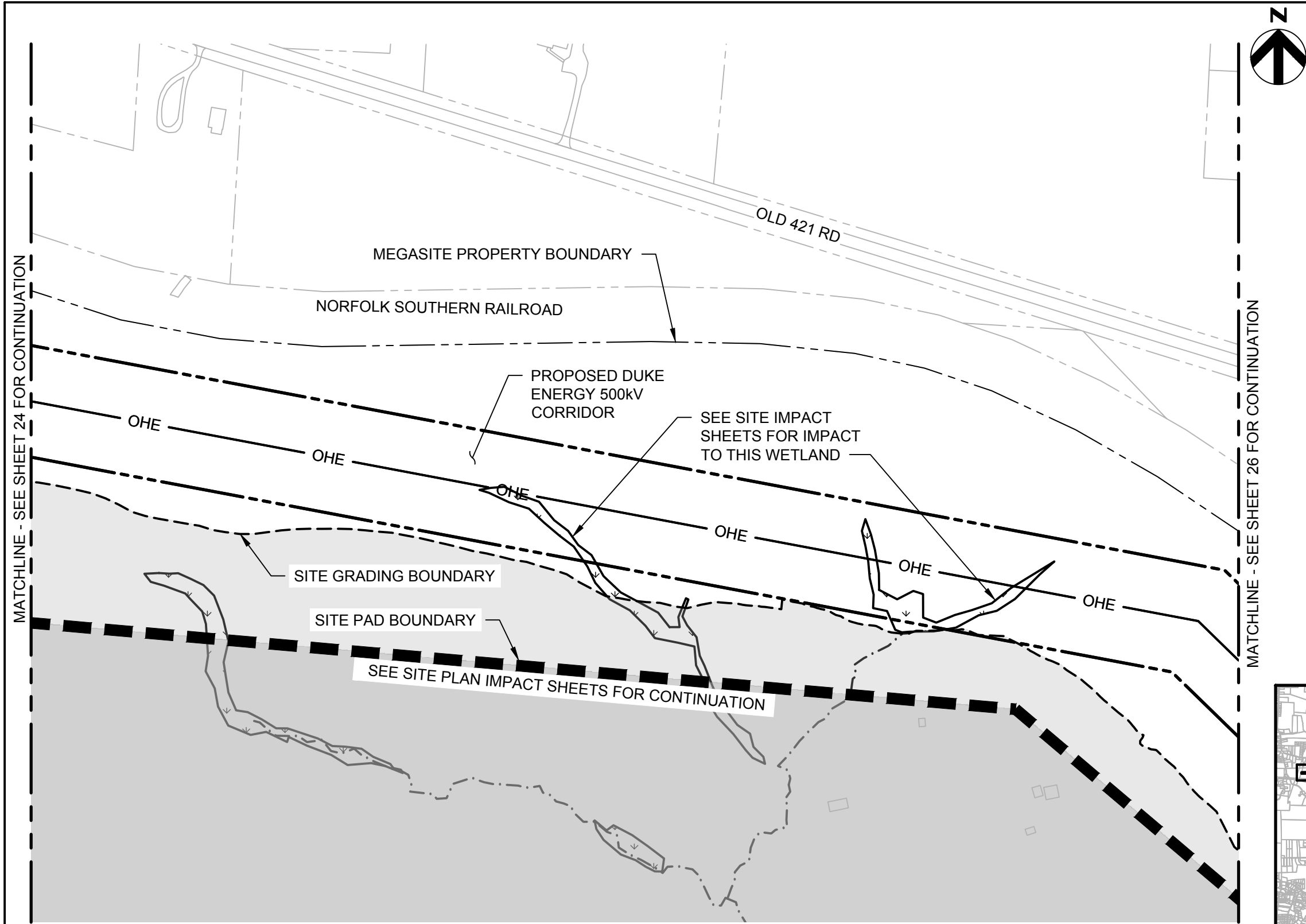
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05/25/2018

SHEET

04X-24



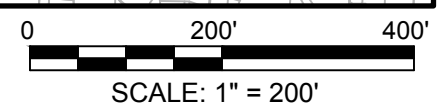


**GENERAL NOTES:**

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET.



**KEY MAP**  
NOT TO SCALE



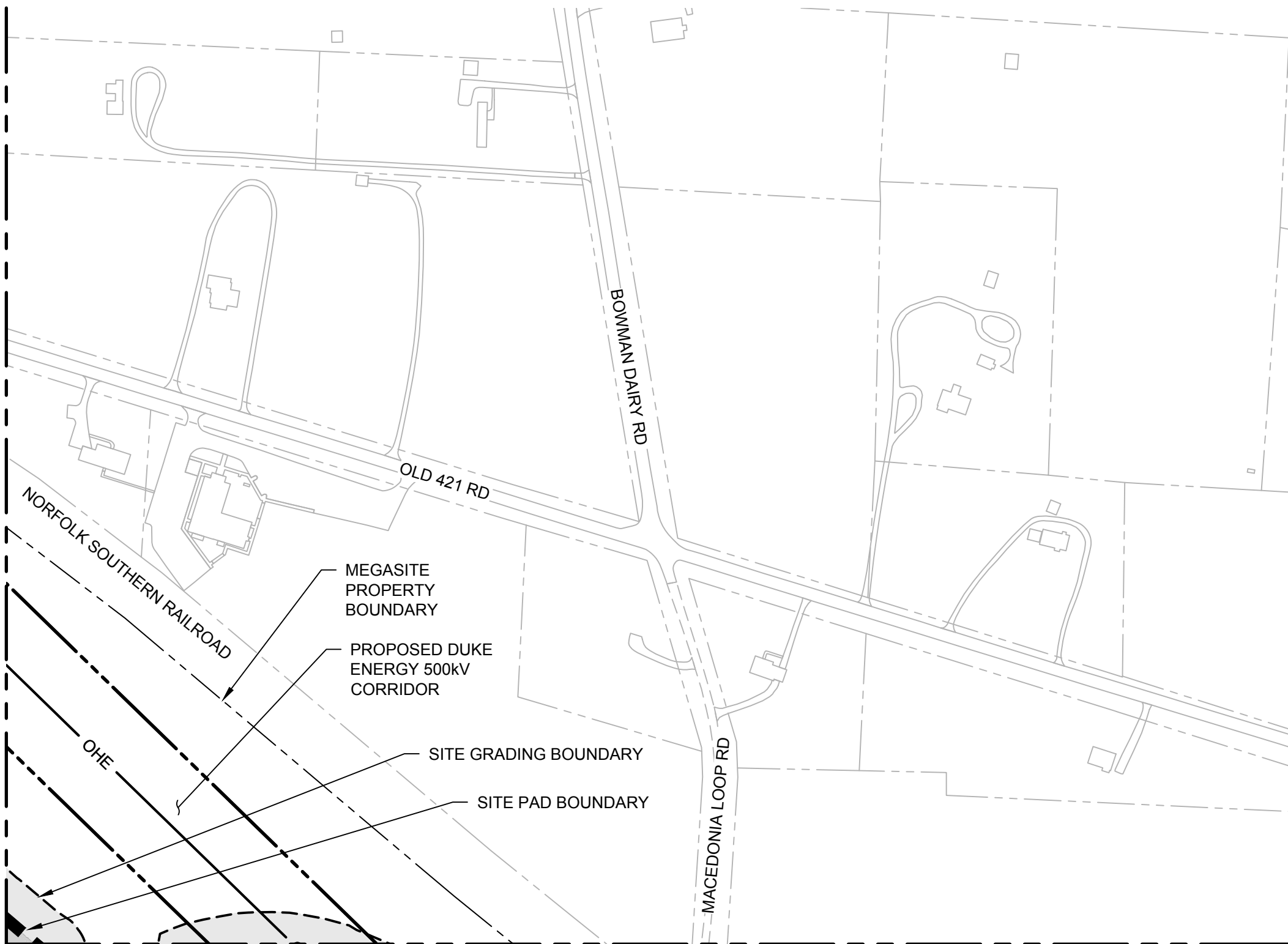
HDR Engineering Inc.  
of the Carolinas  
  
555 Fayetteville Street, Suite 1100  
Raleigh, NC 27601  
Tel: 919.232.6600  
  
N.C.B.E.L.S. License Number: F-0116

**PROJECT GRMS  
DUKE ENERGY CORRIDORS  
JURISDICTIONAL IMPACTS**

DATE  
05/25/2018  
  
SHEET  
04X-25



MATCHLINE - SEE SHEET 25 FOR CONTINUATION

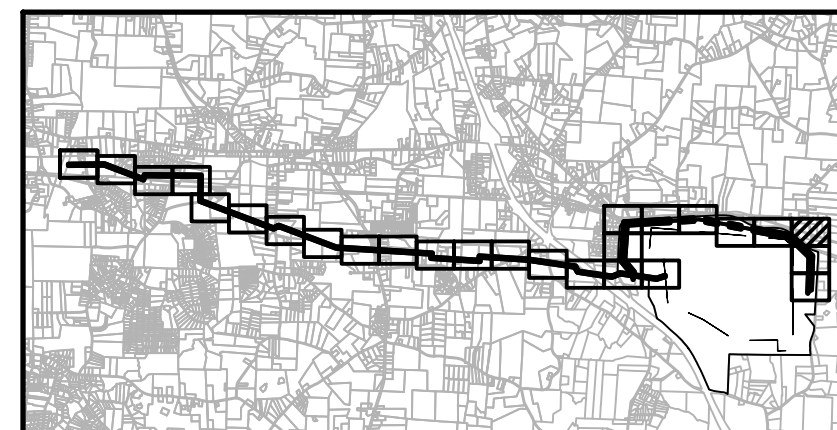


MATCHLINE - SEE SHEET 27 FOR CONTINUATION



**GENERAL NOTES:**

1. SEE SHEET 04X-02 FOR LEGEND.
2. NO IMPACTS TO JURISDICTIONAL STREAMS ON THIS SHEET.



**KEY MAP**

NOT TO SCALE

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SCALE: 1" = 200'



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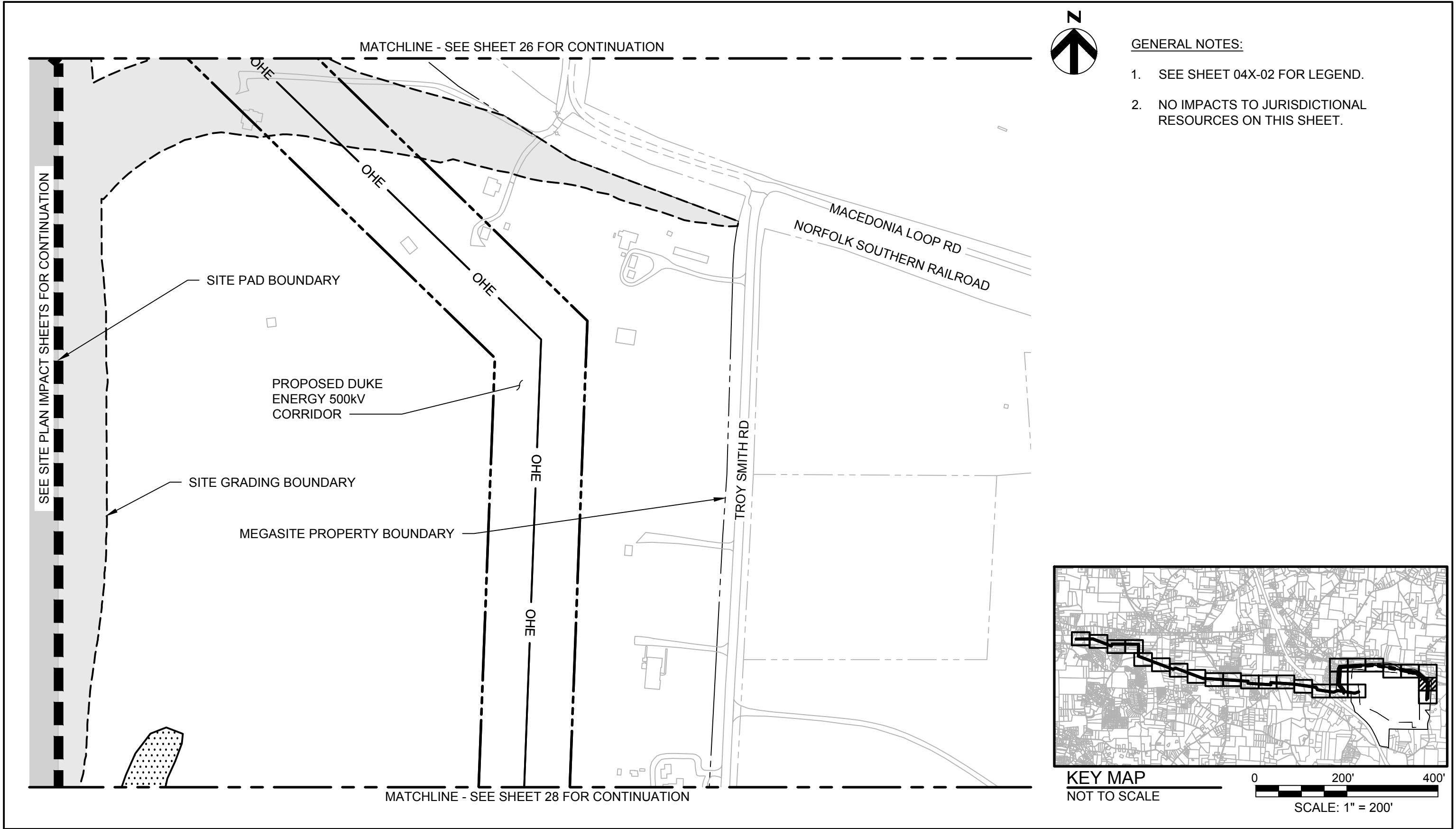
DATE

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04X-26





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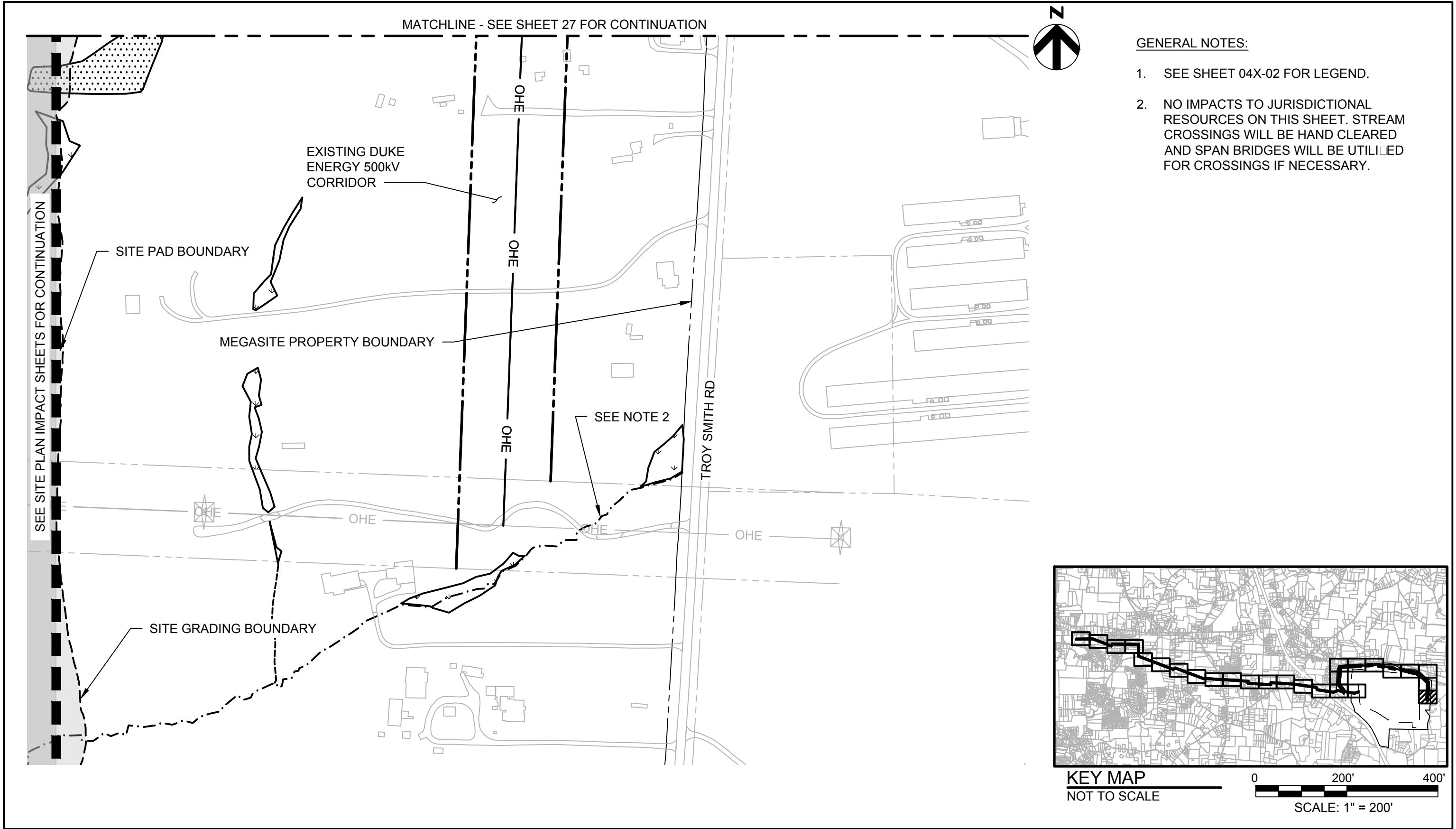
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04X-28









- Skilled and semi-skilled workforce of over 200 thousand within 40 miles of the site.
- The overall project purpose is accurately stated by the preceding statement of purpose and need. Accordingly, a location can only satisfy the overall project purpose if it satisfies the Location Requirements.

## 3.2 Discussion

Randolph County and City of Greensboro are part of the Piedmont Triad Area, which has been historically notable for large textile, tobacco, and furniture companies. As recently as 20 years ago, the Piedmont Triad Area was the most manufacturing-intensive region in the most manufacturing-intensive state (Brod, 2016). However, most of those jobs were in textile and apparel manufacturing—industries which have undergone significant changes in the form of automation and outsourcing during the past two decades. As a result, manufacturing jobs in the Greensboro-High Point Metropolitan Statistical Area (which includes Randolph County) have fallen from 28% of total employment in 1990 to just 15% in 2018—representing a loss of 32,500 jobs during that time (NCDOC, 2018).

This historic job loss has severely impacted Randolph County and City of Greensboro, as the workforce has struggled to adjust to the loss of manufacturing jobs (Brod, 2016). Randolph County and City of Greensboro have also been unable to regain jobs lost as a result of the 2008 recession, whereas North Carolina as a whole has experienced overall employment growth on par with the national average since that time (Brod, 2017). Furthermore, in 2016 dollars, per capita personal income in Guilford County and Randolph County remained well below the national average (USCB, 2018a). Based on available data, the per capita income has been stagnant from 2010 to 2016 in Randolph County, indicating a lack of growth (USCB, 2018b).

The ability of an economic development project such as the Proposed Project to provide the intended economic benefits is well-established, as discussed in Appendix E (Walden, 2017). Such a project is expected to employ upwards of 4,000 workers with total labor compensation of \$351 million, and value-added for goods produced in excess of \$1 billion (Walden, 2017 - Table 3). The Proposed Project is also expected to bring a multiplier effect to Randolph County and City of Greensboro, positively impacting supply chain businesses, consumer spending, and public revenues.

# 4 Alternatives

## 4.1 Alternatives Development

This section identifies and evaluates a broad range of alternatives in light of the overall purpose of the Proposed Project to identify practicable alternatives to the Proposed Project as part of the process of identifying the least environmentally damaging *practicable* alternative (LEDPA). An alternative is practicable if it is “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.” 40 CFR 230.3(l). In identifying and developing this list of alternatives, the GRMF has considered and included alternatives falling within the following categories:





- The proposed alternative (the Proposed Project);
- Alternatives that would involve no discharges of dredged or fill material into the waters of the United States (the “no action” alternative);
- Alternative offsite locations, including those that might involve less adverse impact to waters of the United States;
- Onsite alternatives that would involve less adverse impact to waters of the United States (which would include modifications to the alignments, site layouts, or design options in the physical layout and operation of the Proposed Project to reduce the amount of impacts to the waters of the United States); and
- Alternatives that would involve greater adverse impact to waters of the United States, but would avoid or minimize other significant adverse environmental consequences including offsite and onsite options.

The range of potential alternatives that was considered included alternative sites and alternative project configurations.

The practicability analysis of the project alternatives was conducted in three levels:

- Level 1 Analysis includes the identification of an extensive list of North Carolina sites and screening of the list to exclude sites that clearly cannot satisfy the Proposed Project’s overall purpose (and are therefore clearly not practicable).
- Level 2 Analysis reviews each alternative advanced from the Level 1 Analysis, if any, to determine if it is “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes” and therefore practicable.

The goal of Level 2 Analysis is to identify practicable alternative locations, if any, for use in identifying the LEDPA.

- Level 3 Analysis reviews different site designs at the proposed site location and at practicable alternative locations, if any.
- Taking into consideration all of the above, the final step of the alternatives analysis is to identify the Least Environmentally Damaging Practicable Alternative (LEDPA), taking into account alternative locations (if any) and alternative site designs.

## 4.2 Identification of Alternatives

### 4.2.1 Criteria for Alternatives

In order for an alternative site to satisfy the overall purpose of the Proposed Project and the applicant’s purpose and need, the site must, at a minimum, meet the Location Requirements identified in Section 3.1:

- 1) The site is centrally located within the Project Region so that employment and economic benefits are delivered to the target area; and
- 2) The site meets the following criteria currently required by transformational automotive manufacturing, production, and assembly facilities:





- Regularly-shaped contiguous area of at least 1,000 acres for a construction pad
- Rail service to the site
- Four-lane controlled access highway adjacent to the site
- Distance of less than 10 miles to the Interstate Highway System
- Distance of less than 30 miles to an international airport
- Sufficient electrical service
- Sufficient municipal water and sewer service
- Skilled and semi-skilled workforce of over 200 thousand within 40 miles of the site.

#### 4.2.2 Range of Alternatives

The State of North Carolina is home to four strategically located megasites (see Figure 1). These megasites and additional alternative locations are discussed below.

- **Proposed Location - Greensboro-Randolph Megasite** – This megasite comprises approximately 1,825 acres located entirely within Randolph County. It is adjacent to and bounded on the southwest side by US 421, and is approximately 9 miles south of I-85. The GRMS currently has three at-grade intersections along US 421. No current interchange exists along US 421, which serves to control access. The site is approximately 21 miles from the Piedmont Triad International Airport. The site has current rail access served by NS.
- **Alternative Locations within the Piedmont Triad Area** - In 2011, the Piedmont Triad Partnership commissioned the Timmons Group to conduct a 12-county Piedmont Triad Area search for and assessment of large tracts of land that might be suitable for development of an advanced manufacturing Original Equipment Manufacturer (OEM) such as an automotive or aviation complex capable of employing large numbers of workers to replace a significant number of jobs lost in the manufacturing sector. Data collected and assessed included those related to environmental considerations, infrastructure, land records, risk assessment, and demographic data.
- **Currituck County Moyock Megasite** – This megasite comprises over 3,000 acres located in Currituck County, adjacent to the border with Virginia and located on the western side of NC 168/Caratoke Highway in Moyock. It is a mixed use site in that it balances commercial uses such as retail stores, medical offices, and high-tech industrial businesses with a variety of residential areas. The site has 505 acres available for industrial use. The site is approximately 15 miles from I-64 and 20 miles from the Hampton Roads Executive Airport in Virginia. The site has current rail access served by Chesapeake and Albemarle Railroad.
- **Chatham-Siler City Advanced Manufacturing Site** - This megasite comprises approximately 1,606 acres (1,073-acre megasite and 533-acre feeder park) located in



Chatham County north of US 64, in Siler City. The nearest interstate to the Chatham-Siler City Advanced Manufacturing Site is I-73/74 approximately 16 miles east of the site. The site has no direct access to an interstate and is approximately 32 miles from the Piedmont Triad International Airport. The site has current rail access served by Norfolk Southern Railway (NS).

- **Moncure Megasite** - This megasite comprises approximately 2,500 acres located entirely within Chatham County. It does not have a direct connection to a four-lane controlled access highway, but is within one mile of US 1 and approximately 18 miles south of I-40. The site is 21 miles from the Raleigh-Durham International Airport. The site has current rail access served by CSX.
- **Kingsboro CSX Select Megasite** - This megasite comprises approximately 1,449 acres located in Edgecombe County. This site was selected by Triangle Tyre Co. in late 2017 to manufacture passenger tires in phase one and commercial tires in its proposed phase two. The facility will provide 800 jobs to Edgecombe County. It is located adjacent to US 64, between the Town of Tarboro and City of Rocky Mount, and approximately 12 miles east of I-95. An interchange exists at US 64 along the western boundary of the site. The site is 13 miles from the Pitt-Greenville Airport. The site has current rail access served by CSX.
- **29 Other Large Land Tracts** - A site search was conducted by HDR Engineering Inc. to identify potentially available (i.e. for sale) large land tracts comprising 1,000 acres or more located within North Carolina. Twenty-nine properties were identified across the state ranging from 1,000 to 8,300 acres. These locations were then mapped with proximity to an interstate, an international airport, and rail access. Of those 29 large land tracts, none of the sites were centrally located in the Project Region. The closest site was in Rockingham County.
- **No Action Alternative** - The Proposed Project is not constructed.



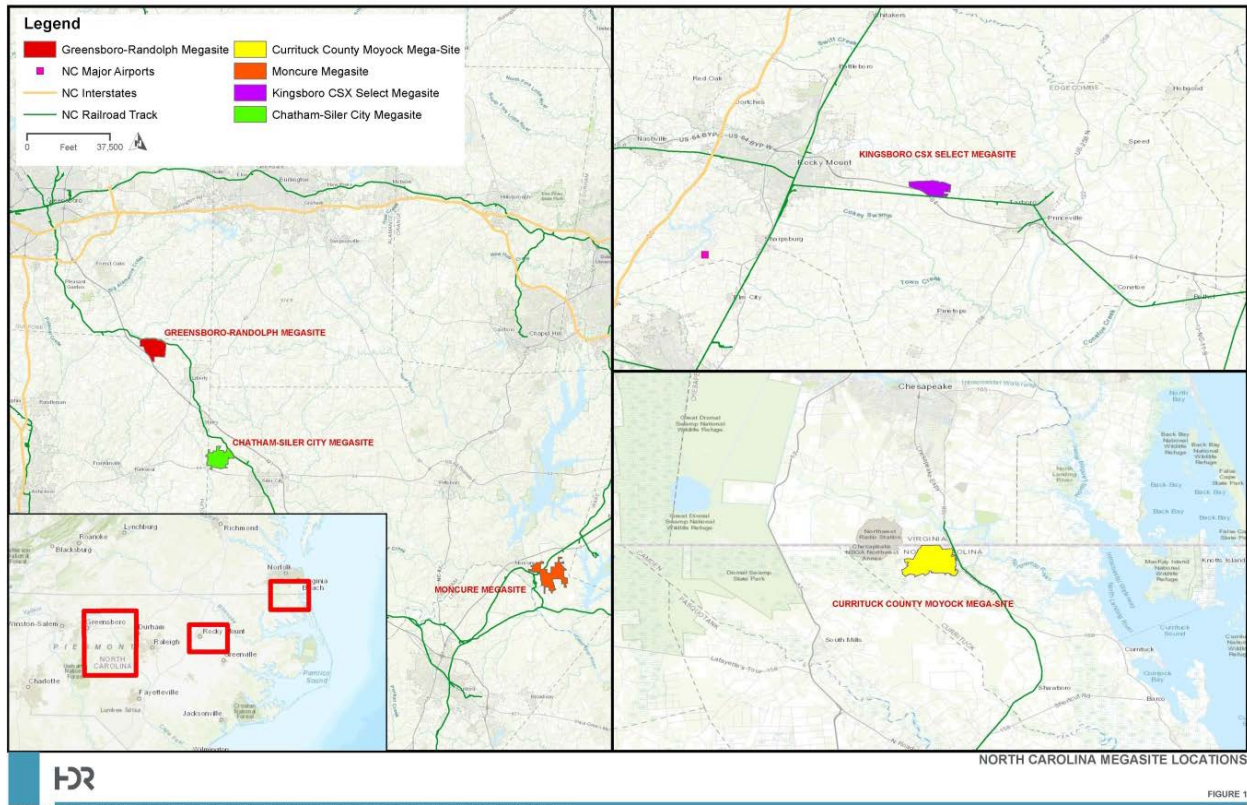


Figure 1. North Carolina Megasite Locations

## 4.3 Alternatives Practicability Analysis

### 4.3.1 Level 1 Analysis

A Level 1 Analysis was performed to eliminate alternative sites that clearly cannot satisfy the overall project purpose. Alternatives that clearly could not meet the overall project purpose were not analyzed further.

- Currituck County Moyock Megasite** - This site is not centrally located within the Project Region and therefore cannot satisfy the project purpose and need. This alternative is over 3,000 acres in size; however, only 505 acres are available for industrial use, less than the required 1,000 acres. In addition, the property is currently slated for mixed-use commercial/residential development, rendering the proximity of the proposed facilities to this type of mixed-use development unsuitable and undesirable. This site was eliminated from further consideration.
- Chatham-Siler City Advanced Manufacturing Site** - This site did not meet three of the required criteria for this Project. It is not centrally located within the Project Region. The nearest designated interstate (I-73/74) exceeds the 10-mile threshold and the closest airport (Piedmont Triad International Airport) is approximately 32 miles from the site. This site was eliminated from further consideration.
- Moncure Megasite** - The site is not centrally located within the Project Region area and does not have a direct connection to a four-lane controlled access, but is within one mile



of US 1 and is approximately 18 miles south of I-40. Because the alternative fails to meet the basic minimum site requirements it was eliminated from further consideration.

- **Kingsboro CSX Select Megaproject** - The site is located adjacent to US 64, between the Town of Tarboro and City of Rocky Mount, and approximately 12 miles east of I-95. An interchange exists at US 64 along the western boundary of the site. The site is 13 miles from the Pitt-Greenville Airport. This alternative is not centrally located within the Project Region and fails to meet the basic minimum site requirements. Therefore, this alternative was eliminated from further consideration by Level 1 analysis. This site was also selected by Triangle Tyre Co. in late 2017 and no longer meets the size requirements.
- **29 Other Large Land Tracts** - The site search for other large land tracts available (i.e., single tracts of land greater than or equal to 1,000 acres listed for sale) in North Carolina identified no properties that might satisfy the minimum site requirements. The two properties that were the least unsuitable were located in Pender County and Buncombe County, were not centrally located within the Project Region, were not zoned for heavy industrial activities, had not had any due diligence activities completed, and did not meet the basic minimum site requirements. For these reasons, other large land tracts potentially available in North Carolina were eliminated from further consideration by the Level 1 analysis.
- **Alternative Locations within the Piedmont Triad Area** - In 2011, the Piedmont Triad Partnership commissioned the Timmons Group to conduct a 12-county Piedmont Triad Area search for and assessment of large tracts of land that might be suitable for development of an advanced manufacturing OEM such as an automotive or aviation complex capable of employing large numbers of workers to replace a significant number of jobs lost in the manufacturing sector. Data collected and assessed included those related to environmental considerations, infrastructure, land records, risk assessment, and demographic data. An assessment program of potential suitable property was developed that compared the sites using the following selection criteria:
  - Acreage – minimum of 1,000 acres (i.e., 1,000 acres of contiguous land capable of being developed; none of the properties assessed contained 1,000 acres within a single tract of land at the time of the study and property owners were not contacted during this study to gauge their interest in selling)
  - Wetlands and streams on site
  - Watershed location
  - Air quality concerns
  - Distance to rail – main line preferred
  - Distance to Interstate or four-lane highway
  - Distance to major airport
  - Power availability
  - Water service availability
  - Wastewater service availability



- Topography
- Access
- Visibility
- Natural gas service availability
- Fiber optic cable availability
- Geology
- Residential nearby
- Rock quarries nearby
- Political concerns

Eleven locations were identified by the Piedmont Triad Partnership study for detailed assessment. Detailed assessment narrowed the list to five locations (Figure 2). The Timmons Group produced the following ranking of the five locations and HDR Engineering Inc. provided the analysis of the distances and lengths (USGS hydrography datasets and National Wetland Inventory Mapping were utilized to make comparisons of each site):

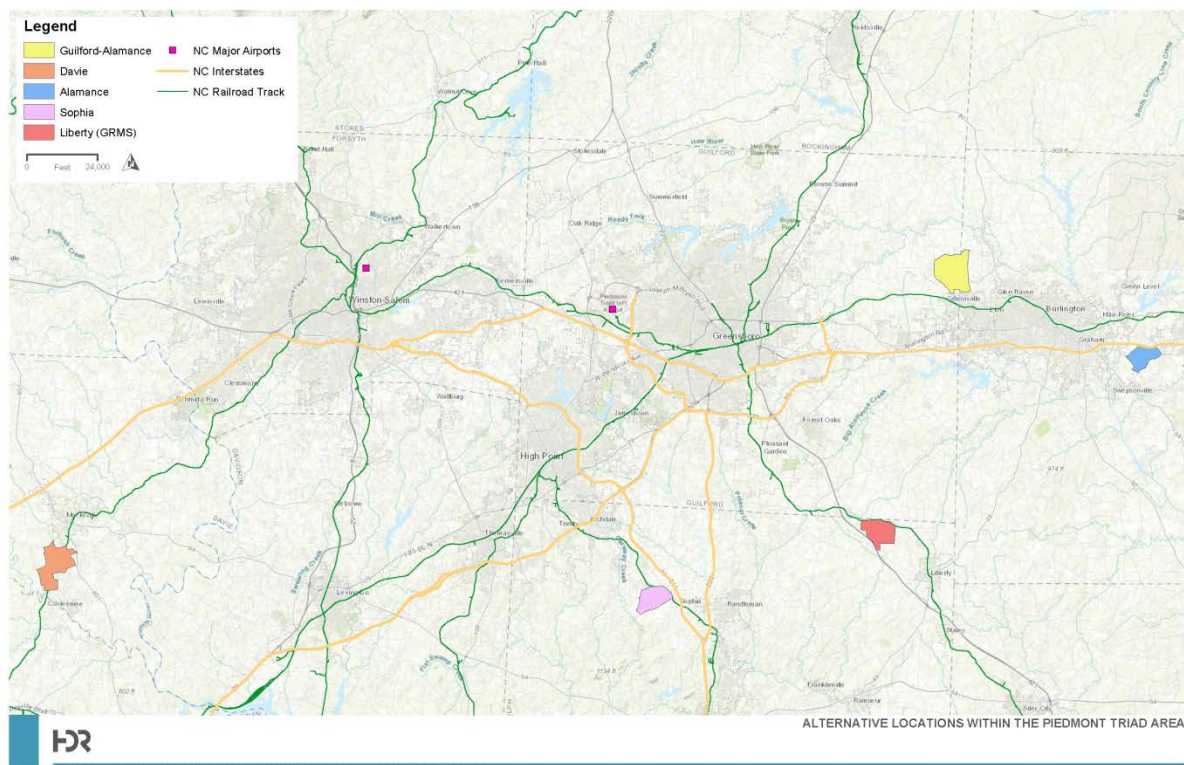
- 1) Randolph County – Liberty (i.e., GRMS – the Proposed Project)
  - Direct rail service at the site
  - Direct access to a four-lane controlled access highway
  - 9 miles to the Interstate Highway System
  - 21 miles to an international airport
  - Close proximity to utilities
  - 36,761 linear feet of stream
  - 87 parcels to create over 1,000 contiguous acres
- 2) Randolph County – Sophia
  - Direct rail service at the site
  - No direct access to a four-lane controlled access highway
  - 1 mile to the Interstate Highway System
  - 18 miles to an international airport
  - Close proximity to utilities
  - 39,112 linear feet of stream
  - 185 parcels to create over 1,000 contiguous acres
- 3) Alamance County – Burlington
  - No direct rail service to the site (~2 miles)
  - No direct access to a four-lane controlled access highway
  - 6 miles to the Interstate Highway System
  - 32 miles to an international airport
  - Close proximity to utilities
  - 29,809 linear feet of stream
  - 52 parcels to create over 1,000 contiguous acres

4) Davie County Mocksville

- Direct rail service at the site
- No direct access to a four-lane controlled access highway
- 4 miles to the Interstate Highway System
- 26 miles to an international airport
- Close proximity to utilities
- 62,064 linear feet of stream
- 71 parcels to create over 1,000 contiguous acres

5) Guilford / Alamance – Prison Farm

- No direct rail service to the site (~2 miles)
- Direct access to a four-lane controlled access highway
- 0 miles to the Interstate Highway System
- 21 miles to an international airport
- Close proximity to utilities
- 70,622 linear feet of stream
- 107 parcels to create over 1,000 contiguous acres



**Figure 2. Alternative Locations within the Piedmont Triad Area**

The results of the study were considered by a committee of Piedmont Triad Partnership and the economic development directors from the top five locations. All agreed that the potential development opportunities at the Randolph County site were superior to the others. In addition,





by applying the criteria set out in Section 4.2.1 to the sites previously studied by the PTP, we see that four sites fail to meet one or more of the criteria: Randolph County – Sophia (no four-lane controlled access highway adjacent to the site and not centrally located within the Project Region); Alamance County – Burlington (not centrally located within the Project Region, no rail service to the site, no four-lane controlled access highway adjacent to the site, and distance of more than 30 miles to an international airport); Davie County Mocksville (not centrally located within the Project Region and no four-lane controlled access highway adjacent to the site); and Guilford / Alamance – Prison Farm (not centrally located within the Project Region and no rail service to the site). Only the GRMS meets all the criteria:

- 1) The site is centrally located within the Project Region so that employment and economic benefits are delivered to the target area; and
- 2) The site meets the following criteria currently required by transformational automotive manufacturing, production, and assembly facilities:
  - The GRMS provides a regularly-shaped contiguous area of 1,825 acres in which to place a 1,000 acre construction pad
  - Norfolk Southern provides rail service to the site
  - US 421, a four-lane controlled access highway, is adjacent to the site
  - I-40 is 9 miles north of the site
  - Piedmont Triad International Airport is 21 miles from the GRMS
  - Duke Energy can provide sufficient electrical service
  - The City of Greensboro can provide sufficient municipal water and sewer service
  - The surrounding area has a skilled and semi-skilled workforce of over 200 thousand within 40 miles of the GRMS.

Although the 2011 study included properties that are not centrally located within the Project Region and would therefore not satisfy the applicant's purpose and need, the GRMS was nonetheless identified as the most suitable site within the 12-county area for an advanced manufacturing OEM complex capable of employing large numbers of workers to replace a significant number of jobs lost in the manufacturing sector.

The GRMS site was the only alternative to meet the applicant's purpose and need, and the only alternative to satisfy the overall project purpose; therefore, this alternative has been advanced to Level 2 analysis.

### 4.3.2 Level 2 Analysis

A Level 2 Analysis was performed to review in greater detail alternatives that advanced following the Level 1 Analysis. The goal of the Level 2 Analysis was to identify the proposed site location of the Proposed Project. A detailed Level 2 Analysis was not necessary in this



application, as the only site that advanced following the Level 1 Analysis was the GRMS. The GRMS is currently available, has been through numerous due diligence studies such as completion of the jurisdictional resources mapping, has concurrence from the North Carolina Historic Preservation Office, has U.S. Fish and Wildlife Service (USFWS) clearance, and has plans for infrastructure in place.

### 4.3.3 Level 3 Analysis

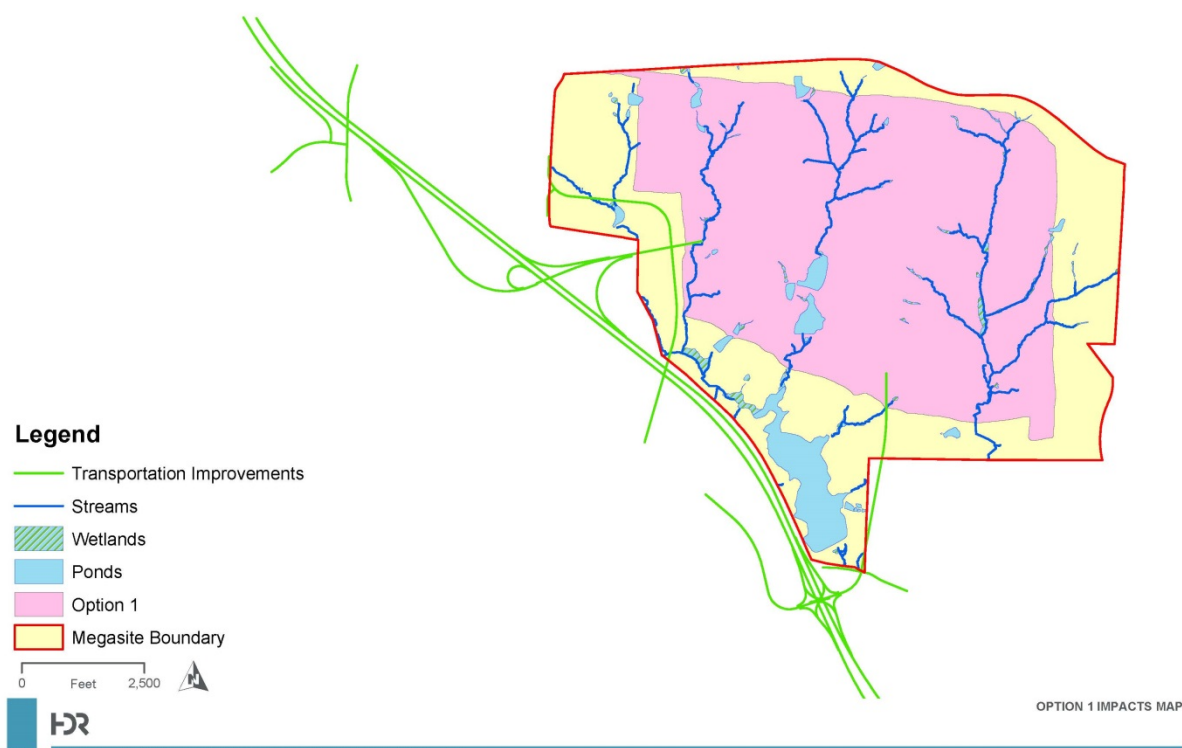
A Level 3 Analysis was performed to focus on alternative layouts for the Proposed Project in terms of accessibility, efficiency, and environmental impacts. Each design utilized an identical site area (1,000-acre construction pad), but with different layouts designed to potentially minimize wetland and stream impacts while still meeting the Proposed Project overall project purpose. The facility must have an efficient layout to support efficient manufacturing processes, deliveries, shipping, and access from a logistical perspective. Layout options 1 through 4, detailed below, represent a variety of Proposed Project configurations that potentially reduce environmental impacts.

#### 4.3.3.1 Layout Onsite Option 1 (Proposed Option)

Option 1 focuses development of the transformational automotive manufacturing, production, and assembly facility along the middle and upper portions of the site, but angles the southern boundary of the pad to avoid impacts to Dodsons Lake and minimize stream and wetland impacts just north of Dodsons Lake (Figure 3). This option provides access to rail and transportation upgrades and provides the largest buffer along the eastern and southern perimeter of the pad where the highest density of residential properties abut the site.

Option 1 provides suitable configuration and access to the necessary facilities while minimizing impacts to certain jurisdictional features and avoiding impacts to Dodsons Lake. The proposed site layout as shown would impact approximately 8.8 acres of wetlands, 17.5 acres of open water, and 36,774 linear feet of stream.



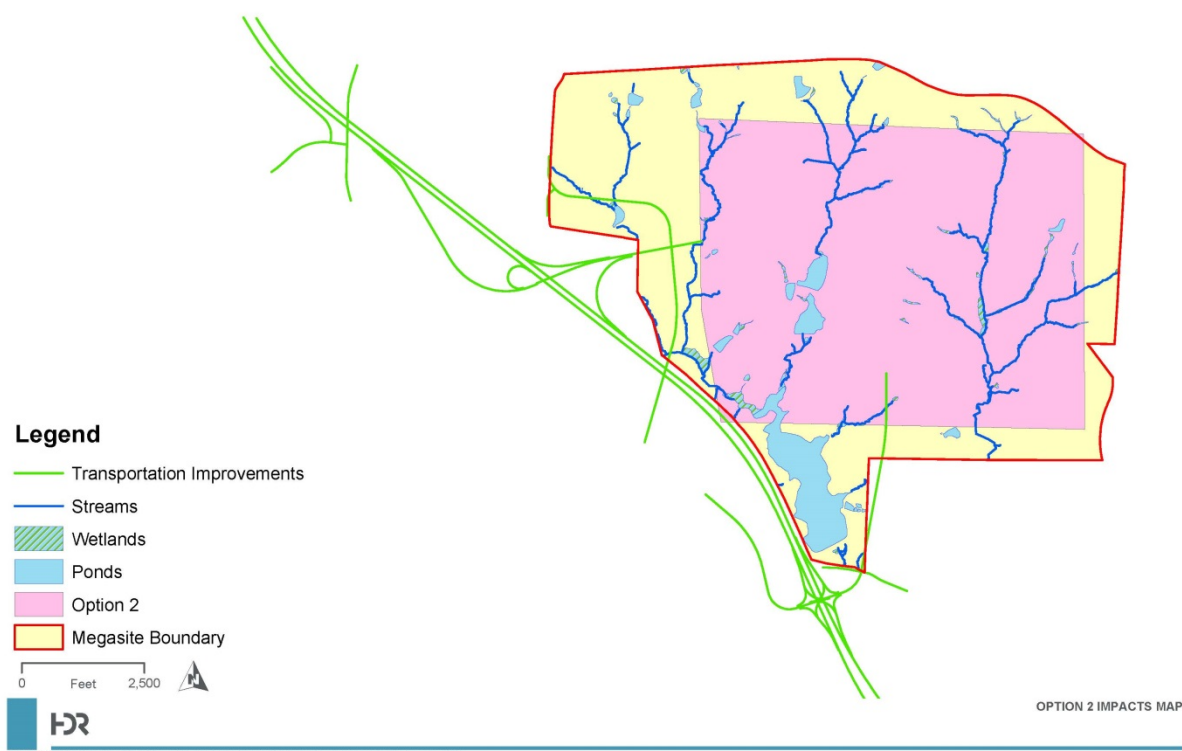


**Figure 3. Alternative Impacts Map – Proposed Layout Onsite Option 1**

#### 4.3.3.2 Layout Onsite Option 2

Option 2 focuses development of the transformational automotive manufacturing, production, and assembly facility in the middle portion of the site but retains a portion of the drainage to the west (Figure 4). This option provides access to the rail and transportation upgrades; however, the layout provides no buffer in the northeast and southwestern corners.

Although Option 2 provides access to the necessary facilities and somewhat reduces stream impacts compared to Option 1, the layout impacts a portion of Dodsons Lake, has the most wetland impacts, and restricts buffer in the northeastern and southwestern corners. The site layout as shown would impact approximately 12.6 acres of wetlands, 20.8 acres of open water, and 36,829 linear feet of stream.



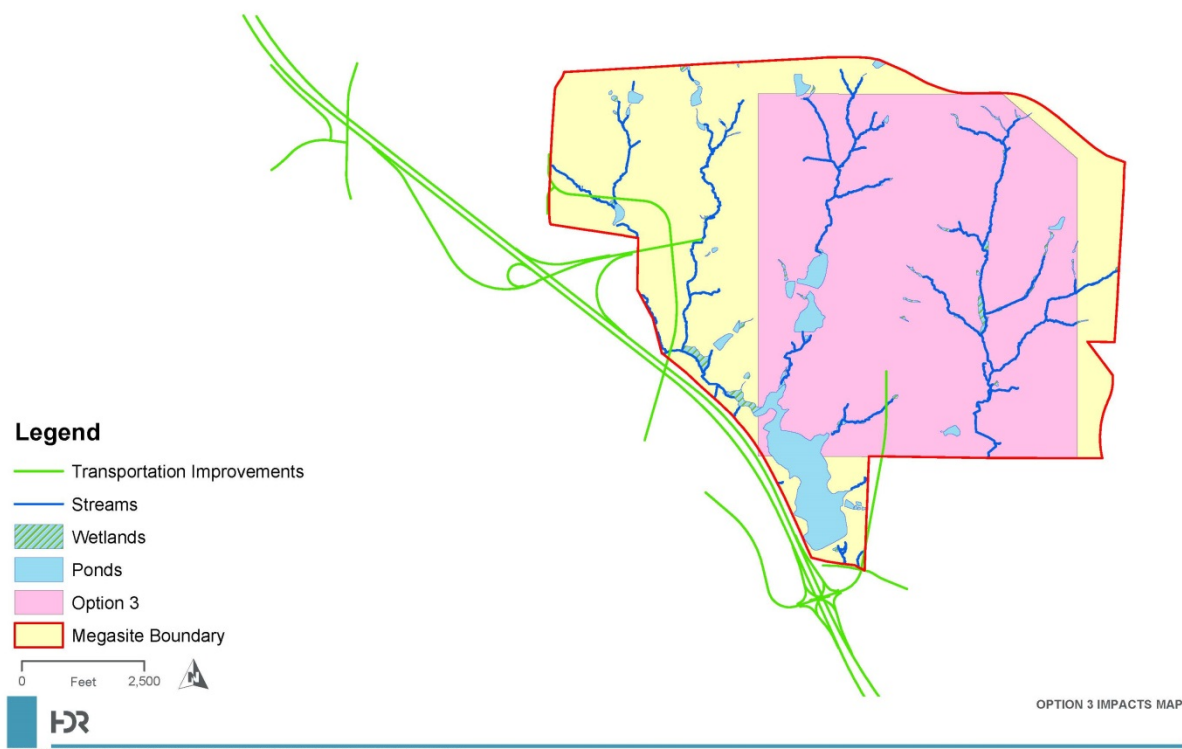
**Figure 4. Alternative Impacts Map – Layout Onsite Option 2**

#### 4.3.3.3 Layout Onsite Option 3

Option 3 shifts development of the transformational automotive manufacturing, production, and assembly facility slightly east and increases avoidance of stream drainages to the west of the site; however, this configuration impacts the upper portion of Dodsons Lake (Figure 5). This option provides no buffer on the southern boundary and restricts available space on the northern boundary for rail upgrades. Option 3 would also require transportation upgrades to extend further east to tie in to the pad. Option 3 provides space for future development to the west.

Although Option 3 reduces stream impacts compared to Option 1, the layout impacts a portion of Dodsons Lake, restricts buffer on the northern boundary, and leaves no buffer on the southern boundary. The site layout as shown would impact approximately 10.3 acres of wetlands, 33.2 acres of open water, and 34,074 linear feet of stream.

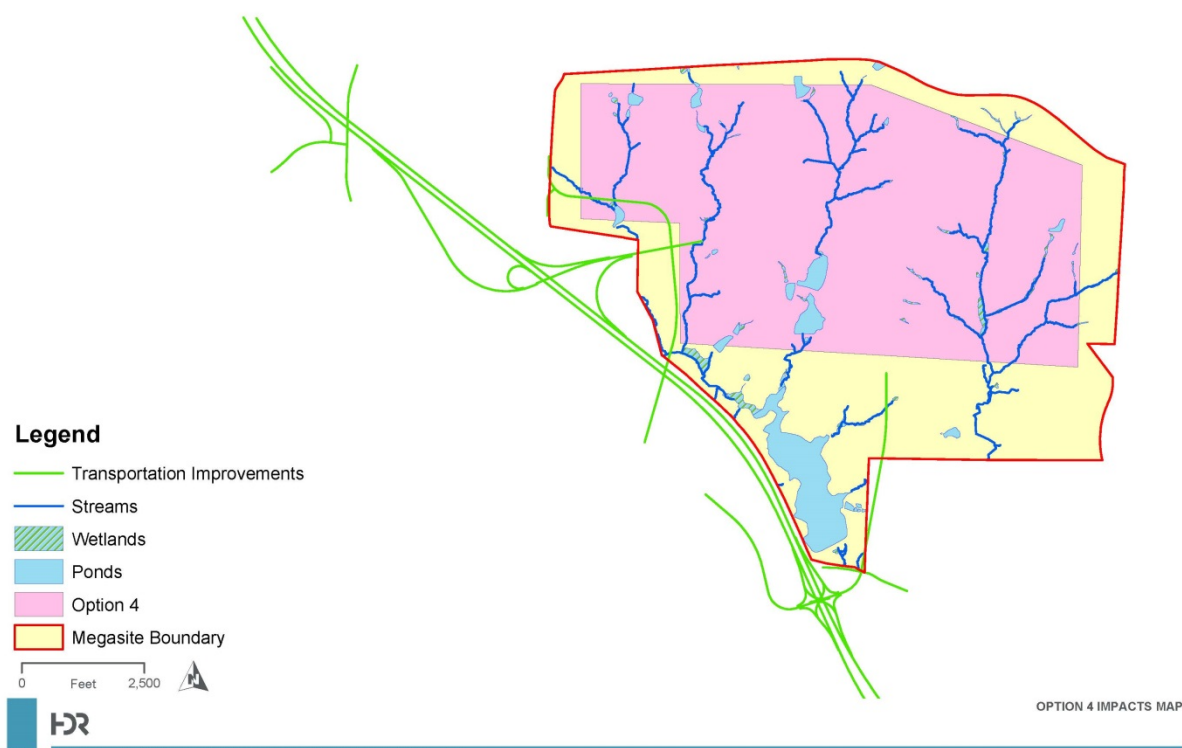




**Figure 5. Alternative Impacts Map – Layout Onsite Option 3**

#### 4.3.3.4 Layout Onsite Option 4

Option 4 focuses development of the transformational automotive manufacturing, production, and assembly facility along the upper portion of the site. This option gives access to the rail corridor and provides the potential for future development to the south (Figure 6). Although Option 4 provides a desirable site layout near the ridge and avoids impacts to Dodsons Lake, the layout would impact every stream drainage on the site resulting in the highest stream impacts of all the options. The site layout would impact approximately 9.5 acres of wetlands, 21.7 acres of open water, and 38,224 linear feet of stream.



**Figure 6. Alternative Impacts Map – Layout Onsite Option 4**

#### 4.3.4 Identification of the Onsite LEDPA

GRMF evaluated a number of layout options as described in Sections 4.3.3.1 through 4.3.3.4. The GRMF proposes Option 1 of the Level 3 Analysis on the GRMS as the Onsite LEDPA. See below for the impact matrix for the four onsite options analyzed.

**Table 1. Summary of Level 3 Layout Options**

Resource	Option 1 (Preferred)	Option 2	Option 3	Option 4
Streams	36,774	36,829	34,074	38,224
Wetlands	8.8	12.6	10.3	9.5
Open Water	17.5	20.8	33.2	21.7
Dodsons Lake	No	Yes	Yes	No

#### 4.3.5 Utility and Transportation Facility LEDPA Determinations

##### 4.3.5.1 City of Greensboro

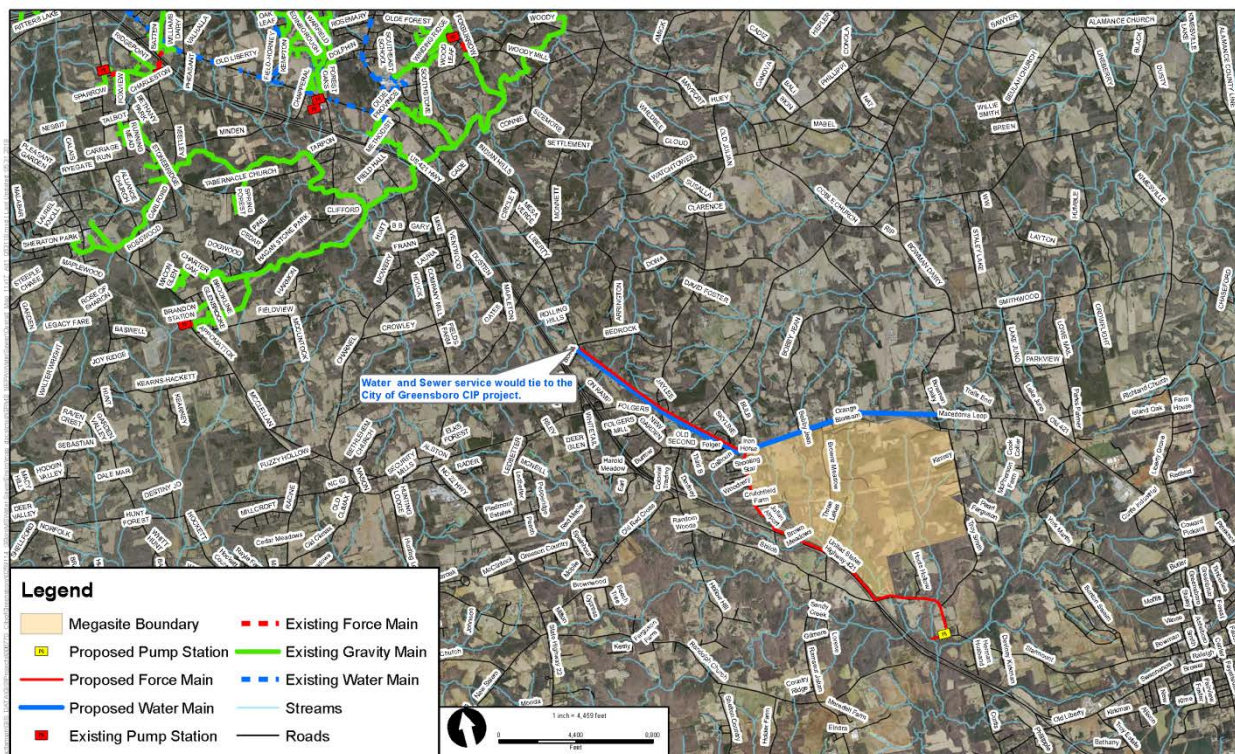
The City of Greensboro identified the size and routing of the proposed water and sewer infrastructure to serve the GRMS site. The infrastructure studies included alternatives ranging from 4.3 to 25.6 miles of 16-inch waterline, 5.7 to 10.2 miles of 16-inch force main to be located adjacent to existing right-of-way or proposed easements, and a 1 to 1.5 million gallon per day sewer lift station. The waterline would connect to a City of Greensboro Capital Improvement Plan (CIP) project or to existing waterlines in two locations to provide multiple feed points to improve reliability and operational flexibility. The pump station would be located just downstream of the GRMS site with the force main conveying the wastewater to an existing



gravity sewer installed along Big Alamance Creek. From there, flow would be transported by gravity to the Big Alamance pump station where it would be pumped back to the City's T.Z. Osborne Water Reclamation Facility for treatment. Three potential alignments for the water and sewer lines were studied to determine the LEDPA with regards to the water and wastewater facilities, as described below.

#### 4.3.5.1.1 Alternative 1 (Proposed Alternative)

Alternative 1 begins at the corner of Bora Drive and Liberty Road where the City of Greensboro CIP water main project is close to the GRMS (Figure 7). It follows Liberty Road southeast toward the site. At the intersection with Julian Airport Road, the water main continues along Old US 421 to the north of the site while the force main continues along Julian Airport Road. The force main alignment then goes southeast along US 421 to the intersection with Starmount Road. The force main then follows Starmount Road to a stream crossing where a proposed pump station would be located.



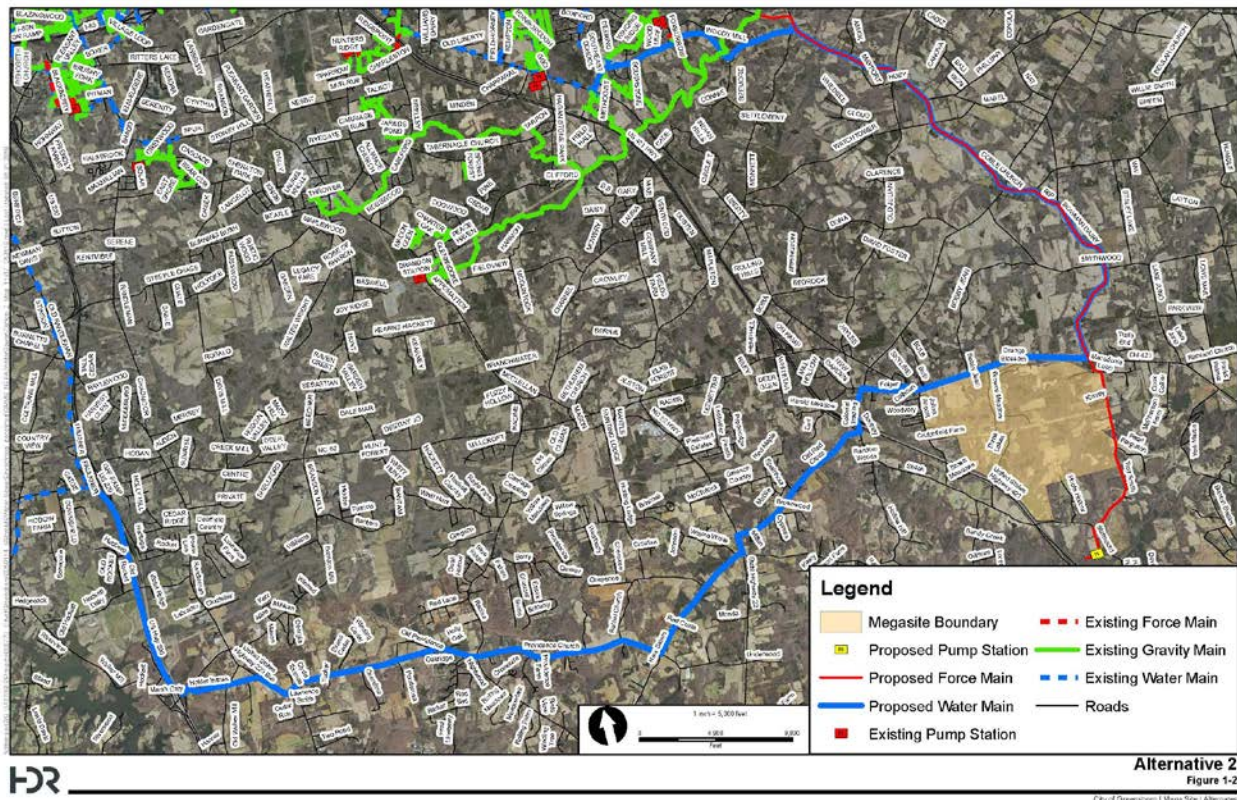
**Figure 7. Water and Sewer Alignment - Alternative 1**

#### 4.3.5.1.2 Alternative 2

Alternative 2 begins at the corner of Woody Mill Road and Liberty Road (Figure 8). It follows Woody Mill Road to Monnett Road, turns north on Monnett Road for a short distance, and then the force main alignment ties in and both then follow Coble Church Road to Rip Road. From Rip Road, the alignment continues south along Bowman Dairy to Old Macedonia Loop Road to the Site. The force main then follows Old Macedonia Loop to Troy Smith Road and then along Troy Smith Road to Starmount Road. The alignment continues along Starmount to the stream crossing where the proposed pump station would be located.



The secondary water main would begin at a tie-in at Faulkner Road and follow US 220 south to Holder Inman Road. It would then follow Holder Inman Road to the east and then along Business 220 to Providence Church Road. The line would then travel east along Providence Church Road to New Salem Road. At this point, the alignment would travel north along New Salem Road, then a short distance on NC 22 to the intersection with Old Red Cross Road. It would then follow Old Red Cross Road to Deviney Road. The line would continue along Deviney Road to Folger Road and then along Old US 421 along the northern Site boundary to the tie at Bowman Dairy Road.

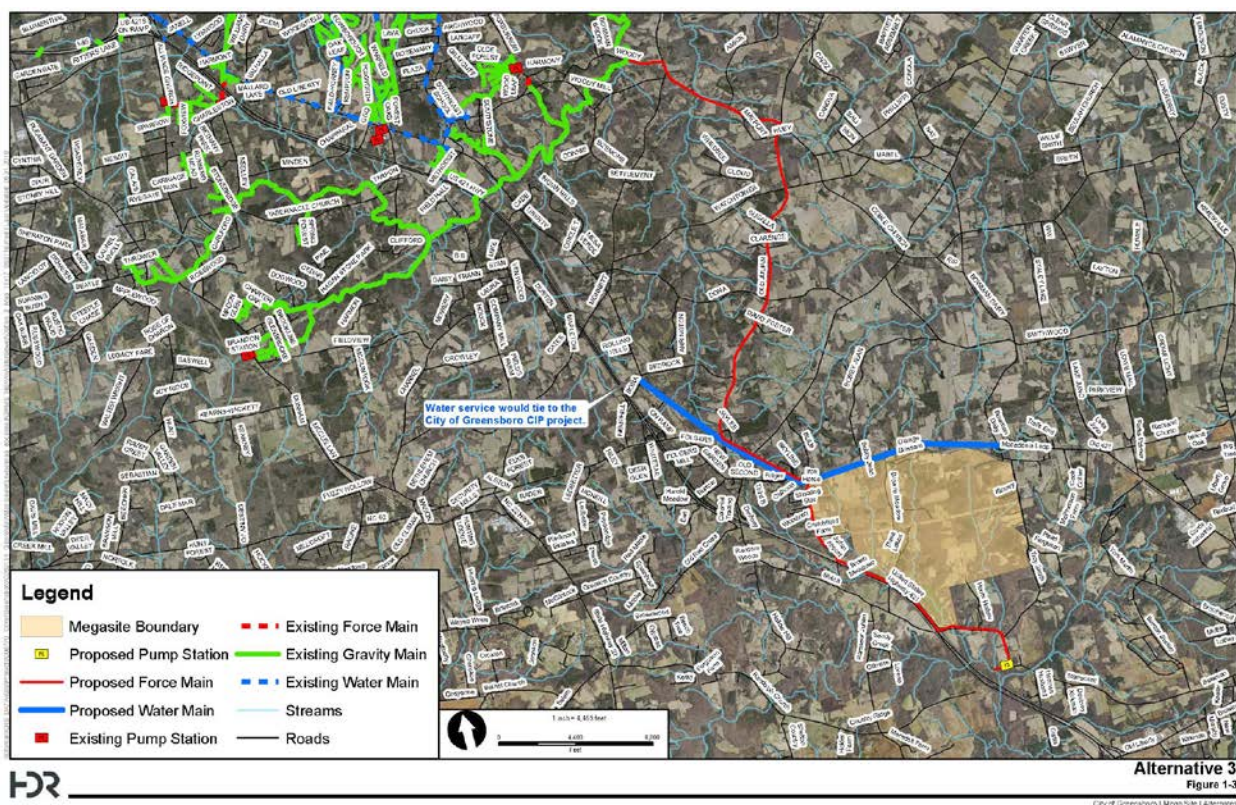


**Figure 8. Water and Sewer Alignment - Alternative 2**

#### 4.3.5.1.3 Alternative 3

The force main for Alternative 3 begins similar to Alternative 2, but rather than continuing along Coble Church Road it turns south along Old Julian Road to Liberty Road (Figure 9). Then along Liberty Road, it follows the same route as Alternative 1 for both the water main and force main. The water main would tie to the City of Greensboro CIP project at the intersection of Bora Drive and Liberty Road then follow Liberty Road to the site.





**Figure 9. Water and Sewer Alignment - Alternative 3**

The three alternatives were evaluated focusing on the development of technical, logistical, and economic feasibility. After reviewing all the data, the City of Greensboro determined Alternative 1 minimized community impacts as well as environmental impacts to the greatest extent practicable. See below for the impact matrix for the three alternatives.

**Table 2. Summary of Water and Sewer Alignment Alternatives**

Resource	Alternative 1 (Preferred Alternative)	Alternative 2	Alternative 3
Waterline Length (miles)	4.3	25.6	4.3
Sewer line length (miles)	5.7	9.7	10.2
Stream crossings	9	33	11
Wetlands (acres)	0.06	0.09	0.15
Ponds	1	4	4
Historic Resources	None	Yes	None

#### 4.3.5.2 Duke Energy

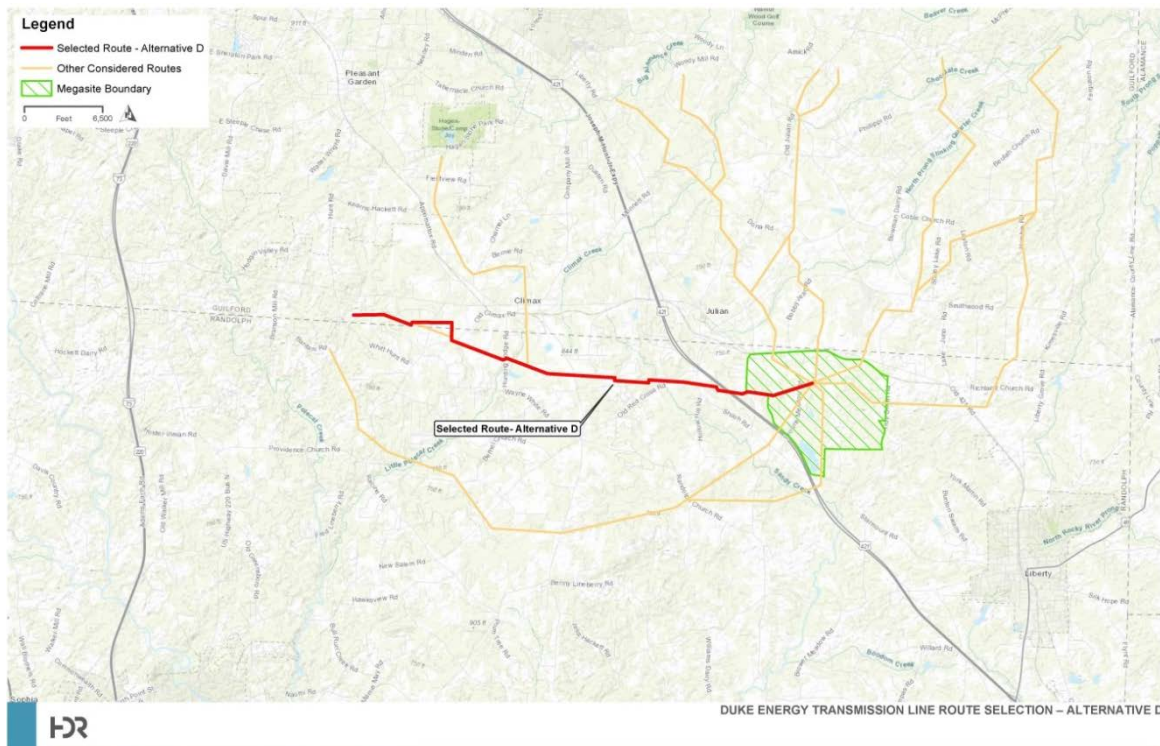
To meet the demand for electrical energy, Duke Energy considered several alternatives to provide power to the GRMS site, but ultimately concluded that a new 100 kV line must be constructed to provide adequate and reliable electrical capacity.

Duke Energy considered 14 alternative transmission line routes (referred to as Routes A through N) prior to selecting the proposed route. Duke Energy completed a thorough evaluation of the alternative routes on a quantitative and qualitative basis, and determined that Route C minimized effects to the broadest range of evaluation factors. However, this alternative involved crossing two land uses that were beyond Duke Energy's eminent domain authority, as described in N.C. Gen. Stat. § 40A-3. These two land uses include a single-family home and

yard area on Racine Road. Right-of-way easements from each of the two property owners would need to be acquired on a willing buyer/willing seller basis. Before making the final route decision, Duke Energy real estate representatives contacted the property owners to determine whether they would consider voluntary conveyance of the right-of-way. The first property owner contacted was not interested in voluntarily conveying right-of-way for the new transmission line; therefore, Route C was determined to have a fatal flaw and was eliminated from further consideration.

Route D was selected as the route for the new 100 kV line, which traverses a similar alignment as Route C described above. Route D was determined to be optimal with respect to Duke Energy's long-term operational and maintenance activities and effectively addresses the concerns conveyed by the community during the open house meetings and through the comment forms because it parallels an existing Duke Energy-owned right-of-way the majority of its length (Figure 10). The adjacent 525 kV line would provide additional asset protection to the new line. In addition, long-term maintenance activities would be reserved to a single transmission line corridor, rather than two, which would decrease maintenance cost, increase efficiency, and minimize cumulative effects to fewer property owners within the community.

Route D is not estimated to be the lowest initial cost of the alternative routes evaluated, and is estimated to cost approximately 22% more than Route G (ranked second). Nevertheless, Duke Energy selected it over Route G as the preferred route because it will similarly minimize effects to environmental resources, cultural resources, land uses, and scenic resources, and is superior with regard to operational and long-term right-of-way line maintenance considerations. Additional information from Duke Energy's report is available upon request. Visit <http://www.power-viz.com/grmegaproject/> to review the preliminary alternative routes and the final route selected.



**Figure 10. Duke Energy Transmission Line Route Selection – Alternative D**



#### 4.3.5.3 Piedmont Natural Gas

Piedmont Natural Gas (PNG) would provide natural gas service to the GRMS. The route has yet to be determined for the gas service lines; however, PNG would utilize existing road and utility rights-of-way where feasible and avoid permanent impacts to jurisdictional resources. Should temporary impacts occur as a result of improvements to PNG pipelines, they will be accounted for and permitted in accordance with applicable state and federal requirements.

#### 4.3.5.4 Norfolk Southern Railroad

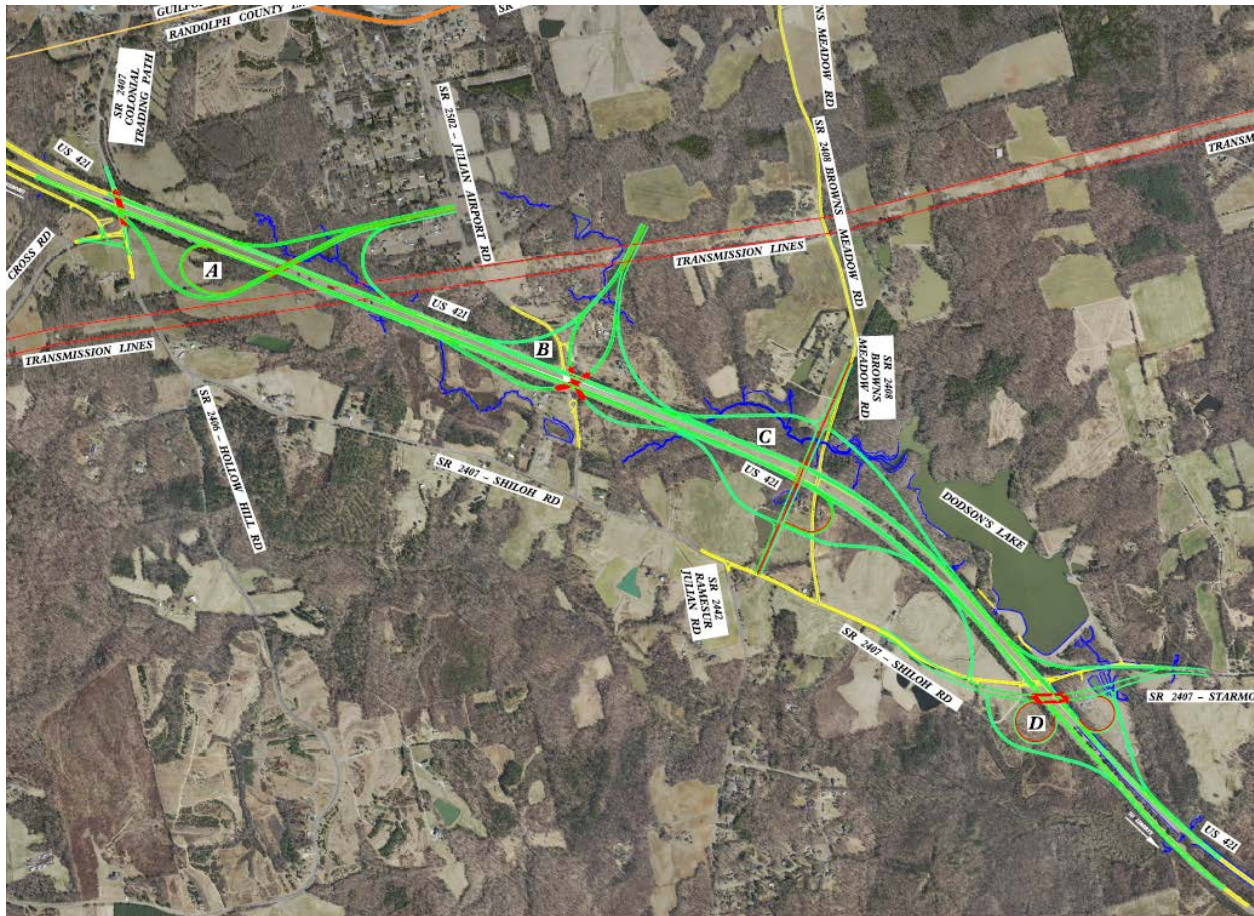
NS would provide rail service to the GRMS. The rail alignment for the GRMS was set based on a number of factors: alignment and profile of existing rail alignment, capacity required for operation, maximum allowable grade of the rail, elevation of the construction pad to balance earthwork, and elevation and location of the rerouted transmission line. The yard tracks within the facility were located along the perimeter of the pad to maximize the footprint available for the future user.

Rail improvements will be contained within the GRMS property and impacts related to the rail improvements are accounted for within the pad impacts. No off-site impacts associated with rail improvements are anticipated. Impacts resulting from the rail expansion have been accounted for on the Site Impact sheets provided in Appendix A.

#### 4.3.5.5 NCDOT

The NCDOT completed a Traffic Impact Analysis, which indicated that two interchanges are necessary and would be located in the area of four proposed closures of at-grade intersections with US 421: Colonial Trading Path, Julian Airport Road, Browns Meadow Road, and Shiloh/Starmount Road (Figure 11). One interchange would be constructed as a system interchange to primarily facilitate site trips, and one interchange would be constructed as a service interchange to facilitate local traffic volumes. The NCDOT initially studied four interchange configurations (A, B, C, and D) to provide access to the GRMS and evaluated these as pairs (Options A/C – Alternative 2, A/D – Alternative 3, and B/D – Alternative 4).





**Figure 11. NCDOT Traffic Impact Analysis – Interchange Configurations**

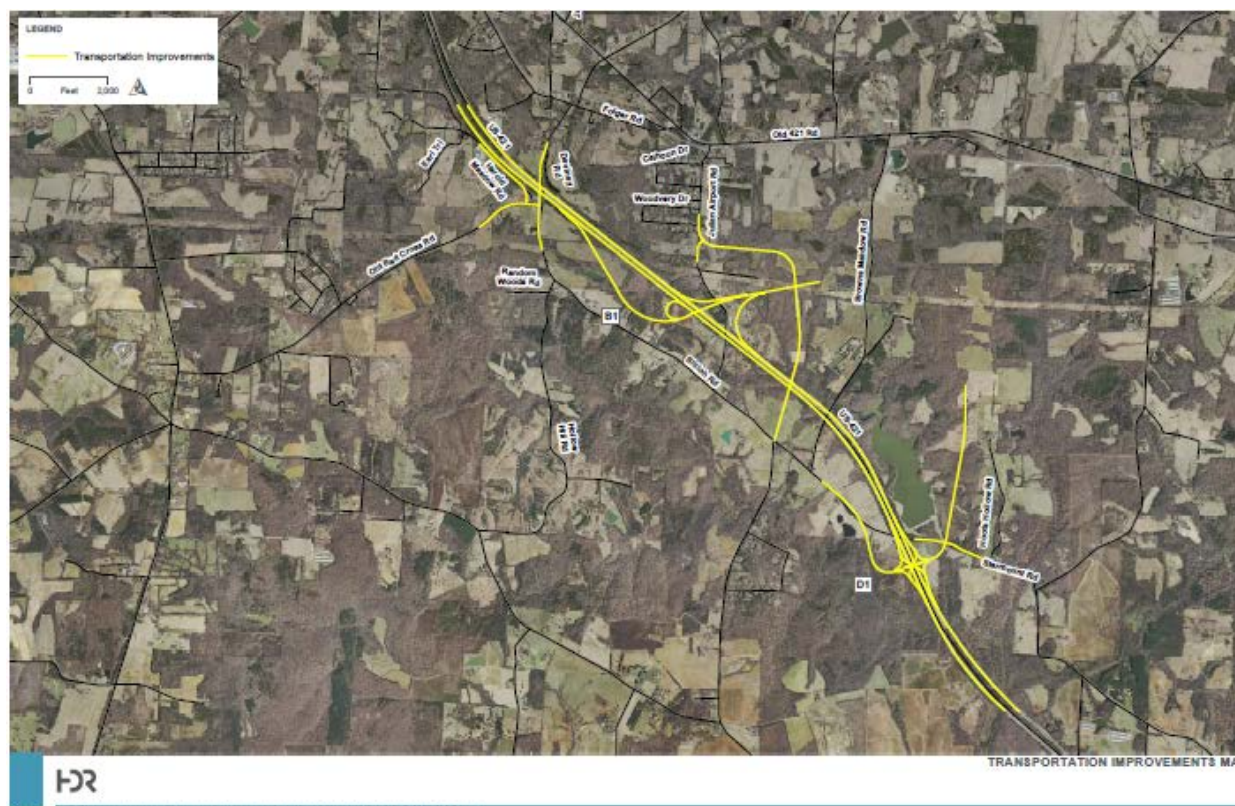
Currently, the NCDOT is assessing a B1/D1 option (Alternative 1 – Figure 12), which essentially relocates the trumpet interchange at the previous Interchange A location to the south of the powerline and redesign of Interchange D to a single point urban interchange configuration. NCDOT is continuing its studies and efforts to refine its design to minimize property and environmental impacts. It is anticipated that the B1/D1 option or modifications to the B1/D1 option would be the LEDPA. Final determination of the LEDPA for the proposed transportation projects is anticipated in the fourth quarter of 2018 with 100 percent designs completed by mid-2019.

A 300-foot buffer was used to estimate impacts for the alternatives. To predict potential impacts on water resources, U.S. Geological Survey (USGS) hydrologic data and National Wetland Inventory (NWI) GIS layers were examined. The predicted potential stream impacts were 15,960 linear feet for Alternative 1 (preferred), 16,516 linear feet for Alternative 2, 12,797 linear feet for Alternative 3, and 14,738 linear feet for Alternative 4. Predicted potential wetland impacts were 3.7 acres for Alternative 1, 4.6 acres for Alternative 2, 6.3 acres for Alternative 3, and 6.3 acres for Alternative 4. Predicted potential lake and pond impacts were 2.7 acres for Alternative 1, 6.4 acres for Alternative 2, 3.5 acres for Alternative 3, and 3.5 acres for Alternative 4. No occurrences of federally endangered or threatened species were found in the predicted impact area for any alternative according to North Carolina Natural Heritage Program Element Occurrences data. North Carolina Historic Preservation Office (HPO) data shows one structure that is listed as Surveyed Only. This structure is located in the predicted impact area of all four



### Table 3. Summary of Transportation Alternative Options

Resource	Alternative 1 (Preferred Alternative)	Alternative 2 (A/C)	Alternative 3 (A/D)	Alternative 4 (B/D)
Streams	15,960	16,516	12,797	14,738
Wetlands	3.7	4.6	6.3	6.3
Ponds	2.7	6.4	3.5	3.5
Parcels	74	94	86	77



**Figure 12. Interchange Alternative 1 (Option B1/D1) Transportation Improvements Map**

#### 4.4 Overall LEDPA Determination

4825-1232-0875.v1