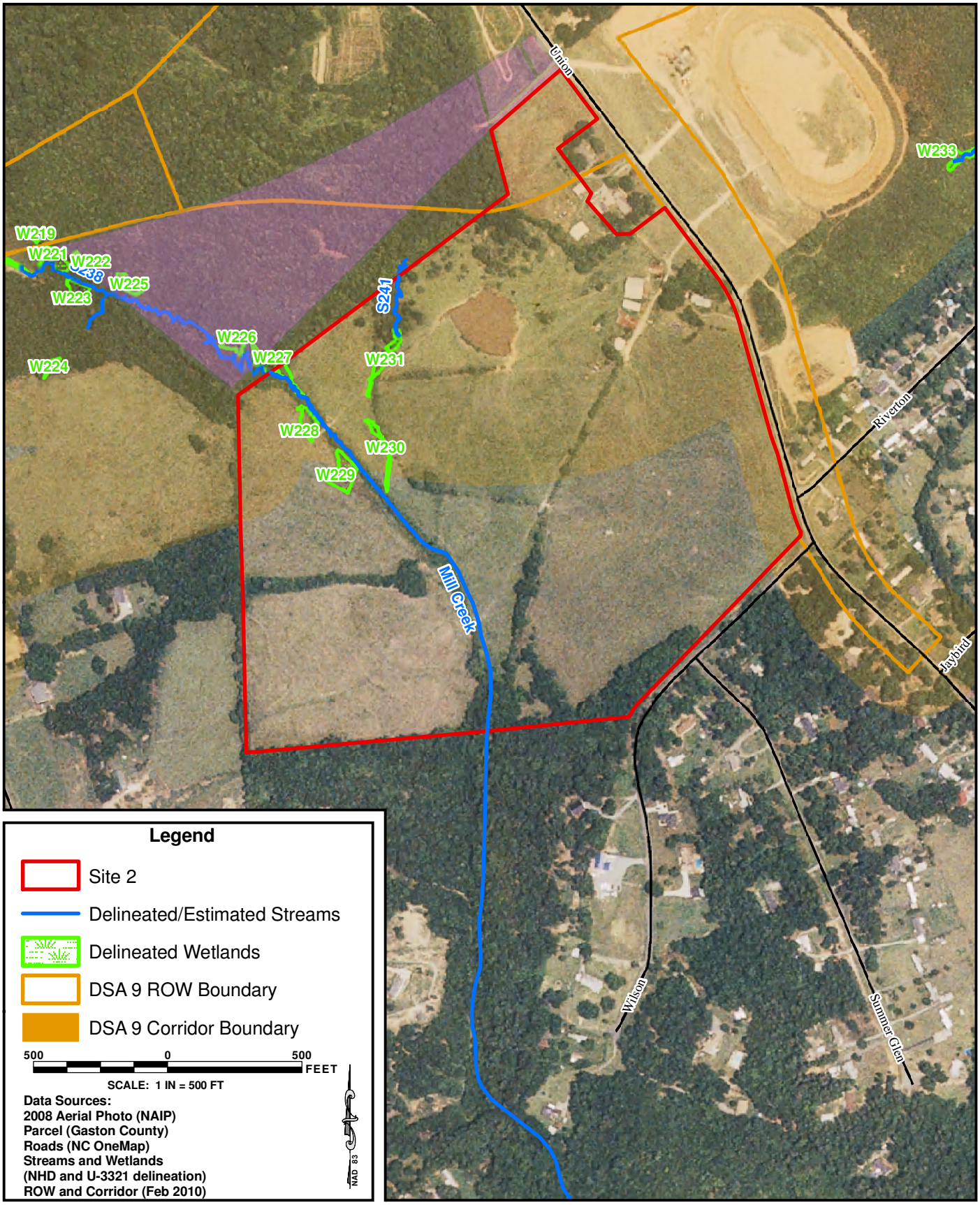


Prepared By:

PBSJ

Mitigation Potential

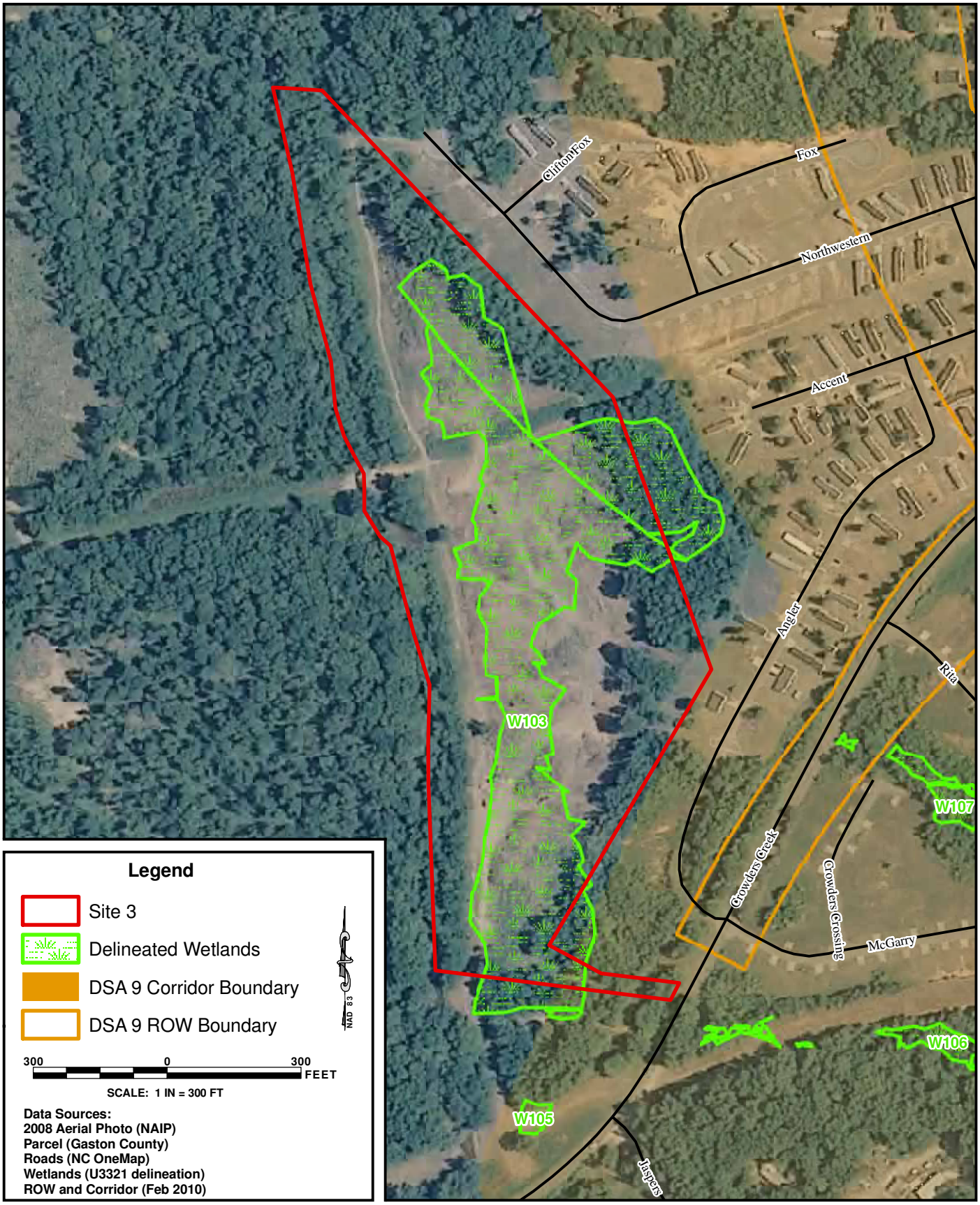
Site 2: 6338 Union Road

Gaston County, North Carolina

Dwn By:	MCG
Ckd By:	JWG
Date:	MAY 2010
Project:	100010933

FIGURE

3



Prepared By:

PBSJ

Mitigation Potential

Site 3: 362 Crowders Creek Road

Gaston County, North Carolina

Dwn By:	MCG
Ckd By:	JWG
Date:	MAY 2010
Project:	100010933

FIGURE

4

APPENDIX A

Impacts to Jurisdictional Resources

APPENDIX A - TABLE 1
STREAM IMPACTS FOR PREFERRED ALTERNATIVE REFINED PRELIMINARY DESIGN
STIP Project U-3321 - Gaston East-West Connector Final EIS

Streams bridged for hydraulic conveyance or as a result of Concurrence Point 2a are noted
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Source for Preferred Alternative Impacts: PBS&J

Stream ID*	Corridor Segment	Stream Name	Hydrologic Unit	Intermittent / Perennial	Bank Height (ft)	Average Width (ft)	Depth (in)	Substrate	Water Quality Classification	USACE Score	NCDWQ Score	Draft EIS DSA 9 Preliminary Design	Preferred Alternative Refined Design*	Preferred Alternative Service Roads
14	West of US 321	Crowders Creek	3050101	Perennial	10 - 15	40 - 55	12	Sand, cobble, bedrock	C	70	34.5 - 52.5	Bridged[1]	Bridged[1]	
22	H2a	UT to Oates Branch	3050101	Perennial	10	4-8	2-3	Sand, gravel, cobble	C	59	38			
22A	H2a	UT to Oates Branch	3050101	Perennial	3	4	2	Gravel	C	NA	NA			
24	H2a	Oates Branch	3050101	Perennial	4	8	6	Cobble	C	62	44	116	116	
25	H2a	Bessemer Branch[2]	3050101	Perennial	2 - 4	5 - 14	2 - 6	Silt, sand, cobble, bedrock	C	48	47	141	141	
26	H2a	UT to Bessemer Branch	3050101	Intermittent	5 - 15	4	1 - 3	Sand, gravel, cobble	C	37	27.5			
27	H2a	UT to Bessemer Branch	3050101	Perennial	5	8	2	Gravel, cobble	C	68	43.5	506	506	
28	H2a	UT to Bessemer Branch	3050101	Intermittent	<1	3	NA	Sand, gravel	C	62	21.25			33
28	H2a	UT to Bessemer Branch	3050101	Perennial	<1 - 2	4 - 8	4	Silt	C	62	48	2231	2231	
29	H2a	UT to Bessemer Branch	3050101	Intermittent	<1	2 - 4	6	Silt	C	64	25.5			
30	H2a	UT to Bessemer Branch	3050101	Intermittent	1 - 4	3	2	Silt	C	56	24.5			
31	H2a	UT to Bessemer Branch	3050101	Intermittent	5	3	1	Sand, silt	C	34	22	183	183	
32	H2a	UT to Bessemer Branch	3050101	Perennial	2	4	2	Gravel, sand	C	65	32	813	813	
33	H2a	UT to Bessemer Branch	3050101	Intermittent	15	8	<1	Sand	C	48	19.5	97	97	
34	H2a	UT to Bessemer Branch	3050101	Perennial	3	4 - 6	6	Silt, sand	C	66	37.5			
35	H2a	UT to Bessemer Branch	3050101	Intermittent	2	3	1	Sand	C	66	NA			
35	H2a	UT to Bessemer Branch	3050101	Perennial	2	3	1	Sand	C	66	38.5			
36	H2a	UT to Crowders Creek	3050101	Perennial	2	8	2	Sand, gravel	C	55	37	1092	1092	
37	H2a	UT to Crowders Creek	3050101	Perennial	4	6	<1	Sand, gravel	C	35	30			
38	H2a	UT to Crowders Creek	3050101	Perennial	1	4	<1	Sand	C	44	34.5			
39	H2a	UT to Crowders Creek	3050101	Perennial	2	4	4	Sand	C	59	41			
40	H2a	UT to Crowders Creek	3050101	Perennial	10	4	1	Gravel, cobble	C	48	29.5[4]			
41	H2a	UT to Long Creek	3050102	Intermittent	15	4	2	Silt	C	53	NA			
41	H2a	UT to Long Creek	3050102	Perennial	15	4	2	Silt	C	53	31.5			
42	H2a	UT to Long Creek	3050102	Perennial	5 - 20	8 - 12	2	Sand, cobble	C	50	36.5			
43	H2a	UT to Kaglor Branch	3050102	Perennial	4 - 15	12	4	Sand, boulders	C	49	33.5			
44	H2a	UT to Kaglor Branch	3050102	Perennial	5 - 15	8 - 12	6	Sand, gravel, cobble	C	51	36	1461	1203	
45	H2a	UT to Kaglor Branch	3050102	Perennial	3	3	3	Cobble, gravel	C	42	26[4]			
46	H2a	UT to Crowders Creek	3050101	Perennial	1	4 - 8	3	Silt, sand	C	61	32.5	923	698	125
46A	H2a	UT to Crowders Creek	3050101	Intermittent	2	3	1	Silt	C	28	20.5	28	28	
47	H2a	UT to Crowders Creek	3050101	Intermittent	5	4	<1	Gravel	C	43	28	116	116	
48	H2a	UT to Crowders Creek	3050101	Intermittent	<1	4	1	Silt	C	54	23.5			
49	H3	UT to Crowders Creek	3050101	Perennial	1	6	3	Silt	C	42	16[4]			
50	H3	UT to Crowders Creek	3050101	Intermittent	1	6	4	Impacted by junkyard and no longer considered jurisdictional based on 4/13/10 verification site visit						
51	H3	UT to Crowders Creek	3050101	Perennial	2	5	1	Sand	C	51	24[4]			
52	H2a/H3	UT to Crowders Creek	3050101	Perennial	8	16	3	Gravel	C	55	48.5	726	663	83
53	H3	UT to Crowders Creek	3050101	Perennial	4	6	2	Gravel	C	52	30			
54	H3	UT to Crowders Creek	3050101	Perennial	3	6	4	Sand, gravel	C	70	37	188	177	
55	H3	UT to Crowders Creek	3050101	Perennial	1 - 2	3	1	Silt	C	NA	26[4]			
56	Just outside H3	UT to Crowders Creek	3050101	Intermittent	2	5	4	Sand	C	66	NA			
56	Just outside H3	UT to Crowders Creek	3050101	Perennial	2	5	4	Sand	C	66	37			
57	H3	UT to Crowders Creek	3050101	Perennial	1 - 6	4 - 8	1	Gravel, sand	C	64	38.3	453	430	
58	H3	UT to Crowders Creek	3050101	Perennial	3	3	1	Sand	C	34	26.5[4]			
69	H3	UT to Crowders Creek	3050101	Perennial	2 - 7	4 - 8	2 - 4	Bedrock, gravel	C	59	41	244	197	
85	H3	UT to Crowders Creek	3050101	Perennial	4	4 - 8	3	Gravel, cobble	C	51	43.5	742	715	
86	H3	UT to Crowders Creek	3050101	Intermittent	2	1 - 6	6	Silt	C	40	25			
87	H3	UT to Crowders Creek	3050101	Perennial	3	2	3	Sand	C	36	23[4]			
88	H3	UT to Crowders Creek	3050101	Intermittent	8	4 - 5	1	Silt	C	46	25.5			
89	H3	UT to Crowders Creek	3050101	Perennial	1 - 15	1 - 5	4	Sand, gravel, bedrock	C	56	31.5	1010	934	
89	H3	UT to Crowders Creek	3050101	Intermittent	<1	3	1	Sand, gravel	C	56	23.25			
90	H3	UT to Crowders Creek	3050101	Perennial	3	1 - 4	1	gravel	C	59	27.5[4]			
91	H3	UT to Crowders Creek	3050101	Perennial	4	3 - 4	1	Silt	C	36	19.5[4]			
92	H3	UT to Crowders Creek	3050101	Perennial	3	8	3	Gravel, silt	C	46	44.5	827	736	
92A	H3	UT to Crowders Creek	3050101	Intermittent	5	8 - 14	3	Silt	C	43	22.5	133	133	
129	J4a	UT to Crowders Creek	3050101	Perennial	<1	6	4	Sand	C	47	23[4]			
130	J4a	UT to Crowders Creek	3050101	Perennial	8 - 10	4 - 6	1	Sand	C	42	29.5[4]	207	197	
131	J4a	UT to Crowders Creek	3050101	Perennial	3 - 5	2	1	Gravel	C	46	26	2054	1960	
132	J4a	UT to Crowders Creek	3050101	Intermittent	2 - 4	4 - 12	6	Bedrock, boulder, sand	C	63	44	25	4	
133	J4a	UT to Crowders Creek	3050101	Perennial	<1 - 2	2 - 4	2	Sand, gravel	C	64	39			
134	H3	UT to Blackwood Creek	3050101	Perennial	4	4 - 8	6	Silt	C	44	26[4]	296	282	
135	H3	Blackwood Creek	3050101	Perennial	8	24 - 32	6	Sand, gravel	C	47	40	Bridged[3]	Bridged[3]	
142	J4b	UT to Crowders Creek	3050101	Intermittent	<1	2	4-5	fine/course sand	C	51	25, 26			
142	J4b	UT to Crowders Creek	3050101	Perennial	2-5	5	5	sand, gravel, cobble, rock	C	74	46			
143	J4b	UT to Crowders Creek	3050101	Intermittent	2	2-3	2	fine/course sand	C	50	25			

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144	J4b	UT to Crowders Creek	3050101	Perennial	2-6	2-3	1	sand, gravel	C	46	31.25			
145	J4b	UT to Crowders Creek	3050101	Intermittent	3- 7	4 - 5	0 - 1	sand, gravel	C	29	21, 28	820	805	
146	J4b	UT to Crowders Creek	3050101	Perennial	7	12	8-10	sand, gravel, cobble, rock	C	75	53	Bridged[1]	Bridged[1]	
147	J2c	UT to Crowders Creek	3050101	Perennial	4-6	10	8	Sand, gravel, bedrock	C	73	46	382	358	
148	J2c	UT to Crowders Creek	3050101	Perennial	<1	2-3	4	fine/course sand	C	72	39.25	71		
156	J2c	UT to Crowders Creek	3050101	Perennial	3 - 8	10 - 12	12	sand, gravel, cobble, boulder	C	77	50.25	603	571	
157	J2c	UT to Crowders Creek	3050101	Perennial	2-4	3-4	4	sand, gravel, cobble, rock	C	79	45	1033	938	
158	J2c	UT to Crowders Creek	3050101	Intermittent	5-8	3	0	fine/course sand	C	34	11.5	178	168	
159	J2c	UT to Crowders Creek	3050101	Intermittent	1-2.5	4	0	fine/course sand	C	NA	20.75			
161	J2c/J2d	UT to Crowders Creek	3050101	Intermittent	1-2	2	1	sand, gravel	C	40	19			
161	J2c	UT to Crowders Creek	3050101	Perennial	3-7	4-8	4	sand, gravel, cobble, rock	C	40	48.75	70		
174	J2d	UT to Crowders Creek	3050101	Perennial	1-2	2	2	sand, gravel	C	55	34.5	908	908	
175	J2d	UT to Crowders Creek	3050101	Perennial	5	3	3	sand, gravel, rock	C	51	35.5			
176	J2d	UT to Crowders Creek	3050101	Intermittent	5	2	1	sand, gravel	C	51	22.5			
177	J2d	UT to Crowders Creek	3050101	Perennial	2-6	4-8	7	sand, gravel, rock, boulder	C	74	51	956	786	
178	J2d	UT to Crowders Creek	3050101	Perennial	4-7	6 - 15	6 - 12	sand, gravel, rock, boulder	C	66, 74	44.5, 50	391	365	
179	J2d	UT to Crowders Creek	3050101	Intermittent	3-4	3	1	fine/course sand	C	44	24.5			
180	J2d	UT to Crowders Creek	3050101	Intermittent	2-3	2	1	fine sand/clay	C	47	24.5			
181	J2d	UT to Crowders Creek	3050101	Perennial	4-7	12	10	sand, gravel, rock, boulder	C	72	55	567	340	
182	J2d	UT to Crowders Creek	3050101	Intermittent	1.5	2	0	fine sand/clay	C	45	17.5	183		
182	J2d	UT to Crowders Creek	3050101	Perennial	1.5	3.5	1	sand, gravel, cobble	C	55	30.5	1866	891	
183	J2d	UT to Crowders Creek	3050101	Perennial	3-7	4	5	sand, gravel, cobble, rock	C	74	48.5	1474	707	
184	J2d	UT to Crowders Creek	3050101	Perennial	NA	NA	NA	NA	C	NA	NA	121	35	
196	J2d	UT to Crowders Creek	3050101	Perennial	4-6	12	12	sand, gravel, rock, boulder	C	72	51	1175	515	
197	J2d	UT to Crowders Creek	3050101	Perennial	0.5-2	3	4	sand, gravel	C	65	40.5			
198	J2d/JX4	UT to Crowders Creek	3050101	Perennial	0.5-3	2-3	4	sand, gravel	C	62	45	159		
199	J2d	UT to Crowders Creek	3050101	Intermittent	0.5-2	2	2	sand, gravel	C	58	28.5	311		
200	J2d/JX4	UT to Crowders Creek	3050101	Intermittent	<1-2	2	1	fine/course sand	C	49	24.5	562	562	
201	J2d	UT to Crowders Creek	3050101	Intermittent	1	2	0	fine sand, rock	C	40	15	152		
202	J2d	UT to Crowders Creek	3050101	Perennial	3-4	2.5-3	5	sand, gravel	C	45	33	487	251	
203	J2d	UT to Crowders Creek	3050101	Perennial	3-4	3	3	sand, gravel, cobble	C	51	38			
210	JX4	UT to Mill Creek	3050101	Perennial	0.5-3.5	2 - 7	5 - 6	sand, gravel, cobble, boulder	C	63, 66	38.5, 44.5	288	265	
211	JX4	UT to Mill Creek	3050101	Perennial	3.5-5	3	3	fine/course sand, gravel	C	42, 66	30, 37, 39.5			
212	JX4	UT to Mill Creek	3050101	Perennial	1.5-2	2-3	3	fine/course sand, gravel	C	47	35			
213	JX4	Mill Creek	3050101	Perennial	1 - 4	2 - 10	2 - 8	sand, gravel, rock, boulder	C	63, 69	34.5, 39.5	530	509	
215	JX4	UT to Mill Creek	3050101	Perennial	1-2	2-3	3	fine/course sand	C	69	42.5			
216	JX4	UT to Mill Creek	3050101	Perennial	1	3	3	sand, gravel	C	72	39.5			
217	JX4	UT to Mill Creek	3050101	Intermittent	1-2	2	2	fine/course sand	C	50	27			
218	JX4	UT to Mill Creek	3050101	Perennial	1	3	4	sand, gravel	C	65	31.5	138	128	
219	JX4	UT to Mill Creek	3050101	Perennial	< 1	2-2.5	4	sand, gravel	C	53	34.25	43	33	
220	JX4	UT to Mill Creek	3050101	Perennial	1-4	4-6	4 - 5	sand, gravel, cobble, bedrock	C	64, 70	42, 43.5	474	439	
221	JX4	UT to Mill Creek	3050101	Perennial	< 1	3.5	3	sand, gravel	C	70	35			
222	JX4	UT to Mill Creek	3050101	Intermittent	< 1	2	2	fine sand/clay	C	76	28.5	413	392	
222	JX4	UT to Mill Creek	3050101	Perennial	< 1	3.5	4	sand, gravel, cobble	C	66	41.25			
223	J1e	UT to Mill Creek	3050101	Perennial	1-1.5	3.5-4.5	7	fine/course sand	C	61	34.25			
224	J1e	UT to Mill Creek	3050101	Perennial	2	2	2	fine/course sand	C	51	33			
225	J1e	UT to Mill Creek	3050101	Perennial	< 1-2	1-3	2	fine/course sand	C	63	34.25			
235	J1f	UT to Catawba Creek	3050101	Perennial	2-5	3-6	4	fine/course sand	C	50	36			146
237	J1f	UT to Catawba Creek	3050101	Perennial	2 - 6	2 - 20	3 - 8	sand, gravel, cobble, bedrock	C	67-75	45.5 - 55	1257	1114	
238	J1e	UT to Mill Creek	3050101	Intermittent	1	1	2	fine sand/clay	C	44	19.5	38	38	
238	J1e	UT to Mill Creek	3050101	Perennial	1-3	2-3	4 - 6	sand, gravel, cobble	C	55, 63	34.5, 35.75	75	70	
239	J1e	UT to Mill Creek	3050101	Intermittent	< 1	1	2	sand, gravel	C	49	20.5	249	249	
240	J1e	UT to Mill Creek	3050101	Intermittent	1	2-3	2	fine sand/clay	C	36	29.5			
241	J1f	UT to Mill Creek	3050101	Intermittent	< 1	2.5	3	sand, gravel	C	39	22.5			
242	J1f	UT to Catawba Creek	3050101	Perennial	1-4	3-5	3 - 4	silt, sand, gravel, rock	C	51, 62	34, 47	2178		
243	J1f	UT to Catawba Creek	3050101	Perennial	< 1	1 - 2	2 - 3	sand, gravel, rock	C	64	34.5			
243	J1f	UT to Catawba Creek	3050101	Intermittent	< 1	1-3	3	sand, gravel, cobble	C	53, 62	25.5, 26		512	
244	J1f	UT to Catawba Creek	3050101	Perennial	< 1	2-3	3	sand, gravel	C	59	33		339	
245	J1f	UT to Catawba Creek	3050101	Intermittent	<1-5	3-4	1	sand, gravel, cobble	C	51	19.5			
246	J1f	UT to Catawba Creek	3050101	Intermittent	1-2	2-3	1	sand, gravel	C	58	29.5	114		

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247	J1f	UT to Catawba Creek	3050101	Intermittent	< 1	< 1.5	2	fine sand/clay	C	54	27.25			
247	J1f	UT to Catawba Creek	3050101	Perennial	1-4	4-12	4	sand, gravel, cobble, bedrock	C	63	44	437		
259	K3a	Catawba Creek	3050101	Perennial	3-6	25 - 50	14 - 15	sand, gravel, cobble	C	71, 86	51, 57.5	Bridged[1]	Bridged[1]	
265	K3a	UT to Catawba Creek	3050101	Perennial	1-2.5	3-4	2	sand, gravel, rock	C	59	34.5			
266	K3a	UT to Catawba Creek	3050101	Perennial	1-2	3-4	5	sand, gravel, rock	C	69	47			
267	K3a	UT to Catawba Creek	3050101	Intermittent	2-3	3-4	2	sediment, sand, gravel	C	27	23.5	120	39	
268	K3a	UT to Catawba Creek	3050101	Perennial	2 - 4	2 - 10	2 - 5	sand, gravel, cobble, rock	C	46, 80	35.25, 52			
270	K1a	UT to Catawba Creek	3050101	Perennial	4-8	6-9	8	sand, gravel, cobble, rock	C	62	50	610	578	
271	K1a	UT to Catawba Creek	3050101	Perennial	4-8	3-6	4	sand, gravel, cobble, rock	C	64	46.5	133	1105	
272	K1a	UT to Catawba Creek	3050101	Perennial	<1-2	2-5	1	sand, gravel, cobble	C	65	35.75			
273	K1a	UT to Catawba Creek	3050101	Perennial	1	2	2	sand, gravel, cobble	C	66	35.5			
274	K1a	UT to Catawba Creek	3050101	Perennial	<1-3	1.5-3.5	4	sand, gravel, cobble	C	74	38.5	363	351	
275	K1a	UT to Catawba Creek	3050101	Perennial	< 1	1.5-3	2	fine/course sand	C	71	35	302	302	
276	K1a	UT to Catawba Creek	3050101	Perennial	2-3	3-7	4	sand, gravel, cobble	C	62	42			
277	K1a	UT to Catawba Creek	3050101	Perennial	1-2	2	3	sand, gravel	C	49	40.75			
278	K1a	UT to Catawba Creek	3050101	Intermittent	1	2.5	2	sand, gravel	C	58	22.5			
279	K3a	UT to Catawba Creek	3050101	Intermittent	1	1-2	3	fine/course sand	C	57	28.5			
280	K3a	UT to Catawba Creek	3050101	Intermittent	1	1.5	1	sand, gravel	C	59.5	22.5	843	843	
281	K3a	UT to Catawba Creek	3050101	Perennial	1-2	2	3	sand, gravel, rock	C	59	30			
286	K3a	UT to S. F. Catawba River	3050102	Intermittent	<1	1-2	1	Silt, sand, gravel	WS-V	54	21, 27.5			
286	K3a	UT to S. F. Catawba River	3050102	Perennial	1-4	2-7	4-6	Silt, sand, gravel, cobble	WS-V	62	31			
286A	K3a	UT to S. F. Catawba River	3050102	Intermittent	1	1-2	1	Silt, sand	WS-V	NA	NA			
287	K3a	UT to S. F. Catawba River	3050102	Intermittent	1	2-3	4	Silt, sand	WS-V	36	23			
287	K3a	UT to S. F. Catawba River	3050102	Perennial	>6	4-6	4	Sand, gravel	WS-V	36	NA			
293A	K3a	UT to S. F. Catawba River	3050102	Intermittent	1	1-2	1	Silt, sand	WS-V	54	22.75			
293A	K3a	UT to S. F. Catawba River	3050102	Perennial	<1	2-3	3-4	Silt, Sand, gravel	WS-V	54	NA			
295	K3a	UT to S. F. Catawba River	3050102	Perennial	2-4	3-5	1-4	Silt, sand, gravel, cobble	WS-V	68	32, 32.25			
296	K3a	UT to S. F. Catawba River	3050102	Perennial	4	6	2-4	Silt, Sand, gravel	WS-V	65.5	34	578	557	
297	K3a	UT to S. F. Catawba River	3050102	Perennial	1-4	3-6	1-4	Silt to cobble, boulder	WS-V	83	31.5	917	652	
298	K3a	UT to S. F. Catawba River	3050102	Intermittent	1-2	3	1	Silt, sand gravel	WS-V	45	19			
298	K3a	UT to S. F. Catawba River	3050102	Perennial	1-2	3	1	Silt, sand gravel	WS-V	45	19[4]			
299	K3a	UT to S. F. Catawba River	3050102	Intermittent	1-2	3	1-2	Silt, Sand, gravel	WS-V	67	26.5			
299	K3a	UT to S. F. Catawba River	3050102	Perennial	2-3	3-4	1-4	Silt, Sand, gravel	WS-V	67	26.5[4]			
300	K3a	UT to S. F. Catawba River	3050102	Intermittent	3	3	1-3	Silt, sand, gravel, cobble	WS-V	79	23.5	1399	1405	
300	K3a	UT to S. F. Catawba River	3050102	Perennial	3	3-5	1-3	Silt, sand, gravel, cobble	WS-V	79	33	193	230	
300A	K3a	UT to S. F. Catawba River	3050102	Intermittent	6	3	1-3	Silt, Sand, gravel	WS-V	42	21			
301	K3a	UT to S. F. Catawba River	3050102	Intermittent	4	3-6	1-2	Silt, Sand, gravel	WS-V	79	23			
301	K3a	UT to S. F. Catawba River	3050102	Perennial	3-4	4-7	1-6	Silt, sand, gravel, cobble	WS-V	79	28.5[4]			
301A	K3a	UT to S. F. Catawba River	3050102	Intermittent	5	3	1-3	Sand, gravel	WS-V	51	19.5			
301B	K3a	UT to S. F. Catawba River	3050102	Intermittent	5	3	1-3	Silt, Sand, gravel	WS-V	51	19.5			
302	K3b	UT to Catawba River	3050101	Intermittent	2-4	3	1-2	Silt, sand	WS-V, B	65	19.5			
303	K3b	UT to Catawba River	3050101	Intermittent	1	2	1	Sand, gravel	WS-V, B	42	23			
303	K3b	UT to Catawba River	3050101	Perennial	2-3	2-4	1-3	Silt, sand, gravel, cobble	WS-V, B	42	31			
304	K3b	UT to Catawba River	3050101	Intermittent	1	3	1-2	Silt, sand	WS-V, B	85	22	260	260	
304	K3b	UT to Catawba River	3050101	Perennial	3	3-5	1-4	Silt, sand, gravel, cobble	WS-V, B	85	31	484	568	
305	K3b	UT to Catawba River	3050101	Perennial	3-4	4-6	3-10	Silt, sand, gravel, cobble	WS-V, B	82	31.5	135		
310	K3c	UT to Catawba River	3050101	Intermittent	1-2	1-3	1-2	Silt, sand, gravel	WS-V, B	NA	NA			
311	K3c	UT to Catawba River	3050101	Intermittent	1	1-2	1	Silt, sand, gravel	WS-V, B	46	19			
311	K3c	UT to Catawba River	3050101	Perennial	1 - 4	3 - 10	2 - 12	Sand, gravel, cobble, boulder	WS-V, B	57, 77	35, 39			
311A	K3c	UT to Catawba River	3050101	Intermittent	<1	1-2	1-2	Silt, sand	WS-V, B	49	23.5			
312	K3c	UT to Catawba River	3050101	Intermittent	1	2-3	1	Silt, sand	WS-V, B	53	23.5	52	26	
312A	K3c	Beaverdam Creek	3050101	Perennial	3-5	8-10	2-12	Silt to cobble, boulder	C	66	50	973	742	
312B	K3c	UT to Catawba River	3050101	Intermittent	1	2	2	Silt, sand	WS-V, B	47	19			
S313	K3c	UT to Catawba River	3050101	Intermittent	4	2-8	2	Silt, Sand, gravel	WS-V, B	63	22			
313A	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-3	3-5	2	Silt, Sand, gravel	C	42	19			
314A	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-3	4-5	1-3	Silt, sand, gravel, cobble	C	50	21.75	226		
314A	K3c	UT to Beaverdam Creek	3050101	Perennial	1-2	2-4	1-2	Silt, sand, gravel, cobble	C	63	33	969		
S315	K3c	UT to Catawba River	3050101	Intermittent	1	1-2	1-3	Silt, sand, gravel	WS-V, B	50	27			
315A	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-2	2-4	1-2	Silt, sand, gravel, cobble	C	NA	NA	176		
316A	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-2	3	1-2	Silt, sand, gravel	C	53	23.5			
317	K3c	UT to Beaverdam Creek	3050101	Intermittent	1	2-3	1-2	Silt, sand, gravel	C	50	22.5			
318	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-3	2-5	1-3	Silt to cobble, boulder	C	47	25	464	466	
318	K3c	UT to Beaverdam Creek	3050101	Perennial	NA	NA	NA	NA	C	47	25[4]			

APPENDIX A - TABLE 1
STREAM IMPACTS FOR PREFERRED ALTERNATIVE REFINED PRELIMINARY DESIGN
STIP Project U-3321 - Gaston East-West Connector Final EIS

Streams bridged for hydraulic conveyance or as a result of Concurrence Point 2a are noted
Stream impacts calculated based on right-of-way limits plus a buffer of 25 feet from each slope stake line
Sources for Stream Attributes and DEIS DSA 9 Impacts: *Natural Resources Technical Report for the Gaston East-West Connector,* Earth Tech, Inc., February 2008
and the Turnpike Environmental Agency Coordination Meeting held April 8, 2008
Source for Preferred Alternative Impacts: PBS&J

Stream ID*	Corridor Segment	Stream Name	Hydrologic Unit	Intermittent / Perennial	Bank Height (ft)	Average Width (ft)	Depth (in)	Substrate	Water Quality Classification	USACE Score	NCDWQ Score	Draft EIS DSA 9 Preliminary Design	Preferred Alternative Refined Design*	Preferred Alternative Service Roads
318A	K3c	UT to Beaverdam Creek	3050101	Perennial	2-4	3-5	2-6	Silt, Sand, gravel	C	68	25.75[4]			
318A	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-3	1-2	1	Silt, Sand, gravel	C	68	21.5	131	131	
318B	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-3	3-5	3	Silt, Sand, gravel	C	41	21.5		90	
318C	K3c	UT to Beaverdam Creek	3050101	Intermittent	2-4	2	3	Silt, sand	C	54	25			
318D	K3c	UT to Beaverdam Creek	3050101	Perennial	1-2	1-2	2	Silt, sand, gravel	C	56	19[4]			
319	K3c	UT to Beaverdam Creek	3050101	Intermittent	1	3	2-5	Silt, sand	C	53	19			
321	K3c	Legion Lake Stream	3050101	Intermittent	1-3	3-6	1-6	Silt, Sand, gravel	C	83	24			
321	K3c	Legion Lake Stream	3050101	Perennial	2-4	5-8	1-12	Silt to cobble, boulder	C	83	33	1610	830	
323	K3c	UT to Beaverdam Creek	3050101	Perennial	1	1-2	1	Silt, sand	C	66	19.5[4]	99	25	
323A	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-2	5	2	Silt, sand, gravel, cobble	C	42	25.5			
324	K3c	UT to Beaverdam Creek	3050101	Intermittent	1	1-2	1-3	Silt, sand	C	48	23			
325	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-2	1-4	1-5	Silt, sand, gravel, cobble	C	48	21.25			
326	K3c	UT to Beaverdam Creek	3050101	Intermittent	1-2	1-2	1-4	Silt, sand, gravel	C	41	21.25	239	336	
326	K3c	UT to Beaverdam Creek	3050101	Perennial	4	3	2-4	Silt, sand, gravel, cobble	C	52	30.5			
328	K3c	UT to Legion Lake Stream	3050101	Intermittent	3-4	4	1-4	Silt, sand, gravel, cobble	C	69	23.5			
328	K3c	UT to Legion Lake Stream	3050101	Perennial	NA	NA	NA	NA	C	69	NA			
329	K3c	UT to Legion Lake Stream	3050101	Intermittent	3-4	3-5	1-3	Silt to cobble, boulder	C	67	24			
330	K3c	UT to Legion Lake Stream	3050101	Intermittent	3-4	3-5	1-3	Silt to cobble, boulder	C	77	26			
330	K3c	UT to Legion Lake Stream	3050101	Perennial	3-4	3-5	1-3	Silt, sand, gravel	C	77	26[4]	74	9	
330A	K3c	UT to Legion Lake Stream	3050101	Intermittent	3-4	2	1-2	Silt, sand, gravel	C	60	20.5			
331	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-3	2-3	1-2	Silt, sand, gravel	C	76.5	27			
331	K3c	UT to Legion Lake Stream	3050101	Perennial	3-6	2-6	1-4	Silt, sand, gravel, cobble	C	76.5	34			
332	K3c	UT to Legion Lake Stream	3050101	Perennial	2-4	2-3	1-3	Silt, sand, gravel	C	82	41	317	58	
333	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-2	1-2	1-2	Silt, sand, gravel	C	74	24.5			
334	K3c	UT to Legion Lake Stream	3050101	Intermittent	2-4	3-5	2-5	Sand, gravel, boulder, bedrock	C	68	21			
335	K3c	UT to Legion Lake Stream	3050101	Perennial	2-3	2-3	2-4	Silt, sand gravel	C	63	34	180	19	
336	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-2	1-3	1-3	Silt, sand, gravel	C	43	20.5			
337	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-4	2-4	1-4	Silt, sand, gravel	C	56	26			
337	K3c	UT to Legion Lake Stream	3050101	Perennial	2-3	3	1-2	Silt, sand, gravel	C	57	23.5[4]			
337A	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-4	2-4	1-4	Silt, sand, gravel	C	74	23.5			
338	K3c	UT to Legion Lake Stream	3050101	Intermittent	1	2	1-2	Silt, sand	C	44	24.5			
338A	K3c	UT to Legion Lake Stream	3050101	Intermittent	1	2	1-2	Silt, sand	C	44	19		34	
338B	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-2	2-3	4	Silt, sand, gravel	C	57.5	20.5	68		
339	K3c	UT to Legion Lake Stream	3050101	Intermittent	1	2	1-2	Silt, sand	C	50	23.5	735	238	
339A	K3c	UT to Legion Lake Stream	3050101	Intermittent	2-4	3-5	2-6	Silt, sand, gravel, cobble	C	53	19	63		
340	K3c	UT to Legion Lake Stream	3050101	Intermittent	2-4	4-6	2-6	Silt, sand, gravel, cobble	C	82	28.5	1082	13	
340	K3c	UT to Legion Lake Stream	3050101	Perennial	1-2	3	1-3	Silt, Sand, gravel	C	82	34	1244		
340A	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-2	2	2	Silt, sand, gravel, cobble	C	70	25	359	182	
341	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-2	2	1-3	Silt, sand, gravel	C	59	21	282		
342	K3c	UT to Legion Lake Stream	3050101	Intermittent	1-2	2	1-2	Silt, sand, gravel	C	53	19.5			
343	K3c	UT to Coffey Creek	3050103	Intermittent	Stream outside study corridor added from USGS mapping				C	73	20.5			
346	J2c	UT to Crowders Creek	3050101	Intermittent	1	2-3	1-2	Silt, sand	C	39	20.5			
347	K3c	UT to Beaverdam Creek	3050101	Perennial	3-4	5	2-3	Silt, sand	C	48	26[4]			
													NO MECK	NO MECK
Total Stream Impacts												**48995**	**36029**	**387**
Perennial Stream Impacts												**38894**	**28679**	**354**
Intermittent Stream Impacts												**10101**	**7350**	**33**

* Stream numbers not consecutive because only those streams within the Preferred Alternative Corridor are listed.

1. Bridge required for hydraulic conveyance.

2. Bessemer Branch - The service road proposed under DSAs 4, 5, 9, 22, 23, and 27 was bridged by request of resource agencies at the Turnpike Environmental Agency Coordination Meeting held April 8, 2008. Preferred Alternative Refined Design changed access

3. Bridged by request of resource agencies at the Turnpike Environmental Agency Coordination Meeting held April 8, 2008.

4. Stream classification elevated to perennial (due to biology) per NCDWQ

APPENDIX A - TABLE 2
WETLAND IMPACTS FOR PREFERRED ALTERNATIVE REFINED PRELIMINARY DESIGN
STIP Project U-3321 - Gaston East-West Connector Final EIS

Wetlands bridged as a result of Concurrence Point 2a are noted
Wetland impacts calculated based on right-of-way limits plus a buffer of 25 feet from each slope stake line
Sources for Attributes and Draft EIS DSA 9 Impacts: *Natural Resources Technical Report for the Gaston East-West Connector,* Earth Tech, Inc., February 2008 and the Turnpike Environmental Agency Coordination Meeting held April 8, 2008
Sources for Preferred Alternative Impacts: PBS&J

Wetland Number*	Corridor Segment	Wetland Size (acres)	Cowardin Classification	DWQ Rating	Wetland Quality Rating	Draft EIS DSA 9 Preliminary Design	Preferred Alternative Refined Design*	Preferred Alternative Service Roads
25	H2a	0.03	PEM1B	37	Low			
26	H2a	0.01	PEM1F	20	Low			
27	H2a	0.01	PSS3C	31	Low			
28	H2a	0.01	PEM1B	27	Low			
29	H2a	0.14	PSS1C	40	Low	0.10	0.10	
30	H2a	0.03	PSS1/3C	44	Low	0.03	0.03	
31	H2a	0.70	PEM1Fh	39	Low			
32	H2a	0.02	PSS1B	31	Low			
33	H2a	0.10	PFO1C	47	Medium			
34	H2a	2.91	PFO1C	73	High			0.07
35	H2a	1.17	PEM1/SS1C	78	High	1.17	1.17	
36	H2a	0.06	PFO1B	40	Low	0.06	0.06	
37	H2a	0.06	PFO1B	21	Low			
37A	H2a	0.01	PFO1B	23	Low			
38	H2a	0.04	PEM1B	21	Low			
39	H2a	0.38	PFO1C	47	Medium			
40	H2a	0.05	PFO1A	26	Low			
41	H2a	0.02	PFO1B	31	Low			
42	H2a	0.002	PFO1B	32	Low			
43	H2a	0.01	NA	NA	NA	0.01	0.01	
44	H2a	0.37	PFO1G	42	Low	0.05	0.05	
45	H2a	0.04	PFO1Ah	19	Low			
46	H3	0.57	PSS1Bds	69	High			
47	H3	0.11	PFO1Cs	16	Low			0.04
48	H3	0.09	PFO1C	59	Medium			0.01
49	H3	0.16	PFO1C	34	Low			
50	H3	0.14	PFO1C	28	Low			
51	H3	2.07	PFO1C	70	High	1.35	1.25	
52	H3	0.23	PFO1Cd	55	Medium			
53	H3	0.20	PFO1C	22	Low			
54	H3	0.48	PFO1C	22	Low			
58	H3	0.06	PEM1C	36	Low	0.01	0.01	
59	H3	0.38	PSS1Fh	46	Medium	0.01	0.01	
77	H3	0.02	PFO1C	39	Low			
78	H3	0.22	PEM1/SS1F	36	Low	0.04	0.03	
79	H3	0.02	PEM1/SS1Fd	39	Low	< 0.01		
80	H3	0.01	PFO1G	36	Low			
81	H3	0.03	PFO1B	20	Low	0.03	0.03	
82	H3	0.38	PFO1Cd	20	Low	0.21	0.21	
83	H3	0.10	PFO1Cd	20	Low	0.01	0.01	
84	H3	0.06	PSS1B	32	Low	0.01	0.01	
85	H3	0.35	PFO1C	63	High			
86	H3	0.03	PEM1B	27	Low	0.03	0.01	
87	H3	0.14	PFO1B	19	Low	< 0.01	< 0.01	
95	H3	0.02	PFO1/4C	23	Low			
99	J4a	2.19	PFO1C/PUBH	34	Low	0.46	0.38	
100	J4a	0.26	PFO1/EM1C	24	Low	0.04	0.02	
103	J4a	6.70	PFO1C	83	High			
106	J4a	0.47	PFO1C/B	39	Low	< 0.01		

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Sources for Preferred Alternative Impacts: PBS&J

Wetland Number*	Corridor Segment	Wetland Size (acres)	Cowardin Classification	DWQ Rating	Wetland Quality Rating	Draft EIS DSA 9 Preliminary Design	Preferred Alternative Refined Design*	Preferred Alternative Service Roads
107	J4a	0.44	PFO/SS1Fh	48	Medium	0.01	0.01	
108	J4a	0.04	PEM1C	16	Low	0.04	0.04	
109	J4a	0.03	PFO1/EM1C	28	Low	0.03	0.03	
142	J2d	1.52	NA	NA	NA			
147	J2d	0.02	PFO1	36	Medium			
148	J2d	0.20	PEM1	41	Medium			
149	J2d	0.17	PFO1	33	Low			
150	J2d	0.40	PFO1	39	Medium			
151	J2d	0.03	PFO1	35	Medium			
152	J2d	0.32	PFO1	39	Medium			
153	JX4	0.05	PFO1	37	Medium			
154	JX4	0.42	PFO1F	43	Medium			
155	JX4	0.13	PFO1	9	Low			
157	JX4	0.39	PFO1	30	Low			
158	JX4	0.01	PFO1	8	Low			
159	JX4	0.63	PEM1	25	Low			
160	JX4	0.05	PFO1	13	Low			
161	JX4	0.17	PFO1	33	Low	< 0.01	< 0.01	
162	JX4	0.10	PFO1	21	Low			
163	JX4	0.03	NA	NA	NA			
164	JX4	0.02	PFO1	4	Low	0.02	0.02	
165	JX4	0.35	PFO1	35	Medium			
166	JX4	0.05	PFO1	7	Low	0.05	0.05	
167	JX4	0.06	PFO1	19	Low			
168	JX4	0.17	NA	NA	NA			
169	JX4	0.21	PFO1	42	Medium			
176	JX4	0.004	PFO1	0	Low			
177	JX4	0.01	PFO1	13	Low			
178	JX4	0.01	PFO1	13	Low			
179	JX4	0.22	PFO1	55	Medium			
180	JX4	0.03	PFO1	21	Low			
181	JX4	0.004	PFO1	13	Low			
182	JX4	0.01	PFO1	2	Low			
183	JX4	0.05	PFO1	23	Low			
184	JX4	0.03	PFO1	8	Low			
187	JX4	0.56	PFO1A	53	Medium			
188	JX4	0.54	PFO1A	43	Medium	0.17	0.16	
189	J1e	5.51	PSS1	51	Medium	0.36	0.33	
190	J1e	0.09	PFO1	13	Low			
191	J1e	0.20	PFO1	13	Low			
192	J1e	0.99	PFO1	59	Medium			
214	J1e	0.15	PFO1	58	Medium			
214	J1e		PFO1	58	Medium			
215	J1e	0.02	PFO1	4	Low			
216	J1e	0.01	PFO1	4	Low			
217	J1e	0.02	PFO1	8	Low	0.02	0.02	
218	J1e	0.05	PEM1	17	Low	0.05	0.05	
219	J1e	0.01	PEM1	15	Low	0.01	0.01	
220	J1e	0.03	PEM1	17	Low			

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Sources for Preferred Alternative Impacts: PBS&J

Wetland Number*	Corridor Segment	Wetland Size (acres)	Cowardin Classification	DWQ Rating	Wetland Quality Rating	Draft EIS DSA 9 Preliminary Design	Preferred Alternative Refined Design*	Preferred Alternative Service Roads
221	J1e	0.12	PFO1	18	Low			
222	J1e	0.02	PFO1	18	Low			
223	J1e	0.09	PEM1	17	Low			
224	J1e	0.02	PFO1	12	Low			
225	J1e	0.06	PFO1	18	Low			
226	J1f	0.06	PFO1	23	Low			
227	J1f	0.18	PFO1	23	Low			
228	J1f	0.12	PEM1	16	Low			
229	J1f	0.22	PEM1	16	Low			
230	J1f	0.06	PEM1	28	Low			
231	J1f	0.10	PEM1	23	Low			
232	J1f	1.20	PEM1	21	Low			
233	J1f	0.07	PSS1	0	Low			
234	J1f	0.03	PFO1	11	Low		0.03	
235	J1f	0.05	PEM1/PFO1	61	Medium	< 0.01		
235A	K1a	0.07	PFO1	17	Low			
236	K1a	0.01	PFO1	0	Low	0.01		
237	K1a	0.56	PFO1	37	Medium			
238	K1a	0.13	PFO1	35	Medium			
239	K1a	0.02	PEM1	18	Low			
239A	K1a	0.05	PEM1	28	Low			
240	K1a	0.09	PFO1	22	Low			
241	K1a	1.34	PFO1	39	Medium	0.89	0.83	
242	K1a	0.15	PSS1	13	Low			
243	K3a	0.10	PFO1	20	Low			
244	K3a	0.06	PFO1	25	Low			
245	K3a	0.59	PFO1Ah	77	High			
246	K3a	0.08	PFO1Ah	77	High	0.03	0.08	
247	K3a	1.26	PFO1Ah	77	High			
248	K3a	4.76	PFO1Ah	93	High	0.66[1]	0.66[1]	
249	K3a	0.18	PFO1Ah	61	Medium			
252	K3a	0.42	PEM1/PSS1/PFO1	9	Low		0.01	
252A	K3a	0.01	PFO1	7	Low			
253	K3a	0.35	PEM1	26	Low	0.35	0.35	
254	K3a	0.11	PEM1	15	Low	0.01		
255	K3a	0.01	PEM1	15	Low	0.01	0.01	
256	K3a	0.02	PEM1	15	Low			
278	K3b	0.18	Palustrine	23	Low			
283A	K3a	0.01	Palustrine	70	High			
284	K3a	0.47	Palustrine	70	High			
285	K3a	0.05	Palustrine	44	Medium	0.04		
286	K3a	0.33	Palustrine	68	High			
287	K3a	0.02	Palustrine	42	Medium			
288	K3a	0.004	Palustrine	46	Medium	< 0.01	< 0.01	
289	K3b	0.23	Palustrine	43	Medium	0.23	0.23	
290	K3b	0.05	Palustrine	64	Medium			
291	K3b	0.07	Palustrine	9	Low			
292	K3b	0.01	Palustrine	32	Low			
293	K3b	0.02	Palustrine	23	Low			

APPENDIX A - TABLE 2
WETLAND IMPACTS FOR PREFERRED ALTERNATIVE REFINED PRELIMINARY DESIGN
STIP Project U-3321 - Gaston East-West Connector Final EIS

Wetlands bridged as a result of Concurrence Point 2a are noted
Wetland impacts calculated based on right-of-way limits plus a buffer of 25 feet from each slope stake line
Sources for Attributes and Draft EIS DSA 9 Impacts: *Natural Resources Technical Report for the Gaston East-West Connector,* Earth Tech, Inc., February 2008 and the Turnpike Environmental Agency Coordination Meeting held April 8, 2008
Sources for Preferred Alternative Impacts: PBS&J

Wetland Number*	Corridor Segment	Wetland Size (acres)	Cowardin Classification	DWQ Rating	Wetland Quality Rating	Draft EIS DSA 9 Preliminary Design	Preferred Alternative Refined Design*	Preferred Alternative Service Roads
293A	K3b	0.00	Palustrine	23	Low			
294	K3b	0.18	Palustrine	38	Medium			
295	K3b	0.01	Palustrine	22	Low			
296	K3c	0.01	Palustrine	NA	NA			
297	K3c	0.30	Palustrine	58	Medium			
317	K3c	4.78	Palustrine	62	Medium	0.37	0.37	
317A	K3c	0.03	Palustrine	31	Low			
318	K3c	0.09	Palustrine	24	Low			
319	K3c	0.30	Palustrine	23	Low			
320	K3c	0.01	Palustrine	23	Low	0.01		
321	K3c	0.02	Palustrine	14	Low	0.02	0.02	
323	K3c	0.02	Palustrine	17	Low	0.02	0.02	
324	K3c	0.02	Palustrine	22	Low	0.02	0.02	
325	K3c	0.03	Palustrine	15	Low	0.03	0.02	
326	K3c	0.08	Palustrine	41	Medium			
327	K3c	0.12	Palustrine	60	Medium			
328	K3c	0.03	Palustrine	53	Medium			
329	K3c	0.56	Palustrine	43	Medium	0.42		
329A	K3c	0.00	Palustrine	27	Low			
330	K3c	0.05	Palustrine	19	Low			
331	K3c	0.05	Palustrine	17	Low			
331A	K3c	0.01	Palustrine	38	Medium			
332	K3c	0.10	Palustrine	38	Medium		0.10	
333	K3c	0.05	Palustrine	17	Low	0.02	0.02	
333A	K3c	0.01	Palustrine	16	Low	0.01		
334	K3c	0.14	Palustrine	42	Medium	0.02	0.03	
335	K3c	0.43	Palustrine	33	Medium			
336	K3c	0.07	Palustrine	11	Low			
337	K3c	0.23	Palustrine	68	High			
337A	K3c	0.03	Palustrine	27	Low			
337B	K3c	0.02	Palustrine	35	Medium			
338	H3	0.35	PEM1	16	Low			
340	H3	0.02	PFO1B	36	High			
TOTAL						**7.5**	**6.9**	**0.1**

* Wetland numbers not consecutive because only those within the Preferred Alternative Corridor are listed.

1. Without extending the Catawba Creek bridge, the impact to Wetland 248 would be 1.50 acres

APPENDIX A - TABLE 3
POND IMPACTS FOR PREFERRED ALTERNATIVE REFINED PRELIMINARY DESIGN
STIP Project U-3321 - Gaston East-West Connector Final EIS

Pond impacts calculated based on right-of-way limits plus a buffer of 25 feet from each slope stake line
Source for Pond Attributes and DSA 9 Impacts: *Natural Resources Technical Report for the Gaston East-West Connector,* Earth Tech, Inc., February 2008
Source for Refined Design Impacts: PBS&J

Earth Tech Pond ID	Corridor Segment	General Location Along Corridor	Total Acres Within Corridor	Cowardin Classification	Draft EIS DSA 9 Preliminary Design	Preferred Alternative Refined Design*	Preferred Alternative Service Roads
4	H2A	South of Belfast Dr	1.31	PEM1/PUBHh			
5	H2A	South of Belfast Dr	1.56	PUBHh/PEM1Fh			0.33
10	H3	Linwood Springs Golf Course	0.82	PUB3Hhx			
11	J4a	Linwood Springs Golf Course	0.93	PUB3Hhx			
12	J4a	Linwood Springs Golf Course	1.23	PUB3Hh	1.23	1.23	
17	J4a	North of New Haven Dr	0.26	PUB3H			
18	J4a	Adjacent to Crowders Creek Rd	0.07	PUB3Hh	0.03	0.03	
24	J2d	East of Robinson Rd	1.43	PUBHh	1.15	1.09	
25	J2d	East of Robinson Rd	1.93	PUBHh			
26	J2d	East of Robinson Rd	0.27	PUBHh			
27	J2d	West of Bud Wilson Rd	0.72	PUBHh			
28	J2d	East of Bud Wilson Rd	0.90	PUBHh			
29	J2d	East of Bud Wilson Rd	0.17	PUBHh			
30	J2d	East of Bud Wilson Rd	0.68	PUBHh	0.68	0.68	
31	JX4	End of Dorchester Dr	0.08	PUBHh			
32	JX4	East of Patrick Rd	0.30	PUBHh			
37	J1e	East of Wilson Farm Rd	0.47	PUBHh	0.34	0.34	
38	J1f	East of Union Rd (NC 274)	0.54	PUBHh		0.52	
40	K1A	East of Rufus Ratchford Rd	0.41	PUBHh	0.41	0.07	
41	K1A	West of Rufus Ratchford Rd	0.65	PUBHh			
44	K3A	West of South New Hope Rd (SR 279)	2.42	PUBHh			
45	K3B	East of South New Hope Rd (SR 279)	1.00	PUBHh			
46	K3B	East of South New Hope Rd (SR 279)	1.04	PUBHh			
52	K3B	East of Boat Club Rd	0.20	PUBHh	0.20	0.20	
56	K3C	West of I-485	1.06	PUBHh			
57	K3C	West of I-485	0.06	PUBHh	0.06	0.06	
58	K3C	East of I-485	1.063	PUBHh			
Total					**4.1**	**4.2**	**0.3**

* This column includes mainline and Y-lines

Pond numbers not consecutive because only those within the Preferred Alternative Study Corridor are listed.

APPENDIX B

Meeting Minutes – March 16, 2010 Agency Meeting

Meeting – Gaston East-West Connector

MEETING MINUTES

Date: March 16, 2010
1:00 pm to 4:00 pm
NCDOT Board Room – Transportation Building, Raleigh, NC

Project: STIP U-3321 Gaston E-W Connector – STP-1213(6)

Gaston E-W Connector – Meeting Regarding Mitigation:

Attendees:
George Hoops, FHWA
Donnie Brew, FHWA
Steve DeWitt, NCDOT-NCTA
Jennifer Harris, NCDOT-NCTA
Todd Tugwell, USACE
Mickey Sugg, USACE
Chris Militscher, USEPA
Polly Lespinasse, NCDENR-DWQ
Brian Wrenn, NCDENR-DWQ
Bill Gilmore, NCDENR-EEP
Jim Stanfill, NCDENR-EEP
Marc Recktenwald, NCDENR-EEP
Beth Harmon, NCDENR-EEP
Andrea Leslie, NCDENR-EEP
Amy Simes, NCDENR
Leilani Paugh, NCDOT-NEU
Bill Barrett, NCDOT-NEU
Linda Fitzgerald, NCDOT-NEU
Greg Thorpe, NCDOT-PDEA
Missy Pair, NCDOT-PDEA
Jeff Dayton, HNTB
Jill Gurak, PBS&J
Michael Gloden, PBS&J
Jens Geratz, PBS&J

Via Telephone:
Liz Hair, USACE

Presentation Materials:
- Agenda
- Handout – NCTA - Garden Parkway - Impacts to Jurisdictional Resources
- Handout – EEP - Garden Parkway Project Search: GIS Search and Field Reconnaissance Results
- Handout – EEP - Available Assets in Catawba 01 and Catawba 02
- Presentation on Site Search Conducted by EEP - Powerpoint Slideshow Printout

Purpose:

Discuss and agree upon the mitigation approach for the Gaston East-West Connector for impacts to jurisdictional resources.

Introduction and Presentation:

Donnie Brew opened the meeting with introductions. He then asked the attendees whether there were any high-level regulatory issues regarding permitting of the Garden Parkway project and the proposed approach of using programmatic mitigation through EEP.

> NCDWQ stated that the location of the mitigation does not hinge on the fact that there are several 303d-listed streams impacted by the project. However, because there are numerous of 303d-listed streams, then mitigation implemented nearby may be more appropriate. NCDWQ always prefers on-site mitigation where feasible, and since there are so many 303d-listed streams, NCDWQ would like to see more local mitigation. However, NCDWQ is not opposed to off-site mitigation.

Bill Gilmore asked whether the project was following the merger process. In the merger process, mitigation is normally discussed after a Least Environmentally Damaging Practicable Alternative (LEDPA) is identified.

> The project is following a modified merger process and Concurrence Points (CP) 1 through 4a have been achieved. LEDPA (CP 3) was identified in October 2009. Avoidance and Minimization (CP 4a) was achieved in February,2010. The refined designs for the Preferred Alternative reduced impacts substantially (by 12,966 linear feet). NCTA has been providing annual updates to EEP on estimated impacts. NCTA has also discussed mitigation with the environmental resource and regulatory agencies since last summer at the monthly meetings.

USACE requested a summary of past discussions with USEPA since Mickey Sugg, Todd Tugwell, and Liz Hair had not attended the meetings. Steve Lund, recently retired, has been the USACE representative on the project.

> NCTA stated that Kathy Matthews of USEPA has expressed concern about the magnitude of impacts and potential impacts to 303d-listed streams. When it was discussed that EEP would be the primary source for mitigation, Ms. Matthews recommended also looking at other potential mitigation such as on-site mitigation or non-traditional mitigation.
>
> Chris Militscher stated that Ms. Matthew's notes indicated she had three basic concerns. One was the use of Bobs Pocket for mitigation credit on this project since the Bobs Pocket is far away from the project and the Bobs Pocket site is not under immediate threat of development. Another recommendation was to have a more aggressive approach to searching for local or more nearby mitigation opportunities and to make sure no good local opportunities were being missed. Finally, USEPA always prefers on-site mitigation if it makes sense from ecosystem, water quality and cost perspectives.
>
> Polly Lespinasse noted that the amount of mitigation available for this project was a concern for NCDWQ since there are other projects in the area that also will need mitigation.

Todd Tugwell stated he was aware of some of USEPA's concerns and that there was also concern that mitigation ratios at Bobs Pocket would not be high.

Jim Stanfill asked if the permitting agencies thought this project is a unique situation (no immediate responses). EEP prepares mitigation in advance for many transportation projects and does not know which mitigation site credits will be applied to each project until the permit is issued. In the case of the Garden Parkway, there is some opportunity to look at mitigation beforehand, which does not happen often. Normally, all mitigation is already in hand before permits and mitigation discussions occur for a project.

Donnie Brew stated that agreement between the agencies for the programmatic approach to mitigation is an effective approach, but sometimes there can be exceptions.

Jill Gurak provided an overview of the project impacts to jurisdictional resources. She noted:

- Draft EIS signed in April 2009
- Draft EIS included impacts for 12 Detailed Study Alternatives (DSAs) based on preliminary engineering designs
- LEDPA and Preferred Alternative is DSA 9
- Design refinements made to DSA 9 reduced stream impacts by over 12,000 linear feet (12,966 linear feet). These included
    - Reducing median width by 20 feet
    - Eliminating the Bud Wilson Road interchange (substantial savings at this location)

  - Reducing the footprint of the Robinson Road, NC 274 (Union Road), and NC 273 (Southpoint Road) interchanges
  - Redesigning the I-485 interchange and reducing the footprint (substantial savings at this location)
- Impacts were calculated based on the preliminary engineering design construction limits with a 25-foot buffer, which is standard NCDOT practice for calculating impacts based on preliminary level design.
- There will be incentives for the Design-Build team to further reduce impacts.
- The impacts to 303d-listed streams noted in the handout are impacts to unnamed tributaries that feed named streams included in the Final 303d list (2008), and are not listed streams themselves. The listed named streams are bridged, including an extended bridge over Catawba Creek to span an adjacent wetland.
- The Draft 2010 list also included South Fork Catawba River, which would be bridged, and McGill Branch and South Crowders Creek, neither of which are impacted by the Preferred Alternative.

Donnie Brew asked if any of the attendees thought the proposed project would not be able to obtain a permit. None of the attendees replied in the affirmative.

Michael Gloden provided an overview of the on-site mitigation survey conducted for the Preferred Alternative (*Technical Memorandum – On-Site Mitigation Field Review*, PBS&J, January 2010). He noted:

- 20 tax parcels containing 1,050 acres were initially identified using GIS.
- The field survey narrowed the sites to seven parcels grouped into three locations. Additional evaluations are still needed, as well as discussions with the property owners.
    1. Stream enhancement of approximately 5,600 linear feet (Linwood Springs Golf Course)
    2. Stream enhancement and restoration of approximately 1,700 linear feet (Harrison Family Dairy Farm)
    3. Wetland enhancement of approximately 6 acres (logged site)
- Enhancement means measures such as revegetation and bank repair.

Leilani Paugh stated the report provides a good survey of sites based on a traditional approach, but there may be opportunities for more creative or non-traditional mitigation. For example: stormwater issues, in-stream work, and watershed preservation. If a potential site is immediately adjacent to the project, then condemnation for this mitigation would not be prohibited. NCDOT is in the process of scheduling a site visit with permitting agencies in Mecklenburg County for a couple projects that include some non-traditional mitigation.

USEPA is interested in non-traditional mitigation opportunities. Chris Militscher stated he thought there were some good opportunities near the Carolina Speedway, and he believes a number of the systems in the project area have degraded over the last several years, even without the proposed project having been implemented.

NCDWQ is interested in considering non-traditional mitigation. However, Brian Wrenn stated the measures would need to be above and beyond what would be required by regulation in order to receive mitigation credit.

USACE stated that it is difficult to determine mitigation ratios for non-traditional mitigation, and when enough is proposed. Mr. Tugwell asked if there has been any monitoring of non-traditional sites.

Leilani Paugh stated NCDOT has not conducted any monitoring in the project area. NCDOT currently is establishing a monitoring program for a project on the coast.

Jim Stanfill suggested that the Charlotte mitigation bank may be the closest example site. They are conducting some monitoring.

EEP has enough mitigation credits now to permit the project fully. EEP provided a list of available assets in a meeting handout. However, no other project would be able to be permitted until additional mitigation credits were obtained in the watershed. Most of the credits that would be used for the proposed project are located in the lower Catawba. Less than half of the credits available from the Bobs Pocket site might have been applied to the Garden Parkway. The available credits are in the monitoring stage, with just a couple sites in the design stage. Required ratios for a project are not normally known until the permit is issued. Historically, ratios have been between 1:1 – 2:1, with the ratio average usually about 1.5:1. The EEP plans for a ratio of 2:1 to be conservative.

Andrea Leslie gave a Powerpoint presentation (attached) on EEP watershed planning in the project area. She noted:

- EEP uses a watershed planning approach based on 8-digit Catalog Unit. Catawba 01 and 02 have several local watershed plans, although none are in Gaston County.
- EEP currently has the following assets (see full list in handout):
    - Restoration: Catawba 01 – 16,352 Stream Mitigation Unit (SMU), Catawba 02 – 18,767 SMU
    - Restoration Equivalent – High Quality Preservation Southern Piedmont ecoregion: 32,928 SMU and Catawba 01 – 5,107 SMU
    - EEP also has riparian wetland credits available, as listed in the handout.
- The GIS site search of local watersheds for the Garden Parkway included parcels in Mecklenburg and Gaston Counties that had more than 1,000 linear feet of stream with land use restoration potential. Project feasibility determined by five criteria: total project stream length greater than 1,500 linear feet, 1-3 landowners, drainage area less than 10 square miles, streams with narrow or no buffer on at least one side, and riparian corridor without severe constraints.
- The GIS analysis sites were then visited in the field in March 2010. After field reconnaissance, EEP identified 8 projects in Crowders Creek drainage (14 digit HU = 3050101180010), 5 projects in Catawba Creek drainage (HU = 3050101180020), and 1 project in South Fork Catawba River East (HU = 3050102060020). Total potential stream restoration length is 32,400 linear feet in Tier 1 (most promising sites) and 12,100 linear feet in Tier 2 (project has significant constraints).
- Further evaluation is needed, along with property owner contact.

Greg Thorpe asked if the agencies would consider mitigation across the state line in South Carolina, since the project is close to the state line. USACE will not accept mitigation outside North Carolina. USEPA and NCDWQ agreed with this statement.

Donnie Brew reviewed some of the main points of the programmatic agreement for mitigating the impacts of transportation projects in North Carolina.

- Requires mitigation to be in the ground before the project is constructed. The mitigation should be in the same 8-digit hydrologic unit and be of the same type as the impacted resource.
- Mitigation ratios are typically 1:1 for restoration and 2:1 for restoration equivalent.
- The benefits of the programmatic approach include achieving mitigation in advance of an impact, and implementing mitigation based on watershed planning. The programmatic approach allows focus on problem watershed areas. This approach also results in predictability for the NCDOT and FHWA in planning and scheduling projects.

Mr. Brew stated that if the programmatic approach is not used for the Garden Parkway, then mitigation already in the ground would not be applied to this project and there would be a project delay while other mitigation is implemented. The programmatic approach does not have a static direct link between particular mitigation sites and projects until the project permit is issued, then the locations/origins of the credits are established so the same credits are not used for another project.

Bill Gilmore stated the EEP program matches impacts of all types of projects in a watershed area with overall watershed needs.

Donnie Brew asked again whether the programmatic mitigation approach would be acceptable for the Garden Parkway. Donnie Brew suggested that the programmatic approach would allow for the EEP to focus future efforts in watershed areas where mitigation is needed. These credits would be applied to future projects, but the Garden Parkway would be the influence that steers these future credits to areas the agencies felt they were most needed. This is a normal process in the programmatic, watershed approach to mitigation.

> USEPA wants FHWA and NCTA to document on-site mitigation opportunities more fully, and also whether there are potential mitigation sites within 1-2 miles of the project. Non-traditional measures also should be fully evaluated and their feasibility or infeasibility documented in the mitigation plan.

Mr. Brew noted this suggestion for studying nearby (not adjacent) mitigation and non-traditional measures would not be the normal process. The non-traditional measures would be difficult to assign ratios to, so would these be "bonus" mitigation?

USACE stated non-traditional opportunities would be implemented only because traditional approaches not available. The programmatic approach was acceptable.

NCDWQ would consider on-site mitigation as the first priority. NCDWQ's permit constraints likely would be related to providing mitigation in Piedmont streams, not Mountain streams (i.e., using credits that are from the same ecoregion). NCDWQ would not be as concerned with thermal classification (cold/cool/warm). However, NCDWQ was comfortable with the programmatic approach to mitigation for the Garden Parkway, with a programmatic adjustment in the focus of the location of mitigation projects in the Catawba 01 and Catawba 02 areas.

EEP noted that there are a number of mitigation opportunities in the Catawba 01 watershed.

NCDWQ stated that the Catawba 01 watershed is large and crosses several ecoregions. Some mitigation in this region may not be appropriate for the project if it occurs in a different ecoregion.

USACE stated that if NCDWQ wants mitigation to occur in specific 14-digit HUCS, then the permit would need to specify this requirement. Greg Thorpe stated that a restriction such as this would likely result in EEP spending more money to find specific mitigation.

EEP has nearby mitigation credits available at Beaverdam Creek of approximately 13,000 linear feet of stream credit. The search for potential nearby mitigation projects presented by Andrea Leslie identified another 32,000 linear feet of Tier 1 projects (those with good possibility) for potential stream mitigation. The EEP would be willing to pursue these potential projects as part of the normal process for identifying mitigation credits in Catawba 01 and Catawba 02. However, these mitigation projects would not be tied directly to the Garden Parkway.

Todd Tugwell also noted that the USACE likely will require mitigation for some intermittent streams. Polly Lespinasse stated that based on her field visits, many of the intermittent streams would be considered "important" from a permitting perspective.

Jim Stanfill noted that EEP does try to provide associated credits that are of the same stream regimen (i.e. cool stream mitigation for cool stream impacts). However, Catawba 01 is large and a few projects in the past have had cold/cool and cool/warm credits allowed.

Chris Militscher noted that USEPA has been providing comments on the proposed project since 2001 and the FHWA and NCTA have known about the impacts and should have been pursuing on-site and nearby mitigation for this project. A conceptual mitigation plan was requested to be included in the Draft EIS.

The Preferred Alternative was identified in October 2009, and an on-site mitigation survey was initiated shortly afterward, following standard procedures. The refined preliminary designs reduced stream impacts by approximately 12,966 linear feet. NCTA was not in a position in the Draft EIS to develop a conceptual mitigation plan. The Final EIS is not completed yet, and FHWA and NCTA intend to include a conceptual mitigation in the Final EIS.

USEPA stated that they cannot comment on the proposed mitigation until there is a more formal presentation of mitigation that considers on-site mitigation, nearby (or near-site) mitigation, and non-traditional measures. USEPA also is concerned about the potential amount of indirect and cumulative impacts since waters in the area are already impaired. The Clean Water Act prohibits actions that further degrade already degraded waters.

FHWA stated they would work with USEPA separately to try to address concerns. NCDOT and FHWA do not mitigate for indirect and cumulative effects.

Marc Recktenwald stated EEP can focus efforts on the potential nearby mitigation sites identified in Andrea Leslie's presentation and have more information to include in a conceptual mitigation plan regarding the feasibility of these sites. EEP can also provide a list of projects already implemented that have benefited the watershed.

NCDOT will work with NCTA and their consultants to evaluate non-traditional measures.

Leilani Paugh will provide examples of other conceptual mitigation plans for use in developing the plan for the Garden Parkway.

Conclusions

A conceptual mitigation plan for the Preferred Alternative will be prepared and summarized in the Final EIS.

EEP has enough credits in hand to permit the Garden Parkway project, including 13,000 linear feet of stream mitigation credits at Beaverdam Creek, just south of the Preferred Alternative.

The programmatic approach is acceptable to NCDWQ and USACE. EEP should initiate a programmatic adjustment in the focus of the location of mitigation projects in the Catawba 01 and Catawba 02 areas.

NCDWQ permit constraints may include provisions related to providing mitigation in Piedmont streams within Catawba 01 and Catawba 02 (rather than Mountain streams).

The USACE and NCDWQ will not accept credits outside of North Carolina (i.e., credits in South Carolina).

NCDWQ and USEPA prefer on-site mitigation where feasible. The on-site mitigation search should be fully documented, including contact with property owners.

NCDWQ and USEPA are interested in more information regarding the feasibility of non-traditional measures for on-site mitigation, and possibly near-site mitigation. NCDOT NEU and NCTA will evaluate non-traditional measures, and will report the results in the conceptual mitigation plan.

USEPA will not comment until they review the conceptual mitigation plan. USEPA would like to see on-site and near-site mitigation and non-traditional measures. They are also concerned with indirect and cumulative effects and further degradation of area streams.

Action Items:

- EEP will provide additional information about the potential mitigation projects identified in the 14-digit HUCs near the project.
- NCTA and NCDOT NEU will evaluate the feasibility of non-traditional mitigation measures for on-site mitigation.
- NCTA will contact the property owners of the three site identified in the on-site mitigation survey to determine their interest.
- NCTA will prepare a conceptual mitigation plan and include a summary in the Final EIS.
- NCTA will coordinate with USACE and NCDWQ to determine the remaining tasks required to identify which intermittent streams are “important”. *Follow-up – For this project, NCDWQ indicated that only “perennial” streams will require mitigation. The project was far enough in the planning process that the new requirement for intermittent stream mitigation does not apply. The mitigation ratio will be 1:1.*

Garden Parkway Project Search: GIS Search and Field Reconnaissance Results
Ecosystem Enhancement Program
10 March 2010

Introduction

This document summarizes the results of a stream restoration project search in the 14-digit hydrologic units affected by the preferred alternative of Garden Parkway. A GIS-based project search was performed in December 2009 and modified in February 2010. All possible projects identified through the GIS analyses were visited in the field to determine feasibility in March 2010.

There are five 14-digit hydrologic units that have streams that may be impacted by the Garden Parkway corridor; three of these are in Catawba 01 and two are in Catawba 02. Most of this 177 square mile area is in Gaston County, although a portion is also in Mecklenburg County. Much of Gastonia, as well as portions of Kings Mountain, Bessemer City, Belmont, and Charlotte, are contained in this area.

GIS Methods & Results

The following steps were performed via GIS:

1. Mecklenburg and Gaston County parcel data from 2009 were intersected with 1:24,000 NHD streams clipped to the 5 14-digit HUs that contain the Garden Parkway corridor.
2. The resulting dataset was dissolved in order to determine total stream length by pin number.
3. Parcels with at least 1,000 ft of stream length were selected.
4. Land use/cover (2001 NLCD) was reclassified and converted to a vector dataset in order to determine buffer type for restoration potential. Two land use/cover classes were determined: those with restoration project potential and without potential. Those land use/cover categories used as restoration potential were-
    - 21- Developed, Open Space of less than 20% impervious cover
    - 22- Developed, Low Density where impervious cover is 20-49%
    - 71- Grassland/Herbaceous not subject to intensive management but can be used for grazing
    - 81- Pasture/Hay
    - 82- Cultivated Crops
5. The parcel dataset determined in step 3 was clipped by the land use/cover with restoration potential.
6. Parcels with stream length of at least 1,000 ft of stream length were selected and a new dataset containing 92 potential projects was created.
7. Each potential project was then analyzed for feasibility with parcel ownership information and 2005 aerial photographs. Possibility for upstream and downstream extension of the project was examined. The following criteria were used to determine whether a project was feasible:
    a. Stream length >1500 ft

b. <4 landowners
c. Drainage area ≤10 square miles
d. Streams with little or no buffer on at least one side
e. Riparian corridor without severe constraints such as large buildings, large roads, and large power line right-of-ways.

Sixteen projects that met the criteria in step 7 above were found in the search area (see Table 1 and Figure 1), which comprise 49,300 ft of stream. Three of the sixteen projects are in golf courses. Most of the sixteen projects are in the western two hydrologic units of Catawba 01. Only 15,900 ft of project were found within 1 mi of the Garden Parkway corridor. 22,400 ft of project (which includes the 15,900 ft within 1 mi) were found within 2 mi of the corridor. Limitations in finding feasible projects were primarily due to the small size of most parcels in this developed area and constraints within the riparian corridors. Those 76 projects that were rejected due to criteria in step 7 are listed in Table 2.

Table 1. Possible restoration projects in the Garden Parkway area.

14-digit HU	**Major stream**	**Number of projects**	**Total project length (ft)**	**Project length w/in 1 mi of Parkway corridor (ft)**	**Project length w/in 2 mi of Parkway corridor (ft)**
Catawba 01					
03050101170040	Catawba R	0	0		
03050101180010	Crowders Cr	9	31500	6900	10900
03050101180020	Catawba Cr	5	14000	7000	9500
Catawba 02					
03050102060020	S Fk Catawba R East	1	2000	2000	2000
03050102070030	S Fk Catawba R West	1	1800		
TOTAL		**16**	**49300**	**15900**	**22400**

Figure 1. Potential projects identified through GIS screen.

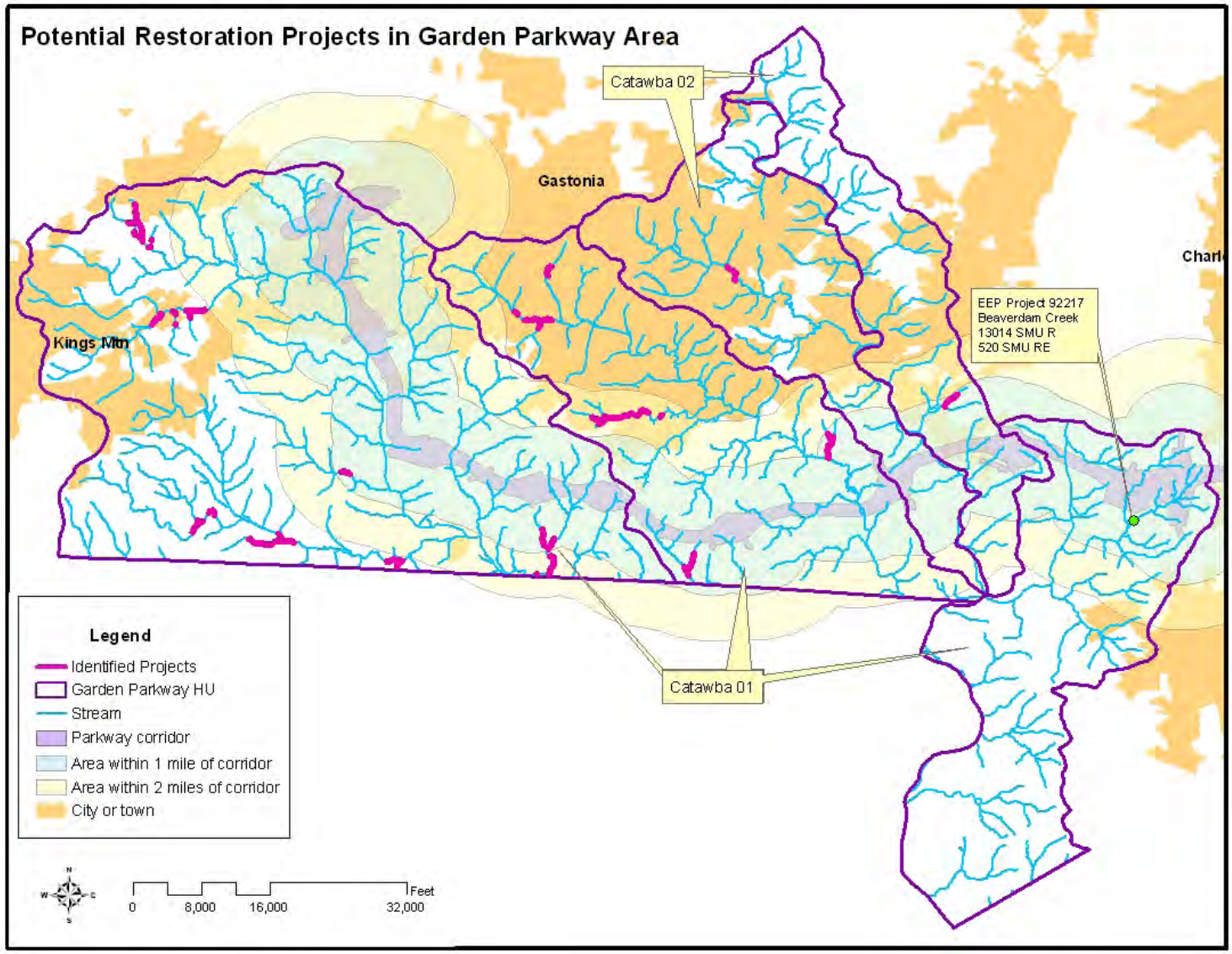

Table 2. Potential projects that did not meet minimal criteria.

Project #	Limiting factors for rejected sites				
	Forested buffer	≥4 landowners	<1500 ft	Drainage area >10 sq mi	Physical constraints
19			x		pond
27	x				along major road
46			x		
54	x				
55	x				
59			x		pond downstream
65			x		golf course
72	x				
83	x				
85	x				
86	x				school in construction?
87	x				
107	x				
113			x		
118				x	golf course, manicured to stream
123		x	x		
124	x				
126	x				
127	x				
130				x	golf course, manicured to stream
131				x	golf course, manicured to stream
132	x				
136	x				
137			x		
138		x			corridor constrained by buildings
141	x				powerline
154	x				
155	x				
160	x	x			
165	x	x			in-line pond
166		x			
167	x				
168	x	x			
175	x	x			
176			x		powerlines in corridor
185		x			powerlines in corridor
186	x	x			
187			x		stream culverted under soccer field
189	x				
190	x	x			
191	x		x		
192			x		in-line pond
193	x				
194	x				
196	x				
197	x				
199			x		apartment complex, corridor constrained
202	x				

Table 2. Potential projects that did not meet minimal criteria (cont).

Project #	Limiting factors for rejected sites				
	Forested buffer	≥4 landowners	<1500 ft	Drainage area >10 sq mi	Physical constraints
204	x				in-line pond
205	x				
224	x				
227	x			x	
229		x	x		
230	x		x		
231	x		x		
233			x		roads in for future development, in corridor
234	x		x		
235			x		in developing property of Franklin Square Mall
237	x		x		
247			x		buffer on 1 side
255	x	x			
257	x				
259	x				
263	x	x			powerline in corridor
265	x				
267	x		x		condominiums along narrow corridor
269	x				
272	x				upstream of pond
273	x				upstream of pond
279	x				in-line pond
280	x		x		in-line pond
281			x		in-line pond
295	x		x		near WTP or WWTP
296	x		x		in-line pond
300			x		in-line pond
312					quarry

Results of Field Reconnaissance

Each of the 16 projects identified through the GIS screen were visited in March 2010. Due to limited time available, landowners were not contacted to determine interest in a project. Projects on private land were not thoroughly evaluated; feasibility was determined based on what could be seen from public right-of-ways.

Projects were placed in one of three feasibility tiers (Table 3), which are:

1. Tier 1: good project possibility
2. Tier 2: project has significant constraints
3. Tier 3: project is not feasible

Nine projects (for a total of 32,400 ft) are in Feasibility Tier 1. Five projects (for a total of 12,100 ft, all in Catawba 01) are in Feasibility Tier 2. Two projects were dropped and are in Feasibility Tier 3. See Figure 2 for project locations and Table 4 for descriptions of each of the sixteen projects evaluated in the field.

Table 3. Possible restoration projects in the Garden Parkway area post-field reconnaissance.

14-digit HU	Major stream	Number of projects	Total project length (ft)	Tier 1 (ft) (good project possibility)	Tier 2 (ft) (projects have considerable constraints)
Catawba 01					
03050101170040	Catawba R	0	0		
03050101180010	Crowders Cr	8	28500	23400	5100
03050101180020	Catawba Cr	5	14000	7000	7000
Catawba 02					
03050102060020	S Fk Catawba R East	1	2000	2000	
03050102070030	S Fk Catawba R West	0	0		
TOTAL		**14**	**44500**	**32400**	**12100**

Figure 2. Potential projects and feasibility tiers after field reconnaissance.

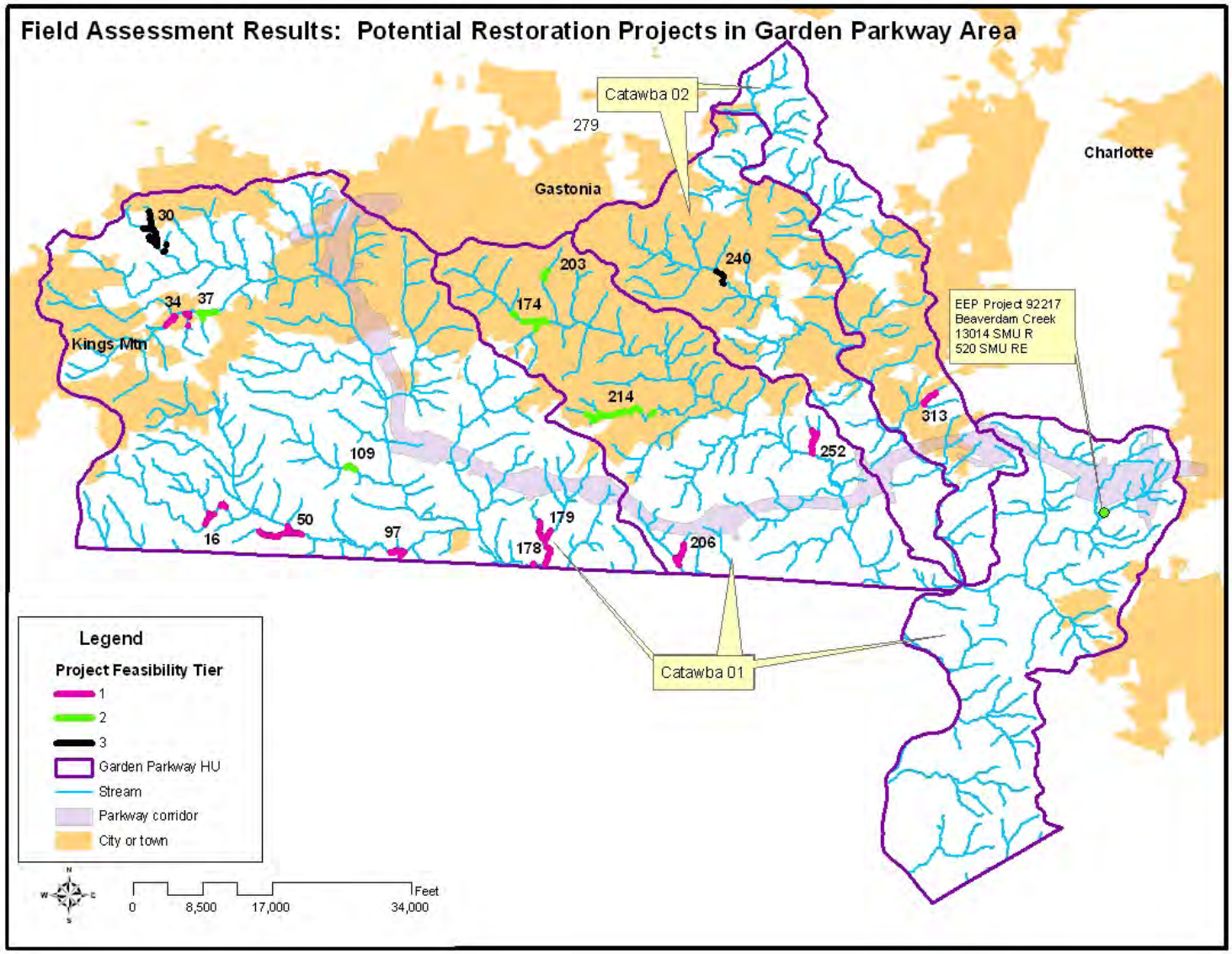

Table 4. Field determinations of project feasibility.

Project #	Est. length (ft)	Key landowner	Description	Constraints	Project Type*	Project Feasiblity**
16	5000	Kenneth & Evelyn Oates	Crop &/or pasture; could view only small portion of property. There, streams eroding & buffered on 1 side	Unknown	R & E?	1
34	1600	Pinnacle Resource Group, LLC	Could view only small portion of property. There, streams with cattle access & limited buffer	Unknown	R & E?	1
50	4000	Alfred Lee Stowe	Cattle access, no buffer, streams eroding. Possible wetland restoration potential	Some streams in narrow pasture; project would cause pasture loss	R & E	1
97	4000	George & Barbara Jackson	Could view only small portion of property. There, streams with horse access & limited buffer	Horse pasture area; project would cause pasture loss	R & E	1
178	4000	Joy Sparrow	Could view only small portion of property. Hayfield & inactive pasture. Stream not fenced out. Buffer on 1 side.		E	1
179	4800	James Thompson	Horse farm, couldn't see streams up close. Horses with stream access, high density use. Some limited woody buffer.		R & E	1
206	2000	David & Katherine Deas	Cattle pasture, with limited stream access. Buffered on 1 side. Stream reasonably stable.		E	1
252	5000	Jeffrey Stowe & Laura Henkel	Nursery & cattle use. Pond. No buffer, overgrazed pasture, livestock access.	Irrigation pond	R	1

*R = restoration; E = enhancement
**Tier 1 = good project possibility, Tier 2 = project has significant constraints, Tier 3 = project is not feasible

Table 4. Field determinations of project feasibility (cont).

Project #	Est. length (ft)	Key landowner	Description	Constraints	Project Type*	Project Feasiblity**
313	2000	Pearl Hand	Good buffer on left bank, selectively logged on right bank. Stream is incised. Stream has been flagged/surveyed.	Possibly current restoration project	R & E	1
37	3000	Lewis & Juanita Young	Crowders Mtn Golf Course; green & rough to stream edge; large stream, active erosion; much privet	Play areas at stream edge, multiple stream crossings	E	2
109	2100	Earl Dwayne Goodson	Could view only small portion of property. There, streams with horse access. Stream with no buffer, eroding.	Intensive horse use, various small structures on bank.	R & E	2
174	3000	City of Gastonia Golf Course	Green at stream edge. No woody vegetation, massive bank failure. Entire property is highly maintained	Play areas at stream edge, multiple stream crossings	E	2
203	1500	City of Gastonia	Lineberger Park. High intensity maintenance. Channel restoration in place (cross vanes, floodplain bench). Buffer needed.	Paved paths & play equipment in 50' buffer	E	2
214	2500	City of Gastonia Country Club	Stream with several in-line ponds & then against property line with multi landowners. Play areas at stream edge	In-line ponds, play areas at stream edge, multiple crossings	R & E	2
30	3000	FMC Corporation	FMC Lithium plant, manufactures buyllithium. Would likely necessitate a Phase 1 enviro assessment	Chemical plant, pond at downstream end		3
240	1800	City of Gastonia	Sewerline easement on right bank, left bank forested with much privet	Sewerline easement		3

*R = restoration; E = enhancement
**Tier 1 = good project possibility, Tier 2 = project has significant constraints, Tier 3 = project is not feasible