Appendix 7-1 and 7-2

APPENDIX 7-1

List of Structures Within 200 Feet of Preliminary Right-of-Way of Preferred and Alternate Routes

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
1	Residence	158	37	Industrial	77
2	Commercial	104	38	Industrial	83
3	Industrial	145	39	Industrial	90
4	Industrial	182	40	Industrial	17
5	Manufacturing	124	41	Industrial	93
6	Residence	59	42	Industrial	157
-	-	-	43	Commercial	92
8	Commercial	112	44	Commercial	14
9	Commercial	152	45	Industrial	94
10	Commercial	145	46	Industrial	151
-	-	-	47	Industrial	0
12	Commercial	130	48	Industrial	69
13	Residence	128	49	Commercial	41
14	Commercial	117	50	Commercial	70
15	Residence	117	51	Commercial	114
16	Commercial	11	52	Commercial	163
17	Commercial	125	53	Manufacturing	44
18	Commercial	27	54	Commercial	61
19	Commercial	54	55	Residence	86
20	Industrial	26	56	Commercial	11
21	Commercial	94	57	Manufacturing	144
22	Commercial	27	58	Industrial	22
23	Commercial	33	59	Commercial	130
24	Commercial	73	60	Commercial	1
25	Commercial	118	61	Industrial	189
26	Commercial	69	62	Industrial	153
27	Commercial	148	63	Commercial	118
28	Commercial	121	64	Manufacturing	22
29	Commercial	55	65	Commercial	36
30	Commercial	28	-	-	-
31	Commercial	70	67	Manufacturing	85
32	Commercial	0	68	Manufacturing	133
33	Industrial	106	69	Commercial	64
34	Commercial	101	70	Commercial	145
35	Manufacturing	68	71	Commercial	31
36	Commercial	23	72	Commercial	159

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
73	Industrial	67	109	Commercial	47
74	Commercial	33	110	Commercial	89
75	Commercial	119	111	Commercial	85
76	Commercial	36	112	Commercial	104
77	Commercial	164	113	Manufacturing	7
78	Commercial	78	114	Residence	198
79	Manufacturing	0	115	Residence	184
80	Industrial	31	116	Residence	178
81	Industrial	12	117	Residence	191
82	Manufacturing	188	118	Residence	193
83	Industrial	87	119	Commercial	127
84	Industrial	73	120	Commercial	86
85	Commercial	1	121	Manufacturing	0
86	Commercial	46	122	Commercial	90
87	Industrial	111	123	Commercial	107
88	Commercial	69	124	Commercial	68
89	Residence	196	125	Commercial	108
90	Commercial	45	126	Medical	113
91	Commercial	170	127	Commercial	67
92	Commercial	152	128	Commercial	138
93	Residence	118	129	Residence	92
94	Commercial	187	130	Commercial	12
95	Commercial	61	131	Commercial	106
96	Commercial	54	132	Commercial	195
97	Commercial	33	133	Commercial	136
98	Commercial	59	134	Residence	196
99	Commercial	104	135	Residence	98
100	Commercial	101	136	Residence	177
101	Commercial	33	137	Residence	95
102	Commercial	39	138	Commercial	96
103	Commercial	180	139	Residence	151
104	Commercial	52	140	Commercial	29
105	Commercial	53	141	Residence	73
106	Residence	172	142	Residence	148
107	Commercial	43	143	Residence	73
108	Commercial	176	144	Residence	97

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
145	Residence	51	181	Residence	158
146	Residence	37	182	Residence	182
147	Apartment	157	183	Residence	141
148	Commercial	3	184	Residence	55
149	Commercial	110	185	Residence	95
150	Residence	194	186	Residence	155
151	Commercial	148	187	Residence	186
152	Commercial	8	188	Residence	138
153	Residence	160	189	Residence	131
154	Commercial	58	190	Residence	131
155	Residence	53	191	Commercial	172
156	Residence	63	192	Residence	126
157	Residence	75	193	Commercial	12
158	Residence	63	194	Commercial	158
159	Commercial	116	195	Residence	137
160	Commercial	190	196	Commercial	158
161	Residence	71	197	Commercial	157
162	Residence	31	198	Residence	133
163	Residence	57	199	Residence	132
164	Residence	145	200	Residence	132
165	Residence	62	201	Residence	133
166	Residence	132	202	Residence	167
167	Residence	179	203	Industrial	111
168	Residence	131	204	Residence	172
169	Residence	38	205	Commercial	0
170	Residence	153	206	Residence	101
171	Residence	128	207	Commercial	94
172	Residence	24	208	Commercial	16
173	Residence	129	209	Residence	101
174	Residence	70	210	Residence	141
175	Residence	136	211	Residence	109
176	Residence	139	212	Residence	126
177	Commercial	21	213	Residence	112
178	Residence	183	214	Residence	83
179	Residence	150	215	Residence	114
180	Residence	153	216	Residence	98

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
217	Residence	110	253	Commercial	121
218	Commercial	7	254	Residence	124
219	Residence	193	255	Residence	130
220	Commercial	6	256	Residence	125
221	Commercial	1	257	Residence	126
222	Commercial	6	258	Residence	127
223	Commercial	2	259	Industrial	133
224	Residence	156	260	Residence	127
225	Commercial	0	261	Residence	118
226	Commercial	9	262	Industrial	64
227	Commercial	113	263	Residence	126
228	Residence	124	264	Residence	123
229	Residence	108	265	Residence	198
230	Commercial	168	266	Residence	122
231	Residence	116	267	Residence	128
232	Manufacturing	22	268	Residence	197
233	Commercial	101	269	Residence	127
234	Commercial	24	270	Residence	129
235	Commercial	33	271	Industrial	59
236	Commercial	105	272	Residence	129
237	Commercial	179	273	Residence	144
238	Commercial	107	274	Residence	188
239	Commercial	118	275	Residence	53
240	Commercial	111	276	Residence	130
241	Manufacturing	101	277	Residence	129
242	Commercial	99	278	Residence	126
243	Manufacturing	193	279	Residence	158
244	Residence	128	280	Residence	34
245	Manufacturing	21	281	Residence	181
246	Apartment	132	282	Residence	31
247	Apartment	130	283	Residence	127
248	Manufacturing	161	284	Residence	36
249	Manufacturing	26	285	Residence	134
250	Residence	134	286	Residence	192
251	Commercial	123	287	Commercial	42
252	Manufacturing	133	288	Residence	178

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
289	Residence	131	325	Commercial	180
290	Commercial	85	326	Residence	29
291	Residence	193	327	Apartment	168
292	Residence	57	328	Government	194
293	Residence	137	329	Residence	183
294	Residence	134	330	Industrial	0
295	Residence	134	331	Residence	189
296	Residence	32	332	Residence	82
297	Commercial	126	333	Residence	37
298	Residence	32	334	Residence	115
299	Medical	124	335	Multifamily	37
300	Residence	32	336	Residence	35
301	Commercial	123	337	Residence	38
302	Commercial	116	338	Residence	139
303	Residence	147	339	Commercial	156
304	Commercial	181	340	Residence	183
305	Commercial	22	341	Residence	132
306	Commercial	115	342	Residence	93
307	Commercial	123	343	Residence	60
308	Commercial	168	344	Residence	47
309	Commercial	94	345	Residence	51
310	Commercial	26	346	Residence	53
311	Residence	129	347	Residence	52
312	Commercial	142	348	Residence	16
313	Residence	189	349	Commercial	121
314	Commercial	19	350	Commercial	184
315	Commercial	126	351	Residence	159
316	Commercial	13	352	Residence	2
317	Residence	183	353	Residence	88
318	Residence	146	354	Residence	38
319	Commercial	55	355	School	11
320	Commercial	89	356	Commercial	156
321	Residence	96	357	Residence	9
322	Commercial	50	358	Commercial	26
323	Commercial	5	359	Residence	122
324	Residence	122	360	Residence	156

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
361	Residence	58	397	Residence	196
362	Residence	17	398	Commercial	128
363	Residence	166	399	Residence	113
364	Residence	43	400	Commercial	128
365	Industrial	40	401	Residence	81
366	Industrial	98	402	Medical	153
367	Residence	63	403	Residence	21
368	Industrial	47	404	Residence	29
369	Residence	115	405	Commercial	25
370	Residence	161	406	Residence	22
371	Residence	65	407	Residence	17
372	Residence	14	408	Residence	20
373	Residence	124	409	Residence	23
374	Residence	81	410	Residence	22
375	Commercial	75	411	Commercial	141
376	Residence	162	412	Residence	30
377	Residence	124	413	Residence	33
378	Residence	81	414	Residence	33
379	Residence	39	415	Residence	30
380	Industrial	41	416	Residence	29
381	Commercial	110	417	Commercial	49
382	Commercial	9	418	Residence	27
383	Commercial	40	419	Residence	27
384	Residence	194	420	Commercial	34
385	Residence	153	421	Commercial	118
386	Manufacturing	39	422	Commercial	57
387	Multifamily	28	423	Commercial	37
388	Commercial	110	424	Residence	54
389	Commercial	60	425	Residence	54
390	Commercial	44	426	Commercial	110
391	Industrial	30	427	Residence	59
392	Industrial, Manufacturing	57	428	Residence	58
393	Residence	163	429	Residence	57
-	-	-	430	Commercial	117
395	Commercial	17	431	Commercial	151
396	Commercial	48	432	Government	77

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
433	Residence	78	469	Commercial	28
434	Residence	69	470	Apartment	32
435	Residence	57	471	Residence	93
436	Residence	57	472	Apartment	86
437	Residence	137	473	Apartment	97
438	Residence	165	474	Commercial	89
439	Residence	193	475	Residence	176
440	Residence	108	476	Apartment	41
441	Residence	154	477	Residence	168
442	Commercial	56	478	Apartment	155
443	Residence	59	479	Apartment	154
444	Residence	59	480	Apartment	46
445	Residence	170	481	Apartment	46
446	Residence	137	482	Apartment	56
447	Residence	133	483	Apartment	107
448	Residence	153	484	Apartment	141
449	Residence	192	485	Apartment	146
450	Residence	181	486	Commercial	3
451	Commercial	119	487	Commercial	35
452	Residence	181	488	Commercial	135
453	Residence	72	489	Commercial	144
454	Residence	75	490	Commercial	147
455	Commercial	20	491	Commercial	154
456	Residence	61	492	Commercial	138
457	Residence	55	-	-	-
458	Residence	55	494	Commercial	135
459	Residence	54	495	Commercial	16
460	Residence	54	496	Commercial	130
461	Residence	53	497	Commercial	111
462	Residence	31	498	Commercial	9
463	Commercial	50	499	Commercial	21
464	Residence	75	500	Commercial	8
465	Residence	38	501	Commercial	142
466	Apartment	40	502	Commercial	184
467	Apartment	37	-	-	-
468	Residence	114	504	Commercial	12

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
505	Commercial	49	541	Residence	0
506	Church	30	542	Residence	71
507	Commercial	0	543	Residence	134
508	Commercial	57	544	Residence	136
509	Residence	186	545	Residence	131
510	Commercial	93	546	Residence	105
511	Commercial	33	547	Residence	107
512	Residence	102	548	Residence	95
513	Residence	6	549	Residence	97
514	Residence	194	550	Residence	103
515	Residence	147	551	Residence	157
516	Residence	40	-	-	-
517	Residence	196	553	Residence	94
518	Residence	135	-	-	-
519	Residence	0	555	Residence	153
520	Residence	60	556	Residence	85
521	Residence	134	557	Residence	99
522	Commercial	0	558	Residence	60
523	Residence	120	559	Commercial	11
524	Residence	125	560	Commercial	75
525	Residence	95	561	Residence	64
526	Residence	64	562	Residence	63
527	Residence	117	563	Residence	93
528	Residence	122	564	Commercial	33
529	Residence	199	565	Residence	136
530	Residence	96	566	Residence	56
531	Residence	63	567	Residence	78
532	Residence	64	568	Residence	131
533	Residence	98	569	Residence	91
534	Residence	191	570	Residence	94
535	Residence	87	571	Residence	68
536	Residence	87	572	Residence	155
537	Residence	77	573	Commercial	101
538	Residence	86	574	Residence	111
539	Residence	102	575	Residence	67
540	Residence	139	576	Residence	57

TABLE 7-1A

Structures Within 200 feet of Preliminary ROW of the Preferred Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
577	Residence	51	613	Commercial	139
578	Residence	100	614	Commercial	64
579	Residence	117	615	Industrial	73
580	Residence	146	616	Industrial	198
581	Residence	164	617	Commercial	181
582	Residence	185	618	Commercial	59
583	Residence	172	619	Commercial	161
584	Residence	0	620	Commercial	69
585	Residence	117	621	Commercial	122
586	Residence	140	622	Commercial	188
587	Residence	168	623	Commercial	112
588	Commercial	89	624	Commercial	181
589	Commercial	142	625	Commercial	84
590	Commercial	30	626	Residence	170
591	Commercial	8	627	Residence	166
592	Commercial	177	628	Commercial	155
593	Commercial	17	629	Medical	97
594	Commercial	187	630	Commercial	2
595	Commercial	125	631	Industrial	0
596	Commercial	34	632	Industrial	86
597	Commercial	110	633	Commercial	82
598	Commercial	112	634	Commercial	5
599	Commercial	47	635	Industrial	22
600	Commercial	129	636	Commercial	157
601	Commercial	130	637	Commercial	106
602	Commercial	81	638	Commercial	7
603	Commercial	127	639	Commercial	61
604	Commercial	141	640	Commercial	115
605	Commercial	149	1298	Residence	189
606	Commercial	156	1299	Residence	198
607	Commercial	91	1300	Commercial	198
608	Commercial	40	1301	Residence	199
609	Industrial	22	1302	Residence	110
610	Commercial	15	1303	Residence	108
611	Industrial	17	-	-	-
612	Residence	181	-	-	-

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
1	Residence	168	678	Commercial	65
2	Commercial	124	679	Commercial	24
3	Industrial	163	680	Commercial	78
-	-	-	681	Commercial	111
5	Manufacturing	142	682	Commercial	109
6	Residence	67	683	Commercial	107
-	-	-	684	Commercial	109
8	Commercial	120	685	Commercial	112
9	Commercial	153	686	Commercial	108
10	Commercial	146	687	Commercial	110
			688	Residence	197
12	Commercial	131	689	Commercial	46
13	Residence	130	690	Commercial	132
14	Commercial	119	691	Industrial	10
15	Residence	119	692	Commercial	153
16	Commercial	9	693	Residence	20
17	Commercial	128	694	Commercial	10
18	Commercial	26	695	Commercial	45
20	Industrial	28	696	Industrial	13
659	Residence	119	697	Commercial	174
660	Residence	95	698	Commercial	174
661	Residence	95	700	Commercial	138
662	Residence	95	701	Manufacturing	74
663	Residence	71	702	Commercial	135
664	Residence	89	703	Commercial	192
665	Residence	155	704	Industrial	127
666	Residence	95	705	Commercial	0
667	Residence	70	706	Government	13
668	Commercial	136	707	Commercial	41
669	Residence	69	708	Commercial	114
670	Residence	69	709	Commercial	39
671	Commercial	83	710	Commercial	64
672	Commercial	115	711	Commercial	189
673	Residence	122	712	Commercial	93
674	Commercial	117	713	Commercial	60
675	Commercial	36	714	Commercial	135
676	Commercial	149	715	Commercial	21

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
716	Commercial	17	753	Residence	57
717	Commercial	164	754	Residence	150
718	Commercial	177	755	Residence	150
719	Industrial	15	756	Commercial	109
720	Commercial	193	757	Residence	167
721	Commercial	168	758	Residence	54
722	Commercial	63	759	Residence	56
723	Commercial	156	760	Residence	197
724	Commercial	113	761	Residence	180
725	Residence	49	762	Residence	53
726	Commercial	89	763	Residence	53
727	Commercial	174	764	Residence	200
728	Industrial	115	765	Residence	200
729	Commercial	69			
730	Commercial	49	767	Residence	53
731	Commercial	167	768	Residence	53
732	Commercial	36	769	Residence	52
733	Commercial	106	770	Residence	132
734	Commercial	52	-	-	-
735	Manufacturing	91	772	Residence	62
736	Commercial	113	773	Residence	87
737	Commercial	162	774	Commercial	151
738	Commercial	111	775	Residence	118
739	Commercial	71	776	Residence	128
-	-	-	777	Residence	104
741	Commercial	61	778	Residence	90
742	Government	13	779	Residence	92
743	Commercial	54	780	Residence	75
744	Government	60	-	-	-
-	-	-	782	Residence	99
-	-	-	783	Residence	71
-	-	-	-	-	-
-	-	-	785	Residence	73
749	Church	55	786	Residence	98
750	Residence	187	787	Residence	73
751	Residence	187	788	Residence	96
-	-	-	789	Residence	70

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
790	Residence	69	827	Residence	120
791	Residence	67	828	Residence	65
792	Residence	150	829	Commercial	161
793	Residence	165	830	Residence	108
794	Residence	72	831	Residence	140
795	Residence	139	832	Commercial	84
796	Residence	62	833	Residence	113
797	Residence	62	834	Residence	90
798	Residence	74	835	Commercial	92
799	Residence	61	836	Residence	121
800	Residence	55	837	Residence	65
801	Residence	76	838	Commercial	165
802	Residence	104	839	Residence	68
803	Residence	102	840	Residence	103
804	Residence	78	841	Residence	67
805	Residence	73	842	Residence	117
806	Residence	44	843	Residence	75
807	Residence	46	844	Government	77
808	Residence	52	845	Church	77
809	Residence	45	846	Residence	87
810	Residence	43	847	Residence	61
811	Residence	170	848	Residence	68
812	Residence	106	849	Residence	89
813	Residence	43	850	Residence	60
814	Residence	52	851	Residence	87
815	Residence	113	852	Residence	144
816	Residence	45	853	Residence	132
817	Residence	62	854	Residence	87
818	Residence	63	855	Residence	77
819	Residence	54	856	Residence	86
820	Residence	60	857	Residence	66
821	Residence	63	858	Residence	89
822	Residence	70	859	Residence	82
823	Residence	50	860	Residence	65
824	Residence	68	861	Residence	87
825	Residence	55	862	Church	82
826	Residence	115	863	Residence	170

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
864	Residence	87	902	Industrial	160
865	Residence	72	-	-	-
866	Residence	86	904	Industrial	0
867	Residence	87	-	-	-
868	Residence	140	-	-	-
869	Commercial	63	-	-	-
870	Residence	72	908	Industrial	0
871	Residence	86	-	-	-
872	Residence	172	-	-	-
873	Residence	80	-	-	-
874	Residence	88	-	-	-
875	Residence	85	-	-	-
876	Residence	158	-	-	-
877	Residence	86	915	Industrial	29
878	Residence	86	916	Industrial	27
879	Residence	88	917	Industrial	63
880	Residence	86	918	Industrial	94
881	Residence	86	919	Commercial	153
882	Commercial	123	920	Industrial	0
883	Residence	85	921	Industrial	96
884	Commercial	91	922	Industrial	150
885	Residence	0	-	-	-
886	Commercial	172	924	Commercial	196
887	Commercial	84	925	Commercial	92
888	Commercial	61	926	Commercial	107
-	-	-	927	Commercial	70
890	Commercial	41	928	Commercial	53
891	Industrial	48	929	Government	23
893	Commercial	114	930	Residence	185
894	Commercial	53	931	Residence	145
895	Commercial	165	932	Residence	105
896	Commercial	152	933	Residence	54
-	-	-	934	Residence	23
898	Manufacturing	104	935	Residence	175
899	Commercial	94	936	Residence	124
900	Commercial	148	937	Residence	76
-	-	-	938	Residence	30

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
939	Residence	26	976	Commercial	80
940	Residence	121	977	Residence	118
941	Residence	46	978	Residence	15
942	Residence	47	979	Residence	181
943	Residence	133	980	Residence	69
944	Residence	50	981	Commercial	19
945	Residence	132	982	Residence	109
946	Residence	38	983	Residence	37
947	Residence	77	984	Residence	139
948	Residence	137	985	Commercial	31
949	Residence	60	986	Commercial	36
950	Residence	37	987	Residence	197
951	Residence	116	988	Commercial	37
952	Residence	20	989	Commercial	5
953	Residence	164	990	Residence	115
954	Residence	64	991	Residence	177
955	Residence	21	992	Commercial	120
956	Commercial	41	993	Residence	184
957	Residence	23	994	Residence	133
958	Commercial	40	995	Commercial	29
959	Commercial	90	996	Commercial	171
960	Commercial	148	997	Commercial	114
961	Commercial	30	998	Residence	93
962	Commercial	129	999	Commercial	37
963	Residence	53	1000	Residence	185
964	Commercial	111	1001	Residence	29
965	Commercial	13	1002	Residence	59
966	Residence	43	1003	Commercial	113
967	Residence	106	1004	Residence	31
968	Residence	199	1005	Residence	23
969	Residence	148	1006	Residence	25
970	Residence	19	1007	Residence	63
971	Residence	132	1008	Residence	104
972	Residence	18	-	-	-
973	Residence	122	1010	Residence	145
974	Residence	15	1011	Residence	185
975	Residence	15	1012	Residence	18

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
1013	Residence	173	1050	Residence	22
1014	Residence	21	1051	Residence	90
1015	Residence	12	1052	Residence	9
1016	Residence	25	1053	Residence	199
1017	Residence	155	1054	Residence	21
-	-	-	1055	Residence	164
1019	Residence	192	1056	Residence	78
1020	Residence	89	1057	Residence	26
1021	Residence	19	1058	Residence	16
1022	Residence	194	1059	Residence	182
1023	Residence	21	1060	Residence	174
1024	Residence	175	1061	Residence	10
1025	Residence	162	1062	Residence	136
1026	Residence	22	1063	Residence	90
1027	Residence	20	1064	Residence	80
1028	Residence	29	1065	Residence	136
1029	Residence	192	1066	Residence	13
1030	Residence	18	1067	Residence	191
1031	Residence	157	1068	Residence	192
1032	Residence	15	1069	Residence	7
1033	Residence	28	1070	Residence	147
1034	Residence	196	1071	Residence	21
1035	Residence	177	1072	Residence	188
1036	Residence	18	1073	Residence	17
1037	Residence	190	1074	Residence	188
1038	Residence	27	1075	Residence	23
1039	Residence	176	1076	Residence	132
1040	Residence	22	1077	Residence	19
1041	Residence	33	1078	Residence	19
1042	Residence	177	1079	Residence	153
1043	Residence	22	1080	Residence	95
1044	Residence	194	1081	Residence	25
1045	Residence	12	1082	Residence	20
1046	Residence	21	1083	Residence	51
1047	Residence	177	1084	Residence	187
1048	Residence	197	1085	Residence	10
1049	Residence	22	1086	Residence	180

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
1087	Residence	33	1124	Commercial	129
1088	Residence	21	1125	Commercial	63
1089	Residence	182	1126	Residence	23
1090	Residence	160	1127	Residence	61
1091	Residence	16	1128	Residence	185
1092	Residence	164	1129	Residence	22
1093	Residence	21	1130	Residence	57
1094	Residence	65	1131	Residence	186
1095	Residence	23	1132	Residence	16
1096	Residence	24	1133	Residence	158
1097	Residence	35	1134	Residence	175
1098	Residence	156	1135	Residence	18
1099	Residence	16	1136	Residence	179
1100	Residence	24	1137	Residence	52
1101	Residence	117	1138	Residence	191
1102	Residence	14	1139	Residence	17
1103	Residence	172	1140	Residence	197
1104	Residence	83	1141	Residence	16
1105	Residence	81	1142	Residence	64
1106	Residence	16	1143	Residence	64
1107	Residence	136	1144	Residence	21
1108	Residence	29	1145	Residence	123
1109	Residence	90	1146	Residence	106
1110	Residence	129	1147	Residence	24
1111	Residence	26	-	-	-
1112	Residence	171	1149	Residence	41
1113	Residence	168	1150	Residence	60
1114	Commercial	88	1151	Residence	29
1115	Residence	33	1152	Residence	192
1116	Residence	86	1153	Residence	42
1117	Residence	131	1154	Residence	25
1118	Commercial	116	1155	Residence	192
1119	Residence	186	1156	Residence	29
1120	Commercial	57	1157	Residence	23
1121	Residence	86	1158	Residence	18
1122	Residence	21	1159	Residence	37
1123	Residence	83	-	-	-

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
-	-	-	1198	Residence	127
-	-	-	1199	Residence	64
-	-	-	1200	Commercial	69
1164	Residence	93	1201	Commercial	151
1165	Commercial	176	1202	Commercial	58
1166	Commercial	126	1203	Commercial	141
1167	Commercial	86	1204	Commercial	45
1168	Commercial	165	1205	Commercial	111
1169	Commercial	139	1206	Industrial	100
-	-	-	1207	Commercial	30
1171	Commercial	111	1208	Manufacturing	179
1172	Commercial	186	1209	Commercial	158
1173	Commercial	168	1210	Commercial	138
1174	Commercial	122	1211	Commercial	141
-	-	-	1212	Commercial	166
1176	Commercial	59	1213	Commercial	168
1177	Commercial	95	1214	Industrial	95
1178	Commercial	174	1215	Industrial	169
1179	Commercial	57	1216	Industrial	115
1180	Commercial	52	1217	Manufacturing	122
1181	Commercial	49	1218	Commercial	101
-	-	-	1219	Commercial	154
-	-	-	1220	Commercial	143
-	-	-	1221	Commercial	10
-	-	-	1222	Commercial	1
1186	Residence	194	1223	Commercial	13
1187	Residence	195	1224	Commercial	2
1188	Residence	165	1225	Commercial	134
1189	Commercial	14	1226	Commercial	135
1190	Commercial	0	1227	Commercial	153
1191	Residence	107	1228	Industrial	135
1192	Commercial	15	1229	Industrial	103
1193	Commercial	0	1230	Commercial	121
1194	Residence	105	1231	Commercial	121
1195	Commercial	18	1232	Manufacturing	57
1196	Residence	119	1233	Commercial	162
1197	Residence	53	1234	Manufacturing	119

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
1235	Commercial	0	1272	Industrial	173
1236	Industrial	179	1273	Industrial	10
1237	Industrial	177	1274	Industrial	31
1238	Commercial	21	1275	Commercial	39
1239	Industrial	39	1276	Commercial	18
1240	Industrial	177	1277	Commercial	39
1241	Commercial	162	1278	Commercial	104
1242	Industrial	84	1279	Commercial	6
1243	Commercial	159	1280	Commercial	46
1244	Manufacturing	18	1281	Industrial	34
1245	Commercial	109	1282	Commercial	6
1246	Commercial	143	1283	Residence	19
1247	Commercial	16	1284	Residence	23
1248	Commercial	198	1285	Commercial	60
1249	Commercial	98	1286	Residence	22
1250	Commercial	185	1287	Commercial	72
1251	Manufacturing	32	1288	Commercial	2
1252	Commercial	154	1289	Commercial	43
1253	Industrial	67	1290	Industrial	142
1254	Commercial	111	1291	Commercial	87
1255	Commercial	80	1292	Commercial	194
1256	Commercial	36	1293	Commercial	26
1257	Commercial	96	1295	Commercial	91
1258	Commercial	158	1296	Commercial	134
1259	Commercial	94	1297	Commercial	185
1260	Industrial	75	1304	Industrial	19
1261	Commercial	72	1305	Industrial	94
1262	Commercial	133	1306	Residential	197
1263	Commercial	163	1307	Industrial	163
1264	Commercial	158	1308	Residential	186
1265	Commercial	159	1309	Residential	123
1266	Government	5	1310	Residential	189
1267	Manufacturing	69	1311	Residential	181
1268	Manufacturing	123	1312	Residential	187
1269	Commercial	118	1313	Residential	130
1270	Industrial	130	1314	Residential	175
1271	Commercial	174	1315	Residential	180

TABLE 7-1B

Structures within 200 feet of Preliminary ROW of the Alternate Route

Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*	Structure ID Number	Structure Type	Distance from Edge of Preliminary ROW (feet)*
1316	Commercial	168	1336	Commercial	78
1317	Commercial	76	1337	Residential	113
1318	Commercial	87	1338	Commercial	189
1319	Industrial	83	1339	Commercial	48
1320	Industrial	139	1340	Commercial	92
1321	Industrial	96	1341	Commercial	61
1322	Industrial	99	1342	Civic Building	191
1323	Industrial	87	1343	Residential	94
1324	Industrial	194	1344	Residential	146
1325	Industrial	188	1345	Residential	172
1326	Industrial	191	1346	Residential	193
1327	Industrial	94	1347	Residential	96
1328	Industrial	94	1348	Residential	152
1329	Industrial	170	1349	Residential	145
1330	Industrial	85	1350	Residential	193
1331	Industrial	32	1351	Residential	110
1332	Industrial	0	1352	Residential	161
1333	Industrial	177	1353	Residential	187
1334	Industrial	189	1354	Commercial	192
1335	Residential	197	1355	Industrial	0

*Structures listed as “0 feet” may be at the edge of or within the nominal preliminary ROW. Note that the preliminary ROW used in this analysis is not final. Duke Energy Ohio understands that the ROW may have to be reduced and modified in places during the development of the final ROW and engineering design.

APPENDIX 7-2

Previously Identified Cultural Resources within 250 Feet of the Preferred Route and Alternate Routes

Table 7-2A. Previously Identified Cultural Resources within 250 Feet of the Preferred Route

OHPO Resource Number	Resource Type	Resource Name	Address	Construction Date
HAM0501550	OHI: Single Dwelling	EB Thompson House	11802 Conrey Rd	1860
HAM0412050	OHI: Single Dwelling	Sara Keeler House	7360 E Kemper Rd	1875
HAM0413350	OHI: Single Dwelling	Melanera Swallow House	11560 Deerfield Rd	1900
HAM0386750	OHI: Residential Domestic	Bizzarri House	6070 Kenridge Dr	1960
HAM0675050	OHI: Single Dwelling		10351 Kenwood Rd	c.1920
HAM0285050	OHI: Residential Domestic		4824 Prospect Ave	1915
HAM0284450	OHI: Residential Domestic		9654 Kenwood Rd	1905
HAM0673450	OHI: Double		4660 Cooper Rd	c.1930
HAM0282750	OHI: Residential Domestic	Ferris House/Hosbrook House	4710 Cooper Rd	1885
HAM0673650	OHI: Unknown Use	Precise Printing Center	4677 Cooper Rd	c.1900
HAM0673550	OHI: Single Dwelling	Crossroads Christian Books/Doug Herty CPA	4675 Cooper Rd	c.1900
HAM0673350	OHI: Single Dwelling		9511 Railroad Ave	c.1890
HAM0673250	OHI: Single Dwelling		9507 Railroad Ave	c.1890
HAM0673150	OHI: Single Dwelling		9503 Railroad Ave	c.1936
HAM0673050	OHI: Single Dwelling		9499 Railroad Ave	c.1920
HAM0672950	OHI: Single Dwelling		9493 Railroad Ave	c.1910
HAM0285150	OHI: Residential Domestic		9493 Railroad Ave	1916
HAM0672850	OHI: Single Dwelling		9491 Railroad Ave	c.1910
HAM0283850	OHI: Residential Domestic	Stephenson House	4654 Hunt Rd	1900
HAM0672750	OHI: Single Dwelling		9414 Blue Ash Rd	c.1930
HAM0672650	OHI: Commercial	Peter Gregory Florists, D&J Transmissions	9201 Floral Ave	c.1940
HAM0691650	OHI: Restaurant/Bar	Johnny Knuckles Blue Bell Tavern	9012 Blue Ash Rd	c.1940
HAM0683550	OHI: Single Dwelling		8920 Blue Ash Rd	c.1930
HAM0691150	OHI: Multiple Dwelling		8948 Blue Ash Rd	c.1945
HAM0691050	OHI: Multiple Dwelling		8946 Blue Ash Rd	c.1945
HAM0690950	OHI: Single Dwelling		8908 Blue Ash Rd	c.1950
HAM0690850	OHI: Single Dwelling		8912 Blue Ash Rd	c.1930
HAM0690750	OHI: Single Dwelling		8910 Blue Ash Rd	c.1950
HAM0690650	OHI: Single Dwelling		8908 Blue Ash Rd	c.1925
HAM0690550	OHI: Single Dwelling		8906 Blue Ash Rd	c.1925
HAM0690450	OHI: Single Dwelling		8904 Blue Ash Rd	c.1925
HAM0690350	OHI: Single Dwelling		8902 Blue Ash Rd	c.1930
HAM0690050	OHI: Single Dwelling		8816 Blue Ash Rd	c.1900
HAM0689950	OHI: Single Dwelling		8814 Blue Ash Rd	c.1940
HAM0689850	OHI: Single Dwelling		8812 Blue Ash Rd	c.1930
HAM0689750	OHI: Single Dwelling		8810 Blue Ash Rd	c.1930
HAM0689650	OHI: Single Dwelling		8808 Blue Ash Rd	c.1930
HAM0689550	OHI: Single Dwelling		8806 Blue Ash Rd	c.1930

OHPO Resource Number	Resource Type	Resource Name	Address	Construction Date
HAM0689450	OHI: Single Dwelling		8804 Blue Ash Rd	c.1930
HAM0689350	OHI: Single Dwelling		8802 Blue Ash Rd	c.1930
HAM0688650	OHI: Single Dwelling		8801 Lancaster Ave	c.1900
HAM0689250	OHI: Single Dwelling		8714 Blue Ash Rd	c.1920
HAM0689150	OHI: Single Dwelling		8712 Blue Ash Rd	c.1920
HAM0689050	OHI: Single Dwelling		8710 Blue Ash Rd	c.1920
HAM0688950	OHI: Single Dwelling		8708 Blue Ash Rd	c.1920
HAM0688550	OHI: Single Dwelling		8711 Lancaster Ave	c. 1940
HAM0688450	OHI: Single Dwelling		8709 Lancaster Ave	c.1934
HAM0688350	OHI: Single Dwelling		8707 Lancaster Ave	c.1940
HAM0688850	OHI: Single Dwelling		8706 Blue Ash Rd	c.1920
HAM0688250	OHI: Church/Religious Structure	Bethlehem United Baptist	8703 Lancaster Ave	c.1950
HAM0688750	OHI: Single Dwelling		8700 Blue Ash Rd	c.1910
HAM0688150	OHI: Single Dwelling		8661 Lancaster Ave	c.1900
HAM0687750	OHI: Single Dwelling		8616 Blue Ash Rd	c.1920
HAM0414850	OHI: Single Dwelling		8661 Lancaster Ave	1900
HAM0687650	OHI: Single Dwelling		8614 Blue Ash Rd	c.1920
HAM0688050	OHI: Single Dwelling		8655 Lancaster Ave	c.1920
HAM0687550	OHI: Single Dwelling		8612 Blue Ash Rd	c.1915
HAM0687950	OHI: Single Dwelling		8653 Lancaster Ave	c.1945
HAM0687850	OHI: Single Dwelling		8651 Lancaster Ave	c.1950
HAM0416050	OHI: COMMERCIAL		8608 Blue Ash Rd	1920
HAM0416150	OHI: Single Dwelling		8606 Blue Ash Rd	1915
HAM0416250	OHI: Single Dwelling		8604 Blue Ash Rd	1915
HAM0414750	OHI: Single Dwelling		4458 Sycamore Ave	1910
HAM0687450	OHI: Other Use	Cincinnati Bell Switching Station	4515 Blue Ash Rd	c.1945
HAM0686750	OHI: Mill/Processing/Manufacturing Facility	Energy Alliances Inc, Schaffeld Woodworking	8469 Blue Ash Rd	c.1945
HAM0687350	OHI: Single Dwelling		8482 Blue Ash Rd	c.1920
HAM0415850	OHI: Single Dwelling	Eliza Ferris House	8467 Vorhees Lane	1900
HAM0686650	OHI: Single Dwelling		8465 Vorhees Ln	c.1920
HAM0686550	OHI: Single Dwelling		8463 Vorhees Ln	c.1890
HAM0415950	OHI: Single Dwelling	David Buxton House	8463 Vorhees Lane	1840

OHPO Resource Number	Resource Type	Resource Name	Address	Construction Date
HAM0686950	OHI: Commercial	Blue Ash Blues, The Ronin Academy, Deer Park Roofing	8460-8464 Blue Ash Rd	c.1920
HAM0686450	OHI: Single Dwelling	Johnson Property	4328 Kugler Mill Rd	c.1955
HAM0686850	OHI: Commercial	Railyard Café, Emerald Rock & Gift Shop, Universal	8450-8454 Blue Ash Rd	c.1920
HAM0686350	OHI: Other Use	Happy Hearts Day Care	4323 Kugler Mill Rd	c.1993
HAM0686250	OHI: Mill/Processing/Manufacturing Facility	Paragon Metal Fabricators	4317 Kugler Mill Rd	
HAM0686150	OHI: Mill/Processing/Manufacturing Facility	Max & Sons General Machine Work Inc	8401 Blue Ash Rd	
HAM0685850	OHI: Mill/Processing/Manufacturing Facility	Champion Cleaning Specialists	8391 Blue Ash Rd	
HAM0685750	OHI: Mill/Processing/Manufacturing Facility	Owens Precision Grinding/Spitzmueller Property	8383 Blue Ash Rd	c.1955
HAM0685250	OHI: Commercial	Kurtz Property/Heger Oil Company	4320 Myrtle Ave	c.1948
HAM0685550	OHI: Single Dwelling		8358 Blue Ash Rd	c.1920
HAM0685450	OHI: Single Dwelling		8356 Blue Ash Rd	c.1930
HAM0685350	OHI: Single Dwelling		8352 Blue Ash Rd	c.1920
HAM0685150	OHI: Mill/Processing/Manufacturing Facility	Sign Studio	4315 Myrtle Ave	1958
HAM0685050	OHI: Commercial	Bill's Kenwood Pool & Hot Tubs	8211 Blue Ash Rd	c.1940
HAM0691550	OHI: Single Dwelling		8208 Blue Ash Rd	c.1920
HAM0691250	OHI: Meeting Hall	Knights of Columbus Bishop Fenwick Council Hall	4421 Linden Ave	c.1970
HAM0691450	OHI: Single Dwelling	Armstrong Stationery Co	8206 Blue Ash Rd	c.1920
HAM0691350	OHI: Commercial	Blue Ash Tree Service	8204 Blue Ash Rd	c.1950
HAM0459650	OHI: Mill/Processing/Manufacturing Facility	Colvin's Corner	4298 E Galbraith Rd	1940
HAM0654250	OHI: Service Station	Herb's Machine Shop & Auto Repair	4347 E Galbraith Rd	c.1930
HAM0682750	OHI: Single Dwelling		8108 Blue Ash Rd	c.1920
HAM0419050	OHI: Single Dwelling		4600 Galbraith Rd	1900

OHPO Resource Number	Resource Type	Resource Name	Address	Construction Date
HAM0637250	OHI: Single Dwelling	Caroline Seelmeyer House/Daniel S. Logan House	7769 Kenwood Rd	1845
HAM0637050	OHI: Single Dwelling	Wiliam Hemmerle House	7500 Montgomery Rd	1870
HAM0398957	OHI: Single Dwelling	FH Miller House	5920 Stewart Rd	1900
HAM0398657	OHI: Single Dwelling	Laura Reeder House	5633 Stewart Rd	1910
HAM0398757	OHI: Single Dwelling	L. Bailey House	5529 Stewart Rd	1855
4583	OGS: Cemetery	Usual Ward Methodist Churchyard	North of Erie Avenue	1830-1850
15385	OGS: Cemetery	Dedrick Farm	Southwest of the Erie Ave and Red Bank Rd intersection	

Table 7-2B. Previously Identified Cultural Resources within 250 Feet of the Alternate Route

OHPO Resource Number	Resource Type	Resource Name	Address	Construction Date
HAM0520850	OHI: Mill/Processing/Manufacturing Facility	Alchem NC/Henry Nagel & Son/Southern States Co-operative	1 Landy Lane	1942
HAM0521150	OHI: Single Dwelling		24 W Pleasant St	1850
HAM0521450	OHI: Church/Religious Structure; Village/Twp/City Hall	Redwine Realtor/Old School Presbyterian Church	26 W Columbia Ave	1843
HAM0521550	OHI: Church/Religious Structure	Our Lady of the Sacred Heart/Ron Convalescent Home	SEC Columbia Ave & Market St	1955
HAM0521650	OHI: Church School	Our Lady of the Sacred Heart	15 W Columbia Ave	1907
HAM0521850	OHI: Single Dwelling	N/A	1418 East St	1860
HAM0522550	OHI: Single Dwelling	N/A	1411 Market St	1860
HAM0606650	OHI: Retail Store/Shop; Restaurant/Bar	Brinkman Saloon & Grocery	8794 Reading Rd	1860
HAM0529150	OHI: Unknown Use	Douglas Sterman Co	205 E Benson St	1920
HAM0604450	OHI: Single Dwelling	Eddie's Café	9184 Reading Rd	1860
HAM0501550	OHI: Single Dwelling; Barn	EB Thompson House	11802 Corney Rd	1860
HAM0525050	OHI: Mill/Processing/Manufacturing Facility	Nevison-Weiskopf Co	8740 Reading Rd	1906
HAM0527950	OHI: Retail Store/Shop	Joseph Singer Tailor Shop	1324 Market St	1880
HAM0830915	OHI: Arena/Field	Cincinnati Gardens	2249 Seymour Ave	1949
HAM0465850	OHI: Mill/Processing/Manufacturing Facility	Emerald Lumber Company/Village Flea Market	2100 Losantiville Ave	1920
HAM0412050	OHI: Single Dwelling	Sara Keeler House	7360 E Kemper Rd	1875
4746; HAM0521350	OGS: Cemetery	Lockland-Reading-Reading-Protestant-Presbyterian (Reading Lockland)	200 West Columbia Avenue	1827-Present
HA0369	OAI: Prehistoric, Unidentified Affiliation, Burial	Cunningham Site	Confidential	N/A
HA0379	OAI: Prehistoric, Unidentified Affiliation, Type Unknown	N/A	Confidential	N/A

Section 4906-5-08
Ecological Information and Compliance with Permitting Requirments

4906-5-08 ECOLOGICAL INFORMATION AND COMPLIANCE WITH PERMITTING REQUIREMENTS

(A) ECOLOGICAL MAP

Maps at a scale of 1:24,000 (1 inch = 2,000 feet) including the corridor 1,000 feet either side of the centerlines (referred to as the 2,000-foot corridor) of the Preferred and Alternate Routes are presented as Figures 7-1A through 7-1F. These maps depict the proposed pipeline alignments and land use classifications, including vegetative cover. Additionally, lakes, ponds, and/or reservoirs, abandoned or undeveloped land, wildlife areas, nature preserves, and conservation areas within the 2,000-foot corridor are identified on these maps. Figures 7-1A through 7-1F also show the proposed regulation station and valve station locations and station expansion areas. Features within 1,000 feet of the proposed routes were identified from published data and verified by the pedestrian ecological field survey. Areas of potential highly erodible soils and slopes of 12 percent or greater for both routes are depicted on Figures 8-4A through 8-4F. An ecological overview map is provided as Figure 8-1. More detailed maps at 1:7,000 scale depicting field-delineated water features are provided as Figures 8-2A through 8 2H (Preferred Route) and Figures 8-3A through 8-3J (Alternate Route).

In the discussion below, the term “survey corridor” refers to the corridor encompassing 100 feet either side of the planned disturbance area (i.e., an estimated 80-foot wide construction work area or right-of-way [ROW]), which equates to a survey corridor of 280 feet in width. This survey corridor was evaluated by CH2M’s field biologists through pedestrian field observations. The term “construction work area (CWA)” refers to the planned 80-foot corridor that will be used during the construction process (temporary equipment access, soil piles, etc.). The planned 80 foot wide CWA along the pipeline is preliminary and conceptual as of this Application submittal. The CWA will be refined once the final route is approved and detailed engineering design and construction plans commence. The use of the 80-foot CWA for purposes of this Application allows for a comparison of the various types of land use settings and sensitive ecological features that are present and the approximate extent of areas that may be disturbed during construction of either the Preferred or Alternate Route.

(B) FIELD SURVEY REPORT FOR VEGETATION AND SURFACE WATERS

The ecological field surveys along the Preferred and Alternate Routes, which included a 280-foot wide survey corridor centered along the Preferred and Alternate Route centerlines, were

conducted between April 11, 2016, and December 22, 2016, and between January 25, 2018, and February 13, 2018, by CH2M's field biologists. The results of the field surveys are presented in the following sections. Duke Energy Ohio has completed all field surveys for the Preferred and Alternate Route corridor.

The field survey work was preceded by review of published mapping, aerial photography, protected federal-listed and state-listed species, and ecological information for at least a 1,000 foot area on either side of the Preferred and Alternate Route centerlines. Map sources included USGS 7.5-minute quadrangle topographic maps, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, and U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey maps.

Published information regarding existing flora and fauna was also requested from the ODNR Department of Wildlife (DOW) Ohio Natural Heritage Program. This request included available GIS shapefiles of the location records of state-listed species within one mile of the proposed Project routes. The information provided by the ODNR-DOW on May 11, 2016, and August 8, 2016, indicated no records of federal and/or state threatened or endangered species, or species of special concern, within 1,000 feet of the Preferred and Alternate Routes (ODNR, 2016a). Copies of any future agency consultation correspondence, including from the USFWS and ODNR-DOW, regarding the Project will be provided to the OPSB case docket.

(1) Vegetative Communities, Wetlands, and Streams in Study Area

(b) Wetlands

(ii) Field-Delineated Wetlands

Forty-eight wetlands and wetland complexes totaling approximately 6.39 acres were delineated within the survey corridors (280 feet width) of the Preferred and Alternate Routes. Of this total, five wetlands are crossed by both routes at the northern end of the routes near WW Feed Station. All field-delineated wetlands are mapped on Figures 8-2A through 8-2H and Figures 8-3A through 8-3J. Detailed information on each wetland is provided in Table 8-2. The anticipated maximum acreage of wetlands within the planned construction workspace, where unavoidable, ranges from an estimated total of 0.91 acres (Alternate Route) to 1.61 acres (Preferred Route) and are summarized in Table 8-2. The potential effects to wetlands are further discussed in Section 4906-05-08(B)(3)(b).

Duke Energy Ohio is committed to further minimizing these possible wetland effects using location-specific construction methodologies that will be detailed further as the engineering design proceeds. No wetlands were identified as Category 3 (i.e., highest quality) wetlands. Two wetlands on the Preferred Route are greater than 0.5 acre and thus construction impacts would not be eligible for the U.S. Army Corps of Engineers' (USACE) general nationwide permit process, therefore Duke Energy Ohio would file for an individual permit to the USACE and the Ohio Environmental Protection Agency (OEPA) if this route were selected. The wetlands crossed by the Alternate Route are all less than 0.5 acre and would qualify under the USACE general nationwide permit process.

TABLE 8-2
Delineated Wetlands within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Wetland Identifier	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Length Crossed by Centerline (feet)[e]	Acreage within Survey Corridor[b]	Acreage within Construction Work Area[c,d]
PREFERRED ROUTE WETLANDS								
P-W001	Preferred	Sheet 8-2A and 8-3A	PFO	54.5	2	0	0.69	0.68
O-W006	Preferred	Sheet 8-2A and 8-3A	PFO	54.5	2	0	0.06	< 0.01
P-W002	Preferred	Sheet 8-2A and 8-3A	PEM	54.5	2	0	0.41	0
P-W003	Preferred	Sheet 8-2A and 8-3A	PEM	54.5	2	0	0.06	0.01
O-W002	Preferred	Sheet 8-2A and 8-3A	PEM/PFO	54.5	2	0	0.01	0
O-W-RH004	Preferred	Sheet 8-2A	PEM/PSS	18	1	12	0.04	0.02
O-W-RH005	Preferred	Sheet 8-2A	PEM	19	1	0	0.01	0
O-W009	Preferred	Sheet 8-2A	PFO	33	1 or 2 gray zone	0	< 0.01	0
O-W008	Preferred	Sheet 8-2A	PEM	26.5	1	0	0.02	< 0.01
O-W010	Preferred	Sheet 8-2A	PEM/PFO	57.5	2	0	0.11	0
O-W011	Preferred	Sheet 8-2B	PFO	57.5	2	288	1.09	0.59
0-W032	Preferred	Sheet 8-2B	PEM	27	1	0	< 0.01	0
O-W012	Preferred	Sheet 8-2B	PEM	22	1	0	< 0.01	< 0.01
O-W302	Preferred	Sheet 8-2B	PEM	10	1	0	< 0.01	0
O-W014	Preferred	Sheet 8-2B	PEM	20	1	0	0.04	0

TABLE 8-2

Delineated Wetlands within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Wetland Identifier	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Length Crossed by Centerline (feet)[e]	Acreage within Survey Corridor[b]	Acreage within Construction Work Area[c,d]
O-W015	Preferred	Sheet 8-2B	PEM	18	1	0	0.01	0
O-W016	Preferred	Sheet 8-2C	PEM	17.5	1	0	0.03	0
O-W017	Preferred	Sheet 8-2C	PEM/PSS	39	modified 2	0	< 0.01	0
O-W301	Preferred	Sheet 8-2C	PFO	28	1	0	0.69	0.14
O-W024	Preferred	Sheet 8-2C	PEM	16	1	0	0.1	0.01
O-W025	Preferred	Sheet 8-2C	PEM/PSS	26	1	0	0.03	0
O-W026	Preferred	Sheet 8-2C	PEM/PSS	33	1 or 2 gray zone	0	0.08	0.05
O-W027	Preferred	Sheet 8-2C	PEM	33	1 or 2 gray zone	0	0.01	0
O-W029	Preferred	Sheet 8-2F	PEM	16	1	37	0.05	0.05
O-W030	Preferred	Sheet 8-2F	PEM	17	1	0	0.04	0.02
BO-W100	Preferred	Sheet 8-2G	PEM	29.5	1	0	0.02	0
O-W300	Preferred	Sheet 8-2G	PEM	29	1	0	0.06	0.01
O-W100	Preferred	Sheet 8-2H	PEM	20	1	0	0.02	0
					TOTAL FOR PREFERRED ROUTE	**337 feet**	**3.73 acres**	**1.61 acres**
ALTERNATE ROUTE WETLANDS								
P-W001	Alternate	Sheet 8-2A and 8-3A	PFO	54.5	2	0	0.53	0.03
O-W006	Alternate	Sheet 8-2A and 8-3A	PFO	54.5	2	200	1.10	0.26

TABLE 8-2

Delineated Wetlands within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Wetland Identifier	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Length Crossed by Centerline (feet)[e]	Acreage within Survey Corridor[b]	Acreage within Construction Work Area[c,d]
P-W002	Alternate	Sheet 8-2A and 8-3A	PEM	54.5	2	0	0.27	0
P-W003	Alternate	Sheet 8-2A and 8-3A	PEM	54.5	2	48	0.06	0.06
O-W002	Alternate	Sheet 8-2A and 8-3A	PEM/PFO	54.5	2	0	0.01	0
P-W004	Alternate	Sheet 8-3A	PEM	29	1 or 2 gray zone	14	0.03	0.02
P-W100	Alternate	Sheet 8-3A	PEM	22	1	32	0.1	0.05
P-WRH06	Alternate	Sheet 8-3A	PEM/PSS	39	2	0	0.1	0
P-W017	Alternate	Sheet 8-3B	PSS	30	1 or 2 gray zone	0	0.02	0
P-W018	Alternate	Sheet 8-3B	PFO	37	modified 2	49	0.14	0.08
M-W001	Alternate	Sheet 8-3B	PFO	35	modified 2	0	0.05	0
P-W019	Alternate	Sheet 8-3B	PFO	42	modified 2	0	0.63	0.15
P-W020	Alternate	Sheet 8-3B	PFO	40.5	modified 2	0	0.21	0.02
P-W014	Alternate	Sheet 8-3B	PEM	25	1	142	0.11	0.11
P-W015	Alternate	Sheet 8-3B	PEM	32.5	1 or 2 gray zone	68	0.04	0.04
P-W016	Alternate	Sheet 8-3B	PSS	33	1 or 2 gray zone	6	< 0.01	< 0.01
P-WRH09	Alternate	Sheet 8-3C	PFO	19.5	1	0	0.01	0
P-WRH08	Alternate	Sheet 8-3C	PEM	18	1	14	0.13	0.02
G-WRH02	Alternate	Sheet 8-3F	PEM	17	1	0	0.01	< 0.01

TABLE 8-2

Delineated Wetlands within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Wetland Identifier	Route	Figure	Cowardin Wetland Type[a]	ORAM Score	ORAM Category	Length Crossed by Centerline (feet)[e]	Acreage within Survey Corridor[b]	Acreage within Construction Work Area[c,d]
G-WRH03	Alternate	Sheet 8-3F	PEM	22	1	2	0.01	< 0.01
G-WRH04	Alternate	Sheet 8-3F	PEM	20	1	0	< 0.01	< 0.01
G-W600	Alternate	Sheet 8-3I	PEM	16	1	0	0.09	0
G-W601	Alternate	Sheet 8-3I	PEM	16	1	0	0.05	0
G-W400a	Alternate	Sheet 8-3I	PEM	33.5	1 or 2 gray zone	0	0.02	< 0.01
G-W400b	Alternate	Sheet 8-3I	PSS	33.5	1 or 2 gray zone	0	0.09	< 0.01
G-W400c	Alternate	Sheet 8-3I	PFO	33.5	1 or 2 gray zone	0	0.03	< 0.01
G-W401	Alternate	Sheet 8-3I	PEM	27.5	1	0	0.02	0
G-W401b	Alternate	Sheet 8-3I	PSS	27.5	1	0	0.01	0
TOTAL FOR ALTERNATE ROUTE						**575 feet**	**3.87 acres**	**0.91 acres**

a Wetland Type: PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested.
b The width of the survey corridor = 280 feet wide.
c The width of the planned CWA = 80 feet wide.
d All measurements listed as < 0.01 were assumed to be 0.01 for calculations.
e All wetlands will be crossed by open cut methods, primarily because of space limitations for boring equipment.
ORAM = Ohio Rapid Assessment Method

(c) Waterbodies

(i) Field-Delineated Streams

Streams and drainage channels were delineated and evaluated during the ecological surveys of the Preferred and Alternate Route corridors. Streams with drainage areas greater than one square mile or maximum pool depths greater than 40 centimeters (cm) were assessed using the OEPA Qualitative Habitat Evaluation Index (QHEI) with a few exceptions. Mill Creek, Duck Creek and Rossmoyne Creek have been assessed by the OEPA and have assigned aquatic life use (ALU) designations to these larger streams (>1 square mile drainage area). The QHEI is one measure that is utilized by OEPA, in association with biotic sampling, to determine a stream's ALU designation in accordance with the Ohio water quality standards (OEPA, 2006). QHEI-classified streams then receive a narrative rating based upon their score:

- Score less than 30 for both headwaters and larger streams = Very Poor
- Score between 30 and 42 for headwaters, and 30 and 44 for larger streams = Poor
- Score between 43 and 54 for headwaters, and 45 and 59 for larger streams = Fair
- Score between 55 and 69 for headwaters, and 60 and 74 for larger streams= Good
- Score greater than or equal to 70 for headwaters, and 75 for larger streams = Excellent

Two streams located along the Preferred Route and one stream located along the Alternate Route, were evaluated using the Ohio QHEI method. Field personnel completed the QHEI near the proposed centerline of the pipeline crossing when possible. Streams with an existing ALU as determined by the OEPA were not scored using the QHEI due to the fact that the OEPA has performed a more detailed biological assessment and thereby assigned the appropriate ALU. These streams are Duck Creek (ALU of Limited Resource Water), Mill Creek (Warmwater Habitat), and Rossmoyne Creek (Warmwater Habitat).

The OEPA's Headwater Habitat Evaluation Index (HHEI) is used to evaluate streams with a drainage area less than or equal to one square mile, and maximum pools depths less than or equal to 40 cm (OEPA, 2012). The HHEI is generally used to assess Primary Headwater Habitat (PHWH) streams that typically fall under the classification of first or second-order streams. The HHEI rates a stream based on its physical habitat and uses that information to determine the biological potential of the stream. The physical habitats scored for the HHEI are substrate type, pool depth, and bankfull width. Scores for "Class I PHWH Streams" range from 0 to 29.9; scores for "Class II

PHWH Streams" range from 30 to 69.9; and scores for "Class III PHWH Streams" range from 70 to 100. A "Modified" qualifier may be added as a prefix to any of these classes if evidence of anthropogenic alterations, such as channelization and bank stabilization, are observed. A higher PHWH class corresponds with a more continuous flow regime. The flow regime determines the physical habitat of the stream, and is therefore indicative of the biological communities it can support.

One hundred and six (106) streams were evaluated using the Headwater Habitat Evaluation Index (HHEI) method. Seventy-four (74) of these streams were identified within the Preferred Route survey corridor and 32 within the Alternate Route survey corridor. The HHEI evaluations were completed at the proposed pipeline crossing points, if crossed by the proposed alignment.

Streams identified during the ecological surveys on the Preferred Route and Alternate Route are shown on Figures 8-2A through 8-2H and Figures 8-3A through 8-3J, respectively. Detailed information on each delineated stream is included in Table 8-3. ALU designations within the Little Miami drainage basin obtained from OAC 3745-1-09 are also provided. The Ohio River, located approximately 4.5 miles south of the Project area, is a traditionally navigable waterway (TNW) as defined by the USACE, as well as the Little Miami River located approximately 2 miles southeast of the Project area.

The Preferred Route centerline would cross 24 streams. The length of streams located within the Preferred Route survey corridor is approximately 22,569 linear feet. The Alternate Route centerline would cross six streams. Note that streams planned to be crossed by trenchless construction techniques (e.g., HDD) are not counted in the streams crossed tallies. The total length of streams located within the survey corridor of the Alternate Route is approximately 6,541 linear feet.

Approximately 4,544 linear feet of stream are located within the planned Preferred Route CWA, while approximately 733 linear feet are located within the planned Alternate Route CWA. The length of streams within the Preferred and Alternate Routes CWA considers streams that will be avoided during construction because of planned HDDs. The linear feet of each stream within the CWA is included in Table 8-3 and anticipated temporary effects to waterbodies is further discussed in Section 4906-05-08(B)(3)(c).

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
PREFERRED ROUTE												
P-S001 UNT Sharon Creek	Preferred	Sheet 8-2A and 8-3A	Perennial	8	16	HHEI	51	N/A	Modified Class II PHWH	Yes	872	91
P-S002 UNT Sharon Creek	Preferred	Sheet 8-2A and 8-3A	Intermittent	3.5	6	HHEI	53	N/A	Modified Class II PHWH	No (HDD)	899	0
P-S003 UNT Sharon Creek	Preferred	Sheet 8-2A and 8-3A	Ephemeral	2.5	2	HHEI	29	N/A	Class I PHWH	No (HDD)	95	0
P-S004 UNT Sharon Creek	Preferred	Sheet 8-2A and 8-3A	Ephemeral	1	0	HHEI	13	N/A	Class I PHWH	No (HDD)	94	0
P-S005 UNT Sharon Creek	Preferred	Sheet 8-2A and 8-3A	Perennial	8	6	HHEI	62	N/A	Modified Class II PHWH	No (HDD)	220	0
O-S007 UNT Sharon Creek	Preferred	Sheet 8-2A and 8-3A	Perennial	12	8	HHEI	69	N/A	Modified Class II PHWH	No (HDD)	88	0
O-SRH05 UNT Sharon Creek	Preferred	Sheet 8-2A	Ephemeral	3	0	HHEI	12	N/A	Modified Class I PHWH	No	73	38
O-S008 UNT Sharon Creek	Preferred	Sheet 8-2A	Intermittent	4	4	HHEI	51	N/A	Modified Class II PHWH	Yes	344	80

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S010 UNT Sharon Creek	Preferred	Sheet 8-2A	Intermittent	3	2	HHEI	30	N/A	Modified Class II PHWH	No	81	0
O-S009 UNT Sharon Creek	Preferred	Sheet 8-2B	Intermittent	3	5	HHEI	39	N/A	Modified Class II PHWH	No	439	107
O-S011 UNT Sharon Creek	Preferred	Sheet 8-2B	Intermittent	7	6	HHEI	56	N/A	Modified Class II PHWH	No	234	0
O-S013 UNT Sharon Creek	Preferred	Sheet 8-2B	Intermittent	10	3	HHEI	44	N/A	Modified Class II PHWH	No	26	0
O-S012 UNT Sharon Creek	Preferred	Sheet 8-2B	Perennial	12	16	HHEI	51	N/A	Modified Class II PHWH	Yes	707	467
O-S014 UNT Sharon Creek	Preferred	Sheet 8-2B	Ephemeral	3	2	HHEI	21	N/A	Modified Class I PHWH	No	49	27
O-S015 UNT Sharon Creek	Preferred	Sheet 8-2B	Ephemeral	3	1	HHEI	22	N/A	Modified Class I PHWH	No	225	50
O-S016 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	3	0	HHEI	17	N/A	Modified Class I PHWH	No	53	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S017 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	4	0	HHEI	15	N/A	Modified Class I PHWH	Yes	246	49
O-S018 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	3	0	HHEI	17	N/A	Modified Class I PHWH	No	41	40
O-S019 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	3	2	HHEI	19	N/A	Modified Class I PHWH	No	105	30
O-S020 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	5	5	HHEI	52	N/A	Modified Class II PHWH	Yes	535	480
O-S021 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	3	2	HHEI	31	N/A	Modified Class II PHWH	Yes	82	82
O-S022 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	3	0	HHEI	16	N/A	Modified Class I PHWH	No	116	16
O-S023 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	3	1	HHEI	22	N/A	Modified Class I PHWH	Yes	110	79
O-S024 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	4	0	HHEI	23	N/A	Modified Class I PHWH	No	170	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S025 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	2	0	HHEI	18	N/A	Modified Class I PHWH	No	162	0
O-S026 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	5	6	HHEI	49	N/A	Modified Class II PHWH	No	64	0
O-S028 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	1	0	HHEI	16	N/A	Modified Class I PHWH	Yes	85	48
O-S029 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	4	20	HHEI	51	N/A	Modified Class II PHWH	No	178	270
O-S030 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	1	0	HHEI	16	N/A	Modified Class I PHWH	Yes	94	76
O-S035 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Perennial	5	9	HHEI	62	N/A	Modified Class II PHWH	Yes	779	506
O-S034 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	4	0	HHEI	28	N/A	Modified Class I PHWH	No	990	0
O-S036 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	3	3	HHEI	33	N/A	Modified Class II PHWH	No	41	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S037 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	1	1.5	HHEI	22	N/A	Modified Class I PHWH	No	40	0
O-S038 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Intermittent	2	2	HHEI	33	N/A	Modified Class II PHWH	No	363	0
O-S039 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	1	0	HHEI	16	N/A	Modified Class I PHWH	No	48	0
O-S040 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2B	Ephemeral	5	0	HHEI	14	N/A	Modified Class I PHWH	No	24	0
O-S041 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Ephemeral	4	0	HHEI	16	N/A	Modified Class I PHWH	No (HDD)	109	0
O-S042 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Perennial	5	6	HHEI	42	N/A	Modified Class II PHWH	No (HDD)	153	0
O-S043 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Ephemeral	2	0	HHEI	16	N/A	Modified Class I PHWH	No (HDD)	56	0
O-S044 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Ephemeral	5	0	HHEI	26	N/A	Modified Class I PHWH	No (HDD)	136	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S045 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Intermittent	5	2	HHEI	32	N/A	Modified Class II PHWH	No (HDD)	90	0
BO-S004 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Perennial	15	5	QHEI	62	N/A	Good	Yes	692	80
BO-S005 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Intermittent	4	0	HHEI	39	N/A	Modified Class II PHWH	No (HDD)	134	0
BO-S006 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Intermittent	2	2	HHEI	32	N/A	Modified Class II PHWH	No (HDD)	36	0
BO-S007 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Ephemeral	2	0	HHEI	17	N/A	Class I PHWH	No (HDD)	28	0
BO-S008 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Perennial	8	11	HHEI	61	N/A	Modified Class II PHWH	No	99	0
O-S047 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Ephemeral	3	0	HHEI	18	N/A	Modified Class I PHWH	No	36	0
O-S048 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Intermittent	4	4	HHEI	51	N/A	Modified Class II PHWH	No	53	13

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S311 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Perennial	8	6	HHEI	63	N/A	Modified Class II PHWH	Yes	273	80
O-S310 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Perennial	4	3	HHEI	48	N/A	Modified Class II PHWH	Yes	125	125
O-S308 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Perennial	5	3	HHEI	53	N/A	Modified Class II PHWH	Yes	884	176
O-S060 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Intermittent	3	4	HHEI	32	N/A	Modified Class II PHWH	Yes	792	457
O-S059 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Intermittent	3	6	HHEI	38	N/A	Modified Class II PHWH	Yes	55	55
O-S061 UNT N. Branch Sycamore Creek	Preferred	Sheet 8-2C	Ephemeral	2	0	HHEI	18	N/A	Modified Class I PHWH	No	46	31
O-S063 UNT Sycamore Creek	Preferred	Sheet 8-2D	Intermittent	3	4	HHEI	38	N/A	Modified Class II PHWH	No (HDD)	598	0
O-S064 UNT Sycamore Creek	Preferred	Sheet 8-2D	Intermittent	2	4	HHEI	32	N/A	Modified Class II PHWH	No (HDD)	31	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S062 UNT Sycamore Creek	Preferred	Sheet 8-2D	Perennial	4	14	HHEI	42	N/A	Modified Class ll PHWH	No (HDD)	161	0
O-S065 UNT Sycamore Creek	Preferred	Sheet 8-2D	Intermittent	4	4	HHEI	32	N/A	Modified Class ll PHWH	No	249	249
O-S083 UNT Duck Creek	Preferred	Sheet 8-2F	Ephemeral	4	0	HHEI	17	N/A	Modified Class I PHWH	No	372	0
O-S085UNT Duck Creek	Preferred	Sheet 8-2F	Ephemeral	4	0	HHEI	26	N/A	Class I PHWH	No	108	0
O-S082 UNT East Fork Duck Creek	Preferred	Sheet 8-2F	Perennial	20	16	HHEI	69	N/A	Class ll PHWH	Yes	1,066	80
O-S088 UNT Duck Creek	Preferred	Sheet 8-2F	Intermittent	5	1.5	HHEI	43	N/A	Class II PHWH	No	154	37
O-S087 UNT Duck Creek	Preferred	Sheet 8-2F	Ephemeral	3	0	HHEI	26	N/A	Class I PHWH	Yes	289	95
O-S086 UNT Duck Creek	Preferred	Sheet 8-2F	Ephemeral	3	0	HHEI	26	N/A	Class I PHWH	Yes	253	88
O-S090 UNT Duck Creek	Preferred	Sheet 8-2F	Ephemeral	2	0	HHEI	17	N/A	Class I PHWH	No	41	0
O-S089 UNT Duck Creek	Preferred	Sheet 8-2F	Ephemeral	3	0	HHEI	27	N/A	Class I PHWH	No	67	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S108 Duck Creek	Preferred	Sheet 8-2G	Perennial	Up to 100	12	None/ OEPA Assessment	N/A	Limited Resource Water	N/A	No	2,565	0
O-S304 UNT Duck Creek	Preferred	Sheet 8-2G	Ephemeral	2	1	HHEI	34	N/A	Modified Class ll PHWH	No	19	0
O-S307 UNT Duck Creek	Preferred	Sheet 8-2G	Intermittent	7	2	HHEI	43	N/A	Modified Class ll PHWH	No	26	0
BO-S100 UNT Duck Creek	Preferred	Sheet 8-2G	Ephemeral	1	0	HHEI	33	N/A	Modified Class ll PHWH	Yes	264	76
BO-S101 UNT Duck Creek	Preferred	Sheet 8-2G	Ephemeral	8	2	HHEI	36	N/A	Modified Class ll PHWH	Yes	284	84
BO-S102 UNT Duck Creek	Preferred	Sheet 8-2G	Ephemeral	3	0	HHEI	23	N/A	Modified Class l PHWH	No	474	0
BO-S103 UNT Duck Creek	Preferred	Sheet 8-2G	Ephemeral	10	4	HHEI	52	N/A	Modified Class ll PHWH	Yes	456	91
BO-S104 Duck Creek	Preferred	Sheet 8-2G	Perennial	50+	12	None/ OEPA Assessment	N/A	Limited Resource Water	N/A	No	1,774	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
O-S301 UNT Duck Creek	Preferred	Sheet 8-2G	Ephemeral	2	2	HHEI	29	N/A	Modified Class I PHWH	Yes	268	89
O-S302 UNT Duck Creek	Preferred	Sheet 8-2G	Ephemeral	2	1	HHEI	17	N/A	Modified Class I PHWH	No	20	0
BO-S105 UNT Duck Creek	Preferred	Sheet 8-2G	Ephemeral	10	2	HHEI	52	N/A	Modified Class II PHWH	No	94	18
BO-S106 UNT Duck Creek	Preferred	Sheet 8-2G	Intermittent	25	6	QHEI	38	N/A	Poor	No	36	0
O-S300 Duck Creek	Preferred	Sheet 8-2H	Intermittent	20	12	None/ OEPA Assessment	N/A	Limited Resource Water	N/A	Yes	331	84
										TOTAL FOR THE PREFERRED ROUTE	**22,569 feet**	**4,544 feet**
ALTERNATE ROUTE												
O-S004 UNT Sharon Creek	Alternate	Sheet 8-3A	Intermittent	4	8	HHEI	42	N/A	Modified Class II PHWH	No	211	0
P-S001 UNT Sharon Creek	Alternate	Sheet 8-3A	Perennial	8	16	HHEI	51	N/A	Modified Class II PHWH	Yes	937	87

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
P-S002 UNT Sharon Creek	Alternate	Sheet 8-2A and 8-3A	Intermittent	3.5	6	HHEI	53	N/A	Modified Class II PHWH	No (HDD)	899	0
P-S003 UNT Sharon Creek	Alternate	Sheet 8-2A and 8-3A	Ephemeral	2.5	2	HHEI	29	N/A	Class I PHWH	No (HDD)	95	0
P-S004 UNT Sharon Creek	Alternate	Sheet 8-2A and 8-3A	Ephemeral	1	0	HHEI	13	N/A	Class l PHWH	No (HDD)	94	0
P-S005 UNT Sharon Creek	Alternate	Sheet 8-2A and 8-3A	Perennial	8	6	HHEI	62	N/A	Modified Class II PHWH	No (HDD)	223	0
O-S007 UNT Sharon Creek	Alternate	Sheet 8-2A and 8-3A	Perennial	12	8	HHEI	69	N/A	Modified Class ll PHWH	No (HDD)	86	0
P-S006 UNT Sharon Creek	Alternate	Sheet 8-3A	Intermittent	4	4	HHEI	31	N/A	Modified Class ll PHWH	No	165	3
P-SRH06 UNT Sharon Creek	Alternate	Sheet 8-3A	Intermittent	8	4	HHEI	43	N/A	Modified Class II PHWH	No	144	4
P-S030 UNT Sharon Creek	Alternate	Sheet 8-3B	Perennial	5	6	HHEI	52	N/A	Modified Class ll PHWH	Yes	82	78

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
P-S031 UNT Sharon Creek	Alternate	Sheet 8-3B	Ephemeral	3	3	HHEI	31	N/A	Class II PHWH	No	103	0
P-S032 UNT Sharon Creek	Alternate	Sheet 8-3B	Ephemeral	3	0	HHEI	16	N/A	Class I PHWH	No	51	26
P-S025 UNT Sharon Creek	Alternate	Sheet 8-3B	Intermittent	3	2	HHEI	19	N/A	Modified Class I PHWH	Yes	146	146
P-S026 UNT Sharon Creek	Alternate	Sheet 8-3B	Intermittent	4	4	HHEI	41	N/A	Modified Class II PHWH	No	50	50
P-S027 UNT Sharon Creek	Alternate	Sheet 8-3B	Perennial	5	4	HHEI	63	N/A	Modified Class II PHWH	No	89	21
P-S028 UNT Sharon Creek	Alternate	Sheet 8-3B	Ephemeral	4	0	HHEI	13	N/A	Modified Class I PHWH	Yes	31	31
P-S029 UNT Sharon Creek	Alternate	Sheet 8-3B	Intermittent	3	5	HHEI	40	N/A	Modified Class II PHWH	No	177	46
P-S022 UNT Sharon Creek	Alternate	Sheet 8-3B	Ephemeral	3	0	HHEI	16	N/A	Class I PHWH	No	29	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
P-S016 UNT Sharon Creek	Alternate	Sheet 8-3C	Intermittent	5	3	HHEI	54	N/A	Modified Class ll PHWH	No	15	0
P-S015 UNT Sharon Creek	Alternate	Sheet 8-3C	Perennial	4	8	HHEI	61	N/A	Modified Class ll PHWH	No	234	0
P-S014 UNT Sharon Creek	Alternate	Sheet 8-3C	Ephemeral	6	0	HHEI	25	N/A	Modified Class l PHWH	No	23	0
P-SRH13 UNT N. Branch Sycamore Creek	Alternate	Sheet 8-3C	Intermittent	9	3	HHEI	48	N/A	Modified Class II PHWH	No	86	0
M-S001 UNT Mill Creek	Alternate	Sheet 8-3E	Intermittent	8	12	HHEI	68	N/A	Modified Class II PHWH	No	283	0
M-S002 UNT Mill Creek	Alternate	Sheet 8-3E	Intermittent	3	1	HHEI	29	N/A	Modified Class I PHWH	No	54	0
G-SRH01 UNT Mill Creek	Alternate	Sheet 8-3E	Intermittent	8	10	HHEI	39	N/A	Modified Class ll PHWH	No	236	2
G-SRH02 UNT Mill Creek	Alternate	Sheet 8-3E	Ephemeral	8	8	HHEI	58	N/A	Modified Class ll PHWH	No (HDD)	120	0

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
G-SRH03 Mill Creek	Alternate	Sheet 8-3E	Perennial	30+	>36	None/ OEPA Assessment	N/A	Warmwater Habitat	N/A	No (HDD)	280	0
G-SRH04 UNT Mill Creek	Alternate	Sheet 8-3F	Ephemeral	3	0	HHEI	24	N/A	Modified Class l PHWH	Yes	250	137
G-SRH05 Rossmoyne Creek	Alternate	Sheet 8-3G	Perennial	20+	14	None/ OEPA Assessment	N/A	Warmwater Habitat	N/A	No (HDD)	230	0
G-SRH06 Mill Creek	Alternate	Sheet 8-3G	Perennial	30+	>36	None/ OEPA Assessment	N/A	Warmwater Habitat	N/A	No (HDD)	415	0
G-SRH08 UNT Mill Creek	Alternate	Sheet 8-3H	Intermittent	9	6	HHEI	63	N/A	Modified Class ll PHWH	Yes	203	93
M-S003 UNT Mill Creek	Alternate	Sheet 8-3H	Intermittent	6	3	HHEI	43	N/A	Modified Class ll PHWH	No	87	0
G-S404 UNT Mill Creek	Alternate	Sheet 8-3I	Perennial	20	33	QHEI	66	N/A	Good	No	161	0
G-S400 UNT Mill Creek	Alternate	Sheet 8-3I	Ephemeral	2	0	HHEI	11	N/A	Modified Class I PHWH	No	174	9

TABLE 8-3
Streams within the Preferred and Alternate Route Environmental Survey Corridor and Construction Work Area

Stream ID / Waterbody Name	Route	Figure	Flow Regime	Top of Bank Width (feet)	Maximum Pool Depth (inches)	Form	Score	OEPA Aquatic Life Use Designation	PHWH Class (HHEI)/ Narrative Rating (QHEI)	Crossed by Centerline[c]	Length (linear feet) within Survey Corridor[a]	Length (linear feet) within Construction Work Area[b]
G-S401 UNT Mill Creek	Alternate	Sheet 8-3I	Ephemeral	3	0	HHEI	21	N/A	Modified Class I PHWH	No	65	0
G-S402 UNT Mill Creek	Alternate	Sheet 8-3I	Ephemeral	1	0	HHEI	14	N/A	Modified Class I PHWH	No	13	0
TOTAL FOR THE ALTERNATE ROUTE											**6,541 feet**	**733 feet**

a The width of the survey corridor was 280 feet wide.

b The width of the planned CWA = 80 feet wide.

c Unless noted in the "Crossed by Centerline" column, the planned crossing method is open cut trench (which is described in Section 4906-5-05 (B) of this Application).

ID = identification

N/A = not applicable

PHWH = Primary Headwater Habitat

QHEI = Qualitative Habitat Evaluation Index

UNT = unnamed tributary

(ii) Lakes, Ponds, and Reservoirs

No major lakes or reservoirs were observed along the proposed Preferred or Alternate Routes. Three ponds totaling 0.24 acre were identified during the field evaluation along the Preferred Route. Ten ponds totaling 2.80 acres were identified along the Alternate Route. Ponds within the survey corridors are shown on Figures 8-2A through 8-2H and Figures 8-3A through 8-3J and are summarized in Table 8-4.

Impacts to ponds from construction, operation, or maintenance of the proposed pipeline are not anticipated. Best management practices (BMPs) to control soil erosion and sedimentation, including utilization of silt fencing, filter sock, etc., will be used as appropriate during construction to minimize runoff siltation.

TABLE 8-4
Delineated Ponds within the Preferred Route and Alternate Route Environmental Survey Corridors

Pond ID	Route	Figure	Acreage within Survey Corridor	Acreage within Construction Work Area[a,b]	Linear Feet Crossed by Centerline [a,b]
O-P003	Preferred	8-2D	0.06	0.05	0
O-P300	Preferred	8-2D	0.12	0.01	0
O-P000	Preferred	8-2F	0.06	0	0
		Total:	**0.24**	**0.06**	**0**
M-P002	Alternate	8-3B	0.57	0	0
P-P100	Alternate	8-3C	1.27	0.12	0
P-401	Alternate	8-3C	< 0.01	0	0
P-P001	Alternate	8-3C	0.27	0	0
M-P003	Alternate	8-3C/D	0.07	0	0
PRH01	Alternate	8-3E	0.08	0	0
PRS02	Alternate	8-3E	0.05	0.02	0
PRH03	Alternate	8-3F	0.06	0	0
PRH04	Alternate	8-3F	0.09	0	0
M-P001	Alternate	8-3F	0.33	0	0
		Total:	**2.80**	**0.14**	**0**

a "0" indicates the pond is not within the construction work area or crossed by the proposed centerline.

b All measurements listed as <0.01 were assumed to be 0.01 for calculations.

(3) Construction Impacts on Vegetation and Surface Waters

(h) Construction Impacts on Vegetation

The following discussion describes the potential effects on woody and herbaceous vegetation along the proposed routes during construction.

Preferred Route: The plant communities that would be most affected by construction of the Preferred Route are herbaceous plants (e.g., grasses, etc.), shrubs, and trees associated with residential areas, woodlots, industrial areas, commercial areas, institutional areas, and recreation areas. Approximately 27,557 linear feet (46.8 acres) of the Preferred Route CWA crosses industrial/commercial/institutional areas, approximately 10,146 linear feet (21.1 acres) crosses woodlots, and approximately 10,808 linear feet (18.2 acres) crosses recreation areas (see Tables 7-3 and 7-4). Given that the CWA will be approximately 80 feet wide (maximum based on preliminary plans), the effects to vegetation are not expected to have a significant cumulative effect on vegetation communities within any localized section of the pipeline route. Although the cumulative acreage of woodlots in the planned CWA is an estimated 21.1 acres, the effects from this clearing would occur over the length of the 13.9 miles of the pipeline route. Duke Energy Ohio recognizes the importance of trees, shrubs, and other vegetation to landowners and, where removal of such vegetation is necessary, Duke Energy Ohio will only remove trees, shrubs, etc. that are essential for construction and operation of the pipeline.

Alternate Route: The plant communities that would be most affected by construction of the Alternate Route are herbaceous plants (e.g., grasses, etc.), shrubs, and trees associated with residential areas, woodlots, industrial areas, commercial areas, institutional areas, and recreation areas. Approximately 28,365 linear feet (47.8 acres) of the Alternate Route CWA crosses industrial/commercial/ institutional areas, approximately 7,538 linear feet (17.1 acres) crosses woodlots, and approximately 4,582 linear feet (7.9 acres) crosses recreation areas (see Tables 7-3 and 7-4). In general, the same level of effects to vegetation communities along the Preferred Route discussed above apply to the Alternate Route as well. The woodlot acreage to be cleared for the Alternate Route would be approximately 19 percent less than for the Preferred Route. Duke Energy Ohio recognizes the importance of trees, shrubs, and other vegetation to landowners and, where removal of such vegetation is necessary, Duke Energy Ohio will only remove trees, shrubs, etc. that are essential for construction and operation of the pipeline.

(i) Construction Impacts on Wetlands

Preferred Route: Twenty-nine (presumed jurisdictional) wetlands were identified along the Preferred Route survey corridor. Three wetlands are crossed by the centerline of the Preferred Route and 1.61 acres are within the proposed CWA. More detailed information about each feature can be found in Table 8-3 in Section 4906-05-08(B)(1)(b)(ii). It is not anticipated that any vegetation clearing activities adjacent to wetlands will result in significant erosion and water quality degradation. As required, woody vegetation in or near wetlands will be hand-cut by chain saws rather than large machinery to the extent possible. Timber mats will be utilized as necessary for vehicles or equipment to cross through any wetland. It is expected that the use of construction equipment within wetland areas can be minimized as numerous access points are along the proposed route from existing roads and other paved surfaces.

Some palustrine forested (PFO) wetlands along the Preferred Route, up to an estimated 1.42 acres, would be converted to palustrine emergent (PEM) wetlands once the trees are removed for construction within the planned 80-foot wide CWA. Emergent wetland areas will be seeded following the completion of construction activities and will be permitted to re-establish as functional wetlands.

Removal of vegetation debris adjacent to wetlands would be accomplished by hand, by using timber matting under standard equipment, or using low-pressure rubber-wheeled vehicles, or vehicles equipped rubber tracks.

Alternate Route: Twenty-eight (presumed jurisdictional) wetlands were identified along the Alternate Route. Ten wetlands are crossed by the centerline of the Alternate Route and 0.91 acres are within the proposed CWA. Detailed information about each feature can be found in Table 8-3 in Section 4906-05-08(B)(1)(b)(ii). The same vegetation clearing and construction equipment access precautions described above for the Preferred Route applies to the Alternate Route.

Some PFO wetlands along the Alternate Route, up to an estimated 0.55 acre, would be converted to PEM wetlands once the trees are removed for construction within the planned 80-foot wide CWA. Emergent wetland areas will be seeded following the completion of construction activities and will be permitted to re-establish as functional wetlands.

(j) Construction Impacts on Waterbodies

The Preferred Route centerline crosses 24 streams. The Alternate Route centerline crosses six streams. Construction effects on these features are included in Table 8-3 and further discussed in Section 4906-05-08(B)(3)(c). Horizontal directional drilling or other boring techniques will be used to install the pipeline beneath selected streams. Table 8-3 includes the crossing method for each stream, most of which will be open cut trench because of the relatively small size of streams.

Approximately 4,544 linear feet of stream are located within the planned Preferred Route CWA, while approximately 733 linear feet are located within the planned Alternate Route CWA.

(D) SITE GEOLOGY

(1) Site Geology

Both the Preferred and Alternate Route corridors occur within the Till Plain section of the Central Lowland physiographic region (Fenneman and Johnson, 1946). The Illinoian Till Plain region of the Till Plain section is characterized by rolling ground moraine of older till generally lacking ice-constructional features such as moraines, kames, and eskers (ODGS, 1998). Bedrock geology beneath both routes consists primarily of Ordovician-aged shale and limestones of the Grant Lake and Fairview Formations, Miamitown Shale, Undivided; Kope Formation; Waynesville and Arnheim Formations, Undivided; and Point Pleasant Formation (USGS, 2014).

Approximately 61 percent of the Preferred Route occurs within the Grant Lake and Fairview Formation, Miamitown Shale, undivided; 15 percent within the Kope Formation; 12 percent within the Point Pleasant Formation; and 12 percent within the Waynesville and Arnheim Formations, undivided (ODGS, 2005).

Approximately 38 percent of the Alternate Route occurs within the Grant Lake and Fairview Formation, Miamitown Shale, undivided; 39 percent within the Kope Formation; 17 percent within the Point Pleasant Formation; and 6 percent within the Waynesville and Arnheim Formations, undivided (ODGS, 2005).

(2) Slope and Foundation Soil Suitability

Landslides can be an issue in the Cincinnati area. However, landslides can be predictable as they are typically caused by inherent geologic conditions. The presence of one or more of the following conditions can cause potential landslide issues: steep slopes, jointed rocks, fine-grained, permeable rock or sediment, clay or shale units subject to lubrication, and the introduction of

large amounts of water. Additionally, one or more of the following triggering mechanisms are generally required to initiate downslope movement: vibrations, over-steepened slope, increased weight on the crown of a slope, and removal of vegetation (ODGS, 1995).

If bedrock slope failure occurs, Ordovician bedrock in Hamilton County generally experiences rotational slumps and earthflows. The majority of bedrock slope failures occur in the shale-dominated Kope Formation or the Miamitown Shale, to a lesser degree. Landslides tend to occur in the thick colluvium developed on these units when excessive hydrostatic pressure builds up in the colluvium (ODGS, 1995). Approximately 61 percent of the Preferred Route occurs within the Miamitown Shale and 15 percent within the Kope Formation. Approximately 38 percent of the Alternate Route occurs within the Miamitown Shale and 39 percent within the Kope Formation.

Landslides are not anticipated to be an issue during Project construction. As discussed in the following subsections, slopes are relatively shallow along both the Preferred and Alternate Routes and no areas along either route are rated as having "severe" potential for erosion.

(a) Slopes

Approximately 11 percent of the Preferred Route centerline traverses land where slopes exceed 12 percent. Slopes exceeding 12 percent occur along approximately 9 percent of the Alternate Route centerline.

During construction, Duke Energy Ohio will implement a SWPPP and associated BMPs as necessary to control erosion and sedimentation in areas with slopes exceeding 12 percent. Once construction is complete, soils will be revegetated and stabilized. As a result, no erosional impacts resulting from slopes exceeding 12 percent are expected.

Figures 8-4A through 8-4F illustrates areas having greater than 12 percent slope as well as the soil erodibility ratings.

(b) Erosion Potential

Erosion is the detachment and movement of soil material and may be natural or accelerated by human activity. Depending on the local landscape and weather conditions, erosion may be very slow or very rapid (USDA NRCS, 1993). The NRCS rates erosion hazard both verbally and numerically. For the soil types crossed by the routes, the hazard is described as "slight," "moderate," and "severe" for roads/trails. The ratings in this interpretation indicate the hazard of

soil loss from off-roads and off-trail areas. The ratings are based on soil erosion factor K and slope. These terms are defined in Table 8-6.

TABLE 8-6
NRCS Erosion Hazard Verbal Classification for Soils Crossed by the Preferred and Alternate Route

NRCS Erosion Hazard Classification	Definition
Slight	Little or no erosion is likely under ordinary climatic conditions.
Moderate	Indicates that some erosion is likely and that erosion-control measures may be needed.
Severe	Indicates that erosion is very likely, and that erosion-control measures are advised.

Source: USDA NRCS, 2016

Water erosion results from the removal of soil material by flowing water and is dependent upon a number of site-specific factors, including soil erodibility factor, topography (slope steepness and length), rainfall, and crop management and conservation practices. Wind erosion can occur in regions of low rainfall or areas experiencing low rainfall, especially during periods of drought. Wind erosion generally is not related to the slope gradient, and wind erosion hazard is increased by removing or reducing the vegetation (USDA NRCS, 1993).

TABLE 8-7
Soil Erosion Hazard Results for the Project

Route	Erosion Hazard	Total Length Along Proposed Route (miles)	Percent of Route
Preferred	Moderate	0.51	3.6%
	Slight	2.17	15.5%
	Not Rated	11.32	80.9%
Alternate	Moderate	0.10	0.7%
	Slight	3.29	25.5%
	Not Rated	9.53	73.8%

Source: USDA NRCS, 2016

None of the soils crossed by the Preferred Route are classified as having a severe erosion hazard and 3.6 percent have a moderate erosion hazard ranking. The remainder of the Preferred Route has an erosion hazard that is either slight or not rated. None of the soils crossed by the Alternate Route are classified as having severe erosion hazard and approximately 0.7 percent have a moderate erosion hazard ranking. The remainder of the Alternate Route has slight susceptibility to erosion or were not rated by the NRCS.

To decrease the occurrence of bedrock slope failure and reduce the erosion hazard potential, subsurface disturbance along the pipeline route will be limited to the trench line. Appropriate engineering slope protections, including trench breakers, will be installed during construction to help limit subsurface water volumes, erosion, and velocities and the associated potential for slope failures. In addition, post-construction surface slope breakers (*i.e.*, water bars) will be installed on steep slopes to help prevent similar surface water runoff issues. Any slope failures that occur as a result of the Project will be promptly corrected by Duke Energy Ohio.

Section 4906-5-08
Figures

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WW Feed Station

Highpoint Regulation Station (Proposed)

Figure 8-2A and 8-3A

Figure 8-3B

Figure 8-2B

Figure 8-3C

Figure 8-3D

Figure 8-3E

Figure 8-3F

Figure 8-3G

Figure 8-2C

Figure 8-2D

Figure 8-3H

Figure 8-2E

Figure 8-3I

Figure 8-2F

Figure 8-3J

Norwood Regulation Station (Proposed)

Figure 8-2G

Figure 8-2H

Fairfax Regulation Station (Preferred Route, Proposed)

LEGEND:

- Stations (Existing and Proposed)
- Preferred Route
- Alternate Route
- Existing Line V
- Figure Key

BASE MAP SOURCE:
USGS 7.5-minute Topographic Quadrangle
Cincinnati East 1982, Glendale 1982
Madeira 1983, Mason 1982

0 5,000 10,000

Scale In Feet

N

DUKE ENERGY

C314V Central Corridor Pipeline Extension Project

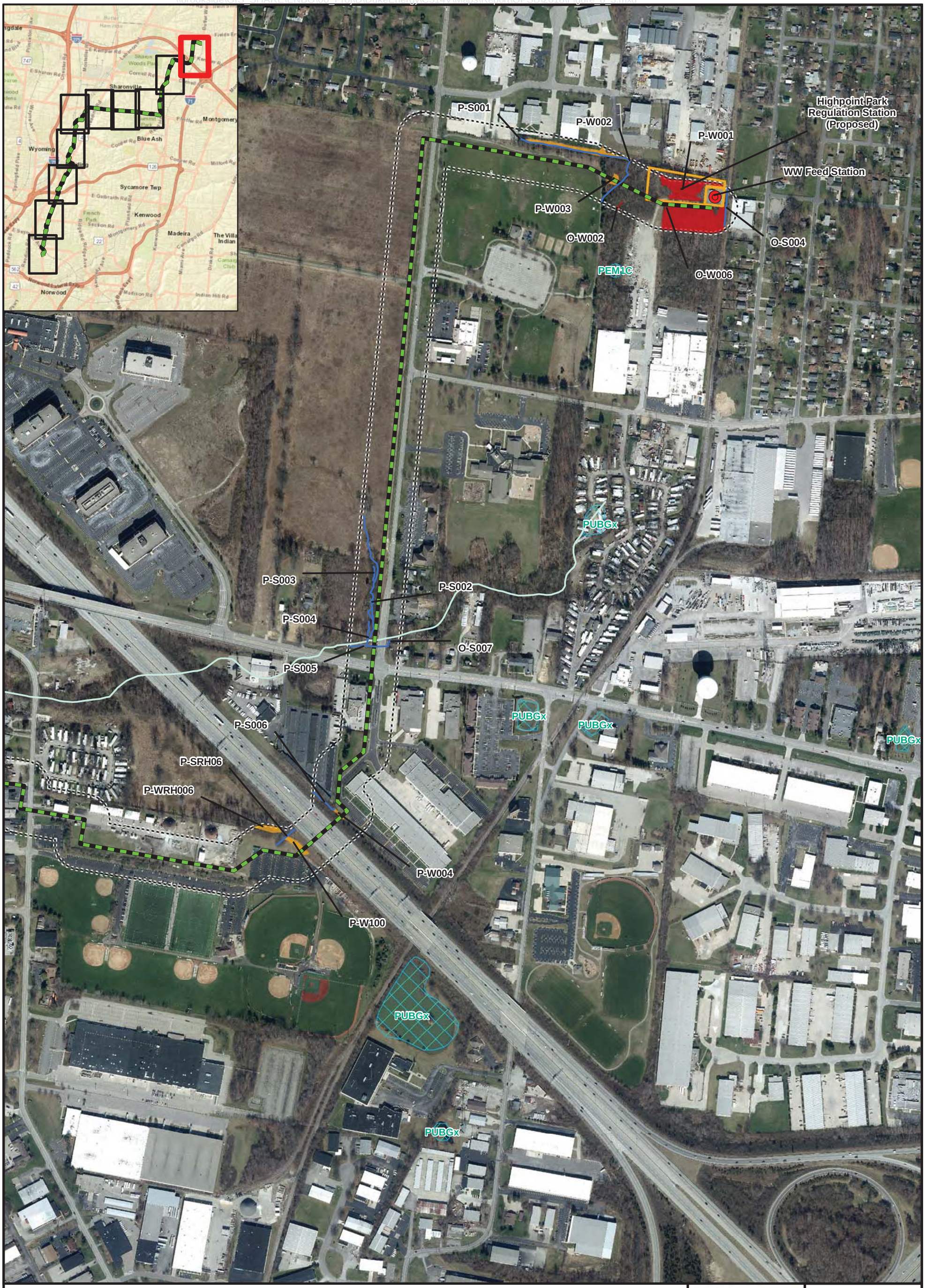
FIGURE 8-1
ECOLOGY INDEX MAP

PN: 672247

CREATED BY: SA

REVIEWED BY:JJ

ch2m



LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

DUKE ENERGY.

C314V Central Corridor Pipeline Extension Project

FIGURE 8-3A
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247
CREATED BY: MV
REVIEWED BY: JJ

ch2m.

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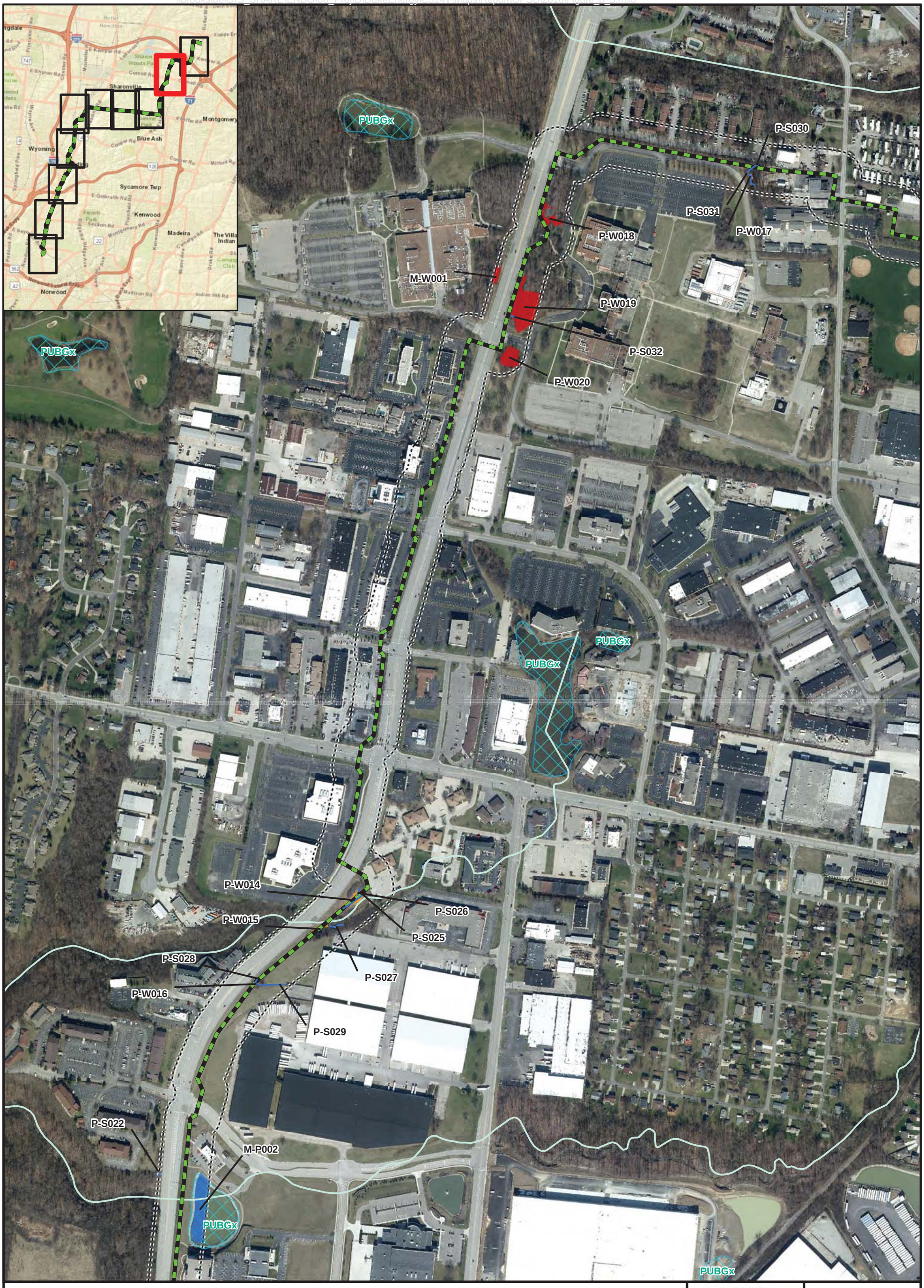


LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

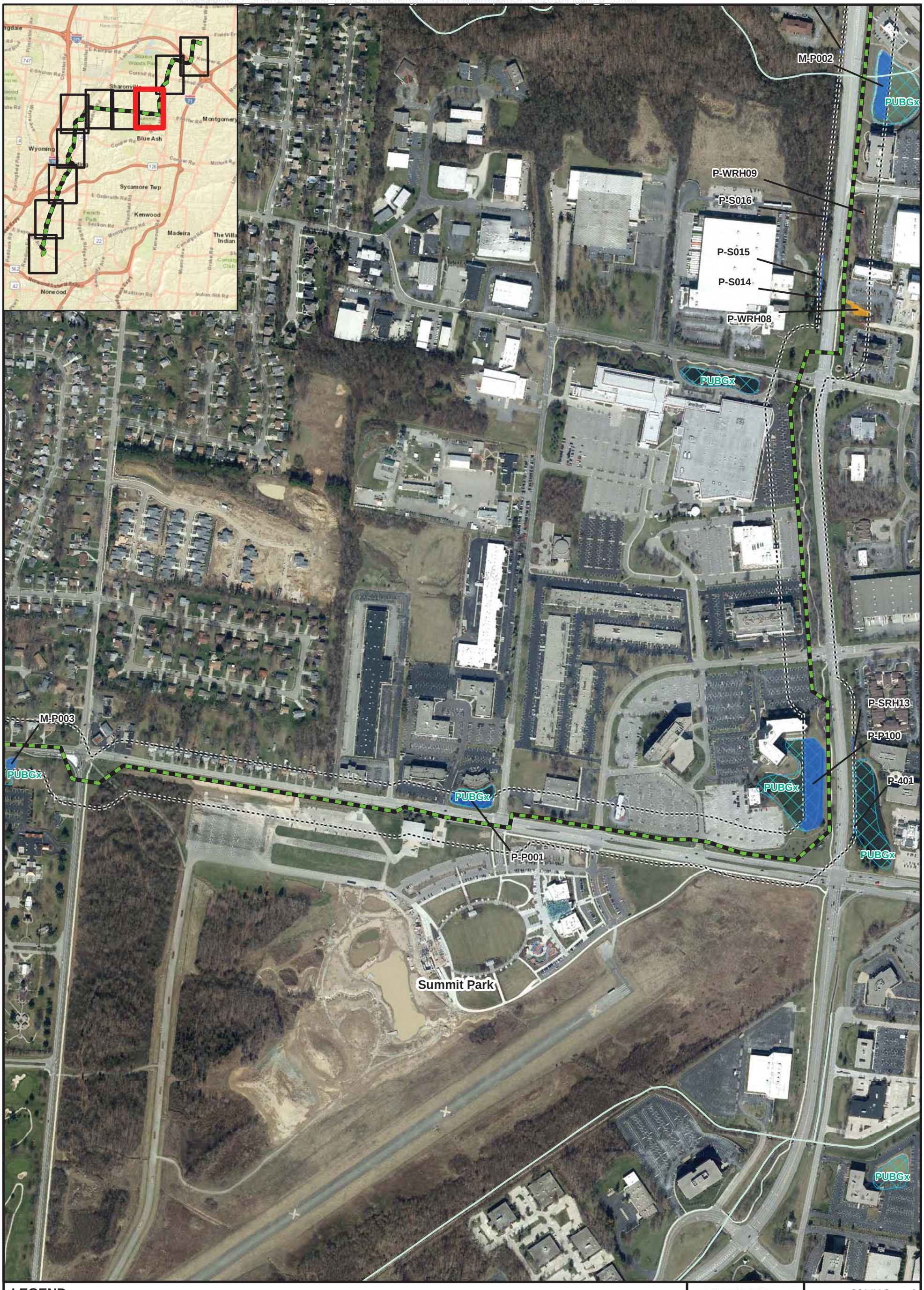
DUKE ENERGY.

C314V Central Corridor Pipeline Extension Project

FIGURE 8-3B
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247
CREATED BY: MV
REVIEWED BY: JJ

ch2m:



LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

DUKE ENERGY

C314V Central Corridor Pipeline Extension Project

FIGURE 8-3C
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247
CREATED BY: MV
REVIEWED BY: JJ

ch2m

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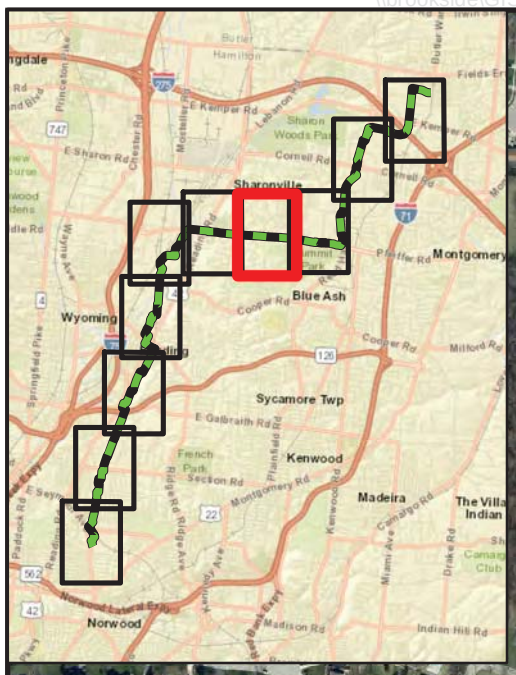

PUBGh
M-S002
M-S001
M-P003
PUBGx
PUBGh

LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

DUKE ENERGY.

C314V Central Corridor Pipeline Extension Project

FIGURE 8-3D
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247
CREATED BY: MV
REVIEWED BY: JJ

ch2m:

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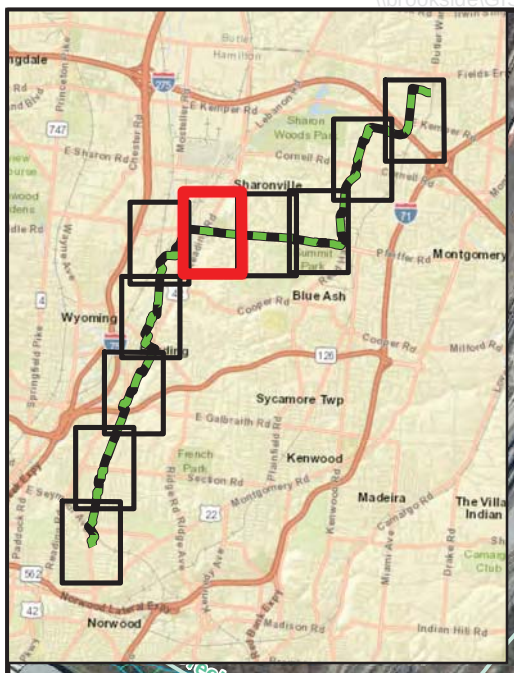

Sharon Creek
Mill Creek
G-SRH03
PRS02
PRH01
G-SRH02
G-SRH01
M-S002
M-S001
R2UBH
PUBGx
PEM1Fh

LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

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C314V Central Corridor Pipeline Extension Project

FIGURE 8-3E
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247
CREATED BY: MV
REVIEWED BY: JJ

ch2m:

LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

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C314V Central Corridor Pipeline Extension Project

FIGURE 8-3F
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247
CREATED BY: MV
REVIEWED BY: JJ

ch2m:

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LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

DUKE ENERGY.

C314V Central Corridor Pipeline Extension Project

FIGURE 8-3G
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

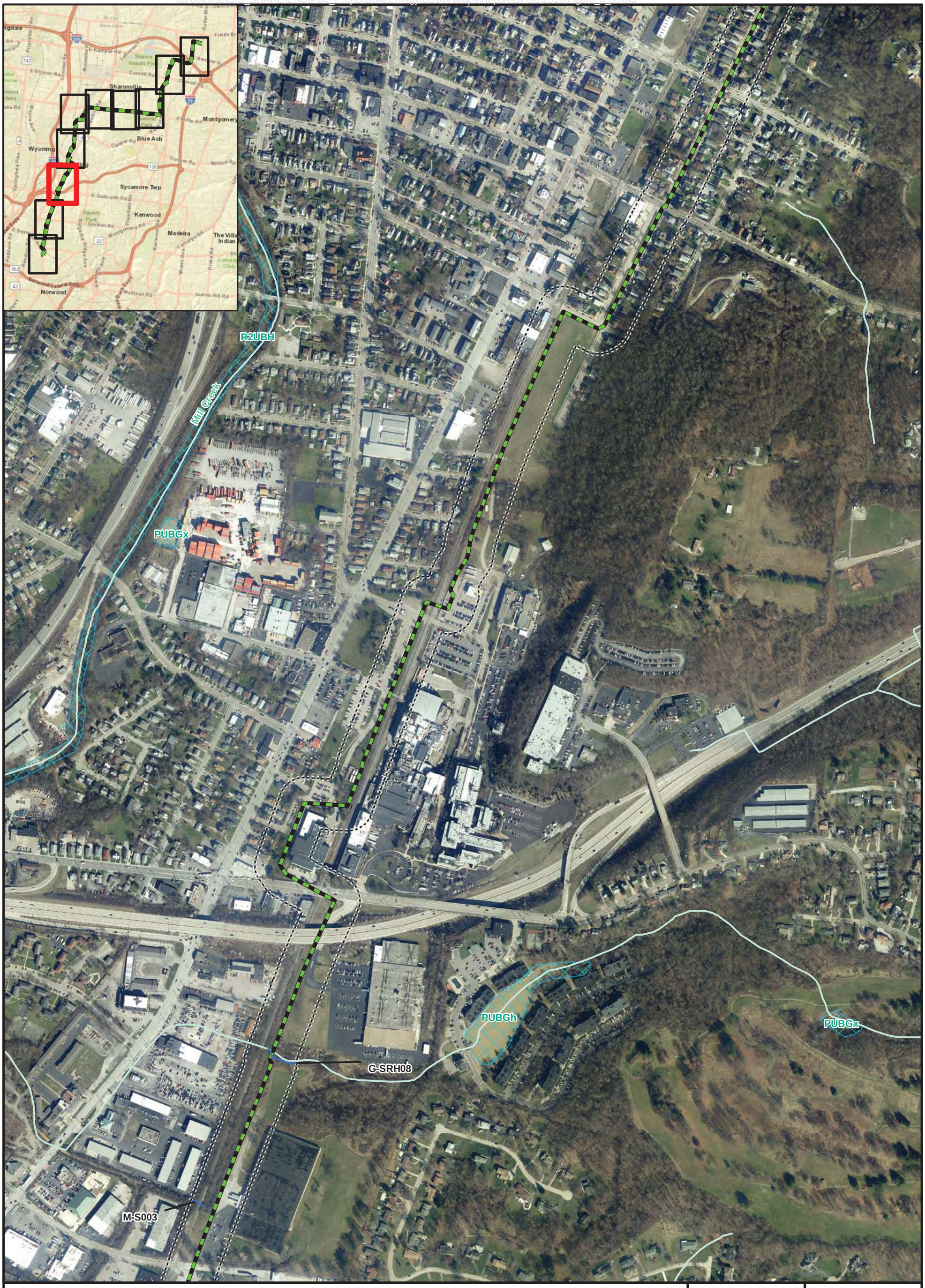
PN: 672247

CREATED BY: MV

REVIEWED BY: JJ

ch2m:

\\brookside\GIS_SHARE\ENBG\00_Proj\D\DukeEnergy\C314V\Maps\Report\OPSB\2018\Figure_8_3.mxd



LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

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FIGURE 8-3H
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247

CREATED BY: MV

REVIEWED BY: JJ

ch2m.

LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

DUKE ENERGY.

C314V Central Corridor Pipeline Extension Project

FIGURE 8-3I
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247
CREATED BY: MV
REVIEWED BY: JJ

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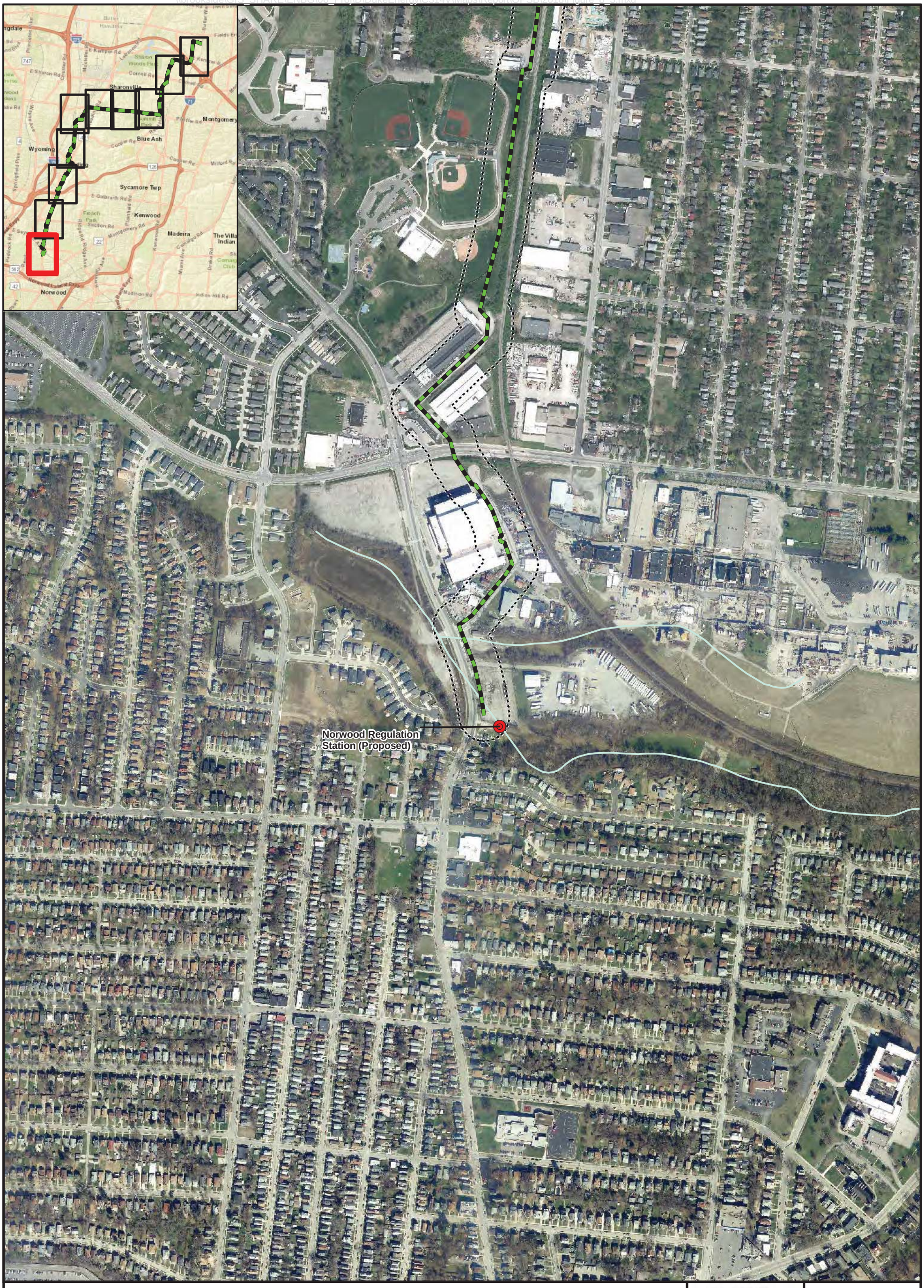

LEGEND:

- Station
- Alternate Route
- Ecological Field Survey Corridor - 280 feet wide
- Delineated Stream
- NHD Stream
- NWI Wetland
- Stations
- Delineated Pond

Delineated Wetlands

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub Shrub

BASE MAP SOURCE:
CAGIS, 2017 Aerial

SPATIAL DATA SOURCES:
NHD Streams - National Hydrography Dataset
NWI Wetlands - US Fish and Wildlife Service

0 500 1,000
Scale In Feet

N

DUKE ENERGY.

C314V Central Corridor Pipeline Extension Project

FIGURE 8-3J
ALTERNATE ROUTE
WETLAND AND WATERBODIES
DELINEATION MAP

PN: 672247
CREATED BY: MV
REVIEWED BY: JJ

ch2m.