

**APPENDIX D**

**NEPA/404 CONCURRENCE POINT #4 MATERIALS**

**Table D-1**  
**US 74 SHELBY BYPASS EIS (R-2707)**  
**Concurrence Point #4 - Avoidance and Minimization**  
**Proposed Resolution of Comments from 1/4/01 Field Review and 1/17/01 Concurrence Point #4 Meeting**  
**Revised September 21, 2004**

Issue #	Approx. Station	Affected Feature(s) (Wetland, DFHL, Stream)	Comment/Request	Proposed Action(s)					Reason/Clarification	Net Avoidance/Minimization <sup>a</sup>		
				No Action on Design Concept	Implement Design Concept as Proposed	Implement/Incorporate Alternate Plan	Correct as Appropriate	Defer/Implement Later		ROW Limits	Construction Limits	Feature
1	207+00	Stream # 2-21 Wetland Sites # 15 and 16	Investigate bridging.	X					A 140-foot bridge would be required, which would have a net cost of approximately \$679,180 (see "Costs" table).	N/A	N/A	N/A
2	223+00	Stream # 2-27	Investigate bridging.	X					A 200-foot bridge would be required, which would have a net cost of approximately \$805,750 (see "Costs" table).	N/A	N/A	N/A
3	266+00	Stream # 3-2	Use 2:1 fill slopes to minimize impact; consider using as on-site mitigation.		X			X	Use of 2:1 slopes is feasible and will reduce linear stream impacts. (Note: 2:1 were used originally, so no change.) Defer mitigation discussions until later.	N/A <sup>b</sup>	N/A <sup>b</sup>	N/A <sup>b</sup>
4	280+00	Stream # 3-5	Use 2:1 fill slopes to minimize impact; consider using as on-site mitigation.		X			X	Use of 2:1 slopes is feasible and will reduce linear stream impacts. (Note: 2:1 were used originally, so no change.) Defer mitigation discussions until later.	N/A <sup>b</sup>	N/A <sup>b</sup>	N/A <sup>b</sup>
5	295+00	Stream # 3-6	Adjust fill slopes and minimize impacts.		X				Use of 2:1 slopes is feasible and will reduce linear stream impacts. (Note: 2:1 were used originally, so no change.)	N/A <sup>b</sup>	N/A <sup>b</sup>	N/A <sup>b</sup>
6	295+00	DFHL Site # 7	Possible use as mitigation.					X	Defer until later mitigation discussions.	N/A	N/A	N/A
7	305+00	DFHL Site # 8	Possible use as mitigation.					X	Defer until later mitigation discussions.	N/A	N/A	N/A
8	320+00	Wetland Site # 22A	Expand to Brushy Creek and use as mitigation.					X	Defer until later mitigation discussions.	N/A	N/A	N/A
9	330+00	Wetland Site # 22B	May be inaccurately located on plans.				X		It was determined that Wetland Site #22B should be left in previously established location.	N/A	N/A	N/A
10	340+00	Stream # 3-9 (Brushy Creek)	Need to stabilize banks; should cut trees at base (root wads) to help stabilize banks.					X	Implement during construction.	N/A <sup>c</sup>	N/A <sup>c</sup>	N/A <sup>c</sup>
11	345+00	DFHL Site # 9 Stream # 3-9 (Brushy Creek) Stream # 3-10 (Also affects Stream # 4-4)	Reconfigure NC 226 interchange to avoid/minimize impacts to Stream 3-10, and put distance between interchange & DFHL Site # 9; also be aware of Stream 3-9 proximity.		X				West ramps can be replaced with east side loop ramps (anticipated traffic volumes will allow this). DFHL Site #9 will remain unimpacted, and ramps are no longer nearby. Impacts to Stream 3-9 remain the same (it will be bridged for hydraulic reasons), and ramps are no longer nearby.	(655 LF) (see footnote d)	(641 LF) (see footnote d)	Streams (see footnote d)
12	385+00	Stream # 4-7 (First Broad River)	Environmental Commitments: * Temporary causeway * Temporary work bridge * Drainage system on bridge for stormwater runoff * Coordinate with local water supply administrator * Hazardous spill basins * Leave vegetation					X	Include in FEIS.	N/A <sup>e</sup>	N/A <sup>e</sup>	N/A <sup>e</sup>

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				No Action on Design Concept	Implement Design Concept as Proposed	Implement/Incorporate Alternate Plan	Correct as Appropriate	Defer/Implement Later		ROW Limits	Construction Limits	Feature	
13	425+00	DFHL Sites # 10 and 11 Stream # 4-13	Bridge stream and DFHL complex, or consider retaining wall to minimize fill; consider using DFHL sites as mitigation.			X			X	A 160-foot bridge would be required, which would have a net cost of approximately \$756,180 (see "Costs" table). A retaining wall would also not be cost-effective. It was decided to use 2:1 slopes instead; these will reduce impacts to the stream and the DFHL complex. Defer mitigation discussions until later.	N/A <sup>b</sup>	N/A <sup>b</sup>	N/A <sup>b</sup>
14	453+00	Stream # 4-17	Investigate bridging.	X						A 200-foot bridge would be required, which would have a net cost of approximately \$762,000 (see "Costs" table).	N/A	N/A	N/A
15 <sup>c</sup>	510+00	Streams # 4-22, 4-23, 4-24, and 4-25	Investigate realigning Lithia Springs Road (SR 1842) to south or bridging.	X						A 1,000-foot bridge would be required, which would have a net cost of approximately \$5,234,330 (see "Costs" table). Road could be shifted to south (see Issue #16); however, there would be a net increase of 1 business relocation and 9 residential relocations, and a net increase in stream impacts of 311 LF, which would not counterbalance the anticipated net decrease in wetlands of 0.14 acre.	N/A	N/A	N/A
16 <sup>c</sup>	530+00	Wetland Sites # 32, 33, 34, and 35 Streams # 5-1, 5-2, 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-9, and 5-10	Reconfigure NC 18 interchange by changing NE and SE quadrant ramps to loop ramps on west side of interchange, and/or shift alignment to south.	X						Ramps cannot be relocated due to anticipated traffic volumes. Road could be shifted to south, but ramifications are extensive (see Issue # 15).			
17	554+00	Streams # 5-7 (Hickory Creek) and 5-9	Investigate bridging.	X						A 180-foot bridge would be required, which would have a net cost of approximately \$705,500 (see "Costs" table).	N/A	N/A	N/A
18	618+00	Wetland Site # 39	Avoid wetland completely or minimize involvement.	X						Further investigations outside of the corridor limit indicated that the wetland site actually expanded in size to the southeast, so current location of realigned NC 180 would appear to be better in terms of minimizing impacts.	N/A	N/A	N/A

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 Revised September 21, 2004

Issue #	Approx. Station	Affected Feature(s) (Wetland, DFHL, Stream)	Comment/Request	Proposed Action(s)					Reason/Clarification	Net Avoidance/Minimization <sup>a</sup>		
				No Action on Design Concept	Implement Design Concept as Proposed	Implement/Incorporate Alternate Plan	Correct as Appropriate	Defer/Implement Later		ROW Limits	Construction Limits	Feature
19	647+00	DFHL Site # 15 Stream # 6-14	Shift alignment south to avoid impacts to DFHL site and minimize stream involvement.	X					Alignment shift is constrained by NC 150 interchange to west. Some shifting might be achievable, but would not likely appreciably reduce impact to DFHL site.	N/A	N/A	N/A
20	735+00	DFHL Site # 22 Streams # 7-1, 7-2, 7-3, 7-4, and 7-5 (Also affects Stream # 7-12 and DFHL Sites #24 and 25)	Shift alignment even further south than was done previously to further reduce DFHL and stream impacts, while still avoiding Stream Site 7-5 and DFHL Site # 24 (Sheets 13 and 14).			X			Further shifting of the alignment to the south is feasible, but would result in additional relocations of 4 NCDOT buildings and 1 residence. It was decided to lower the grade in this area instead. This reduced the footprint of the construction limits and subsequently those impacts (as shown at right), although ROW limits (and therefore ROW impacts) increased somewhat.	10 LF 0.017 acre	(420 LF) (0.034 acre)	Streams DFHL
21	764+00	DFHL Site # 25 Stream # 7-12	Investigate bridging; consider using remainder of DFHL site for mitigation.	X				X	A 150-foot bridge would be required, which would have a net cost of approximately \$716,700 (see "Costs" table). Defer mitigation discussions until later.	N/A	N/A	N/A
22	827+00	DFHL Site # 31	Modify loops/ramps of bypass terminus interchange to avoid DFHL site; if avoided, the site could be used for mitigation.	X					Ramps cannot be switched due to anticipated traffic volumes.	N/A	N/A	N/A
23	905+00	Wetland Sites # 58 and 59 Streams # 8-6 and 8-7	Investigate removing ramp in NE quadrant to minimize wetland and stream impacts (especially confluence of two streams).	X					Due to need for service road in NE quadrant, eliminating ramp will not resolve problem	N/A	N/A	N/A
24	910+00	DFHL Site # 32 Streams # 8-8, 8-9, and 8-11	Investigate bridging or shifting SR 2245 alignment to reduce DFHL and stream impacts.		X				A 230-foot bridge would be required, which would have a net cost of approximately \$250,000 (see "Costs" table). SR 2245 shift is feasible and has been implemented; this eliminates the crossing of the confluence of Streams 8-8, 8-9 and 8-11. DFHL fragmentation was not lessened as originally thought because DFHL site extends well beyond corridor boundary, but construction limit impacts are decreased.	60 LF 0.09 acre	(496 LF) (0.115 acre)	Streams DFHL
N/A	157+00	Stream 2-11 (Beaverdam Creek)	Investigate bridging (per NCDOT)		X				Bridging is feasible. A 130-foot bridge would be required, which would have a net cost of approximately \$179,750 (see "Costs" table).	(353 LF)	(261 LF)	Streams

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**Revised September 21, 2004**

Issue #	Approx. Station	Affected Feature(s) (Wetland, DFHL, Stream)	Comment/Request	Proposed Action(s)					Reason/Clarification	Net Avoidance/Minimization <sup>a</sup>		
				No Action on Design Concept	Implement Design Concept as Proposed	Implement/Incorporate Alternate Plan	Correct as Appropriate	Defer/Implement Later		ROW Limits	Construction Limits	Feature
N/A	160+00	Wetland Site # 6B	May not actually be a wetland.				X		N/A	N/A	N/A	
N/A	N/A	General comment concerning entire project	Use 2:1 fill slopes to minimize impacts at streams (also see issues #3, 4, 5, and 13).		X				NOT TOTALED HERE (INDIVIDUAL QUANTITIES WOULD BE REFLECTED IN "STREAMS" TABLE LINE ITEMS)			

a This column shows the net composite final impact *change* (not the actual final impacted quantities themselves), based on NCDOT's proposed changes. This is the sum of the changes to the features in each category (stream, wetland, DFHL) identified for that issue. Parentheses indicate decrease in impact.

b There was no change in impacts due to the fact that 2:1 fill slopes were already in place prior to investigating this issue.

c This only reflects changes resulting from implementing Issue #10; it does not reflect avoidance/minimization resulting from the bridging of Brushy Creek (see "Streams" table).

d The total avoidance/minimization indicated here includes only those savings resulting from incorporating the proposed design change suggested in Issue #11; bridging of Brushy Creek will result in additional avoidance/minimization (see "Streams" table).

e This only reflects changes resulting from implementing Issue #12; it does not reflect avoidance/minimization resulting from the bridging of First Broad River (see "Streams" table).

f Impacts of Issues 15 and 16 are addressed jointly because the previously proposed alignment shift would cause changes in impacts to affected features in both areas.

**Table D-2**  
**US 74 SHELBY BYPASS EIS (R-2707)**  
**Concurrence Point #4 - Avoidance and Minimization**  
**Streams (Revised Per Discussions at 1/17/01 Concurrence Point #4 Meeting and per S. Lund Stream Changes) & Preliminary Mitigation Estimates**  
**April 28, 2004**

Stream Segments Within Watershed	Perennial / Intermittent	Channel Length (lf)	Issue Number	Adjacent Wetlands, DFHL, or Both (Intermittent Streams Only)	Requires Mitigation Although Not Adjacent to Wetlands / DFHL Sites (Intermittent Streams Only)	Right-of-Way Impacts						Construction Limit Impacts						Mitigation Issues		COST OF AVOIDANCE AND MINIMIZATION / COMMENTS
						AVOIDANCE		MINIMIZATION		FINAL IMPACT (LF)	AVOIDANCE		MINIMIZATION		FINAL IMPACT (LF)	Site To Be Bridged (No Impact and No Mitigation Required)	Site Identified by US ACOE as Requiring Mitigation			
						Impacted?	Impacted Length (lf)	Change in Impact (lf)	Revised Impact (lf)		Additional Change in Impact (lf)	Total Change in Impact (lf)	Impacted?	Impacted Length (lf)				Change in Impact (lf)	Revised Impact (lf)	
<b>WATERSHED 1 - SANDY RUN CREEK</b>																				
1-1 Sandy Run Creek	P	1,329																		Technically, this is outside project limits.
1-2 Unnamed Tributary to 1-1	I	611																		Technically, this is outside project limits.
1-3 Unnamed Tributary to 1-1	P	1,262				X	308		308		X	206		206					X	
1-4 Unnamed Tributary to 1-3	I	18				X	18		18		X	18		18						
<b>WATERSHED 2 - BEAVERDAM CREEK</b>																				
2-1 Unnamed Tributary to 2-11	I	680		X																
2-2 Unnamed Tributary to 2-1	P	312				X	37		37		X	21		21					X	
2-3 Unnamed Tributary to 2-2	I	431																		
a 2-4 Upper Segment to 2-5	P	921				X	365		365		X	279		279					X	
a 2-5 Unnamed Tributary to 2-11	P	2,655																		
2-6 Unnamed Tributary to 2-5	P	1,608				X	244		244		X	195		195					X	
2-7 Unnamed Tributary to 2-5	P	1,103																		
2-8 Unnamed Tributary to 2-7	I	446		X																
2-9 Unnamed Tributary to 2-8	I	61		X																
2-10 Unnamed Tributary to 2-8	I	146																		
2-11 Beaverdam Creek *	P	1,520				X	353		353	(353)	X	261		261	(261)			0	X	Approximate net cost of \$179,750
b 2-12 Unnamed Tributary to 2-11	I	183																		
b 2-13 Upper Segment to 2-12	P	795																		
b 2-14 Upper Segment to 2-13	P	202																		
b 2-15 Upper Segment to 2-14	P	2,818																		
2-16 Unnamed Tributary to 2-14	I	208		X																
2-17 Unnamed Tributary to 2-15	P	977				X	407		407		X	250		250				250	X	
2-18 Unnamed Tributary to 2-20	P	225																		
2-19 Unnamed Tributary to 2-15	P	145																		
2-20 Unnamed Tributary to 2-15	P	480																		
c 2-21 Upper Segment to 2-23	I	320	1	X		X	304		304		X	217		217				217	X	
2-22 Unnamed Tributary to 2-23	I	82		X																
c 2-23 Unnamed Tributary to 2-27	I	2,147		X																
2-24 Unnamed Tributary to 2-23	I	72		X																
2-25 Unnamed Tributary to 2-27	I	1,220		X																
2-26 Unnamed Tributary to 2-27	I	375				X														
2-27 Unnamed Tributary to 2-11	P	2,368	2			X	497		497		X	413		413				413	X	
2-28 Unnamed Tributary to 2-25	I	141		X																
2-29 Unnamed Tributary to 2-27	I	161				X														





















**Table D-5**  
**US 74 SHELBY BYPASS EIS (R-2707)**  
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**Cost of Bridging Versus Cost of Culvert/Stream Mitigation**  
**May 3, 2001 (Revised September 2, 2004)**

Issue # (1)	Feature(s) Included in Bridging	Length of Bridge (ft)	Alternate Structure (Culvert)	Length of Impacted Stream (LF) (2)	COST			Net Total (4)
					Bridge	Culvert	Stream Mitigation (3)	
1	Stream 2-21 Wetland Sites 15 & 16	140	220' - 72-inch pipe	304	\$784,000	\$28,820	\$76,000	\$679,180
2	Stream 2-27	200	300' - 1 - 8' x 8' RCBC	497	\$1,120,000	\$190,000	\$124,250	\$805,750
13	Stream 4-13 DFHL Sites 10 & 11	160	220' - 72-inch pipe	524	\$896,000	\$28,820	\$131,000	\$736,180
14	Stream 4-17	200	350' - 1 - 7' x 7' RCBC	492	\$1,120,000	\$235,000	\$123,000	\$762,000
15*	Streams 4-22, 4-23, 4-24, 4-25	1,000	260' - 54-inch pipe and 350' - 72-inch pipe	1,168	\$5,600,000	\$73,670	\$292,000	\$5,234,330
17	Streams 5-7 and 5-9	180	225' - 1 - 7' x 7' RCBC	730	\$1,008,000	\$120,000	\$182,500	\$705,500
21	Stream 7-12 DFHL Site 25	150	210' - 60-inch pipe	384	\$840,000	\$27,300	\$96,000	\$716,700
24**	Streams 8-8, 8-9, 8-11 DFHL Site 32	230	300' - 1 - 7' x 7' RCBC	172	\$483,000	\$190,000	\$43,000	\$250,000
N/A	Stream 2-11	130	220' - 3 - 9' x 8' RCBC	353	\$728,000	\$460,000	\$88,250	\$179,750
<b>STRUCTURES REQUIRED BASED ON HYDRAULIC CONSIDERATIONS***</b>								
N/A	Stream 3-9 (Brushy Creek)	339	N/A	673	\$1,898,400	N/A	N/A	N/A
N/A	Stream 4-7 (First Broad River)	265	N/A	339	\$1,484,000	N/A	N/A	N/A
N/A	Stream 7-27 (Buffalo Creek)	363	N/A	388	\$2,032,800	N/A	N/A	N/A

Note: Includes all sites examined for bridging, whether currently proposed by NCDOT for implementation or not.

- (1) "Issue #" refers to the nomenclature used on the "Summary of Comments from 1/4/01 Field Review and Proposed Disposition" and "Proposed Resolution of Comments from 1/4/01 Field Review and 1/17/01 Concurrence Point #4 Meeting" tables.
- (2) Based on ROW data.
- (3) Stream mitigation was computed at 2 x \$125/foot x impacted length of stream.
- (4) Net Total = Cost of Bridge - Cost of Culvert - Stream Mitigation Cost.

\* Stream length impacted is based on a reduction of approximately 1,100 linear feet due to required stream relocation.  
 \*\* Stream length impacted is based on SR 2245 shift in lieu of bridging, which would result in only Stream 8-9 being impacted at SR 2245.  
 \*\*\* Since these were implemented for hydraulic reasons, alternate culvert sizes were never computed.

Added to December 5, 2000 Preferred Alternative preliminary design construction cost estimate to generate revised construction cost.