



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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LYNDO TIPPETT
SECRETARY

May 31, 2007

Mr. Monte Matthews
U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of Neuse Road, Suite 120
Raleigh, NC 27615

Subject: Modification to 404 Individual Permit No. 200520314
Modification to 401 Individual Permit No. 05-0061
TIP # R-3415
Widening of NC 67 from Jonesville to Booneville
Yadkin County, North Carolina
WBS: 34541.3.2 (DWQ Permit Fee: \$475)

Dear Mr. Matthews:

We have recently started construction of the subject project. As you are aware, over the course of the last month we have identified a number of locations along the project corridor where quality onsite mitigation can be performed in lieu of payment to the Ecosystem Enhancement Program. Although there are insufficient on-site opportunities to offset impacts for the entire project, we believe that these onsite improvements can substantially lower our offsite mitigation obligations. We therefore request that the mitigation requirements in our permits be lowered by accepting the proposed onsite mitigation identified in this letter.

Construction of this project will require stream relocations at Sites 1, 3 and 6. We believe that the relocated channels as designed will be a substantial improvement over current conditions. In addition, scaling errors have resulted in a minor overestimation of the actual culvert extension lengths. The net result is a 51' reduction in actual culvert extension length throughout the project. A summary table is attached.

There are other onsite improvements that we will be making at many of the culvert extension locations. A site by site proposal is listed below with a summary table attached.

Site #1

This triple barreled 9'x15' RCBC will be extended a total of 24'. Adding concrete sills to both stormwater barrels will isolate base flow to the western barrel. This will increase base flow depth inside of the culvert and will improve aquatic life passage during periods of low flow. Floodplain construction will provide the

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stream earlier access to the easternmost stormwater barrel during storm events. This will decrease water velocity in the other two barrels and will reduce bed and bank scour potential at the outlet. Constructed floodplains will be seeded with native grasses and matted with coir fiber and will look similar to the triple barreled culvert that we visited on the US 601 project on April 17, 2007.

We are proposing to place the inlets of all three barrels at grade (there is no need to bury the silled stormwater barrel extensions and this should prevent a head cut in the base flow barrel). The base flow barrel outlet will be placed at grade as well.

As a result of the overestimated culvert extension length and the onsite improvements listed above, it is requested that offsite mitigation associated with this culvert extension be reduced from 32' down to 0'.

Site #1 also has a stream relocation. The existing channel is incised with very little sinuosity and numerous vertical eroding banks. The new stream channel will provide increased sinuosity and two cross vane rock weirs. Banks will be placed on a 3:1 slope, seeded and matted with coir fiber. Type I Streambank Reforestation will be implemented and shall consist of 50% *Salix nigra* and 50% *Cornus amomum*. Please note that we also plan to relocate the eastern rock weir to the western end of the relocated channel where it will be more beneficial in preventing a headcut. There will be no net loss of stream footage associated with this relocation.

If the onsite mitigation is approved, the Department is proposing to acquire additional right-of-way to provide a permanent protected buffer. The proposed buffer will extend southward from the top of the new streambank to a distance 30' away. Woven wire restricted access fencing will be erected on the new right of way line to prevent mowing in the protected buffer. The adjacent land is a grassed meadow. Considering that the existing channel has no protected buffer, we believe that the proposed 30' buffer is more than adequate onsite compensation. Our local DWQ representative has verbally agreed to this proposal. We are also proposing 3-year visual and photographic monitoring.

In light of the onsite improvements detailed above and considering the poor condition of the existing stream channel, it is requested that offsite mitigation associated with this stream relocation be reduced from 325' down to 0'.

Site #2

This triple barreled 8'x12' RCBC will be extended a total of 21'. As with Site #1, concrete sills will be added to both stormwater barrels to isolate base flow to the western barrel. As a result, base flow depth and aquatic life passage will be improved during periods of low flow. Floodplain construction will provide the stream earlier access to the easternmost stormwater barrel during storm events. This will decrease water velocity in the other two barrels and will reduce bed and bank scour potential at the outlet. Constructed floodplains will be seeded with native grasses and matted with coir fiber and will look similar to Site #1.

This culvert is also perched. We will construct the outlet extension with the proposed 1' drop and add a sloped concrete floor in the base flow barrel. A concrete sill will be added at the end of the base flow barrel outlet extension up to the natural streambed elevation at that location. I do not believe that will cause the entire culvert to back fill with natural stream material but do think that will help reduce scour at

the outlet since the extension will be on a > 10% grade due to the existing perched condition. We will place the inlets of all three barrels at grade.

As a result of the overestimated culvert extension length and the onsite improvements listed above, it is requested that offsite mitigation associated with this culvert extension be reduced from 28' down to 0'.

Site #3

This double barreled 8'x 8' RCBC will be extended a total of 43'. Base flow will continue to be isolated to the western barrel by adding a sill to the stormwater barrel inlet. Floodplain construction will provide the stream earlier access to the stormwater barrel during storm events. This will decrease water velocity in the base flow barrel and will reduce bed and bank scour potential at the outlet. Constructed floodplains will be seeded with native grasses and matted with coir fiber.

This culvert is also perched. As with Site #2, we plan to add a sloped concrete floor to the base flow barrel extension to transition the vertical drop inside of the culvert and reestablish aquatic life passage. Please note that burying the outlet of this culvert extension will not facilitate retention of natural stream substrate material. Since the slope will be less than 5%, we plan to place the outlet of this culvert at grade.

Due to the overestimated culvert extension length and the onsite improvements listed above, it is requested that offsite mitigation associated with this culvert extension be reduced from 46' down to 0'.

Site #3 also has two stream relocations on the inlet side of the culvert, which were constructed last week. Prior to relocation, the eastern channel had eroded the roadway shoulder over the years. As a result, a small retaining wall was constructed several years ago to stabilize the area until the channel could be relocated under this TIP project (see attached photographs). The section just downstream of the wall was also armored with large concrete slabs years ago. The new channel has provided a more natural setting for this stream and placed it farther away from the roadway. The retaining wall and concrete slabs were replaced with 2:1 earthen slopes that were seeded with native grasses and matted with coir fiber. Please note that we have eliminated *Detail 33* (riprap embankment) from the plans. A cross vane rock weir has also been added to the stream. Type I Streambank Reforestation will be implemented and shall consist of 50% *Salix nigra* and 50% *Cornus amomum*. There is a net gain of 3' of stream associated with this relocation.

If the onsite mitigation is approved, the Department is proposing to acquire additional right-of-way to provide a permanent protected buffer. The proposed buffer will extend northward from the top of the new streambank to a distance 30' away. Woven wire restricted access fencing will be erected on the new right of way line to prevent mowing in the protected buffer. The adjacent land is a grassed meadow. Considering that the existing channel has no protected buffer, we believe that the proposed 30' buffer is more than adequate onsite compensation. Our local DWQ representative has verbally agreed to this commitment. We are also proposing 3-year visual and photographic monitoring.

In light of the onsite improvements detailed above, and considering the poor condition of the preconstruction stream channel, it is requested that offsite mitigation associated with this stream relocation be reduced from 282' down to 0'.

Site #4

This 4' x 5' RCBC will be collared and extended a total of 64' with 60" RCP. This culvert is also perched. In order to minimize upstream headcut potential, we plan to place the inlet of this culvert at grade. Due to the existing perched condition, burying the outlet of this culvert extension will not facilitate retention of natural stream substrate material. As a result, we plan to place the outlet at grade.

As a result of unperching this culvert and reestablishing aquatic life passage, it is requested that offsite mitigation associated with this culvert extension be reduced from 60' down to 0' or any other lesser number deemed appropriate. If the Corps is unwilling to provide onsite credit for this improvement, then the off site mitigation requirement should be increased from 60' to 64' since that is the actual length of the culvert extension.

Site #5

This 6' x 5' RCBC will be extended a total of 36'. In order to minimize upstream headcut potential, we plan to place the inlet of this culvert at grade. We will bury the outlet extension 1' and add a concrete sill up to the natural streambed elevation at that location to assist with substrate retention.

Although this culvert is functioning fairly well, there is substantial streambank instability in two sharp bends just downstream of the culvert (see plan sheet and attached photos). As a means of reducing off-site mitigation associated with impacts at this site, we had considered eliminating these sharp bends and stabilizing the banks even though they are beyond our construction limits.

At the time of our field inspection you considered this proposal to be an improvement in spite of the net loss of stream footage. After a more detailed review, this turned out to be an impractical means of offsetting the mitigation fee at this site. As a result, we will revert back to the initial plan to pay the off-site mitigation and leave the downstream area as is. The off-site mitigation requirement should still be reduced from 38' down to 36' since that is the actual culvert extension length.

Site #6

Site #6 is a short stream relocation that will basically eliminate a bend in the creek that is falling within our fill slope. The relocated stream section will have 2:1 banks and will be seeded and matted with coir fiber. Type I Streambank Reforestation will be implemented and shall consist of 50% *Salix nigra* and 50% *Cornus amomum*. Total net loss of stream footage associated with this relocation will be 49'.

If the onsite mitigation is approved, the Department is proposing to acquire additional right-of-way to provide a permanent protected buffer. The proposed buffer will extend southward from the top of the new relocated streambank to a distance 30' away. Woven wire restricted access fencing will be erected on the new right of way line to limit disturbance in the protected buffer. The adjacent land is wooded. Considering that the existing channel has no protected buffer, we believe that the proposed 30' buffer is more than adequate onsite compensation. Our local DWQ representative has verbally agreed to this commitment. We are also proposing 3-year visual and photographic monitoring.

We therefore request that offsite mitigation associated with this stream relocation be reduced from 126' down to 49'.

Site #7

This 4' x 5' RCBC will be collared and extended a total of **44'** with 60" RCP. This culvert is also perched. For reasons previously stated, we plan to place the inlet and outlet of this culvert at grade.

As a result of the overestimated culvert extension length as well as unperching this culvert and reestablishing aquatic life passage, it is requested that offsite mitigation associated with this culvert extension be reduced from 48' down to 0' or any other lesser number deemed appropriate. If the Corps is unwilling to provide onsite credit for unperching the culvert, then the off site requirement should still be reduced from 48' down to 44' since that is the actual length of the culvert extension.

Site #8

This 4' x 4' RCBC will be collared and extended a total of **36'** with 54" RCP. We plan to place the inlet and outlet of this culvert at grade. There are no onsite improvements available at this location. However, the off site mitigation requirement should be reduced to from 49' down to 36' since that is the actual length of the culvert extension.

Site #9

This 4' x 4' RCBC will be collared and extended a total of **68'** with 54" RCP. This culvert is also perched. As with several of the other sites, we plan to place the inlet and outlet of this culvert at grade since that appears to be the most logical alternative.

As a result of the overestimated culvert extension length as well as unperching this culvert and reestablishing aquatic life passage, it is requested that offsite mitigation associated with this culvert extension be reduced from 98' down to 0' or any other lesser number deemed appropriate. If the Corps is unwilling to provide onsite credit for unperching the culvert, then the off site requirement should still be reduced to from 98' down to 68' since that is the actual length of the culvert extension.

Site #10

This 3' x 4' RCBC will be collared and extended a total of **92'** with 48" RCP. This culvert is also perched. Again, due to existing site conditions, we plan to place the inlet and outlet of this culvert at grade.

As a result of unperching this culvert and reestablishing aquatic life passage, it is requested that offsite mitigation associated with this culvert extension be reduced from 80' down to 0' or any other lesser number deemed appropriate. If the Corps is unwilling to provide onsite credit for unperching the culvert, then the off site requirement should be increased from 80' to 92' since that is the actual length of the culvert extension.

I am forwarding a copy of this document to Sue Homewood, NCDENR, Division of Water Quality, for her review. It is requested that the 401 permit for this project be modified to reflect the revised off-site mitigation requirements and impact totals. Any permit revision should be sent directly to me with a copy sent to the US Army Corps of Engineers and the NCDOT Natural Environment Unit.

Mr. Monte Matthews
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If further information is required, or if you need clarification on any of these points, please let me know and we will work through it together. I'd be happy to meet on-site again with anyone who may be interested. Your early review and consideration will be appreciated.

Sincerely,



Heath Slaughter
Division 11 Environmental Officer

Enclosures

cc: Monte Matthews, US Army Corps of Engineers (1 additional copy)
John Hennessy, Division of Water Quality (5 copies)
Sue Homewood, Division of Water Quality
Mike Pettyjohn, PE, Division Engineer
Trent Beaver, PE, Division Construction Engineer
Mark Freeman, PE, Resident Engineer
Heath Slaughter, Division Environmental Officer
Neil Trivette, Roadside Environmental Field Operations Engineer
Phil Harris, PE, Natural Environment Unit
Randy Griffin, Natural Environment Engineering Group

MITIGATION REQUIREMENT SUMMARY FOR R-3415, NC 67, YADKIN COUNTY

	Site 1	Site 2	Site 3	Site 4
Permitted Culvert Impact	32'	28'	46'	60'
Actual Culvert Extension Length	24'	21'	43'	64'
Permitted Stream Relocation	325'	N/A	74' & 208'	N/A
COE Mitigation @ Site	357'	28'	328'	60'
DV/Q Mitigation @ Site	325' for stream relocation	28' due to Site 3 impacts to same creek	328'	0'
Division 11 proposed Mitigation	0'	0'	0'	0' - 64'
Reason	No net loss from relocation Adding stream buffer Isolating flow to one barrel Constructing floodplains Adding sills to culvert	Unperching Culvert Isolating flow to one barrel Constructing Floodplains Adding sills to culvert	Net gain of 3' on relocation Adding stream buffer Unperching culvert Constructing Floodplains Adding sill to culvert	Unperching culvert
	Site 5	Site 6	Site 7	Site 8
Permitted Culvert Impact	38'	N/A	48'	49'
Actual Culvert Extension Length	36'	N/A	44'	36'
Permitted Stream Relocation	N/A	126'	N/A	N/A
COE Mitigation @ Site	38'	126'	48'	49'
DV/Q Mitigation @ Site	0'	0'	0'	0'
Division 11 proposed Mitigation	36'	49'	0' - 44'	36'
Reason	Also adding concrete sill	49' (net stream footage lost) Adding stream buffer	Unperching culvert	

	Site 9	Site 10		
Permitted Culvert Impact	98'	80'		
Actual Culvert Extension Length	68'	92'		
Permitted Stream Relocation	N/A	N/A		
COE Mitigation @ Site	98'	80'		
DWQ Mitigation @ Site	0'	0'		
Division 11 proposed Mitigation	0' - 68'	0' - 92'		
Reason	Unperching culvert	Unperching culvert		

R3415- Summary of Culvert Extension Lengths in Plan vs. Permitted Extension Lengths

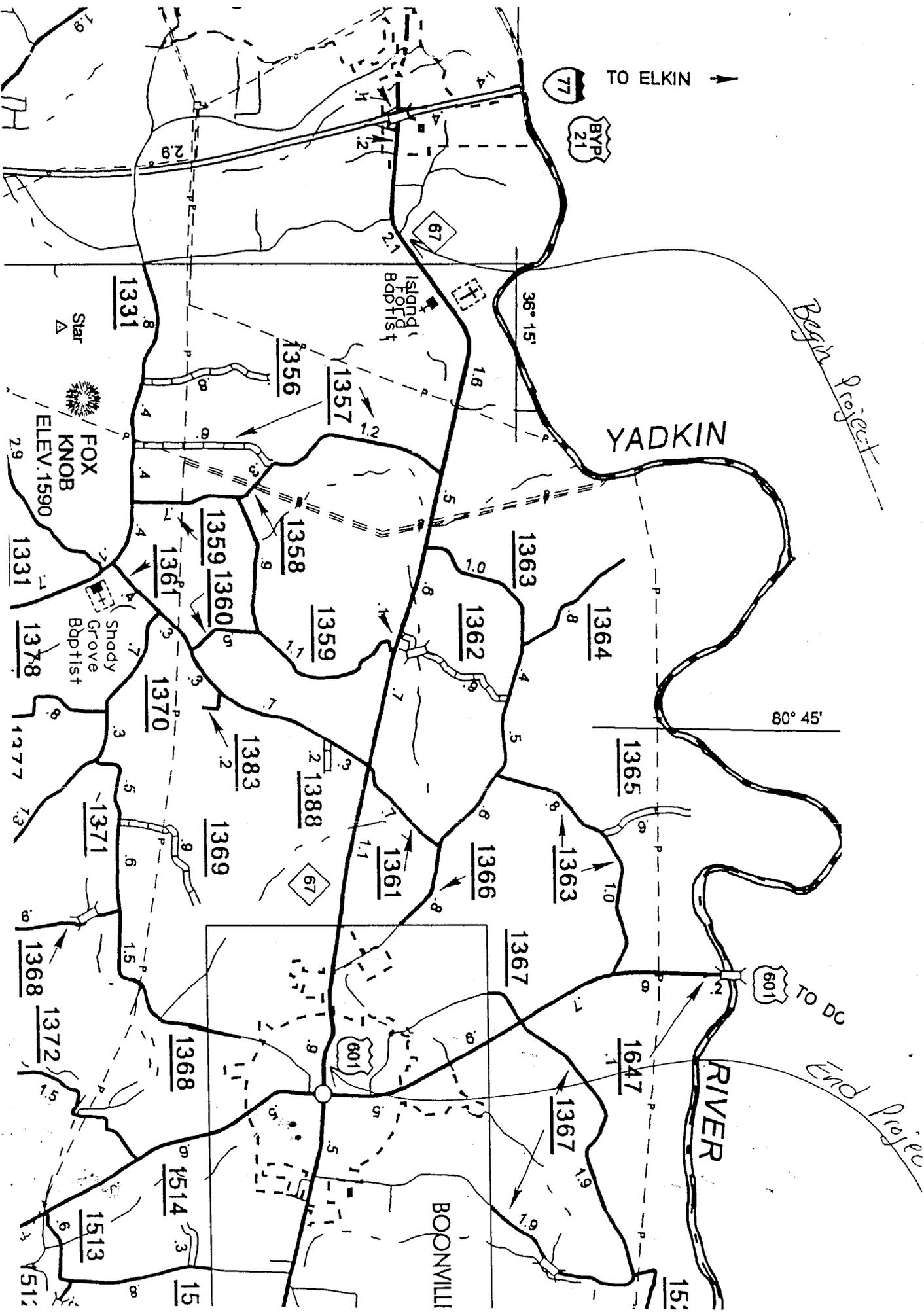
Site #	Station	Sheet	Structure/Description	Notes:	Plan Extension Lengths	Permitted Extension Lengths	+/- From Permit
1	79+43	9	Extend 3 @ 9'x15' RCBC	L-O-11'-5" 0.5% - 0.7" 90D	23'-11"	32'	- 8'
C1				R-1-12'-6" 0.5% - 0.75" 2' sill on E Barrel			
2	119+06	12	Extend 3 @ 8'x12' RCBC	L-O-10'-11" 0.9% - 1.18" - 1' drop 90D	21'-4"	28'	- 7'
C2				R-1-10'-5" 0.9% - 1.13" - 2' sill on E Barrel			
3	141+90	13	Extend 2 @ 8'x8' RCBC	L-1-11'-6" 0.39% - 0.5" - 1' sill on E Barrel	20'-10" (43)**	46'	- 3'
C3				R-O-9'-4" -0.39% - 0.44" - 1'-6" drop			
4	153+48	14	Retain, collar and extend 4'x5' RCBC with 60" RCP	L-O-28' (5'-8"JB) - Angle E 118D R-1-32' (1'-6"C) - Angle E	60' (64')*	60'	+ 4'
5	171+37	15	Extend 6'x5' RCBC	L-O-17'-2" 2.5% - 5.1" 90D	35'-10"	38'	- 2'
C4				R-1-18'-8" 1.3% - 2.9" 6' Str/12'-8" 30D to E			
7	222+43	19	Retain and extend 4'x5' RCBC with 60" RCP	L-1-20' - 90D to Rd (5'-8"JB) R-O-20' - Str Ext. - (5'-8" JB)	40' (44')*	48'	- 4'
8	225+52	19	Retain and extend 4'x4' RCBC with 54" RCP	L-1-16' - Skew to W (1'-6"C) R-O-20' - Str. Ext. (1'-6"C)	36'	49'	- 13'
9	233+96	20	Retain and extend 4'x4' RCBC with 54" RCP	L-1-40' - Skew to E R-O-28' - Str Ext.	68'	98'	- 30'
10	246+75	21	Retain and extend 3'x4' RCBC with 48" RCP	L-1-48' - Skew to E R-O-40' - Skew to W	88' (92')*	80'	+ 12'
Revised Totals					428'	479'	- 51'

Notes:

- * 3 Junction Boxes with inside dimensions of 3'8" (use 4')
- ** Outlet end has an additional 22' of concrete apron between the wing walls

Stream Relocations

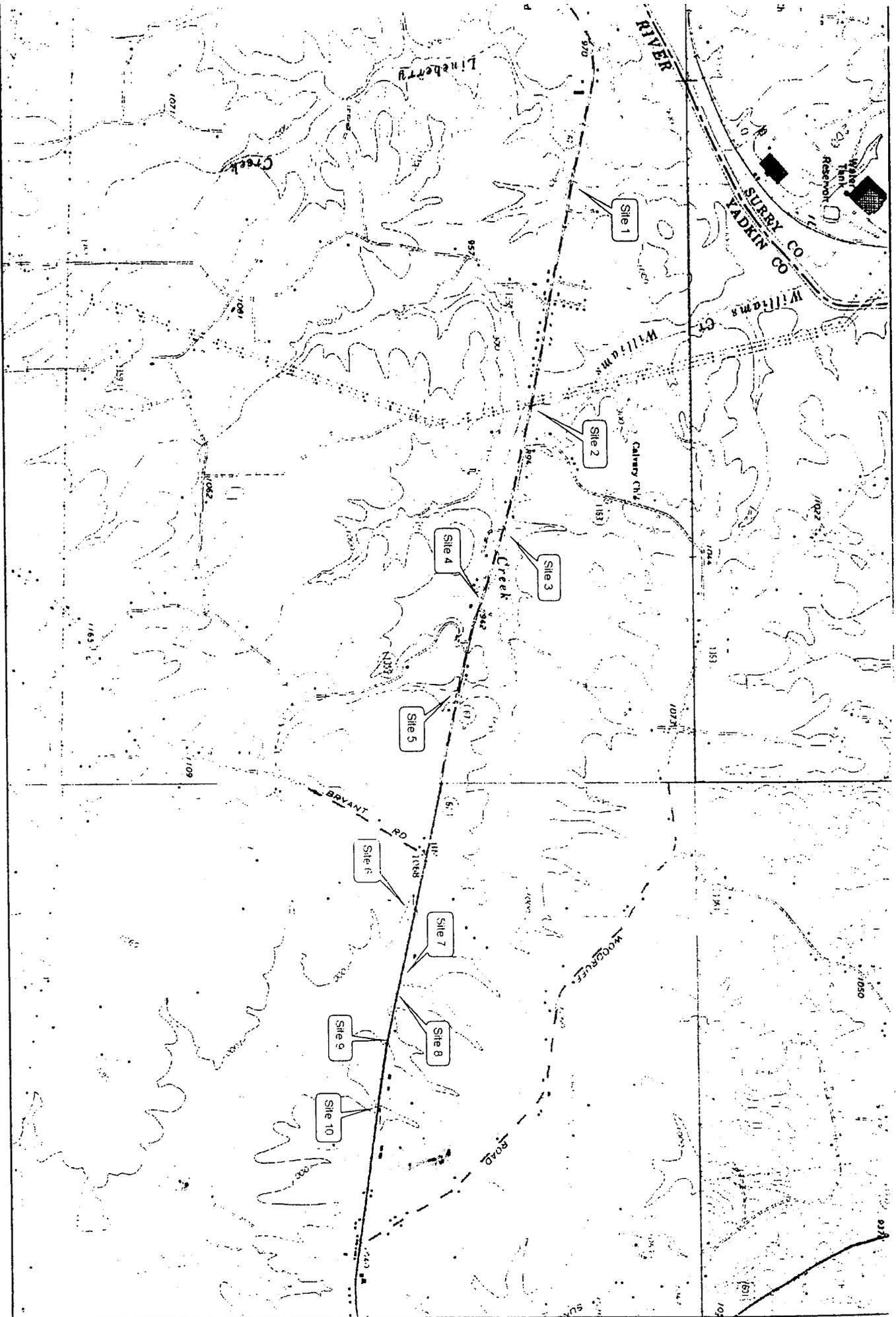
Site #	Station	Sheet	Structure/Description	Notes:	Onsite Reconstructed Length	Permitted Impact Length	Final Perm. Impact
1	81+00 Rt.	9	Stream Relocation - 325'	No net loss	325'	325'	0
3	141+50 Lt. 143+00 Lt.	13 13	Stream Relocation - 74' Stream Relocation - 208'	No net loss <i>Relocated section will be 3' longer</i>	74' 211'	74' 208'	0 -3'
6	209+25 Rt.	18	Stream Relocation - 126'	Relocating 77' and Eliminating 49'	77'	126'	49'
Revised Totals					687'	733'	46'



Name: ELKIN SOUTH
Date: 5/31/2007
Scale: 1 inch equals 2222 feet

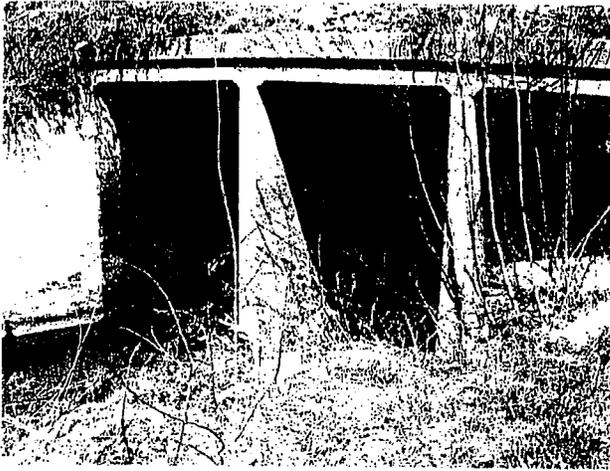
Location: 036 2381184° N 080.7572159° W

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1. Inlet view of Site #1 culvert. Note that base flow is not isolated to one barrel and a high right bank is preventing most stormwater flow from entering the easternmost barrel.
2. Outlet view of Site #1 culvert. A floodplain has formed behind the base flow barrel instead of behind the stormwater barrels. We will correct this situation with appropriate floodplain construction on the inlet and outlet sides of this culvert.
3. Site #1 downstream view.
- 4-6. Photos of UT to Lineberry Creek east of the Site #1 culvert location.



7.



8.



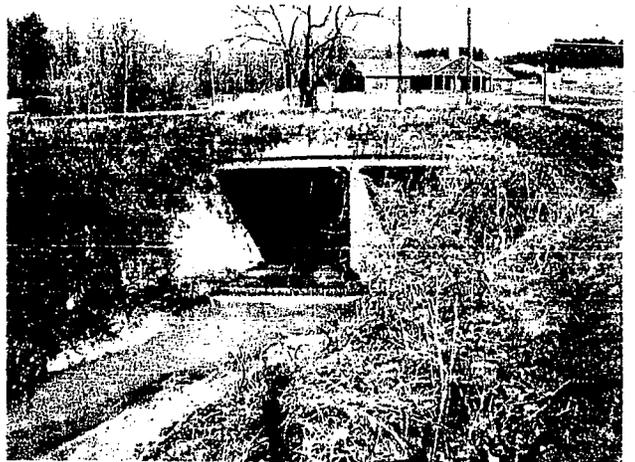
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10.



11.

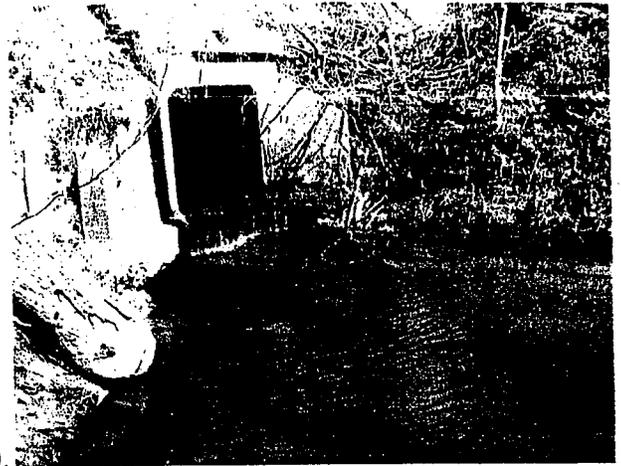


12.

7. Inlet view of Site #2 culvert.
8. Outlet view of Site #2 culvert. Note that flow is not isolated to the base flow barrel and the culvert is perched. We will be correcting this situation as well as constructing floodplains.
9. Williams Creek just upstream of the Site #3 culvert. This stream has already been relocated away from this slope failure and retaining wall.
10. Williams Creek at the Site #3 culvert inlet. Due to the relocation, the concrete slabs no longer armor this streambank. A floodplain will be created in front of the eastern barrel to reduce water velocity in the base flow barrel during storm events.
11. View of UT to Williams Creek entering the Site #3 culvert.
12. Site #3 culvert outlet is perched. We will be correcting this situation as well as constructing a downstream floodplain.



19.



20.



21.



22.

19. Perched culvert outlet at Site #7. As mentioned in the letter, the pipe extension will be placed at grade to reduce the slope of the extension.
20. Perched culvert outlet at Site #9. As mentioned in the letter, the pipe extension will be placed at grade to reduce the slope of the extension.
21. Site #10 culvert inlet.
22. Perched culvert outlet at Site #10. As mentioned in the letter, the pipe extension will be placed at grade to reduce the slope of the extension.