APPENDIX D

Raw Data Maps
Dry spillway from pond, banks are scoured, wetland/beaver pond below spillway.
Looks good—probably perennial
Deeply incised

**POTENTIAL BMP**
Bank erosion past fence
Likely caused by cow access to stream

**POTENTIAL BMP**
Upstream end erosion

Pond outfall—clear water discharge
Large amounts of bank erosion and highly incised below outfall
Old trash dump against stream

Stream becomes slightly incised

Trib is incised here and upstream - appears to be stable

Some existing retention areas at development site discharging into incised ephemeral - very little buffer

Probably ephemeral

POTENTIAL BMP SITE
RETENTION AREA

Incised "F" channel with debris jams, low base-flow and chute cut-offs

JONES CREEK
BUCKHORN BRANCH
OLD NC 86
DROMOLAND RD
KELLY CT
TALLYHO TRL
TOWNE RIDGE LN
BRITTON DR
LAKE HOGAN FARM
RD
JONES CREEK PL
TALLYHO TRL
EUBANKS RD
DUBLIN RD
LEAK LN

Legend
Mesh
Streams
Bolin Creek Subbasins
2 Foot Contours
Streams
General stream note
Stream problem area note
BMP Note
GPS Points
Orange County Roads
Public Works
Planimetrics
Waterbodies
BMP Notes
Map Pages
Trib is incised here and upstream - but appears to be stable

Probably ephemeral

Ongoing development

Some existing retention areas at development site discharging into incised ephemeral - very little buffer

Begin incision appears to be old

End incision

Big (>3ft) headcut

Some flow from yards may be causing headcuts (observed rills)

Legend:
- Streams
- Wetlands
- Orange County Roads
- Riparian Areas
- Waterbodies
- Basins
- Bolin Creek Subbasins
- 2 Foot Contours
- General stream sites
- Stream problem area notes

Text:
- BMP Note
- Stream problem area notes

Map Pages

JONES RD
LEAK LN
ROGERS RD
MEADOW RUN CT
DROMOLAND RD

BD13
BD 27
BD 25
BD 26
BD 29

B

12
13

600 300 0 600 Feet

3 7 6 8

GPS Points
Sidewalk
Orange County Roads
Planimetrics
Waterbodies
 Streams
Bolin Creek Subbasins
2 Foot Contours
General stream sites
Stream problem area notes
BMP Notes
Map Pages
Reference-reach quality "E" stream But with high amounts of sediment

POSSIBLE BMP RETROFIT CONCRETE OUTFALL

POSSIBLE BMP RETENTION POND

POSSIBLE BMP RETROFIT

POSSIBLE BANK STABILIZATION

Utility Easement Impacts

Bank scour

Legend

- Streams
- Sidewalks
- Orange County Roads
- Manholes
- Manholes
- Structures
- Railroads Suburbs
- 2 Foot Contours

General stream note

Stream problem area note

BMP Note

Map Pages

GPS Points

Planimetrics

Waterbodies

Bolin Creek Subasins

2 Foot Contours

General stream note

Stream problem area note

BMP Note

Map Pages
Beavers

Beaverdams and culvert scour

POSSIBLE BMP HERE

Existing wetland

probably ephemeral

Existing BMP below road—seems to overflow and flow diffusely across floodplain

POSSIBLE BMPS ALONG GREENWAY

Development occurring close to Bolin Creek, possible future stormwater inputs

Nice wetland and greenspace

POSSIBLE BMP HERE

ALONG GREENWAY

STREAM RESTORATION/WETLANDS IN OLD, AGGRADED POND

Old stone dam and filled pond behind it

Stream is extremely incised here
In

Incision

Looks good

Beavers

POTENTIAL BMP LOCATION
BELOW CULVERT

Triple 36” CMP culvert blows out into incised stream
Floodplain is wide enough for off-channel BMP

Probably ephemeral

Headcut working upstream

POSSIBLE BMP LOCATION
BELOW POWERLINE CROSSING
STREAM HAS BEEN PUSHED AGAINST VALLEY WALL AND RELIC INCISION

Channelized and overwidened

BMP POSSIBILITY
UPSTREAM OR DOWNSTREAM OF CULVERT

Incised channel

POTENTIAL BMP
BELOW POWERLINE CROSSING
STREAM HAS BEEN PUSHED AGAINST VALLEY WALL AND RELIC INCISION
Former attempted erosion control
Considerable amounts of stormwater runoff

Potential BMP
Retention Area

Potential BMP
Stormwater Wetland

Sewer encroaching on street causing buffer impacts and bank failure

Road/trail erosion along sewer

Exposed sewer

Probably ephemeral

Incised

Exposed sewer

Incised

Road/trail erosion along sewer

Exposed sewer
Bedrock channel with waterfall

High incision

POSSIBLE BMP HERE
GRASSY SWALE, RAIN GARDEN OR LEVEL SPREADERS

Scour in channel in backyards and probably ephemeral channel

Stable "Bc" channel
Good bankfull features

Looks good

Beaver pond wetlands
backwater influence from beaver dams
Good preservation area

Beaver influence ends

POSSIBLE BMP HERE

Scour in channel in backyards and probably ephemeral channel

POSSIBLE BMP HERE
GRASSY SWALE, RAIN GARDEN OR LEVEL SPREADERS
POTENTIAL BMP
STREAM RESTORATION/WETLANDS
IN OLD, AGGRADED POND

Probably ephemeral

Looks good

POSSIBLE BMP
FLOODPLAIN DIVERSION TO WETLANDS

Incision begins on Jolly Branch
active erosion

Slight bank erosion where powerline easement crosses

POSSIBLE BMP
SWALE OR RETENTION AREA FOR PIPE DISCHARGE

Incision ends

POSSIBLE BMP
RETENTION AREA FOR PIPE DISCHARGE FROM SCHOOL

48" RCP is undercut by flow,
causing bank scour downstream

POSSIBLE BMP
RETENTION AREA FOR PIPE OUTLET FROM SCHOOL
**Legend**
- **Streams**
- **Orange County Roads**
- **Waterbodies**
- **2 Foot Contours**
- **Sidewalks**
- **General stream scale**
- **Stream problem area note**

**Stream Notes**
- Channelized and overwidened Channelized stream
- Impacts from 4 wheeler trail
- Old retention basin beneath gravel driveway is silted in
- Stormwater outfall
- Debris clogs
- Probably ephemeral
- Begin anerobic conditions
- End of incision
- Start of incision
- Blowout beneath railroad tracks
- POSSIBLE BMP
  - Repair or expand existing, failing BMP
  - Rain garden or silt trap in parking lot of church
  - Side channel discharge

**Map Pages**
- 11
- 12
- 16
- 17
- 18
- 22
POSSIBLE BMP
NEED ENERGY DISSIPATION FROM PIPE OUTLET

NEED BUFFER AND BANKFULL BENCH ALONG THIS SECTION

INCISED - APPEARS TO BE MECHANICALLY STRAIGHTENED CHANNEL

POTENTIAL BMP
STORMWATER BASIN

Legend
- Streams
- Sidewalks
- Orange County Roads
- Manholes
- Manholes
- Waterbodies
- 2 Foot Contours
- 1 Foot Contours
- Storm Drain Culverts
- Storm Drain Inlets
- Storm Drain Outlets
- Potential BMP Notes
- Map Pages

General stream note
Stream problem area note
BMP Note
Need BMPs all along this stretch due to lack of vegetation in yards.

POSSIBLE BMP: Mass wasting scour

POSSIBLE BMP: Culvert

POSSIBLE BMP: Pipe outfall

POSSIBLE BMP: Sheared banks - Low Bank Height is 3'

POSSIBLE BMP: Looks good - "B" stream

POSSIBLE BMP: Extreme wasting

Old building foundation above

Pipe outfall

Stormwater scour near RR Trestle

Sewer smell in air

POSSIBLE BMP: RETENTION AREA OR STABILIZATION NEEDED

Ditch needs rip-rap or grade control

Service road erosion - needs turnouts

Scour and downcut

Incised channel

Erosion from sewer easement

Stable

Rock "dam" built 2' high

Intermittent bank failures

NEED BMPS HERE

Overly wide

Overly wide

POSSIBLE BMP

POSSIBLE BMP

POTENTIAL WETLAND

Incised

Wasting along these banks

Erosion from sewer easement

Stable

Rock "dam" built 2' high

Intermittent bank failures

NEED BMPS HERE

Overly wide

Overly wide

POSSIBLE BMP

POSSIBLE BMP

POTENTIAL WETLAND

Incised
Erosion from sewer easement

Looks good—probably ephemeral

Looks good—probably intermittent

Vegetation removal causing significant erosion along RR grade

Incised

Head cut

Probably ephemeral

Erosion from dirt road

Some stable and some incised reaches along this stream

POTENTIAL BMP

OUTFALL CAUSING SCOUR IN CHANNEL

POTENTIAL BMP

CONSTRUCTED WETLAND

"F" Channel

Looks good

Roadway outfall

Boulder dominated

Incised channel

Undercut bank and scour from sewer impacts

Needs basic stabilization

POTENTIAL BMP

NOT NEEDED DIRECTLY

Storm sewer impacts

Needs basic stabilization

Probably intermittent

Incision due to headcut

POTENTIAL BMP

NOT NEEDED DIRECTLY

Legend

Streams

Waterbodies

Roads

Bolin Creek Subbasins

2 Foot Contours

Legend

Streams

Waterbodies

Roads

Bolin Creek Subbasins

2 Foot Contours

Legend

Streams

Waterbodies

Roads

Bolin Creek Subbasins

2 Foot Contours

Legend

Streams

Waterbodies

Roads

Bolin Creek Subbasins

2 Foot Contours

Legend

Streams

Waterbodies

Roads

Bolin Creek Subbasins

2 Foot Contours
POSSIBLE BMP: Many areas of extreme wasting are observed, including Old building foundation above.

POSSIBLE BMP: Pipe outfall.

POSSIBLE BMP: Culvert.

POSSIBLE BMP: Elevated FES with no outlet protection.

POSSIBLE BMP: Incised channel.

POSSIBLE BMP: Heavy sediment load.

POSSIBLE BMP: Severely entrenched "G" channel.

POSSIBLE BMP: Undercut bank and scour from sewer impacts.

POTENTIAL BMP: Need BMP here to reduce stress on banks and reduce stormwater volume.

POTENTIAL BMP: Buffer impacts from vegetation removal, greenway impacts.

POTENTIAL BMP: Road fill contributing to incision.

POTENTIAL BMP: Need cross vane for bank protection.

Legend:
- Waterbodies
- Orange County Roads
- Infrastructure
- Wetlands
- Stream
- 2-Foot Contours
- Stream problem area note
- BMP Notes
- Map Pages

Text:
- Extreme wasting
- Old building foundation above
- Pipe outfall
- Culvert
- Elevated FES with no outlet protection
- Incised channel
- Heavy sediment load
- Severely entrenched "G" channel
- Undercut bank and scour from sewer impacts
New, large (>60") RCP installed at road crossing
Seems to have reduced SW velocity

POSSIBLE BMP
SIDE CHANNEL DISCHARGE
WETLAND OR BASIN
Incised
Kudzu field
Pipe outlet from apartments
Discharging directly into stream
Incised some erosion

POSSIBLE BMP
ENERGY DISSIPATION NEEDED
AT CURB-GUTTER OUTLET
Severe gulley erosion caused by buried pipe
Discharging stormwater system along street
Concrete "weir" or dam in stream

POSSIBLE BMP
OLD SW BASIN NEEDS REPAIR
Large mass wasting
Start of incision
Winding nature of floodplain
Gulley erosion on steep hillside

POSSIBLE BMP
CURRENTLY NO RETENTION HERE
Large mass wasting
Concrete "weir" or dam in stream

POSSIBLE BMP
Transition to "A" channel- stable
Stable
Mass failure along road
Severe gulley erosion caused by buried pipe
Discharging stormwater system along street
Concrete "weir" or dam in stream
Entrenched, incised

Beginning of more severe bank erosion

Possible BMP

Bedrock ends upstream erosion

Mass wasting banks

Severe wasting

Bedrock ends upstream erosion

End of severe instability

is “B” the rest of the way up

Possible BMP

Old channel in floodplain

Possible BMP

Side-channel

Could do side-channel BMP’s along this valley

Utility crossing causing problems

Pipe outlet for subdivision

Needs BMP

Possible BMP

South side of sewer line needs retention

Need bank stabilization

Legend

- Streams
- Sidewalks
- Orange County Roads
- Wetlands
- Waterbodies
- Baseline Creek Subbasins
- 2 Foot Contours
- General stream note
- Stream problem area note

BD 77

BD 75

BD 63

BD 65

BD 64

BD 60

BD 61

BD 59

BD 62

BD 67

BD 66

BD 68

BD 69

BD 70

BD 71

BD 58

BD 55

BD 57

BD 56

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BD 23

BD 22

BD 21

BD 20

BD 19

BD 18

BD 17

BD 16

BD 15

BD 14

BD 13

BD 12

BD 11

BD 10

BD 9

BD 8

BD 7

BD 6

BD 5

BD 4

BD 3

BD 2

BD 1
A lot of flow and stress on banks

Entrenched, but mostly stable

Bank wasting from utility vehicles crossing stream

POSSIBLE BMP
NEEDS RETENTION

Stream crossing

Incised

POSSIBLE BMP
NEED RETENTION HERE, HAVE BROKEN PIPE OUTFALL

Stable "A" to "B" stream - Probably ephemeral

Incised

POSSIBLE BMP
RETENTION POND IN KUDZU FIELD
Large mass wasting

Incision at confluence, likely caused by failing BMP on trib

Old dam and silt-filled pond looks good; stable

- Old BMP on steep slope has filled in - rock check dams on stream below

Partial buried 12" RCP, need improved stormwater outfall

-series of headcuts progressing up steep channel - active erosion

Small gulley on hill - needs treatment of some type

General stream note
Stream problem area note
BMP Note
Map Pages
 tributary needs treatment

Ditch from apartment complex causing minor erosion near greenway

Channelized in concrete

POSSIBLE BMP
RESTORE CHANNEL; REMOVE CONCRETE

Road crossing is causing downstream impacts

Incised

Modified-channelized with aggradation

Old, actively eroding ditch

Channelized in concrete

30

BD88-END DITCH GREAT BMP SITE

BD89

Modiffed-channelized with aggradation

BD78 BD 79

BD78 BD79

BD78

BD80-POSSIBLE BMP

RESTORE CHANNEL; REMOVE CONCRETE
Road crossing is causing downstream impacts

Bolin Creek Subbasins

BD80-POSSIBLE REFERE

Legend
- Structures
- Sidewalks
- Orange County Roads
-滨河

Map Pages

BD80

Legend
- 2 Foot Contours
- General stream notes
- Stream problem area note
- BMP notes

GPS Points

Sidewalk
Orange County Roads
Planimetrics
Waterbodies
Streams

Legend
- Structures
- Sidewalks
- Orange County Roads
-滨河

Map Pages

BD80

Legend
- 2 Foot Contours
- General stream notes
- Stream problem area note
- BMP notes

GPS Points

Sidewalk
Orange County Roads
Planimetrics
Waterbodies
Streams

Legend
- Structures
- Sidewalks
- Orange County Roads
-滨河

Map Pages
small gulley on hill needs treatment of some type