



Debris Diversion & Collection Device

Smith Mountain Project – Debris Management Plan



Debris Diversion & Collection Device

- Appalachian Power Company (APCo) proposes a debris diversion and collection device for the mouth of the Pigg River
- APCo would like to acknowledge and thank each of the following partners
 - Pacific Netting Products Inc. (PNP) – part of Badinotti Group (Italian Co.)
 - GEI Consultants
 - W. F. Baird Associates
 - HDR, Inc.
 - Terracon
 - Hurt & Proffitt, Inc.
 - Marine Solutions Inc.



Design Considerations

- Iterative Approach
- Multiple sites considered
 - Environmental impacts and potential effects to aquatic species
 - Accessibility
 - Water
 - Land
 - Efficiency
 - Address debris before entering Leesville Lake
 - Boat Navigation
- Debris Capture Options
 - “Modified Fishhook”
 - Deflector/Collector
 - Additional equipment
- Pigg River/Leesville Lake confluence site
 - “Modified Fishhook” style chosen
 - Pigg River 65-75% debris source – 2,000-5,500 tons
 - Close to debris off-load site



Design Specifications

- 2 conditions evaluated
 - Condition I
 - Design criteria 85% of historical flow (20,500cfs) with estimated associated debris capture (6.25 ac.)
 - 2010 event based
 - Smaller footprint – socketed individual pilings with single boom system
 - Condition II
 - Design criteria maximum historical flow (65,600cfs) with estimated associated debris capture (10+ ac.)
 - 1987 event based
 - Larger footprint – clustered pilings with twin boom system
- Debris capture/retainage efficiency
 - Conditions I & II - nearly identical debris capture/retainage for flows up to 5' second flow velocities
 - Condition 1 design maximum 5'/sec flow
 - Condition II design 9'/sec flow
 - Industry standard maximum efficient debris capture is 5' second flows
- Engineering Consulting Firms and Manufacturer consider Condition 1 incorporates the best modern practices and debris capture efficiency currently available
- Designs include controlled release points



Piling Information

- 13 - 36" diameter steel pilings
 - 618.5' top of piling
 - Grout filled
 - 617.7' maximum design flood elevation
- 3 Micropiles/piling
 - Micropile casings grout filled
 - Socketed to bedrock
- High visibility
- Safety features



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- 36" diameter HDPE Multifunction Boom material
 - 1155' total boom length
 - Pile sliders w/floatation
 - Seamless boom features
 - Designed break link installed
 - 2' coverage above and below lake surface
 - Includes 1' weighted debris skirt
- 7acre debris retention area
- Rock anchor on southern shoreline
- High visibility
- Debris barge mooring (multiple locations)
- Boat passage (approx. 72')



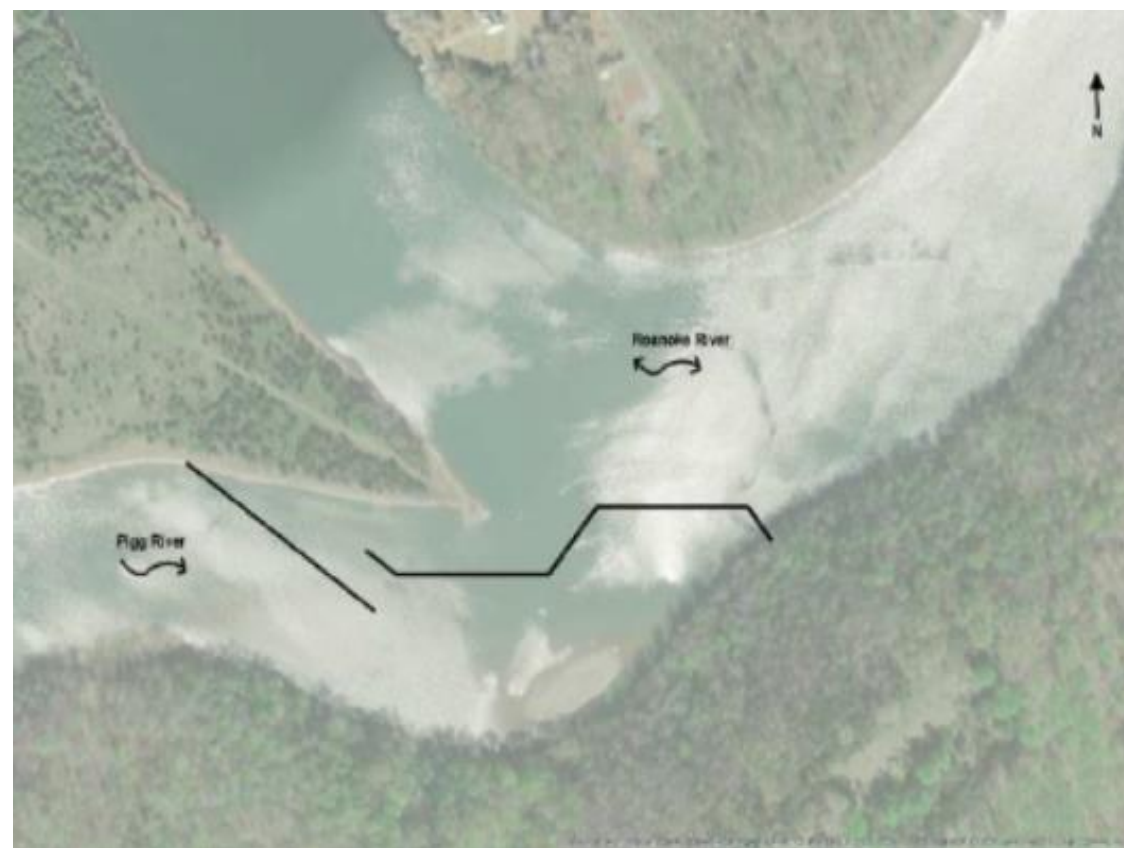
Next Steps

- APCO consults with Debris Technical Review Committee
 - APCO seeks written project support from the Tri County Lakes Administrative Commission and the Leesville Lake Association prior to submitting a Joint Permit Application
 - Letters of support will be included with the application
- Joint Permit Application
 - U.S. Army Corp. of Engineers (USACE) permit approval required
 - Virginia Department of Environmental Quality
 - Virginia Marine Resource Commission permit approval required
- Permit Phase 12 to 18 months (est.)
- Federal Energy Regulatory Commission approval required
- Construction estimate 8 months
- Project value

Design Considerations

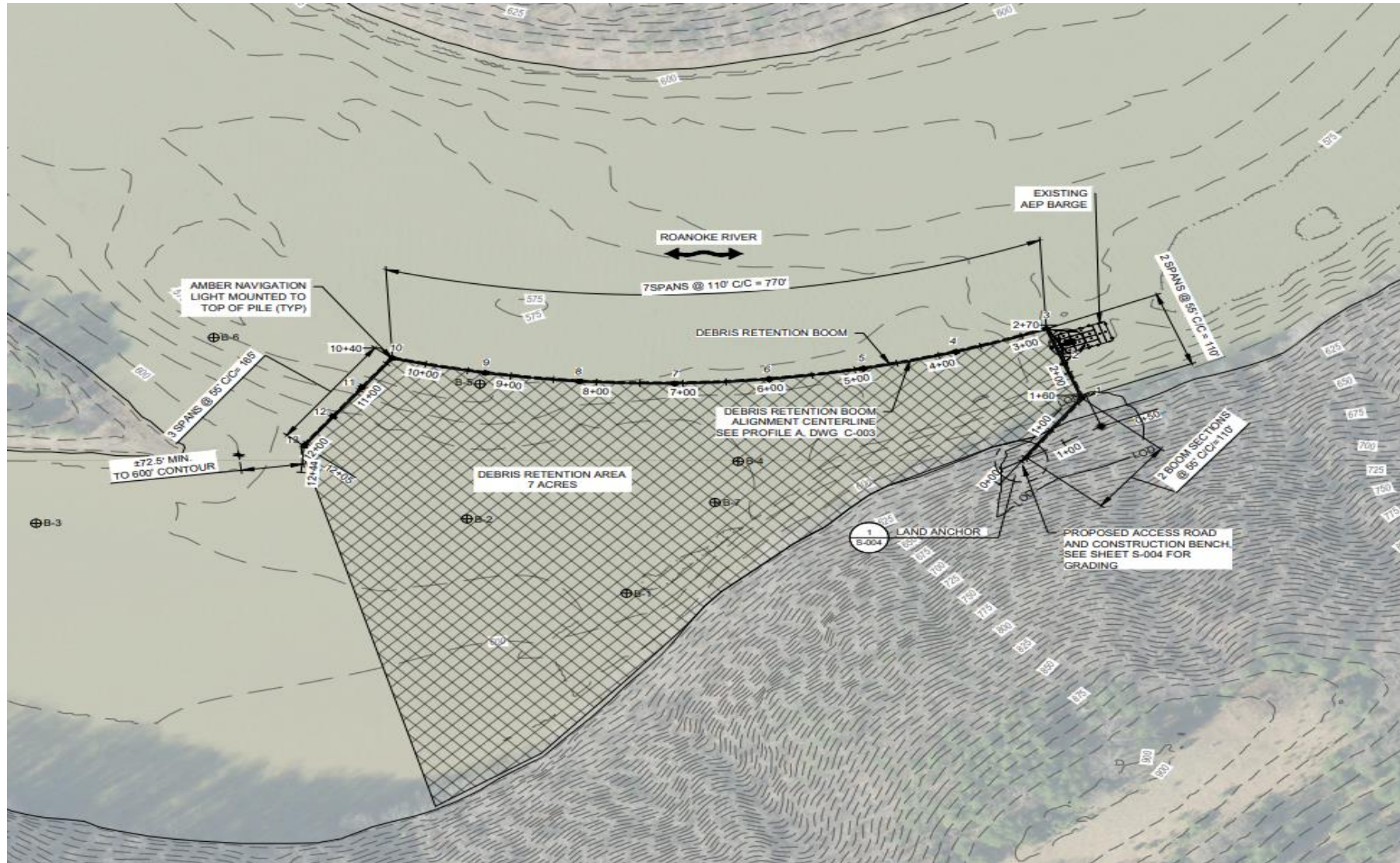


Modified Fishhook Design

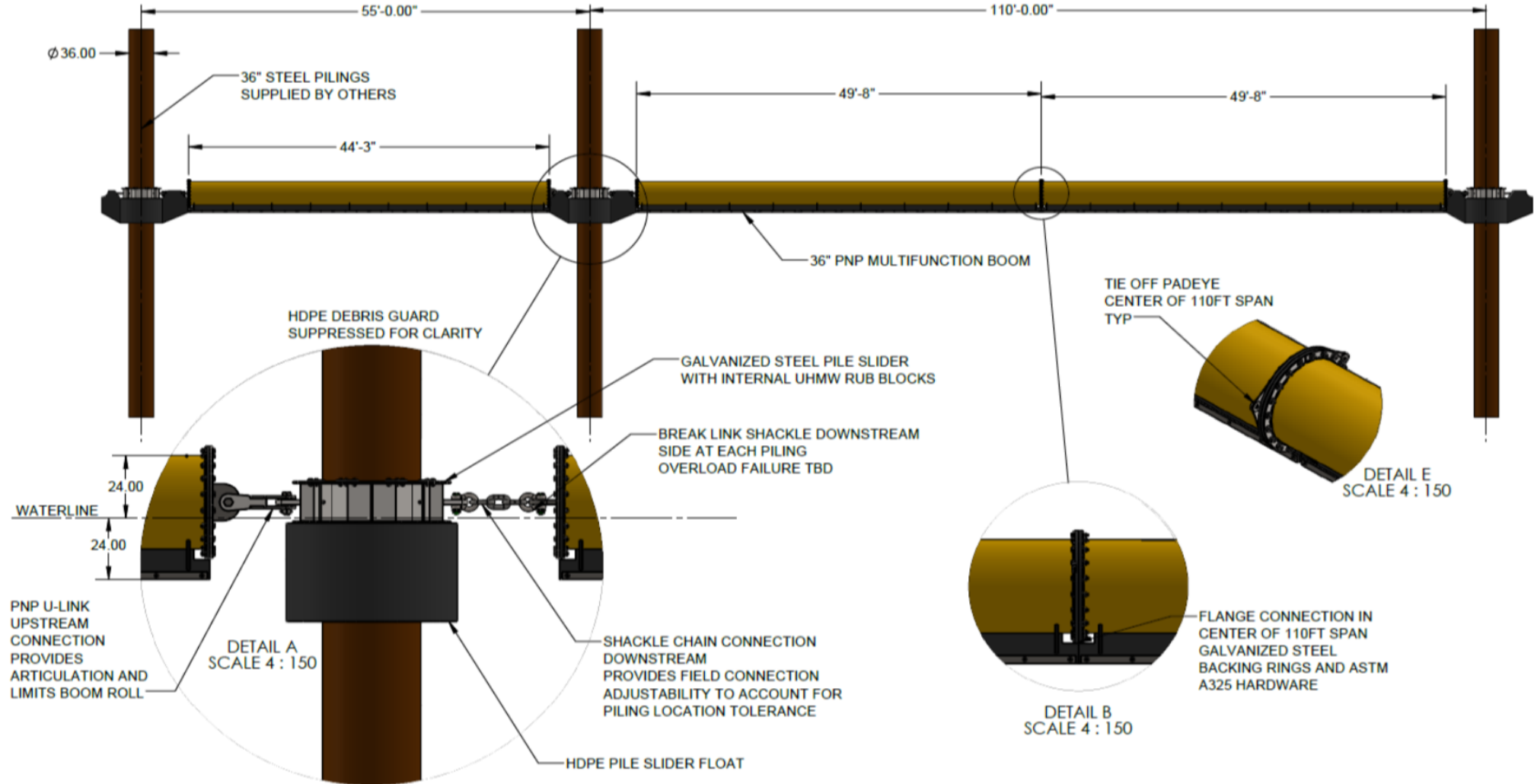


Deflector/Collector Design

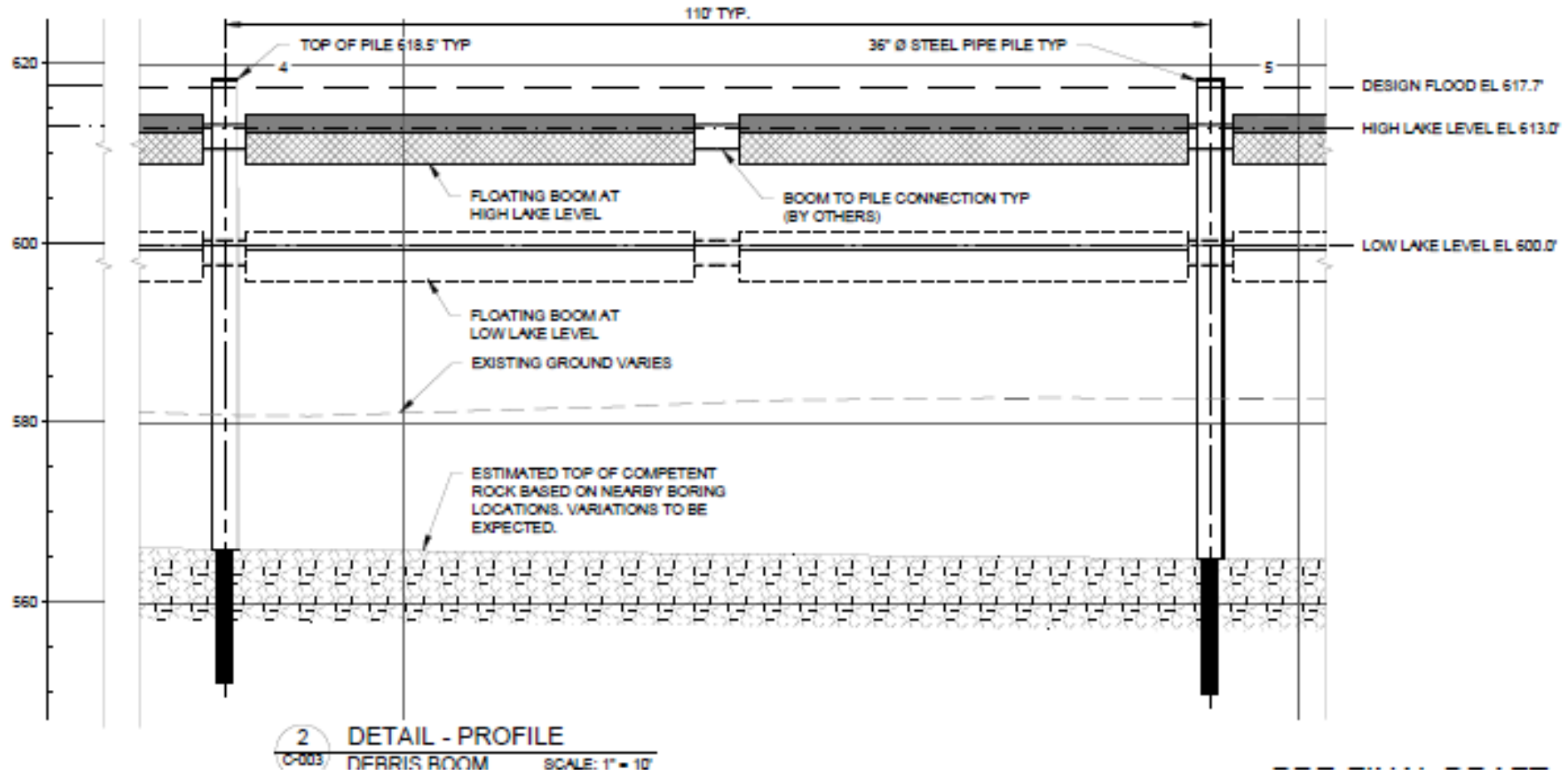
“Modified Fishhook” Design



Piling/Boom View



Piling/Boom Drawing



Debris Diversion & Collection Device

BOOM ANCHOR POINT ALONG SOUTHERN BANK OF LEESVILLE LAKE - LOOKING UPSTREAM



Debris Diversion & Collection Device

APPROACHING PIGG RIVER CONFLUENCE FROM
LEESVILLE LAKE TO THE EAST - LOOKING UPSTREAM



Debris Diversion & Collection Device

APPROACHING LEESVILLE LAKE FROM PIGG RIVER TO THE WEST - LOOKING DOWNSTREAM



Debris Diversion & Collection Device

APPROACHING PIGG RIVER CONFLUENCE FROM LEESVILLE LAKE TO THE EAST
AT LOW LAKE ELEVATION - LOOKING UPSTREAM

