

South Fork Rivanna Reservoir Dredging Feasibility Study

Summary



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South Fork Rivanna Reservoir Dredging Feasibility Study

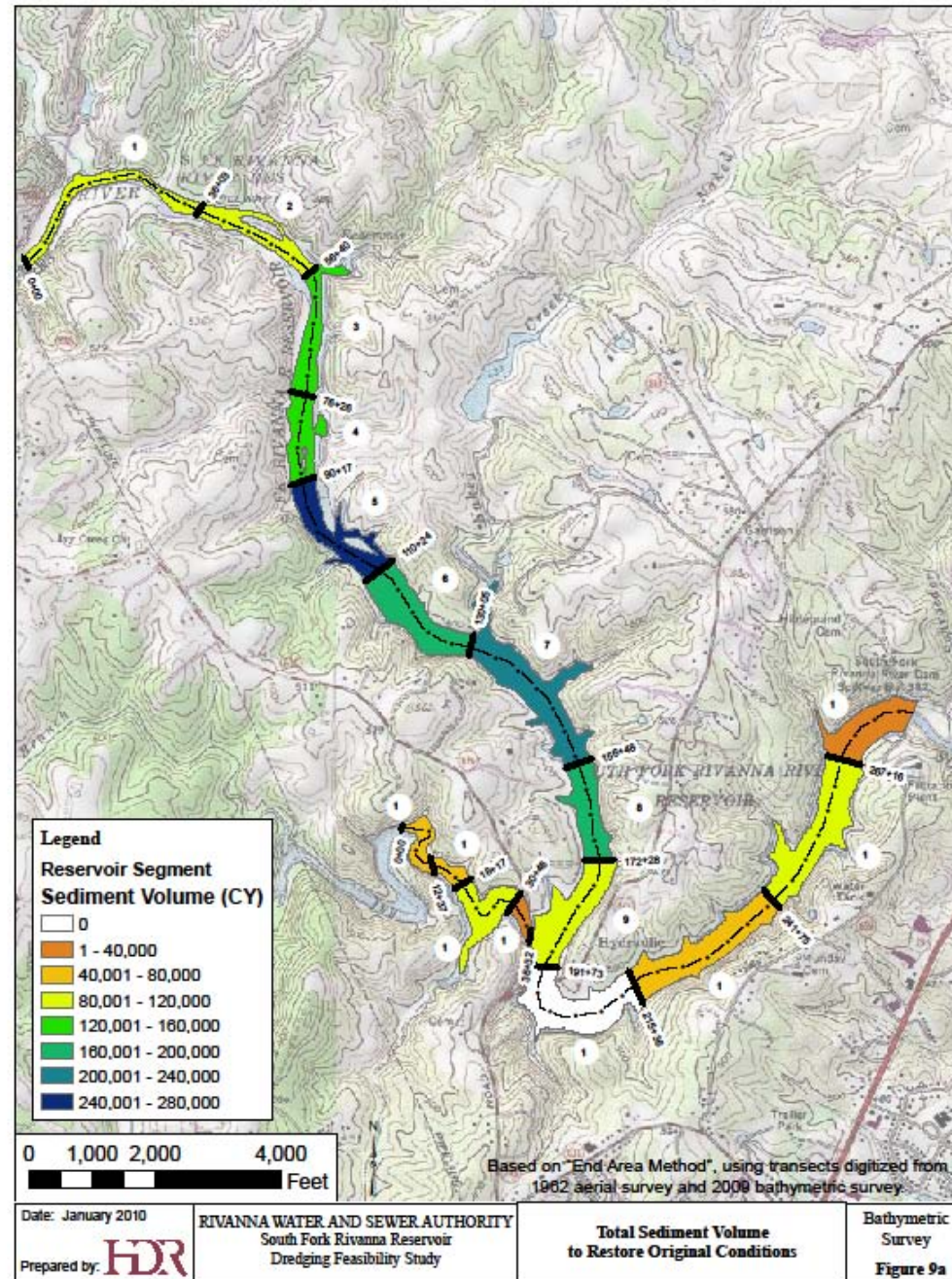
- Phase I - Reservoir Characterization
 - Task 1. Wetlands Assessment
 - Task 2. Bathymetric Survey
 - Task 3. Pre-Dredge Survey
 - Task 4. Sediment Characterization
 - Task 5. Public Meeting
- Phase II – Dredging Feasibility
 - Task 6. Dredging Alternatives
 - Task 7. Dewatering & Processing Site Alternatives
 - Task 10. Beneficial Use Assessment
 - Task 8. Public Meeting
- Phase III – Summary
 - Task 9. Summary Report



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Reservoir Characterization Summary

- Sediment is clean, no environmental contaminants
- Most of the sediment is in upper reaches and Ivy Creek
- >50% sand in uppermost segments
- > 75 % silt & clay in remainder
- Some sediment deposits have become vegetated wetlands
- Only in-water obstacle is Woodland Road Bridge
- Limited access to Reservoir

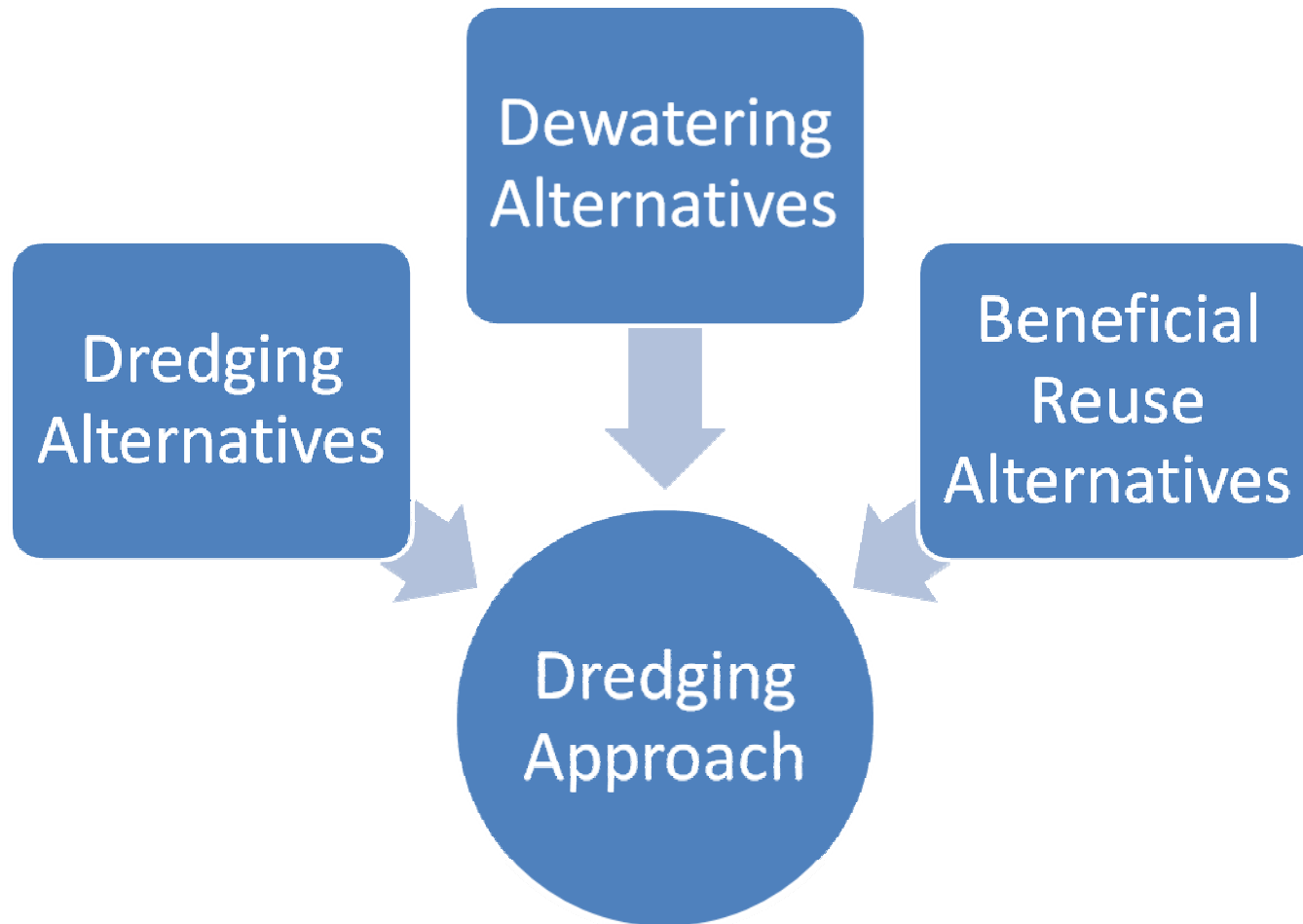


Sediment Volume

| Reservoir Segment | 2009 Sediment Volume | 2009 Sediment Volume Above Intake | Estimated Dredging Volume* | Estimated Dredging Volume Above Intake* |
|--------------------------------|----------------------|-----------------------------------|----------------------------|---|
| Upper Main Stem (cy) | 1,359,689 | 797,994 | 1,192,000 | 631,000 |
| MG | | | 241 | 127 |
| Lower Main Stem (cy) | 150,028 | 0 | 119,000 | 0 |
| MG | | | 24 | 0 |
| Ivy Creek (cy) | 232,850 | 120,397 | 230,000 | 117,000 |
| MG | | | 46 | 24 |
| Total (cy) | 1,742,567 | 918,391 | 1,541,000 | 748,000 |
| MG | | | 311 | 151 |
| Recommended Target (cy) | | | 1,422,000 | 748,000 |

*Estimated dredging volumes are approximate values based on no-dredge buffers. Final project design may increase or decrease dredging volumes.

Dredging Feasibility Analyses



Hydraulic Dredging



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Hydraulic Dredging

ADVANTAGES

- Minimal disturbance to lake, less turbidity
- Doesn't require lakeside trucking

DISADVANTAGES

- Dredged material must be dewatered
- Pipeline route to dewatering site
- Large upland area for dewatering basin



Local Market for Similar Materials

Topsoil
(screened)

- \$28 - \$33 cy delivered
- Variable demand, multiple small users

Topsoil
(unscreened)

- \$18 - \$23 cy delivered
- Variable demand, multiple small users

Fill

- \$16 - \$18 cy delivered
- Variable demand; Charlottesville Airport potential large user

Sand

- \$52 - \$62 cy delivered
- Multiple users

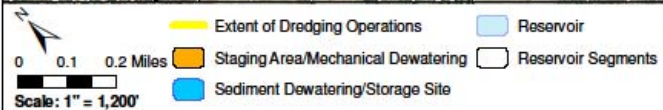
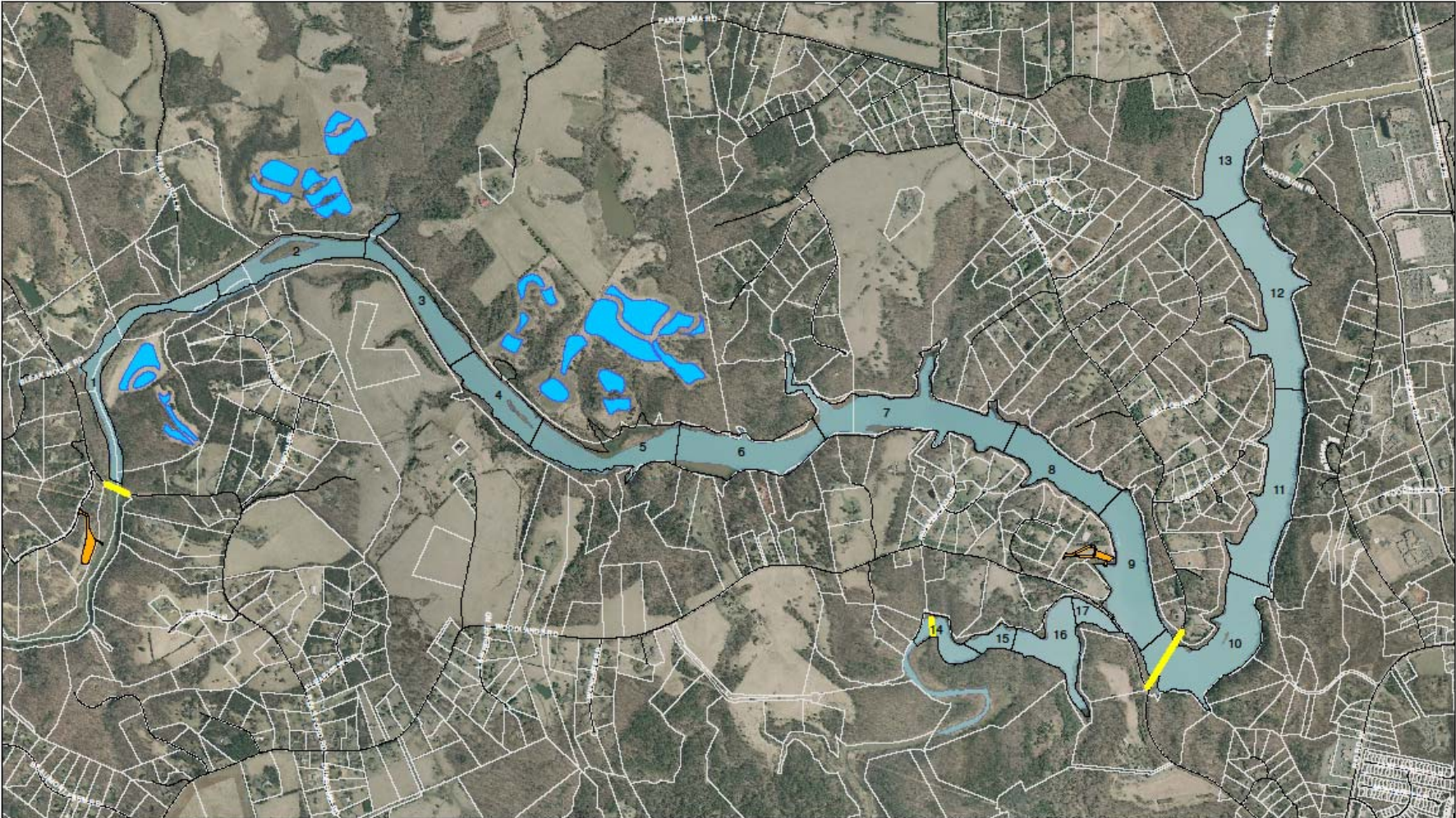
Two Part Dredging Approach to Maximize Dredging Volume

PART ONE

- Hydraulic dredge Segments 1-3
- Staging at Connelly Site
- Mechanical Dewatering at Connelly Site
- Beneficial Reuse of sand and other material

• PART TWO

- Hydraulic dredge Segments 4 – 9 & Ivy Creek
- Staging at Virginia Rowing Association
- Dewater at Panorama Farms Area 1b & 3, Lewellyn site
- No reuse



Source: GIS data from Albemarle County,
Aerial Imagery © 2007 Commonwealth of Virginia

Prepared by: **HDR** Date: May 2010

RIVANNA WATER AND SEWER AUTHORITY
South Fork Rivanna Reservoir
Dredging Feasibility Study

Dredging Alternatives Report

Figure 10: Dredge Staging and Dewatering Sites

Part One

- 290,124 cy in Segments 1-3
 - 189,097 cy of sand
 - 101,227 cy of remaining sediment
- Cost = \$7,766,518 to \$12,973,515
- Cost per cy is \$27 to \$45



Potential Cost Offset with Reuse

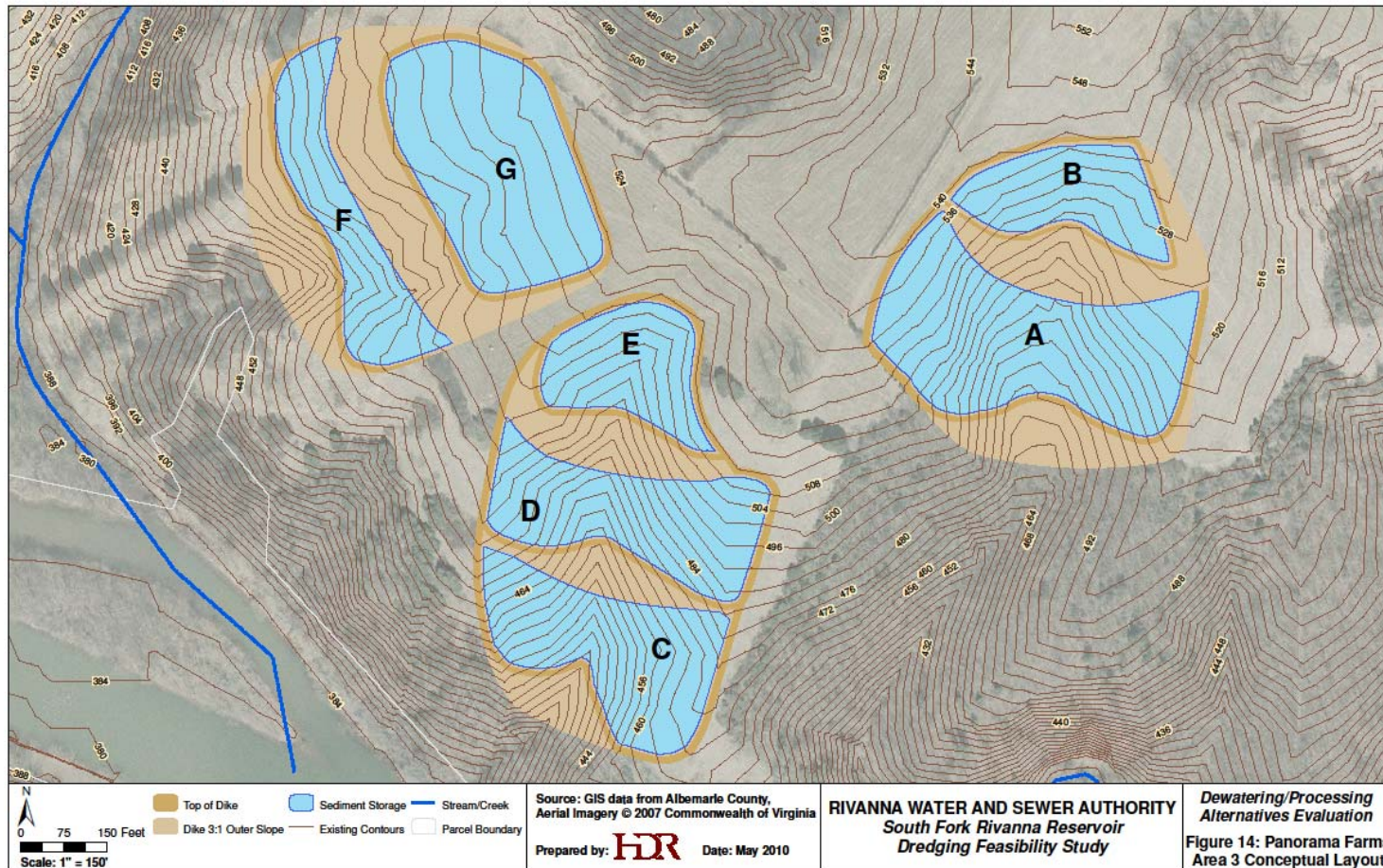
- Cost of screening, loading & hauling dredged material compared to local material pricing
- Cost Recovery for Sand
 - \$4,774,699 to \$9,469,978
- Cost Recovery for Remaining Sediment
 - \$126,534 to \$2,133,865 if used as topsoil
 - (-\$177,147) to \$1,222,822 if used as fill
- Cost of stockpiling not included

Part Two

835,686 cy

Cost = \$26,271,273 to
\$27,219,996

Cost per cy = \$33



Two Part Dredging Approach

- Dredging volume = 1,126,010 cy
- Cost = \$34,037,791 to \$40,193,511 (Does not include potential off-set from material recovery)
- Cost per cy = \$31 to \$36
- Restores all useable water supply volume plus 56% of the dead storage volume in Upper Main Stem and Ivy Creek
- Removes 79% of the 1,422,000 cy maximum dredging target

Questions ?

