Alternative R-1a: Gillis Falls Reservoir (Proposed – El 610)

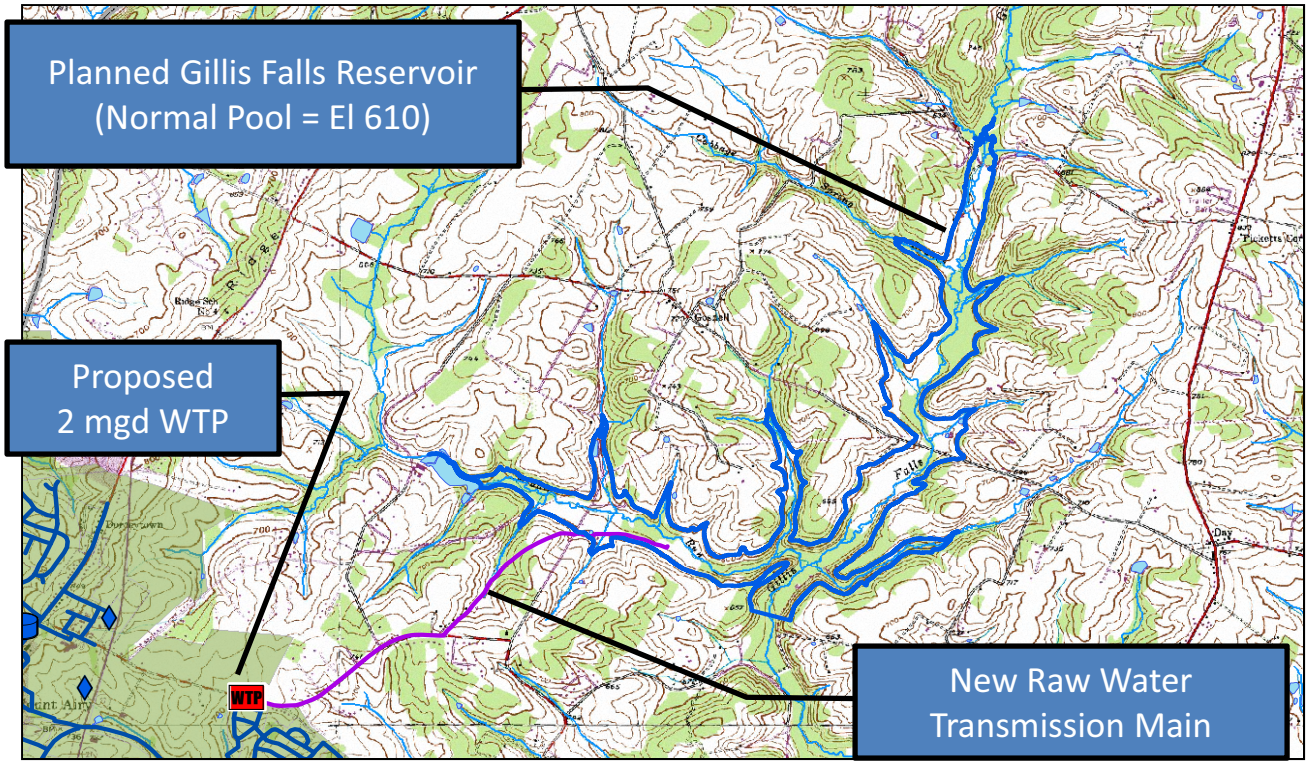
MALCOLM PIRNIE

Description of Alternative:

- Reservoir planned as regional water supply for Mount Airy and Freedom/Sykesville Water Service Areas
- Safe Yield = 3.85 mgd; Total Volume = 4.15 BG; dead storage assumed below elevation 580 ft
- Drainage Area = 17.4 square miles
- Surface Area = 452 ac. at Normal Pool El. 610 ft
- Average minimum release of 5.45 mgd
- Raw water to be treated at new 2 mgd WTP in Mt. Airy.
- Requires 2.0 miles of new Raw Water Transmission Main
- One pump station at reservoir

Key Implementation Steps:

- County complete purchase of approximately 587 acres of land, including +/- 5 residences
- Key Permits Required:
  - USACE Section 404 permit
  - Water Appropriation and Use Permit
  - Water and Sewerage Construction Permit
  - Non-tidal Wetland and Waterways Permit
  - Dam Safety Permit
- Renegotiate more realistic reservoir release rates
- Complete surveys for aquatic habitat and cultural resources within the affected project footprint.
- Develop Mitigation Plan:
  - Approx. 10.1 miles of stream impacts
  - Approx. 177 acres of wetland impacts
- Class III natural trout stream would require downgrading to Class IV recreational trout stream
- Address Tier II stream designations extending upstream on north arm from Gillis Road crossing and extending downstream from just upstream of the dam site.



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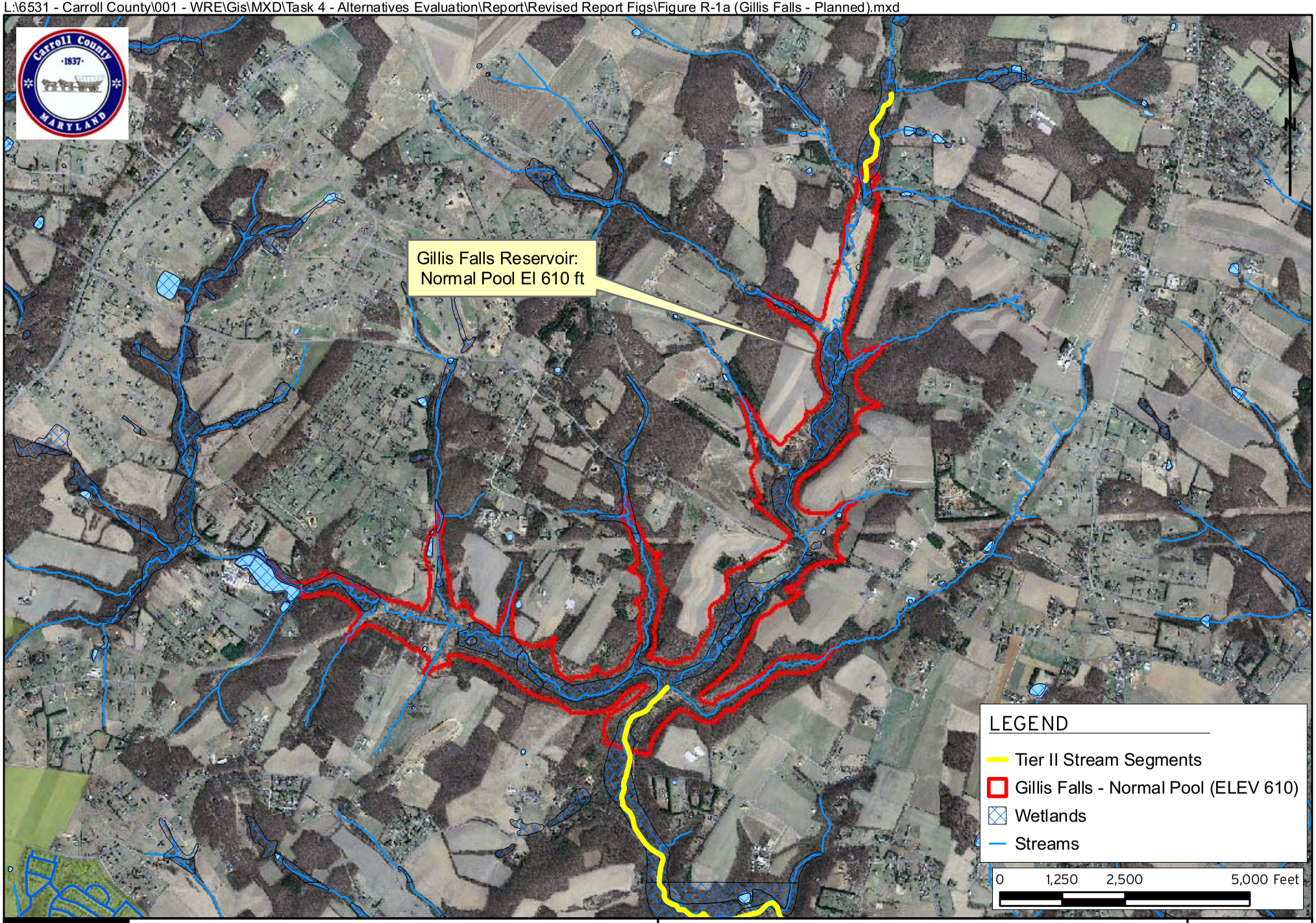


MALCOLM PIRNIE

CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Alternative R-1a:
Gillis Falls Reservoir (Proposed)

Aug 2009

Figure R-1a

Alternative R-1b: Gillis Falls Reservoir (Expanded – El 630)

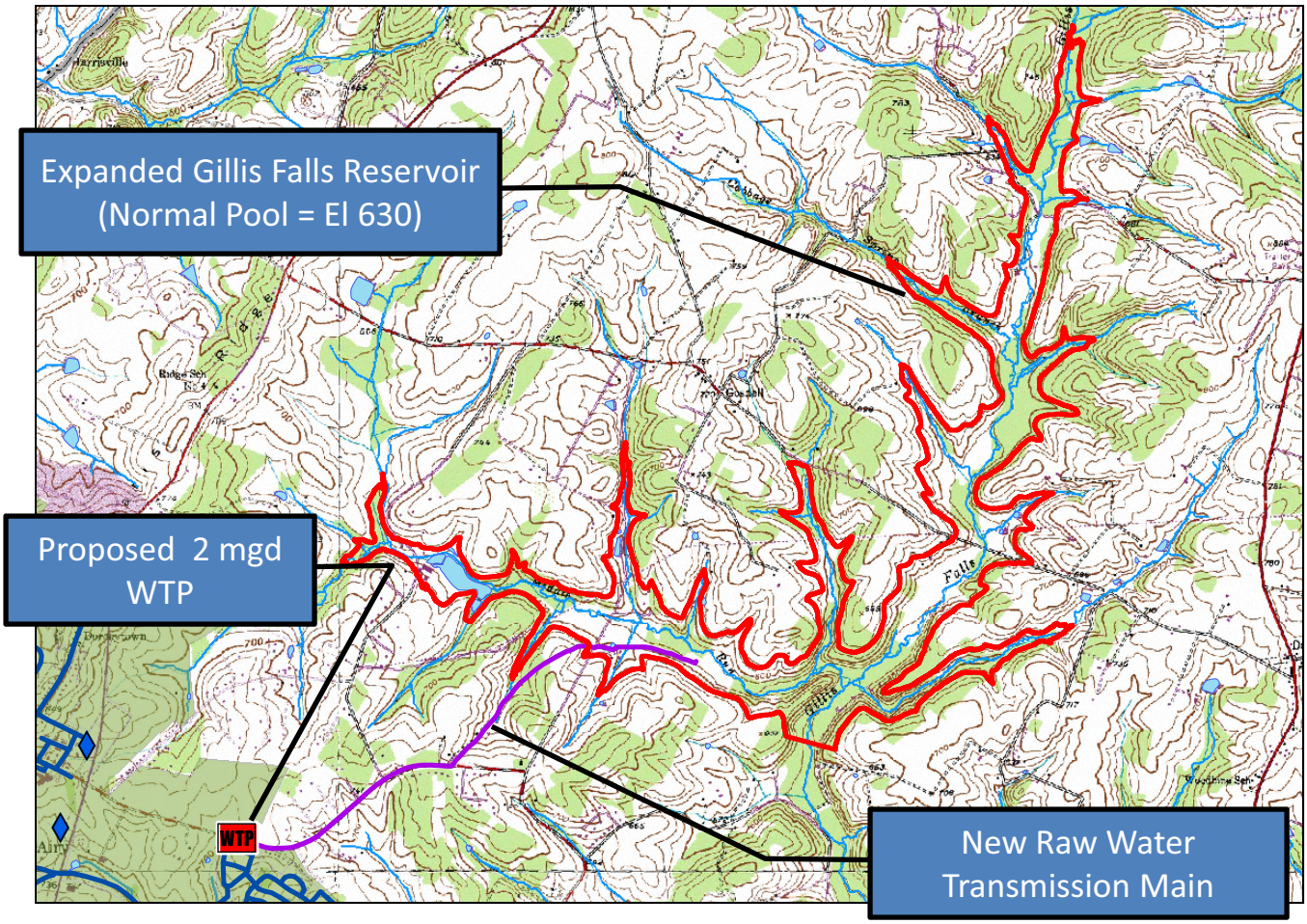
MALCOLM PIRNIE

Description of Alternative:

- Reservoir planned as regional water supply for Mount Airy and Freedom/Sykesville Water Service Areas
- Safe Yield = 5.0 mgd; Total Volume = 8.02 BG; dead storage assumed below elevation 580 ft
- Drainage Area = 17.4 square miles
- Surface Area = 744 ac. at Normal Pool El. 630 ft
- Average minimum release of 5.45 mgd
- Raw water to be treated at new 2 mgd WTP in Mt. Airy.
- Requires 2.0 miles of new Raw Water Transmission Main
- One pump station at reservoir

Key Implementation Steps:

- County complete purchase of approximately 1,541 acres of land, including +/- 16 residences
- Key Permits Required:
  - USACE Section 404 permit
  - Water Appropriation and Use Permit
  - Water and Sewerage Construction Permit
  - Non-tidal Wetland and Waterways Permit
  - Dam Safety Permit
- Renegotiate more realistic reservoir release rates
- Complete surveys for aquatic habitat and cultural resources within the affected project footprint.
- Develop Mitigation Plan:
  - Approx. 14.2 miles of stream impacts
  - Approx. 225 acres of wetland impacts
- Class III natural trout stream would require downgrading to Class IV recreational trout stream
- Address Tier II stream designations extending upstream on north arm from Gillis Road crossing and extending downstream from just upstream of the dam site.



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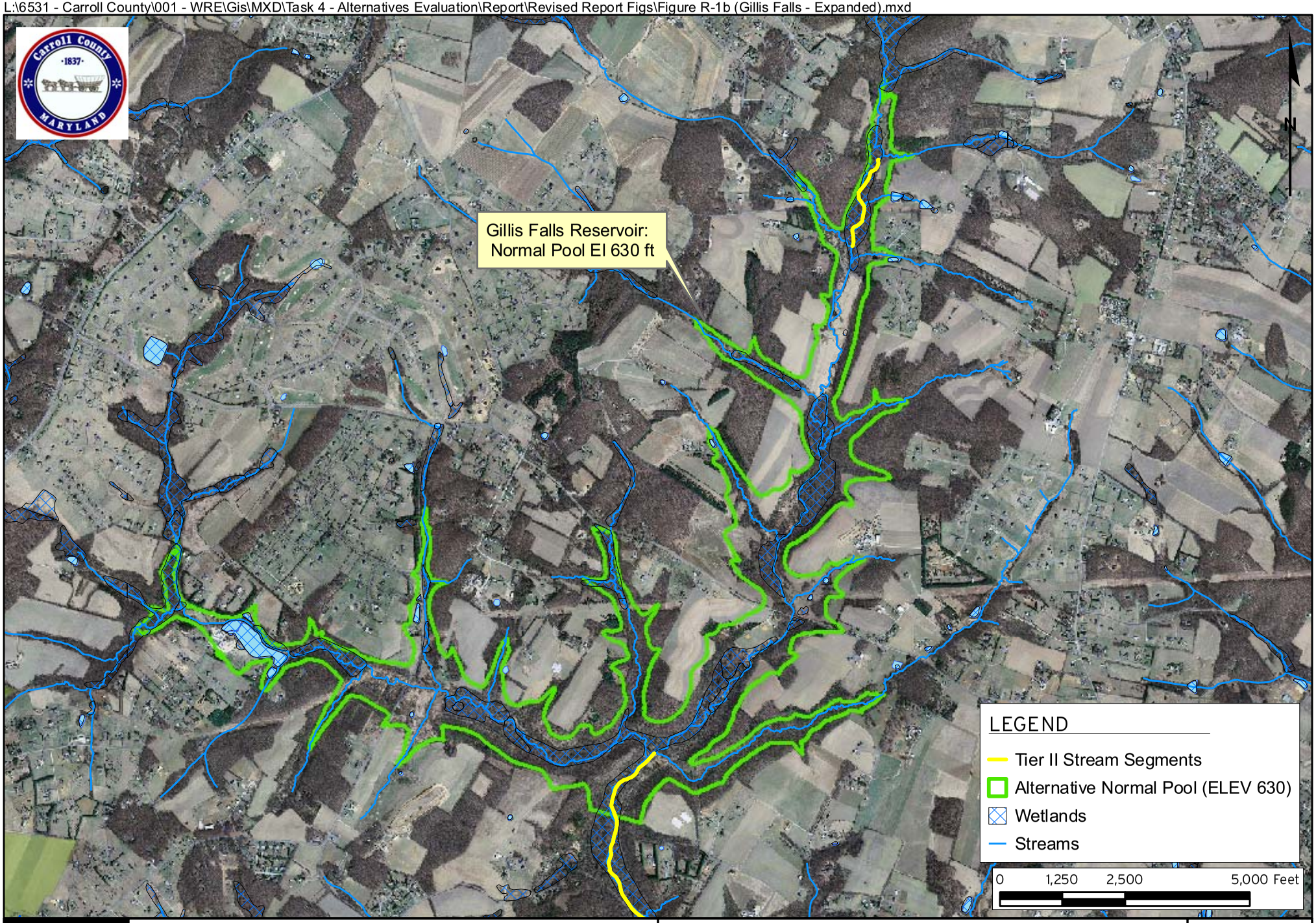


MALCOLM PIRNIE

CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Alternative R-1b:
Gillis Falls Reservoir (Expanded)

Aug 2009

Figure R-1b

Alternative R-2: Piney Run Reservoir – Use as Water Resource

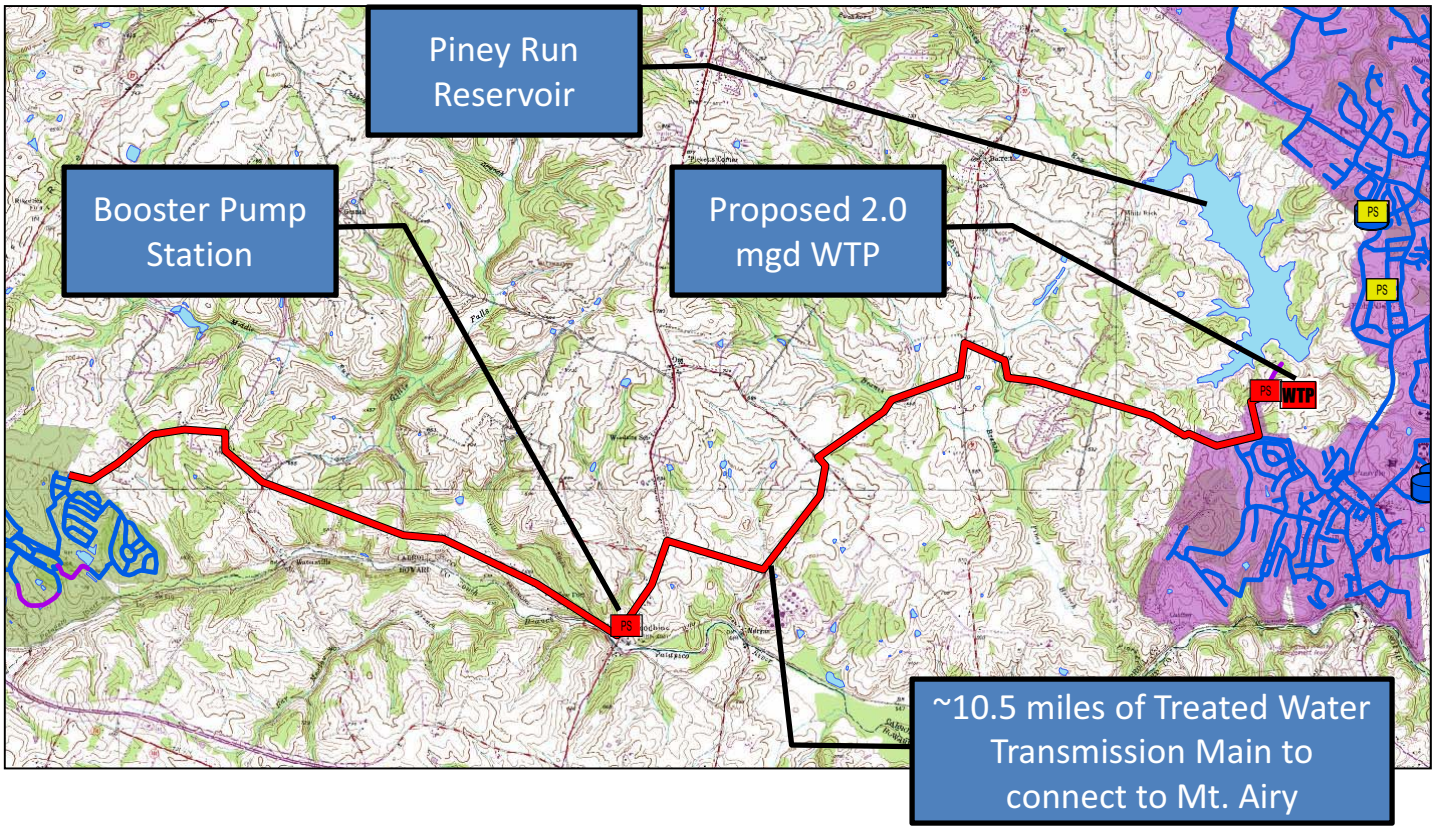
MALCOLM PIRNIE

Description of Alternative:

- Convert existing reservoir (completed in 1975) to water supply source for Mt. Airy and possibly Sykesville/Freedom Water Service Area
- Safe Yield = 3.65 mgd; Total Volume = 1.97 BG
- Drainage Area = 10.43 square miles
- Surface Area = 298 ac. at Normal Pool El. 524 ft
- Average minimum release = 1.0 mgd
- Construct new 2.0 mgd WTP on Hollenberry Road and 1.0 MG storage facility
- Approximately 1,000 feet of 16" raw water transmission main
- Approximately 10.5 miles of 16-inch treated water transmission main to connect to Mt. Airy service area.
- Two pump stations (one at WTP, one booster pump station near Woodbine).
- 2.0 MG Storage Tank (located near Woodbine)

Key Implementation Steps:

- Potential community opposition for project.
- Key Permit Required:
  - Water and Sewerage Construction Permit
- Land Easement/Acquisition for WTP and pipeline
- Pipeline, storage, and pump station engineering



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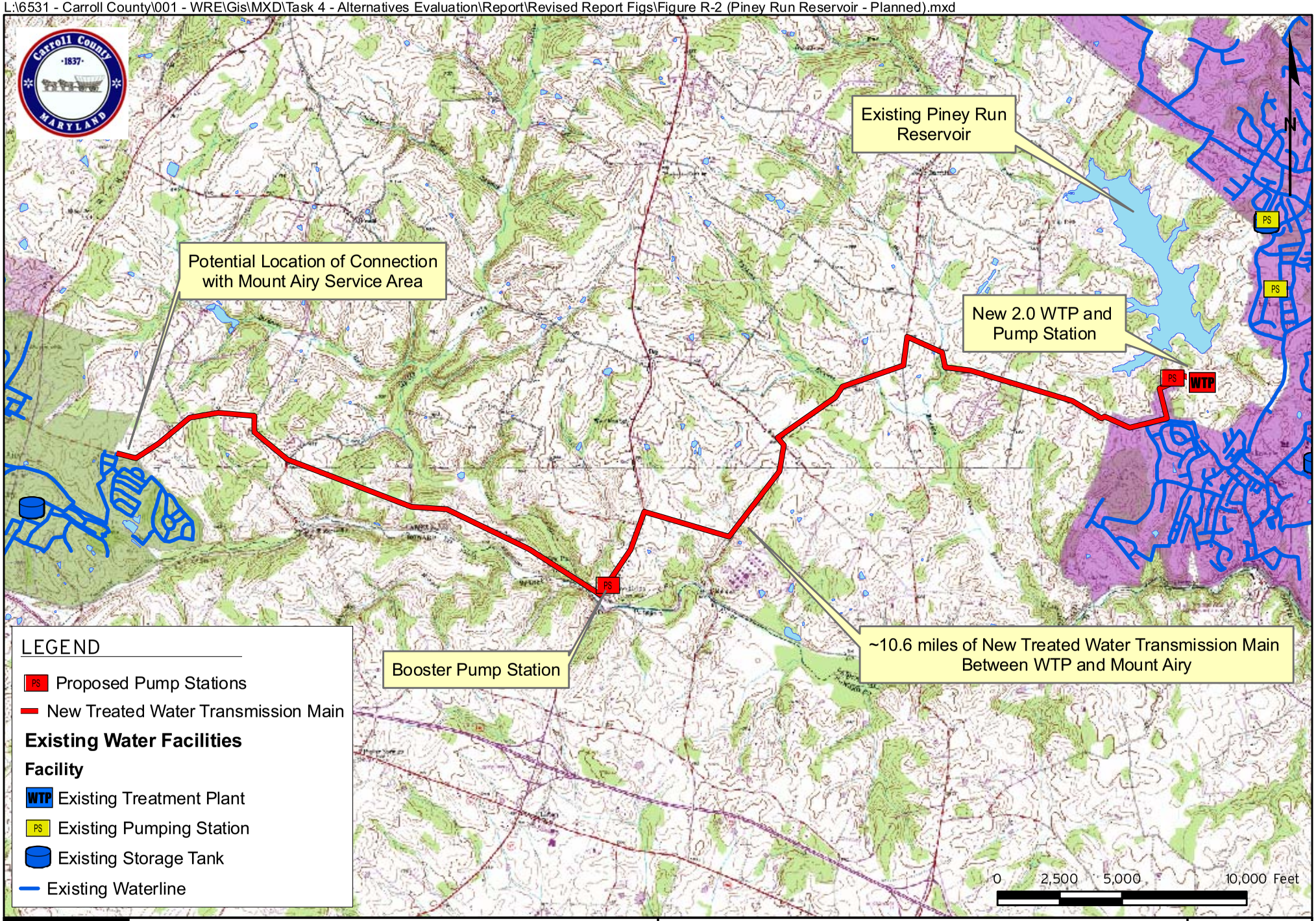


MALCOLM PIRNIE

CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Alternative R-2:
Piney Run Reservoir - Use as Water Source

Aug 2009

Figure R-2

Alternative R-3: Expansion of Piney Run Reservoir

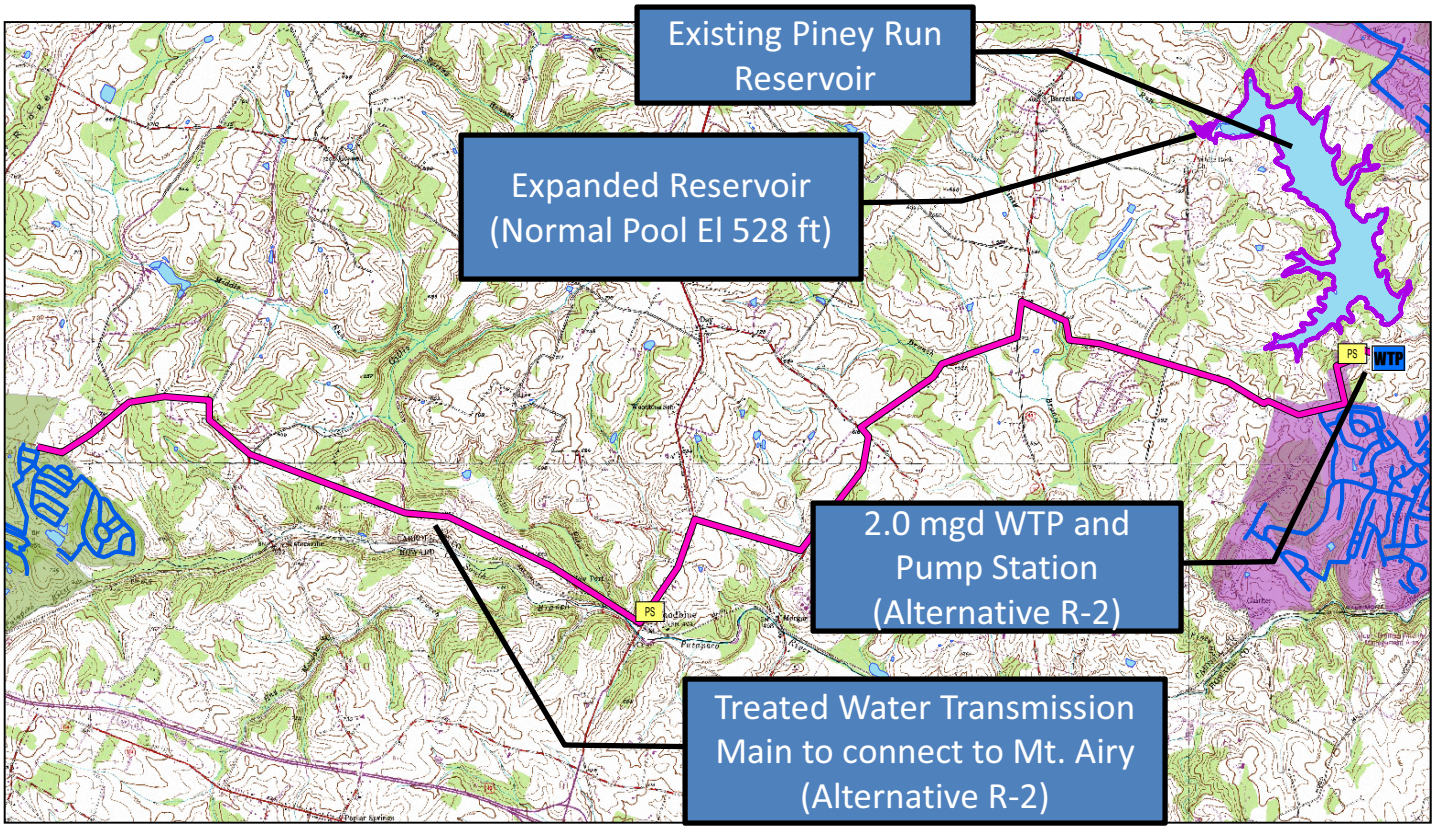
MALCOLM PIRNIE

Description of Alternative:

- Increase capacity of existing Piney Run Reservoir by raising the spillway riser and emergency spillway.
- Raise normal pool elevation by 4 feet
  - Safe Yield: 4.11 mgd (incremental increase of 0.46 mgd from existing Piney Run Reservoir, Alternative R-2)
  - Surface Area: 336 acres
  - Normal Pool: 528 ft
  - Volume: 2.40 BG
  - Average Min. Release = 1.0 mgd
- All components of Alternative R-2 would already be in place prior to expansion of Piney Run Reservoir.

Key Implementation Steps:

- Receive approval from MDE Dam Safety to raise normal pool elevation and change dam classification from current "high hazard" designation.
- Key Permits Required:
  - Water Appropriation and Use Permit
  - Non-tidal Wetlands and Waterways Permit
  - Dam Safety Permit
- Land Easement/Acquisition for reservoir expansion.
- Complete surveys for aquatic habitat and cultural resources within the affected project footprint.
- Develop Mitigation Plan:
  - Wetland Impacts: 12.6 acres
  - Stream Impacts: 1.05 miles
- Confirm that any impacts to Waters Edge Farm and County park/marina can be addressed.



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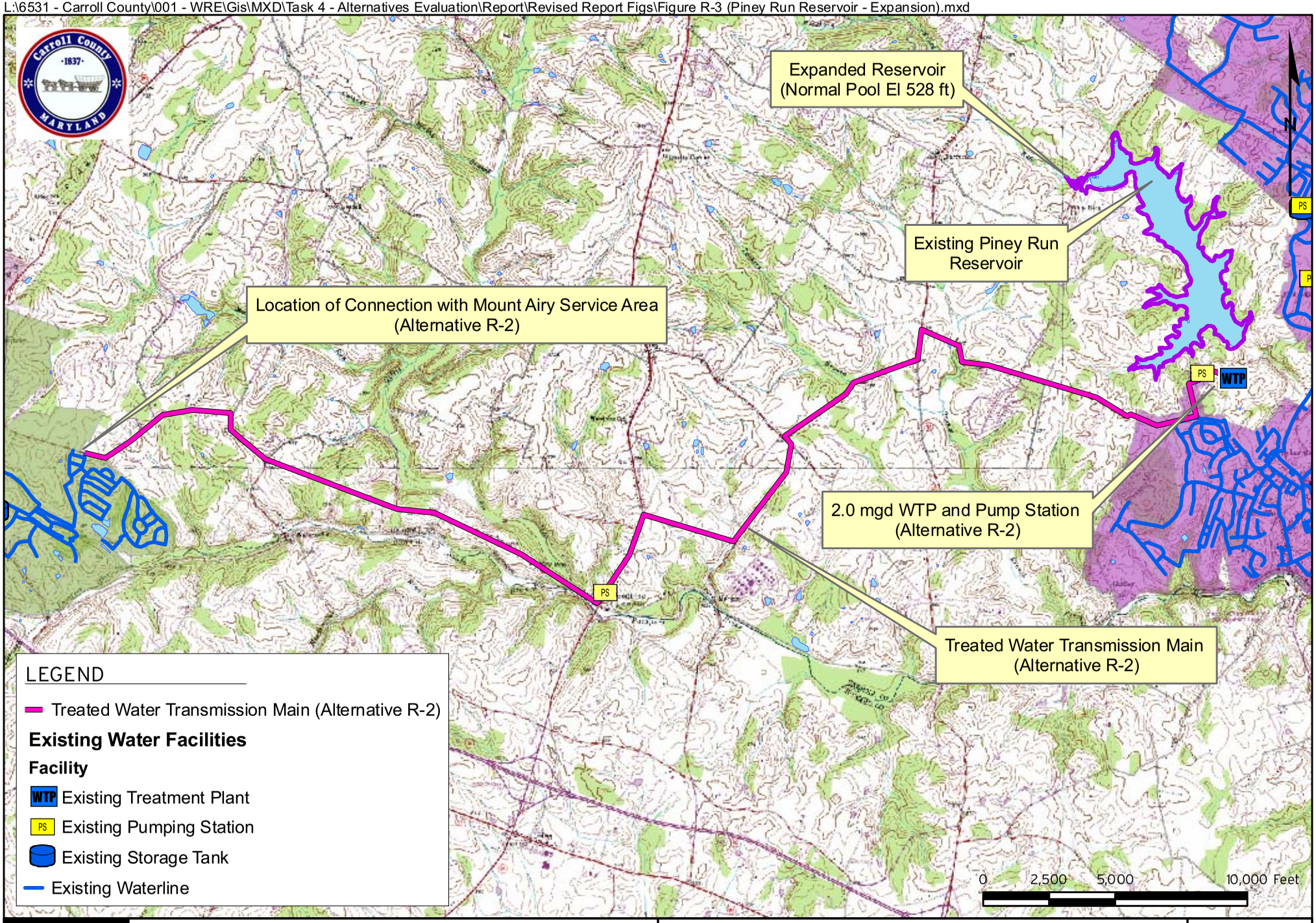


MALCOLM PIRNIE

CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Alternative R-3:
Expansion of Piney Run Reservoir

Aug 2009

Figure R-3

Alternative R-4a: Union Mills Reservoir (Proposed – El 610)

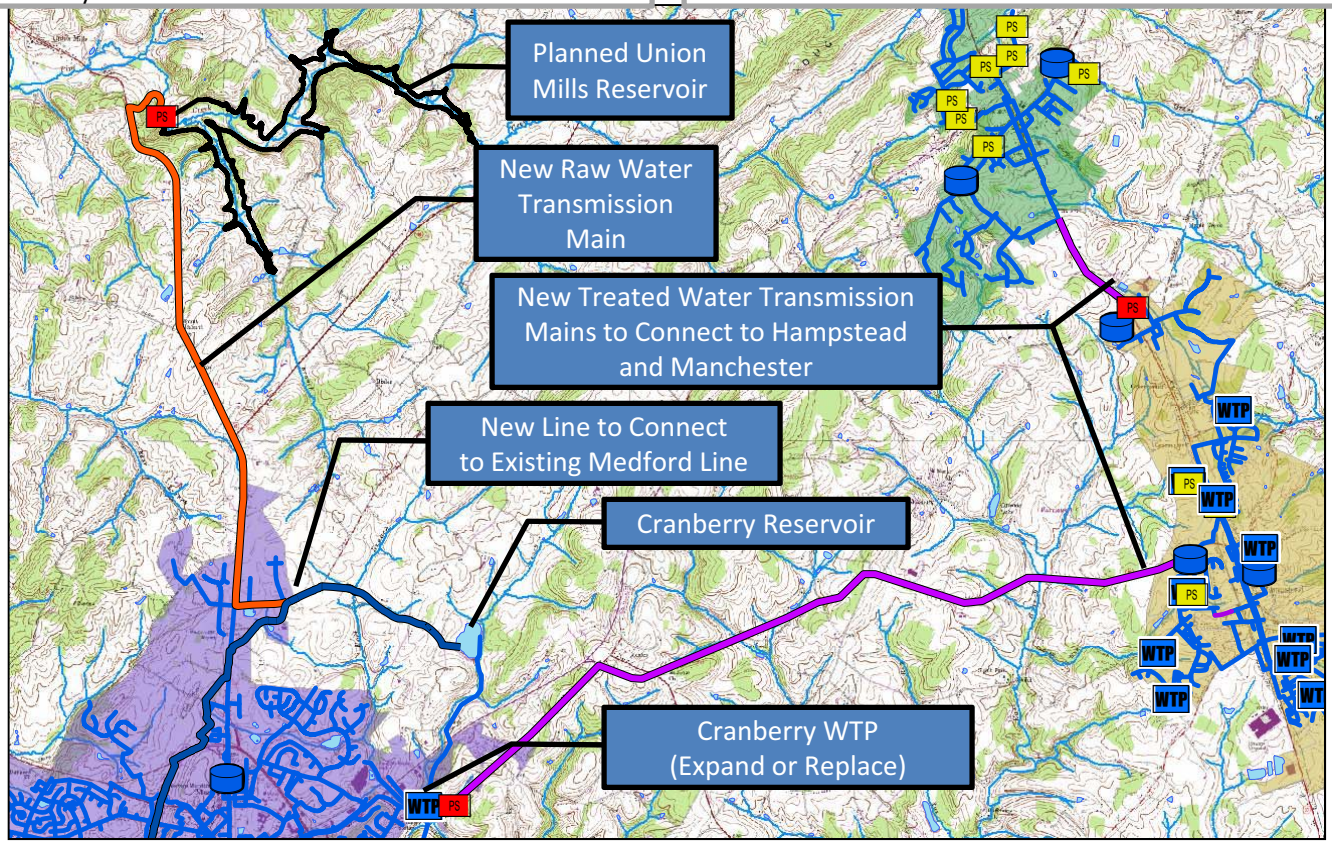
MALCOLM PIRNIE

Description of Alternative:

- Regional reservoir planned to supplement Westminster, Hampstead, Manchester and Taneytown Water Service Areas and provide flood control
- Safe Yield = 3.76 mgd; Total Volume = 2.44 BG
- Drainage Area = 24.86 square miles
- Surface Area = 298 ac. at Normal Pool El. 610 ft
- Average minimum release = 5.48 mgd
- Phased implementation – potential for phased implementation, starting with a groundwater option (G-7) and/or a surface water intake on Big Pipe Creek (S-2). If either project is completed, the raw water pipeline will already be in place for the Union Mills Reservoir.
- Construction of a new 3.2 mgd WTP in vicinity of existing Cranberry WTP or expand Cranberry WTP capacity by 3.2 mgd.
- Installation of approximately 5 miles of 20-inch raw water transmission mains to connect Union Mills Reservoir to Cranberry Reservoir.
- Installation of approximately 7.8 miles of treated water transmission main to connect to Hampstead and Manchester Water Service Areas.
- New intake and three new pump stations
- Taneytown to be served through flow augmentation of Big Pipe Creek and downstream withdrawal. Construction of a new 1.8 mgd WTP in Taneytown. Installation of approximately 1.0 mile of raw water transmission mains in Taneytown to connect intake to new WTP

Key Implementation Steps:

- County complete purchase of approximately 781 acres of land, including +/- 3 residences
- Key Permits Required:
  - USACE Section 404 permit
  - Water Appropriation and Use Permit
  - Water and Sewerage Construction Permit
  - Non-tidal Wetland and Waterways Permit
  - Dam Safety Permit
- Complete surveys for aquatic habitat and cultural resources within the affected project footprint.
- Develop Mitigation Plan:
  - Approx. 8.4 miles of stream impacts
  - Approx. 114 acres of wetland impacts
- Negotiate less restrictive minimum reservoir releases with MDE to increase project safe yield.
- Confirm that any impacts to Whittaker Chambers Farm (National Historic Landmark) can be addressed.
- Confirm that any potential water quality impacts on reservoir from adjacent John Owings Landfill can be addressed.



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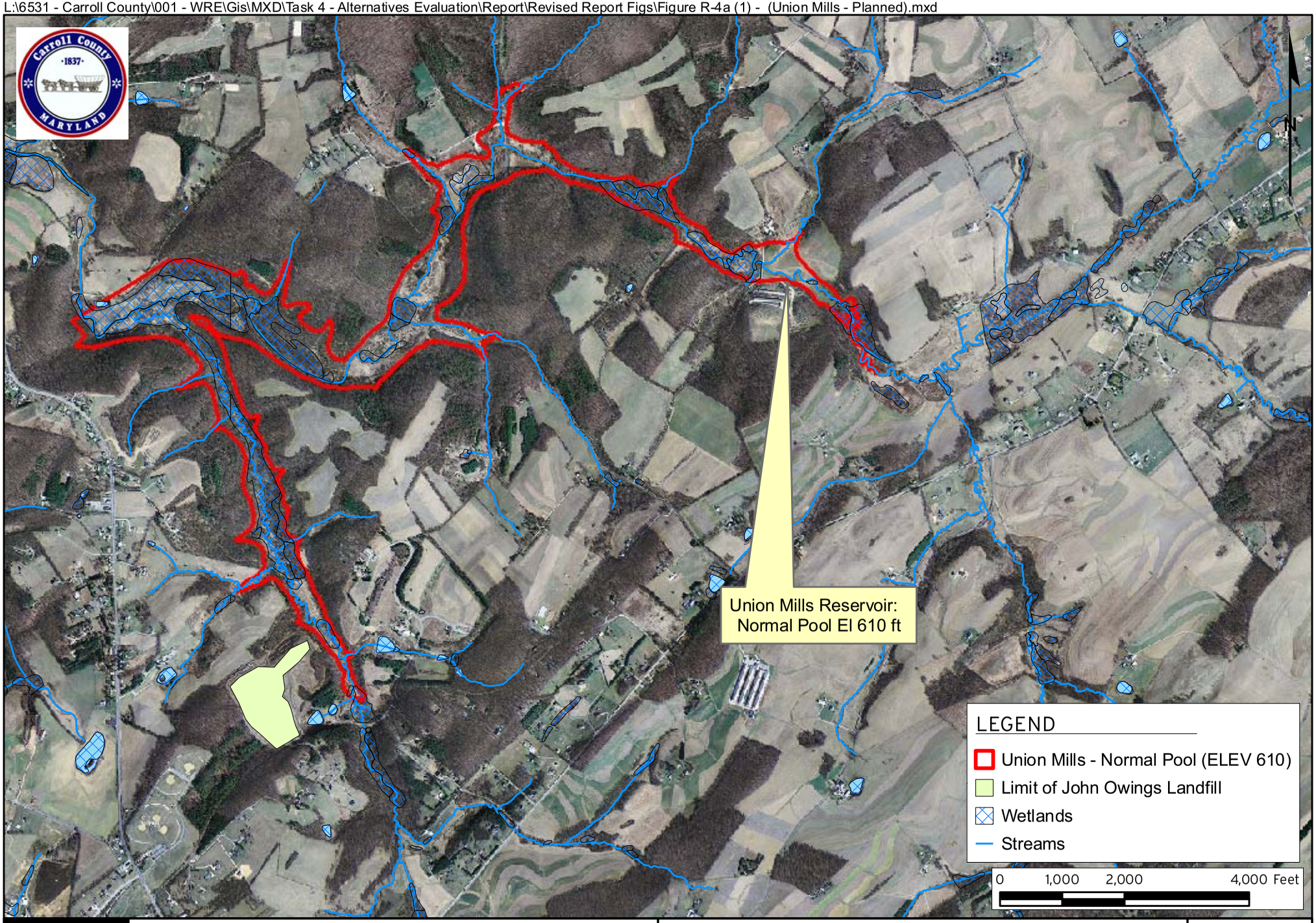

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CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Alternative R-4a:
Union Mills Reservoir (Proposed)

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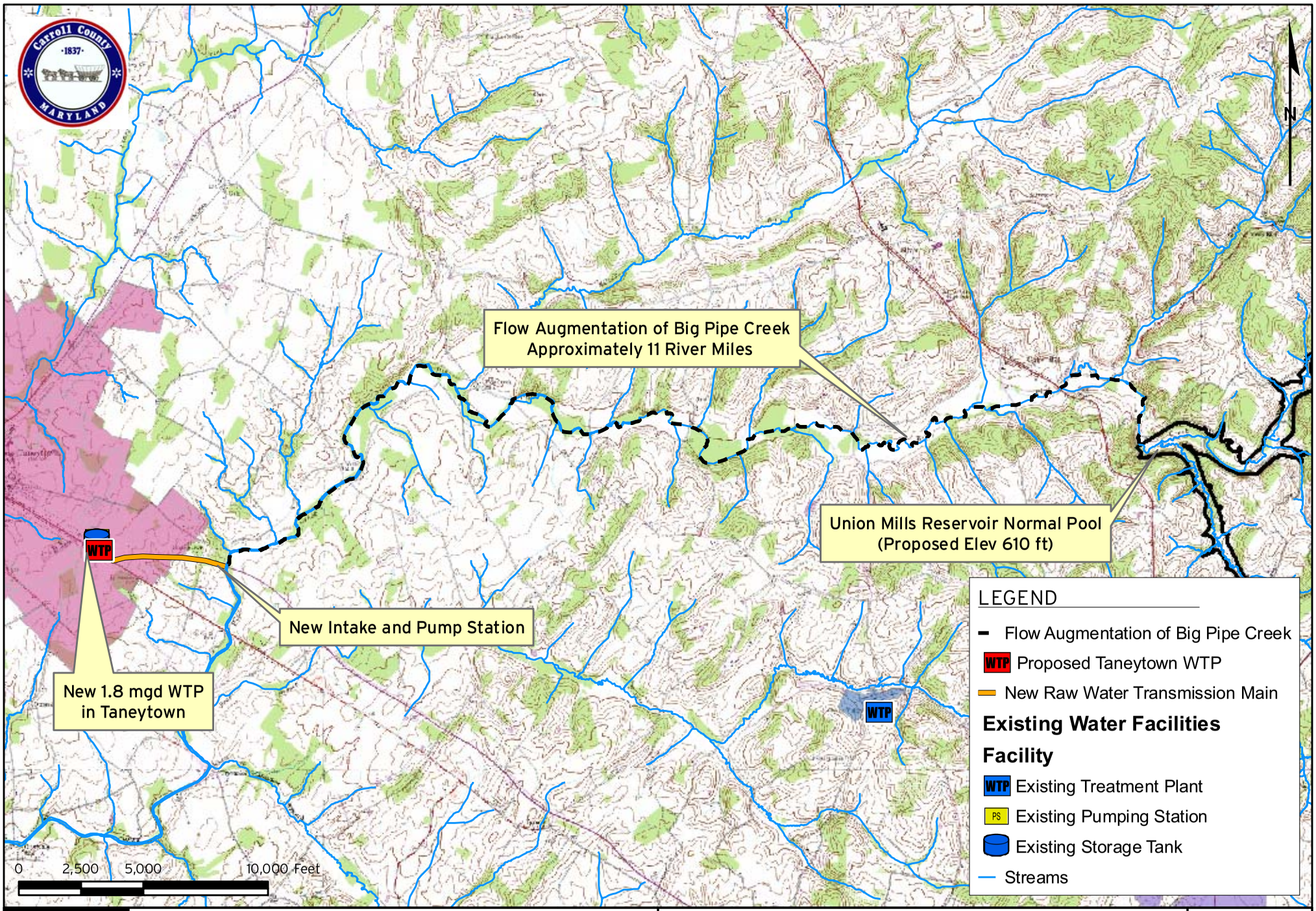
Figure R-4a(1)



MALCOLM PIRNIE

CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Union Mills Reservoir Flow Augmentation of
Big Pipe Creek to Supply Taneytown

Aug 2009

Figure R-4a (2)

Alternative R-4b: Union Mills Reservoir (Expanded – El 630)

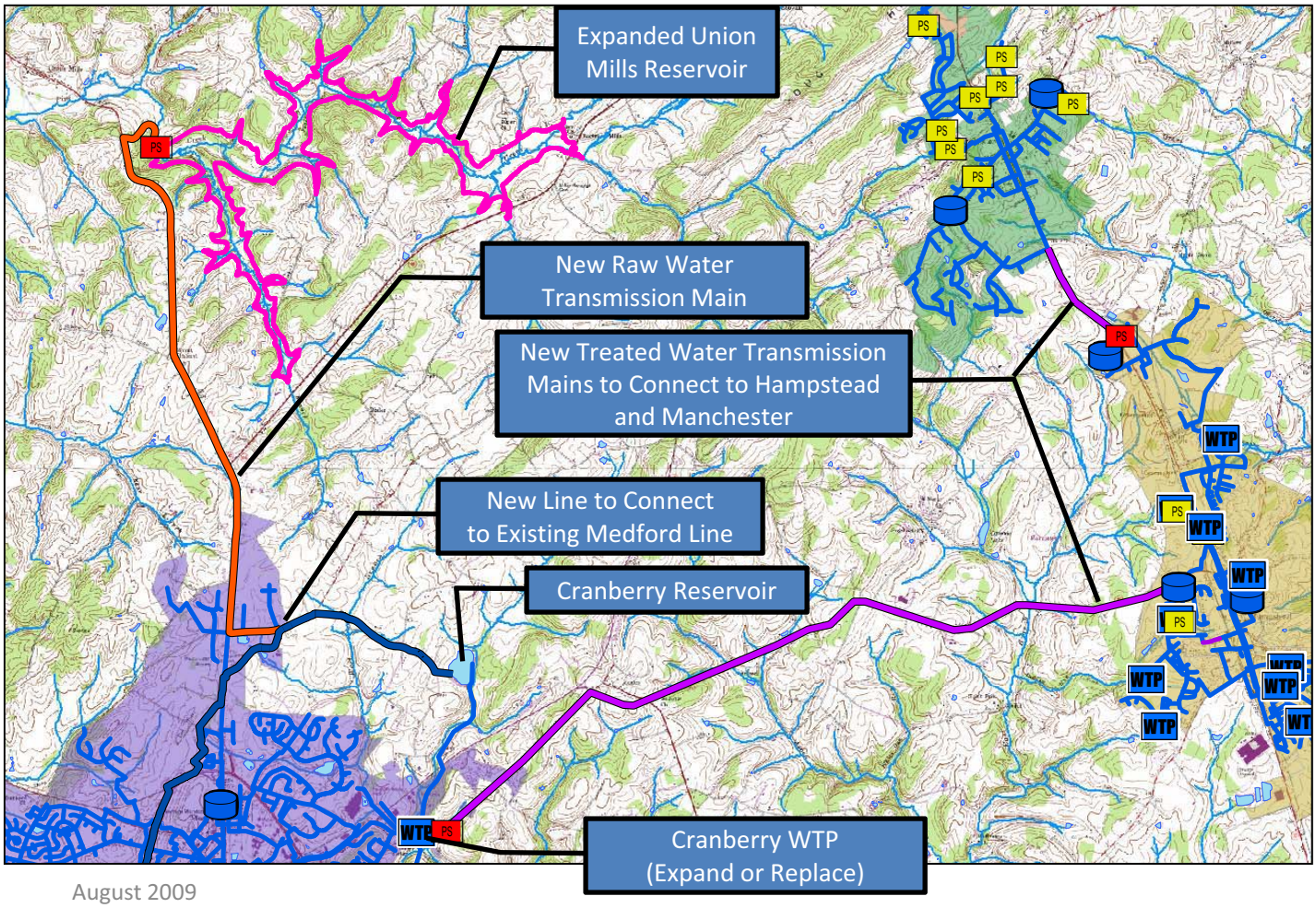
MALCOLM PIRNIE

Description of Alternative:

- Regional reservoir planned to supplement Westminster, Hampstead, Manchester and Taneytown Water Service Areas and provide flood control
- Safe Yield = 7.93 mgd; Total Volume = 5.49 BG
- Drainage Area = 24.86 square miles
- Surface Area = 633 ac. at Normal Pool El. 630 ft
- Average minimum release = 5.48 mgd
- Construction of a new 3.2 mgd WTP in vicinity of existing Cranberry WTP or expand Cranberry WTP capacity by 3.2 mgd.
- Installation of approximately 5 miles of 36-inch raw water transmission mains to connect Union Mills Reservoir to Cranberry Reservoir.
- Installation of approximately 7.8 miles of treated water transmission main to connect to Hampstead and Manchester Water Service Areas.
- New intake and three new pump stations
- Taneytown to be served through flow augmentation of Big Pipe Creek and downstream withdrawal. Construction of a new 1.8 mgd WTP in Taneytown. Installation of approximately 1.0 mile of raw water transmission mains in Taneytown to connect intake to new WTP .

Key Implementation Steps:

- County complete purchase of approximately 1,144 acres of land, including +/- 4 residences
- Key Permits Required:
  - USACE Section 404 permit
  - Water Appropriation and Use Permit
  - Water and Sewerage Construction Permit
  - Non-tidal Wetland and Waterways Permit
  - Dam Safety Permit
- Complete surveys for aquatic habitat and cultural resources within the affected project footprint.
- Develop Mitigation Plan:
  - Approx. 15.1 miles of stream impacts
  - Approx. 165 acres of wetland impacts
- Negotiate less restrictive minimum reservoir releases with MDE to increase project safe yield.
- Confirm that any impacts to Whittaker Chambers Farm (National Historic Landmark) can be addressed.
- Confirm that any potential water quality impacts on reservoir from adjacent John Owings Landfill can be addressed.



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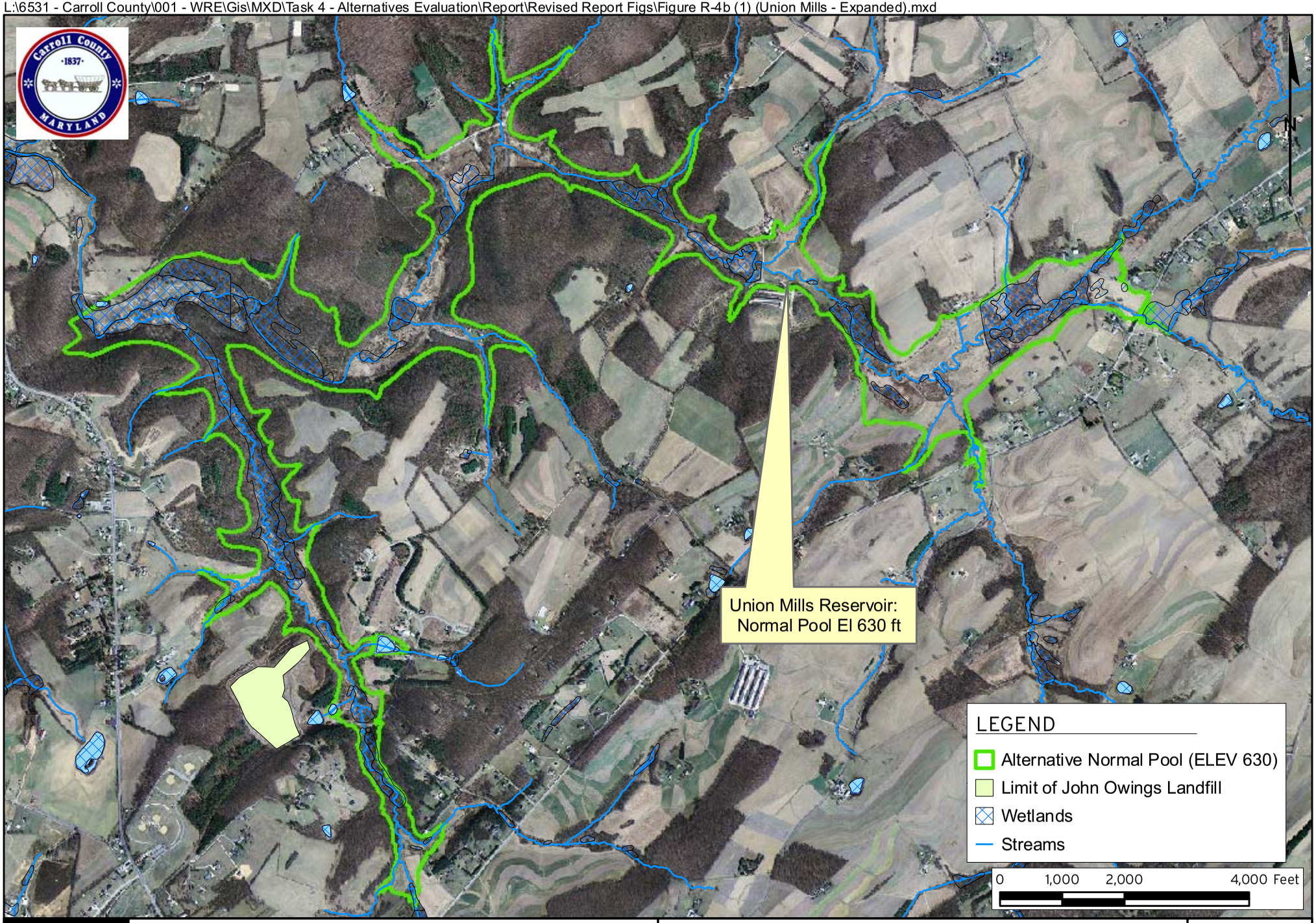

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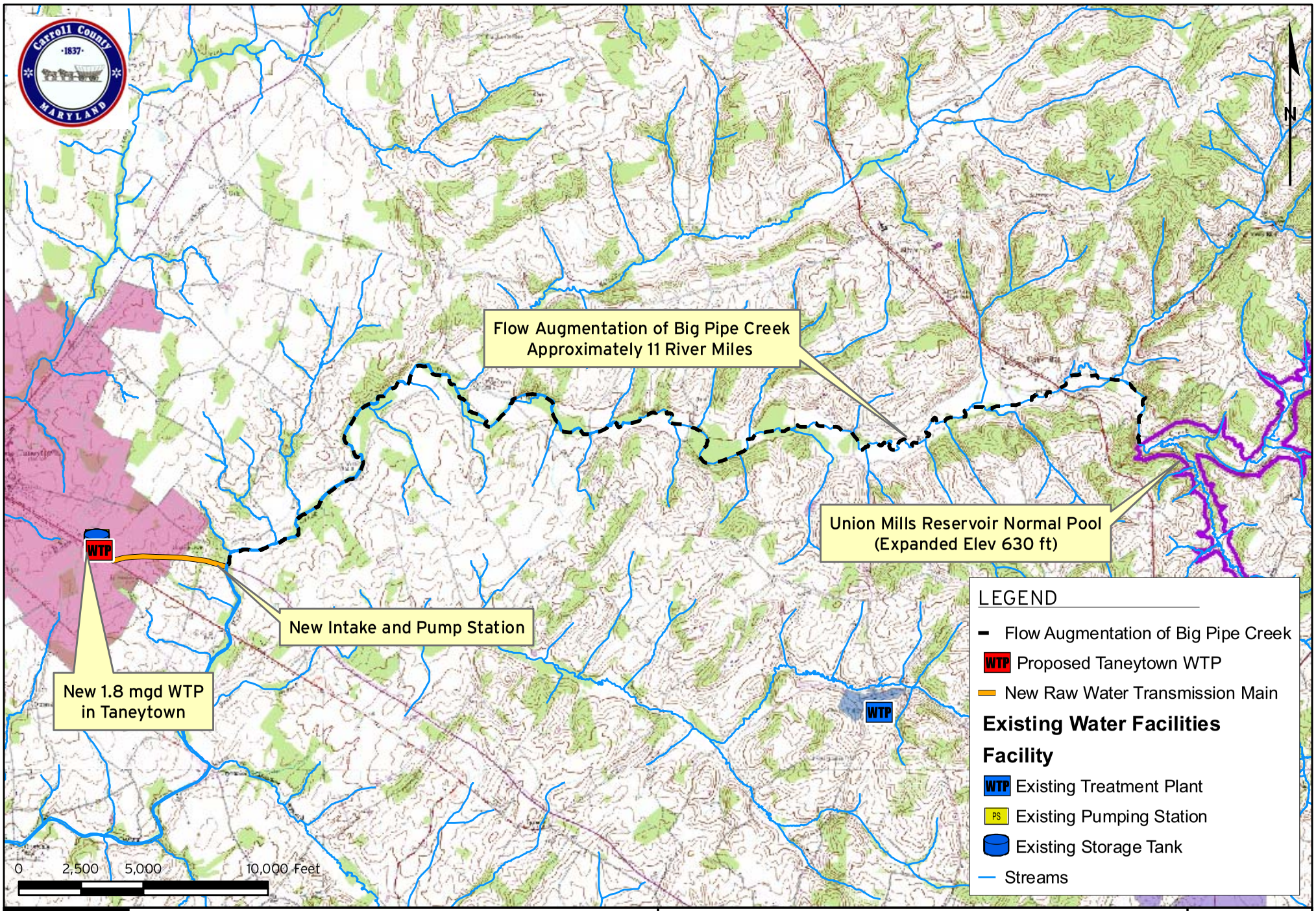
CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Alternative R-4b:
Union Mills Reservoir (Expanded)

Aug 2009

Figure R-4b(1)



MALCOLM PIRNIE

CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Union Mills Reservoir Flow Augmentation of
Big Pipe Creek to Supply Taneytown

Aug 2009

Figure R-4b (2)

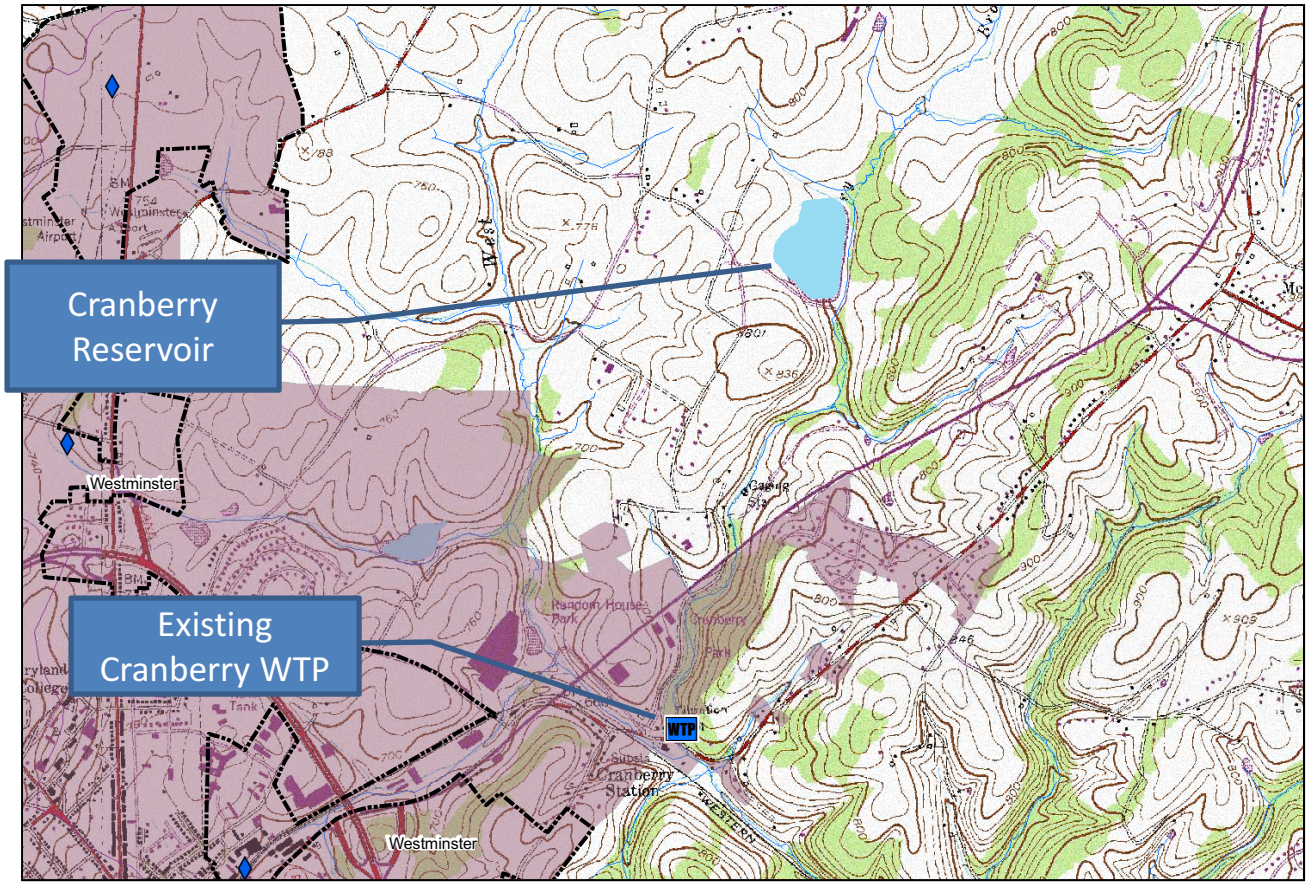
Alternative R-5: Increase Capacity of Cranberry Reservoir

Description of Alternative:

- 115 MG raw water reservoir located along Cranberry Branch, north of Lucabaugh Mill Rd.
- All water in the reservoir is pumped from the raw water intake on Cranberry Branch. The raw water in the reservoir is used either when conditions prevent direct withdrawal from the stream or to supplement low stream flow.
- Two potential expansion options:
    - Expand horizontally through purchase of additional property (60 MG increase)
    - Expand vertically through raising dam one foot (~8 MG increase).
- According to Westminster staff, vertical expansion is the most likely alternative, resulting in an estimated 0.1 mgd safe yield increase (based on the current safe yield of 1.17 mgd and existing capacity of 115 MG).

Key Implementation Steps:

- City of Westminster to purchase additional land and/or receive permission from MD Dam Safety to raise dam by one foot.
- Key Permit Required:
    - Dam Safety Permit
- Overcome political and community opposition with the horizontal expansion option. Previous attempts to purchase land required for horizontal expansion of the reservoir have been unsuccessful.



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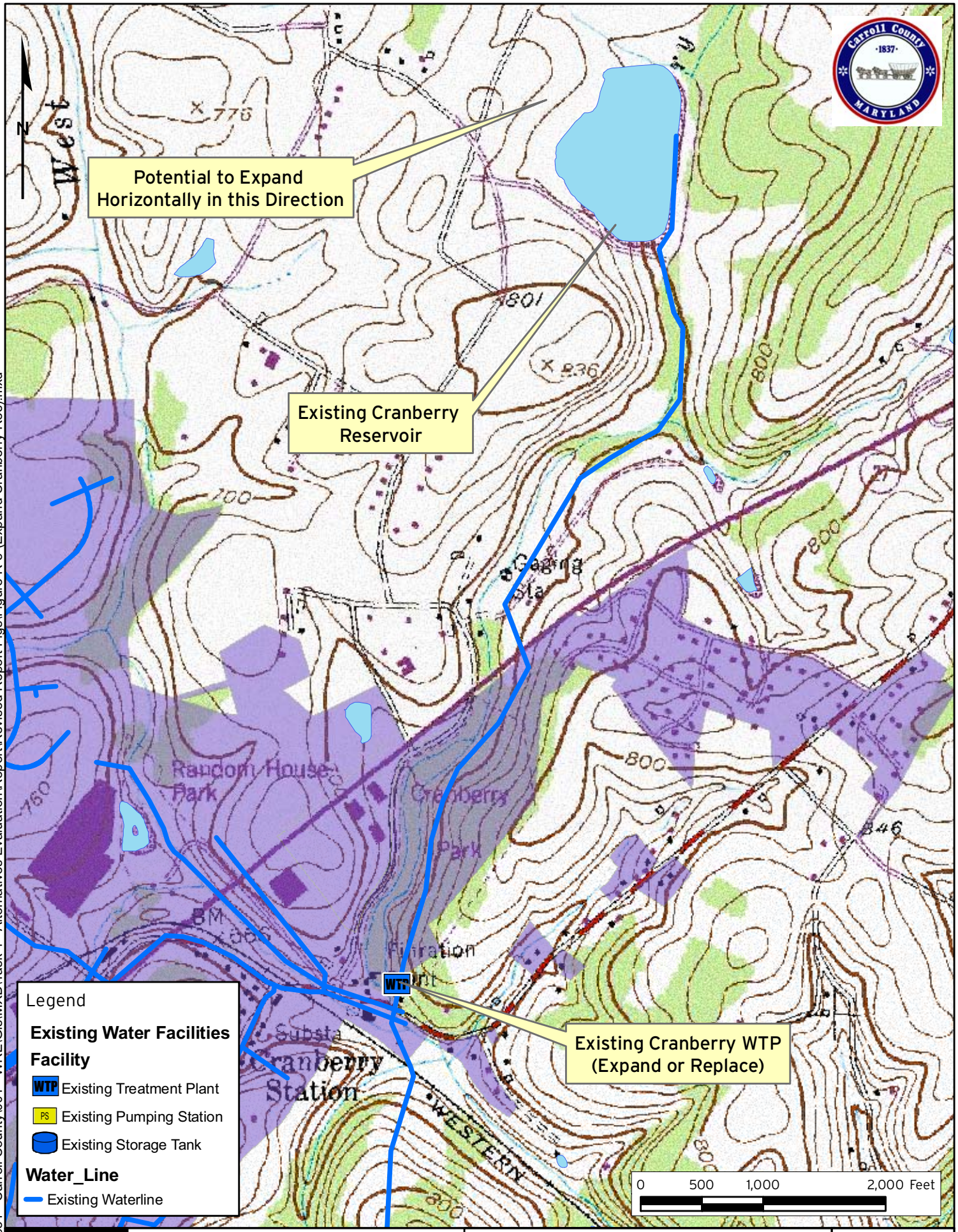

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MALCOLM PIRNIE

CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Alternative R-5:
Increase Capacity of Cranberry Reservoir

Aug 2009

Figure R-5

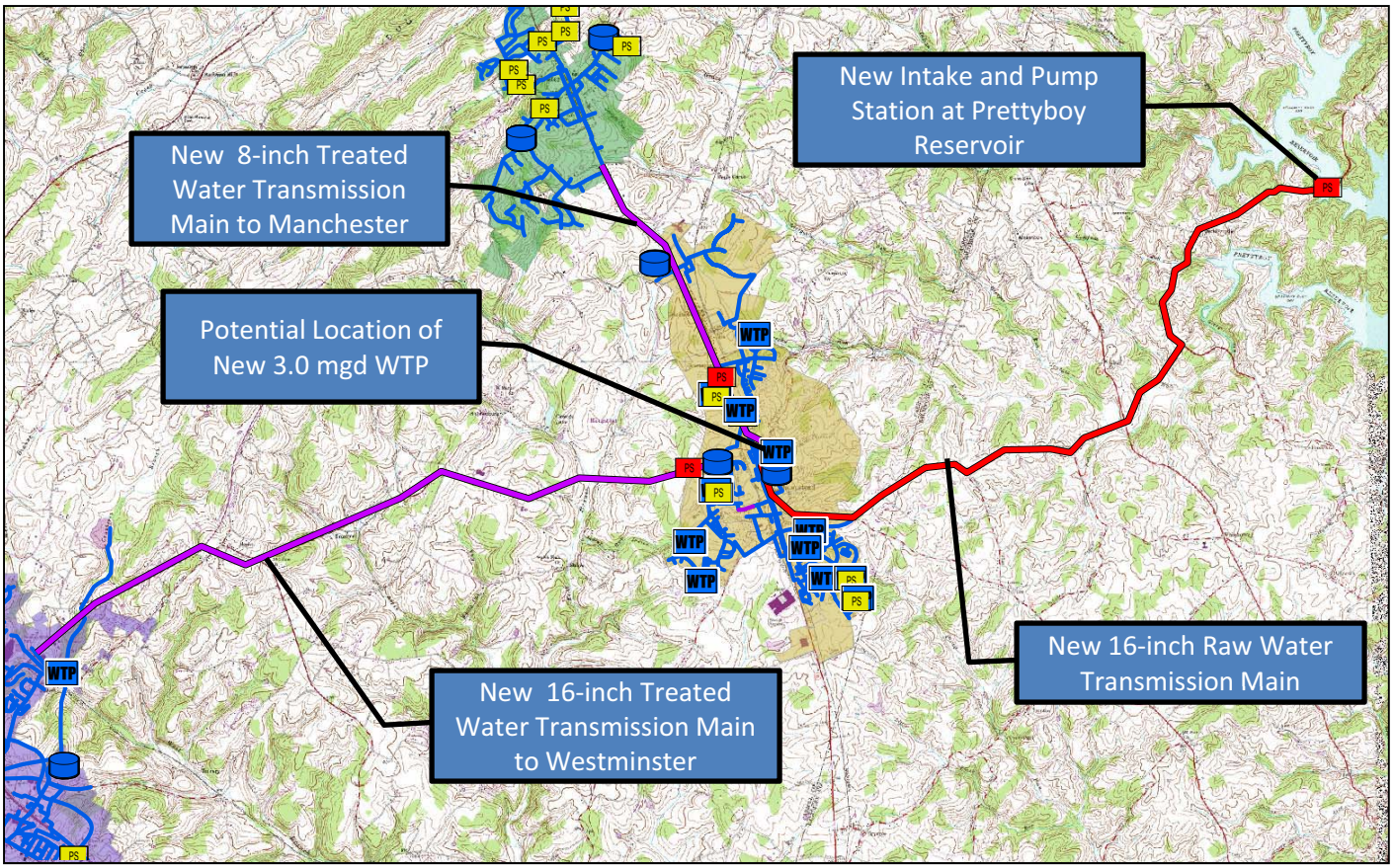
Alternative R-6: Prettyboy Reservoir

Description of Alternative:

- Potential for Baltimore's Prettyboy Reservoir to supply parts of northeastern Carroll County
- Baltimore's plans to develop a 120 mgd treatment plant for its Susquehanna River supply could significantly increase the reliability of Baltimore's water system (assuming more regular use of Susquehanna supply) such that purchase of excess capacity from Prettyboy Reservoir may become more practicable
- Baltimore water system stores 74.3 BG in 3 reservoirs draining 463 sq. mi. and includes 137 mgd capacity (250 mgd allowable) Susquehanna River Withdrawal.
- Conceptual alternative includes piping 3.0 mgd of raw water from Prettyboy via a 7.5-mile transmission main to a WTP in Hampstead.
- Requires new 3.0 mgd WTP in Hampstead.
- Regional approach to this option includes an interconnection with the Manchester (3.0-mile transmission main) and Westminster (6.7-mile transmission main) Service Areas to help supply future demands.
- Requires one high service pump station located at the intake on Prettyboy Reservoir, and two pump stations for the Manchester and Westminster interconnections.

Key Implementation Steps:

- Pursue an agreement with the City of Baltimore to purchase raw water from Prettyboy Reservoir.
- Evaluate treatment capacity of Manchester and/or Hampstead WTPs to treat additional water.
- Land Easement/Acquisition for pump station, intake, pipeline , and new WTP.
- Design and permitting for new intake and transmission mains.
- Key Permits Required:
  - USACE Section 404 Permit (assumes that a foundation will be constructed in the reservoir for the new intake structure).
  - Water and Sewerage Construction Permit
  - Water Appropriation and Use Permit
  - Non-tidal Wetlands and Waterways Permit
- Overcome potential local opposition in Baltimore County.



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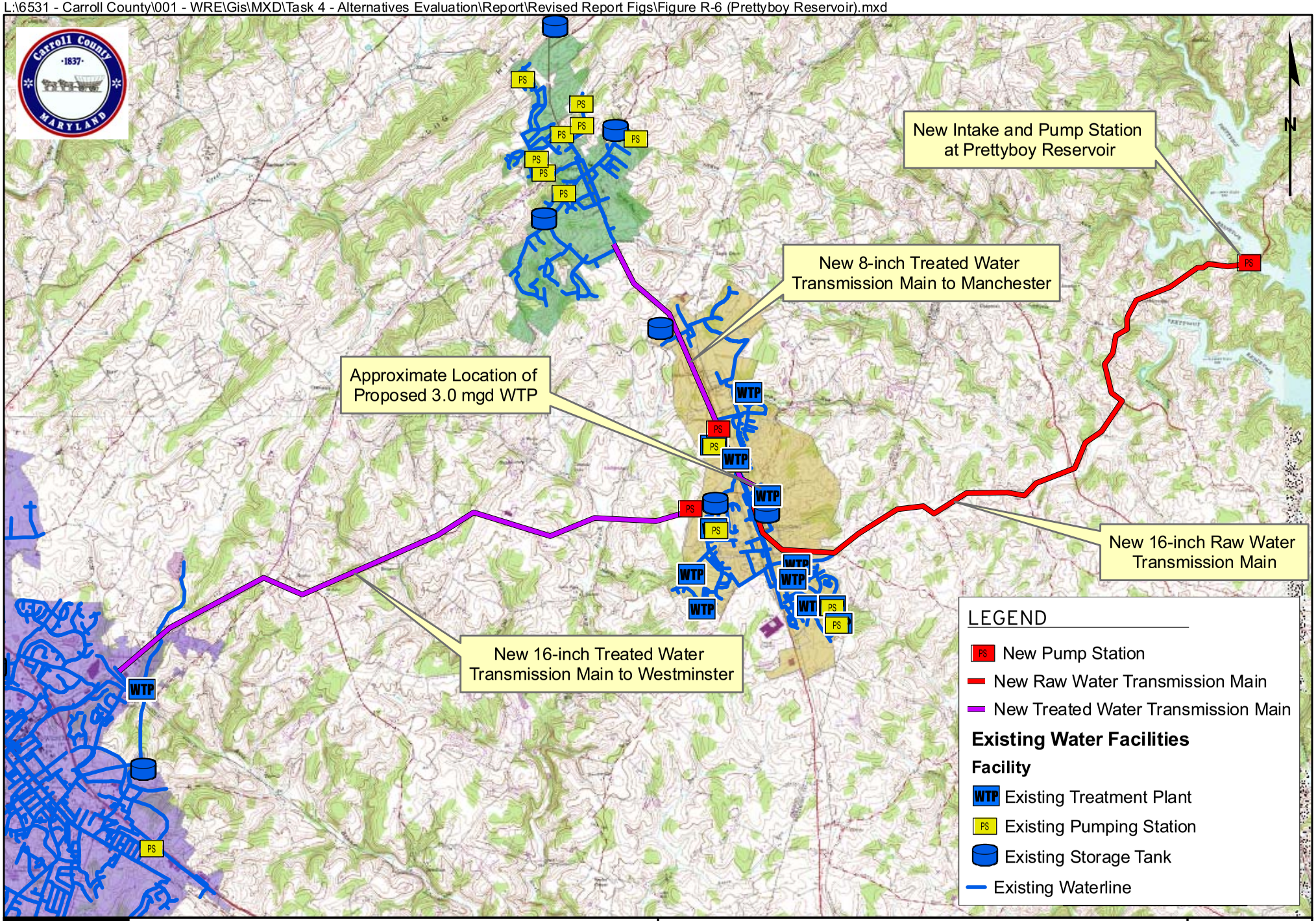

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CARROLL COUNTY, MD
ALTERNATIVES EVALUATION

Alternative R-6:
Prettyboy Reservoir

Aug 2009

Figure R-6