

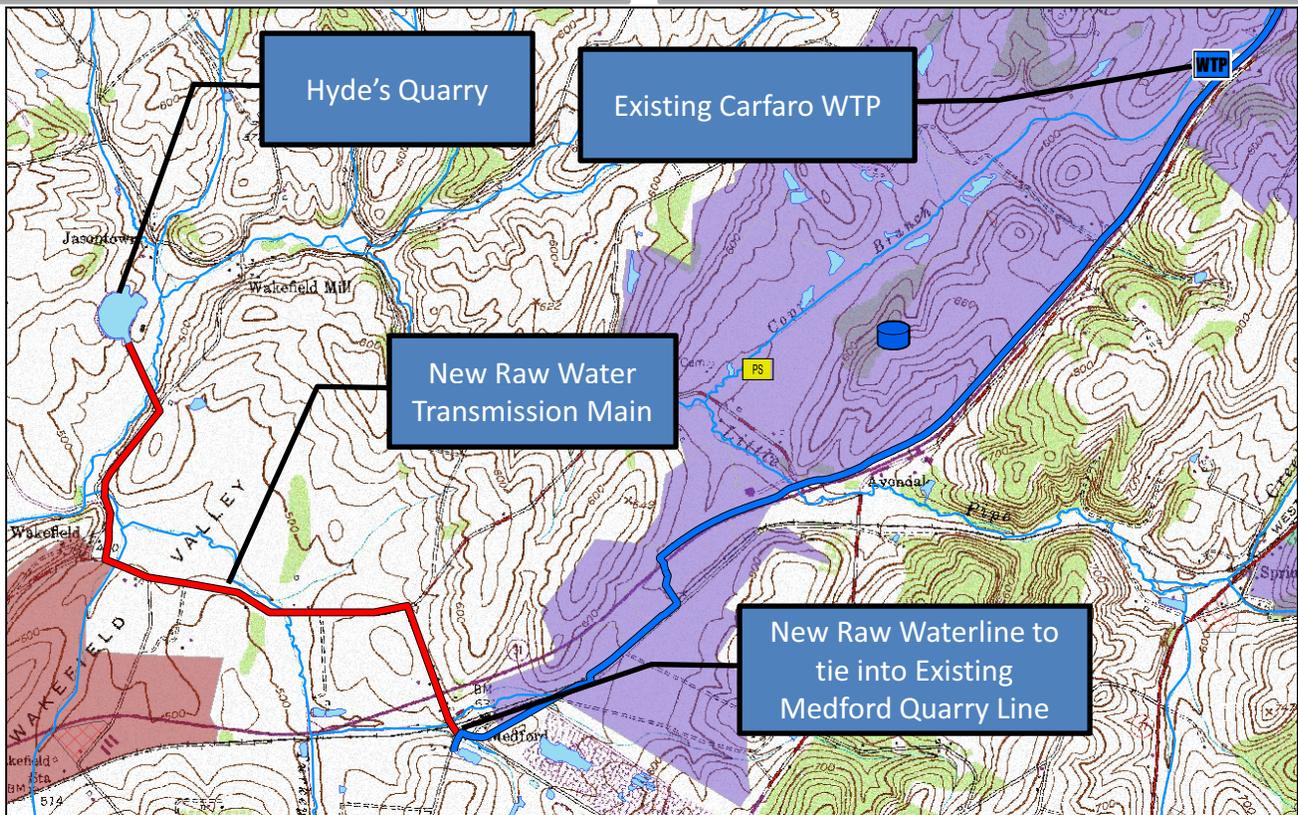
Alternative Q-1: Hyde's Quarry – New Raw Water Reservoir

Description of Alternative:

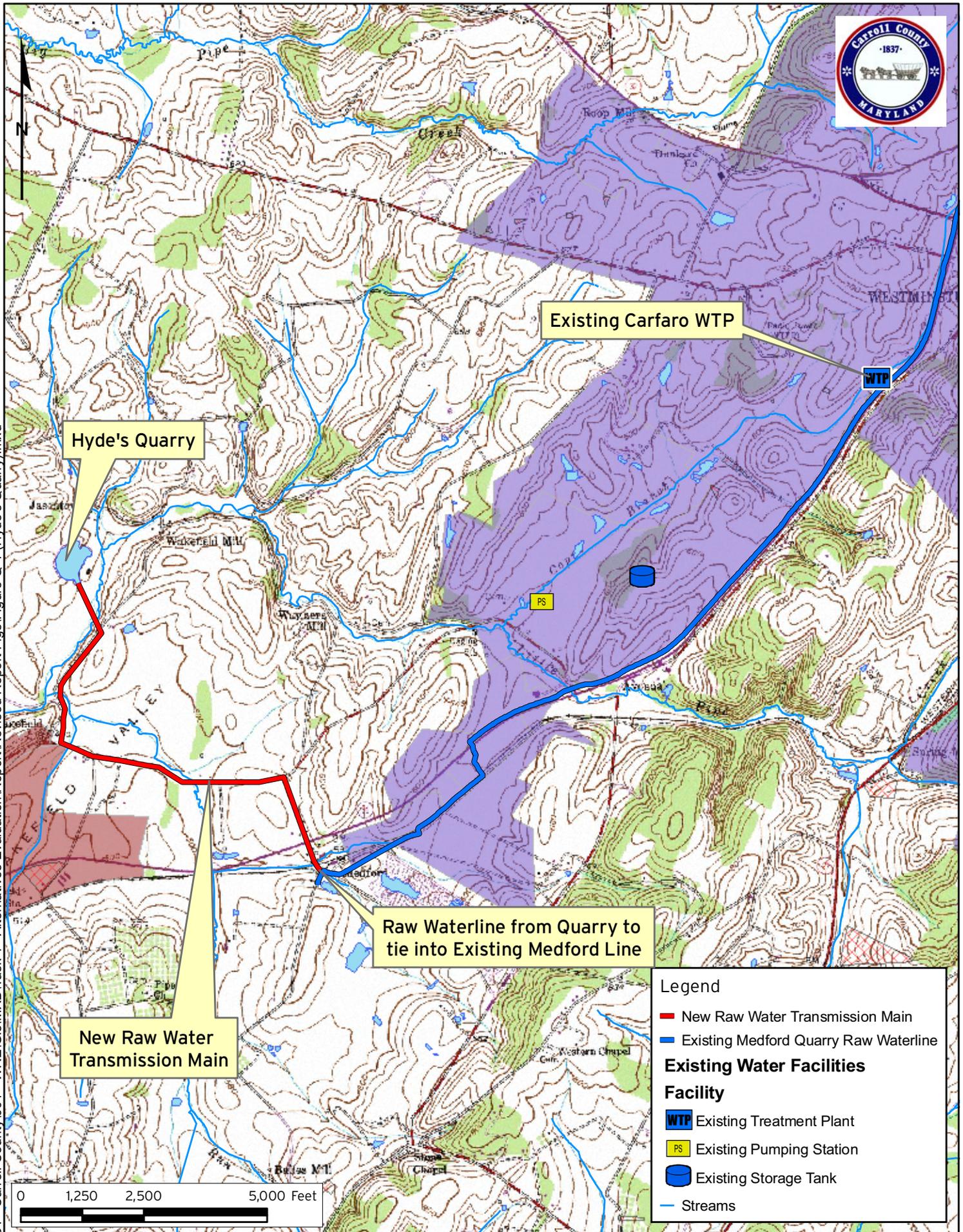
- Extend raw water line from Hyde's Quarry to City of Westminster's system for additional supply. Treat at existing Carfaro WTP.
- Quarry could serve as backup to Little Pipe Creek intake during periods of drought or as new water source
- Surface area of 9 acres, 50-75 feet deep
- Approximately 1.0 mgd AAD (based on dewatering allocation). Approximate yield of 0.5 mgd needed to serve as backup supply for Little Pipe Creek Intake.
- Approximately 2 miles of raw water transmission mains to tie into existing Medford Quarry Line

Key Implementation Steps:

- Land and Easement Acquisition
- Additional testing, including tests to ensure that flow from Little Pipe Creek does not infiltrate into quarry. WWTP effluent is discharged to Little Pipe Creek approximately 2 miles upstream of the quarry.
- Key Permits Required:
 - Water Appropriation and Use Permit
 - Water and Sewerage Construction Permit
- Steps completed to date:
 - Withdrawal application submitted in December 2006. Initially quarry to be used as backup for Little Pipe Creek. Once Hyde's Quarry withdrawal is permitted and connected to the City's system, use quarry as additional water supply source.
- Confirm that storage volume of Hyde's Quarry is adequate to secure the desired 0.5 mgd stream intake.
- Pipeline from Hyde's Quarry would need to be constructed through Carroll County Agricultural Land Preservation Easements.



August 2009



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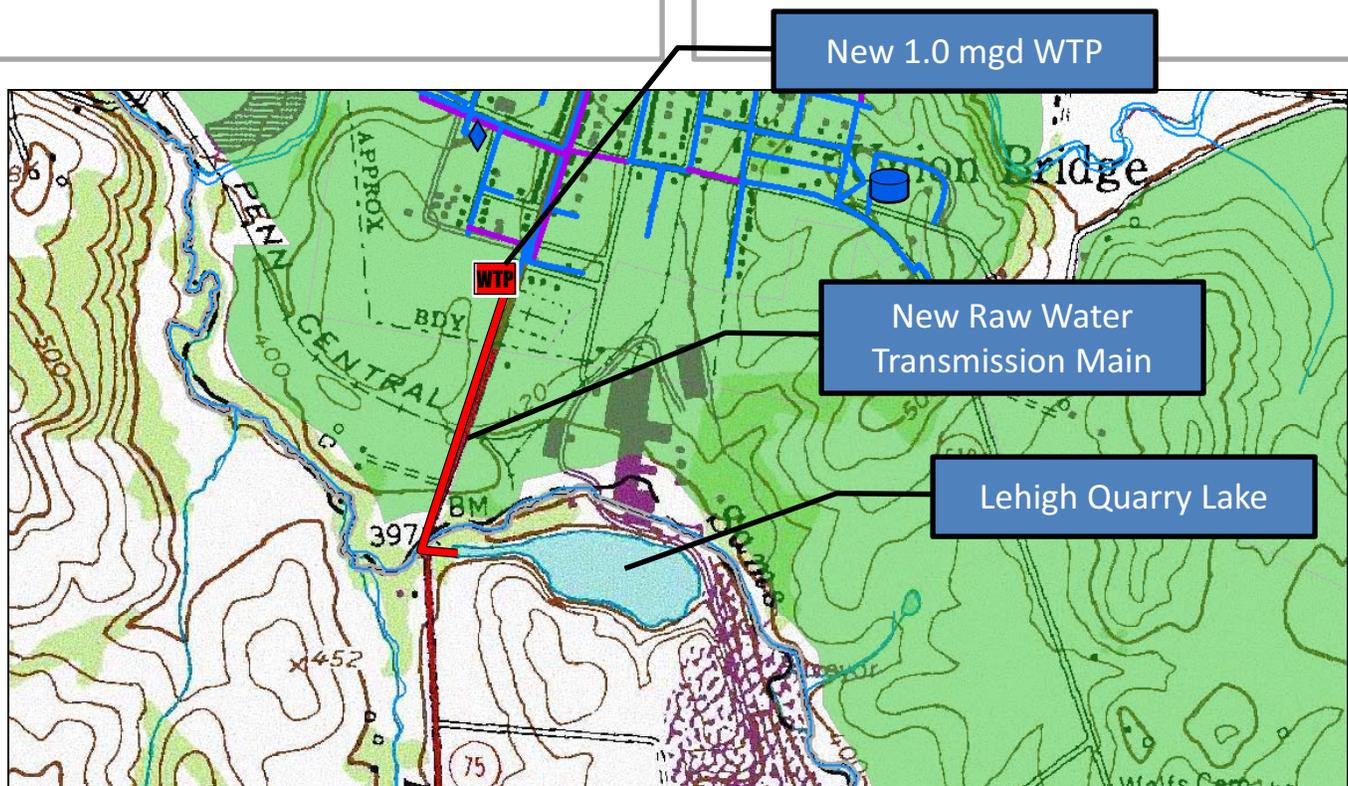
Alternative Q-2: Lehigh Quarry – Union Bridge

Description of Alternative:

- Lehigh Quarry as raw water reservoir for Union Bridge. Inactive quarry that has filled with water and discharges to Sams Creek. Another pit is currently being mined, but it appears that the need could be satisfied using the existing inactive pit.
- Requires improvements at the existing floating lake pump station to allow for significant drawdown of the lake without interrupting or significantly impacting the existing pump station. In addition, an in-line booster pump needs to be installed in order to maintain pressure in the line if the water level is drawn down too low.
- New 0.5-mile raw water transmission lines to Union Bridge and new 1.0 mgd WTP
- Lehigh Cement Company has appropriation permit (effective June 1, 2005) to withdraw 1 mgd AAD (2 mgd average during month of maximum use) for quarry dewatering.
- Target supply at 0.6 mgd to meet future Union Bridge Service Area needs.

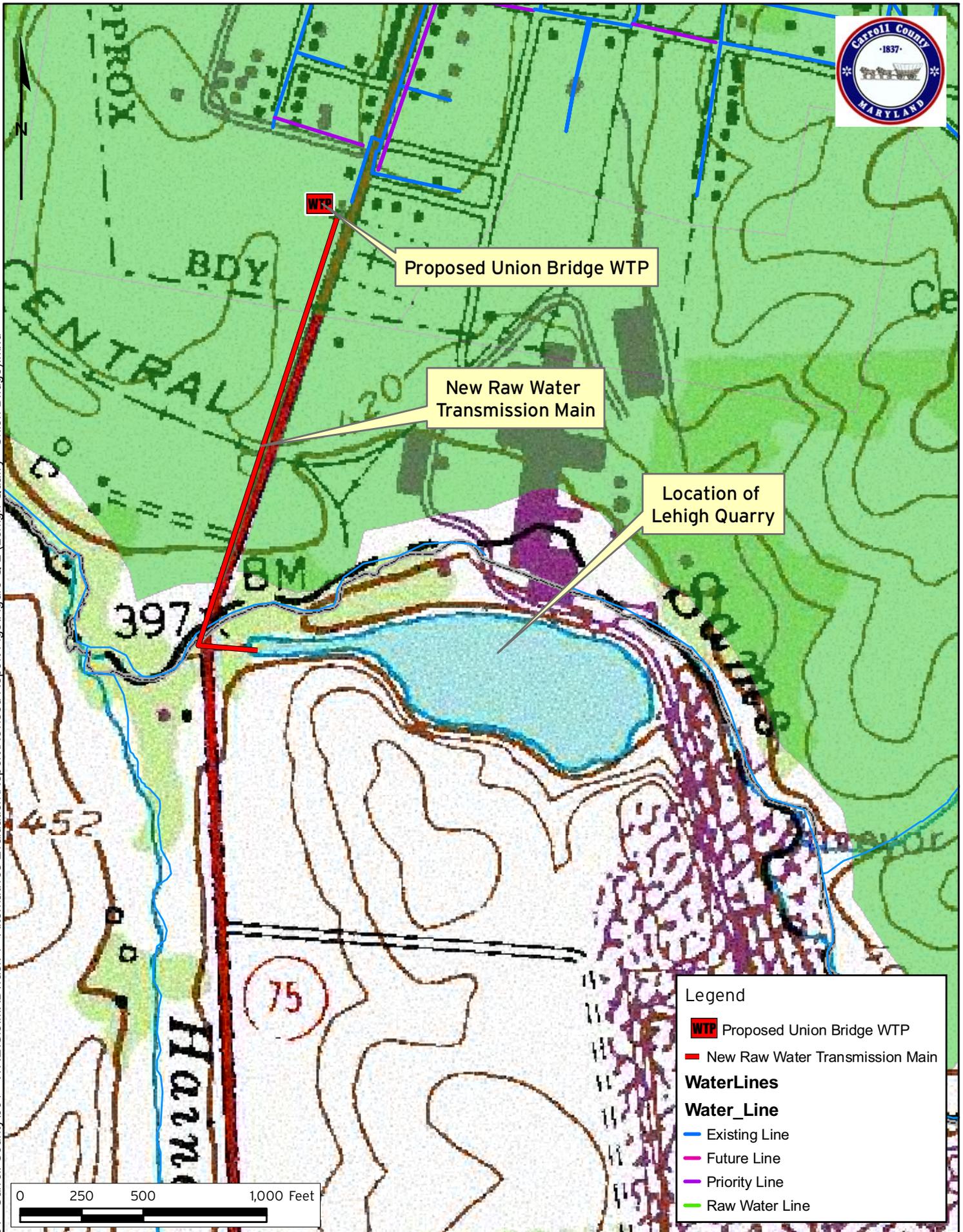
Key Implementation Steps:

- Either wait to utilize this source after quarry operations have ceased (since quarry currently uses this source as cooling water) or implement measures to ensure contamination potential is minimized.
- Key Permits Required:
 - Water Appropriation and Use Permit
 - Water and Sewerage Construction Permit
- Develop agreement with quarry owner





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Legend

-  Proposed Union Bridge WTP
-  New Raw Water Transmission Main

WaterLines

Water_Line

-  Existing Line
-  Future Line
-  Priority Line
-  Raw Water Line



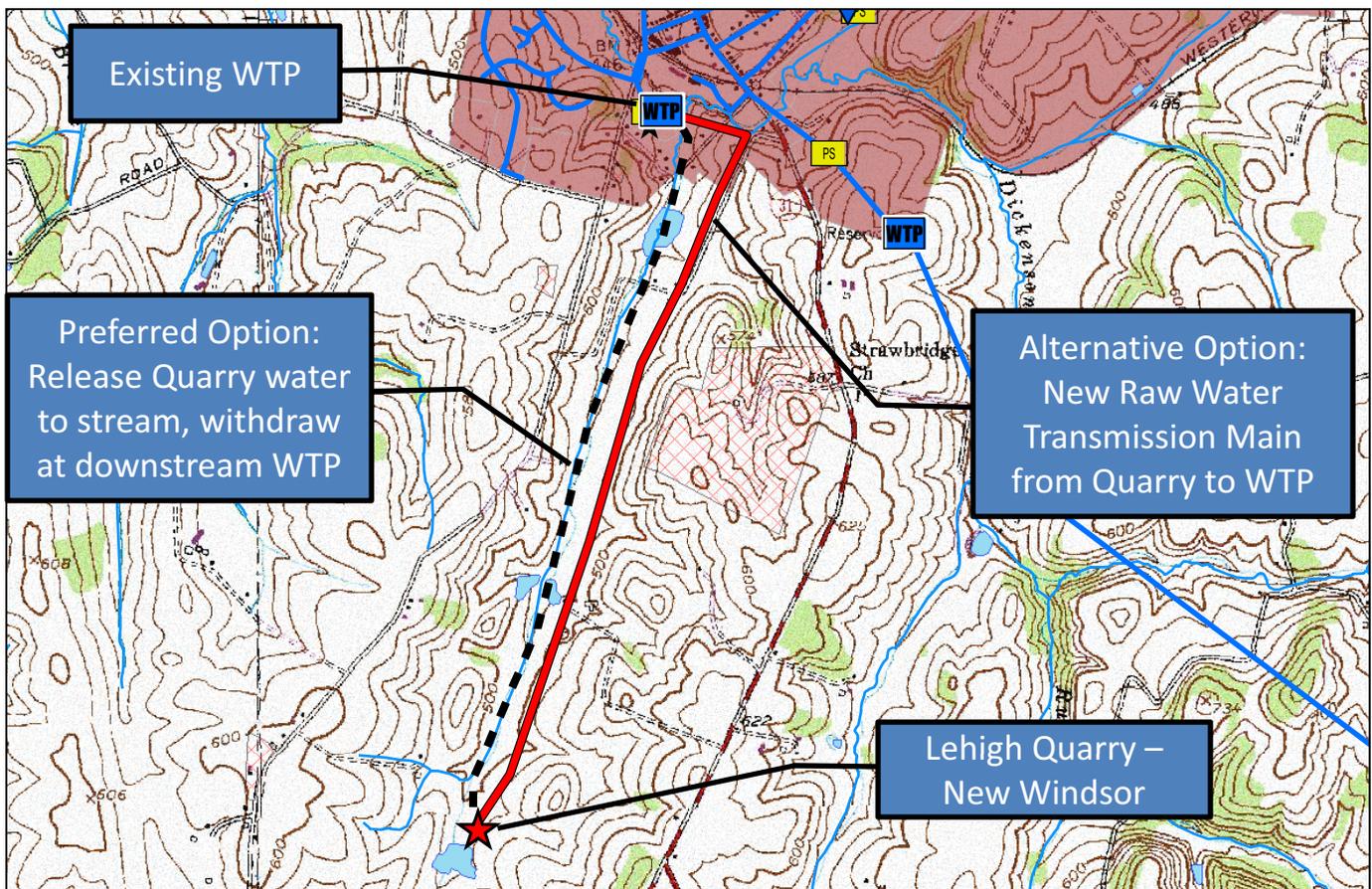
Alternative Q-3: Lehigh Quarry – New Windsor

Description of Alternative:

- Lehigh Quarry as raw water reservoir
- Quarry is still being developed, and will likely take 10 years before a “hole” is formed that can be dewatered. Estimated 20-40 years before quarry is inactive, leaving a potential raw water source.
- May require a new 1.7-mile raw water transmission main to New Windsor water service area.
- Target supply at 0.25 mgd to meet future New Windsor Service Area needs.
- Dewatering permit allocation of 1 mgd AAD, 2 mgd average during month of maximum use.

Key Implementation Steps:

- Obtain appropriations permit for use of discharge from dewatering operations or use of inactive quarry as raw water source.
- Approval from MDE to release quarry water to stream for withdrawal downstream at WTP. Pending water quality testing of discharge water.
- Key Permits Required:
 - Water Appropriation and Use Permit
 - Water and Sewerage Construction Permit





Existing New Windsor WTP
(Expansion Required)

Option 1: Release Quarry Water
to Stream to be Withdrawn at WTP

Option 2: New Raw Water
Transmission Main

Location of
Lehigh Quarry

Legend

Lehigh Quarry Transmission Options

- Release to Stream
- Raw Water Main

Existing Water Facilities

- Existing Treatment Plant
- Existing Pumping Station
- Existing Storage Tank
- Existing Waterlines
- ▣ County-Owned Property

0 600 1,200 2,400 Feet

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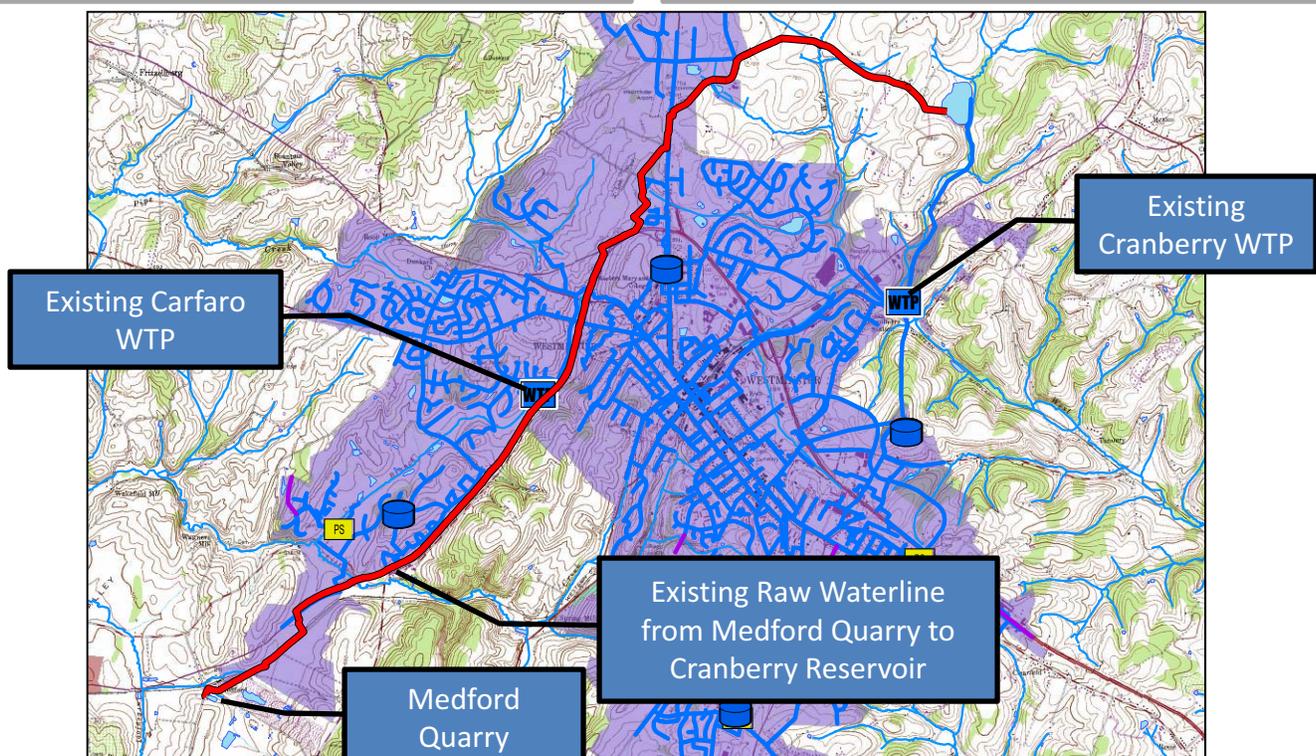
Alternative Q-4: Medford Quarry – Use as Permanent Water Supply

Description of Alternative:

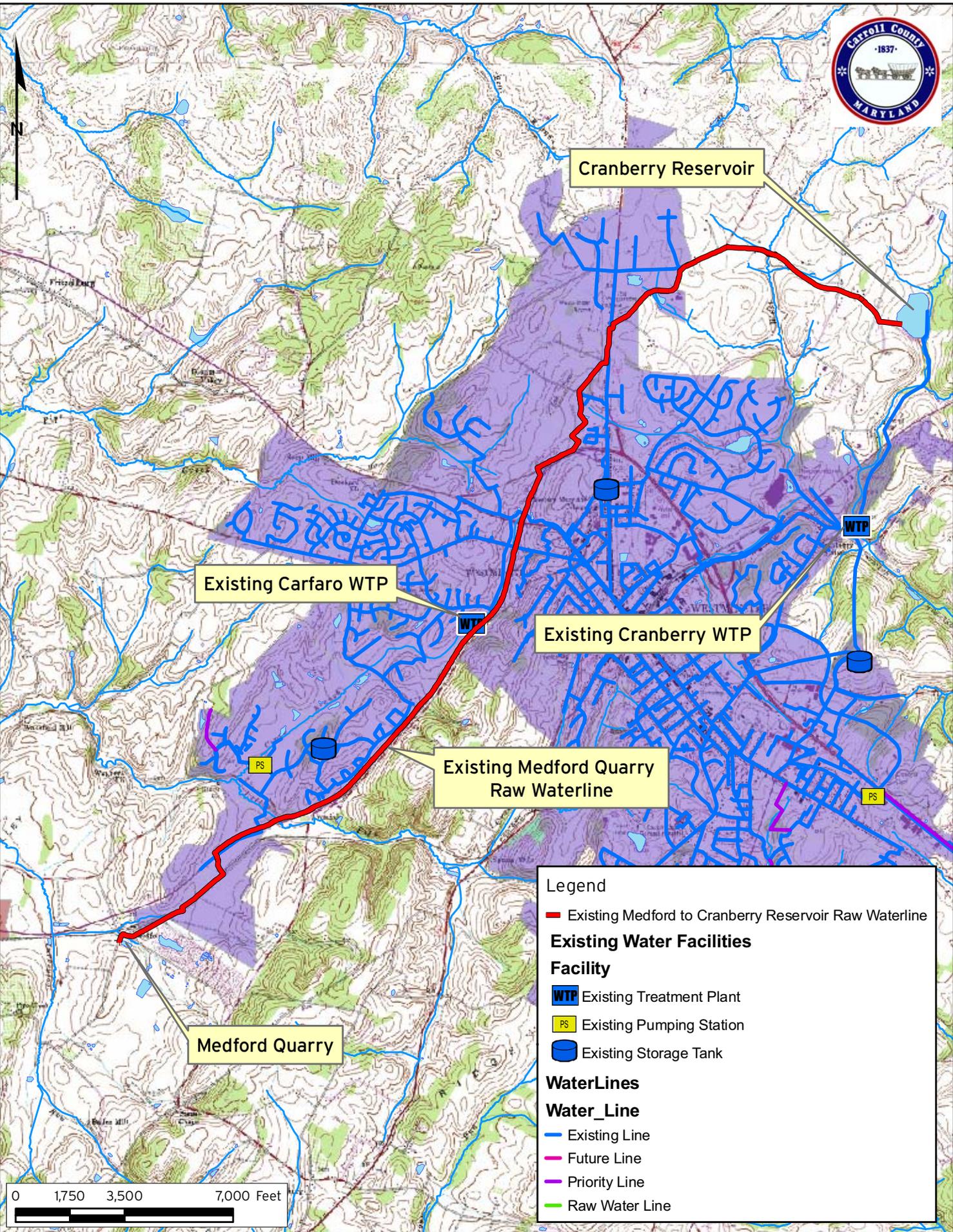
- Medford Quarry currently appropriated for “emergency use” only (90-day backup supply). This option includes having the appropriation definition changed by MDE to allow Westminster to use the Medford Quarry as a permanent water supply, not just an emergency supply source.
- Current Emergency (90-day) Appropriation:
 - 162,000 gpd annual average
 - 655,000 gpd maximum daily withdrawal
- Note – according to the Impact Analysis Summary included as part of the appropriation permit, the amount of groundwater available on the quarry property is 139,000 gpd avg.. The amount of water that was pumped from the quarry during the summer of the 2002 drought (90-day period) was approximately 922,500 gpd.
- Pipeline and associated facilities are already in place for the use of water from the Medford Quarry.
- Medford Quarry water can be treated at Carfaro or Cranberry WTPs (no capacity expansion required).

Key Implementation Steps:

- Obtain approval from MDE to change the conditions of Westminster’s current appropriation permit (CL2002G042(03)).
- Analyze water supply potential via the appropriation process



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Legend

- Existing Medford to Cranberry Reservoir Raw Waterline

Existing Water Facilities

Facility

- WTP Existing Treatment Plant
- PS Existing Pumping Station
- Existing Storage Tank

WaterLines

Water_Line

- Existing Line
- Future Line
- Priority Line
- Raw Water Line

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