Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

November 1, 2017

RE: Water Appropriation and Use Permit No.: MO2016G004 (01)
Publication of Permit Decision

Dear Property Owner, Public Official, Interested Person or Applicant:

On October 30, 2017 the Water and Science Administration (Administration) issued Water Appropriation and Use Permit No. MO2016G004(01) to Purple Line Transit Constructors, LLC to appropriate and use an annual average of 50,000 gallons of water per day (gpd) and an average of 100,000 gpd during the month of maximum use for lowering groundwater levels to facilitate construction of the Bethesda Station South Entrance (Bethesda Shaft). Water is to be withdrawn from a sump at the base of the excavation in the Lower Pelitic Schist, Wissahickon Formation. The site is located at Elm Street between Wisconsin Avenue and East Lane, Bethesda, Montgomery County, Maryland.

After examination and consideration of the documents received and evidence in the application file and record, the Administration has determined that the application meets the statutory and regulatory criteria necessary for issuance of a Water Appropriation and Use Permit. The Impact Analysis Summary used in reaching this determination is enclosed with this permit decision. A copy of Water Appropriation and Use Permit No. MO2016G004 (01) is available upon request.

This is a final agency determination; there is no further opportunity for administrative review. The applicant or any person with standing who participated in the public participation process through the submission of written or oral comments may petition for judicial review in the Circuit Court in the County where the permitted activity is to occur. The petition for judicial review must be filed within 30 days of the publication of the permit decision. Please see the attached fact sheet for additional information about the judicial review process.

If you have any questions or need any additional information, please do not hesitate to contact me at (410) 537-3590.

Sincerely,

John Grace
Water Supply Program

Enclosures

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
RESPONSE TO COMMENTS DOCUMENT
IN THE MATTER OF:

Water Appropriation and Use Permit No: MO2016G004(01)
For Purple Line Transit Constructors, LLC (Bethesda Shaft)

Introduction

The Maryland Department of the Environment (MDE) Water Supply Program (WSP) received an application from Purple Line Transit Constructors, LLC (PLTC) requesting an annual average of 30,000 gallons of groundwater per day (gpd) and an average of 40,000 gpd in the month of maximum use to lower groundwater levels to facilitate the construction of the Bethesda Shaft. The Bethesda Shaft project is also known and referred to as the Bethesda Station South Entrance (BSSE). Water was requested to be withdrawn from one well in the Lower Pelitic Schist of the Wissahickon Formation. The initial application was received in August of 2016. A package of instructions to complete the application was mailed by the WSP to PLTC in September of 2016. In December of 2016 the WSP received from PLTC a technical report, "Purple Line Bethesda Station South Entrance Dewatering Estimate Report," and other information requested by the WSP regarding the planned dewatering. On January 30, 2017 PLTC reported to the WSP that they had mailed notices to the list of interested persons by January 17, 2017. These notices stated that the requested withdrawal was for an annual average of 30,000 gpd and an average of 40,000 gpd during the month of maximum use. The WSP completed its review of the technical report after PLTC had sent out its notices and noted that the technical report recommended quantities approximately equal to an annual average of 50,000 gpd and an average of 100,000 gpd in the month of maximum use. A new application for these revised quantities was signed by PLTC on February 10, 2017. The new application also clarified that the water would be withdrawn from a sump at the base of the excavation (not a drilled well) and corrected earlier errors regarding the watershed receiving the discharge from the proposed dewatering operation.

The Annotated Code of Maryland, Environment Article § 5–506 (e)(1)(ii) states that MDE may waive the notice and hearing requirements prescribed in § 5-204 if the appropriation requested is for a construction dewatering project. It is MDE's practice to require interested parties (contiguous property owners and local elected officials) to be notified by the applicant, but waive the requirement for publication of a notice in a newspaper, waive the mailing of notices by MDE and waive the holding of an informational hearing. Following PLTC's mailing of notices the WSP received several phone calls, emails and comments from interested parties, requesting additional time for review of the permit file and to provide comments. Several interested parties indicated that the WSP had not provided the adequate time for public participation. While the statutory requirement had been met, the WSP decided to provide additional time to comment and make documents concerning the project readily available to the public. A website link was established for the project. The WSP extended the comment period until April 19, 2017. All persons who submitted comments previously to the WSP were informed on March 30, 2017 about the website and the extension of the comment period. The website provided access to the permit application, permit documents, the dewatering report, and comments already received and information related to the application.

This document summarizes comments relative to the proposed use of water that were received from interested parties and provides responses to these comments. Comments of a similar theme or topic were grouped together. Comments not relevant to the appropriation and use of water are not included. A summary of the WSP's technical analysis is contained in the Impact Analysis Summary, which is enclosed with the Final Permit Decision letter, a separate document. The Impact Analysis Summary replaces the Preliminary Impact Analysis Summary, which was made available during the public comment period.

1. **Linkage to Federal Environmental Impact Statement/Federal Funding**: More than one commenter asserted that the water appropriation and potential impacts from the appropriation necessary for the construction of the Bethesda Shaft should have been covered by the Environmental Impact Statement (EIS) for the Purple Line. A commenter argued that the construction dewatering need was new information and should have precipitated a revision and modification to the EIS. A commenter also questioned the legality of granting a Water Appropriation and Use permit since there was not a valid EIS in place (at the time of the comment) for the Purple Line Project. A comment questioned if the PLTC had standing to pursue or received a permit due to the projects linkage to a Federal Grant.

   Response: The applicant has asserted that the Bethesda Shaft project is fully funded by Montgomery County and therefore not subject to NEPA, Section 106 or other federal laws that are triggered when a project requires federal funding or federal actions. Water Appropriation and Use permit applications do not require Environmental Impact Statements. Water Appropriation and Use permits applications are governed by Title 5 of Environment Article, Annotated Code of Maryland and COMAR 26.17.06. The PLTC, LLC is a Maryland business and therefore eligible to receive a Water Appropriation and Use Permit.

2. **Request for additional public participation:** Several comments received prior to the WSP extending the public comment period argued for one or more of the following: extending the comment period; increasing the opportunity for comment; notifying a broader set of entities; holding a hearing; and, making project information available on line. One commenter asserted that he, as the attorney who represented the opposition to the Purple Line EIS before Judge Leon, the Friends of the Capital Crescent Trail and the Town of Chevy Chase should have been included in the original list of interested parties on this project. The attorney stated his intent to sue to protect the violation of law if the construction dewatering permit were issued without further expanded notice, the holding of a hearing and without the assessments required by law. More than one comment requested that a decision on the permit be either delayed or denied. Arguments were made in support of conducting on a more complete environmental assessment for the proposed dewatering withdrawal. Other commenters indicated that they believed the public notice was inadequate; specifics about the project were lacking and, the environmental assessment insufficient and information concerning the withdrawal and discharge information conflicting.

Response: As noted in the introduction of this document MDE did extend the original comment period and with cooperation of the applicant made specifics about the project available on the internet. These steps went beyond the minimum requirements of the law concerning public participation. Maryland law describes interested parties as the property owners contiguous to the parcel upon which the appropriation will occur and local elected officials (see Annotated Code of Maryland, Environment Article § 5-204(b)). If other persons also wish to be included in the list of interested persons then they are to request to be included. When the WSP received notice of the interest by the attorney, the Friends of the Capital Crescent Trail, other private citizens, and the Town of Chevy Chase, they each were included on the list of interested persons and provided adequate time to comment on the application by extending the comment period.

The law governing public participation concerning construction dewatering projects waives the requirement for notice and to hold public informational hearings (see Annotated Code of Maryland, Environment Article § 5-506 (e)(1)(ii)). The PLTC met all of the public participation requirements of Maryland law.

The WSP has taken additional time to consider all of the comments raised during the public participation process and has completed its assessment required by Maryland law and regulation. The WSP notes that the applicant has maintained that the funding for the Bethesda Shaft is a separate project from the Purple Line and is being funded solely by Montgomery County. The WSP has received no applications for dewatering needs for the Purple Line project within either of the two watersheds impacted by this project, thus there would be no cumulative impact of the Bethesda Shaft water withdrawal request with other dewatering needs for the Purple Line project.

Maryland law states: "If the Department believes from the evidence before the Department and based upon State water resources policy declared in this subtitle that the applicant's plans provide greatest feasible utilization of the waters of the State, adequately preserve public safety, and promote the general public welfare, the Department shall grant the permit to appropriate or use the waters, construct, reconstruct or repair the proposed reservoir, dam or waterway obstruction, or accomplish any combination of these objectives. If the Department believes from the evidence before the Department that the proposed appropriation or use of State waters or proposed construction is inadequate, wasteful, dangerous, impracticable or detrimental to the best public interest, the Department may reject the application or suggest modifications to the proposed plans to protect the public welfare and safety." (Annotated Code of Maryland, Environment Article § 5-507(a)) There are no federal laws with jurisdiction regarding the appropriation or use of water for this project.

The assessments required by law have been fulfilled: the applicant has demonstrated the reasonableness of the quantity needed; the applicant has demonstrated that the withdrawal is necessary to enable the Bethesda Shaft project to be constructed; the applicant has asserted that public safety will be improved by the construction of the shaft by providing a second exit from the Bethesda Red Line Metro; the applicant has provided analysis to show that the withdrawal will not jeopardize the State's natural resources; and the evidence before the WSP documents that no other users of the resource will be unreasonably impacted by the proposed withdrawal and that the proposed withdrawal is not wasteful, dangerous or impractical, and is for a project for the public good. For these reasons the WSP is issuing the permit for the withdrawal of water for the Bethesda Shaft.

3. **Possible impact to historic features:** A commenter stated that the project may undercut or affect a historic building (Community Hardware and Paint Store) located near the project. The commenter questioned if the applicant had revealed the presence of this historic building on the acknowledgement form submitted to the WSP as part of the application. The commenter also stated that the law requiring the acknowledgement form may have intended that applicants notify the MDE of the presence of nearby historic buildings and not just those on the property. The commenter also referenced the possible presence of a historic spring on the property adjoining the proposed Bethesda Shaft, which he proffered might be the reason for the naming of Bethesda.

   Response: The groundwater was measured at the project site to be approximately 55 feet below land surface at the proposed Bethesda Shaft. Since the water level is already 55 feet below land surface, below building foundation depth, further lowering of the groundwater level to enable the construction of the Bethesda Shaft will not impact the integrity of nearby buildings. The Acknowledgement form only requires that applicants indicate the presence of historical sites within the property to be permitted and not on adjacent properties. As there would be no impact caused by the dewatering on adjoining properties there was no need for the applicant to identify historic sites on adjoining properties.

   A spring is a concentrated discharge of groundwater issuing from a more or less defined opening. No spring exists at the site since the water level is so far below ground. Springs may emerge from the ground where the water table intersects the land surface. A publication of Maryland springs (Maryland Geological Survey Publication RI 42, 1985, Maryland Springs – Their Physical, Thermal and Chemical Characteristics) does not include a spring in the vicinity of the Bethesda Shaft. The 1965 USGS topographic map (photorevised 1971) of the Washington West quadrangle, shows the beginning elevations of the nearest streams (Willet Branch to the southwest and Coquelin Run to the northwest), where they are mapped as perennial streams, to begin at elevations approximately 280 ft msl and 260 ft msl respectively. The topographic map shows by a dash and dotted symbol that the uppermost reaches of Coquelin Run is intermittent (from elevation 260 ft msl to 310 ft msl). All of these elevations are well below the land surface elevation of 340 to 345 feet at the project site.

4. **Possible impacts to nearby watersheds – changes in flows:** A commenter asked how the proposed withdrawal would affect the three watersheds of Bethesda and for how long and in what way? The Town of Chevy Chase reasoned that close to half of the extracted water would originate from the Coquelin Run watershed. A party wished to know how the PLTC intends to restore the natural flow system and requested that the permit require the restoration of natural flows. The Town of Chevy Chase asserted that Coquelin Run begins as a perennial stream in the vicinity of Elm Street Park less than 400 feet from the project site, fed by springs or groundwater flow. The Town also suggested that the proximity to the stream would result in a higher rate of groundwater extraction than estimated by PLTC's contractor. A commenter noted that the Administration's Preliminary Impact Assessment did not discuss impacts to surface water. Another commenter observed that neither the permit application nor the Administration's Preliminary Impact Analysis identified the basin from which the water would be withdrawn or returned. The commenter noted that the Preliminary Impact Analysis stated that the water would be returned to the same basin from which it is being withdrawn, which was not consistent with the information on the original application. A commenter asked if the discharge of the dewatering water to the Little Falls watershed would be injurious to the watershed and wished to know the magnitude of the withdrawal and discharge relative to flows in Little Falls Branch and Coquelin Run. A commenter voiced concerns regarding potential impacts to Long Branch and Sligo Creek since these watersheds were identified on the initial application as the receiving water for the discharge from the dewatering operation.

   Response: The Administration's Preliminary Impact Analysis Summary has been modified and finalized to present a more thorough assessment of impacts. The revised Impact Analysis Summary is enclosed with this Response to Comments Document. This Response to Comments Document, however, explains in greater detail the WSP's analysis and responses to the specific environmental concerns raised.

   As noted above in response to Comment 3 above, there is no spring on the site. Surface water divides are a reasonable approximation of groundwater flow divides in the non carbonate crystalline rock basins in the Piedmont province of Maryland, such as present at the project site. The proposed shaft is within the Little Falls watershed and Willet Branch is tributary of Little Falls and downhill of the project site. Thus by location, the dewatering of the proposed shaft will capture groundwater that would otherwise discharge into Willet Branch. Because the shaft location is relatively close to the watershed divide between Little Falls and the Lower Rock Creek Watershed (about 500 feet from the shaft center), some of the groundwater that is proposed to be withdrawn will likely originate from within the Lower Rock Creek watershed, in which Coquelin Run is the nearest tributary to the project site.

The discharge from the dewatering operation is proposed through a nearby storm drain into the Little Falls (Willet Branch) watershed. The revised application, submitted February 10, 2017 documents that the withdrawal will be in the Little Falls watershed and that the discharge will be to the Little Falls watershed (no activity is associated with Sligo Creek or Long Branch watersheds – this was an error on the initial application).

The dewatering will result in a depressed water table around the project site. The depression is greatest at the shaft and lessens with distance from the shaft. While the shaft and cavern are being excavated, groundwater will be removed from the surrounding rock matrix, depleting the water table and reducing the amount of groundwater stored in the surrounding rock. This period of construction represents the highest anticipated rate of inflow into the excavation. After the excavation reaches its full depth and lateral extent, the cone of depression will stabilize and the groundwater being removed (captured) represent groundwater that would have naturally discharged into nearby streams. The resulting cone of depression surrounding a groundwater withdrawal results in a capture zone. That is, the precipitation that infiltrates through the soil and down to the level of saturation (e.g, to the groundwater) within the capture zone, would ultimately be captured by the dewatering operation were it to continue indefinitely.

PLTC estimated that 80 percent of the capture zone area is within the Little Falls watershed and 20 percent in the Coquelin Run watershed. The WSP conducted its own analysis of the capture zone that would be created from the proposed dewatering. The WSP obtained water level data from the PLTC from borings in the area (Table 5-1, Preliminary Geotechnical Engineering Report, Retaining Walls at Bethesda Station, December 2013). Using the aquifer properties obtained from the aquifer test conducted by PLTC (see Purple Line Bethesda Station South Entrance Dewatering Estimate Report, October 20, 2016) the month of maximum use withdrawal rate of 100,000 gpd for a 150 day period with no recharge (e.g. June – October) was modeled and the resulting drawdown contours were super-imposed on the water table configuration obtained from the borings from Table 5-1. A 150 day period was chosen, as it represents a typical time period during which no groundwater recharge might occur. The maximum monthly pumping rate for the full period provides a high end estimate of the capture zone size and potential high end estimate of the loss of water to Coquelin Run. New groundwater elevations were obtained for each intersection of the drawdown contours with the groundwater elevation contours. The new groundwater elevations were then contoured to enable the determination of groundwater flow direction and the resulting change in the watershed divide between the two basins. This modeling showed that some of the groundwater that would be pumped from the Bethesda Shaft would originate within the Coquelin Run watershed. A capture zone to the proposed Bethesda Shaft was delineated based on the resulting groundwater elevation contours. The area of the capture zone was then calculated from the scaled map.

The WSP modeling results produced a capture zone area of 88.1 acres. Seventy-nine (79) percent (or 69.8 acres) were in the Little Falls (Willet Branch) watershed and twenty-one (21) percent (or 18.3 acres) were in the Coquelin Run watershed. Multiplying the percentage of the capture area in each watershed by the average annual withdrawal rate of 50,000 gpd yields an estimate of the proposed appropriation that would originate from each watershed. Multiplying 0.21 by 50,000 gpd results in 10,500 gpd originating from Coquelin Run watershed and multiplying 0.79 by 50,000 gpd results in 39,500 gpd originating from the Willet Branch watershed.

In order to put these quantities (39,500 gpd, 10,500 gpd, 50,000 gpd and 100,000 gpd) in perspective with flows and groundwater contributions to the two headwater streams (Willet Branch and Coquelin Run) information on the watershed size and natural flows was obtained. The watershed providing water to the headwater of Willet Branch above elevation 280 ft msl was measured using the USGS Stream Stat tool (available on-line) and was found to be 0.26 square miles (which is approximately 166 acres). Annual groundwater discharge rates into Maryland's Piedmont streams have been estimated by the WSP following USGS procedures. Data from a reference gage is used to calculate a unit area rate in inches per year of effective recharge (which is also referred to as groundwater discharge). Reference gages are selected based on proximity to the project location and similarity of geologic setting. The Rock Creek gage is an acceptable gage for the project location.

Using data collected for the period of record at the nearby gage on Rock Creek as the reference gage (USGS gage number 01648000), the annual groundwater discharge over the watershed was calculated to average 8.1 inches per year and the annual streamflow over the watershed was calculated to average 14.2 inches per year. Multiplying the Willet Branch headwater watershed area of 166 acres by 8.1 inches and converting to gallons per day, results in a daily average groundwater discharge of 100,000 gpd for the headwaters of Willet Branch. Multiplying the Willet Branch headwater watershed area of 166 acres by 14.2 inches and converting to gallons per day, results in a daily average stream flow of 175,400 gpd for the headwaters of Willet Branch.

The watershed providing water to Coquelin Run above 260 feet elevation was also determined using USGS Steam Stat tool and was found to be 0.42 square miles (which is approximately 270 acres). Using the same nearby USGS Rock Creek gage, an annual baseflow discharge of 160,700 gpd and an annual average total discharge of 279,200 gpd was estimated for the headwaters of Coquelin Run.

If the water withdrawn from the excavation were not returned to Willet Branch, the impact of the dewatering operation would represent a fairly significant loss of groundwater flow to the headwater stream. Consequently the proposal by PLTC to return the water to the Little Falls (Willet Branch) watershed is appropriate and the return of the water withdrawn from the excavation will be explicitly required in a condition within the Water Appropriation and Use Permit issued to the PLTC.

Conversely the calculated loss of water to the Coquelin Run watershed of 10,500 gpd is relatively small (about 6% of the groundwater baseflow and 4% of the annual streamflow). This minor reduction in streamflow will not cause unreasonable impacts to Coquelin Run. The loss of flow, does not justify requiring PLTC to return a portion of their discharge back to the headwaters of Coquelin Run.

The average annual groundwater discharge rate of 8.1 inches per year can also provide a second method to estimate the quantity of water proposed for withdrawal that would originate from the two watersheds. Multiplying the acres of the capture zone in the Willet Branch watershed (69.8 acres) by 8.1 inches/year and converting the units to gallons per day yields a daily discharge of about 42,000 gpd. Multiplying the acres of capture zone in the Coquelin Run watershed (18.3 acres) by 8.1 inches/year and converting the units to gallons per day yields a daily discharge of about 11,000 gpd. Since the two methods have very good agreement (39,500 gpd vs 42,000 gpd for groundwater originating within Willet Branch and 10,500 gpd vs 11,000 gpd for groundwater originating with Coquelin Run) the WSP is confident that the estimated quantity of the proposed average annual withdrawal (50,000 gpd) is reasonable and that the loss of water from the Coquelin Run watershed (about 10,500 to 11,000 gpd) is also realistic.

Comments from the Town of Chevy Chase indicate that shallow springs and seeps near Elm Street Park feed the upper reaches of Coquelin Run. While the Town has asserted that the stream is perennial adjacent to the Park, the USGS Washington West quadrangle topographic map shows that Coquelin Run begins as an intermittent stream about 800 feet east of Elm Street Park at elevation 310 ft msl. According to the USGS topo map Coquelin Run becomes a perennial stream at elevation 260 msl, about 3000 feet downstream of Elm Street Park. The groundwater elevation measured at the project site is approximately 286 feet msl, which is considerably lower than the elevation of Elm Street Park and the upper most reaches of Coquelin Run.

Groundwater and land surface elevations at seven boring locations along the proposed route of the Purple Line northwest, north and northeast of Elm Street Park were also examined. The depth to groundwater ranged from 8.5 feet to 48.5 feet below land surface, with an average depth of twenty (20) feet below land surface. Groundwater elevations in these borings ranged between 312 and 284 feet msl. The channel of Coquelin Run hits elevation 312 feet about 200 feet north of the eastern half of Leland Park, which is east of and downstream of Elm Street Park.

Under the conditions prior to the construction of the Bethesda Station South Entrance, it is noted that: groundwater elevations directly under the project site are considerably lower than the elevation of the intermittent headwater Coquelin Run; groundwater elevations along the proposed Purple Line are considerably below the land surface and also below the elevation of the adjoining Coquelin Run stream channel elevation; and the groundwater in the Coquelin Run watershed within the area of influence from the proposed dewatering contributes to baseflow at considerable distances downstream of Elm Street Park.

Due to the evidence from water levels measured at the project site and nearby borings along the Purple Line route, and the original mapping of the hydrography of Coquelin Run by the USGS, the WSP has concluded that shallow seeps near Elm Street Park are not hydraulically connected to deeper groundwater that will be intercepted by the construction of the Bethesda Shaft. The WSP concludes that any shallow springs or seeps near Elm Street Park are most likely supported by perched water table condition(s). The shallow springs and seeps, where present, would be supported by local precipitation infiltrating into areas of adjacent higher elevations. Therefore, lowering of the water table centered at the Bethesda Shaft would not impact such shallow seeps and springs, nor would the presence of the stream near Elm Street Park increase the expected withdrawal rate from the Bethesda Shaft excavation.

In the earliest phases of dewatering, water is captured from groundwater stored in the surrounding formation. As time progresses more and more of the water withdrawn represents intercepted groundwater that would have ultimately discharged as baseflow. Conversely less of the water being withdrawn represents water being removed from storage. Initially then, the discharge from the dewatering would add additional water to Willet Branch, while after a period of time the water being discharged is replacing water that would have been discharged into Willet Branch plus an additional amount of water that would originate from the Coquelin Run watershed. The additional water estimated to be contributed to Willet Branch by the Coquelin Run watershed (10,500 gpd to 11,000 gpd) represents an 11% increase over the long term average groundwater discharge into Willet Branch, but would be well within the range of natural variability.

In order to help visualize what a loss of 11,000 gpd and discharges of 50,000 gpd and 100,000 gpd might represent to a headwater Piedmont stream the following analysis was performed. If one assumes that the stream is two feet wide and flows at a uniform velocity of just one foot per second, the height of a discharge of 11,000 gpd, 50,000 gpd and 100,000 gpd can be calculated. A loss of flow of 11,000 gpd under those conditions would reduce the stream depth by about 0.1 inches, a discharge of 50,000 gpd under those conditions would increase the stream's depth by about 0.5 inches and a discharge of 100,000 gpd would increase the stream's depth by about 1 inch. None of these changes would be injurious to the stream or substantially change the characteristics of the stream or cause unreasonable impacts.

Water appropriation and use approvals do not require that withdrawals have no impact on the natural flow system or require a restoration to preexisting natural flows. Maryland's laws and regulations require that impacts from proposed withdrawals must not be unreasonable. The anticipated loss of water from Coquelin Run in the Lower Rock Creek watershed is very minor in comparison to the natural flows and consequently there is not a requirement for this construction dewatering project to restore flows calculated to originate from Coquelin Run back to Coquelin Run.

5. **Possible impacts to wildlife, trees and vegetation:** A commenter questioned the effect that the diversion would cause on protected wildlife downstream including an array of migratory birds, which are federally protected and require to varying degrees access to water and wetlands. One commenter alleged that the lowering of the water table several feet at Elm Street Park would possibly cause the trees in the Park to die. This commenter also indicated that killing trees on a park is a violation of the Highway Act when other alternatives exist. A comment also expressed concerns about possible impacts on local gardens.

   A commenter expressed concern that withdrawal would divert a significant flow from the headwater of Coquelin Run with substantial negative impacts on the aquatic and terrestrial biota. A commenter noted that the withdrawal period for the project is anticipated to be four years, which was stated to be a long time for trees, streams and wildlife. A commenter highlighted three endangered amphipods that depend on water tables being where they are now for their survival and recovery. This commenter identified three endangered *Stygobromus* amphipods as potentially being in the area: the Kenk's amphipod; the Hay's amphipod; and, the Sextarius amphipod.

   A commenter questioned how dewatering that would last for four years would adversely impact the amphipods and the shallow springs and seeps on which they rely, considering that the modeling of the dewatering impacts for 60 days projected several feet of drawdown at 500 feet from the withdrawal location.

   Response: As the above analysis demonstrates, (see response to Comment 4 above), the quantity of consumptive withdrawal of groundwater originating in the Coquelin Run watershed would have very little change in natural flows and therefore would have no impact on water availability for migratory birds or other wildlife further downstream. There are no projected wetlands impacts from the proposed Bethesda Shaft dewatering.

   In the project area the depth to groundwater is approximately 55 feet below grade or approximately at elevation 286 ft msl. Thus the vegetation in the project area is not dependent on groundwater. Elm Street Park is about 400 feet from the project site. There were no borings conducted in Elm Street Park. The groundwater elevation in the borings at the same topographic position as Elm Street Park relative to Coquelin Run (Boring 1-RW-B-62, which is about 500 feet east of Elm Street Park) indicate that groundwater in the area is approximately 10 feet below land surface. It is not likely that trees in the Park are relying on groundwater as their main source of water as literature on tree root systems indicate that 99 percent of the roots are usually within the top three feet of soil. With plentiful rainfall in the humid east, vegetation does not need to rely on groundwater to prosper. Further lowering of the water table several feet in this area is therefore unlikely to adversely impact trees or other vegetation in the Park.

The locations of the Kenk's and Hay's amphipods in the Rock Creek watershed are discussed in an August 22, 2014 letter from the US Fish and Wildlife Service (USFWS) to the Federal Transit Administration. These species are located significantly downstream from the project site and well outside of the range of influence of the dewatering operation. The USFWS letter indicates that there is one known site of the near the Purple Line project. This location is at the Coquelin Run spring in the Chevy Chase Lakes residential development. The Coquelin Run spring is over a mile from the proposed Bethesda Shaft, well outside the zone of influence from the dewatering.

An undated report by Dr. David Clair Cutler of American University "Seepage Springs and Stygobromus Amphipods Near the Proposed Purple Line Light Rail" describes the occurrence of *Stygobromus* amphipod species in the region. The report states "All of these species are found in extremely shallow groundwater habitats, vertically isolated from the water table. These habitats are miniature drainage basins, typically less than 100 yards in linear extent, that are fed by subsurface water and underlain by either clay or some other impermeable material." Since the shallow groundwater habitat of these amphipods is isolated from the deeper groundwater by less permeable materials, the dewatering of the deep groundwater at the project site will not affect the habitat of the *Stygobromus* amphipods or adversely impact these species, even if present closer to the project site than currently documented. That is, the shallow seeps are fed by infiltrating precipitation trapped above a less permeable layer and not by deep groundwater.

6. **Possible impacts of water discharge:** How will the water be protected from pollution or from overwhelming the sewer system or streams into which it will be diverted in the process? A commenter cited the presence of hazardous material sites in the area. One commenter requested that an individual discharge permit be obtained for the project, another asked if a discharge permit would be required and another commenter noted that a separate discharge permit would be required for the project. A commenter requested that the Department allow for a coordinated public review of both permits. The Town of Chevy Chase requested a full impact of the discharge be evaluated prior to the WSP granting approval of the withdrawal request. A commenter asked if it was common for a project that involves both dewatering and discharge to have the two permits not considered at the same time.

Response: The regulation of the discharge water from the dewatering will be regulated through a National Pollutant Discharge Elimination System (NPDES) permit and not the Water Appropriation and Use permit. Each permit is covered by different statutory and public notice requirements, thus there is not a unified public review process for the two permits. For more information on the status of the facilities NPDES permit application please contact Michael Richardson, Chief of the Industrial and General Permits Division at michael.richardson@maryland.gov. While it is not uncommon for WSP staff to communicate with NPDES staff concerning groundwater quality issues that might be encountered during dewatering, the permit processes are not linked and can be handled simultaneously or sequentially. The WSP has been in communication with the staff tasked with the NPDES permit for the dewatering discharge regarding the Bethesda Shaft as described further below.

PLTC is proposing to discharge the water after treatment at an on-site treatment plant into a storm drain on Elm Street. PLTC provided maps showing that the Elm Street drain discharges to Willet Branch of the Little Falls watershed. PLTC has to address any concerns regarding the capacity of the storm drain system with the owner of the storm drain and not the WSP. The applicant has informed the WSP that their analysis shows that the storm drain system can safely handle the proposed discharge quantities as it is significantly lower than storm flows handled by the storm drain system.

MDE's Land Restoration Program maintains records of sites with documented groundwater or soil contamination and makes available to the public a map of these sites – see http://mdewin64.mde.state.md.us/LRP/index.html and fact sheets - see http://mde.maryland.gov/programs/LAND/MarylandBrownfieldVCP/Pages/errp_factsheets.aspx . A review of the map in the immediate vicinity of the project site showed multiple sites for which data has been provided to the MDE Land Restoration Program. A review of the available fact sheets by the WSP and discussion with the Land Restoration Program revealed that several of the locations had soil or groundwater contamination from volatile organic chemicals (dry cleaning solvents or petroleum products) and arsenic (soil contamination was documented at one site). The MDE NPDES permit staff was advised of these findings and informed the WSP that they will incorporate water quality standards and monitoring for volatile organic compounds and metals in the Bethesda Shaft NPDES permit.

7. **Coordination with permit applications for the Purple Line:** Several commenters wished to know if the Army Corps of Engineers and those involved in the review of the joint application for the Purple Line were aware of this requested appropriation for dewatering and if a meaningful assessment of the cumulative effect up on the waters of the US and State that the relatively large proposed withdrawal would have.

Response: The Army Corps of Engineers, MDE, and Maryland Department of Natural Resources have been informed of the proposed dewatering permit application. MDE WSP has evaluated the dewatering application to ensure that the application conforms to Maryland's Water Appropriation and Use laws and regulations. This response to comment document and the Impact Analysis Summary addresses the potential impact of the proposed appropriation on the State's natural resources. There does not appear to be any cumulative impact from the proposed dewatering activity for the Bethesda Shaft with the other potential impacts associated with the construction of the Purple Line

8. **Comment – Changes in quantity requested:** Commenters observed that the quantity requested to be withdrawn had increased to as much as 100,000 with an average of 50,000 gallons per day and wished to know how that change affected the schedule for processing the permit.

   Response: It is not unusual for the quantities initially applied for to be revised during the application review process. The change in quantity did not impact the timeline for processing this application. The permit application was revised to reflect the maximum average daily withdrawal that would be needed in any year and month of the project. The change in quantity was not due to a change in scope of the project or location. It is also noted that the public had adequate opportunity to consider the higher rate of proposed withdrawal during the extended comment period (see response to Comment 2). The timeline of reviewing the project application prior to granting the permit was extended to ensure a thorough analysis of all the comments received during the public comment period.

9. **Question on the length of the withdrawal period:** Commenters sought an explanation regarding the long term need for dewatering and one commenter indicated that the current Red Line Bethesda Station is not waterproofed, thus resulting in dewatering after the period of construction.

   Response: PLTC has confirmed that the anticipated construction period is four years. The Washington Metropolitan Area Transit Authority (WMATA) is responsible for obtaining an appropriation permit for dewatering needed after the conclusion of the construction period. WMATA has been informed of their responsibility to apply for this permit by the WSP. PLTC informed the WSP that the Shaft and accompanying cavern will not be watertight but will be designed to allow for ongoing dewatering. The most accurate estimates of the long term need will be available from analyzing the water withdrawal data collected during the construction.

10. **Comment – Specific questions regarding Coquelin Run:** Comments were received regarding both the possible impacts of Coquelin Run receiving additional water from the discharge (concern about possible flooding) and loosing water from the proposed construction dewatering withdrawal. The Town of Chevy Chase also raised concerns about the possible impact from the discharge on properties in the Town.

    Response: Proposed withdrawals are evaluated based on the criteria established through Maryland's laws and regulations. In summary a beneficial appropriation or use must be a reasonable estimate of the anticipated level of use for the permit period, and the requested withdrawal may not have an unreasonable impact on the waters of the State or other users of the waters of the State (see COMAR 26.17.06.06.A). All property owners have the right to make a beneficial use of water as long as the impacts of the use are not unreasonable and the applicable criteria of Maryland's laws and regulations are met. The permitted use of water may result in the removal of water from the watershed in which it naturally occurs.

    As described in answer to Comment 4 above, the project is located in the Little Falls (Willet Branch) watershed and only a portion of the withdrawal is estimated to capture groundwater that is within the Coquelin Run watershed. Our analysis indicates that the Coquelin Run will not be harmed by the withdrawal and that the discharge from the dewatering will be to Little Falls and not Coquelin Run. There is therefore no increased risk of flooding Coquelin Run or adverse impacts from the discharge to properties in the Town of Chevy Chase as a consequence of the Bethesda Shaft project. Responses to previous comments above address concerns regarding potential impacts to vegetation and wildlife.

11. **Comment – impacts of additional Purple Line withdrawals:** A comment was made regarding the impact of other withdrawals that would be needed for the Purple Line and how it would affect the withdrawal for the Bethesda Shaft. The comment also referenced hazardous material sites along the Purple Line.

    Response: As stated in response to Comment 2 above, there are no proposed withdrawals for the Purple line in the Little Falls or Lower Rock Creek watersheds, thus there are no cumulative impacts from this request for the Bethesda Shaft and other withdrawals that may needed for the Purple Line. Concerns regarding hazardous material sites near the Bethesda Shaft are addressed in response to Comment 6 above.

12. **Comment:** Can you point me to where in the MD regulations the requirements for a appropriation and use permit are spelled out?

    Response: The links below provide you with the laws and regulations that govern the water appropriation and use permit.

    https://www.lexisnexis.com/hottopics/mdW/

    http://www.dsd.state.md.us/COMAR/SubtitleSearch.aspx?search=26.17.06.*

October 26, 2017

Date

John W. Grace, Chief
Source Protection and Appropriation
Division Water Supply Program

Purple Line Transit Constructors, LLC
(Name of Applicant)

MO2016G004/01
(Application No.)

Mahmoud S Mahmoud
(Assigned WSA Project Manager)

October 26, 2017
(Date Form Completed)

IMPACT ANALYSIS SUMMARY

I. REASONABLENESS OF THE AMOUNT OF WATER REQUESTED IN RELATION TO THE ANTICIPATED LEVEL OF USE DURING THE PERMIT PERIOD.

The applicant initially requested to appropriate and use an annual average of 30,000 gallons of groundwater per day (gpd) and an average of 40,000 gpd during the month of maximum use to lower groundwater levels to facilitate the construction of the Bethesda shaft of the purple line. Notification sent by the applicant stated the requested quantity was an annual average of 30,000 gpd and 40,000 gpd during the month of maximum use from one well in the Lower Pelitic Schist of the Wissahickon Formation. Additional information provided by the applicant indicates that a flow rate between 40,000 gpd and 60,000 gpd is required to maintain the groundwater levels below. A higher rate, up to 100,000 gpd is needed during the initial dewatering period. The applicant also clarified that the water will be withdrawn from a sump at the base of the excavation. The Department proposed an annual average of 50,000 gpd and an average of 100,000 gpd during the month of maximum use. It is anticipated that the project will be completed within four years. The revised quantities are reasonable for the requested use.

II. REASONABLENESS OF THE IMPACT OF THE REQUESTED WITHDRAWAL ON THE RESOURCE.

The proposed Bethesda Shaft is within the Willet Branch portion of the Little Falls watershed. The dewatering of the proposed shaft will capture groundwater that would discharge into Willet Branch. The shaft location is relatively close to the watershed divide between Little Falls (Willet Branch) and Lower Rock Creek (Coquelin Run) watershed. The topographic divide is about 500 ft from the shaft center. The Department conducted an analysis to determine capture zone that would be created from the proposed dewatering and the portion of the capture zone in each watershed. Using the aquifer properties obtained from the aquifer test conducted by the consultant, the month of maximum use withdrawal rate of 100,000 gpd for a 150 day period of no recharge was modeled. The area of the capture zone was a total of 88 acres. The modeling showed that about 69.8 acres (79%) of the withdrawal would originate capture groundwater from the Little Falls (Willet Branch) watershed and 18.3 acres (21%) from Lower Rock Creek (Coquelin Run) watershed.

The Lower Pelitic Schist of the Wissahickon Formation (as mapped by the Geologic Map of Montgomery County and the District of Columbia, by the State of Maryland Department of Geology, Mines and Water Resources, 1953) is a crystalline rock aquifer of Maryland's Piedmont Province. This aquifer like other aquifers of the Piedmont, is recharged by the portion of the precipitation that infiltrates through the soil and continues to percolate downward to the zone of saturation (where all of the pore spaces and fractures are filled with water). This water stored in the saturated portion of the saprolite and rock matrix is defined as groundwater, and will eventually discharge into local streams. The amount of precipitation that reaches groundwater can be estimated by analyzing continuous stream gage data.

The watershed providing water to the headwater of Willet Branch and Coquelin Run are approximately 166 acres and 270 acres, respectively. Using the nearby gage on Rock Creek (USGS gage # 01648000), the average annual groundwater discharge to was determined to be about 8.1 inch/year and annual stream flow is about 14.2 in/year. Applying these rates to the 166 acre headwater area of Willet Branch yields a groundwater discharge rate of 100,000 gpd and an annual average stream flow rate of 175,400 gpd. For the 270 acre headwater of Coquelin Run, the annual average groundwater discharge is about 162,700 gpd and annual stream flow is 285,200 gpd.

Seventy nine (79%) of the proposed annual average dewatering or 39,500 gpd, represents about 40% of the estimated baseflow and about 23% of the total stream flow at the headwaters of Willet Branch. Because the water withdrawn will be returned to the headwaters of Willet Branch via the discharge to the storm drain system, there will be no loss of baseflow to the Little Falls watershed.

Twenty one (21%) of the proposed annual dewatering rate or 10,500 gpd, represents about 6% of the baseflow and about 4% of the total streamflow at the headwaters of Coquelin Run. This water lost to Coquelin Run will not unreasonably impact the aquatic habitat or stream flow in Coquelin Run. The anticipated loss of water from Coquelin Run is very minor in comparison to natural flows.

III. REASONABLENESS OF THE IMPACT OF THE REQUESTED WITHDRAWAL ON OTHER USERS OF THE RESOURCE.

The dewatering will result in a depressed water table around the project site. The depression is greater at the shaft and lessens within distance from the shaft. Time-distance-drawdown projections were developed using a transmissivity of 171 ft2/day and a storativity value of 0.1, from the consultant's report. Using these values, pumping the proposed well at the maximum rate of 100,000 gpd for 150 days with no recharge to the aquifer produced about six feet of drawdown at a distance of 500 feet from property boundary. The area is served by public water (WSSC). The only known groundwater users in the region are for dewatering. No unreasonable impacts to other users of the resource are expected.

FACT SHEET
JUDICIAL REVIEW PROCESS

Legislation passed by the 2009 General Assembly changes procedures for certain permits issued by the Department, including water appropriation permits. The judicial review procedures took effect on January 1, 2010 and applies to final permit decisions issued on and after January 1, 2010.

Under pre-existing procedures, permit applicants and third parties with standing under Maryland law could challenge the issuance of a permit or the conditions of a permit through a request for a "contested case" adjudicatory hearing conducted by the Office of Administrative Hearings. Effective January 1, 2010, the "contested case" process no longer applies to final decisions on applications for these permits. Rather, permits can be challenged through a request for direct judicial review in the Circuit Court for the county where the activity authorized by the permit will occur. Applicants, and persons who meet standing requirements under federal law and who participated in a public comment process by submitting written or oral comments (where an opportunity for public comment was provided), may seek judicial review. Judicial review will be based on the administrative record for the permit compiled by the Department and limited to issues raised in the public comment process (unless no public comment process was provided, in which case the review will be limited to issues that are connected to the permit).

Who Has Standing?
Anyone who meets the threshold standing requirements under federal law and is either the applicant or someone who participated in the public participation process through the submission of written or oral comments, as provided in Environment Article § 5-204, Annotated Code of Maryland. The three traditional criteria for establishing standing under federal law are injury, causation, and redressability, although how each criterion is applied is highly fact-specific and varies from case to case. Further, an association has standing under federal law to bring suit on behalf of its members when its members would otherwise have standing to sue in their own right, the interests at stake are related to the organization's purpose, and neither the claim asserted nor the relief requested requires the participation of individual members in the lawsuit.

What is the Procedure for Seeking Judicial Review?
Petitions for judicial review of a final determination or permit decision subject to judicial review must be filed in accordance with § 1-605 of the Environment Article no later than 30 days following publication by the Department of a notice of final determination or final permit decision and must be filed in the circuit court of the county where the permit application states that the proposed activity will occur. Petitions for judicial review must conform to the applicable Maryland Rules of Civil Procedure (Title 7, Chapter 200).

To review the legislation follow the link below:
http://mgaleg.maryland.gov/2009rs/chapters_noln/Ch_650_sb1065T.pdf

For a complete list of permits that these procedures apply to follow the link below:
http://www.mde.maryland.gov/programs/researchcenter/legislativetestimony/pages/jrproc.aspx