



April 1, 2026

Oaks HOA
Palmyra, Pennsylvania
info@palmyraoaks.com

Re: Updated Site Assessment/Observations – The Oaks Residential Development
Palmyra, Lebanon County, Pennsylvania
ALW Project No. 2024-09C

Dear Oaks HOA Board,

As authorized by The Oaks HOA (Client), the ALW Group, LLC (ALW) visited the above residential development located in Palmyra, PA on March 11, 2026. The purpose of the meeting was to review and note any significant changes in observed site conditions throughout the Oaks development since the time of our last assessment in November of 2024. Prior to the site reconnaissance, we discussed any noticeable changes to the grounds and/or features within the development footprint.

This document has been prepared to outline some of the significant findings, observations, and background associated with the housing development, stormwater management (SWM) facilities throughout the footprint of the Oaks development, with particularly focus on the condition of existing site features and the conveyance of stormwater. Further, it is our understanding that this document will be utilized to provide guidance as it relates to future and/or ongoing maintenance activities within the Oaks development.

Project Location/Description

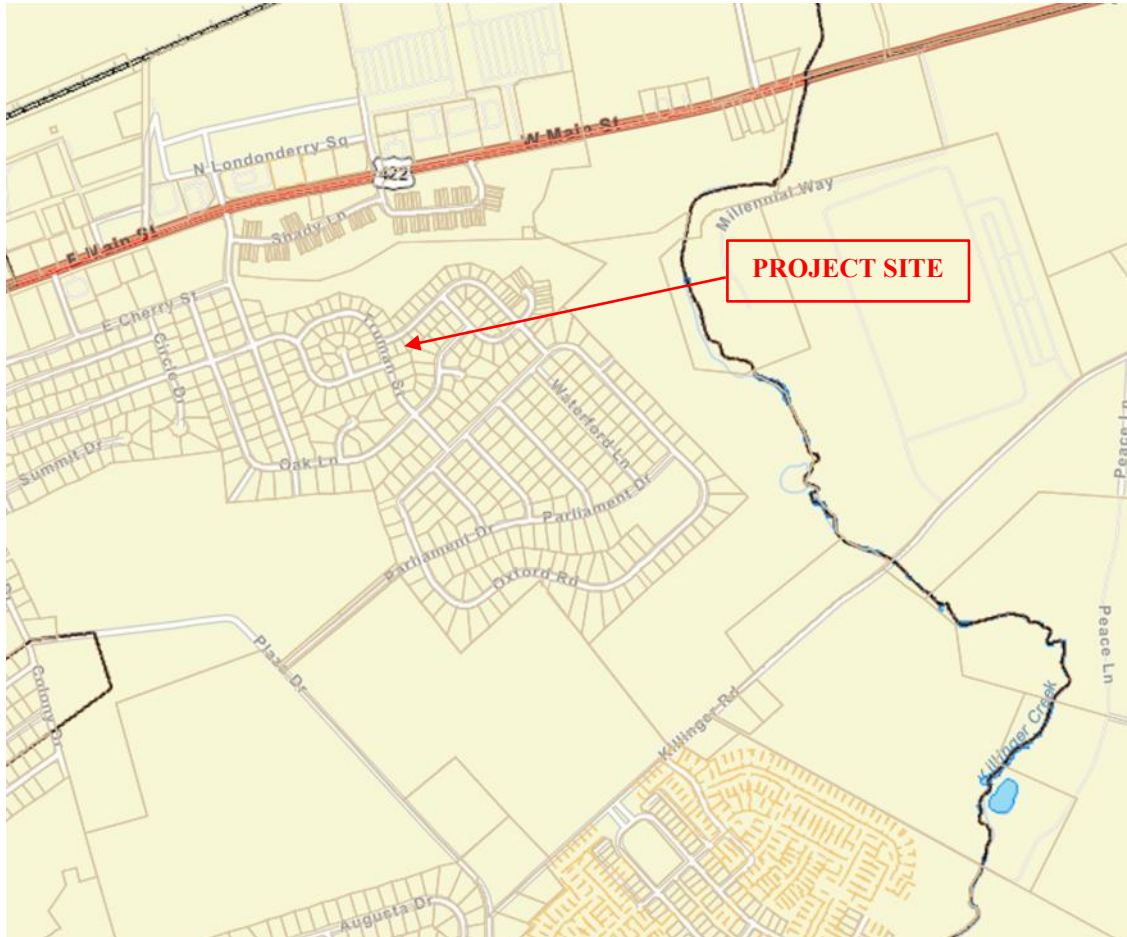
The Oaks residential development is situated in the Palmyra area of Lebanon County, Pennsylvania. There are approximately 150+ residential dwellings comprising The Oaks. Specifically, the development is situated in North Londonderry Township, along the southern side of Route 422. See **Figure 1** below.

The residential development primarily consists of multi-story residences bordered and bisected by numerous paved streets. Municipal sewer and water services are provided to the development along with SWM facilities. SWM inlets are placed throughout the streets and within several swale/green areas between houses.

The entire development is bound to the north by SWM basins, trees and green space. In general, surface water drainage and stormwater runoff flows from areas of high to low (south to north).



FIGURE 1 – SITE LOCATION PLAN



NOTES: Figure 1 modified from open street maps via © 2024 Microsoft



Site Reconnaissance/Significant Observations

ALW Licensed Professional Geologist, Scott Summers visited the site on March 11, 2026. The site reconnaissance was performed with members of the HOA and included traversing common areas and spaces throughout the development, including roadways, green spaces, SWM basins and drainage easement. It has been reported that areas/items noted in our 2024 summary, particularly those associated with stormwater management (SWM) structures (i.e. end walls, rip-rap aprons) are to be addressed (repaired) some time in the spring of 2026.

In summary, our site visit revealed the following key observations and findings:

- The overall condition of paved streets and green areas was considered good. No significant areas of concern were noted with respect to pavement surfaces, green swales between houses, or inlet structures.
- The overall condition of SWM facilities, such as basin inflow pipes and structures, embankments, and emergency release components, was noted to be in good condition. No obvious concerns were noted with respect to the condition of basin bottoms or embankments other than as previously noted in the 2024 assessment. SWM facilities appear to be properly functioning.
- As was previously noted in 2024, there are currently a series of open/active sinkholes just beyond (to the north) SWM Basin #1 situated near the northeast corner of the Oaks development. The sinkholes can generally be grouped into three (3) larger features. These features are situated in a topographically low area just beyond the outflow pipe from SWM Basin #3. Bedrock outcrops were visible within the sidewalls of one or more of the features. It is likely that these features are “connected” in the subsurface. The open features are currently secured within orange safety fencing.

The open sinkholes are currently situated within the wooded drainage area just beyond the toe of the embankment for SWM Basin #3. No apparent concerns were noted during the site reconnaissance with respect to the embankment. However, there is evidence of recent expansion of these openings. Several areas of the sidewalls show “fresh” erosion and collapse. We recommend periodic monitoring of these features and the adjacent ground surfaces to document that no significant ground loss is occurring over time throughout this area of the property. Restoration of these features may also be considered.

- Several recent openings/subsidence features were observed along the easement/common areas behind house on Hickory Avenue between SWM Basin #1 and #2. Several openings at the ground surface were noted along the top of the slope bordering the wooded easement area to the north. It was noted that several 1-foot by 1-foot openings occurred along the chain-link fencing at the top off the slope. At least one of these openings extended beyond 3 feet in depth before it was



closed up at the bottom. It appears that animals (groundhogs) are now using these openings as burrows. This is a common condition/occurrence in sinkhole-prone areas. Subsidence features are easy to excavate for burrowing animals/pests and so often, they will use soft, weak or openings in the subsurface.

- Several recent openings/subsidence features were observed along the easement/common areas behind houses (roughly between 41-53) along Hickory Street between SWM Basin #1 and #2. Several openings at the ground surface were noted along the top of the slope bordering the wooded easement area to the north. It was noted that several 1-foot by 1-foot openings occurred along the chain-link fencing at the top off the slope. At least one of these openings extended beyond 3 feet in depth before it was closed up at the bottom. It appears that animals (groundhogs) are now using these openings as burrows.

Similarly, beyond a small cluster of trees to the rear (north) of 41-43 Hickory Street, we observed an area of irregular subsidence with numerous small openings and depressions at the ground level. Please see attached **Site Photographs** and **Site Features Plan**. Some evidence of loose or intact bedrock could be observed within several of these open depressions. Generally, the open depressions are not several large (<1 foot in diameter); however, the “clustered” nature and orientation of these features in a group may indicate a larger area of soil erosion occurring in the subsurface. We recommend that this area be closely observed from season to season through the year, noting any increased subsidence or additional openings at the ground surface.

- As requested, we also provided assessment of the steep slope above SWM Basin #1 which forms the rear of several houses at the terminus of Pin Oak Street. The steep slope is mostly vegetated and includes a fence along the top of slope. In general, steep slopes such as this one, which are in close proximity to structures or are used as structural support (holding up parking lots, decks, patios, etc.) are not recommended to be constructed at grades steeper than 3:1 (3 feet horizontal by every 1 foot of vertical rise). It appears that the constructed slope in this area is steeper than 3:1 (appears to be 2:1 or steeper). As such, there are certainly some general concerns relative to the ongoing maintenance of the slope.

A detailed review of the slope conditions (toe, crest, and along the embankment) on March 11, 2026 indicated that the slope appears to be stable and in good condition. There is no indication of active or past slope (soil) movement and there are no obvious or substantial surficial erosion concerns at this time.

The slope face is largely vegetated with grasses and small shrubs/bushes. The observed vegetation includes both native and invasive plant species, mainly with shallow root systems. There are no larger shrubs or trees along or at the top of the embankment. The vegetated cover is a critical aspect of maintaining the current slope condition. Small ground-cover type vegetation is beneficial in helping to maintain/keep soil consolidated (or stable) and in place. Vegetated



cover also assists in reducing surface water collection and concentration along the slope. Removing the vegetation along the embankment would subject the slope to increased risks of surface failures (soil sliding and erosion) and is not recommended. We recommend maintaining much of the vegetation in its current condition. Open areas along the embankment, without vegetation, should be planted with small plants/shrubs, grasses, ground-cover type plants. The Pennsylvania Department of Conservation and Natural resources along with the US Department of Agriculture, have numerous available resources concerning slope stabilization using vegetative cover. Further, the Lebanon County Conservation District may also have local listings of ideal native flowers, plants and shrubs that can be incorporated.

Two items that we recommend be addressed relative to the current slope conditions/observations:

- (1) Rodent holes and ground hog burrows were observed throughout the embankment. In general it is not recommended to allow small rodents/pests to use the embankment for tunnels/burrows. Burrows and tunnels weaken the face of the slope causing additional erosion over time and also create areas/repositories for water collection, which in turn, can accelerate the weakening of soil conditions along the face of the slope. We recommend closing of all animal burrows/tunnels observed on the slope. This process should be repeated, as needed, annually.
- (2) The top of the slope is marked with a fence, which covers the majority of the limits of the top of the slope. On the downslope side of the fence, we noted a mowed walking path appears to be maintained. This leaves the “crest” or top of slope edge with very little vegetative cover. Surface water runoff above the slope generally drains in the direction of the slope or adjacent to it. We recommend that mowing/maintenance of the small grass strip on the downslope side of the fence be ceased. The top of the crest is a critical point in the overall slope construction. Surface water runoff that can infiltrate into the top of slope area may lead to short and longer-term problems with the overall integrity of the slope with time. Vegetating this area to the edge of the top of slope is preferred will help reduce erosion and stability concerns. Plantings along the edge of the top of slope should not be completed at one time so as to reduce the overall disturbance along the top of the slope during a single season. We suggest staging the plantings/vegetative cover in this area of the slope over several seasons. See the attached **Site Photographs** for additional details.



Summary Recommendations/Budget Considerations

1. Although no immediate concern was noted at this time, SWM inlets and alignments should be properly maintained.
2. The steep slope behind Pin Oak Street requires not immediate corrective actions. Recommendations relative to the maintenance of the sloped area have been included in above sections of this report. We suggest consultation with an appropriate landscape contractor regarding additional plantings along the slope. Rodent/pest burrows should be completely plugged using soil that will readily compact within the burrow. Granular soils (sand), rocks, topsoil or other organic materials should not be used. Moistened clay soils (clay soils with some water added) can be placed and compacted to cutoff the burrow entry and will make it more difficult for rodents/pests to return.
3. Open/active subsidence features along the rear (north) common or drainage and utility easement areas should be closely monitored from season to season, noting any significant changes at the ground surface. As discussed, the most economical solution at this time would be to plug/fill these various openings with compacted clay soils. We do not recommend the use of sand, rocks, concrete, topsoil or other materials as they will only cause increased infiltration of water into the openings in the subsurface and eventually lead to additional erosion. Placing compacted clay materials into these openings will help to direct surface water past or beyond these areas. Please note, the outlined mitigation is not a long-term solution to possible or eventual deeper sinkhole development. The recommendations provided are meant to represent short-term or basic maintenance measures that are both economical and practical to the HOA when attempting to address mitigation of these sensitive areas of the property. Further, openings such as those observed, represent safety concerns.
4. The larger active/open sinkholes beyond SWM Basin #1 should remain secure with safety fence since these features may represent a liability consideration. The condition of these openings should be periodically monitored to ensure no significant ground loss is occurring that may jeopardize other surrounding site features. From the time of our last inspection (Nov. 2024), it is obvious that these features have expanded with additional soil loss (both along the sidewalls and in some cases, along the bottom of the observed openings). Although some additional erosion and collapse was observed within the sinkholes, it does not appear that these features represent any type of imminent catastrophic situation to surrounding sensitive areas (i.e. toe of embankment at SWM Basin #1) in the near-term. It is likely that some tree loss may occur in the near future, as the observed erosion is encroaching on several tree root systems. As stated above, these areas should be monitored annually so that any significant changes to these features can be accurately documented and evaluated with respect to any new risk considerations.



Consideration could be given to closing these features. Estimated costs for closure of the existing sinkhole features are unknown at this time and will vary based on the approach, equipment and materials utilized. If requested, additional consultation can be performed to ascertain costs associated with practical and economical solutions to restoration of these features.

Closing

The information contained herein has been provided for the exclusive use of The Oaks HOA, their assigns, and attorneys. Use of this information by a third-party or other entity beyond those parties listed is strictly prohibited without the prior consent of ALW. Use of this information by unauthorized parties is done so, at their own risk and ALW can not be held responsible for such use.

Sinkhole development and the mitigation/remedial efforts associated with their restoration is extremely complicated/complex. Further, there is no guarantee or warranty against sinkhole development, even after remedial efforts/activities. The opinions and recommendation presented herein have been provided according to accepted industry standards/practices within this geologic setting.

We appreciate the opportunity to be of assistance to you on this project. Should you have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,



Scott A. Summers, PG
Commonwealth of Pennsylvania
Licensed Professional Geologist

Attachments: Site Photographs
Site Features



SITE PHOTOGRAPHS

Photograph No. 1 – Steep Slope behind residences at Pin Oak Street. Although no visible in this photograph, there is a small mowed or maintained strip at the top of this slope on the “outside” of this fence.





Photograph No. 2 – Photograph of an area of subsidence, openings and depressions at the ground surface that appear to be grouped or clustered and has recently formed according to the HOA.



Closed and open depressions were observed throughout this area





SITE FEATURES PLAN

