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May 3, 2023

Joseph Marley, President
National Land Developers, LLC
1010 Wilson Avenue
Glen Mills, PA 19342

RE: Conditional Use Application, Milford Township, Pike County
Property: 247 Route 6 - Tax Map Parcel 096.00-01-16

Dear Mr. Marley.

At your request, we have prepared this letter to provide a summary of the existing hydrogeological information pertaining to the above-referenced 44-acre property (the ”Site”) in Milford Township, Pike County, Pennsylvania that National Land Developers, LLC, is proposing to develop as a 434,000 square foot warehouse with parking and related Site improvements. We also include in this letter our recommendations for characterization and monitoring strategies for the Site once conditional use approval is obtained. Characterization and monitoring activities are intended to address the Township’s concerns regarding the effect of the development on local groundwater resources.

Geologic Setting

The bedrock underlying the Site consists of siltstone and silty-shale of the Sloat Brook Member of the Trimmers Rock Formation (Sevon and others, 1989). According to Sevon and others (1989), the basic structure is a homocline. Dips in the vicinity of the Site are approximately 10^{o} to the northwest. Steeply dipping N6^{o}E and N85^{o}E striking joint sets are prominent throughout the region. There are no mapped faults in the vicinity of the project Site.

The surficial geology of the Milford Quadrangle was recently mapped by Witte (2012). The Site is underlain by late Wisconsinan glacial-lake delta deposits that according to Witte consist of “stratified, sand, gravel, and silt deposited by meltwater streams in proglacial lakes at and beyond the stagnant glacier margin. [It] includes well sorted sand and boulder-cobble to pebble gravel in planar to cross-bedded glaciofluvial topset beds that are as much as 25 feet thick. Topset

beds overlie and grade into foreset beds that dip 20^{o} to 35^{o} basinward and consist of well- to moderately-sorted, rhythmically-bedded cobble-pebble and pebble gravel and sand. These beds grade downward and outward into ripple cross-laminated and parallel-laminated, sand, silt, and pebble gravel that dip less than 20^{o}. Lower foreset beds grade into gently inclined prodelta bottomset beds of rhythmically-bedded, ripple cross-laminated to graded fine sand and silt with minor clay drapes. Thickness may be as much as 100 feet." Records for an abandoned residential well on the Site (Envirosite Corporation, 2022) indicated that the unconsolidated deposits were 67 feet thick.

Figure 1 shows a LIDAR hillshade map with locations of wells from the Pennsylvania Geological Survey (2017) database. The wells are labeled with bedrock elevations that were calculated by subtracting the reported depths to bedrock from surface elevations. The red contours shown in Figure 1 are bedrock elevation contours interpolated from the well data. One buried valley diverts groundwater from the western portion of the project Site to the south, away from the headwaters of Milford spring. A larger buried valley extends northeastward across the Site and is part of the spring watershed area.

The approximately 800-foot-wide alluvial plain of Saw Creek is located ~150 feet east of the Site. The alluvium is likely to be thin as its thickness is limited by elevation of the knickpoint at Pinchot Falls.

The highest elevation areas west and south of the Site are covered with till consisting of compact, unstratified, poorly sorted sandy silt with clasts of various rock types (Witte, 2012).

Conceptual Model

Figure 2 is a schematic geologic cross-section drawn along line A-A' in Figure 1. The cross-section shows the thickness and distribution of deltaic and alluvial deposits. Our conceptual model of the water table is also shown. It is based on the static water level of 30 feet below the ground surface reported for the single on-site well, the elevation of Saw Creek, and the constraint that under steady- state conditions an increase in thickness of a homogeneous aquifer results in a decrease in hydraulic gradient. The conceptual model shows Saw Creek as a losing stream. Todd Giddings and Associates (2006) reported losing reaches along Saw Creek south of the Site but reported no hydraulic gradient data from areas adjacent to the stream. The bedrock contours presented in Figure 1 suggest that groundwater may flow parallel to the stream in the vicinity of the Site and then toward the paleo-confluence of Saw Creek and Vantine Brook near present day Milford Springs. Groundwater from a western portion of the Site may discharge to the south.

The proposed stormwater infiltration basins and galleries on the project Site are positioned to take advantage of the surrounding wetland areas for contaminant mitigation. With respect to the proposed land-based wastewater management needs for the project, the available soil mapping and confirmation testing indicate the soils within the proposed management area are typical of the Chenango gravelly fine sandy loam (89B). The Chenango soil series is typically described as a very deep, well to somewhat excessively drained soil that formed in “water-sorted” alluvial or glacial fluvial deposits. The available on-site testing confirms the soils are generally suitable for the use of a conventional elevated sand mound system with standard septic tank effluent, but the project is proposing to pretreat the domestic wastewater with a Premier Tech Aqua PL-122 effluent filter and a series of Premier Tech Aqua Ecoflo Coco Filters that will further reduce the loading to the treatment area. Based on the hydrological setting, it appears the local discharge zone will be a wetland complex located on the project Site that is hydrologically downgradient of the proposed wastewater management area. This suggests that prior to leaving the Site, the applied wastewater will not only be pretreated, aerobically treated within the management area, but will be exposed to anaerobic conditions within the wetland complex. These anaerobic conditions should further decrease the biological, organic, and nutrient loading to the local watershed. Like the proposed stormwater facilities, the natural features of the parcel will provide natural barriers that will promote denitrification and sequestering of environmental pollutants. This hypothesis will be tested as part of the confirmation testing that will be conducted with the local agency and the PADEP to confirm the suitability of the proposed wastewater management approach as part of the sewage planning process following receipt of conditional use approval and prior to submission of preliminary land development plans.

Conclusions and Recommendations

The proposed piezometer and monitoring well locations (Appendix A) appear to be adequate to refine the understanding of the nature of the unconsolidated deposits, aquifer characteristics, the directions and rates of groundwater flow from the Site, and background water quality. The data collected will also allow for assessment of the adequacy of the proposed monitoring well array. Additionally, we recommend that geotechnical analysis of the material include detailed textural/grading analysis (particle size and sand sieve analysis) and documenting the anion and cation exchange capacity and organic matter content of the near surface soils and other

unconsolidated deposits. The intent of collecting these data is to satisfy PADEP permitting requirements and to develop an effective site management and monitoring strategy once conditional use approval is obtained.

Please let us know if you have any questions.

Sincerely,

COOK GEOLOGIC, LLC

Robert Cook, Ph.D., P.G.

Geologist

and,

B.F. ENVIRONMENTAL CONSULTANTS, INC.

Brian Oram, P.G.

Geologist/Soil Scientist

Attachments: Figure 1 – Bedrock elevation contour map

Figure 2 – Geologic cross-section A-A'

Appendix A – Proposed well/piezometer and sampling location map

References

Envirosite Corporation, 2022, **Government Records Report**, Milford Distribution Facility, Report Generated July 1, 2022.

LVL Engineering Group, 2023, **Conditional Use Plans For Milford Warehouse Facility**, Milford Township, Pike County, Pennsylvania, 7 sheets.

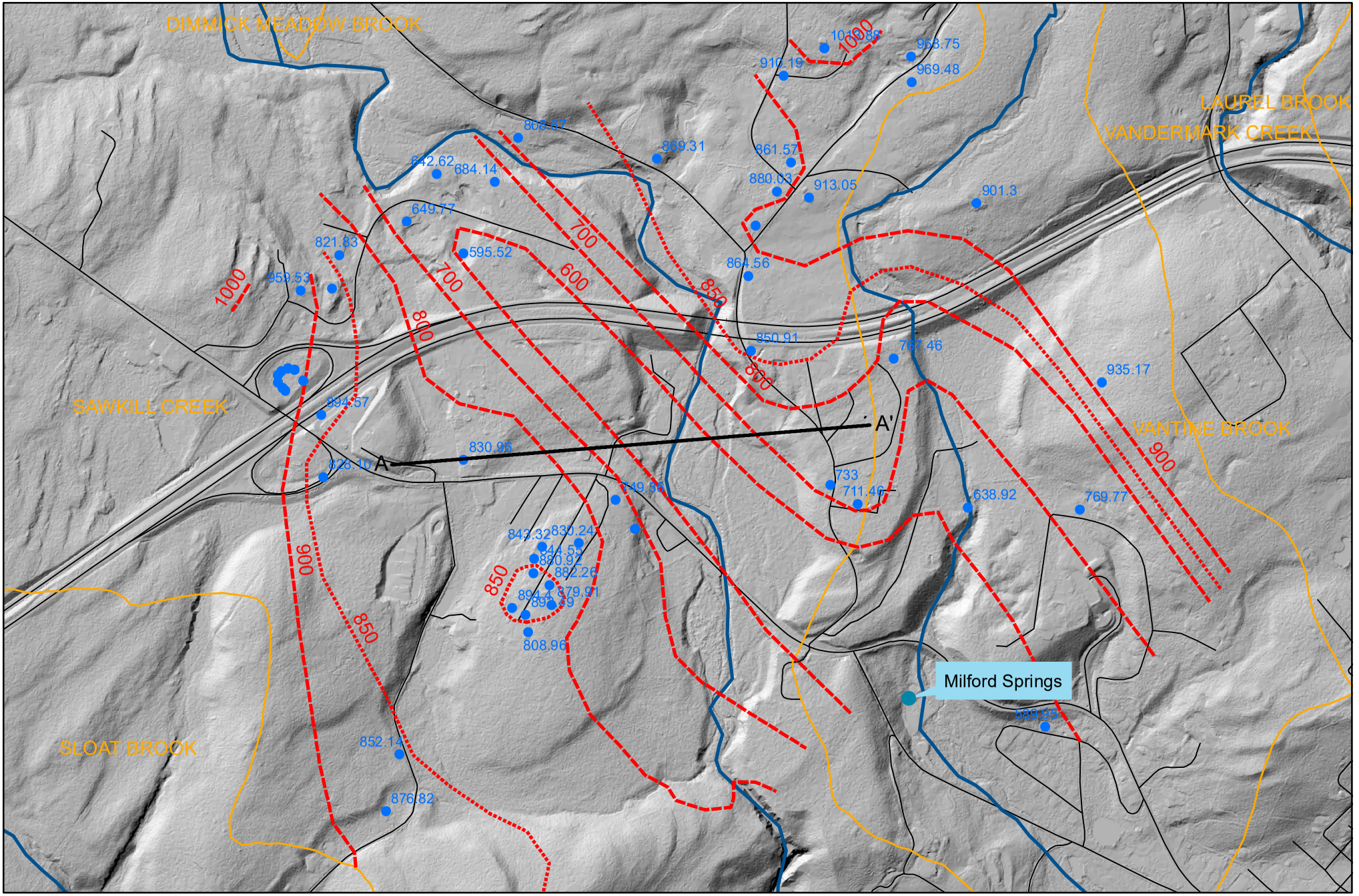
Pennsylvania Geological Survey, 2017, **Pennsylvania groundwater information system(PaGWIS)**: Pennsylvania Geological Survey, 4th ser., SQL database (accessed September 22, 2022, http://dcnr.state.pa.us/topogeo/groundwater/pagwis/records/index.htm).

Todd Giddings and Associates, Inc., June 2006, **Source water protection plan for the Milford Springs, Milford Township, Pike County, Pennsylvania**, Municipal Authority of The Borough of Milford, PA, 63 p.

Sevon, W.D., Berg, T.M., Schultz, L.D., and Crowl, G.H., 1989, **Geology and mineral resources of Pike County, Pennsylvania**, Pennsylvania Geological Survey, County Report 52, 1:50,000.

Witte, R.W., 2012, **Surficial geologic map of the Milford quadrangle, Sussex County, New Jersey, and part of Pike County, Pennsylvania**, New Jersey Geological Survey, Open-file Map OFM 96, 1:24,000.

FIGURE 1



PAGWIS data ● **Bedrock elevation contours** Streams Watershed

Interpretation of paleodrainage pattern based on depth to bedrock data.

April 16, 2023

1,000 500 0 1,000 Feet

N

COOK GEOLOGIC, LLC

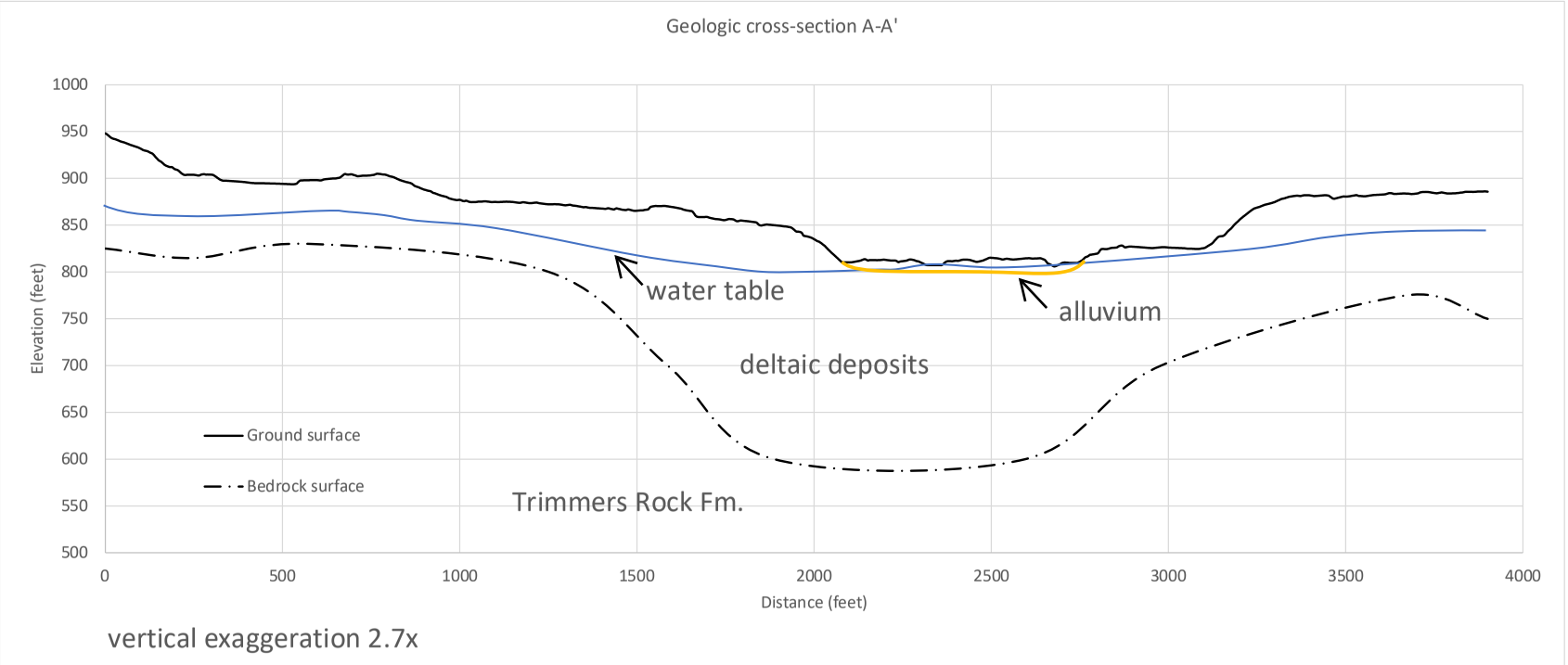
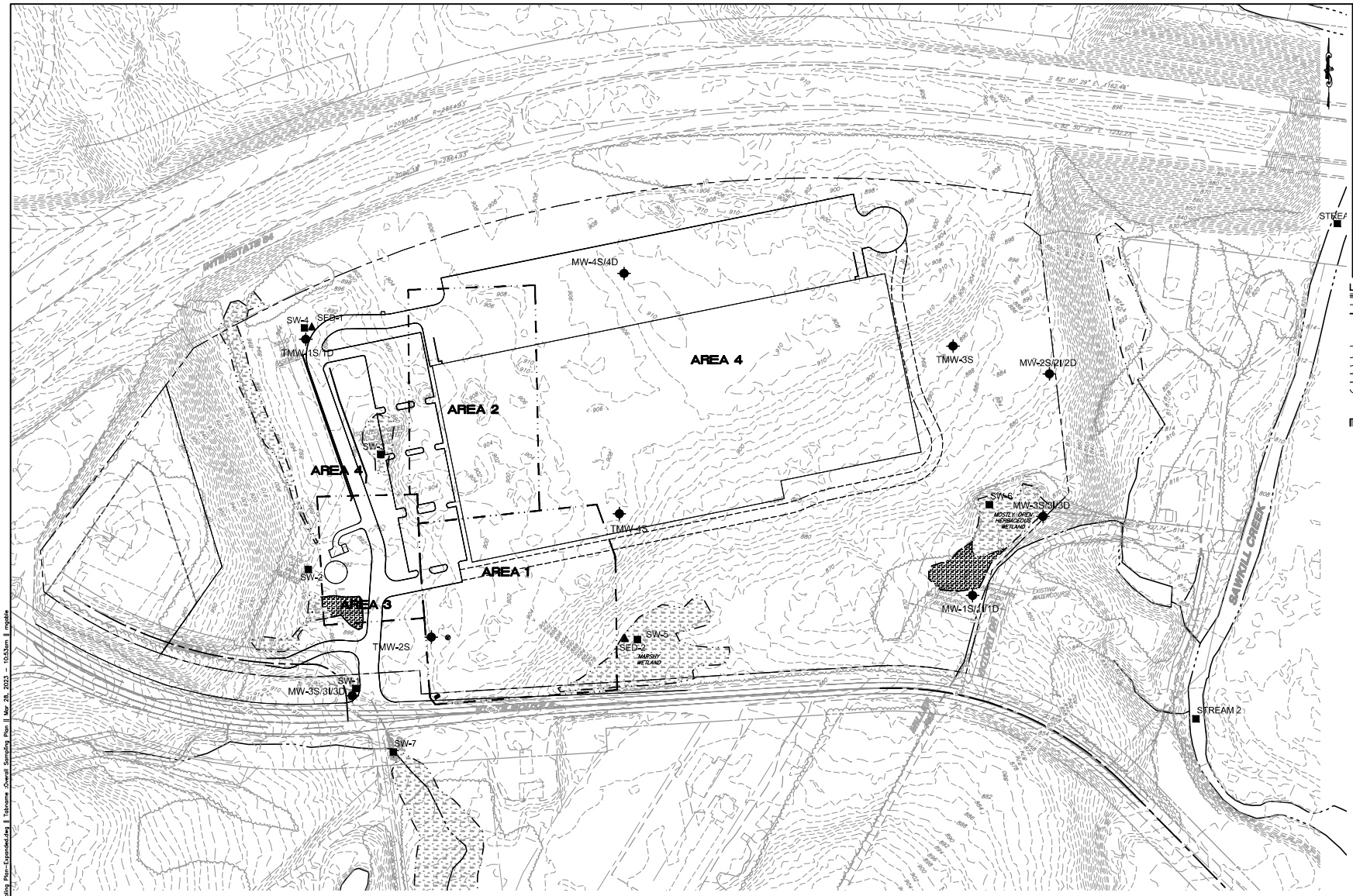
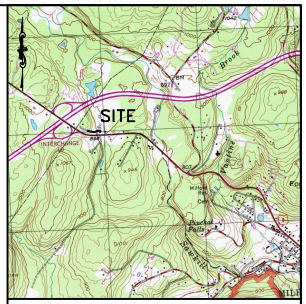


Figure 2 - Schematic cross-section along line A-A' in Figure 1.

APPENDIX A

Sampling plan





LOCATION MAP
SCALE: 1"=2000'
SOURCE: MILFORD PA USGS QUAD MAP

LEGEND

- ADJOINER LINE
- EXISTING BOUNDARY
- EXISTING BUILDINGS
- EXISTING BUILDING SETBACK LINES
- 288 EXISTING CONTOUR
- 290 EXISTING INDEX CONTOUR
- EXISTING EDGE OF PAVEMENT
- EXISTING LEGAL RIGHT-OF-WAY
- EXISTING TREELINE
- EXISTING WELL (GROUND ELEV = 899)
- EXISTING WETLANDS
- PROPOSED BUILDING
- 1-1 PROPOSED SOIL SAMPLING LOCATION
- MW-1S/1I/1D PROPOSED GROUNDWATER MONITORING WELL LOCATION
- SW-6 PROPOSED SURFACE WATER SAMPLING LOCATION

S:\2021\218686\Dwg\Final Dwgs\Environmental\Sampling Plan-Expanded.dwg | Tahranee, Overall Sampling Plan | Mar 28, 2023 - 10:53am | mpable

REVISIONS :

DATE	DESCRIPTION	DATE	DESCRIPTION

PROJECT :
MILFORD DISTRIBUTION FACILITY
MILFORD TOWNSHIP
PIKE COUNTY, PA.

APPLICANT :
NATIONAL LAND DEVELOPERS, LLC
1010 WILSON AVENUE
GLEN MILLS, PA. 19342

0 40 100 200 300
SCALE : 1"= 100'

JOB NO.: 218686
DRAWN BY: SMR
CHECKED BY: LRW
SCALE: 1" = 100'
PLAN STATUS: PLANNING

TITLE : OVERALL SAMPLING LOCATION PLAN

DOYLESTOWN (215) 345-9400
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LVL ENGINEERING GROUP
BETHLEHEM CORPORATE OFFICE 559 MAIN STREET, SUITE 230 BETHLEHEM, PA 18018 (610) 419-9407

SHEET 1 OF 1

PROJECT NAME : MILFORD DISTRIBUTION FACILITY

DATE: MARCH 28, 2023