ARRO Consulting, Inc.
Corporate Headquarters
108 West Airport Road
Lititz, PA 17543
P: (717) 569-7021

February 25, 2022

To: Lower Macungie Township Planning Commission
Upper Macungie Township Planning Commission
Lehigh Valley Planning Commission

RE: TREXLERTOWN ACT 537 SPECIAL STUDY

Dear Planning Commission:

On behalf of the Lehigh County Authority and the Townships of Lower Macungie and Upper Macungie, we are submitting one copy of the enclosed draft Trexlertown Act 537 Special Study for your review and comment. As required by the Pennsylvania Sewage Facilities Act (25 PA Code § 71), the Special Study must be reviewed by municipal planning agencies prior to public notice and municipal adoption.

Background

This Trexlertown Special Study (TSS) is being done to address sewage capacity needs within the Western Lehigh Interceptor (WLI) near Trexlertown. The interceptor experiences dry-day surcharging and wet-weather overflows during intense rain events. Lehigh County Authority (LCA) has developed alternatives to temporarily address this situation until a long-term solution can be developed during preparation of the regional long-term Act 537 Plan.

The service area primarily impacted by this portion of the WLI includes Upper Macungie Township and Lower Macungie Township.

Selected Alternative

A new interim pump station and force main located near the Industrial Pretreatment Plant-(PTP) that will divert flow away from the Western Lehigh Interceptor and pump it into the Upper Macungie Trunk Line (UMTL) at manhole PH3034A. The UMTL has both unused dry day (approximately 2.5 MGD) and unused wet weather (0.6 MGD) capacity and flows by gravity into the Spring Creek Pump Station. Note that the Western Lehigh Interceptor also flows by gravity into the Spring Creek Pump Station, so the impact on the Spring Creek Pump Station should be negligible. No improvements are being proposed to that Pump Station at this time. There are no improvements, modifications or additions to the City's centralized collection system planned

under this Interim Plan. This plan does not increase the sewage service area in any of the contributing municipalities.

This Interim Act 537 Plan constitutes a corrective action plan intended to address sewerage needs in the WLI service area. Your timely review is necessary to address ongoing sewage conveyance needs. Should you have any comments, please email them directly to the attention of Michael A. Schober with ARRO Consulting at Michael.schober@arroconsulting.com.

Thank you for your timely review.

Sincerely,

Michael A. Schober, P.E., BCEE
Vice President, Director of Business Development

Lehigh Valley Planning Commission

STEVEN GLICKMAN
Chair

CHRISTOPHER AMATO
Vice Chair

KEVIN SCHMIDT
Treasurer

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Executive Director

Planning for the Future of Lehigh and Northampton Counties at 961 Marcon Blvd., Ste 310, Allentown, PA 18109 ■ (610) 264-4544 ■ lvpc@lvpc.org ■ www.lvpc.org

March 25, 2022

Mr. Michael Schober, PE, BCEE
Vice President, Director of Business Development
ARRO Consulting, Inc.
108 West Airport Road
Lititz, PA 17543

Re: Act 537 Review – Trexlertown Special Study – Lehigh County Authority
Lower Macungie/Upper Macungie Townships
Lehigh County

Dear Mr. Schober:

The Lehigh Valley Planning Commission (LVPC), at its regular monthly meeting on March 24, 2022, reviewed the above-referenced plan pursuant to the requirements of the Pennsylvania Sewage Facilities Act (Act 537). Our review was based on the goals, policies and actions of *FutureLV: The Regional Plan*. We offer the following comments.

The purpose of the Trexlertown Act 537 Special Study is to temporarily address the hydraulic issues within a two-mile portion of the Lehigh County Authority's Western Lehigh Interceptor (WLI) near Trexlertown, as identified in the 2020 Kline's Island Sewer System Interim Act 537 Plan. The study area straddles Upper Macungie and Lower Macungie townships.

The study identifies an interim solution to alleviate the problem by constructing a new pump station and force main near the Industrial Pretreatment Plant along Route 100 in Upper Macungie Township. This temporary alternative will address the situation until a long-term solution is developed as part of the long-term Kline's Island Regional Act 537 Plan currently underway, with a completion date of March 2025. The new pump station will divert 2.5 million gallons per day from the WLI and pump it into the Upper Macungie Trunk Line, which has available capacity. The Upper Macungie Trunk Line ultimately discharges into the Spring Creek pump station located in Lower Macungie Township. The WLI also ultimately flows to the Spring Creek pump station, therefore, no impacts to the pump station are anticipated with the construction of the proposed alternative.

The proposed temporary alternative to address the hydraulic issues in the WLI exhibits consistency with *FutureLV: The Regional Plan.* Providing adequate, environmentally sound sewage disposal aligns with the FutureLV actions to "improve the utility and mobility infrastructure of the region" (under Policy 1.1) and "protect the quality and quantity of surface and groundwater" (under Policy 3.2).

Please call me if you have any questions.

Sincerely,

Susan L. Rockwell
Senior Environmental Planner

cc: Philip DePoe, Lehigh County Authority
Bruce Beitel, Manager, Lower Macungie Township
Robert Ibach, Jr., Manager, Upper Macungie Township
Bharat Patel, PE, PA Department of Environmental Protection

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

Negative Survey Form

(This form may be used if the Phase I guidelines have been followed and no cultural resources have been identified.)

1. Project Identification:

Project Number: 2021PR06757

Project Name &/or Agency Tracking #: Lehigh County Authority Trexlertown Special Study, Trexlertown Sanitary Sewer Main - Grange Park Realignment, Upper Macungie Township, Lehigh County, Pennsylvania

Agency: Pennsylvania Department of Environmental Protection **Applicant:** Lehigh County Authority

Preparers Name and affiliation: Frank G. Mikolic III, Principal Investigator, A.D. Marble

Date Prepared: 4/28/22

Project Area County/Municipality (list all)

County	Municipality
Lehigh	Upper Macungie Township

2. Project Setting: (check all that apply)

☒ urban/suburban; ☐ rural
☒ upland; ☐ floodplain/terrace (☐active; ☐stable terrace)

7.5" USGS Quadrangle(s) Name (list all):

Name	Date
Allentown West	1985

Physiographic Zone(s)(list All. Use DCNR Map 13 compiled by W.D. Sevon, Fourth Edition, 2000.):

Physiographic Zone
Ridge and Valley - Great Valley Section

Project Area Drainage(s), (list all) (Sub-basin and Watershed can be obtained from CRGIS):

Sub-basin	Watershed	Major Stream	Minor Stream
2 Central Delaware	C	Lehigh River	Iron Run

3. Basic Field Conditions:

(Text fields will expand as needed. Please be complete)

Area of APE / Project Area in hectares: 0.36 Hectares tested: 0.24

General Description of APE / Project Area:

The proposed project's Area of Potential Effects (APE) is located within the southeast corner of Upper Macungie Township in southern Lehigh County, Pennsylvania (Figure 1). The Trexlertown Sanitary Sewer Main project area is located on an upland landform, roughly paralleling the southbound lanes of S.R. 0222 (Trexlertown Bypass) between Grange Road to the east and S.R. 0100 to the west. S.R. 3009 (Ruppsville Road) traverses northeast to southwest through the western portion of the project area. A Phase I survey was completed on the alignment by A.D. Marble in February 2022. This form is an addendum to the negative survey form completed for the February 2022 project. In late March, the design of a portion of the sewer line within Upper Macungie Township's Grange Park was shifted north and outside of the area previously surveyed in February. This new alignment, referred to as the Grange Park Realignment, traverses approximately 200 to 675 feet north of the previous alignment and through

the northern portion of Site #1 (36LH0241). The alignment roughly parallels the southern boundaries of two paved parking lots and traverses northeast to southwest, where it meets the February 2022 APE. A total of 0.12 hectare (0.3 ac) of the APE were previously surveyed by McCormick Taylor in 1997 during the US 222 Corridor Design Location Study.

The archaeological APE of the Grange Park Realignment measures approximately 0.36 hectare (0.9 ac), and consists of a 2,174-linear foot alignment measuring 20 feet in width. The proposed sewer line will connect to an existing sewer line located approximately 560 feet southwest of Grange Road (Photograph 1). The alignment then traverses southwest through Upper Macungie Township's Grange Park (Photographs 2 to 5). The area surrounding the APE is relatively developed, and is surrounded by commercial warehouses and residential developments. The portions of the APE that were not previously surveyed by McCormick Taylor in 1997 were tested via three test areas designated Areas C, D, and E. Area C is open, maintained lawn located at the eastern most portion of the APE paralleling Lenape Trail (the park access road) and the southern edge of a paved parking lot (Photograph 1). The new alignment will meet an existing manhole at the eastern terminus of Area C (Photographs 2 and 3). Area D is located adjacent to the southern edges of two paved parking lots and contains the northern portion of 36LH0241. The area consists of maintained lawn used for recreational fields (Photograph 4). Area E is located within an open field, with maintained lawn bordering the southern edge of a paved parking lot (Photograph 5).

Type of Proposed Project/Impact: Per the Pennsylvania Department of Environmental Protection-approved (PADEP-approved) Interim 537 Plan, action is regulatory and required to alleviate the current sanitary sewer interceptor system bottleneck in the Trexlertown area. The specific solution had not yet been clearly identified when the Interim 537 Plan was being prepared. Now that further engineering and modeling analyses are complete, a working solution has been identified for the project. Since the Interim 537 Plan did not identify the solution, a Special Act 537 Study (which this survey is part of) is required in order to permit this project. Construction is expected to be completed by early 2025.

The proposed project involves the construction of a 2.5 million-gallon per day (MGD) pump station at the LCA Pretreatment Plant (downstream of the effluent). An approximately 1.5-mile force main (18 inches in width) will be installed from the pump station to an Upper Macungie Township manhole in the Grange Park area (Figure 2). The easement will measure 20 feet in width, and the line will be installed at least 4 feet below ground surface. This diverted flow will enter the Upper Macungie Township's interceptor at this manhole, which ultimately will flow into the LCA Spring Creek Pump Station.

As stated previously, the eastern portion of the proposed sewer line within Grange Park was shifted north and outside of the original alignment that was previously surveyed in February 2022. The original alignment was chosen to minimize construction disturbance within the Township's Grange Park. The Township is now moving forward with plans (in the near term) to improve Grange Park. As part of the proposed park improvements, the realignment of the proposed force main (paralleling a proposed parking lot) is recommended to minimize future Township plans within the park.

Date of field investigation(s): April 15, 2022

Description of Field Conditions including percentage of surface visibility: Weather conditions at the time of the survey were partly cloudy, with no precipitation. Ground visibility was zero throughout the APE under maintained lawn.

4. Previously Recorded Archaeological Sites within APE / Project Area and not relocated by this project:

PASS Site Number	Reason not re-located
36LH0241	The portion of the site located within the APE has been destroyed by previous park development.

5. Survey Methodology: (check all that apply to the entire project; attach any supporting documents)

☒ PASS file Research ☐ Contacted Local Historical Association/Commission/Park/Etc.
☐ Informant Data ☒ Historic Records/Maps/Photos ☒ SCS Soil Maps

☐ Surface Survey ☐ Geomorphological Borings ☒ STPs
☐ Test Units ☐ Geomorphological Trenches ☐ Remote Sensing
Other: _____

Professional Geomorphologist was ☐Present or ☒ Not Present During Field Investigations

Name: _____ Affiliation: _____

Formal Geomorphological Report Prepared: ☐ Yes ☒ No

6. Results: (Describe both the design and the results of every methodology checked in **5.** Include the size and condition of the area tested by each.)

Environmental Context

The project area is located within the Great Valley Section of the Ridge and Valley Physiographic Province (Pennsylvania Department of Conservation and Natural Resources [PADCNR] 2002). This region is characterized by fairly steep upland topography with rugged terrain and exposed bedrock (Custer 1996:12). High-grade quartzite and jasper available from the Hardyston Formation of this region were favored by the precontact occupants, and several quarry sites have been documented (Anthony and Roberts 1988; Custer 1996:13; Hatch 1993, 1994; Hatch and Miller 1985; King and Hatch 1997). Historically, coal and iron resources fueled later industrial development (Hatch et al. 1985:94-98). The Great Valley consists of a well-watered, broad limestone valley. The physiographic province contains a rich and varied environment with fertile river valleys attractive to historic and precontact agriculturalists (Custer 1996:14; Fenneman 1938:195; Thornbury 1965; Raber 1985:6; Hatch et al. 1985:94-98). The bedrock geology is ascribable to the Cambrian Age Allentown Formation. This formation consists of medium to medium dark gray, thick-bedded dolomite and impure limestone; and dark gray chert stringers and nodules with some orange-brown weathering calcareous siltstone at the base (Socolow 1980; Grossman-Bailey 2009). Elevations range from approximately 132 meters within the western portion of the APE to 130 meters above mean sea level (amsl) within the eastern portion of the APE (Google Earth 2022).

Three soil types are present within the project APE (Figure 3). Mapped soils include Clarksburg silt loam, 0 to 3 percent slopes (CmA); Washington silt loam, 0 to 3 percent slopes (WaA); and Washington silt loam, 3 to 8 percent slopes (WaB). Clarksburg series soils are moderately well-drained soils on upland flats. The Washington series soils consist of deep soils that are well drained on shoulders and backslopes. The underlying material, mainly a yellowish brown silt loam or silty clay loam, is glacial till or frost-churned material weathered from limestone (Carey and Yaworski 1963; U.S. Department of Agriculture, Natural Resources Conservation Service [USDA-NRCS] 2022). Washington series soils are the primary soil within the APE, and are located within the eastern, central, and western portions. A small section of Clarksburg series soils is located within the eastern portions of the APE.

Background Research

Background research for the project area included an examination of the Pennsylvania State Historic Preservation Office's (PA SHPO's) Pennsylvania's State Historic and Archaeological Resource Exchange (PA-SHARE) website, as well as an examination of aerial photographs, histories, and historic atlases and maps. No buildings appear within the APE on the 1862 Aschbach, 1865 Aschbach and Traubel, 1876 Davis, or on the 1902, 1964, and 1985 U.S. Geographic Survey (USGS) topographic maps; or the 1938, 1958, 1971, 1992, 2005, 2008, and 2019 historic aerials (Aschbach 1862; Aschbach and Traubel 1865; Davis 1876; USDA-NRCS 1938, 1958, 1971; Google Earth 1992, 2005, 2008, and 2019; U.S. Geological Survey [USGS] 1902, 1964, and 1985; Figures 4 to 8G). The nineteenth-century maps of the APE indicate that the area was agricultural in nature, with scattered structures located along Ruppsville and Cetronia roads. The 1862 and 1865 maps indicate a quarry to the south of the APE. The series of twentieth-century USGS topographic maps and historic aerials illustrate the level of development that has occurred within the area surrounding the APE. Commercial development in the area began to occur in the mid- to late 1990s. The largest impacts to the area were the construction of S.R. 0222 (Trexlertown Bypass) in 2002, south of the APE; and of Grange Park in the early twenty-first century. Upper Macungie Township purchased the area that would become Grange Park in 2002, and construction on park amenities began after 2005. Impacts related

to the construction of the park included the grading of the property and the construction of parking lots, basketball courts, and pavilions.

PA-SHARE indicates that one previously recorded archaeological site is located within the APE: Site #1 (36LH0241). The APE traverses the northern portion of Site #1 (36LH0241), a low density lithic scatter idenified by McCormick Taylor during their 1997 survey for the S.R. 0222 bypass. A total of 46 sites are located within 3.2 kilometers of the APE (Table 1). The majority of these sites are precontact (n=35), with lesser numbers of historic (n=7) and precontact/historic (n=4) sites. The sites contain Archaic to Late Woodland (n=1), Middle Archaic to Late Woodland (n=1), Late Archaic (n=13), Early to Late Woodland (n=1), and Late Woodland (n=1) components. A total of 18 of the precontact sites do not contain temporal components. The sites are classified as lithic scatters (n=18), open (n=18), procurement (n=1), or campsites (n=1) located primarily within 107 meters of water. The historic sites consist of late-eighteenth- to twentieth-century farmsteads (n=5), or commercial (n=1) and residential buildings (n=1). The majority of the historic sites contain nineteenth- to twentieth-century components, with the exception being the National Register of Historic Places-eligible (National Register-eligible) Hunsicker South site (36LH0242), which was noted to contain a late-eighteenth-century component. The four sites that contain both precontact and historic components are generally classified as open sites, with the exception of the National Register-eligible Heimnitz site (36LH0267), which contains Late Archaic lithic scatter and mid-nineteenth- to twentieth-century domestic deposits. The statewide precontact probability model analysis on PA-SHARE indicates that the majority of the APE is located within high potential areas, with smaller areas of moderate potential at the eastern and western ends. The Maxatawney Path is located approximately 1.3 kilometers to the south along Hamilton Boulevard. The Maxatawney Path, a Native Amercan path, ran from Lechawekink at the forks of the Delaware (present-day Easton) to Maiden Creek and Reading (Wallace 1998).

Table 1. Archaeological Sites within a 3.2-Kilometer Radius of the APE.

Site No.	Site Name	Temporal Period	Site Type	Topographic Setting	National Register Status	Meters to Water
36LH0003	P-2	Precontact - Archaic - Late Woodland	Flake scatter	Terrace/ floodplain	Undetermined	Adjacent
36LH0020	-	Precontact	Open	Terrace	Undetermined	Adjacent
36LH0022	-	Precontact	Open	Upland flat	Undetermined	16
36LH0039	T-1	Precontact- Middle Archaic to Late Woodland	Open	Upland flat	Undetermined	Adjacent
36LH0048	AW-6	Precontact	Open	Upland flat	Undetermined	917
36LH0119	P-1	Precontact - Late Archaic	Lithic scatter	Terrace	Undetermined	183
36LH0120	P-3	Precontact	Lithic scatter	Terrace	Undetermined	152
36LH0121	P-4	Precontact	Lithic scatter	Terrace	Undetermined	914
36LH0122	P-5	Precontact	Lithic scatter	Terrace	Undetermined	91
36LH0123	P-6	Precontact - Late Archaic, Early to Late Woodland	Campsite	Upland and floodplain	Undetermined	25
36LH0151	P-37	Precontact	Lithic scatter	Low marsh	Undetermined	Adjacent
36LH0191	Breinigsville	Precontact	Open	Upland flat	Undetermined	Adjacent
36LH0192	Trexlertown	Precontact - Late Archaic	Open	Upland flat	Undetermined	Adjacent
36LH0193	Krocksville	Precontact	Open	Hillslope	Undetermined	61
36LH0195	Grim Road	Precontact	Open	Sinkhole/ spring?	Undetermined	Adjacent

Site No.	Site Name	Temporal Period	Site Type	Topographic Setting	National Register Status	Meters to Water
36LH0200	Ancient Oaks	Precontact - Late Archaic	Open	Upland flat	Undetermined	30
36LH0208	Mosser Road 1	Precontact - Late Archaic	Open	Upland slope	Undetermined	91
36LH0209	Mosser Road 2	Precontact - Late Archaic	Procurement	Upland slope	Not eligible	91
36LH0210	Mosser Road 3	Precontact	Open	Upland slope	Undetermined	91
36LH0211	Mosser Road 4	Precontact/Historic - nineteenth century	Open	Upland slope	Undetermined	Adjacent
36LH0212	Iron Run 5	Precontact	Open	Upland slope	Not eligible	76
36LH0213	Monge	Precontact - Late Archaic	Open	Upland flat	Undetermined	91
36LH0223	Grange Road	Precontact - Late Archaic	Lithic scatter	Upland flat	Eligible	2,195
36LH0224	Tyson House	Precontact/Historic	Open	Upland flat	Undetermined	2,225
36LH0225	-	Precontact	Open	Upland slope	Undetermined	Adjacent
36LH0227	Miller/Moyer Farmstead	Historic - nineteenth century	Farmstead	Upland	Demolished	610
36LH0236	-	Precontact	Open	Upland flat	Undetermined	Adjacent
36LH0240	Krause	Historic - nineteenth to twentieth centuries	Farmstead	Upland flat	Undetermined	91
36LH0241*	Site #1	Precontact	Low density lithic scatter	Upland flat	Undetermined	427
36LH0242	Hunsicker South	Historic - late eighteenth through twentieth centuries	Farmstead	Upland flat	Eligible	152
36LH0243	Hunsicker North	Historic - nineteenth to twentieth centuries	Farmstead	Upland flat	Undetermined	122
36LH0257	Haines' Tavern/Loose Farmstead	Historic - nineteenth century	Commercial and domestic	Terrace	Undetermined	61
36LH0266	Spring Creek	Precontact	Lithic scatter	Floodplain	Undetermined	Adjacent
36LH0267	Heimnitz Property	Precontact - Late Archaic/Historic - mid-nineteenth to twentieth centuries	Domestic and precontact lithic scatter	Floodplain	Eligible	91
36LH0294	Site 1	Precontact - Late Archaic	Lithic scatter	Ridgetop	Not eligible	1,159
36LH0295	Site 2	Precontact - Late Archaic	Lithic scatter	Ridgetop	Not eligible	1,014
36LH0296	Site 3	Precontact - Late Archaic	Lithic scatter	Upland flat	Not eligible	Adjacent
36LH0297	Site 4	Precontact - Late Archaic	Lithic scatter	Ridgetop	Not eligible	402
36LH0298	Site 5	Precontact - Late Archaic	Lithic scatter	Floodplain	Not eligible	Adjacent
36LH0299	Site 6	Precontact	Lithic scatter	Upland flat	Not eligible	Adjacent
36LH0300	Site 7	Precontact - Woodland	Lithic scatter	Floodplain	Not eligible	402

Site No.	Site Name	Temporal Period	Site Type	Topographic Setting	National Register Status	Meters to Water
36LH0301	Site 8	Precontact	Lithic scatter	Floodplain	Not eligible	949
36LH0302	Site 9	Precontact - Late Archaic	Lithic scatter	Ridgetop	Undetermined	1,159
36LH0304	Schantz	Historic - mid-twentieth century	Residence	Upland	Undetermined	Adjacent
36LH0314	Heintz Farmstead	Historic - nineteenth century	Farmstead	Upland flat	Undetermined	61
36LH0360	The Iron Run Site	Precontact/Historic - nineteenth century	Open	Floodplain	Undetermined	117

Source: PA SHPO 2022
* Located within APE

PA-SHARE indicates that two previous archaeological surveys traverse or overlap the current APE (McCormick Taylor 1997; A.D. Marble 2022). The majority of the APE was previously surveyed by McCormick Taylor in 1997 during the US 222 Corridor Design Location Study, Breinigsville to the I-78 Interchange. The current project is located within Alternative E of the S.R. 0222 project, which overlaps with portions of the S.R. 0222 project surveyed by Cultural Heritage Research Services, Inc. (CHRS) in 1994, 1995, and 1997 (Basalik et al. 1994; Basalik 1994; Lewis and Basalik 1995). The areas surveyed by CHRS are located outside of the current project APE. McCormick Taylor completed surface collection and subsurface testing throughout Alternative E, and identified four new archaeological sites: 36LH0240, 36LH0241, 36LH0242, and 36LH0243. They also identified one previously identified site (36LH0122) and two potential historic sites (identified as sites B and C). All of the sites except for 36LH0242 were recommended eligible for the National Register, and were avoided by the proposed alignment (McCormick Taylor 1997).

As mentioned previously, the northern portion of site 36LH0241 was identified within the APE during a systematic surface survey by McCormick Taylor during their 1997 survey. The site was identified within a large, open agricultural field, and was noted as being relatively remote from surface water. A total of 28 precontact lithic artifacts were recovered from the surface of the site. These artifacts included chert Woodland projectile points (n=2), flakes (n=9), shatter (n=6), fire-cracked rock (FCR; n=6), flake tools (n=2), a tested chert cobble (n=1), a hammerstone (n=1), and a possible ground stone tool fragment (n=1). Three shovel test pits (STPs) were excavated along the edge of the site to explore the potential for buried deposits, but no additional cultural material was recovered. Soil profiles included an approximately 1-foot thick plowzone directly atop of subsoil. The site was classified as a low-density lithic scatter; however, the recovery of FCR suggests that it may contain subsurface precontact features, such as hearths. The design team for the S.R. 0222 project was able to shift the alignment to the south in order to avoid the site. Phase II evaluation of the site was recommended if the project was to ever impact the site (McCormick Taylor 1997:43-46).

A.D. Marble completed a survey for the original alignment of the Trexlertown Sanitary Sewer Main project in February 2022. Excavations took place within two test areas (Areas A and B) that were either previously unsurveyed or were located adjacent to the southern edge of 36LH0241. Area A was located within Grange Park, while Area B was located near the LCA Pretreatment Plant near S.R. 0100. Site 36LH0241 was located approximately 1.5 meters to the north of the alignment. A total of 20 STPs were excavated at a 15-meter interval, and six STPs adjacent to 36LH0241 were excavated at a 5-meter interval. Excavations identified a severely disturbed landscape within the APE with compacted fill atop of a truncated subsoil, a result of grading activities for the construction of the park and pretreatment facility. Testing recovered one chert tertiary flake from fill material near 36LH0241. No other precontact or historic artifacts were recovered during the Phase I survey. This flake was likely re-deposited within the APE during construction/grading activities, and did not represent an intact archaeological resource. No additional archaeology was recommended for the APE of the original alignment (A.D. Marble 2022). PA SHPO concurred with the results and recommendations of the negative survey form within a letter dated March 21, 2022 (Diehl and Hanson 2022; Attachment 1).

Field Methodology

Phase I archaeological fieldwork began with a pedestrian reconnaissance survey of the APE. Subsurface testing was limited to areas of the APE that were not tested during previous archaeological surveys and that were located within site 36LH0241. Areas of standing water, slopes over 15 percent, or areas of obvious disturbance were not tested during the survey. Subsurface testing consisted of the hand excavation of 57-centimeter diameter STPs to investigate original, intact sediments or archaeological deposits. Twenty-five STPs were excavated at 15-meter intervals within Areas C, D, and E. Excavation of STPs within 36LH0241 began at a 5-meter interval; however, the interval was extended to 15 meters due to the level of disturbance present within the first STP. Test area and STP designations were continued from the February 2022 survey, beginning with the Area C test area and STP designation 27.

Soils from the STPs were excavated according to recognizable natural strata, extending at least 10 centimeters into sterile subsoil to a maximum depth of 1 meter, or to shallower depths as warranted. All excavated sediments were screened through 0.25-inch mesh hardware cloth in order to recover any artifacts that were present. Information regarding the soil texture and color, depth of any cultural materials recovered, and any soil disturbance was recorded on standard electronic excavation forms. Daily field notes and excavation information were kept by the field director. The archaeological investigations were documented via digital color photography.

Lab Methodology

No artifacts were recovered from the APE during the current survey.

Results

Phase I Archaeological Survey Results

Phase I archaeological subsurface testing was completed on April 15, 2022. Phase I excavations were limited to the eastern portion of the APE (Area C), near site 36LH0241 (Area D), and within a small previously unsurveyed portion of the APE near where the new alignment meets the original alignment (Area E). Areas of the APE noted to have been previously surveyed for archaeological resources were not tested during the survey. The APE measures 0.36 hectare (0.9 ac), with 0.12 hectare (0.3 ac) previously surveyed, and 0.24 hectare (0.09 ac) testable. Testing involved the excavation of 25 STPs (Figure 9). Figure 9 also displays the test areas and previously excavated STP locations for the February 2022 survey. No precontact or historic artifacts were recovered during the survey. No subsurface historic or precontact features were identified within the APE during the survey. STP and photograph locations are depicted on Figure 9. Representative soil profiles are depicted on Figure 10.

Area C

Testing of the 0.12-ha (0.32-ac) area within Grange Park at the eastern end of the APE consisted of 14 STPs excavated at a 15-meter interval (STPs 33 to 46; Figure 9). The test area consists of a relatively flat, open area of maintained lawn extending from an existing manhole to the southern edge of a paved parking lot (Photographs 1 to 3). STP soil profiles within the test area consist primarily of a 10- to 55-centimeter thick 10YR 6/8 heavily compacted clay loam fill (Fill I) atop a truncated 7.5YR 5/6 clay loam subsoil (B-horizon; Figure 10). A second fill layer (Fill II) was identified below the Fill I within STP 39, and consisted of a 10YR 5/6 mottled with a 7.5YR 5/8 clay loam atop of subsoil. Historic aerials show this area as agricultural land until the the early twenty-first century, when it was graded for construction of Grange Park (Figures 8A to 8G). The 2005 and 2008 aerials clearly show the grading that occurred within Area C (Figures 8E and 8F). No historic or precontact artifacts were recovered during Phase I testing of the test area.

Area D

Testing of the 0.06-ha (0.14-ac) area within the northern portion of 36LH0241 consisted of six STPs excavated at a 15-meter interval (STPs 27 to 32; Figure 9). The APE follows the edge of two large, paved parking lots and contains open, maintained lawn bordering a recreational field (Photograph 4). The recreational fields present just south of the APE, and also containing site 36LH0241, have been heavily graded in order to create a level playing

surface. STP soil profiles within the test area consist of a 17- to 44-centimeter thick 10YR 6/8 heavily compacted clay loam fill layer directly atop a truncated 7.5YR 5/6 clay loam subsoil (B-horizon; Figure 10). All soils within the test area are heavily compacted and contain sharp breaks between layers, indicating past grading activity. McCormick Taylor identified a plowzone atop of subsoil in this area during their 1997 survey; this plowzone now appears to be gone, replaced by a compacted fill layer. No historic or precontact artifacts were recovered during Phase I testing of the test area.

Area E

Five STPs (STPs 47 to 51) were excavated within the 0.06-ha (0.14-ac) previously unsurveyed western portion of the APE at a 15-meter interval (Figure 9). This area is an open, maintained lawn area located adjacent to the southern edge of a large, paved parking lot. The STP soil profile for the test area consists of multiple layers of compacted fill directly atop of truncated subsoil. Profiles consist of a 10YR 6/8 heavily compacted clay loam fill layer directly atop a truncated 7.5YR 5/6 clay loam subsoil (B-horizon; Figure 10). As with the previous two test areas, all soils within the test area are heavily compacted and contain sharp breaks between layers, indicating past grading activity. No historic or precontact artifacts were recovered during Phase I testing of the test area.

Conclusions and Recommendations

Phase I investigations were conducted within areas of the Grange Park Realignment APE within the northern portion of 36LH0241 (Area D) and within portions of two open fields (Areas A and E) that were previously unsurveyed for archaeological resources. Consistent with the results from the February 2022 A.D. Marble survey, all three areas have been severely disturbed as a result of the construction of Grange Park in the early twenty-first century (A.D. Marble 2022). The statewide precontact probability model on PA-SHARE classifies the majority of the APE as having a moderate to high probability for precontact archaeological resources; unfortunately, twenty-first century development has significantly modified the upland landforms within and surrounding the APE. All of the test areas contain heavily compacted fill layers atop of a truncated subsoil, which is undoubtably a result of grading activities for the construction of the park. Given the amount of disturbance noted within the APE just south of site 36LH0241 (noted during the February 2022 survey) and within the northern portion of the site, it appears likely the site was destroyed during construction of a recreational field for the park. No precontact or historic artifacts or features were identified during Phase I testing. No additional archaeology is recommended for the APE as currently designed.

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7. Statewide Pre-Contact Probability Model Analysis: (Use the model from CRGIS to determine portions of the project area that were located within each sensitivity tier and list all testing methods used within each tier. If more than one method was used, estimate the percentage of the tier tested by each method. In the Sites Located section, include Isolated Finds for which a number is assigned.)

Sensitivity Tier	Area within this Tier	Percent of Total Project Area	Method(s) Used to test this tier (Use list from 5 above. Include % if multiple.)	Number of Sites Located
High	3,434 sq. m.	85 %	STP and pedestrian survey	0
Moderate	605 sq. m.	15 %	STP and pedestrian survey	0
Low	0 sq. m.	0 %	N/A	0

8. Required Attachments:

☒ 7.5' USGS Quadrangle Map delineating APE / Project Area
☒ Project map showing testing strategy(ies)
☒ Testing strategy justification / predictive model
☒ Supporting photographs with descriptions of view and view direction
☒ Engineering / Project Plans if prepared
☐ Geomorphological Report if prepared
☒ Representative excavation profiles and descriptions

List all other attachments to this Negative Survey Form:

Attachment Type
Figures: Figure 1. Project Location Map Figure 2. Project Plan Figure 3: Soils Map Figure 4. 1862 Map of Lehigh County Figure 5. 1865 Map of Lehigh County Figure 6. 1876 Map of Upper Macungie Township Figure 7A. 1902 Twentieth-Century USGS Map of the Project Area Figure 7B. 1964 Twentieth-Century USGS Map of the Project Area Figure 7C. 1999 Twentieth-Century USGS Map of the Project Area Figure 8A. 1938 Aerial of the Project Area Figure 8B. 1958 Aerial of the Project Area Figure 8C. 1971 Aerial of the Project Area Figure 8D. 1992 Aerial of the Project Area Figure 8E. 2005 Aerial of the Project Area Figure 8F. 2008 Aerial of the Project Area Figure 8G. 2019 Aerial of the Project Area Figure 9. Archaeological Field Map Figure 10. Representative Shovel Test Pit Profiles **Photographs:** Photograph 1: View of Area C from the eastern end of the Grange Park Realignment APE, showing where it will connect to the existing sewer line. Facing northwest. Photograph 2: View of Area C in the Grange Park Realignment APE, showing current conditions. Facing southwest.

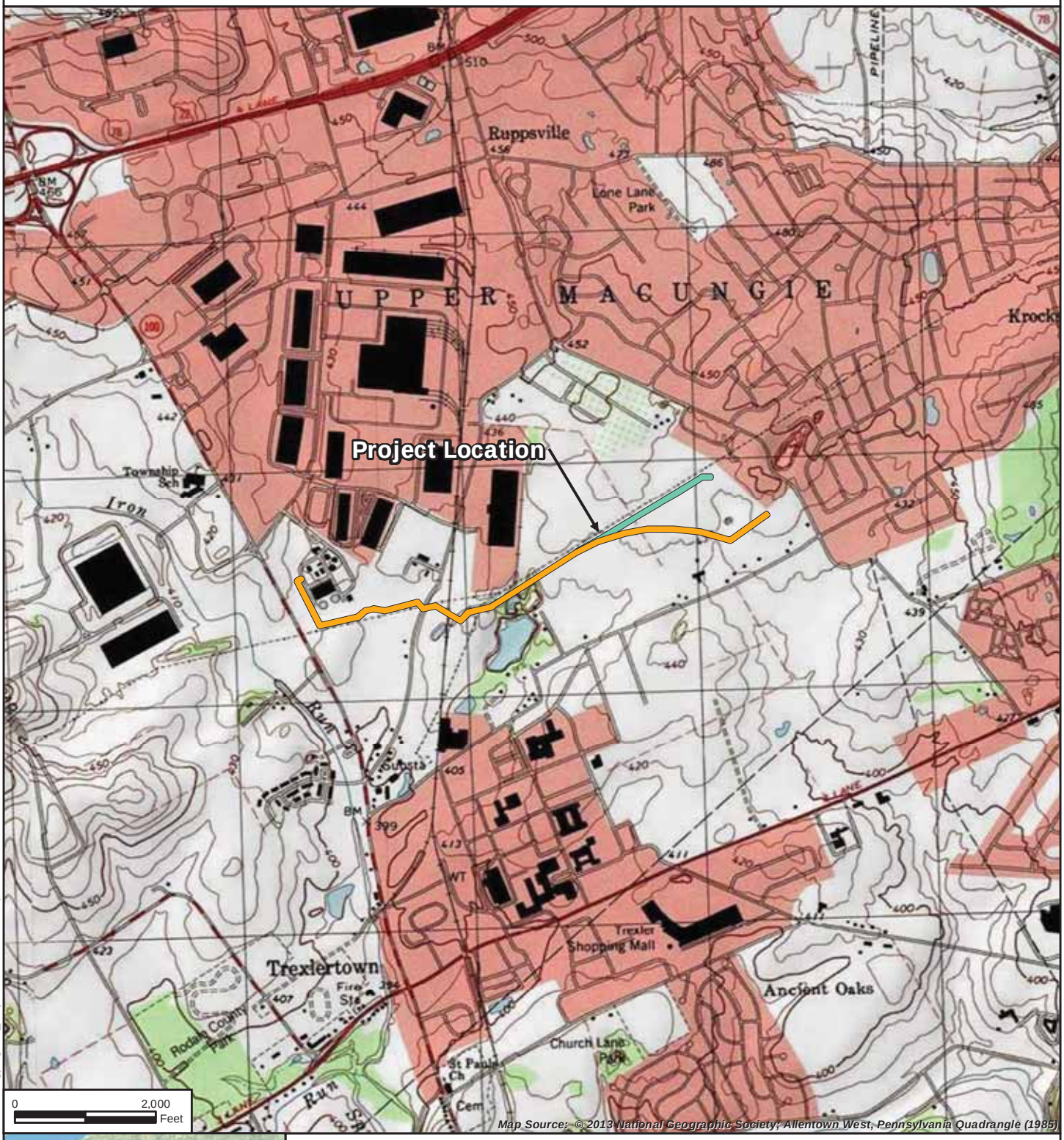
Photograph 3:	View of Area C from the western end of the test area in the Grange Park Realignment APE, showing current conditions. Facing northeast.
Photograph 4:	View of Area D in the Grange Park Realignment APE, showing the northern area of Site #1 (36LH0241) tested during the survey. Facing northeast.
Photograph 5:	View of Area E in the Grange Park Realignment APE, showing current conditions. Facing southwest.

Attachment 1: PA SHPO Concurrence Letter for the Trexlertown Sanitary Sewer Main Project

Figures

Figure 1
Project Location Map

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania



Site Coordinates: 40.564719, -75.596660

Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

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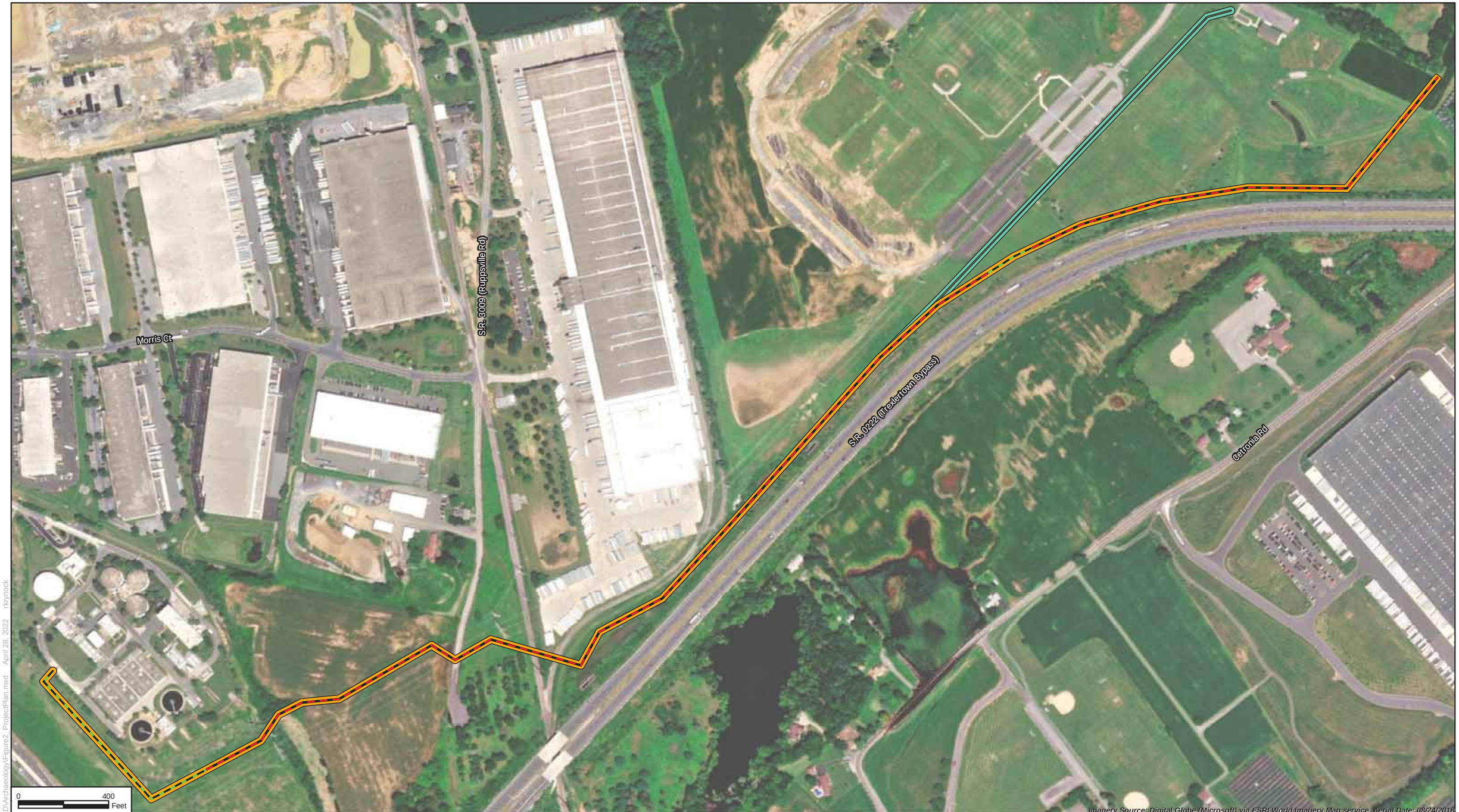

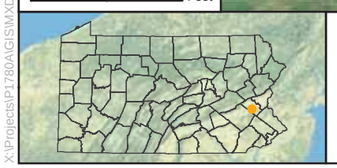

Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Previously Surveyed Portions of the Corridor

Proposed Force Main Corridor

Figure 2
Project Plan

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

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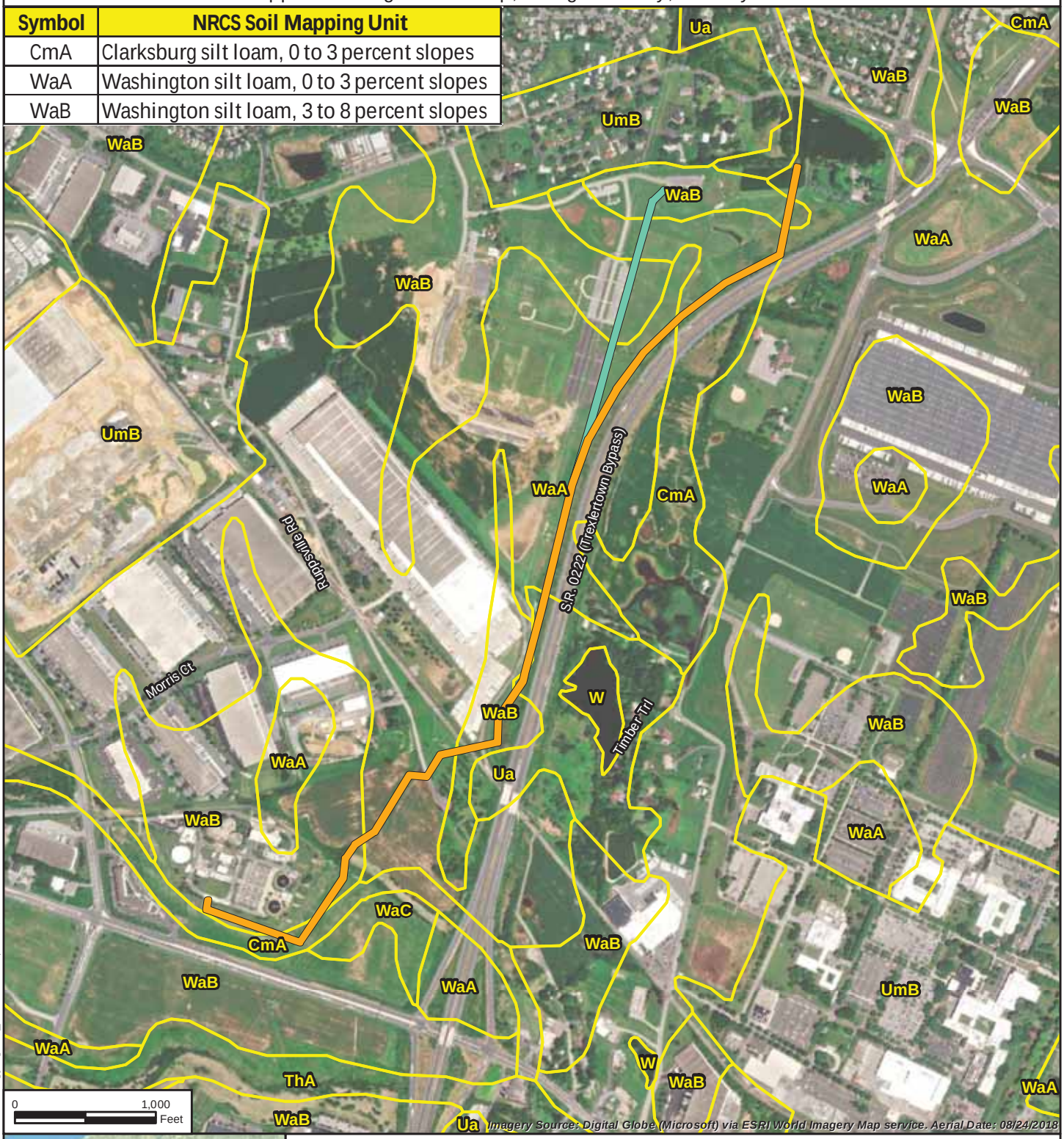
Figure 3
Soils Map

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

Symbol	NRCS Soil Mapping Unit
CmA	Clarksburg silt loam, 0 to 3 percent slopes
WaA	Washington silt loam, 0 to 3 percent slopes
WaB	Washington silt loam, 3 to 8 percent slopes



Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Lehigh County Soils

Data Source: USDA Lehigh County Soils 2020

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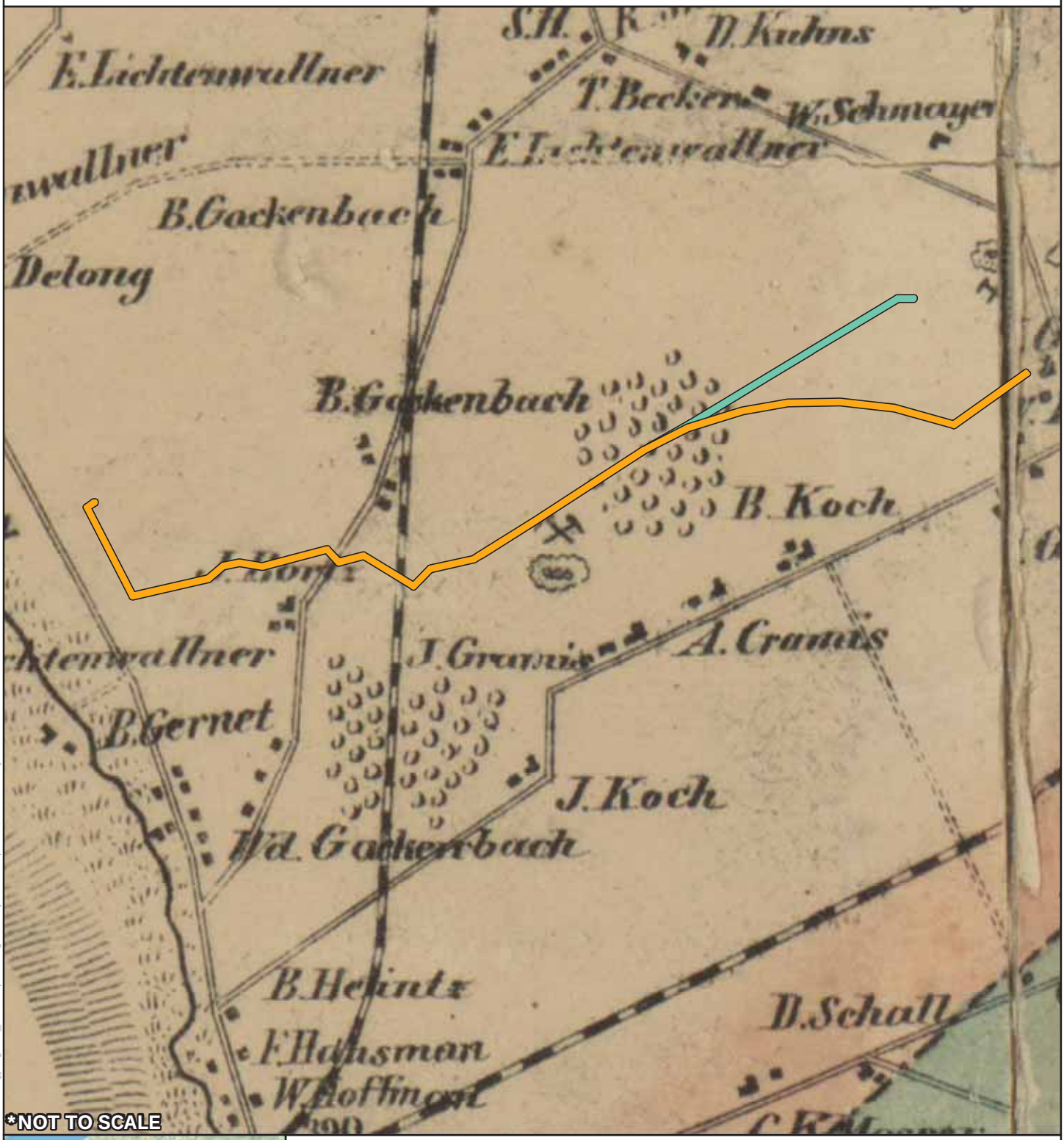
Figure 4
1862 Map of Lehigh County
Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania



Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: Aschbach 1862

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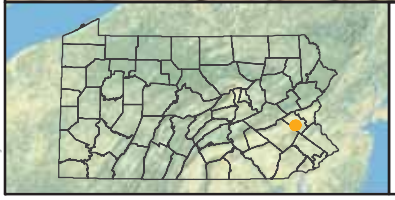
Figure 5
1865 Map of Lehigh County
Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

*NOT TO SCALE



Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: Aschbach and Traubel 1865

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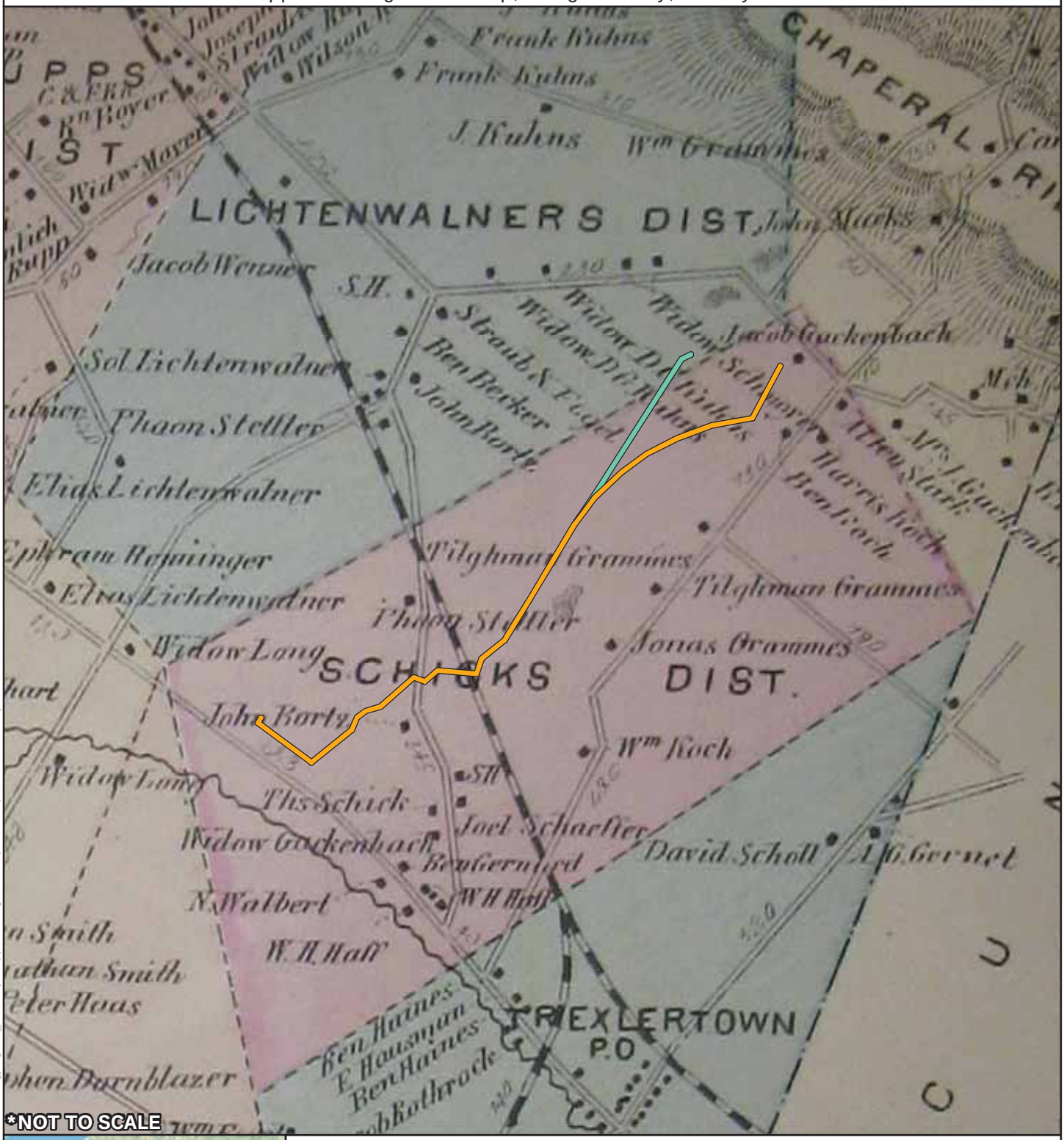
Figure 6
1876 Map of Upper Macungie Township

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania



Data Source: Davis 1876

X:\Projects\P1780\AG\SMXD\Archaeology\Figure6_1876MapOfUpperMacungieTownship.mxd April 28, 2022 rkrynock

Figure 7A
1902 Twentieth-Century USGS Map of the Project Area
Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: USGS 1902

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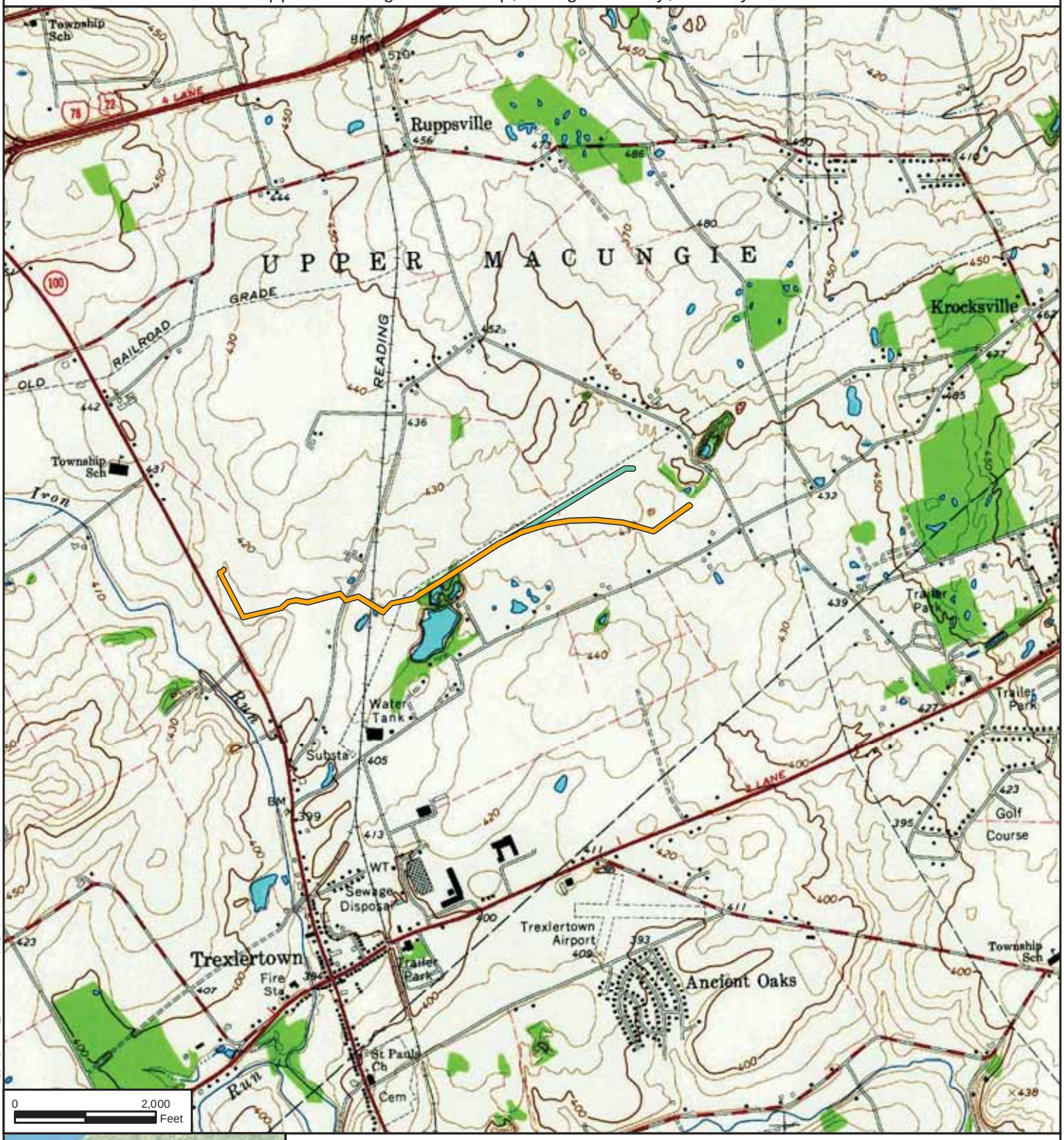
Figure 7B
1964 Twentieth-Century USGS Map of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania



Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: USGS 1964

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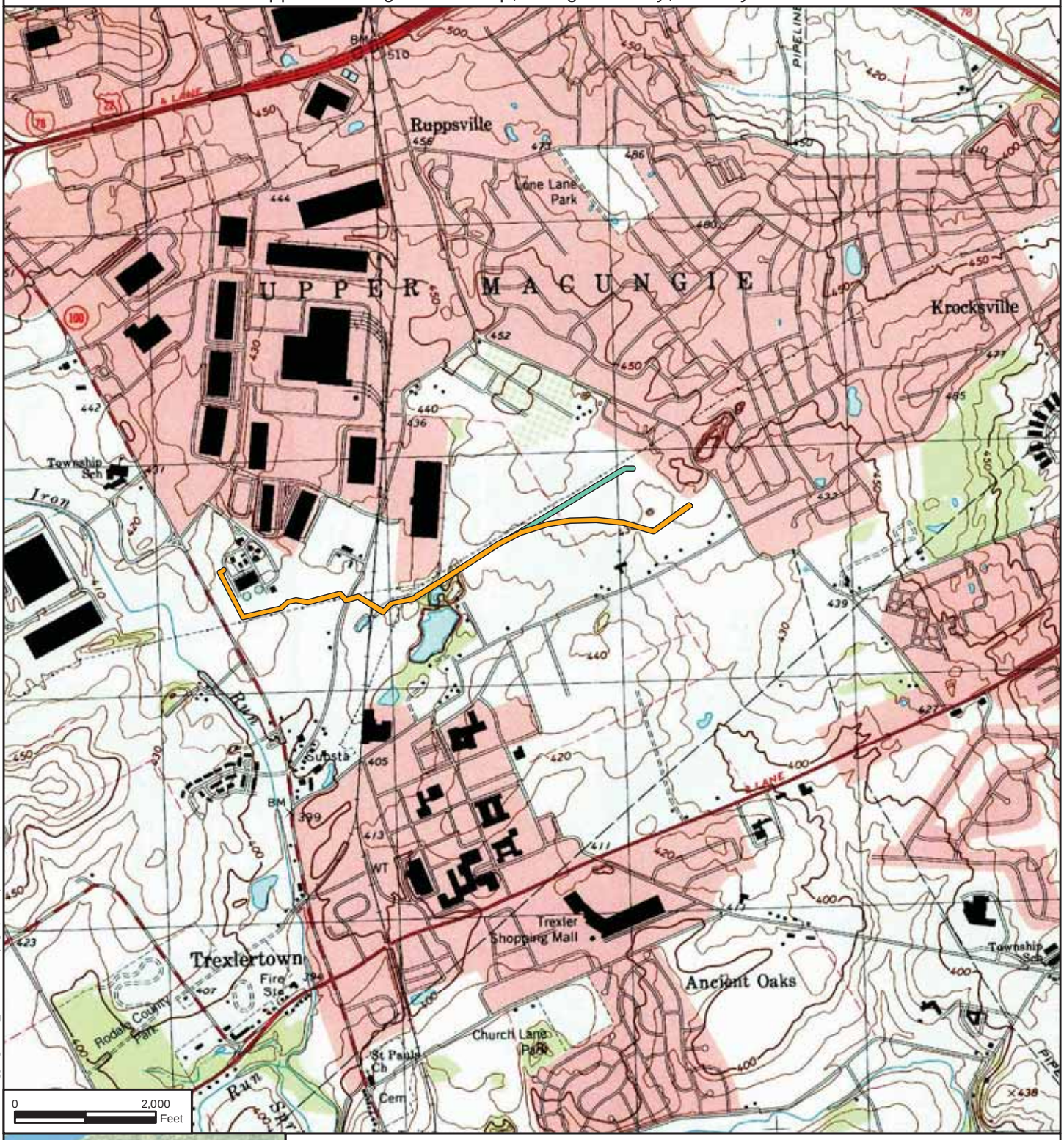
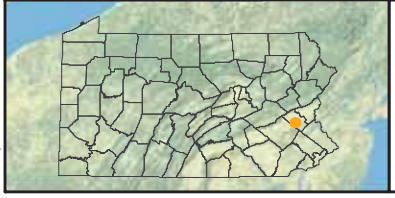
Figure 7C
1999 Twentieth-Century USGS Map of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania





Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: USGS 1999

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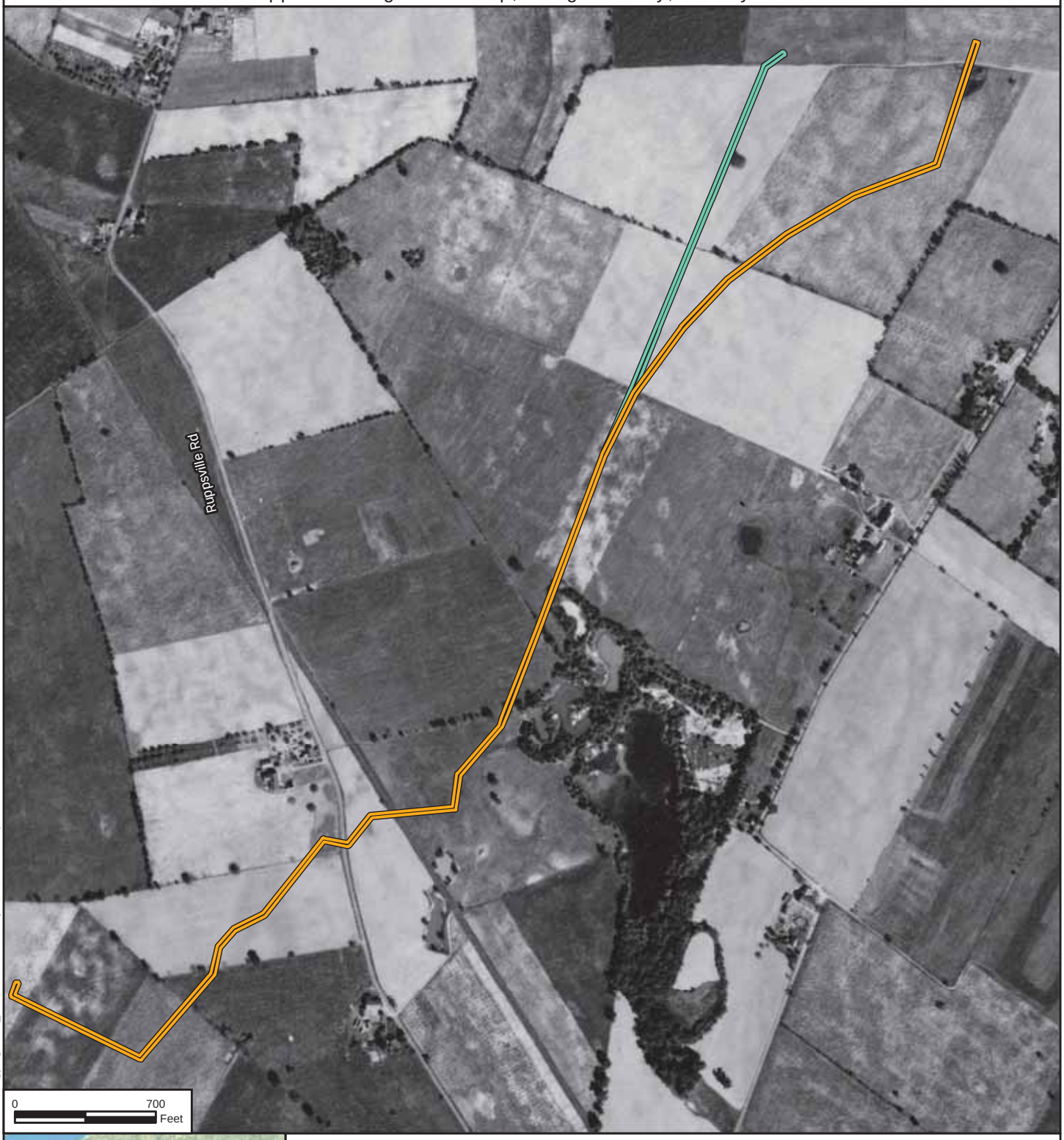
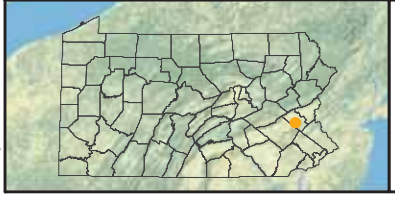
Figure 8A
1938 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania





Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: USDA-NRCS 1938

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Figure 8B
1958 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: USDA-NRCS 1958

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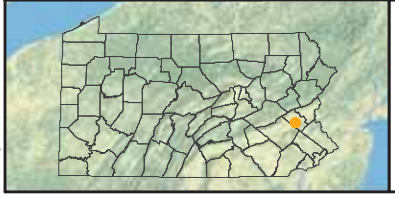
Figure 8C
1971 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania



Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: USDA-NRCS 1971

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Figure 8D
1992 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: Google Earth 1992

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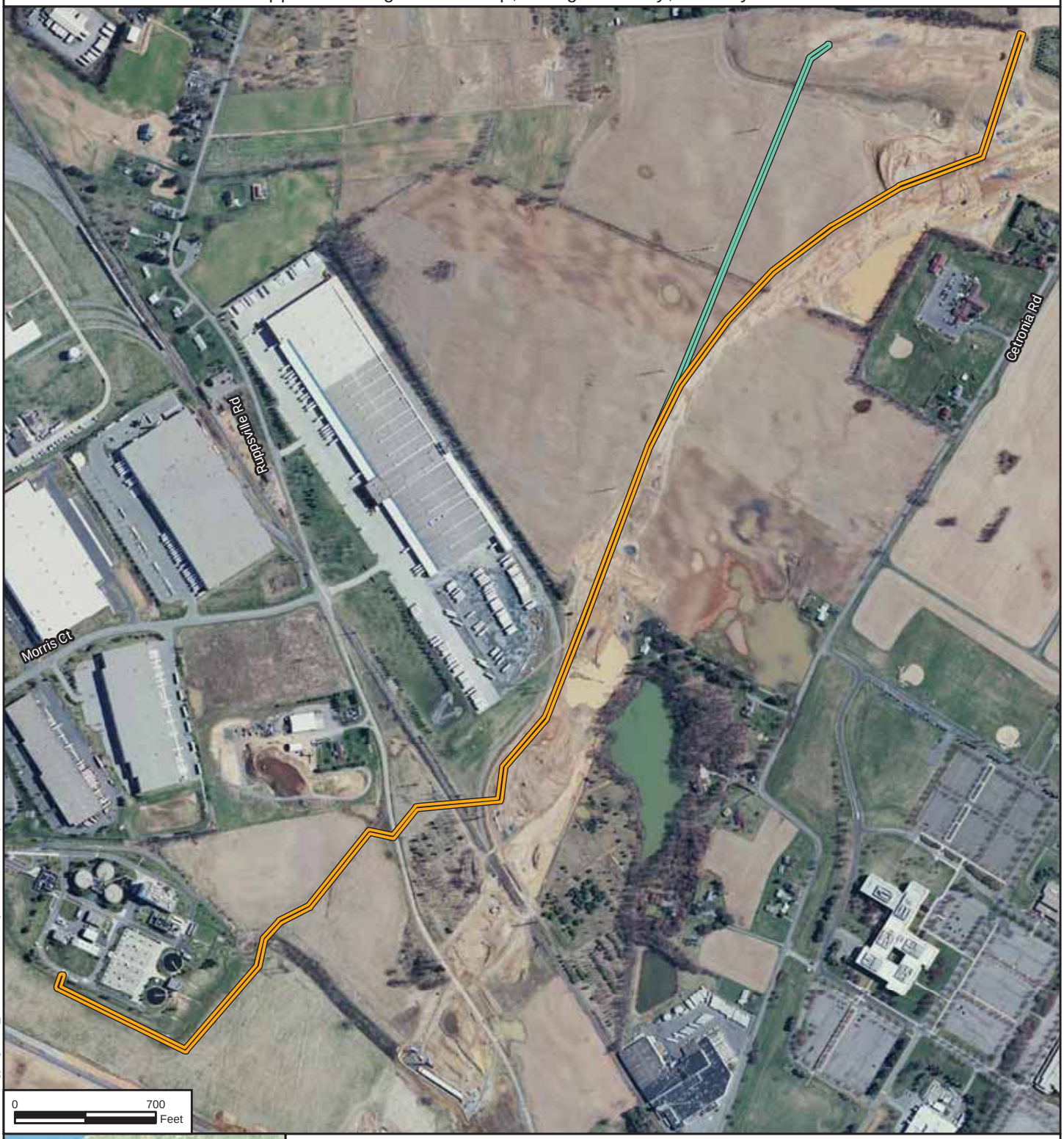
Figure 8E
2005 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania



Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: PA DCNR 2005

X:\Projects\P1780\AGIS\MXD\Archaeology\Figure8E_2005AerialOfTheProjectArea.mxd April 27, 2022 eturkovich

Figure 8F
2008 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: PA DCNR 2008

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Figure 8G
2019 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

Trexlertown Sanitary Sewer Main Alignment APE (February 2022)

Grange Park Realignment APE (April 2022)

Data Source: PA DCNR 2019

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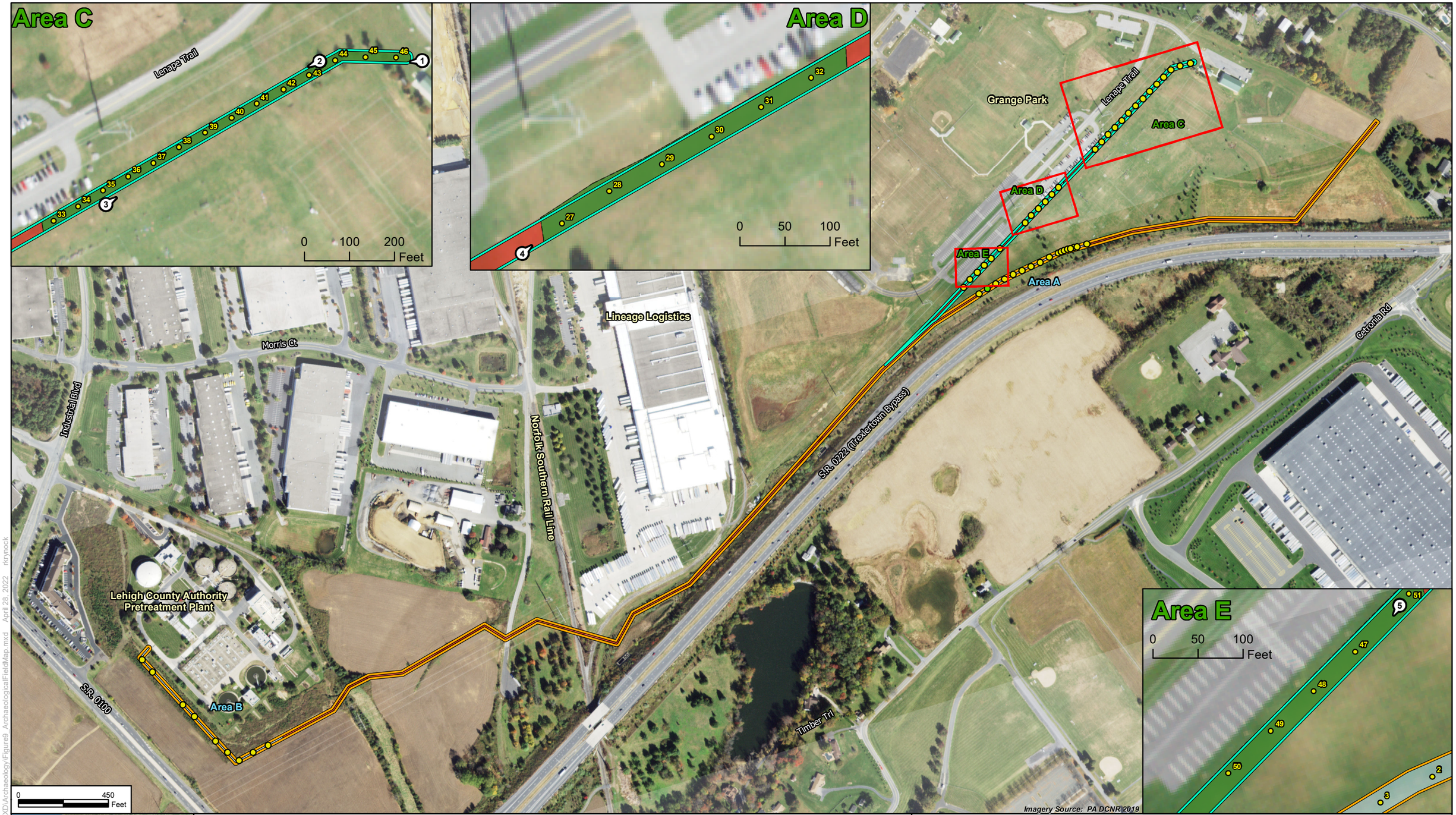

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Excavated Shovel Test Pit
Shovel Test Pit Positive for Precontact Artifact
Grange Park Realignment APE (April 2022)
Trexlertown Sanitary Sewer Main Alignment APE (February 2022)
Previously Surveyed Areas
Test Area (February 2022)
Test Area (April 2022)
Photograph Locations

Figure 9
Archaeological Field Map
Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main – Grange Park Realignment
Upper Macungie Township, Lehigh County, Pennsylvania

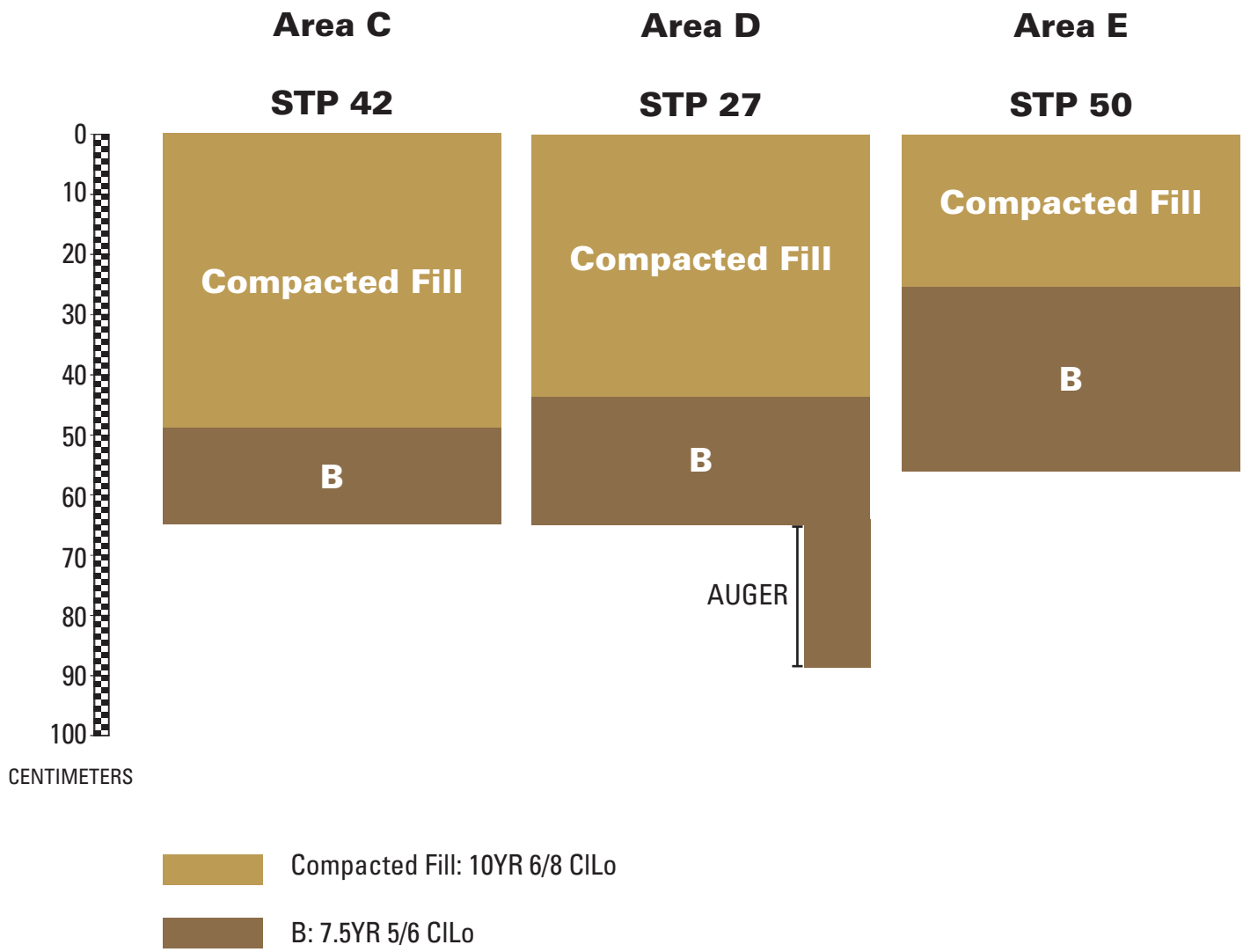

Figure 10
Representative Shovel Test Pit Profiles
Lehigh County Authority Trexlertown Special Study, Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

Photographs

Photograph 1: View of Area C from the eastern end of the Grange Park Realignment APE, showing where it will connect to the existing sewer line. Facing northwest (April 2022).

Photograph 2: View of Area C in the Grange Park Realignment APE, showing current conditions. Facing southwest (April 2022).

Photograph 3: View of Area C from the western end of the test area in the Grange Park Realignment APE, showing current conditions. Facing northeast (April 2022).

Photograph 4: View of Area D in the Grange Park Realignment APE, showing the northern area of Site #1 (36LH0241) tested during the survey. Facing northeast (April 2022).

Photograph 5: View of Area E in the Grange Park Realignment APE, showing current conditions. Facing southwest (April 2022).

Attachment 1: PA SHPO Concurrence Letter for the Trexlertown Sanitary Sewer Main Project

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

March 21, 2022

Michael Schober
ARRO Consulting Inc.
108 West Airport Road
Lititz PA 17543000

RE: ER Project # 2021PR06757.002, Trexlertown Sanitary Sewer Main, Department of Environmental Protection

Dear Michael Schober:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Archaeological Resources
No Archaeological Concerns - Environmental Review - Negative Survey Report/Negative Survey Form

This report meets our standards and specifications as outlined in Guidelines for Archaeological Investigations in Pennsylvania (SHPO 2021) and the Secretary of the Interior's Guidelines for Archaeological Documentation. We agree with the recommendations of this report, and in our opinion, no further archaeological work is necessary for this project. If project plans should change and/or you should be made aware of historic property concerns, please reinitiate consultation with our office using PA-SHARE.

For questions concerning archaeological resources, please contact Casey Hanson at chanson@pa.gov.

Sincerely,

Emma Diehl
Environmental Review Division Manager

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

March 21, 2022

Michael Schober
ARRO Consulting Inc.
108 West Airport Road
Lititz PA 17543000

RE: ER Project # 2021PR06757.002, Trexlertown Sanitary Sewer Main, Department of Environmental Protection

Dear Michael Schober:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

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Emma Diehl
Environmental Review Division Manager

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

Negative Survey Form

(This form may be used if the Phase I guidelines have been followed and no cultural resources have been identified.)

1. Project Identification:

Project Number: 2021PR06757

Project Name &/or Agency Tracking #: Lehigh County Authority Trexlertown Special Study, Trexlertown Sanitary Sewer Main, Upper Macungie Township, Lehigh County, Pennsylvania

Agency: Pennsylvania Department of Environmental Protection **Applicant:** Lehigh County Authority

Preparers Name and affiliation: Frank G. Mikolic III, Principal Investigator, A.D. Marble

Date Prepared: 2/22/22

Project Area County/Municipality (list all)

County	Municipality
Lehigh	Upper Macungie Township

2. Project Setting: (check all that apply)

☒ urban/suburban; ☐ rural
☒ upland; ☐ floodplain/terrace (☐active; ☐stable terrace)

7.5" USGS Quadrangle(s) Name (list all):

Name	Date
Allentown West	1985

Physiographic Zone(s)(list All. Use DCNR Map 13 compiled by W.D. Sevon, Fourth Edition, 2000.):

Physiographic Zone
Ridge and Valley - Great Valley Section

Project Area Drainage(s), (list all) (Sub-basin and Watershed can be obtained from CRGIS):

Sub-basin	Watershed	Major Stream	Minor Stream
2 Central Delaware	C	Lehigh River	Iron Run

3. Basic Field Conditions:

(Text fields will expand as needed. Please be complete)

Area of APE / Project Area in hectares: 1.4 Hectares tested: 0.3

General Description of APE / Project Area:

The proposed project's Area of Potential Effects (APE) is located within the southeast corner of Upper Macungie Township in southern Lehigh County, Pennsylvania (Figure 1). The project area is located on an upland landform, roughly paralleling the southbound lanes of S.R. 0222 (Trexlertown Bypass) between Grange Road to the east and S.R. 0100 to the west. S.R. 3009 (Ruppsville Road) traverses northeast to southwest through the western portion of the project area. A Norfolk Southern rail line runs just to the east of Ruppsville Road and through the APE in this same section. The APE also crosses a rail spur line leading to/from the Lineage Logistics facility at 7132 Ruppsville Road. The western portion of the current project alignment overlaps an area previously surveyed by Richard Grubb and Associates (RGA) in 2009 for the proposed Iron Run Force Main Project. This previously surveyed area extends from the southern portion of the Lineage Logistics facility at 7132 Ruppsville Road west to the Lehigh County

Authority (LCA) Pretreatment Plant at 7676 Industrial Boulevard. The majority of the remaining APE was previously surveyed by McCormick Taylor in 1997 during the US 222 Corridor Design Location Study.

The archaeological APE measures approximately 1.4 hectare (3.54 ac), consisting of a 7,781-linear foot alignment measuring 20 feet in width. The APE will connect to an existing sewer line located approximately 560 feet southwest of Grange Road (Photograph 1). The alignment then traverses southwest through Upper Macungie Township's Grange Park, past the southern Lineage Logistics facility at 7132 Ruppsville Road between the rail spur line and S.R. 0222 (Trexlertown Bypass; Photographs 2 to 5). A large stormwater basin is present adjacent to the APE in this area (Photograph 6). An incised drainage ditch parallels the S.R. 0222 roadway, and a large earthen berm is located adjacent to the ditch within Grange Park (Photographs 6 and 7). The APE then follows a rail spur rail line, crosses the Norfolk Southern rail line and Ruppsville Road, continues southwest through two large fallow fields, and runs along the southern and western boundaries of the LCA Pretreatment Plant at 7676 Industrial Boulevard (Photographs 8 to 10). The proposed line then runs northwest and into the treatment plant. An eroded drainage ditch is present along the western boundary of the plant (Photograph 11). The area surrounding the APE is relatively developed, and is surrounded by commercial warehouses and residential developments.

Type of Proposed Project/Impact: Per the Pennsylvania Department of Environmental Protection-approved (PADEP-approved) Interim 537 Plan, action is regulatory and required to alleviate the current sanitary sewer interceptor system bottleneck in the Trexlertown area. The specific solution had not yet been clearly identified when the Interim 537 Plan was being prepared. Now that further engineering and modeling analysis is completed, a working solution has been identified for the project. Since the Interim 537 Plan did not identify the solution, a Special Act 537 Study (which this survey is part of) is required in order to permit this project. Construction is expected to be completed by early 2025.

The proposed project involves the construction of a 2.5 million-gallon per day (MGD) pump station at the LCA Pretreatment Plant (downstream of the effluent). An approximately 1.5-mile force main (18 inches in width) will be installed from the pump station to an Upper Macungie Township manhole in the Grange Park area (Figure 2). The easement will measure 20 feet in width, and the line will be installed at least 4 feet below ground surface. This diverted flow will enter the Upper Macungie Township's interceptor at this manhole, which ultimately will flow into the LCA Spring Creek Pump Station.

Date of field investigation(s): January 26 to 28, 2022

Description of Field Conditions including percentage of surface visibility: Weather conditions at the time of the survey were partly cloudy, with no precipitation. Ground visibility was zero throughout the APE under shrubs, grasses, and brush.

4. Previously Recorded Archaeological Sites within APE / Project Area and not relocated by this project:

PASS Site Number	Reason not re-located
N/A	N/A

5. Survey Methodology: (check all that apply to the entire project; attach any supporting documents)

☒ PASS file Research ☐ Contacted Local Historical Association/Commission/Park/Etc.
☐ Informant Data ☒ Historic Records/Maps/Photos ☒ SCS Soil Maps
☐ Surface Survey ☐ Geomorphological Borings ☒ STPs
☐ Test Units ☐ Geomorphological Trenches ☐ Remote Sensing
Other: _____

Professional Geomorphologist was ☐ Present or ☒ Not Present During Field Investigations

Name: _____ Affiliation: _____

Formal Geomorphological Report Prepared: ☐ Yes ☒ No

6. Results: (Describe both the design and the results of every methodology checked in **5.** Include the size and condition of the area tested by each.)

Environmental Context

The project area is located within the Great Valley Section of the Ridge and Valley Physiographic Province (Pennsylvania Department of Conservation and Natural Resources [PADCNR] 2002). This region is characterized by fairly steep upland topography with rugged terrain and exposed bedrock (Custer 1996:12). High-grade quartzite and jasper available from the Hardyston Formation of this region were favored by the precontact occupants, and several quarry sites have been documented (Anthony and Roberts 1988; Custer 1996:13; Hatch 1993, 1994; Hatch and Miller 1985; King and Hatch 1997). Historically, coal and iron resources fueled later industrial development (Hatch et al. 1985:94-98). The Great Valley consists of a well-watered, broad limestone valley. The physiographic province contains a rich and varied environment with fertile river valleys attractive to historic and precontact agriculturalists (Custer 1996:14; Fenneman 1938:195; Thornbury 1965; Raber 1985:6; Hatch et al. 1985:94-98). The bedrock geology is ascribable to the Cambrian Age Allentown Formation. This formation consists of medium to medium dark gray, thick-bedded dolomite and impure limestone; and dark gray chert stringers and nodules with some orange-brown weathering calcareous siltstone at the base (Socolow 1980; Grossman-Bailey 2009). Elevations range from approximately 125 meters within the western portion of the APE to 130 meters above mean sea level (amsl) within the eastern portion of the APE (Google Earth 2022).

Four soil types are present within the project APE (Figure 3). Mapped soils include Clarksburg silt loam, 0 to 3 percent slopes (CmA); Udorthents (Ua); Washington silt loam, 0 to 3 percent slopes (WaA); and Washington silt loam, 3 to 8 percent slopes (WaB). Clarksburg series soils are moderately well-drained soils on upland flats. Udorthents soils consist of moderately well-drained, man-made and altered materials from mixed rock types located on valleys, ridges, and hills. The Washington series soils consist of deep soils that are well drained on shoulders and backslopes. The underlying material, mainly a yellowish brown silt loam or silty clay loam, is glacial till or frost-churned material weathered from limestone (Carey and Yaworski 1963; U.S. Department of Agricultural, Natural Resources Conservation Service [USDA-NRCS] 2022). Clarksburg series soils are located within the eastern and western portions of the APE, Udorthents are located within the center of the APE, and Washington soils are located within the eastern, western, and central portions of the APE.

Background Research

Background research for the project area included an examination of the Pennsylvania State Historic Preservation Office's (PA SHPO's) Pennsylvania's State Historic and Archaeological Resource Exchange (PA-SHARE) website, as well as an examination of aerial photographs, histories, and historic atlases and maps. No buildings appear within the APE on the 1862 Aschbach, 1865 Aschbach and Traubel, 1876 Davis, or on the 1902, 1964, and 1985 U.S. Geographic Survey (USGS) topographic maps; or the 1938, 1958, 1971, 1992, 2005, 2008, and 2019 historic aerials (Aschbach 1862; Aschbach and Traubel 1865; Davis 1876; USDA-NRCS 1938, 1958, 1971; Google Earth 1992, 2005, 2008, and 2019; U.S. Geological Survey [USGS] 1902, 1964 and 1985; Figures 4 to 8G). The nineteenth-century maps of the APE indicate that the area was agricultural in nature, with scattered structures located along Ruppsville and Cetronia roads. The 1862 and 1865 maps indicate a quarry to the south of the APE. The series of twentieth-century USGS topographic maps and historic aerials illustrate the level of development that has occurred within the area surrounding the APE. Commercial development in the area began to occur in the mid- to late 1990s, which included the construction of the Lineage Logistics facility at 7132 Ruppsville Road adjacent to the APE. The largest impacts to the area were the construction of S.R. 0222 (Trexlertown Bypass) in 2002 and of Grange Park in the early twenty-first century. The S.R. 0222 (Trexlertown Bypass) project involved earth moving and the placement of more than 1 million cubic yards of earthen fill at the interchange area near Breinigsville and a replacement wetland area near Trexlertown Road and Spring Creek Road (PA Highways 2020). Upper Macungie Township purchased the area that would become Grange Park in 2002, and construction on park amenities began after 2005. Impacts related to the construction of the park included the grading of the property and the construction of parking lots, basketball courts, and pavilions.

PA-SHARE indicates that there are no recorded archaeological sites within the APE; however, 46 sites are located within 3.2 kilometers (2 mi) of the APE (Table 1). The majority of these sites are precontact (n=35), with lesser

numbers of historic (n=7) and precontact/historic (n=4) sites. The sites contain Archaic to Late Woodland (n=1), Middle Archaic to Late Woodland (n=1), Late Archaic (n=13), Early to Late Woodland (n=1) and Late Woodland (n=1) components. A total of 18 of the precontact sites do not contain temporal components. The sites are classified as lithic scatters (n=18), open (n=15), procurement (n=1), or campsites (n=1) located primarily within 107 meters (350 ft) of water. The historic sites consist of late-eighteenth- to twentieth-century farmsteads (n=5) or commercial (n=1) and residential buildings (n=1). The majority of the historic sites contain nineteenth- to twentieth-century components, with the exception being the National Register of Historic Places-eligible (National Register-eligible) Hunsicker South site (36LH0242), which was noted to contain a late-eighteenth-century component. The four sites that contain both precontact and historic components are generally classified as open sites, with the exception of the National Register-eligible Heimnitz site (36LH0267), which contains Late Archaic lithic scatter and mid-nineteenth- to twentieth-century domestic deposits. The statewide precontact probability model analysis on PA-SHARE indicates that the majority of the APE is located within moderate and high potential areas. Site #1 (36LH0241), a low density lithic scatter idenified by McCormick Taylor during their 1997 survey for the S.R. 0222 bypass, is located approximately 1.5 meters (5 ft) to the north of the APE. The Maxatawney Path is located approximately 1.1 kilometers (0.7 mi) to the south along Hamilton Boulevard. The Maxatawney Path, a Native Amercan path, ran from Lechawekink at the forks of the Delaware (present-day Easton) to Maiden Creek and Reading (Wallace 1998).

Table 1. Archaeological Sites within a 3.2-Kilometer (2-Mi) Radius of the APE.

Site No.	Site Name	Temporal Period	Site Type	Topographic Setting	National Register Status	Meters to Water
36LH0003	P-2	Precontact – Archaic - Late Woodland	Flake scatter	Terrace/ floodplain	Undetermined	Adjacent
36LH0020	-	Precontact	Open	Terrace	Undetermined	Adjacent
36LH0022	-	Precontact	Open	Upland flat	Undetermined	16
36LH0039	T-1	Precontact- Middle Archaic to Late Woodland	Open	Upland flat	Undetermined	Adjacent
36LH0048	AW-6	Precontact	Open	Upland flat	Undetermined	917
36LH0119	P-1	Precontact - Late Archaic	Lithic scatter	Terrace	Undetermined	183
36LH0120	P-3	Precontact	Lithic scatter	Terrace	Undetermined	152
36LH0121	P-4	Precontact	Lithic scatter	Terrace	Undetermined	914
36LH0122	P-5	Precontact	Lithic scatter	Terrace	Undetermined	91
36LH0123	P-6	Precontact - Late Archaic, Early to Late Woodland	Campsite	Upland and floodplain	Undetermined	25
36LH0151	P-37	Precontact	Lithic scatter	Low marsh	Undetermined	Adjacent
36LH0191	Breinigsville	Precontact	Open	Upland flat	Undetermined	Adjacent
36LH0192	Trexlertown	Precontact - Late Archaic	Open	Upland flat	Undetermined	Adjacent
36LH0193	Krocksville	Precontact	Open	Hillslope	Undetermined	61
36LH0195	Grim Road	Precontact	Open	Sinkhole/ spring?	Undetermined	Adjacent
36LH0200	Ancient Oaks	Precontact - Late Archaic	Open	Upland flat	Undetermined	30
36LH0208	Mosser Road 1	Precontact - Late Archaic	Open	Upland slope	Undetermined	91

Site No.	Site Name	Temporal Period	Site Type	Topographic Setting	National Register Status	Meters to Water
36LH0209	Mosser Road 2	Precontact - Late Archaic	Procurement	Upland slope	Not eligible	91
36LH0210	Mosser Road 3	Precontact	Open	Upland slope	Undetermined	91
36LH0211	Mosser Road 4	Precontact/Historic - nineteenth century	Open	Upland slope	Undetermined	Adjacent
36LH0212	Iron Run 5	Precontact	Open	Upland slope	Not eligible	76
36LH0213	Monge	Precontact - Late Archaic	Open	Upland flat	Undetermined	91
36LH0223	Grange Road	Precontact - Late Archaic	Lithic scatter	Upland flat	Eligible	2,195
36LH0224	Tyson House	Precontact/Historic	Open	Upland flat	Undetermined	2,225
36LH0225	-	Precontact	Open	Upland slope	Undetermined	Adjacent
36LH0227	Miller/Moyer Farmstead	Historic - nineteenth century	Farmstead	Upland	Demolished	610
36LH0236	-	Precontact	Open	Upland flat	Undetermined	Adjacent
36LH0240	Krause	Historic - nineteenth to twentieth centuries	Farmstead	Upland flat	Undetermined	91
36LH0241	Site #1	Precontact	Low density lithic scatter	Upland flat	Undetermined	427
36LH0242	Hunsicker South	Historic - late eighteenth through twentieth centuries	Farmstead	Upland flat	Eligible	152
36LH0243	Hunsicker North	Historic - nineteenth to twentieth centuries	Farmstead	Upland flat	Undetermined	122
36LH0257	Haines' Tavern/Loose Farmstead	Historic - nineteenth century	Commercial and domestic	Terrace	Undetermined	61
36LH0266	Spring Creek	Precontact	Lithic scatter	Floodplain	Undetermined	Adjacent
36LH0267	Heimnitz Property	Precontact - Late Archaic/Historic - mid-nineteenth to twentieth centuries	Domestic and precontact lithic scatter	Floodplain	Eligible	91
36LH0294	Site 1	Precontact - Late Archaic	Lithic scatter	Ridgetop	Not eligible	1,159
36LH0295	Site 2	Precontact - Late Archaic	Lithic scatter	Ridgetop	Not eligible	1,014
36LH0296	Site 3	Precontact - Late Archaic	Lithic scatter	Upland flat	Not eligible	Adjacent
36LH0297	Site 4	Precontact - Late Archaic	Lithic scatter	Ridgetop	Not eligible	402
36LH0298	Site 5	Precontact - Late Archaic	Lithic scatter	Floodplain	Not eligible	Adjacent
36LH0299	Site 6	Precontact	Lithic scatter	Upland flat	Not eligible	Adjacent
36LH0300	Site 7	Precontact - Woodland	Lithic scatter	Floodplain	Not eligible	402
36LH0301	Site 8	Precontact	Lithic scatter	Floodplain	Not eligible	949
36LH0302	Site 9	Precontact - Late Archaic	Lithic scatter	Ridgetop	Undetermined	1,159

Site No.	Site Name	Temporal Period	Site Type	Topographic Setting	National Register Status	Meters to Water
36LH0304	Schantz	Historic - mid-twentieth century	Residence	Upland	Undetermined	Adjacent
36LH0314	Heintz Farmstead	Historic - nineteenth century	Farmstead	Upland flat	Undetermined	61
36LH0360	The Iron Run Site	Precontact/Historic - nineteenth century	Open	Floodplain	Undetermined	117

Source: PA SHPO 2022

PA-SHARE indicates that three previous archaeological surveys traverse or overlap the current APE (John Milner Associates 1983; McCormick Taylor 1997; Grossman-Bailey 2009). One of these, identified as a survey for the Approved Alignment for Interstate 78 (I-78; completed in 1983 by John Milner Associates) is mapped as running through the central portion of the APE, just east of the railroad spur leading to a cold storage facility owned by Lineage Logistics. However, I-78 is located well north of the APE, and it appears that either the survey was incorrectly mapped or the incorrect report was uploaded for the survey polygon. The survey was completed in Northampton County, and the report does not discuss any areas located within the current APE.

The majority of the APE was previously surveyed by McCormick Taylor in 1997 during the US 222 Corridor Design Location Study, Breinigsville to the I-78 Interchange. The current project is located within Alternative E of the S.R. 0222 project, which overlaps with portions of the S.R. 0222 project surveyed by Cultural Heritage Research Services, Inc. (CHRS) in 1994, 1995, and 1997 (Basalik et al. 1994; Basalik 1994; Lewis and Basalik 1995). The areas surveyed by CHRS are located outside of the current project APE. McCormick Taylor completed surface collection and subsurface testing throughout Alternative E, and identified four new archaeological sites: 36LH0240, 36LH0241, 36LH0242, and 36LH0243. They also identified one previously identified site (36LH0122) and two potential historic sites (identified as sites B and C). All of the sites except for 36LH0242 were recommended eligible for the National Register, and were avoided by the proposed alignment (McCormick Taylor 1997).

As mentioned previously, site 36LH0241 was identified approximately 1.5 meters (5 ft) to the north of the APE during a systematic surface survey by McCormick Taylor during their 1997 survey. The site was identified within a large, open agricultural field, and was noted as being relatively remote from surface water. A total of 28 precontact lithic artifacts were recovered from the surface of the site. These artifacts included chert Woodland projectile points (n=2), flakes (n=9), shatter (n=6), fire-cracked rock (FCR; n=6), flake tools (n=2), a tested chert cobble (n=1), a hammerstone (n=1), and a possible ground stone tool fragment (n=1). Three shovel test pits (STPs) were excavated along the edge of the site to explore the potential for buried deposits, but no additional cultural material was recovered. Soil profiles included an approximately 1-foot thick plowzone directly atop of subsoil. The site was classified as a low-density lithic scatter; however, the recovery of FCR suggests that it may contain subsurface precontact features, such as hearths. The design team for the S.R. 0222 project was able to shift the alignment to the south in order to avoid the site. Phase II evaluation of the site was recommended if the project was to ever impact the site (McCormick Taylor 1997:43-46).

RGA completed a Phase I survey for the proposed Iron Run Force Main Project in 2009 that overlaps western portions of the current APE. The proposed project consisted of the construction of 19,000 linear feet of 20-inch ductile iron sanitary sewer main. Approximately 5 acres of the 18.6-acre APE was tested, and the remainder of the APE was determined to have a low potential for archaeological resources. The alignment was divided into eight sections (Sections 1 through 8), and in consultation with PA SHPO, testing was only required for Sections 1, 3, and 5, as the remaining sections were determined to be previously disturbed. Sections 1 and 2 of the survey fall within the current APE and overlap the alignment for the current project. These sections extended west from the southern portion of the Lineage Logistics facility at 7132 Ruppsville Road to the southern and western portions of the existing LCA Pretreatment Plant at 7676 Industrial Boulevard. The area within Section 2, which bordered the Lineage Logistics facility, was determined to be disturbed, and was not tested. Section 1 extended from Ruppsville Road to the treatment facility, and was tested with 53 STPs. The majority of the tests identified a plowzone atop of subsoil; however, tests located along the western edge of the treatment facility were noted to be disturbed with clay fill atop of subsoil. Testing recovered a total of three historic artifacts, two fragments of undiagnostic whiteware, and a fragment of amber beer bottle glass recovered from the fill material. Modern plastic wrappers and chunks of asphalt were also noted and discarded in the field. No intact archaeological resources were identified during the survey,

and no additional testing was recommended for the project (Grossman-Bailey 2009). The construction for the proposed Iron Run Force Main Project was never completed.

Field Methodology

Phase I archaeological fieldwork began with a pedestrian reconnaissance survey of the APE. Subsurface testing was limited to areas of the APE that were not tested during previous archaeological surveys and that were within the APE near the southern portion of site 36LH0241. Areas of standing water, slopes over 15 percent, or areas of obvious disturbance were not tested during the survey. Subsurface testing consisted of the hand excavation of 57-centimeter diameter STPs to investigate original, intact sediments or archaeological deposits. Twenty STPs were excavated at 15-meter (49.2-ft) intervals within the western portion of the APE near the pretreatment plant, and within the surveyed area in the eastern portion of the APE in Grange Park. Six STPs were excavated at 5-meter (16.4 ft) intervals within the area near site 36LH0241.

Soils from the STPs were excavated according to recognizable natural strata, extending at least 10 centimeters into sterile subsoil to a maximum depth of 1 meter, or to shallower depths as warranted. All excavated sediments were screened through 0.25-inch mesh hardware cloth in order to recover any artifacts that were present. Information regarding the soil texture and color, depth of any cultural materials recovered, and any soil disturbance was recorded on standard electronic excavation forms. Daily field notes and excavation information were kept by the field director. The archaeological investigations were documented via digital color photography.

Lab Methodology

One non-site, undiagnostic artifact was recovered during the Phase I survey and will either be returned to the landowner or discarded pending consultation with Upper Macungie Township (landowner).

Results

Phase I Archaeological Survey Results

Phase I archaeological subsurface testing was completed between January 26 and 28, 2022. Phase I excavations were limited to the eastern portion of the APE near site 36LH0241 (Area A) and the western portion of the APE near the pretreatment plant (Area B). Areas of the APE noted to have been previously surveyed for archaeological resources were not tested during the survey. The APE measures 1.4 hectare (3.54 ac), with 1.1 hectare (2.74 ac) previously surveyed, and 0.3 hectare (0.8 ac) testable. Testing involved the excavation of 26 STPs (Figure 9). One precontact artifact was recovered from fill material and does not represent an intact, significant archaeological resource. No historic artifacts were recovered during the survey. No subsurface historic or precontact features were identified within the APE during the survey. STP and photograph locations are depicted on Figure 9. Representative soil profiles are depicted on Figure 10.

Area A - Test Area Within Grange Park Near Site 36LH0241

Testing of the 0.1-ha (0.3-ac) area within Grange Park near site 36LH0241 consisted of 11 STPs excavated at a 15-meter (49.2-ft) interval (STPs 1 to 10 and 17), and six STPs excavated at a 5-meter (16.4-ft) interval (STPs 11 to 16; Figure 9). The previously identified site 36LH0241 is located approximately 1.5 meters (5 ft) to the north of the APE in this area. The APE follows the toe-of-slope of a large, artificial berm within the park area that partially screens recreational fields at the park from the S.R. 0222 roadway (Photograph 7). STPs were excavated at the toe-of-slope of this berm. The recreational field areas present on the north side of the berm, and containing site 36LH0241, have been heavily graded in order to create a level playing surface and to create the berm (Photograph 12).

STP soil profiles within the test area consist primarily of a 9- to 12-centimeter thick 10YR 3/2 silt loam layer of topsoil (A-horizon) atop a 10- to 54-centimeter thick 5YR 6/8 clay loam Fill I, a 14- to 30-centimeter thick 5YR 5/6 clay loam Fill II, and a truncated 7.5YR 5/6 clay loam subsoil (B-horizon; Figure 10). All soils within the test area are heavily compacted and contain sharp breaks between layers, indicating past grading activity. McCormick Taylor identified

a plowzone atop of subsoil in this area during their 1997 survey; this plowzone now appears to be gone, replaced by a recent topsoil layer at the surface to facilitate the growth of grass followed by two fill layers. Testing recovered one chert tertiary flake from the Fill II layer of STP 4 (Photograph 13). No other precontact or historic artifacts were recovered from the test area during the Phase I survey.

Area B - Test Area Near the LCA Pretreatment Plant

Nine STPs (STPs 18 to 26) were excavated within the 0.2-ha (0.5-ac) area adjacent to the pretreatment plant at a 15-meter (49.2-ft) interval (Figure 9). This area was located adjacent to the southern and western boundaries of the pretreatment plant fenceline, within an overgrown area with high grass and brush. A wide, slightly incised drainage ditch travereses the center of the area, and tests were slightly offset from the center line within the APE to avoid the ditch (Photograph 11). The STP soil profile for the test area consists of multiple layers of compacted fill directly atop of truncated subsoil. Profiles consist of a 22- to 33-centimeter thick 10YR 5/6 sandy loam Fill I, and a 20- to 39-centimeter thick 10YR 4/4 sandy loam Fill II atop of a 7.5YR 5/6 clay loam subsoil (B-horizon; Figure 10). This profile is the same as that identified by RGA in their 2009 survey for the Iron Run Force Main Project. As with the previous test area, all soils within the test area are heavily compacted and contain sharp breaks between layers, indicating past grading activity. No historic or precontact artifacts were recovered during Phase I testing of the test area.

Conclusions and Recommendations

Phase I investigations were conducted within areas of the APE within Grange Park near site 36LH0241 and adjacent to the LCA Pretreatment Plant. Both areas have been severely disturbed as a result of the construction of S.R. 0222 (Trexlertown Bypass) and Grange Park in the early twenty-first century. The statewide precontact probability model on PA-SHARE classifies the majority of the APE as having a moderate to high probability for precontact archaeological resources; unfortunately, twenty-first century development has significantly modified the upland landforms within and surrounding the APE. Both test areas contain multiple, compacted fill layers atop of a truncated subsoil, which is undoubtably a result of grading activities for the construction of the park and pretreatment facility. One chert tertiary flake was recovered from a fill layer within STP 4, which was located just west of site 36LH0241 in Grange Park. This flake may be related to the site; however, it was likely re-deposited within the APE during construction/grading activities, and does not represent an intact archaeological resource. Given the amount of disturbance noted within the APE just south of site 36LH0241, it appears likely the site was destroyed during construction of a recreational field for the park. No additional precontact or historic artifacts or features were identified during Phase I testing. No additional archaeology is recommended for the APE as currently designed.

References Cited

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7. Statewide Pre-Contact Probability Model Analysis: (Use the model from CRGIS to determine portions of the project area that were located within each sensitivity tier and list all testing methods used within each tier. If more than one method was used, estimate the percentage of the tier tested by each method. In the Sites Located section, include Isolated Finds for which a number is assigned.)

Sensitivity Tier	Area within this Tier	Percent of Total Project Area	Method(s) Used to test this tier (Use list from 5 above. Include % if multiple.)	Number of Sites Located
High	5,498.188 sq. m.	38 %	Shovel test pit and pedestrian survey	0
Moderate	5,488.897 sq. m.	38 %	Shovel test pit and pedestrian survey	0
Low	3,338.842 sq. m.	24 %	Shovel test pit and pedestrian survey	0

8. Required Attachments:

☒ 7.5' USGS Quadrangle Map delineating APE / Project Area
☒ Project map showing testing strategy(ies)
☒ Testing strategy justification / predictive model
☒ Supporting photographs with descriptions of view and view direction
☒ Engineering / Project Plans if prepared
☐ Geomorphological Report if prepared
☒ Representative excavation profiles and descriptions

List all other attachments to this Negative Survey Form:

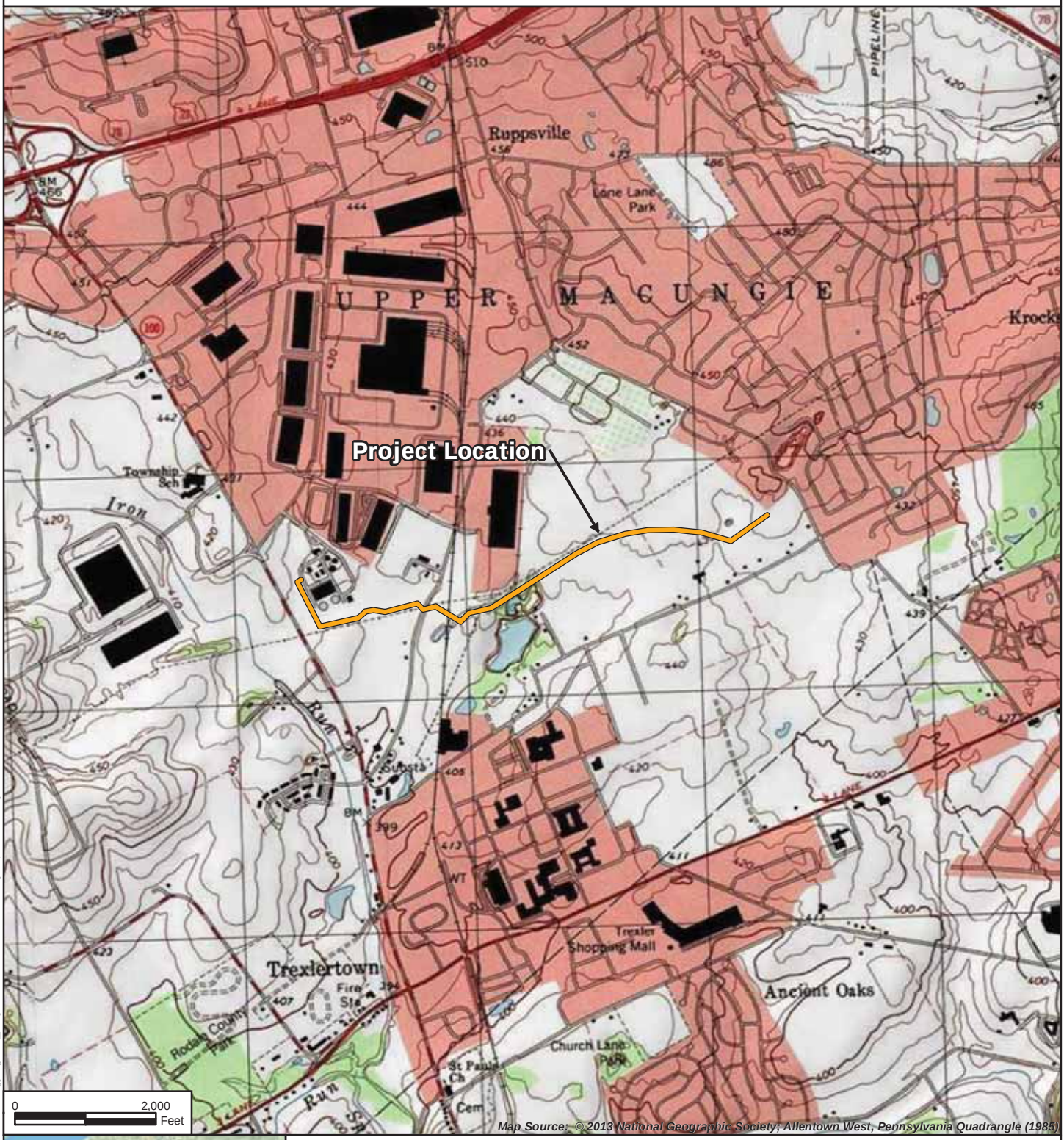
Attachment Type
Figures: Figure 1. Project Location Map Figure 2. Project Plan Figure 3: Soils Map Figure 4. 1862 Map of Lehigh County Figure 5. 1865 Map of Lehigh County Figure 6. 1876 Map of Upper Macungie Township Figures 7A to 7C. Twentieth-Century USGS Maps of the Project Area Figures 8A to 8G. Aerials of the Project Area Figure 9. Archaeological Field Map Figure 10. Representative Shovel Test Pit Profiles Photographs: Photograph 1: Overview of the APE, looking toward the eastern end where the proposed line will join an existing line. Facing northeast. Photograph 2: Overview of the eastern portion of the APE, showing the raised artificial berm in Grange Park. Facing northwest.

Photograph 3:	Overview of the eastern portion of the APE within Grange Park, looking toward Area A. Facing west.
Photograph 4:	Overview of the APE, looking toward the eastern end of the APE. Facing northeast.
Photograph 5:	Area of the APE between the S.R. 0222 drainage ditch and the railroad spur line. Facing southwest.
Photograph 6:	View of a stormwater basin located north of the APE. Facing northwest.
Photograph 7:	View of a raised artificial berm within Grange Park. Facing southwest.
Photograph 8:	View of the portion of the APE between S.R. 0222 and the railroad spur line. Facing northwest.
Photograph 9:	View from Ruppsville Road of a portion of the western APE within a fallow field. Facing northwest.
Photograph 10:	View of a portion of the western APE within a fallow field just south of the pretreatment plant. Facing east.
Photograph 11:	Overview of the western portion of the APE, Area B, adjacent to the western end of the pretreatment plant. The drainage ditch is visible along the right side of the photograph. Facing southeast.
Photograph 12:	View of the 36LH0241 site area within Grange Park and outside of the APE.
Photograph 13:	Chert tertiary flake recovered from Fill II, STP 4, in Area A (note the flake was broken in half during transit).

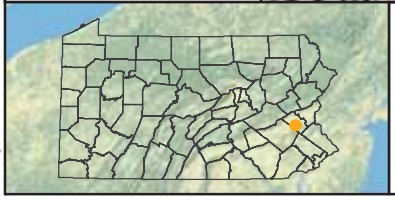
Figures

Figure 1
Project Location Map

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania



Map Source: © 2013 National Geographic Society; Allentown West, Pennsylvania Quadrangle (1985)



Site Coordinates: 40.564719, -75.596660

Area of Potential Effects

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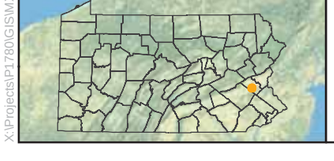

Previously Surveyed Portions of the Corridor

Proposed Force Main Corridor

Area of Potential Effects

Figure 2
Project Plan

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

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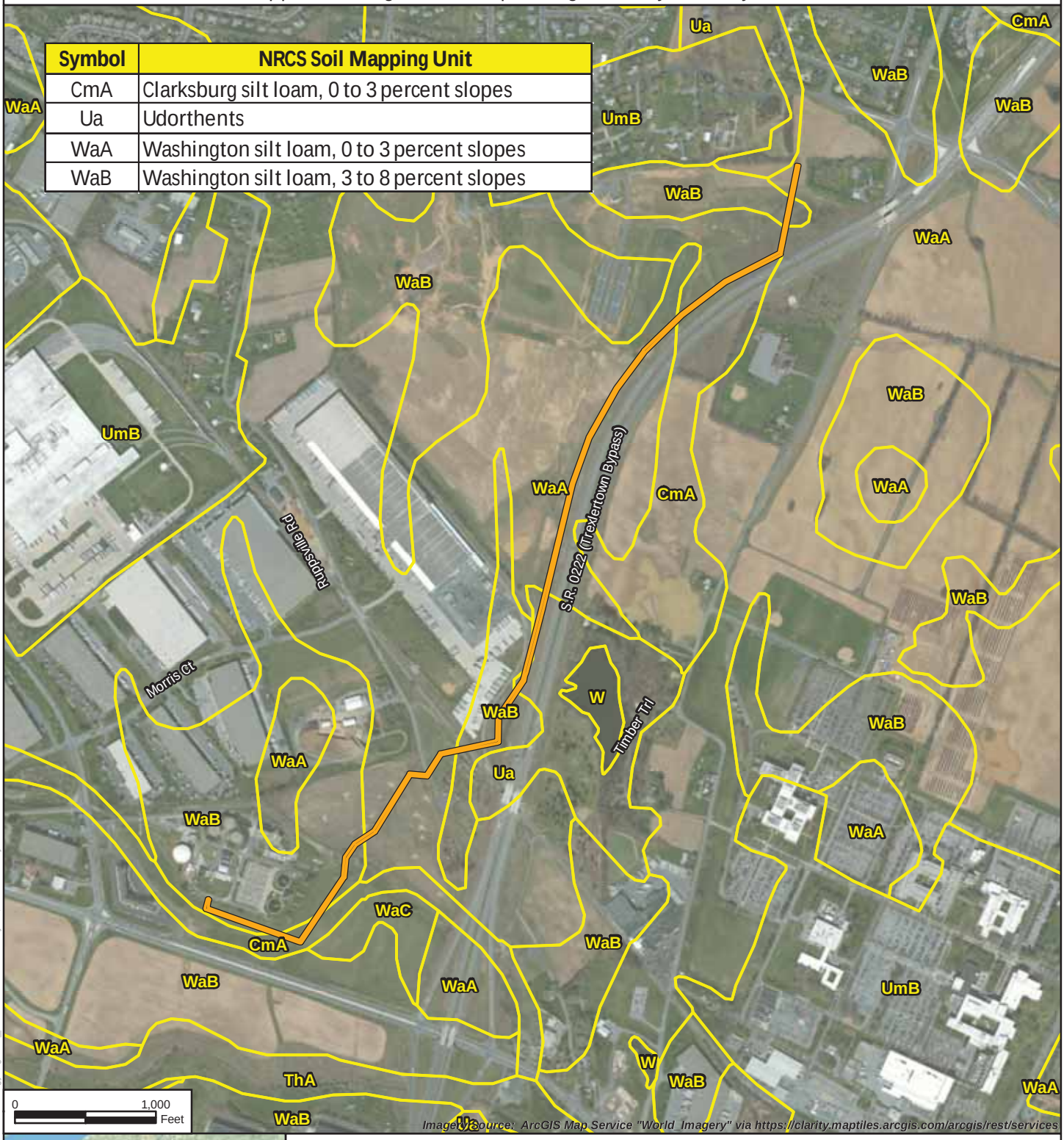
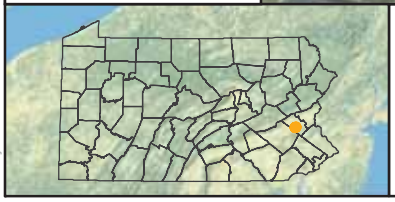
Figure 3
Soils Map

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania



Symbol	NRCS Soil Mapping Unit
CmA	Clarksburg silt loam, 0 to 3 percent slopes
Ua	Udorthents
WaA	Washington silt loam, 0 to 3 percent slopes
WaB	Washington silt loam, 3 to 8 percent slopes



Area of Potential Effects

Lehigh County Soils

Data Source: USDA Lehigh County Soils 2020

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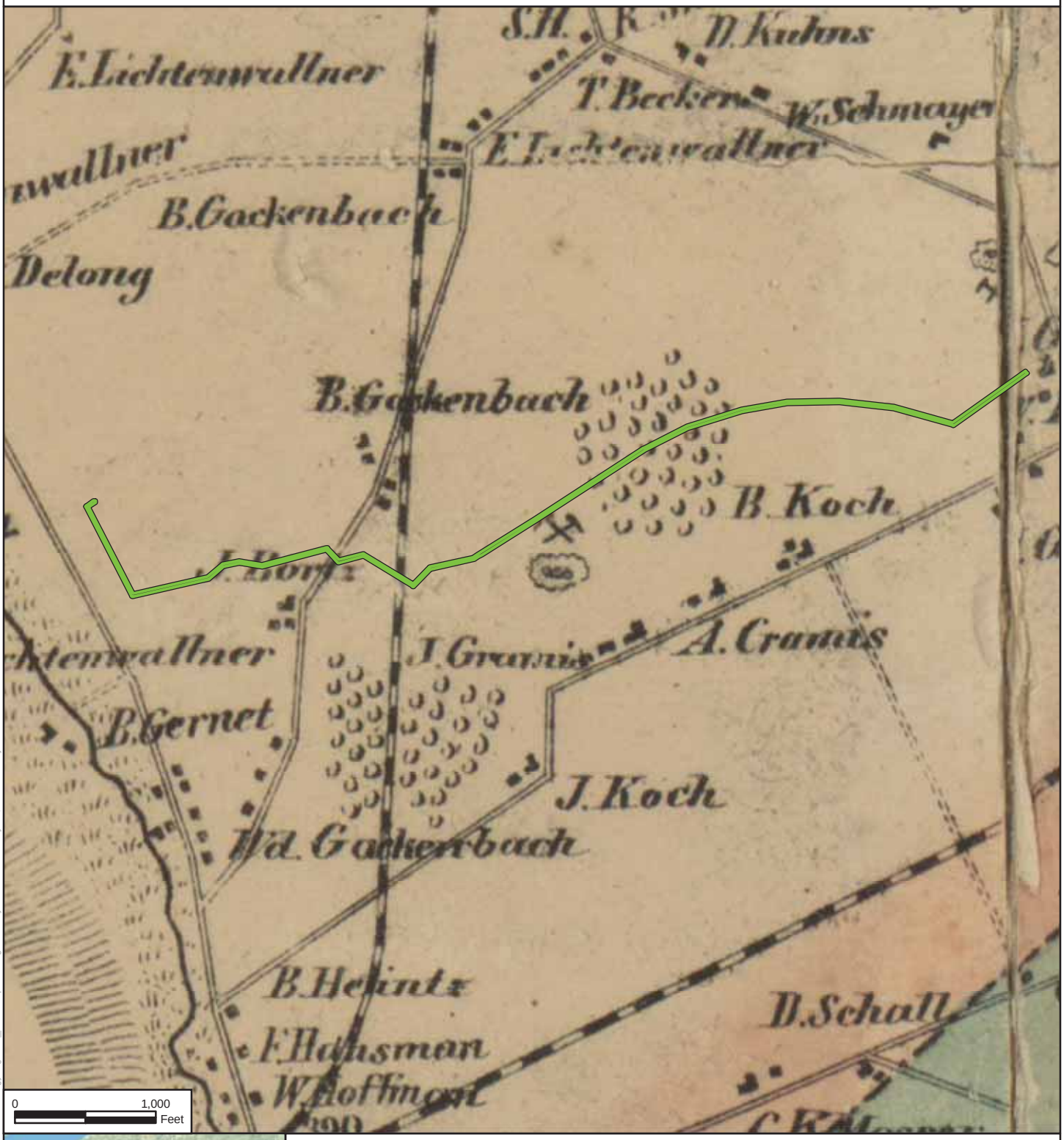
Figure 4
1862 Map of Lehigh County
Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania



Area of Potential Effects

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Data Source: Aschbach 1862

Figure 5
1865 Map of Lehigh County
Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

Area of Potential Effects

Data Source: Aschbach and Traubel 1865

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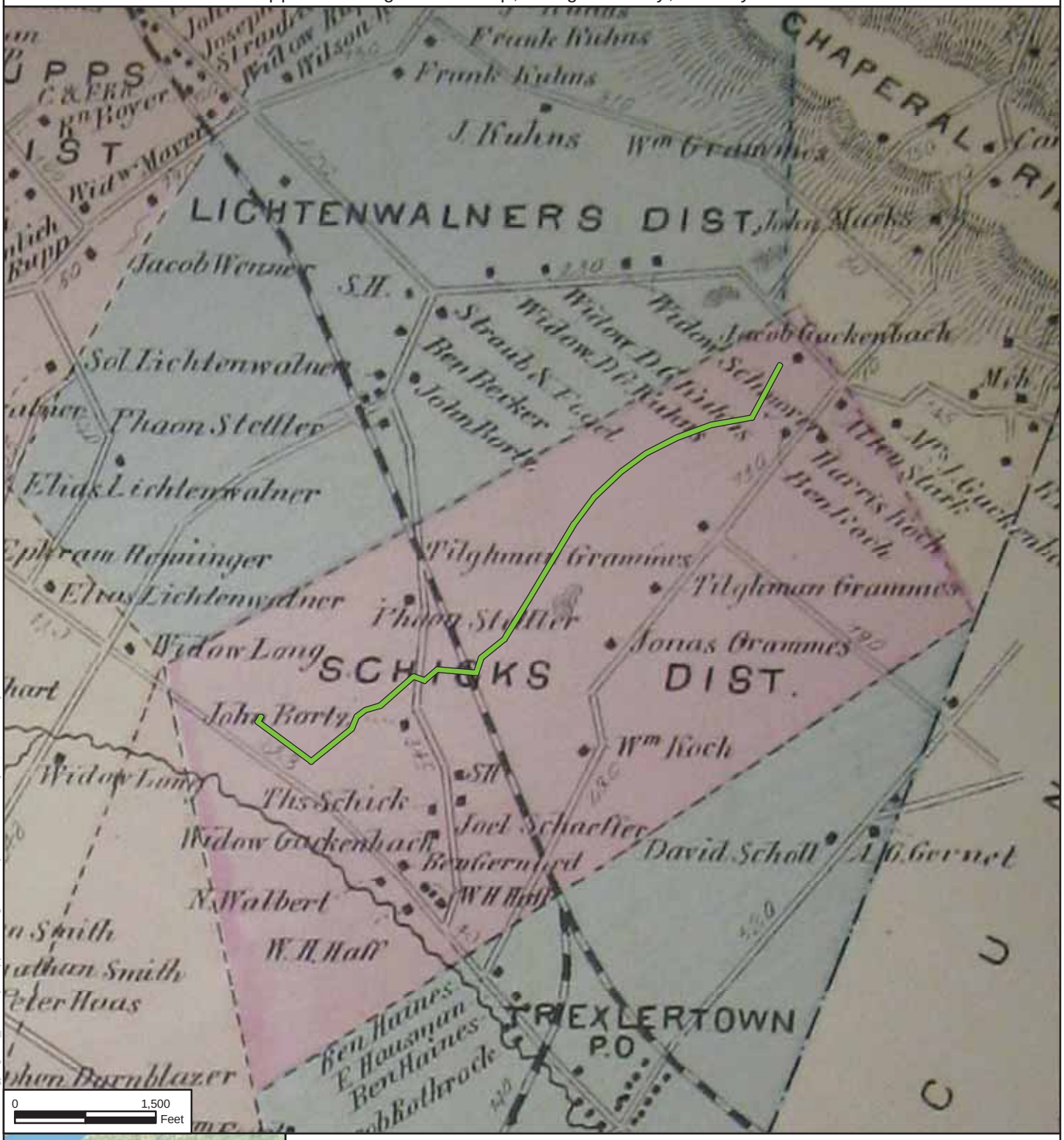
Figure 6
1876 Map of Upper Macungie Township

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

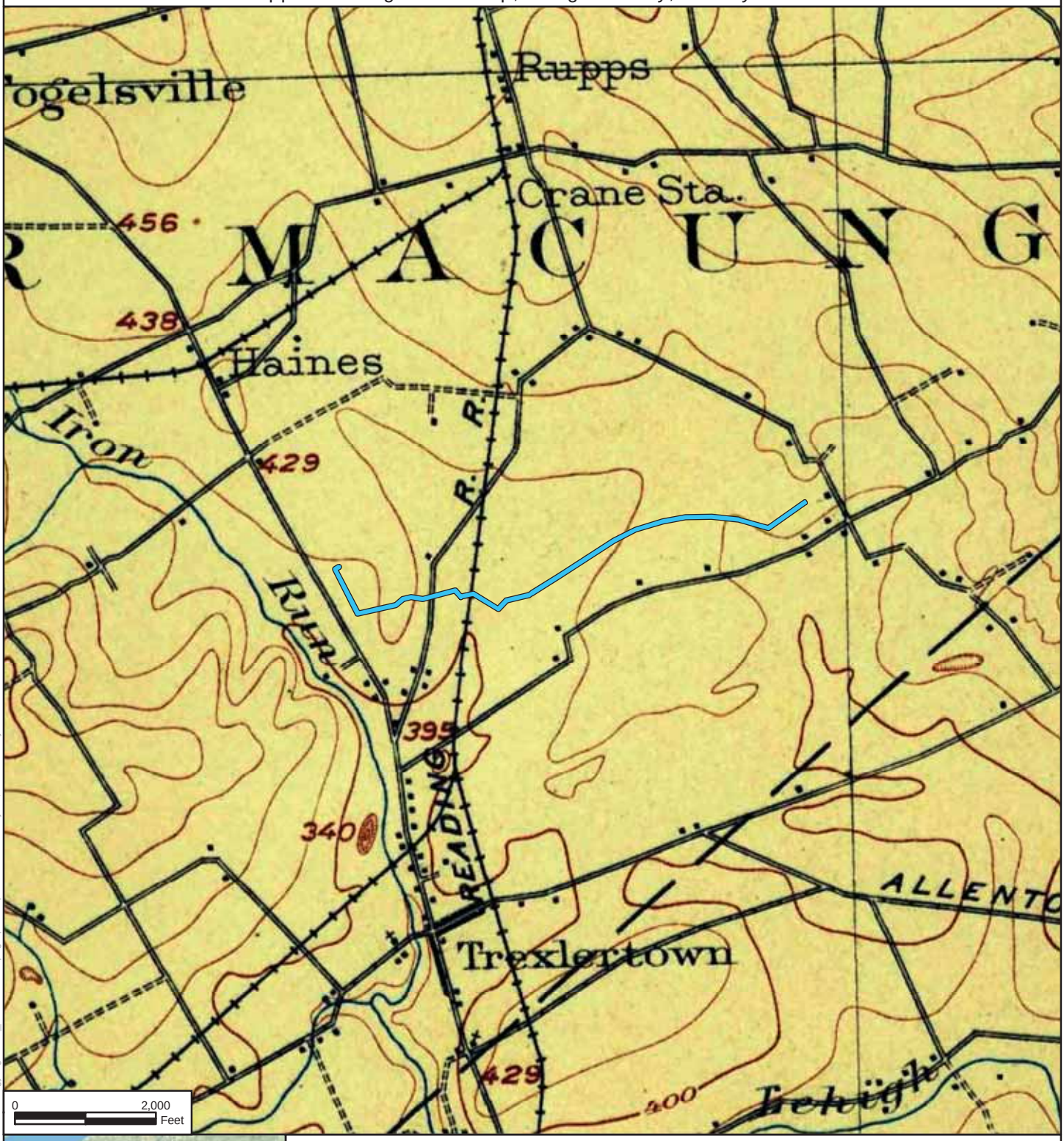


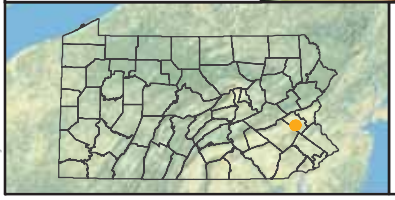
X:\Projects\P1780\GIS\MXD\Archaeology\Figure6_1876MapOfUpperMacungieTownship.mxd February 18, 2022 azajac

Data Source: Davis 1876

Figure 7A
1902 Twentieth-Century USGS Map of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania





Area of Potential Effects

Data Source: USGS 1902

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Figure 7B
1964 Twentieth-Century USGS Map of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

Area of Potential Effects

Data Source: USGS 1964

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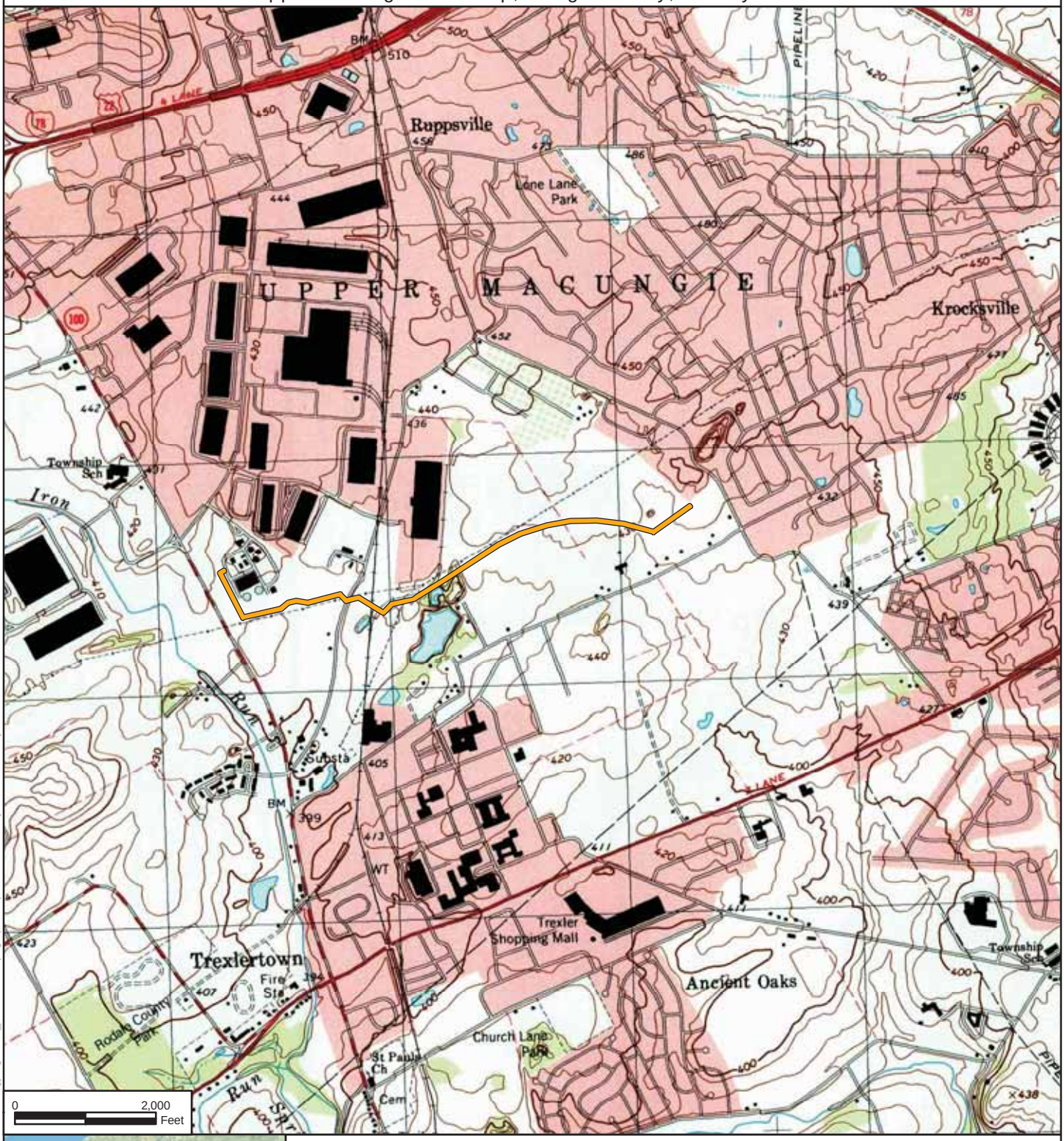
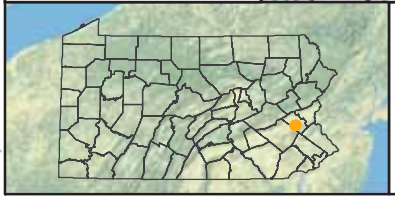
Figure 7C
1999 Twentieth-Century USGS Map of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania





Area of Potential Effects

Data Source: USGS 1999

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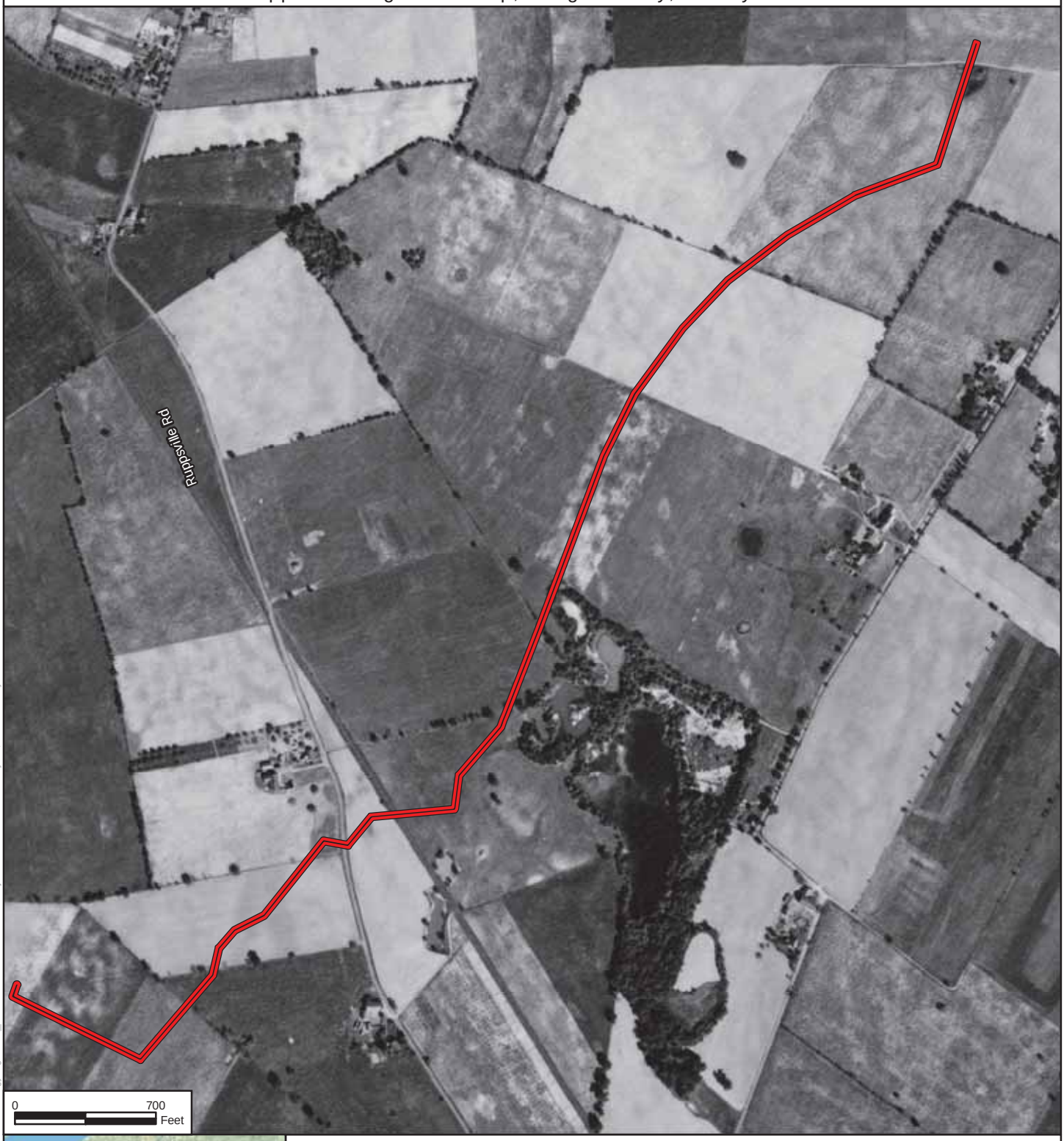
Figure 8A
1938 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania



Area of Potential Effects

Data Source: USDA-NRCS 1938

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Figure 8B
1958 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

Area of Potential Effects

Data Source: USDA-NRCS 1958

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Figure 8C
1971 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

Area of Potential Effects

Data Source: USDA-NRCS 1971

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Figure 8D
1992 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

Area of Potential Effects

Data Source: Google Earth 1992

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Figure 8E
2005 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

Area of Potential Effects

Data Source: Google Earth 2005

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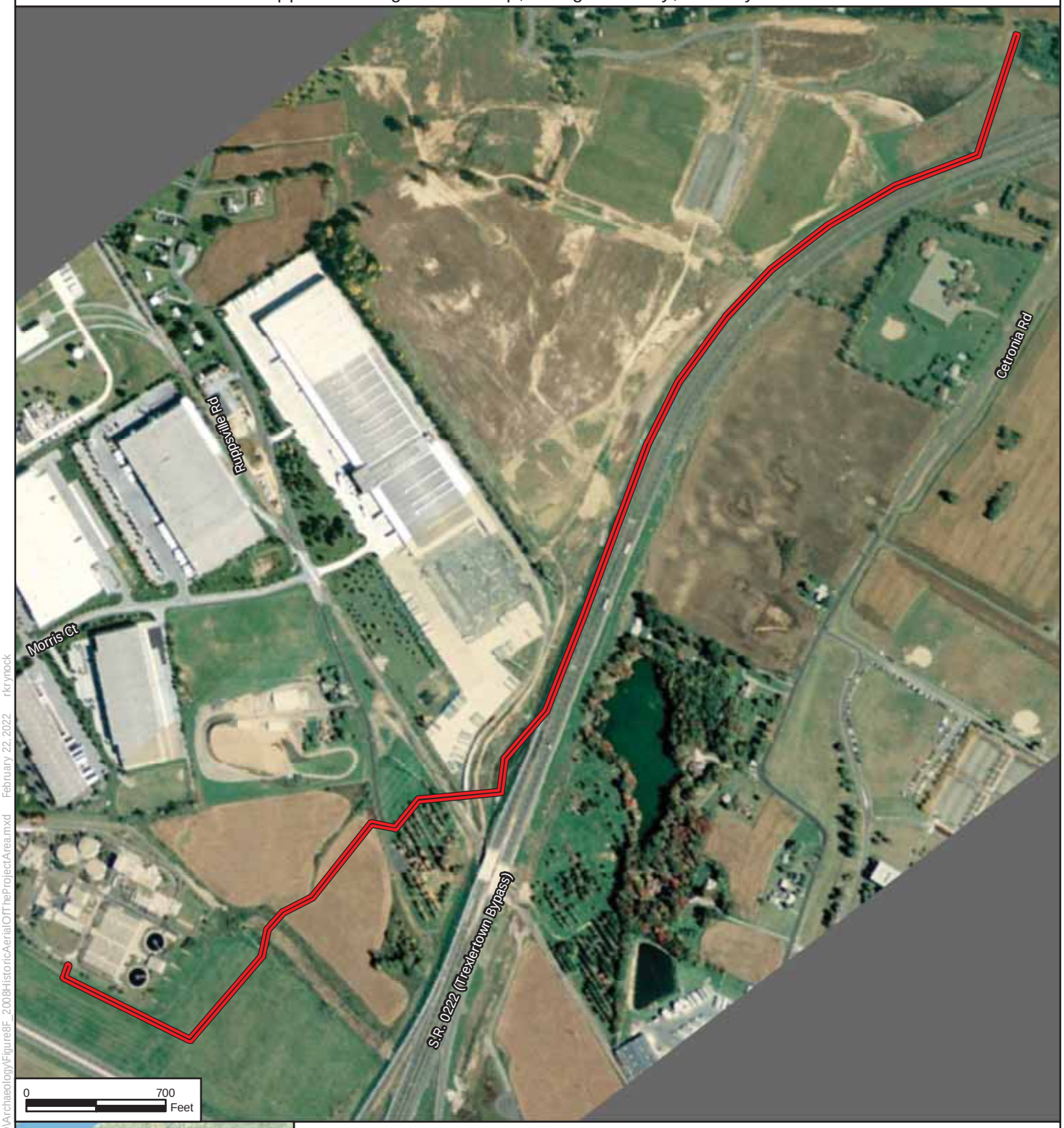
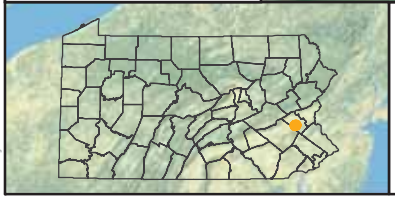
Figure 8F
2008 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania





Area of Potential Effects

Data Source: Google Earth 2008

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Figure 8G
2019 Aerial of the Project Area

Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

Area of Potential Effects

Data Source: Google Earth 2019

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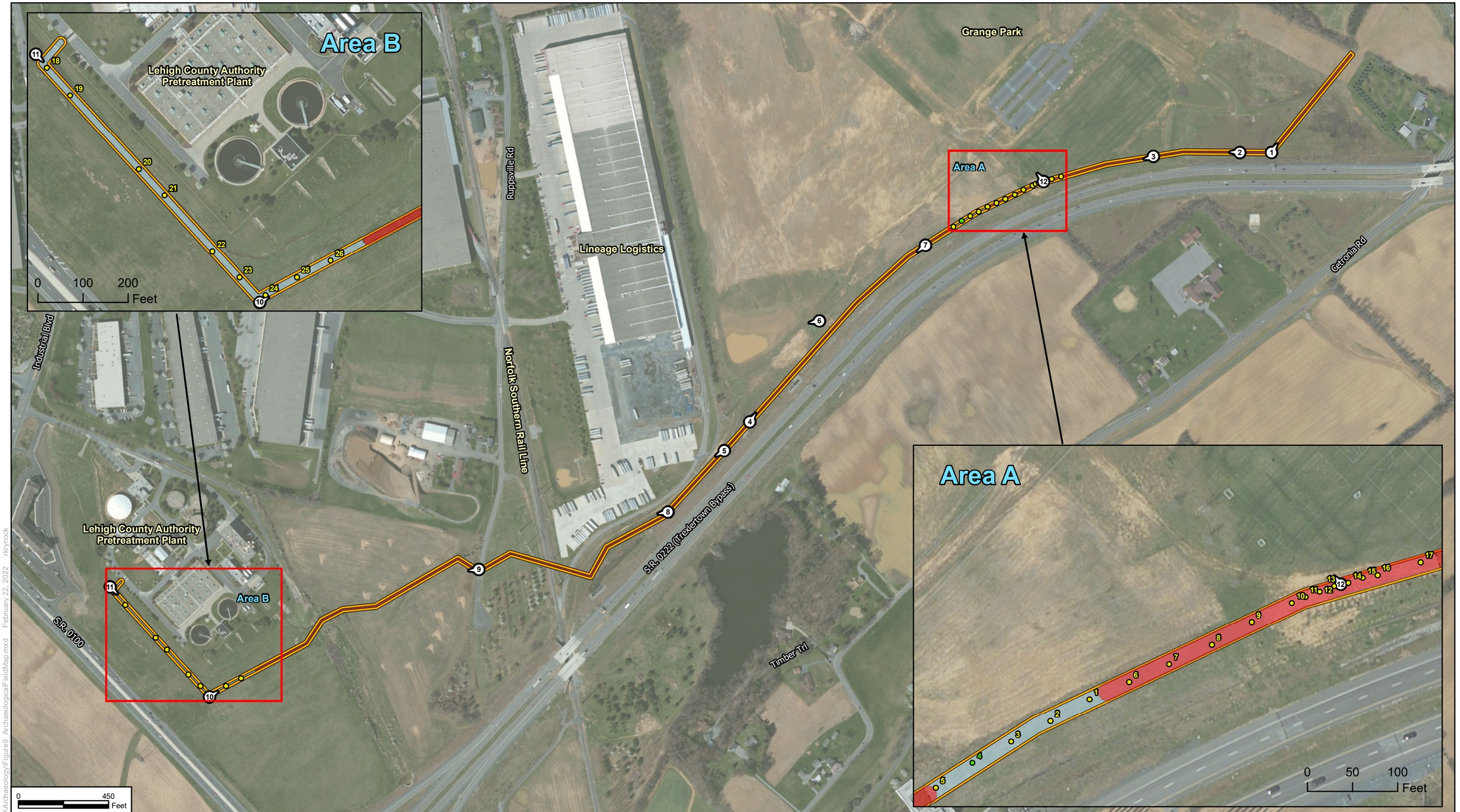

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Photograph Locations
Excavated Shovel Test Pits
Shovel Tests Positive for Precontact Artifacts
Area of Potential Effects
Previously Surveyed Areas
Test Area

Data Source: Institution/Entity/Etc 2009 {UPDATE ENTIRELY}

Figure 9
Archaeological Field Map
Lehigh County Authority Trexlertown Special Study
Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

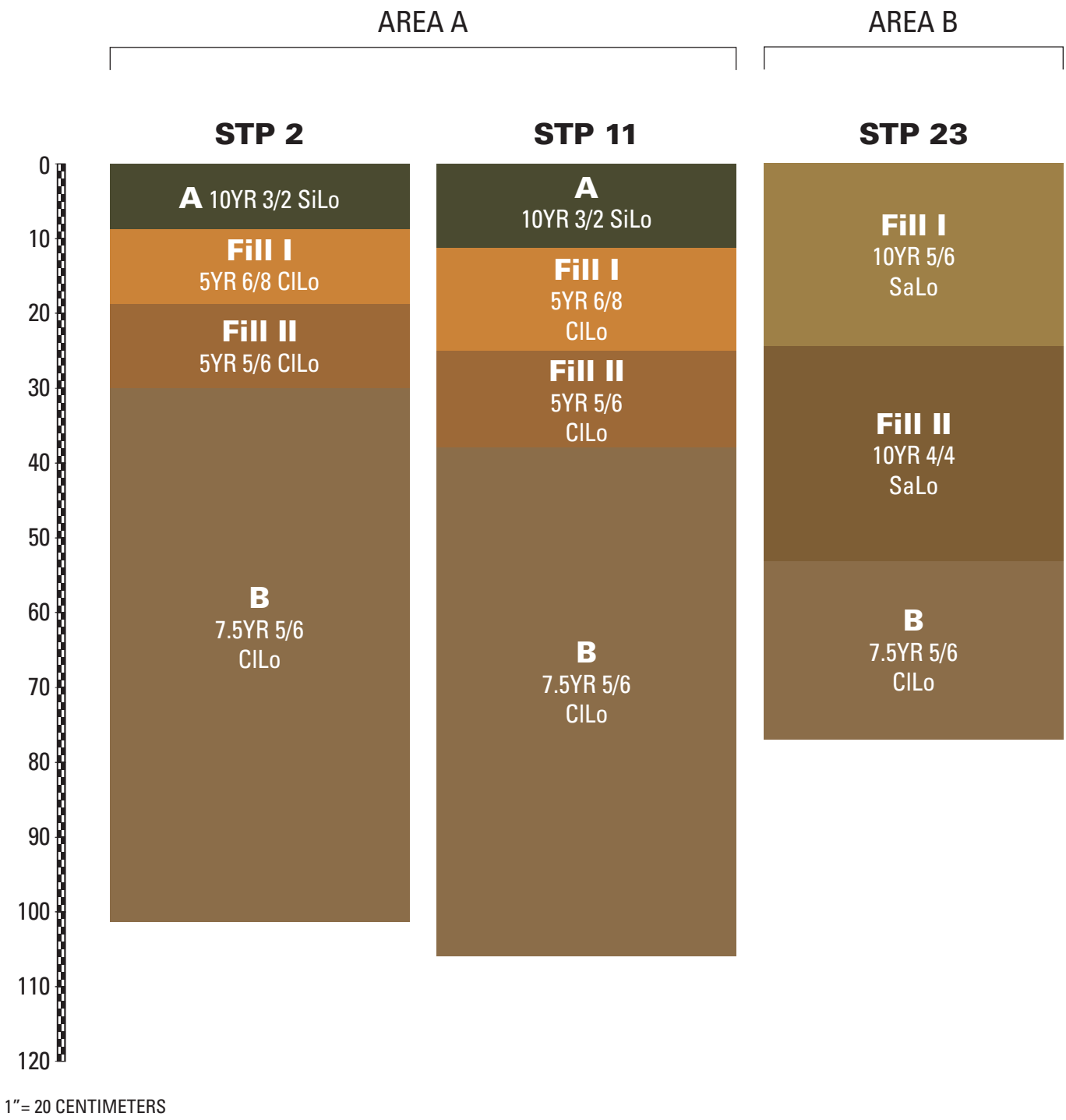

Figure 10
Representative Shovel Test Pit Profiles
Lehigh County Authority Trexlertown Special Study, Trexlertown Sanitary Sewer Main
Upper Macungie Township, Lehigh County, Pennsylvania

X:\Graphics\Projects\P1780\Phase I Survey\P1780Phase1Survey_profiles Folder

Photographs

Photograph 1: Overview of the APE, looking toward the eastern end where the proposed line will join an existing line. Facing northeast (February 2022).

Photograph 2: Overview of the eastern portion of the APE, showing the raised artificial berm in Grange Park. Facing northwest (February 2022).

Photograph 3: Overview of the eastern portion of the APE within Grange Park, looking toward Area A. Facing west (February 2022).

Photograph 4: Overview of the APE, looking toward the eastern end of the APE. Facing northeast (February 2022).

Photograph 5: Area of the APE between the S.R. 0222 drainage ditch and the railroad spur line. Facing southwest (February 2022).

Photograph 6: View of a stormwater basin located north of the APE. Facing northwest (February 2022).

Photograph 7: View of a raised artificial berm within Grange Park. Facing southwest (February 2022).

Photograph 8: View of the portion of the APE between S.R. 0222 and the railroad spur line. Facing northwest (February 2022).

Photograph 9: View from Ruppsville Road of a portion of the western APE within a fallow field. Facing northwest (February 2022).

Photograph 10: View of a portion of the western APE within a fallow field just south of the pretreatment plant. Facing east (February 2022).

Photograph 11: Overview of the western portion of the APE, Area B, adjacent to the western end of the pretreatment plant. The drainage ditch is visible along the right side of the photograph. Facing southeast (February 2022).

Photograph 12: View of the 36LH0241 site area within Grange Park and outside of the APE (February 2022).

Photograph 13: Chert tertiary flake recovered from Fill II, STP 4, in Area A (note the flake was broken in half during transit; February 2022).

TREXLERTOWN ACT 537 SPECIAL STUDY

SUBMITTED TO:

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

SUBMITTED ON BEHALF OF:

LEHIGH COUNTY AUTHORITY

February 2022

Prepared by:

ARRO Consulting, Inc.

108 West Airport Road

Lititz, PA 17543

OUT-IN-FRONT. EVERY STEP OF THE WAY.

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PLAN SUMMARY

A. PROPOSED SERVICE AREA AND MAJOR PROBLEMS

This Trexlertown Special Study (TSS) is being done to address sewage capacity needs within the Western Lehigh Interceptor (WLI) near Trexlertown. The interceptor experiences dry-day surcharging and wet-weather overflows during intense rain events and Lehigh County Authority (LCA) has developed alternatives to temporarily address this situation until a long-term solution can be developed during preparation of the regional long-term Act 537 Plan.

The Kline's Island Sewer System Interim Act 537 Plan has been adopted by the Kline's Island Sewer System (KISS) municipalities and approved by PADEP. The Implementation Schedule in the Plan includes construction of the Trexlertown area temporary improvements during the planning period of 2021 to 2025. The Implementation Schedule also includes evaluation and selection of a long-term solution to the hydraulic issues related to the Western Lehigh Interceptor and downstream conveyance facilities. Submission of the long-term Act 537 Plan, which includes these solutions, is scheduled for March 2025. Design and construction of these long-term improvements will begin after March 2025 and will include a construction implementation schedule through 2035. Projects beyond 2035 will require another Act 537 submission after March 2025.

The service area primarily impacted by this portion of the WLI includes Upper Macungie Township and Lower Macungie Township.

B. IDENTIFY ALTERNATIVES

Two alternatives were considered to temporarily resolve the hydraulic issues in the Western Lehigh Interceptor. See Appendix 6 for a map of the two proposed alternatives. They are:

1. INTERIM PUMP STATION

A new interim pump station and force main located near the Industrial Pretreatment Plant- (PTP) that will divert flow away from the Western Lehigh Interceptor and pump it into the Upper Macungie Trunk Line (UMTL) at manhole PH3034A. The UMTL has both unused dry day (approximately 2.5 MGD) and unused wet weather (0.6 MGD) capacity and flows by gravity into the Spring Creek Pump Station. Note that the Western Lehigh Interceptor also flows by gravity into the Spring Creek Pump Station, so the impact on the Spring Creek Pump Station should be negligible. No improvements are being proposed to that Pump Station at this time.

2. TREXLERTOWN AND ANCIENT OAKS INTERCEPTOR/IN-LINE STORAGE

A new interceptor that will parallel the Iron Run (i.e., the Upper Western Lehigh Interceptor) and Western Lehigh Interceptors from the Gun Club (MH U67) to Spring Creek Road (MH L300). Providing in-line storage via a parallel 72" diameter pipe in this area was also modeled. Both of these alternatives did not resolve the dry or wet day issues and only moved the sanitary sewer overflow problem downstream (to the Ancient Oaks Interceptor).

The selected alternative is the interim pump station and force main to divert sewage away from the WLI. An interceptor operating agreement between UMT and LCA will be needed to implement this alternative. Terms of the agreement are still being negotiated; however, the Interim Pump Station (the selected

alternative) is expected to be in service through at least 2030. Exact details of the decommissioning will be handled within the Final Act 537 Plan that is due by March 2025.

C. COST OF IMPLEMENTATION

In order to construct the Interim Pump Station alternative, flow from near the LCA PTP would be diverted from the Western Lehigh Interceptor to the Upper Macungie Trunk Line using a 2.5 MGD Interim Pump Station and 1.5 mile long 18" HDPE force main to connect to Upper Macungie Trunk Line. This will take 2-3 years to complete, including time to secure regulatory permits, and cost approximately $6 million.

D. MUNICIPAL COMMITMENTS NECESSARY TO IMPLEMENT PLAN

Inter-municipal agreements are already in place to implement the actions in this Special Study. The Signatory municipalities have reviewed and adopted this Special Study (when submitted to DEP). However, an interceptor operating agreement between UMT and LCA will be needed to implement this alternative.

E. IMPLEMENTATION SCHEDULE

TASK	START	FINISH
Submit Special Study to PADEP		June 2022
PADEP Approval of Special Study	June 2022	October 2022
Preliminary Design	March 2022	August 2022
Final Design & Submit Permits	August 2022	December 2022
Receive Permits	December 2022	April 2023
Bid Phase	May 2023	July 2023
Construction Phase	August 2023	February 2025

MUNICIPAL ADOPTIONS

Copies of all Municipal Adoptions can be found in Appendix 11.

PLANNING COMMISSION / COUNTY HEALTH DEPARTMENT COMMENTS

Copies of all Planning Commission and County Health Department comments can be found in Appendix 12.

PUBLICATION

Proof of Publication can be found in Appendix 13.

COMMENTS AND RESPONSES

Public comments and responses can be found in Appendix 14.

IMPLEMENTATION SCHEDULE

Refer to previous page for the Implementation Schedule.

CONSISTENCY DOCUMENTATION

There were no inconsistencies identified and therefore, none to be resolved. Applications were made to the Pennsylvania Natural Diversity Index as well as the Pennsylvania Historic Museum Commission. See Appendix 9 and 10 for that documentation.

BACKGROUND

In 2007, EPA issued an Administrative Order (AO) to the City of Allentown requiring discharges from Outfall 003 be considered SSOs as that sewage had not received treatment and to provide corrective measures.

In 2008, in response to self-reporting of conveyance capacity limitations and excess I&I from LCA's Western Lehigh Interceptor, the Pennsylvania Department of Environmental Protection (DEP) required LCA, Upper Macungie, Lower Macungie, Weisenberg, Lowhill, and Upper Milford townships, and Macungie and Alburtis boroughs to develop a Chapter 94.21 Corrective Action Plan (CAP) for the areas identified as having significant capacity restrictions. The cited entities formed the Western Lehigh Sewerage Partnership (WLSP) and developed the Sewer Capacity Assurance and Rehabilitation Program (SCARP) to provide a formalized and planned method of evaluating the WLSP sewer systems, prioritize and conduct I&I source removal via sewer rehabilitation and private property clear-water elimination, and development of storage and conveyance expansions. To support this work, flow metering was conducted in 2009 and a hydraulic model was developed in 2011.

In 2009, in response to self-reported overflows from Allentown's central interceptor systems, EPA issued a second Administrative Order (AO). This AO addressed system-wide capacity issues for all Signatories to the KISS (Alburtis Borough, Emmaus Borough, Coplay Whitehall Sewer Authority, South Whitehall Township, Lower Macungie Township, Upper Macungie Township, Upper Milford Township, Salisbury Township, Lowhill Township, Macungie Borough, Weisenberg Township, Hanover Township, LCA, and the City of Allentown). Each of the contributors were required to submit a semi-annual report to EPA and DEP indicating what actions they had taken to address RDII conditions.

During this time there were semi-annual meetings to discuss the program on addressing the AOs while the Signatories worked independently on RDII remedial projects and programs within their service areas. There was not a more unified or collective approach to addressing the AOs until the WLSP and the City combined their two models to form the first KISS model (in 2014), which covered 75% of the actual KISS. The City and the WLSP individually and then jointly evaluated their projected future flows, considered the planned source reduction efforts of all Signatories, and selected a preferred alternative managing both dry and wet-weather treatment and conveyance of both current and future flows through 2040. Although a valuable tool and resource, the KISS model represents only 3/4ths of the sewer system, is calibrated from 2008 and 2009 flow data, uses only available entry-point flows from the other sewer Signatories, and except for the WLSP portion does not model antecedent conditions or changing groundwater conditions due to climate changes. The KISS Model is being updated and will serve as the initial foundation for modeling flow information collected during the Flow Characterization Study (FCS) being done as part of the approved Interim Act 537 Plan.

Over the years while the Signatories were working on their remediation projects and programs, there were periodic meetings with EPA and DEP. EPA acknowledged the progress in its letter of 11/2/2017 noting , " …it is evident that the ongoing efforts to reduce inflow and infiltration (I&I) and to generally upgrade and maintain the infrastructure in the area served by Kline's Island have been effective" and suggested that, rather than pursue multi-million dollar projects at the Kline's Island Wastewater Treatment Plant (KIWWTP), that the Signatories should work cooperatively and develop regional solutions to the problems which would be cost effective and provide continuing and lasting reductions in RDII. EPA suggested that the Signatories work cooperatively and submit a Regional Flow Management Strategy (RFMS). The RFMS was submitted in accordance with EPA's directive in 2018. This Regional Flow Management Strategy was intended to guide the development and implementation of Signatories' individual sewer I&I reduction plans so that they provide results that support the achievement of both municipal and regional goals for sewer system performance. This Strategy reflects broad-based commitments of action, collaboration, and cooperation. The RFMS contained flow characterization studies and anticipated conveyance or storage expansions to handle current and future dry and peak wet-weather flows.

EPA accepted the RFMS and withdrew the AOs on 3/19/2019 noting, "EPA has reviewed the regional flow management strategy and has found it acceptable" and "…hereby finds that all of the Respondents to the Administrative Orders CWA-03-2009-0313DN and CWA-03-2007-0332DN have completed the requirements". Oversight of the RFMS was delegated to DEP. DEP reviewed the RFMS and issued a review and comment letter to which the contributors responded.

Unfortunately, beginning in August 2018 and continuing through July 2019, the Lehigh Valley received the most annual rainfall since local rainfall data began being collected in 1895. The Lehigh Valley experienced 67 inches in 2018 and 61 inches in 2019, well over the annual average of 45 inches. In particular, during the 12-month period of August 2018 through July 2019, the region received 80 inches of precipitation. These continuing rainfalls saturated the ground surrounding the collection system piping of all service areas. The groundwater levels were 20-25 feet above normal during and after that annual period.

In addition to the 2018-2019 situation, DEP expressed concerns about future growth and continued efforts to address RDII. Beginning in August 2019, a series of meetings were held with representatives of DEP and the Signatories, to address the 2019 hydraulic overload. DEP required a Corrective Action Plan be developed that would include elements already in the RFMS. An Interim Act 537 Plan was to be submitted by mid-September 2020 which would include the steps for developing a Long-term Act 537 Plan to be submitted in 2025.

More specifically, the discussions focused on evaluating and documenting the KIWWTP's capacity to address continued higher flows if wet-weather patterns continue, illustrating the region's commitment to cooperative management of the KISS, and developing a plan to address the long-term capacity requirements of the system to meet the economic and environmental needs of the region. Through these discussions, a three-phase approach has been developed as follows:

Phase 1 – 2020 Corrective Action & Connection Management Plan

Beginning in 2020, all new connections for all Signatories to the KISS were managed under the terms of a regional corrective action plan managed by DEP and implemented by LCA under the requirements of an Interim Act 537 Plan developed by the Signatories and submitted to DEP by September 2020. The primary thrust of the corrective action plan is the development of the Interim Act 537 Plan, quarterly progress

reporting to DEP, and new developments requiring sewer service approved in accordance with a formal allocation request to DEP. The Interim Act 537 Plan was approved by DEP on January 17, 2020.

Phase 2 – Interim Act 537 Plan, Corrective Action & Connection Management Plan

From 2021 to 2025, the KISS Signatories will work cooperatively to develop a regional Long-Term Act 537 Plan. This plan will evaluate all Signatories' dry-weather and wet-weather flows projected through 2050, including peak flows and anticipated changes in regional weather patterns, and develop the facilities plan and other actions required to address those needs.

DEP's requirements for the Act 537 Sewage Facilities Plan include an evaluation of flows that can be removed by I&I programs in addition to construction of new facilities such as upsized parallel interceptors, pump stations, storage tanks, and treatment plant expansion/upgrades. This work will include flow monitoring and an update to the KISS hydraulic model to support the revised analysis of options previously evaluated, such as expansion of the KIWWTP, upgrade of LCA's Industrial Pretreatment Plant to provide full treatment, construction of parallel interceptors, construction of regional pump stations, and construction of storage facilities to address peak flows after consideration of I&I removal estimates. The plan that is ultimately developed and proposed to DEP by 2025 will include a financial and organizational / legal analysis to determine appropriate cost-sharing and inter-municipal agreement structures.

While this critical planning work is being completed, all KISS Signatories will continue to implement ongoing I&I source removal programs within their sewer collection systems. LCA will move forward on design and construction of facilities to address the hydraulic bottleneck in the system located in the Trexlertown area to improve service to customers in this area. This project was kicked off in 2019 with a feasibility study and hydraulic modeling being conducted in 2020.

New sewer connections during the time period of 2021 to 2025 will be based on the needs identified in the approved Interim Act 537 Plan and the region's satisfactory progress on this work as reported in quarterly reports to DEP. This Interim Act 537 Plan was approved by PADEP on June 25, 2021.

Phase 3 – Regional Act 537 Plan

Implementation will begin upon approval by DEP. Approval of new connections to the sewer system after 2025 will be based on details of the plan and plan approval by DEP. This plan is scheduled to be submitted to DEP in March 2025.

I. PREVIOUS WASTEWATER PLANNING

A. EXISTING WASTEWATER PLANNING

1. PREVIOUS ACT 537 PLANNING

In September of 2020, the KISS municipalities submitted an Interim Act 537 Plan to DEP. That Plan was subsequently approved by DEP in June of 2021. Among other issues, the Interim Act 537 Plan included a schedule to address conveyance issues in the Western Lehigh Interceptor near Trexlertown. This Special Study is a result of the Interim Act 537 Planning effort.

In 2009, peak flow issues in the Western Lehigh Sewerage Partnership (WLSP) service area caused the DEP to review sewer connections in the WLSP communities. The WLSP communities consist of Upper Milford Township, Weisenberg Township, Lower Macungie Township, Upper Macungie Township, Lowhill Township, Borough of Alburtis and the Borough of Macungie. Pursuant to communications with PADEP and in accordance with Chapter 94 requirements, LCA and the above municipalities and, where applicable, their wastewater authorities, elected to prepare and implement a corrective action plan to collectively address the problems within each of these sanitary sewer systems. The Sewer Capacity Assurance and Rehabilitation Program (SCARP) was the resulting corrective action plan (approved by DEP in 2011 and was in place until late 2019).

Prior to the DEP approval, the *Sewer Capacity Assurance and Rehabilitation Program* was initiated by the Wester Lehigh Sewage Partners to address peak wet weather flows in the Western Lehigh service area. Subsequently, in 2018, the Western Lehigh Sewage Partners developed *Source Reduction Plans* and *Capital Improvement Plans* for each of the municipalities in the WLI, including Upper Macungie Township and Lower Macungie Township (these Plans were submitted to the EPA and PA DEP in 2018 – see below).

In August of 2018, the City of Allentown and its Signatories submitted a Regional Flow Management Strategy (RFMS) to USEPA and PADEP. The key components of the RFMS included: 1) collection system operation and maintenance, 2) system characterization, 3) inflow and infiltration removal, and 4) flow monitoring. The RFMS coordinates the development and implementation of each Signatory's I/I Source Reduction Program (SRP), in order to maximize the reduction of the excess infiltration and inflow from the sanitary sewer system.

While not a focus of this Special Act 537 Study, the Iron Run Pump Station was conceived in the mid-1990s and was designed in the 2000s. This pump station would also have diverted flow away from the WLI via a pump station and force main. The force main would have tied directly into the Spring Creek force main. This project was ultimately not built due to downstream surcharging issues. The 3 million gallon Flow Equalization Basin (FEB) at the PTP was built instead in 2010 (as part of the SCARP program) to relieve WLI issues.

In addition, a study was completed in 2020 to identify parallel interceptor routes in the Trexlertown area. Since hydraulic sewer modeling also indicates that this parallel interceptor option also caused downstream surcharging issues, the recommended route is not being selected for this Study.

With the approval of the Interim Plan, the provisions of the SCARP discontinued and were replaced by the Interim Plan. In addition to the Interim Act 537 Plan that was approved in 2021, the two affected municipalities also have previous wastewater planning:

Upper Macungie Township

In 2010, Upper Macungie Township submitted an Act 537 Planning Supplement to PA DEP to supplement its previous Act 537 Sewage Facilities Plan which was approved March 10, 1993. The supplement serves to expand the public sewer service area and add a new On-lot Sewage Management Program, to address the needs of individual on-lot systems in the Township. The Township also has an approved Sewer Capacity Assurance & Rehabilitation Program dated October 2009 that was approved and adopted by the Township. Refer to the prior page for details on the discontinued SCARP.

Lower Macungie Township

Lower Macungie Township submitted an Act 537 Planning Supplement to PA DEP to supplement its previous Act 537 Sewage Facilities Plan, which was approved January 1, 1987. The supplement serves to expand the public sewer service area and add a new On-lot Sewage Management Program, to address the needs of individual on-lot systems in the Township. The current supplement is dated January 2, 2013. The Township also has an approved Sewer Capacity Assurance & Rehabilitation Program dated October 2009 that was approved and adopted by the Township. Refer to the prior page for details on the discontinued SCARP.

2. IMPLEMENTATION SCHEDULE OMITTED ITEMS

There are no tasks within the current implementation schedule from the interim act 537 plan that were omitted. All tasks from that plan are presently on schedule.

3. CHAPTER 94 CORRECTIVE ACTION PLAN

Although the Interim 537 Plan was approved in June 2021 and the region received the Part 2 permit hydraulic re-rate for the Kline's Island WWTP in December 2021, the KISS system is still operating under the terms of a Chapter 94 connection management plan (Corrective Action Plan) through at least March 2025.

II. PHYSICAL AND DEMOGRAPHIC ANALYSIS

A. PLANNING AREA, MUNICIPAL BOUNDARIES, SERVICE AREA BOUNDARIES

The planning area for this section of the WLI is Upper Macungie Township and Lower Macungie Township. Both townships are part of The Kline's Island Sewage System (KISS) which provides service to a large area including the City of Allentown, Upper Milford Township, Weisenberg Township, Borough of Alburtis, Borough of Emmaus, Borough of Macungie, Lower Macungie Township, Lowhill Township, Salisbury Township, South Whitehall Township, Upper Macungie Township, North Whitehall Township, Coplay Borough, Whitehall Township and Hanover Township.

Upper Macungie Township and Lower Macungie Township are adjacent to each other and located southwest of the City of Allentown. Refer to the KISS Planning Area Map in Appendix 1 and the Collection System Maps found in Appendix 2 which shows the extent of the existing sewer system in the Planning Area.

B. PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

The physical characteristics of the Planning Area are shown on the Topographic Map, the Wetlands and Hydric Soils Map and the Floodplains Map found in Appendices 3, 4 and 5, respectively.

Upper Macungie Township

Upper Macungie Township is approximately 25 square miles and is located in western Lehigh County with a resident population of over 26, 000 and a working population of approximately 45,000. The Township is

bordered by South Whitehall Township to the east, Lower Macungie Township to the south, Berks County to the west and Lowhill and Weisenberg Townships to the north. The majority of the Township lies within the Little Lehigh Creek Watershed with a small portion located in the Jordan Creek Watershed.

Lower Macungie Township

Lower Macungie Township is one of the largest municipalities in the Lehigh Valley, covering 22.6 square miles. The population has been rapidly increasing, growing 60% from 2000 to 2010 according to the Census. The Township is drained by Little Lehigh Creek and Swabia Creek.

C. WETLAND IDENTIFICATION

The National Wetlands Inventory for Pennsylvania was consulted to determine if wetlands or hydric soils were located in the area of the proposed project. Appendix 4 includes a map indicating those areas identified as wetlands or hydric soils. The proposed project does not impact wetlands or hydric soils.

III. EXISTING SEWAGE FACILITIES IN THE PLANNING AREA

A. MUNICIPAL AND NON-MUNICIPAL, INDIVIDUAL, AND COMMUNITY SEWERAGE SYSTEMS IN THE PLANNING AREA

1. LOCATION, SIZE, AND OWNERSHIP OF FACILITIES

Sewage flows originating in northwest section of Upper Macungie Township are transported by gravity in the Western Lehigh Interceptor into Lower Macungie Township on its way to the Spring Creek Pump Station. The WLI and the Spring Creek Pump Station are owned, operated and maintained by the Lehigh County Authority and ranges in size from 21” to 36”.

Sewage flows originating in the upper central section of Upper Macungie Township are transported by gravity in the Upper Macungie Trunk Line (UMTL) on its way to the Spring Creek Pump Station. The UMTL is owned and maintained by Upper Macungie Township and ranges in size from 12” to 24”.

Lower Macungie Township has multiple connection points into both the WLI (both upstream and downstream of the Spring Creek Pump Station) and the UMTL.

A significant portion of the LCA flow receives pretreatment at the LCA Industrial Pretreatment Plant (PTP) located in Upper Macungie Township. This partially-treated wastewater is then conveyed to the City of Allentown’s KIWWTP via the WLI.

The Spring Creek Pump Station discharges to LCA’s Little Lehigh Relief Interceptor – upstream of both the LCA Park Pump Station (located in the Allentown Parkway) and the KIWWTP.

2. PROBLEMS WITH EXISTING FACILITIES

The Western Lehigh Interceptor (WLI) originates in Upper Macungie Township and flows into Lower Macungie Township on its way to the Spring Creek Pump Station. Due to peak wet weather flows and a very flat profile, the WLI has experienced surcharging and sanitary sewer overflows (SSO’s). The KISS modeling of alternatives identified the 2-mile section of the Western Lehigh Interceptor from just north of

Hamilton Boulevard through to Spring Creek Road as being currently within 0.5 MGD of its dry weather capacity and within a decade of being well over its wet-weather level of protection (LOP) goals. The capacity issues with the WLI have been well documented and were the subject of a *2009 Sewer Capacity Assurance and Rehabilitation Program* initiated by the Wester Lehigh Sewage Partners. Subsequently, in 2018, the Western Lehigh Sewage Partners developed *Source Reduction Plans* and *Capital Improvement Plans* for each of the municipalities in the WLI, including Upper Macungie Township and Lower Macungie Township.

A more detailed description of problems with the existing facilities can be found in Appendix 6 - Arcadis Interim Pumping Solution Analysis and Cost Estimate.

IV. FUTURE GROWTH AND LAND DEVELOPMENT

A. IDENTIFICATION OF MUNICIPAL AND COUNTY PLANNING DOCUMENTS

1. ZONING AND LAND USE FOR THE PLANNING AREA

There are several land use ordinances that can be used as a guide for planning future needs in the Planning Area. Each municipality has its own land use ordinances, as follows:

- Upper Macungie Township Subdivision and Land Development Ordinance and Zoning Ordinance
- Lower Macungie Township Subdivision and Land Development Ordinance and Zoning Ordinance

The purpose set forth by these subdivision and land development ordinances is as follows:

- to provide and protect for the public health, safety, and general welfare of the community;
- to guide for future growth and development of the municipality in accordance with the Comprehensive Plan;
- to provide for adequate light, air, and privacy, to secure safety from fire, flood, and other danger, and to prevent overcrowding of the land and undue congestion of population;
- to protect the character and the social and economic stability of the municipality and to encourage the orderly and beneficial development of the municipality;
- to protect and conserve the value of the land throughout the municipality and the value of buildings and improvements upon the lands; and to minimize the conflicts among the uses of land and buildings;
- to guide public and private policy and action in order to provide adequate and efficient transportation, water, sewerage, schools, parks, playgrounds, recreation, and other public requirements and facilities;
- to provide the most beneficial relationship between the uses of land and building, the circulation of pedestrian and vehicular traffic throughout the municipality, having particular regard to the

avoidance of congestion in the streets and highways, and to provide for the proper location and width of streets and building lines;

- to establish reasonable standards of design and procedures for land development in order to further the orderly layout and use of the land; and to ensure proper legal descriptions and monumenting of land developments;
- to ensure that public facilities and available and will have a sufficient capacity to serve the proposed subdivision and/or land development;
- to prevent the pollution of air, streams, and ponds; to ensure the adequacy of drainage facilities; to safeguard the water table; and to encourage the wise use and management of natural resources throughout the western Lehigh region in order to preserve the integrity, stability, and the beauty of the community and the value of the land;
- to ensure the natural beauty and topography of the municipality and to ensure appropriate development with regard to these natural features; and
- to provide for adequate open space through the most efficient design and layout of the land.

The purpose set forth by the municipal zoning ordinance is as follows:

To promote the public health, safety, morals or the general welfare of the present and future inhabitants of the municipality by:

- Encouraging the most appropriate use of land;
- Preventing the overcrowding over land;
- Avoiding undue congestion of population;
- Conserving the value of land and buildings;
- Lessening the congestion of traffic on the roads and highways;
- Providing for adequate light and air;
- Securing safety from fire, panic, flood or other dangers;
- Facilitating the adequate provision of transportation, vehicular parking and loading space, water, sewerage, schools, parks and other public grounds and facilities;
- Giving reasonable consideration, among other things, to the character of all areas of the Township and their particular suitability for particular land uses;
- Giving effect to the policies, proposals, and the statement of community development objectives contain in the Comprehensive Plan; and
- Promoting small business development and fostering a business-friendly environment in the municipality.

2. IDENTIFICATION OF ZONING REGULATIONS

Each municipality in the Planning Area has its own Zoning Ordinance/Code that serves to establish regulations that apply to all zoning districts.

B. DESCRIPTION OF GROWTH AND DEVELOPMENT

1. AREAS WITH EXISTING DEVELOPMENT OR PLOTTED SUBDIVISIONS

The municipalities have a network of trunk mains and tributary mains that collect flow from subdivisions within the Planning Area. The map in Appendix 2 shows the bounds of the existing collection and conveyance system. However, it is not the intent of this Plan to preclude a planning module from expanding the service area.

2. LAND USE DESIGNATIONS

Land use within the Planning Area is designated per each municipality's respective Zoning Ordinance. Zoning for the Planning Area can be found within each municipality's Zoning ordinance. Each Municipality submitted flow projections consistent with their respective Municipal Zoning Ordinance.

3. FUTURE GROWTH AREAS, POPULATION, AND EDU PROJECTIONS FOR THE PLANNING AREA

Growth and development projections for Upper Macungie Township and Lower Macungie Township for the period 2020-2050 can be found in Table 4.1. These projections were determined by each municipality based on known pending or anticipated development. These flow projections are based on only new projected planning modules and do not include previously approved modules. Individual flow projections for each Signatory, including project locations, EDUs, parcel address, type of development and development year can be found in Appendix 7.

The UMTL's existing 2021 average dry day flow entering just upstream of the Spring Creek Pump Station is approximately 0.85 MGD. Of this 2021 dry day flow, approximately 0.33 MGD is from the various Lower Macungie Township upstream connection points. The 2021 peak dry day flow was 1.40 MGD and the ultimate peak flow was 4.75 MGD.

This Special Study does not propose the expansion of any existing sewer service areas.

Table 4.1 are the projected total flows for both Townships in accordance with the DEP approved 2020 Connection Management Plan, the DEP approved Interim 537 Plan, and preliminary numbers for the Final Act 537 Plan (2026-2050).

Table 4.1

MUNICIPALITY	2020 FLOW PROJECTION (GPD) APPROVED	2021-2025 FLOW PROJECTION (GPD) APPROVED	2026-2050 FLOW PROJECTION (GPD)
Lower Macungie Township	276,996	286,778	147,153
Upper Macungie Township	428,269	458,711	689,607
Total	705,265	745,489	836,760

4. ZONING AND/OR SUBDIVISION REGULATIONS FOR PLANNED DEVELOPMENT

The Subdivision and Land Development regulations, which govern development within the Planning Area, are included in each individual municipality's Subdivision and Land Development Ordinances. These regulations provide each municipality with design standards for open space, recreation, storm water management, sanitary sewage systems, water supply, and other public utilities.

5. SEWAGE PLANNING NECESSARY TO PROVIDE ADEQUATE TREATMENT FOR 5- AND 10-YEAR FUTURE PLANNING PERIODS

As noted in the previous section, this Special Study is based on a planning horizon of 2025 to 2050 as it relates to evaluating interceptor capacities.

Note that of the flows listed for UMT in Table 4.1, approximately 0.17 MGD of additional dry day peak flow is expected to enter the UMTL (upstream of the proposed connection point) by 2050. Of the flows listed for LMT in Table 4.1, approximately 0.05 MGD of additional dry day peak flow is expected to enter the UMTL by 2050. In other words, this interceptor drainage basin is well built out already. All of this has been accounted for in the hydraulic sewer model when preparing the alternative analyses.

V. IDENTIFY ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

A. CONVENTIONAL COLLECTION, CONVEYANCE, TREATMENT AND DISCHARGE ALTERNATIVES

1. POTENTIAL TO EXTEND EXISTING FACILITIES TO AREAS OF NEED

The purpose of this Special Study is to address the conveyance capacity within the WLI near Trexlertown. Extending existing facilities is not being considered in this Special Study. However, it is not the intent of this Special Study to preclude a planning module from expanding the service area.

2. NEED FOR NEW COMMUNITY SEWAGE SYSTEMS

Two alternatives are being considered to temporarily resolve the hydraulic issues in the Western Lehigh Interceptor. They are:

a. A new interim pump station located at the Lehigh County Industrial Pretreatment Plant that will divert flow away from the Western Lehigh Interceptor and pump it into the Upper Macungie Trunk Line (UMTL) at manhole PH3034A. The UMTL has adequate unused capacity and flows by gravity into the Spring Creek Pump Station. Note that the Western Lehigh Interceptor also flows by gravity into the Spring Creek Pump Station, so the impact on the Spring Creek Pump Station should be negligible.
b. A new interceptor that will parallel Iron Run and Western Lehigh Interceptors from Gun Club (U67) and Spring Creek Road (L300), providing in-line storage to handle diurnal peaks without moving dry day SSOs into Ancient Oaks section (the Western Lehigh Interceptor in this area).

The new pump station alternative is the preferred alternative. Modeling shows that at a pumping rate of 2.5 MGD, total system overflows during the model proofing period (2030) drops 94.5 % without causing overflows in the UMTL. There are 44 manhole segments in the UMLT from the proposed connection to

Spring Creek Pump Station, the average capacity is 6.74 MGD (minimum of 3.70 MGD and maximum of 18.06 MGD). Flow (design point of 2.5 MGD) entering the UMLT from the proposed pump station will be controlled via downstream control point(s) in the UMLT. The exact location(s) will be determined during the design phase. See Appendix 6 for more information on the sewer modeling.

Provisions for the Final Act 537 Plan will be made as appropriate. These potential provisions include, but are not limited to, the following: (1) parallel force main; (2) additional pump location; (3) wet well sizing. The Final Act 537 Plan that is due by March 2025 will discuss details of the potential future decommissioning of this proposed pump station.

Alternative 2, the parallel interceptor with in-line storage, was determined to not work since downstream pipes are too small to convey the projected flows. Under this alternative, all projects under consideration for the Final 537 Plan would need to be implemented first; thus, this alternative cannot be selected at this time.

The selected alternative includes the construction of a new sewage pump station and force main to transfer sewage flows away from the WLI and into the UMTL. These are the only new sewage systems being contemplated under this Special Study. This is not considered an extension of existing facilities. However, it is not the intent of this Special Study to preclude a planning module from expanding the service area.

Refer to Appendix 6 for a detailed description of each alternative.

B. NO-ACTION ALTERNATIVE IMPACTS

The No-Action alternative could have adverse impacts on water quality/public health, growth potential, Community Economic Conditions, recreational, opportunities, drinking water sources and may create other environmental concerns.

No-Action would eventually result in an increase of sanitary sewer overflows and would adversely impact public health, recreation and drinking water supplies. Furthermore, no-action would precipitate a prohibition of new connections resulting in diminished economic conditions and potential environmental degradation.

1. WATER QUALITY/PUBLIC HEALTH

An increase or continuation of sanitary sewer overflows would have a negative impact on water quality and public health.

2. GROWTH POTENTIAL

An increase or continuation of sanitary sewer overflows would limit or prevent additional connections to the sewer system in this service area. A connection limitation or moratorium would negatively impact growth potential in the service area.

3. COMMUNITY ECONOMIC CONDITIONS

An increase or continuation of sanitary sewer overflows would result in a limitation or moratorium to connections as discussed in the section above. These limitations would suppress or stop economic growth in the service area.

4. RECREATIONAL OPPORTUNITIES

An increase or continuation of sanitary sewer overflows would negatively impact local waterways and could limit recreational activities such as swimming, fishing and boating.

5. DRINKING WATER SOURCES

An increase or continuation of sanitary sewer overflows could negatively impact downstream drinking water sources by increasing the concentrations of contaminants in the drinking water source supply.

6. OTHER ENVIRONMENTAL CONCERNS

An increase or continuation of sanitary sewer overflows could negatively impact public health due to the increased potential for human direct contact with untreated sewage.

VI. EVALUATION OF ALTERNATIVES

A. CONSISTENCY DETERMINATION

Title 25, Chapter 71.21(a)(5) of the Pennsylvania Code requires that each alternative which is available to provide for new or improved sewage facilities for each area of need be evaluated for consistency with the objectives and policies of Comprehensive Plans, state water plans, plans developed under Chapter 94, plans developed under the Federal Water Quality Act, anti-degradation requirements, Pennsylvania's prime agriculture land policy, plans adopted by the county and approved PA DEP under the Storm Water Management Act, wetland protection, protection of rare, endangered or threatened plant and animal species as identified by the Pennsylvania Natural Diversity Inventory, and the Historical and Museum Commission. The consistency determination is as follows:

1. CLEAN STREAMS LAW/ CLEAN WATER ACT

Sections 4 and 5 of the Clean Streams Law require that consideration be given to water quality management and pollution control in a watershed as a whole. The 2009 Sewer Capacity Assurance & Rehabilitation Program for the Western Lehigh Partners was superseded by the DEP approval of the Interim Act 537 Plan in June of 2021. Flow issues in the Kline's Island Sewer System and activation of bypass Outfall 003 led USEPA to issue two Administrative Orders in 2007 and 2009. Both required the KISS municipalities to reduce excessive I/I flow into the collection system. Both Administrative Orders were satisfactorily resolved.

2. MUNICIPAL WASTELOAD MANAGEMENT PLANS

Upper Macungie Township and Lower Macungie Township annually submit a Chapter 94 Municipal Wasteload Management Report to DEP for their respective systems. The 2020 Chapter 94 Plans submitted by the municipalities identified their individual efforts toward extraneous I/I flow reduction. This Special Study is consistent with the plans identified in the Municipal Chapter 94 Reports.

3. TITLE II OF THE CLEAN WATER ACT

There are no current Section 201 Facility Plans in effect on this system. Therefore, there are no Section 201 Facility plans with which to measure consistency.

4. COMPREHENSIVE PLANNING

Municipal Comprehensive Plans designate areas for residential, commercial, and industrial developments and agricultural preservation and floodplain areas within the two affected municipalities. This Special Study is consistent with the Comprehensive Plans of the two affected Municipalities. A brief summary of each municipality's comprehensive plan is as follows:

Upper Macungie Township

The Upper Macungie Township Comprehensive Plan (A Plan for Growth Management and Preservation) was adopted October of 2019. The primary goals of the plan are to protect the community character of the Township and protect its natural resources and farmland preservation along with sustainable development. This plan does not expand the Township's current Urban Growth Boundary (Act 537 Boundary) but rather encourages extending the Open Space Preservation District zoning regulations outside the Act 537 Sewer Service Area to protect natural resources.

Lower Macungie Township

Lower Macungie Township is a part of the Southwestern Lehigh County Comprehensive Plan, adopted by the Township in April 2005. The other municipalities addressed in the Comprehensive Plan are Alburtis, Emmaus and Macungie Boroughs, and Lower Milford and Upper Milford Townships. The major recommendations include updating each municipality's development regulations to carry out the land use plan, updating existing zoning ordinances, and resolving outstanding traffic issues.

5. ANTIDEGRADATION REQUIREMENTS

Chapters 93, 95 and 102 under Pennsylvania's Clean Stream Law classifies all surface waters according to uses to be protected and establishes water quality criteria which need to be maintained in the surface waters. The proposed alternatives in the Special Study do not propose to increase the monthly average flow at the KIWWTP and is consistent with Chapter 95 and 102. No new surface water discharges are proposed under this Special Study.

6. STATE WATER PLANS

In order to meet the rapidly expanding demands for water throughout the Nation, it the policy of the Congress to encourage the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis by the Federal Government, States, localities, and private enterprise with the cooperation of all affected Federal agencies, States, local governments, individuals, corporations, business enterprises, and others concerned. The selected approach in this Special Study does not propose any new discharges to receiving waters and is; therefore, consistent with state water plans.

7. PENNSYLVANIA PRIME AGRICULTURAL LAND POLICY

Both Lower Macungie Township and Upper Macungie Township have zoning and planning in place to identify and protect prime agricultural land.

Lower Macungie Township's Zoning Ordinance includes an Agricultural Protection District whose purpose is to "protect and promote the continuation of agriculture, particularly in areas with prime agricultural lands, consistent with the Governor's Executive Order 2003-2 dated March 20, 2003. To support the Governor's Executive Order regarding the irreversible conversion of prime agricultural land to uses that result in its loss as an environmental and essential food and fiber resource across the Commonwealth of Pennsylvania. To implement the 2005 Southwestern Lehigh County Comprehensive Plan and the Lehigh Valley Comprehensive Plan 2030, which emphasizes the need for effective zoning regulations to preserve prime agricultural land and to identify the AP-Agricultural Protection District as an area which includes Class I and Class II soils which are the "very best agricultural soils."

Upper Macungie has similarly addressed the protection of prime agricultural land in their Township Comprehensive Plan and Zoning Ordinance which includes the adoption of Agricultural Protection Zones (APZ). Among other strategies, the Comprehensive Plan includes "maintaining the Urban Growth Boundary (the Township's established Act 537 Growth Boundary) to assure that agricultural lands not preserved adjacent to this boundary are not targeted for development."

An overlay map of prime agricultural soils can be found in Appendix 8.

8. COUNTY STORMWATER MANAGEMENT PLANS

In 2005 the Lehigh Valley Planning Commission prepared an Act 167 update for the Little Lehigh Creek. The updated plan includes an exemption from certain requirements of the Ordinance in the Plan and Ordinance for new developments which are expected to have an insignificant impact on the watershed. The exemption provides that any development which would create 10,000 square-feet or less of additional impervious cover will not be required to meet the Drainage Plan. The proposed pump station anticipated in the selected alternative will be considerably less than 10,000 square-feet of impervious area.

9. WETLAND PROTECTION

The National Wetlands Inventory for Pennsylvania was consulted to determine if wetlands or hydric soils were located in the area of the proposed project. Appendix 4 includes a map indicating those areas identified as wetlands or hydric soils. The proposed project does not impact wetlands or hydric soils.

10. PROTECTION OF RARE, ENDANGERED OR THREATENED PLANT AND ANIMAL SPECIES

Pennsylvania Department of Conservation and Natural Resources Project Search (ID: PNDI-744909) was conducted to determine if the proposed project would impact endangered or threatened species. The Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. A copy of the PNDI result is included in Appendix 9.

11. HISTORICAL AND ARCHEOLOGICAL RESOURCE PROTECTION

A.D. Marble, Inc. conducted an archaeological Area of Potential Effects (APE) study of the project area encompassed by the proposed force main. No historic artifacts were recovered during the survey. No subsurface historic or precontact features were identified within the APE during the survey. A full copy of the APE study can be found in Appendix 10.

B. RESOLUTION OF INCONSISTENCIES

No inconsistencies were identified in the consistency evaluation.

C. COST ESTIMATES AND PRESENT WORTH ANALYSIS

As outlined in the Arcadis memo in Appendix 6, the cost estimates for the two alternatives can be summarized as follows:

ALTERNATIVE	PROBABLE COST
Interim Pump Station	$6,000,000
Interceptor / In-Line Storage	$30,000,000

A present worth analysis was not completed because of the significant difference in costs between the two alternatives. Also, a 20-year present worth analysis on an interim facility may not be valid.

D. FINANCING METHODS

This project was anticipated by the Lehigh County Authority and funding for it was built into the 2022-2026 capital plan. The funding for the Trexlertown Project would be from Lehigh County Authority cash reserves. The municipalities would be back charged in accordance with the intermunicipal agreements.

E. ADMINISTRATIVE ORGANIZATIONS AND LEGAL AUTHORITY TO IMPLEMENT THE ALTERNATIVE

The current organizations, authorities, municipalities and their inter-municipal agreements are sufficient and legal to implement the selected alternatives. However, an interceptor operating agreement between UMT and LCA will be needed to implement this alternative.

VII. INSTITUTIONAL EVALUATION

A. ANALYSIS OF THE MUNICIPALITIES, PAST ACTIONS, AND PRESENT PERFORMANCE

1. FINANCIAL & DEBT STATUS

Approval of the Special Study shall be based on the feasibility for implementation of the selected alternative in relation to applicable administrative and institutional requirements. The Lehigh County Authority and its partners, including Upper Macungie Township and Lower Macungie Township, have the appropriate inter-municipal agreements in place to proceed with the selected alternative. Appropriate financial planning is in place to adequately finance the project.

2. STAFFING AND ADMINISTRATIVE RESOURCES

Lehigh County Authority maintains adequate professional and administrative staff to perform these projects. Staff is regularly supplemented with outside professional staff to perform detailed planning, design, permitting and construction phase services.

3. LEGAL AUTHORITY

Through existing inter-municipal agreements, Upper Macungie Township and Lower Macungie Township have authorized Lehigh County Authority to be their agent in managing the sewer interceptors in their respective townships. Lower Macungie Township and Upper Macungie Township both own and operate their respective collection systems and are responsible for billing for sewer services. Through an existing inter-municipal agreement, the Lehigh County Authority sends a quarterly bill to the two Townships which is based on the amount of water used per property. The two Townships pay Lehigh County Authority for this service and then directly bill the Township sewer customers to recoup the cost.

a. Implement Recommendations
   The Lehigh County Authority owns and is responsible for the operation and maintenance of the WLI and Spring Creek Pump Station. LCA owns the Pretreatment Plant which is operated under contract by Jacobs. The UMTL is owned, operated, and maintained by Upper Macungie Township. LCA will own, operate, and maintain the new proposed pump station and force main. LCA will have the responsibility to build the pump station and force main described in the selected alternative.

b. Implement Operation & Maintenance Activities
   The Lehigh County Authority is responsible for the operation of the WLI and the Spring Creek Pump Station as well as the Lehigh County Pretreatment Plant. The Authority already is responsible for operations and maintenance and will continue to have the responsibility for these facilities as well as the proposed pump station and force main described in the selected alternative.

c. Set User Fees and Purchasing
   The Lehigh County Authority has an administrative staff that performs purchasing duties as part of the Authority's responsibilities under the inter-municipal agreements with Upper Macungie Township and Lower Macungie Township. The same inter-municipal agreements establish the fees that Lehigh County Authority will charge the Townships for their services. The Townships then determine the appropriate user fees to charge the Township sewer customers.

d. Negotiate Agreements
   Through existing inter-municipal agreements, Upper Macungie Township and Lower Macungie Township have authorized Lehigh County Authority to be their agent in managing the sewer interceptors in their respective townships. The Lehigh County Authority is authorized to negotiate agreements in order to perform the responsibilities outlined in the inter-municipal agreements.

e. Raise Necessary Capital
   Through existing inter-municipal agreements, Upper Macungie Township and Lower Macungie Township have authorized Lehigh County Authority to be their agent in managing the sewer interceptors in their respective townships. The Lehigh County Authority is authorized to raise capital in order to perform the responsibilities outlined in the inter-municipal agreements.

B. INSTITUTIONAL ALTERNATIVES NECESSARY TO IMPLEMENT THE TECHNICAL ALTERNATIVE

1. FUNCTIONS OF EXISTING AND PROPOSED ORGANIZATIONS

The existing sewage collection and conveyance systems are owned by the respective municipality and operated by either the respective municipality or a service agreement with LCA. The municipalities have the necessary staff and resources in place for day-to-day operations and maintenance of the overall system either through their own authority or an agreement with another, and the existing municipal governments oversee this staff.

2. COST OF ADMINISTRATION, IMPLEMENTABILITY AND CAPABILITY OF LCA TO REACT TO FUTURE NEEDS

Lehigh County Authority has existing administrative, planning, engineering and purchasing departments already established and capable of performing multiple large infrastructure projects. The cost to administer the selected alternative can easily be included into the existing structure of the Authority. The selected alternative is a project that is very similar in nature to dozens of projects already performed by the Authority. The Authority performs robust capital planning as well as growth planning and is constantly evaluating future needs.

C. ADMINISTRATIVE AND LEGAL ACTIVITIES TO BE COMPLETED AND ADOPTED TO ENSURE THE IMPLEMENTATION OF THE TECHNICAL ALTERNATIVE

1. REQUIRED ORDINANCES, STANDARDS, REGULATIONS, AND INTER-MUNICIPAL AGREEMENTS

All required Ordinances, Regulations and inter-municipal agreements are already in place. Additional Ordinances or Regulations are not required. However, an interceptor operating agreement between UMT and LCA will be needed to implement this alternative.

2. LEGAL DOCUMENTS

All existing Inter-municipal Agreements that are in place are adequate to address the selected alternative. Additional legal documents are not required.

3. DATES AND TIMEFRAMES

No documents or other administrative activities are required to implement this Plan so there are no tasks to add to the Implementation Schedule.

D. IDENTIFY PROPOSED INSTITUTIONAL ALTERNATIVE FOR IMPLEMENTING THE SELECTED TECHNICAL ALTERNATIVE

No changes to the institutions are recommended to implement this Special Study.

The December 29, 1981 Inter-Municipal sewage agreement states in part that “the appropriate parties agree to enter into discussions and negotiations in an effort to attempt to arrive at agreements on the following matters:

1. The establishment of a regional sewer agency of some type to possibly own and operate the Treatment Plant, to plan and build any future treatment plants as they may be needed, to own and operate major interceptors and to own and operate all the collection systems themselves."

Although the Inter-municipal sewage agreement does not require the parties to agree to regionalization, the topic will be discussed as part of the Long-term Act 537 Planning process.

VIII. IMPLEMENTATION SCHEDULE AND JUSTIFICATION FOR SELECTED TECHNICAL AND INSTITUTIONAL ALTERNATIVES

A. IDENTIFY AND JUSTIFY THE SELECTED ALTERNATIVE BASED ON THE FOLLOWING:

The selected alternative is a new pump station located at the Lehigh County Industrial Pretreatment Plant that will divert flow away from the Western Lehigh Interceptor (WLI) and pump it into the Upper Macungie Trunk Line (UMTL).

1. EXISTING WASTEWATER DISPOSAL NEEDS

Sewage flow metering and modelling indicate an imminent need to divert sewage flows from the WLI. The existing interceptor is relatively flat and under surcharged conditions during dry-day flows and overflows during significant rain events. The selected alternative within this Special Study will help alleviate the dry-day surcharge conditions and will help to reduce the volume of overflows during significant rain events through 2035. The long-term solution (beyond 2035) will be identified in the Regional Act 537 Plan that is under development.

2. FUTURE WASTEWATER DISPOSAL NEEDS

Design of the selected alternative considers growth and flow projections from Upper Macungie Township and Lower Macungie Township through the 2050 planning horizon. Details of the Township's flow projections can be found in Appendix 7.

3. OPERATIONS AND MAINTENANCE CONSIDERATIONS

The existing Source Reduction Plans for collection systems and existing O&M plans for pump stations provide the necessary operations and maintenance for the selected alternative. LCA staff regularly operate and maintain pump stations throughout the LCA service area. The addition of the interim pump station will be easily assimilated into the LCA operations and maintenance program.

4. COST EFFECTIVENESS

Construction of a 2.5 MGD pump station and force main is a very cost-effective solution for dealing with capacity issues in a large diameter interceptor. The alternative of constructing a parallel interceptor with storage would be many times more expensive than the selected alternative.

5. AVAILABILITY OF MANAGEMENT AND ADMINISTRATIVE SYSTEMS

The existing Authority and Municipal institutions along with their inter-municipal agreements are adequate to implement the project selected in this Special Study. However, an interceptor operating

agreement between UMT and LCA will be needed to implement this alternative. Details of this new operating agreement are still being negotiated.

6. FINANCING METHODS

The Lehigh County Authority has a number of financing methods available to implement the selected alternative. The impacted Townships could fund the project, or LCA could finance the project and include the cost of financing in the quarterly user fee to the Townships. LCA also has the ability to borrow funds, issue bonds and submit grant funding applications.

7. ENVIRONMENTAL SOUNDNESS

The selected alternative proposes to construct a small pump station at the existing site of the Lehigh County Pretreatment Plant. The proposed force main is approximately 1.5 miles long and primarily located within the recreational parks of Upper Macungie Township. Application through the Pennsylvania Natural Diversity Index (PNDI) and the Pennsylvania Historic Museum Commission (PHMC) did not indicate any environmental or historic issues of concern. A review of national wetland inventory indicates that no wetlands will be impacted. Therefore, the selected alternative is consistent with environmental soundness and natural resource planning and preservation programs.

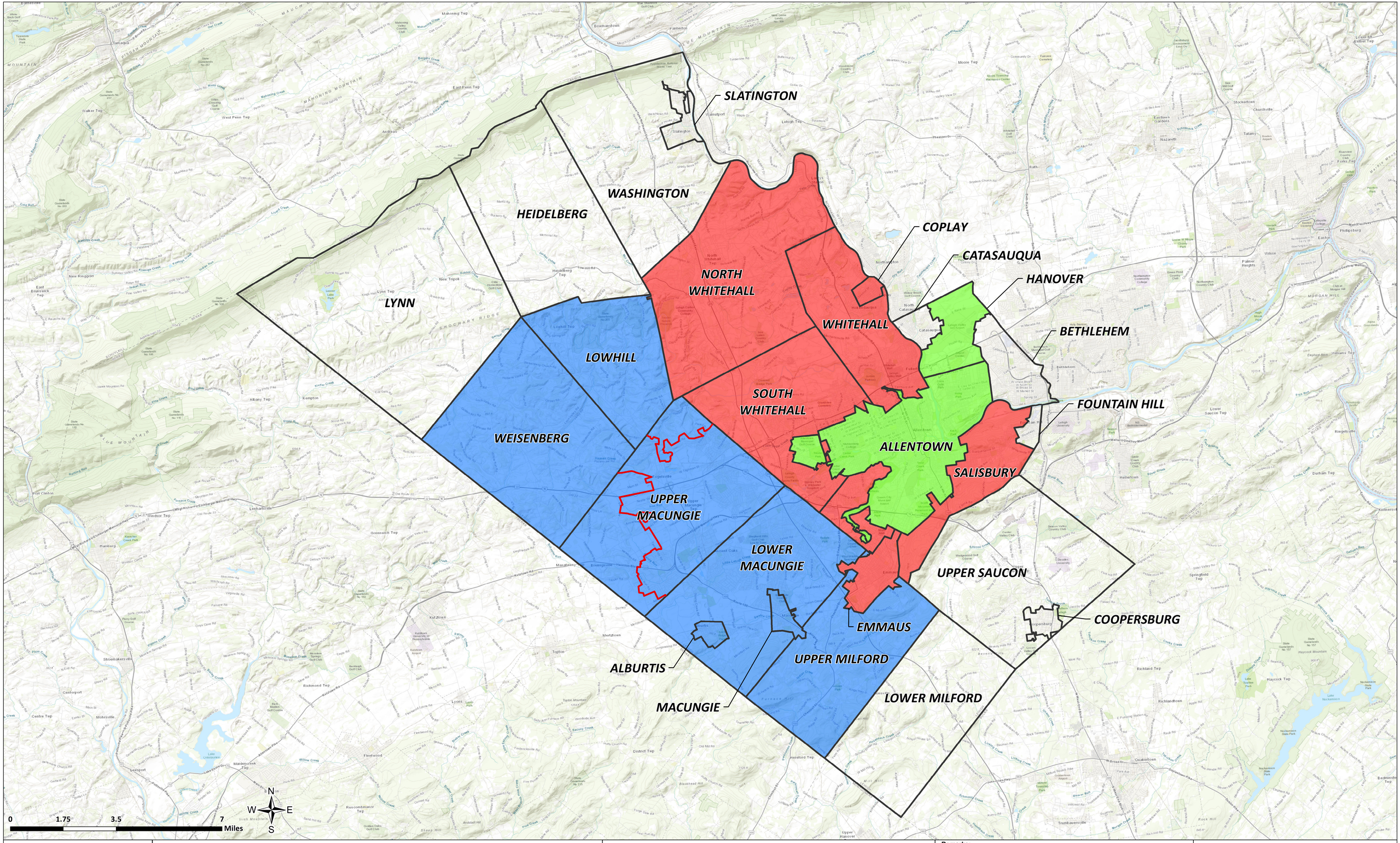
B. DESIGNATION OF FINANCING PLAN

This project was anticipated by the Lehigh County Authority and funding for it was built into the 2022-2026 capital plan. The funding for the Trexlertown Project would be from Lehigh County Authority cash reserves. The municipalities would be back charged in accordance with the intermunicipal agreements.

C. IMPLEMENTATION SCHEDULE

The following Implementation Schedule represents the necessary steps to implement the selected alternative of constructing a pump station and force main to divert sewage from the WLI to the UMTL. The table that follows is a best estimate of the time needed to complete the project recommended in this Special Study. The potential exists for changes during implementation which will be addressed and the schedule modified accordingly.

TASK	START	FINISH
Submit Special Study to PADEP		June 2022
PADEP Approval of Special Study	June 2022	October 2022
Preliminary Design	March 2022	August 2022
Final Design & Submit Permits	August 2022	December 2022
Receive Permits	December 2022	April 2023
Bid Phase	May 2023	July 2023
Construction Phase	August 2023	February 2025



Lehigh County Authority

City of Allentown*

City Signatories**

LCA Signatories

Act 537 Boundary

* Hanover Township is a direct customer to the City of Allentown

** North Whitehall Township is a direct customer of Coplay-Whitehall Sewer Authority

LEHIGH COUNTY AUTHORITY

KISS PLANNING AREA

INTERIM 537 PLAN

LEHIGH COUNTY, PENNSYLVANIA

Remarks:

KISS MUNICIPALITIES

City of Allentown	Borough of Alburtis
Borough of Coplay	Borough of Emmaus
Borough of Macungie	Lower Macungie Township
Hanover Township	North Whitehall Township
Lowhill Township	South Whitehall Township
Salisbury Township	Upper Milford Township
Upper Macungie Township	Whitehall Township
Weisenberg Township	

LEHIGH COUNTY AUTHORITY GIS

DATE: 3/5/2020 SCALE: 1:82,000

CREATED: AKW CHECKED: MDB

NORTH WHITEHALL

COPLAY

WHITEHALL

CATASAUQUA

HANOVER

BETHLEHEM

LOWHILL

SOUTH WHITEHALL

WEISENBERG

Kline's Island Wastewater Treatment Plant

Park Pump Station

SALISBURY

LGA Pretreatment Plant

UPPER MACUNGIE

LOWER MACUNGIE

Spring Creek Pump Station

EMMAUS

UPPER SAUCON

UPPER MILFORD

LOWER MILFORD

0 0.75 1.5 3 Miles

N W E S

Lehigh County Authority

- Pump Station
- Treatment Plant
- Spring Creek Force Main
- Western Lehigh Sanitary Service Area
- Western Lehigh Interceptor
- Alburtis Sanitary Main
- Emmaus Sanitary Main
- South Whitehall Sanitary Main
- Lower Macungie Sanitary Main
- Upper Macungie Sanitary Main
- Trout Creek Trunk Sewer Line
- District No. 29 Trunk Sewer Line
- Emmaus Sewer Trunk Line
- Front Street - Union Street Trunk Line
- Jordan Creek Trunk Line
- Lehigh River Trunk Line
- Little Lehigh Trunk Line
- Maple Street Sewer
- City of Allentown Signatories

LEHIGH COUNTY AUTHORITY

KISS COLLECTION SYSTEM

INTERIM 537 PLAN

LEHIGH COUNTY, PENNSYLVANIA

Remarks:

1. Borough of Macungie infrastructure not shown
2. Salisbury Infrastructure not shown
3. Coplay - Whitehall Sewer Authority Infrastructure not shown
4. Hanover Infrastructure not shown

LEHIGH COUNTY AUTHORITY GIS

DATE: 3/4/2020 *SCALE: 1:40,000*

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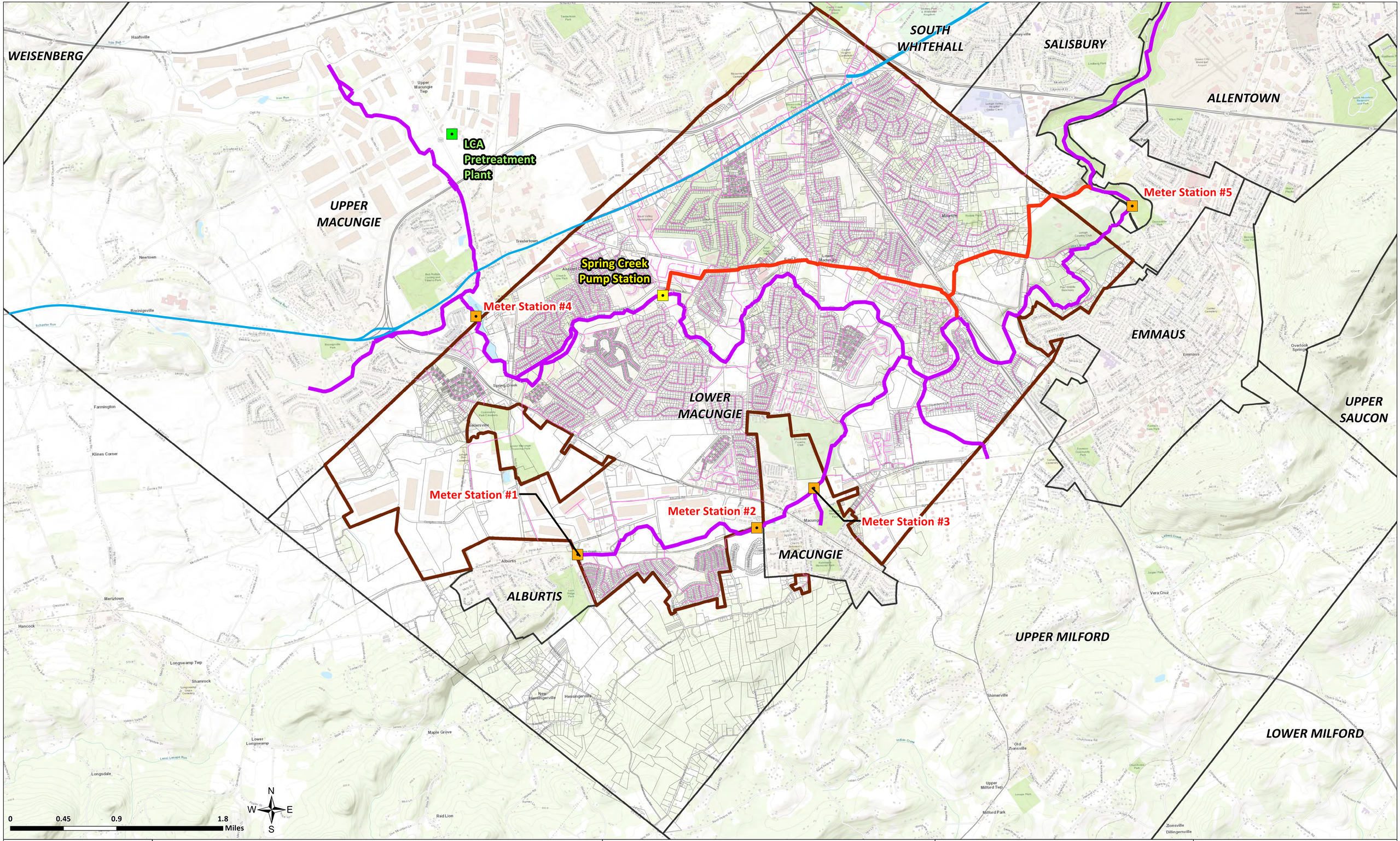

Lehigh County Authority

Meter Station	Spring Creek Force Main	Hamilton Blvd
Pump Station	Western Lehigh Interceptor	Act 537 Boundary
Treatment Plant	Lower Macungie Sanitary Main	Parcels

LOWER MACUNGIE TOWNSHIP

KISS COLLECTION SYSTEM

INTERIM 537 PLAN

LEHIGH COUNTY, PENNSYLVANIA

Remarks:

REVISED 5/12/2021

LEHIGH COUNTY AUTHORITY GIS

DATE: 4/28/2021 *SCALE: 1:21,000*

CREATED: AKW *CHECKED: MDB*

NORTH WHITEHALL

LOWHILL

WEISENBERG

SOUTH WHITEHALL

ALLENTOWN

UPPER MACUNGIE

SALISBURY

LOWER MACUNGIE

EMMAUS

MACUNGIE

UPPER MILFORD

LCA Pretreatment Plant

Spring Creek Pump Station

Meter Station #4

0 0.5 1 2 Miles

N W E S

Lehigh County Authority

Meter Station	Spring Creek Force Main	Hamilton Blvd
Pump Station	Western Lehigh Interceptor	Act 537 Boundary
Treatment Plant	Upper Macungie Sanitary Main	Parcels

UPPER MACUNGIE TOWNSHIP

KISS COLLECTION SYSTEM

INTERIM 537 PLAN

LEHIGH COUNTY, PENNSYLVANIA

Remarks:

REVISED 5/12/2021

LEHIGH COUNTY AUTHORITY GIS

DATE: 4/28/2021 *SCALE: 1:22,000*

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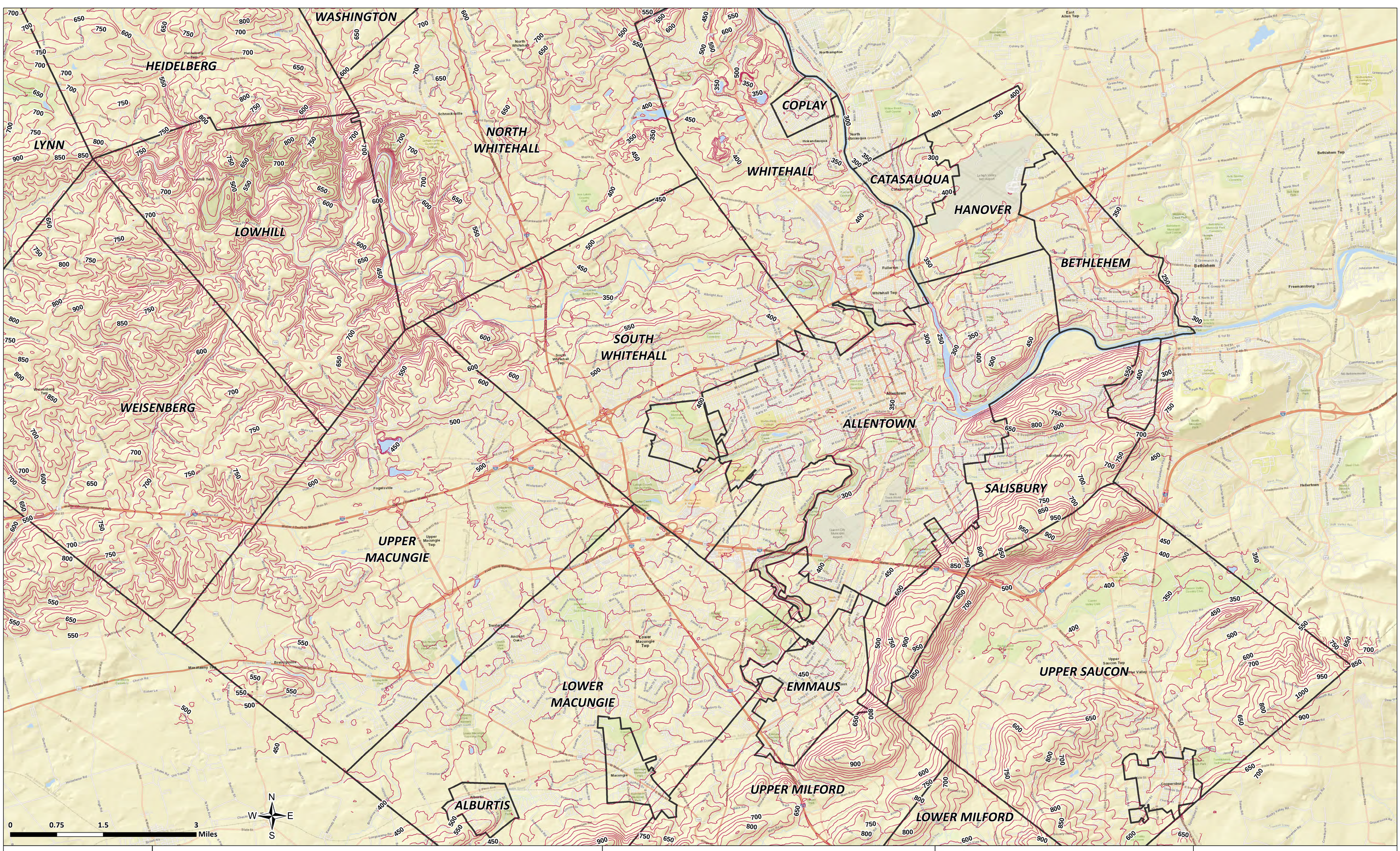


Lehigh County Authority

50ft Contour

LEHIGH COUNTY AUTHORITY

KISS TOPOGRAPHY

TREXLERTOWN SPECIAL STUDY

LEHIGH COUNTY, PENNSYLVANIA

Remarks:

LEHIGH COUNTY AUTHORITY GIS

DATE: 5/12/2021 *SCALE: 1:40,000*

CREATED: AKW *CHECKED: MDB*

Legend

- Proposed Force Main Alignment
- Wetlands
- Hydric Soils

Trexlertown Special Study

Hydric Soils & Wetlands

0 750 1,500 3,000 Feet

1 inch = 1,250 feet

N W E S

ARRO

Updated 12/20/2021

May 2006 Source: Natural Lands Trust with input data from PA DEP.
National Wetlands Inventory for Pennsylvania 2009 - U S Fish and Wildlife Service

WASHINGTON TOWNSHIP
ALLEN TOWNSHIP
EAST ALLEN TOWNSHIP
NORTHAMPTON BOROUGH
HEIDELBERG TOWNSHIP
NORTH WHITEHALL TOWNSHIP
COPLAY BOROUGH
N. CATASAUQUA BOROUGH
HANOVER TOWNSHIP
WHITEHALL TOWNSHIP
CATASAUQUA BOROUGH
HANOVER TOWNSHIP
LOWHILL TOWNSHIP
BETHLEHEM CITY
SOUTH WHITEHALL TOWNSHIP
ALLENTOWN CITY
SALISBURY TOWNSHIP
SALISBURY TOWNSHIP
UPPER MACUNGIE TOWNSHIP
UPPER SAUCON TOWNSHIP
EMMAUS BOROUGH
LOWER MACUNGIE TOWNSHIP
MACUNGIE BOROUGH
ALBURTIS BOROUGH
UPPER MILFORD TOWNSHIP
LONGSWAMP TOWNSHIP
LOWER MILFORD TOWNSHIP
HEREFORD TOWNSHIP
DISTRICT TOWNSHIP
MILFORD TOWNSHIP
UPPER HANOVER TOWNSHIP

\\LANCFILE4\gis\lehigh_county\Klines Island Interim Act 537\KlinesIslandAct537_Floodplains2.mxd

Legend

- Municipal Boundary

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- 0.2% Annual Chance Flood Hazard

TREXLERTOWN SPECIAL STUDY

Floodplains

0 3,750 7,500 15,000 Feet

1 inch = 7,500 feet

N W E S

ARRO

Memo

SUBJECT
Interim Pumping Solution Analysis and Cost Estimate
DATE
November 12, 2021

TO
Phil DePoe, LCA

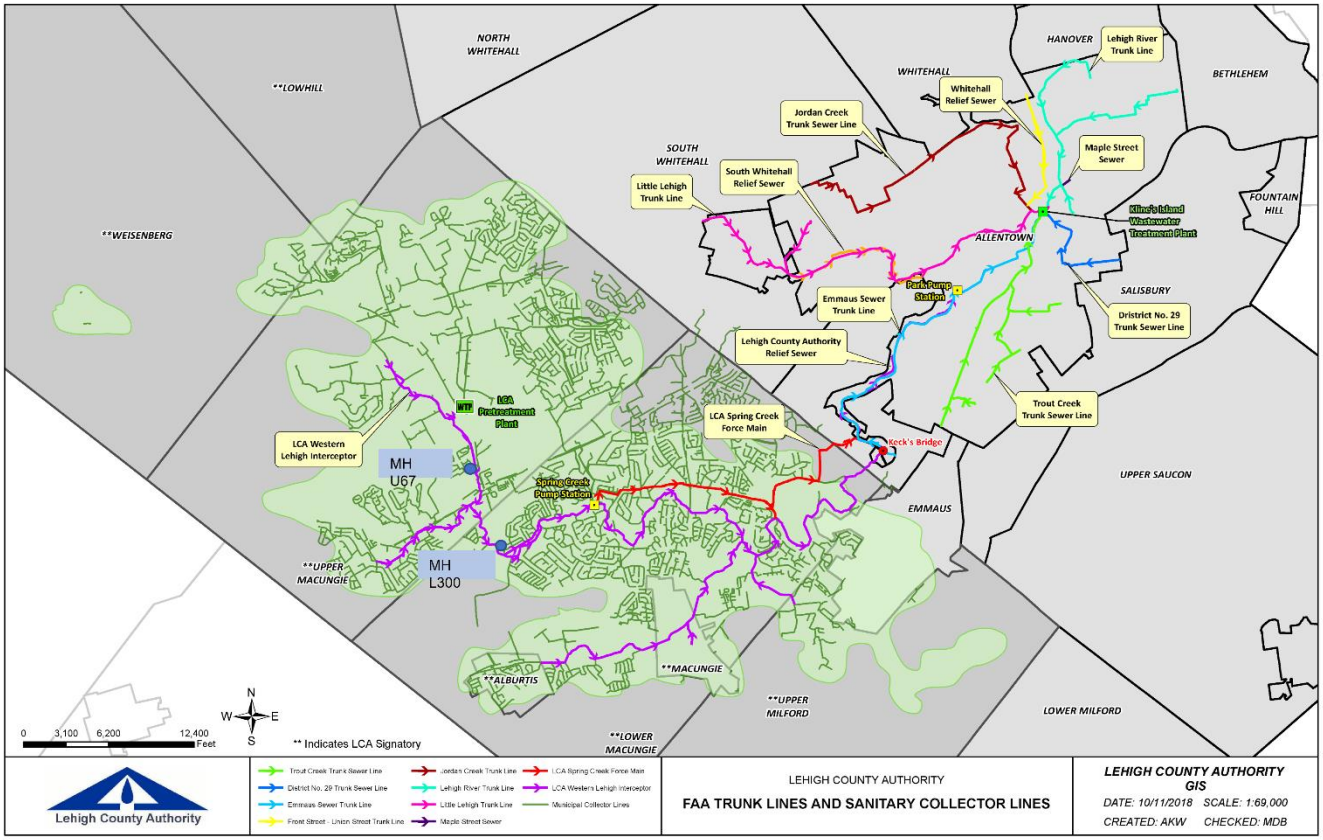
PROJECT NUMBER
30047126

COPIES TO
Mike Schober, Arro

NAME
Jim Shelton

BACKGROUND

Wastewater flows by gravity through most western Lehigh County in the Kline's Island Sewer System (KISS) sewerage system. In the western-most portion of the KISS, the Western Lehigh Interceptor (WLI), constructed in 1972, transports sewage from Lehigh County Authority's (LCA) industrial pretreatment plant (PTP) and the neighboring municipalities south and east into the Little Lehigh Interceptor (LLI), which is owned by the City of Allentown. Sewage from the communities served by the WLI flows to the 40 million gallon per day (MGD) Kline's Island Wastewater Treatment Plant (KIWWTP) in Allentown, a regional facility owned by the City of Allentown and operated by LCA under the terms of a 50-year lease agreement. The WLI serves the communities of Upper Macungie Township, Lower Macungie Township, Lowhill Township, Weisenberg

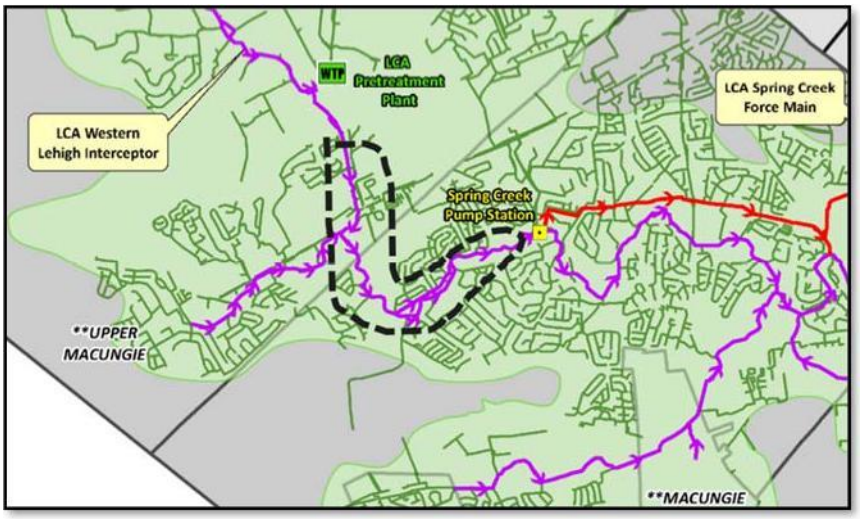


Township, Upper Milford Township, Macungie Borough, and Alburtis Borough. Over time, additional development, especially from the high industrial and residential growth in these communities, has increased the loading to the KISS. Increasing inflow and infiltration from all KISS communities has increased flows over time as well.. In the 1990s, the portion of the WLI from Mill Creek Road to Kecks Bridge became the first portion of the WLI to become hydraulically overloaded, primarily because of growth. *(Rainfall derived inflow and infiltration {RDII} is present in the WLI and its client municipalities, but much of these systems are newer sewers, so overall RDII leakage is moderate).*

In response to interceptors reaching capacity, LCA constructed the Spring Creek Pump Station (SCPS) in 1998 and extended its forcemain to connect downstream of Kecks Bridge in 2005. The SCPS was used exclusively as a wet weather relief pump station from 1998 until 2015. However, since 2015, ongoing increases in industrial flows and residential growth have led to the SCPS to be used daily to keep downstream flow levels in the WLI from grossly surcharging or overflowing.

In the early 2000s, field observations showed sections of the WLI from the PTP to SCPS, referred to as the Trexlertown and Ancient Oaks sections, were the next hydraulically limited section of the interceptor. From 2001 to 2008, LCA designed the Iron Run Pump Station (IRPS) and Forcemain (FM) to alleviate these conditions. Conceived as a 5.5 MGD peak wet weather relief facility, this pump station would be sited at the LCA PTP and pump into the existing SCPS forcemain. LCA acquired all easements for the forcemain. The City objected to the construction of this pump station because it would increase the peak wet weather flows their LLI and KIWWTP would have to handle. On February 17, 2009, PADEP granted a Water Quality Management Part II permit to construct the IRPS/FM conditioned upon LCA completing a technical analysis showing the IRPS/FM project would not exacerbate overflows in the City's park system or have adverse impact on the City's drinking water intakes on the Little Lehigh Creek, and that LCA would identify and implement any measures needed to alleviate these conditions. LCA abandoned plans to construct the IRPS/FM and instead constructed the PTP's 3.3 million gallon Flow Equalization Basin (FEB) in late 2009 to provide similar relief without increasing wet weather peak flow rates into City wastewater systems.

In 2012, modeling and field observations showed sections of the WLI from the PTP to SCPS, referred to as the Trexlertown and Ancient Oaks sections, were nearing overflow conditions during dry weather. This 5-mile stretch of the WLI contains several zero slope and reverse slope sections, some of which were by design and some of which were the result of subsidence following initial construction 50 years ago. During dry days, this portion of the WLI pipeline is and has been surcharged for nearly 20 years, with surcharges slowly increasing over time. Modeling in 2018 indicated that approximately 0.5 MGD of additional dry weather flow could be placed into the WLI without daily dry weather overflows.



To address this and other wider-spread regional capacity issues, two USEPA Administrative Orders (AO) and a PADEP Chapter 94 Corrective Action were implemented by USEPA and PADEP in 2007, 2009, and 2009, respectively. To address the requirements of these orders, LCA developed the Sewer Capacity Assurance and Rehabilitation Plan (SCARP), which was coordinated with the City of Allentown AO action plans. These plans were developed with PADEP and USEPA input and were reviewed and verbally approved by USEPA and PADEP in 2017. The sequential paralleling of over-capacity sections of the WLI, including the Trexlertown and Ancient Oaks sections, once the downstream improvements at Kline's Island WWTP and regional pumping station capacity were constructed, were part of the approved action plans.

Upon request of the USEPA, the KISS municipalities developed a Regional Flow Management Strategy (RFMS) in 2018, which focused on I&I Source Reduction Programs and ongoing regional flow characterization. This plan satisfied USEPA and DEP and all prior regulatory actions (AOs and Chapter 94 actions) were satisfied in early 2019. As a result, the plans for capital-intensive upgrades to the interceptors and KIWWTP were shelved.

Ongoing addition of new sewage connections and the advent of a particularly wet period from August 2018 to July 2019 caused regular dry weather overflows in limited locations and extreme interceptor surcharging almost daily during this period of frequent-but-moderate rainfall events. These widespread system challenges clearly revealed the limits of the regional interceptor system, and caused the KIWWTP to exceed its permitted design capacity of 40 MGD for several months during the 2019 calendar year. This led to a new Chapter 94 action taken by PADEP in late 2019, resulting in a regulatory mandate to conduct a regional Kline's Island Sewer System (KISS) system-wide Act 537 Plan. PADEP approved an "interim" Act 537 Plan in September 2020, which includes a Connection Management Plan to control the ongoing growth within all the KISS systems, the Long-Term Act 537 Plan workplan, and the identification of specific projects that would be necessary prior to the

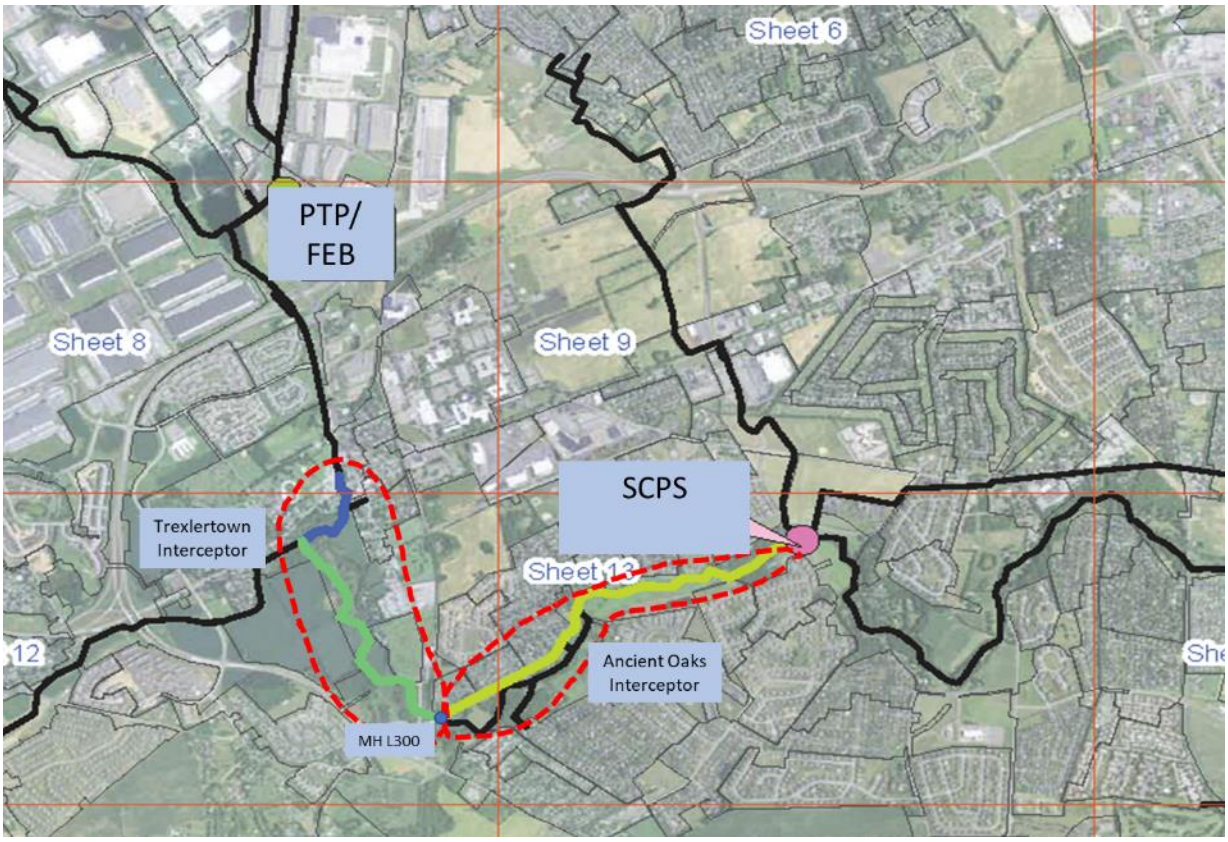
completion of the Long-term Act 537 Plan. The Long-term Act 537 Plan must be completed by March 2025. The specific projects that much be completed during the 2021-2025 planning period include alleviating the dry weather flow restrictions in the Trexlertown and Ancient Oaks sections of the WLI without increasing the peak wet weather flow to the City of Allentown's LLI or the KIWWTP.

CONSTRAINTS AND CONSIDERATIONS

1. The interim solution must protect against dry weather overflows until the Long-term Act 537 Plan solution is constructed and fully operational. As this section of conveyance is the most upstream of all the infrastructure to be addressed, and as downstream conveyance improvements are needed before the long-term improvements for these sewers can be implemented, this implies a minimal operating period through at least 2030 and likely through 2040.
2. As part of the Long-term Act 537 Plan development work, LCA is investigating the concept of converting its PTP into a full-treatment NPDES facility with a direct discharge to the Lehigh River. This option offers a variety of potential environmental, social, political and financial benefits, which must be fully explored. Some of the options being explored include removal of significant flows from the WLI, which could potentially eliminate or greatly reduce the length and diameter of any paralleling of the Trexlertown and Ancient Oaks sections of the WLI.
3. Any increase in conveyance capacity must not trigger an increase in peak wet weather flow to the LLI or the KIWWTP until the needed downstream improvements are constructed. (These are the same requirements contained in the February 17, 2009, PADEP Part II Permit approval letter for the IRPS, described above).
4. To the extent practical, the chosen interim solution should be made part of the ultimate solution determined via the Long-term Act 537 Plan. Some flexibility within the design of the interim solution would be desirable to allow for future modification or expansion to suit the needs of the Long-term Act 537 Plan solution..

ALTERNATIVES EVALUATED

1. **Trexlertown and Ancient Oaks Interceptor/In-line Storage** - The original concept for this interim plan was to construct a new interceptor (called the Trexlertown Interceptor) parallel to the Lower Iron Run Trunk Line and the WLI from north of Hamilton Boulevard (MH U67) to the intersection of Spring Creek Road and Route 100 (MH L300) that would provide additional dry day capacity where the WLI suffers



flat or negative slope sections.

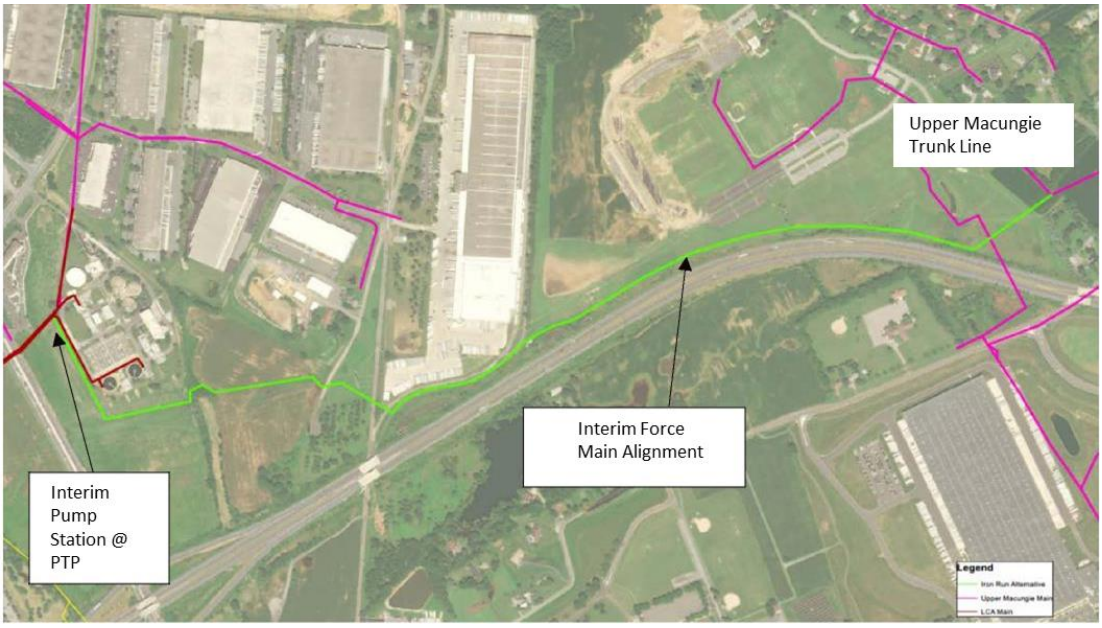
As the WLI pipes below MH L300 were also flow restricted (just not as much), the additional concept of providing in-line storage by increasing the diameter of these parallel pipes was considered. Diurnal peak flows would be stored in the pipe, then released during the low flow evening hours. However, modelling showed that by 2030, the daily flow demand nearly matched the hydraulic capacity of the WLI between MH L300 and SCPS and that the daily stored volume could not be removed unless the WLI between MH L300 and SCPS (called Ancient Oaks Interceptor) were also paralleled, allowing the capacity of the SCPS to be fully utilized. This 5 mile expansion/paralleling of the WLI between MH U67 and SCPS would cost $20-$30M, would take 5-8 years to complete, and would have significant wetland, riparian, easement acquisition, and constructability issues. While it would solve current system challenges, the project would potentially be unnecessary in the future depending on the Long-term Act 537 Plan solution that is selected by the region, as noted above.

Acquisition of easements would be particularly difficult given property owners and their intended development plans. The alignment of the parallel interceptor(s) would lie within wet soils and adjacent to streams that routinely flood over a large area. This solution provides needed dry weather relief for the portions of the WLI that are flow limited and do not send higher flows than currently sent to the

downstream City sewer systems. Permitting would likely be onerous due to…. Construction costs are currently difficult to estimate given widely varying groundwater conditions near the streams.

If the permanent solution is to convert the PTP to a direct discharge NPDES facility, as described above, this interceptor would become redundant. If that does not happen and all flows continue to go to KIWWTP, this project would need to be sized to provide full future wet weather capabilities. Because the Long-term Act 537 Plan solution is not currently known, there is risk associated with incorrectly sizing these parallel interceptors in the interim period.

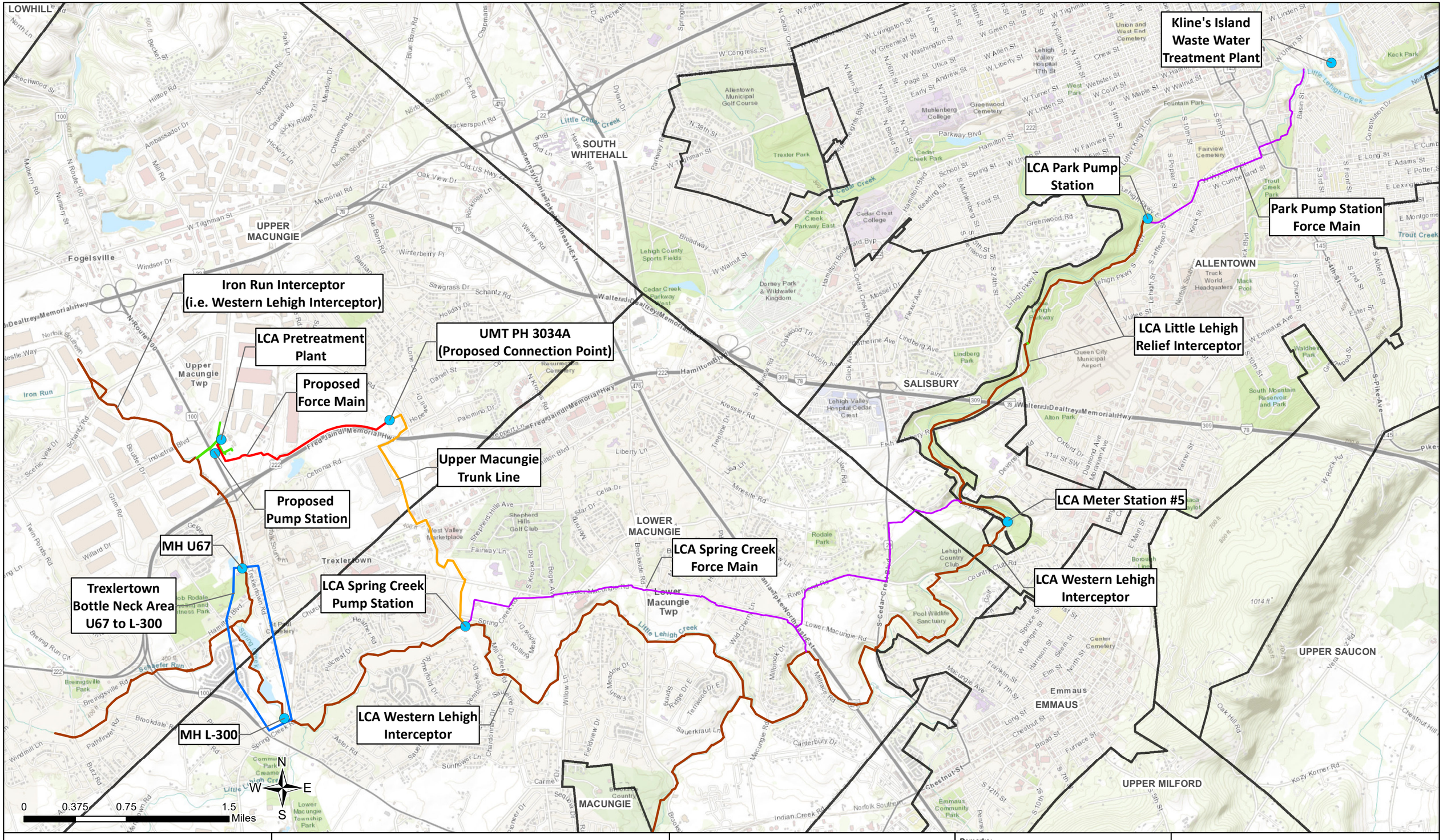
2. **Interim Pump Station** – The model shows the Upper Macungie Trunk Line has up to 3 MGD of available dry day capacity through to the SCPS within the 2030 planning horizon. To take advantage of this excess capacity, flow from near the LCA PTP would be diverted from the Lower Iron Run Trunk Line to the



Upper Macungie Trunk Line using a 2.5 MGD Interim Pump Station and 1.5 mile long 24" HDPE forcemain to connect to Upper Macungie Trunk Line. This will take 2-3 years to complete, including time to secure regulatory permits, and cost approximately $6M.

The pump station would be located on LCA property and the force main alignment is through existing easements or Upper Macungie Township Park property. Upper Macungie Township supports both construction through their parkland and the interim use of their sewer trunkline. This solution bypasses those sections of the existing interceptor that are flow limited and do not send higher flows than currently sent to the downstream City sewer systems. Permitting should be straight forward, proper easements exist, there are no significant wetland or riparian issues, and the depth of force main construction will reduce constructability concerns.

If the permanent solution is to convert the PTP to a direct discharge NPDES facility, this force main can be readily expanded in its proposed location. If the parallel/expansion of the gravity interceptor option is selected, the cost of this project is moderate and allows significant economic development to move forward with minimal delay.



Lehigh County Authority

Proposed Force Main
Upper Macungie Trunk Line
Existing LCA Force Main
LCA Collector Mains
LCA Interceptor Mains

LEHIGH COUNTY AUTHORITY

TREXLERTOWN ACT 537 SPECIAL STUDY

LEHIGH COUNTY, PENNSYLVANIA

Remarks:

LEHIGH COUNTY AUTHORITY GIS

DATE: 2/22/2022 *SCALE: 1:40,103*

CREATED: AKW *CHECKED:*

ACT 537 PLAN – FUTURE DEVELOPMENT FLOWS

Municipality Name Lower Macungie Township

GPD/EDU:	223

				TOTALS	552.99	1251.46			276,996
				Residential	168.13	705.00		Developments	157,215
				Comm./Ind.	384.86	546.46		31	119,781
Development Name	Address	Tax Parcel ID	Zoning	Type of Development	Acres	EDUs	Specifics	Projected Development Year	2020 Projected Flow (gpd)
SPRING CREEK PROPERTIES - LUTRON ELECTRONICS SEWER CONNECTION	8240 SPRING CREEK RD	546441331883	O	Light Industry	51.17	5.61	Warehouse	2020	1,250
	3200 ORCHARD RD	547317461693	I	Commercial	36.62	2.17	Warehouse	2020	485
TACO BELL	5374 HAMILTON BLVD	547565309727 and 547565430027	C	Commercial	0.49	19.00	Fast Food Restaurant and Office Building	2020	4,237
SPRING CREEK	8783 CONGDON HILL DR	546317224584	HI-S	Heavy Industry	53.38	46.83	Warehouse	2020	10,444
SPRING CREEK	8615 CONGDON HILL DR	546327146378	HI-S	Heavy Industry	46.29	46.83	Warehouse	2020	10,444
SPRING CREEK	8449 CONGDON HILL DR	546337222951	HI-S	Heavy Industry	58.81	46.83	Warehouse	2020	10,444
SPRING CREEK	8444 CONGDON HILL DR	546328866910	HI-S	Heavy Industry	8.02	46.83	Warehouse	2020	10,444
SPRING CREEK	8323 CONGDON HILL DR	546338922117	C-SC	Commercial	16.37	46.83	Warehouse	2020	10,444
	6240 HAMILTON BLVD	547512982095	C	Commercial	1.35	5.38	Commercial Building	2020	1,200
	6217 HAMILTON BLVD	547513751934	C	Commercial	6.28	5.38	Commercial Building	2020	1,200
	1111 GRANGE RD	547523993704	U	Commercial	2.93	10.67	Restaurant	2020	2,380
TREXLER BUSINESS CENTER	6150 HAMILTON BLVD	547522461516, 547512886266, 547512989833, 547522291861, 547523312452, and 547523724340	C	Commercial	9.23	26.46	Office Space and Retail Center	2020	5,900
JAINDL COMMERCIAL PARK NORTH	6161 HAMILTON BLVD	547523172939	C	Commercial	4.93	19.00	Office Building, Restaurant, and Retail Center	2020	4,200
MILLBROOK FARMS 6	4521 INDIAN CREEK RD	548463715168	S	Residential	20.93	42.00	42 Lot Subdivision	2020	9,366
STONE HILL MEADOWS, PHASE 2	3611 GEHMAN RD	547366121766 and 547367516707	R	Residential	62.04	85.00	85 Lot Subdivision	2020	18,955
WEIS MARKETS	3440 GRANDVIEW DR	547358396443	C	Commercial	13.07	84.98	Commercial Building	2020	18,950
SCHOENECK ROAD LOT 1 - AIR PRODUCTS	3262 SCHOENECK RD	546397842621	I	Light Industry	13.43	15.70	Warehouse	2020	3,500
AL-MAQASID	7394 ALBURTIS RD	547307561048	I	Commercial	12.22		Seminary	2020	
HAMILTON CROSSINGS NORTH	617 N KROCKS RD	547567692461	HC	Residential	52.81	416.00	400 Apartments, Commercial Building, and Restaurant	2020	92,768
	4511 CEDARBROOK RD	547599803773	HE	Commercial	25.22	57.00	2 Hotels, Office Building, and Small Commercial Building	2020	12,711
SUBURBAN SELF SERVE CARWASH	6452 HAMILTON BLVD	547502627743	C	Commercial	1.83	4.95	Car Wash	2020	1,104
U-HAUL OF LOWER MACUNGIE	7785 SPRING CREEK RD	546454069300	SR	Commercial	4.82	5.00	Commercial Building	2020	1,200
INDIAN CREEK VILLAGE	5415 INDIAN CREEK RD	548420386208	S	Residential	0.74	2.00	2 Lot Subdivision	2020	446
	1620 HIDDEN VALLEY RD	548523007822	S	Residential	0.64	1.00	Single Family Homes	2020	223
MOUNTAIN VIEW ESTATES	2062 ELBOW LN	548540155494	S	Residential	13.46	27.00	27 Lot Subdivision	2020	6,021
SCHAEFER RUN COMMONS	8189 HAMILTON BLVD	546436126075	SR	Residential	9.82	112.00	Condominium Town Homes	2020	24,976
	4440 HAMILTON BLVD	548518102010	HC	Commercial	1.93	5.00	Commercial Building	2020	1,200
KROCKS COURT	5621 HAMILTON BLVD	547554086045	C	Commercial	1.27	15.00	Retail Center and Commercial Building	2020	3,345
ALLEN ORGAN REDEVELOPMENT	3370 PA ROUTE 100	547358862563	C	Commercial	14.19	16.00	Office Building	2020	3,500
ABE DOORS & WINDOWS REDEVELOPMENT	6718 HAMILTON BLVD	546591274189	C	Commercial	1.00	15.00	Car Wash and Retail Center	2020	1,200
DRIES SUBDIVISION	3500 BROOKSIDE RD	548400346497	U	Residential	7.69	20.00	20 Apartments	2020	4,460

ACT 537 PLAN – FUTURE DEVELOPMENT FLOWS

Municipality Name Lower Macungie Township

GPD/EDU:	223

	TOTALS	219.95	1286
	Residential	143.08	430.00
	Comm./Ind.	76.87	855.82

1286.00

	286,778
Developments	121,981
37	164,797

Development Name	Address	Tax Parcel ID	Zoning	Type of Development	Acres	EDUs	Specifics	Projected Development Year	2021-2025 New Flow
JAINDL SPRING CREEK PROPERTIES	8741 AND 8899 MERTZTOWN RD	546403301298 and 545492191847	U	Residential	117.17	400.00	400 Lot Subdivision	2021	89,200
RESERVE ALLOCATION						560.00		2021 - 2025	124,880
COUNTRY HOME ACRES	1398 DORNEY AVE	548555146831	S	Residential	0.50	1.00	Single Family Homes	2021	223
SPRING CREEK	8120 SAUERKRAUT LN	546349494923	HI-S	Heavy Industry	32.96	46.83	Warehouse	2022	10,444
LEHIGH VALLEY S I P	7505 ALBURTIS RD	546397890673	O	Light Industry	3.58	5.83	Warehouse	2022	1,300
	1715 WEILERS RD	546424400941	U	Residential	0.21	1.00	Single Family Homes	2022	223
GRAYMOOR	6519 RUTHERFORD DR	547417365931	SR	Residential	2.25	1.00	Single Family Homes	2022	223
GRAYMOOR	1849 PEMBROOKE DR	547427543259	SR	Residential	0.64	1.00	Single Family Homes	2022	223
LOWER MACUNGIE FUNERAL HOME	6503 LOWER MACUNGIE RD	547510178161	U	Commercial	5.80	2.09	Funeral Home	2022	465
	6126 HAMILTON BLVD	547522687870	C	Commercial	4.34	15.70	Office Building	2022	3,500
	6084 HAMILTON BLVD	547523725177	C	Commercial	1.43	1.12	Commercial Building	2022	250
MILLBROOK FARMS	2887 EXETER DR	548456678394	S	Residential	1.36	1.00	Single Family Homes	2022	223
	2291 RIVERBEND RD	548459186327	S	Residential	0.29	1.00	Single Family Homes	2022	223
MILLBROOK FARMS	3170 SHEFFIELD DR	548465605590	S	Residential	0.54	1.00	Single Family Homes	2022	223
MILLBROOK FARMS	3184 SHEFFIELD DR	548465708045	S	Residential	0.53	1.00	Single Family Homes	2022	223
MILLBROOK FARMS	3177 SHEFFIELD DR	548465921353	S	Residential	0.71	1.00	Single Family Homes	2022	223
MILLBROOK FARMS	3194 SHEFFIELD DR	548475100121	S	Residential	0.95	1.00	Single Family Homes	2022	223
MILLBROOK FARMS	3183 SHEFFIELD DR	548475111895	S	Residential	0.92	1.00	Single Family Homes	2022	223
COUNTRY HOME ACRES	1406 DORNEY AVE	548555042697	S	Residential	0.49	1.00	Single Family Homes	2022	223
BODY ELITE	5518 HAMILTON BLVD	547554080100 and 547554687577	C	Commercial	0.49	2.38	Commercial Building	2022	530
SPRING CREEK	8219 SAUERKRAUT LN	546348273194	C-SC	Commercial	5.13	46.83	Warehouse	2023	10,444
SPRING CREEK	8290 SAUERKRAUT LN	546349045087	C-SC	Commercial	4.04	46.83	Warehouse	2023	10,444
LEHIGH VALLEY S I P	7428 INDUSTRIAL PARK WAY	546398930430	O	Light Industry	3.95	5.83	Warehouse	2023	1,300
ANCIENT OAKS	7680 CATALPA DR	546455709184	S	Residential	0.20	1.00	Single Family Homes	2023	223
L W & I A SCHMOYER	6275 MOUNTAIN RD	547385378248	R	Residential	2.11	1.00	Single Family Homes	2023	223
ALLEN WEST ESTATES	1065 PINE GROVE CIR	547595682090	S	Residential	1.73	5.00	Single Family Homes	2023	1,115
	1105 MINESITE RD	548505370858	U	Residential	1.03	1.00	Single Family Homes	2023	223
BROOKHAVEN	1885 BRIARCLIFFE TER	548561253973	S	Residential	1.60	1.00	Single Family Homes	2023	223
BROOKHAVEN	3866 MAULFAIR DR REAR	548571912045	S	Residential	3.97	1.00	Single Family Homes	2023	223
BROOKHAVEN	3800 MAULFAIR DR	548581145302	S	Residential	1.45	1.00	Single Family Homes	2023	223
ANCIENT OAKS	7601 SPRING CREEK RD	546465119437	S	Residential	0.22	1.00	Single Family Homes	2024	223
HARRIS YORK	2520 GRACIE LONE	548437783430	S	Residential	0.45	1.00	Single Family Homes	2024	223
	2164 S CEDAR CREST BLVD	548582221646	S	Residential	2.73	1.00	Single Family Homes	2024	223
SCHAEFER RUN WEST	1530 PINEWIND DR	546414784773	SR	Residential	0.18	1.00	Single Family Homes	2025	223
SCHAEFER RUN WEST	1541 WEILERS RD	546415805799	U	Residential	0.32	1.00	Single Family Homes	2025	223
SCHAEFER RUN WEST	1521 WEILERS RD	546415811614	U	Residential	0.32	1.00	Single Family Homes	2025	223
ANCIENT OAKS	7677 CATALPA DR	546455605571	S	Residential	0.22	1.00	Single Family Homes	2025	223
SPRING CREEK ESTATES	1255 DANNER RD	546590635649	U	Commercial	1.69	5.38	Commercial Building	2025	1,200
SCHAEFER RUN COMMONS	8189 HAMILTON BLVD	546436126075	SR	Residential	9.82	112.00	Condominium Town Homes	2020	24,976
MILL CREEK ESATES	2770 MILL CREEK RD	547442345955	SR	Residential	3.66	5.00	5 Lot Subdivision	2022	1,115

ACT 537 PLAN – FUTURE DEVELOPMENT FLOWS

Municipality Name Lower Macungie Township

GPD/EDU:	223

TOTALS	500.79	659.88
Residential		
Comm./Ind.		

Developments	147,153
50	

Development Name	Address	Tax Parcel ID	Zoning	Type of Development	Acres	EDUs	Specifics	Projected Development Year	2026-2050 Projected Flow (gpd)
SCHAEFER RUN WEST	1530 PINEWIND DR	546414784773	SR	Residential	0.18	1.00	Single Family Homes	2025	223
SCHAEFER RUN WEST	1541 WEILERS RD	546415805799	U	Residential	0.32	1.00	Single Family Homes	2025	223
SCHAEFER RUN WEST	1521 WEILERS RD	546415811614	U	Residential	0.32	1.00	Single Family Homes	2025	223
ANCIENT OAKS	7677 CATALPA DR	546455605571	S	Residential	0.22	1.00	Single Family Homes	2025	223
SPRING CREEK ESTATES	1255 DANNER RD	546590635649	U	Commercial	1.69	5.38	Commercial Building	2025	1,200
SCHAEFER RUN WEST	8330 SCHAEFER RUN RD	546425060178	R3	Residential	5.16	10.00	Condominium Town Homes	2026	2,230
ANCIENT OAKS	7699 CATALPA DR	546454684107	S	Residential	0.30	1.00	Single Family Homes	2026	223
ANCIENT OAKS	7687 CATALPA DR	546454694580	S	Residential	0.23	1.00	Single Family Homes	2026	223
ANCIENT OAKS	7673 SPRING CREEK RD	546454890055	S	Residential	0.24	1.00	Single Family Homes	2026	223
ANCIENT OAKS	7661 SPRING CREEK RD	546454990619	S	Residential	0.20	1.00	Single Family Homes	2026	223
MACUNGIE CROSSING	5949 HAMILTON BLVD	547534605755	C	Commercial	4.27	20.36	Commercial Shopping Center	2026	4,540
BELLE CHASE	6300 LOWER MACUNGIE RD	547429666813	U	Residential	45.65	68.00	68 Lot Subdivision	2027	15,164
HARRIS YORK	2645 HOUGHTON LEAN	548437003849	S	Residential	0.44	1.00	Single Family Homes	2027	223
HARRIS YORK	2630 HOUGHTON LEAN	548437133086	S	Residential	0.38	1.00	Single Family Homes	2027	223
HARRIS YORK	2605 GRACIE LONE	548437454473	S	Residential	0.39	1.00	Single Family Homes	2027	223
HARRIS YORK	2680 GRACIE LONE	548437606410	S	Residential	0.48	1.00	Single Family Homes	2027	223
CLEARVIEW MANOR	1215 MINESITE RD	548505837633	S	Residential	0.80	1.00	Single Family Homes	2027	223
	8401 BROOKDALE RD	546414452244	SR	Residential	1.59	1.00	Single Family Homes	2030	223
	1741 TREXLERTOWN RD	546455419805	C	Commercial	2.28	4.00	Commercial Building	2030	892
	2204 PA ROUTE 100	546463500437	AP	Commercial	5.65	5.38	Commercial Building	2030	1,200
SPRING CREEK PROPERTIES, REVISED SUBDIVISION 2	2550 PA ROUTE 100	546480379486	C-SC	Commercial	14.00	208.52	Warehouse	2030	46,500
	1873 MILL CREEK RD	547437488744	S	Residential	0.42	1.00	Single Family Homes	2030	223
RAY A LEIBENSPERGER	1696 BOGIE AVE	547459582883	S	Residential	0.69	1.00	Single Family Homes	2030	223
	2201 BROOKSIDE RD	547498965042	S	Commercial	38.73	10.31	Church	2030	2,300
	1138 MILL CREEK RD	547501927036	C	Commercial	1.36	5.38	Commercial Building	2030	1,200
	5500 EAST TEXAS RD	547570664009	S	Residential	0.42	1.00	Single Family Homes	2030	223
	5451 LOWER MACUNGIE RD	547580102825	S	Residential	0.47	1.00	Single Family Homes	2030	223
	895 N BROOKSIDE RD	547586843230	C	Commercial	0.20	5.38	Small Commercial Building	2030	1,200
	5739 N WALNUT ST	548308798301	S	Residential	0.25	1.00	Single Family Homes	2030	223
	5037 WILD CHERRY LN	548417521482	S	Residential	10.00	14.00	14 Single Family Homes	2030	3,122
	2812 MACUNGIE RD	548435592578	S	Residential	3.01	4.00	Single Family Homes	2030	892
	4261 INDIAN CREEK RD	548484009331	S	Residential	0.80	1.00	Single Family Homes	2030	223
	1790 MINESITE RD	548542683336	S	Residential	1.22	1.00	Single Family Homes	2030	223
	1799 MINESITE RD	548543920440	S	Residential	0.96	1.00	Single Family Homes	2030	223
	4175 EAST TEXAS RD	548544282198	S	Residential	0.14	1.00	Single Family Homes	2030	223
COUNTRY HOME ACRES	1414 DORNEY AVE	548545846577	S	Residential	0.63	1.00	Single Family Homes	2030	223
	7975 QUARRY RD	546450811376	HI-S	Heavy Industry	0.80	3.59	Small Commercial Building	2040	800
	7462 CHURCH LN	546458659265	S	Residential	1.00	1.00	Single Family Homes	2040	223
	7290 DRAGONFLY LN	546490973315	O	Commercial	1.13	5.38	Commercial Building	2040	1,200
SPRING CREEK ESTATES	6659 STEIN WAY	547500145077	U	Commercial	2.16	5.38	Commercial Building	2040	1,200
	6309 LOWER MACUNGIE RD	547510666928	U	Commercial	8.97	24.22	School Property	2040	5,400
	5606 EAST TEXAS RD	547570116323	S	Residential	0.50	1.00	Single Family Homes	2040	223
	1170 BROOKSIDE RD	547575517362	U	Commercial	229.89	24.22	School Property	2040	5,400
	4982 HAMILTON BLVD	547586456122	C	Commercial	0.25	5.38	Small Office Building	2040	1,200

	85 N WALNUT ST	548308523423	R-10	Residential	0.23	1.00	Single Family Homes	2040	223
	5390 INDIAN CREEK RD	548420454875	S	Residential	0.87	1.00	Single Family Homes	2040	223
	2940 MACUNGIE RD	548434570485	S	Residential	3.11	1.00	Single Family Homes	2040	223
COUNTRY HOME ACRES	1422 DORNEY AVE	548545735769	S	Residential	0.82	1.00	Single Family Homes	2040	223
	2760 RIVERBEND RD	549419516332	SR	Residential	1.00	1.00	Single Family Homes	2040	223
DORNEY TRACT	2250 RIVERBEND RD 2300 RIVERBEND RD 2500 RIVERBEND RD 2525 RIVERBEND RD 2550 RIVERBEND RD 2700 LOWER MACUNGIE RD	548469002576 548467782380 548458530739 548459023659 548448864184 548448356522 548449206770	S	Residential	106.00	200.00	Single Family Homes	2040	44,600

ACT 537 PLAN – FUTURE DEVELOPMENT FLOWS

Municipality Name **Upper Macungie Township**

GPD/EDU:	223

TOTALS	199	1,920
Residential	7	25
Comm./Ind.	192	1,895

	428,269
Developments	5,575
7	422,694

428,267

Development Name	Address	Tax Parcel ID	Zoning	Type of Development	Acres	EDUs	Specifics	Projected Development Year	2020 Projected Flow (gpd)
Ridgeline Warehouse	7352 Industrial Boulevard	546548068154	LI	Light Industry	91.86	1794	811200 - Manufacturer	2020	400,000
Isett Development	5420 Crackersport Road	547606891901	LI	Light Industry	6.05	5	21609 Office	2020	1,200
NFI - Lehigh Valley West	0371 - 0171 Oldt Road / 255 Nestle Way	545546394524, 545556280552, 545556886863, 545566289323, 545566695106, 545577129831	LI	Light Industry	51.50	5	384500 Warehouse	2020	1,148
Laurel Fields Phase 5	Werley Road	547652518261	R5	Residential	7.45	25	Condominium Town Homes	2020	5,575
Shoppes at Trexler Plaza	5917 W. Tilghman Street	546675889200	HC	Commercial	1.29	8	Service/Retail	2020	1,784
Atas International	8364 Main Street	545640486849	LI	Light Industry	30.00	7	496800 Manufacturing Center	2020	1,561
Mill Creek Hotel	0671 Grange Road	547515262267	R5	Commercial	11.00	76	142025 (6-Story Hotel)	2020	16,999

ACT 537 PLAN – FUTURE DEVELOPMENT FLOWS

Municipality Name **Upper Macungie Township**

GPD/EDU:	223

TOTALS	617	2,058
Residential	392	761
Comm./Ind.	225	1,297

	458,711
Developments	169,703
24	289,008

Development Name	Address	Tax Parcel ID	Zoning	Type of Development	Acres	EDUs	Specifics	Projected Development Year	2021 - 2025 Projected Flow (gpd)
Valley West Estates	0448 Oldt Road	545536806264	R1	Residential	25.00	18	18 Additional Connections	2021	4,014
Oak Tree Manor	5528 Muth Circle	547539186567	R2	Residential	0.47	1	Single Family Lots	2021	223
Parkland Fields	Krock's and Schantz's Road	Various	R2	Residential	3.25	6	6 - Single Family	2021	1,338
Trexler Fields	Swallow Tail Lane / Spring White Drive	Various	R2	Residential	3.08	25	Twins	2021	5,575
Trinity Wesleyan Church Additions	6735 Cetronia Road	546585241740	R2	Commercial	8.31	2	5500 Addition	2021	513
Lehigh Hills Lot 5 (Jaindl SFD)	1670 Route 100, 1250 Nursery Street, 1325 Church Street	545646416416, 545666149618, 545663095372, 545663817989, 545665892003	R2	Residential	211.93	291	Twins, Single Homes, Commercial Facility	2021	64,893
Weilers Road Twins	8451 Hamilton Boulevard	546407565875	R3	Residential	12.90	82	82 - Twins	2021	18,286
Woda Development	8853 Hamilton Boulevard	545486074486	NC	Commercial	8.65	55	Townhomes	2021	12,265
Oak Tree Manor	5540 Muth Circle	547539591504	R2	Residential	0.50	1	Single Family Lots	2022	223
Upper Macungie Community Center	0360 Grange Road	546567986933	R2	Commercial	14.74	15	63750 Public Center	2022	3,345
	1050 Mill Road	545697510390	LI	Light Industry	8.54	9	Office/ Warehouse	2023	2,114
(Potential Large Industrial User?)	8364 Main Street	545640486849	LI	Light Industry	145.00	1000	Office/ Warehouse	2023	223,000
Hidden Meadows	0600 Werley Road	547633789965	R5	Residential	34.77	168	Condominium Town Homes	2024	37,464
Summit Reality	Grim and Mosser	545590537065	HC	Commercial	5.00	25	Commercial Center	2025	5,575
Summit Reality	1046 Grim Road	546500437908	HC	Commercial	6.12	27	Commercial Center	2025	6,021
Haaf-tercha Industrial Park No. 2	9230 Long Lane	545449785823	R1	Residential	84.00	64	Single Family Lots	2025	14,272
	7034 Ambassador Drive West	546607903881	LI	Light Industry	9.20	5	Office/ Warehouse	2025	1,200
	7124 Ambassador Drive	545685938300	LI	Light Industry	19.13	158	Office/ Warehouse	2025	35,234
	1331 Blue Barn Road	546698869134	R2	Residential	2.01	1	Single Family Lots	2025	223
Green Hills	1330 Highland Drive	546659258727	R2	Residential	1.20	1	Single Family Lots	2025	223
Green Hills	5760 Clauser Road	546669313869	R2	Residential	1.50	1	Single Family Lots	2025	223
Morningside	6454 Overlook Road	546639810179	R2	Residential	1.11	1	Single Family Lots	2025	223
	5831 Cetronia Road	547527746367	R3	Residential	1.00	1	Single Family Lots	2025	223
(fmr. Faust Junkyard)	0681 Grange Road	547515975744	R5	Residential	9.67	100	100 Apartments	2025	22,300

ACT 537 PLAN – FUTURE DEVELOPMENT FLOWS

Municipality Name **Upper Macungie Township**

GPD/EDU:	223

TOTALS	935	3,092
Residential	732	1,933
Comm./Ind.	203	1,159

	689,607
Developments	431,059
56	258,548

Development Name	Address	Tax Parcel ID	Zoning	Type of Development	Acres	EDUs	Specifics	Projected Development Year	2026-2050 Projected Flow (gpd)
Trexlertown Shopping Center	7150 Hamilton Boulevard	546469492409	HC	Commercial	14.96	13	Shopping Center	2026	2,999
Lone Pond Estates	0319 Cressman Drive	547508747553	R2	Residential	0.72	1	Single Family Lots	2026	223
Hopewell Farms	6066 Palomino Drive	547526882409	R2	Residential	0.50	1	Single Family Lots	2028	223
Hopewell Farms	6074 Palomino Drive	547536091266	R2	Residential	0.50	1	Single Family Lots	2028	223
Hopewell Farms	6082 Palomino Drive	547537109316	R2	Residential	0.75	1	Single Family Lots	2028	223
	5947 Reppert Lane	547526702383	R3	Residential	3.16	1	Single Family Lots	2028	223
Mill Run	1001 Glenlivet Drive	545683174905	LI	Light Industry	4.07	18	Office/ Warehouse	2030	4,068
Blue Barn Estates	1450 Blue Barn Road	546699232555	R2	Residential	7.24	14	14 Lot Subdivision	2030	3,122
	9141 Hamilton Blvd	545457900766	R1	Residential	11.78	19	Single Family Lots	2030	4,237
Coke Expansion	7551 Schantz Road	546519682040	LI	Light Industry	43.01	734	100000-50000	2035	163,579
Two Windsor Plaza	7500 Windsor Drive	546601173950	LI	Light Industry	5.00	27	Office	2035	5,999
Tamerler	0935 Blue Barn Road	546686969436	NC	Commercial	15.84	5	Commercial Center	2035	1,200
Fallbrook	9160 Schantz Road	545542002551	R1	Residential	51.59	74	74 - Single Family	2035	16,502
Lone Pond Estates	0320 Burrell Boulevard	547508943111	R2	Residential	1.20	1	Single Family Lots	2035	223
Lone Pond Estates	0323 Burrell Boulevard	547518160051	R2	Residential	0.60	1	Single Family Lots	2035	223
Holiday Hills	5830 Mertz Drive	547610290812	R2	Residential	0.30	1	Single Family Lots	2035	223
Park Place West	0227 Hopewell Drive	546599845527	R2	Residential	0.30	1	Single Family Lots	2035	223
Mosser Road Development	1050 Mosser Road	546500715895	R3	Residential	7.78	10	10 - Single Family	2035	2,230
	0110 PA Route 100	546507790709	LI	Light Industry	11.31	51	Office/ Warehouse	2035	11,311
	7761 Industrial Boulevard	546516308616	Li	Light Industry	20.37	91	Office/ Warehouse	2035	20,369
	7762 Industrial Boulevard	546524269913	LI	Light Industry	38.82	5	Office/ Warehouse	2035	1,200
	0749 PA Route 100	546535100991	LI	Light Industry	6.27	28	Office/ Warehouse	2035	6,282
	0871 PA Route 100	545683851133	LI	Light Industry	9.97	75	Office/ Restaurant	2035	16,801
	7312 Windsor Drive	546612222713	LI	Light Industry	7.62	8	Office/ Warehouse	2035	1,800
	7240 Windsor Drive	546612728695	LI	Light Industry	2.04	8	Office/ Warehouse	2035	1,800
	8738 Hamilton Boulevard	545486321583	NC	Commercial	2.67	4	Small Commercial Property	2035	801
	8026 Main Street	545662219785	NC	Residential	1.00	1	Single Family Lots	2035	223
	8557 Main Street	545631277726	R1	Residential	17.00	30	30 - Single Family	2035	6,690
	0621 Twin Ponds Road	545560688996	R1	Residential	7.15	12	Single Family Lots	2035	2,676
	5177 Cetronia Road	547517313750	R2	Residential	13.70	25	25 - Single Family	2035	5,575
	9129 Breinigsville Road	545456811550	R2	Residential	1.57	1	Single Family Lots	2035	223
	1190 Grange Road	547524880744	R5	Residential	46.00	200	200 Apartments	2035	44,600
	6748 Ruppsville Road	546651689151	R3	Residential	10.10	52	52 Units (Apartments)	2040	11,596
	5562 East Lane	546751861330	R1	Residential	13.87	12	12- 'Single Family Homes	2040	2,676
	0450 Bastian Lane	546662292655	R3	Residential	26.42	120	120 - 'Twins	2040	26,760

ACT 537 PLAN – FUTURE DEVELOPMENT FLOWS

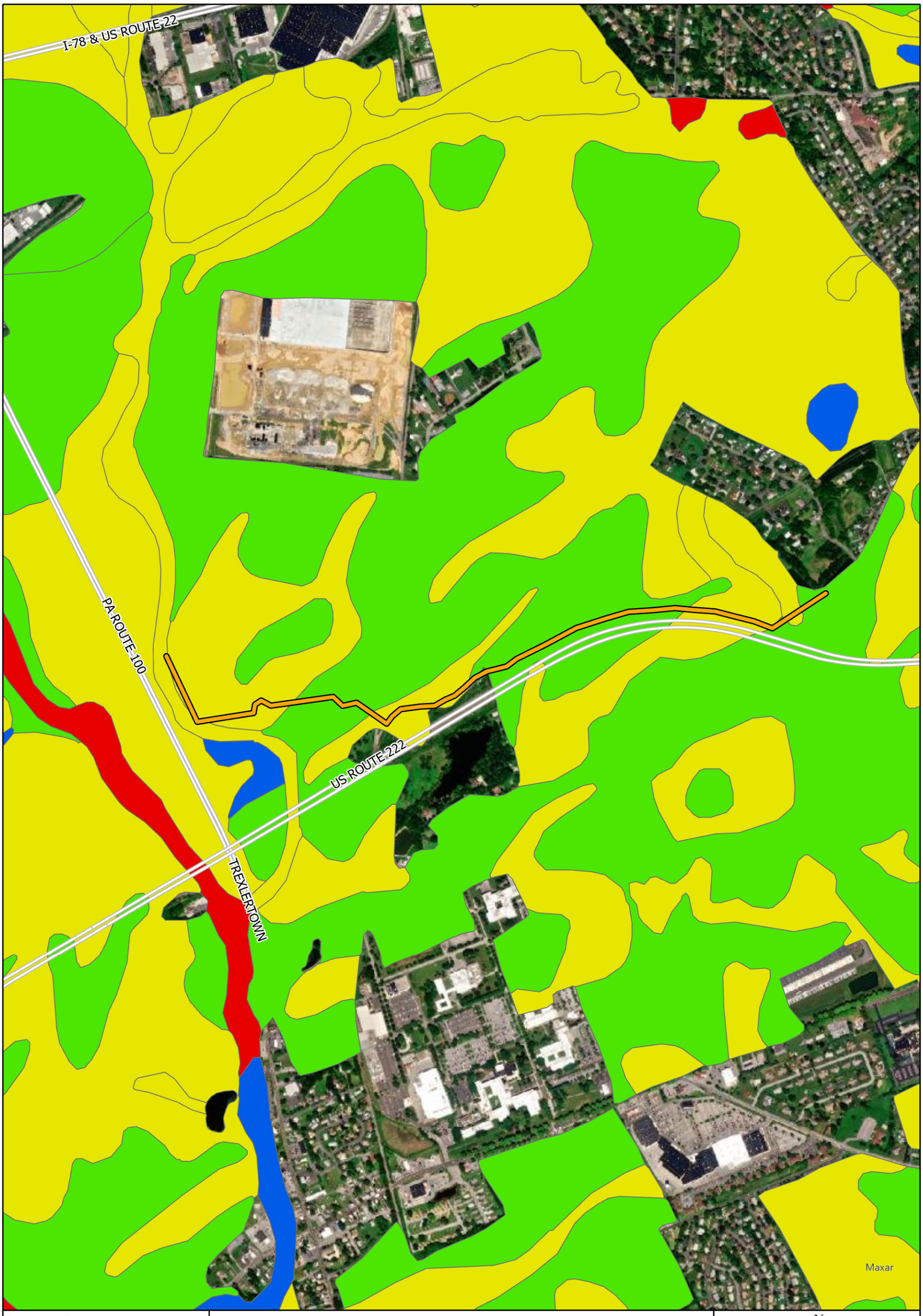
Municipality Name **Upper Macungie Township**

GPD/EDU:	223

TOTALS	935	3,092
Residential	732	1,933
Comm./Ind.	203	1,159

	689,607
Developments	431,059
56	258,548

Development Name	Address	Tax Parcel ID	Zoning	Type of Development	Acres	EDUs	Specifics	Projected Development Year	2026-2050 Projected Flow (gpd)
Allentown Osteopathic Med Center	5511 Crackersport Road	546697829967	R5	Residential	46.30	427	Town Homes and Apartments	2045	95,221
Ash Lane	9229 Mertztown Road	545470990647	U	Residential	44.70	22	22 Lot Single Family Subdivision	2045	4,906
	1334 Trexlertown Road	546448110709	C	Residential	21.84	70	Single Family Lots	2045	15,610
	7540 Ruppsville Road	546543581137	LI	Light Industry	8.72	45	Office/ Warehouse	2045	9,999
	0121 Nestle Way	545576122157	LI	Light Industry	3.76	5	Office/ Warehouse	2045	1,200
	0690 Church Street	545671537591	NC	Commercial	9.00	41	Commercial Center	2045	9,143
	9762 Trexler Road	545424874856	R1	Residential	28.00	60	60 - Single Family	2045	13,380
	1260 Church Street	545642574354	R1	Residential	27.00	47	47 - Single Family	2045	10,481
	8771 Main Street	545611783743	R1	Residential	80.50	141	141 - Single Family	2045	31,443
	8363 Main Street	545642015742	R1	Residential	22.91	40	40 - Single Family	2045	8,920
	9249 Newtown Road	545447796601	R1	Residential	7.52	14	Single Family Lots	2045	3,122
	9233 Newtown Road	545457269545	R1	Residential	10.06	18	Single Family Lots	2045	4,014
	9230 Long Lane	545449785823	R1	Residential	84.39	148	Single Family Lots	2045	33,004
	5137 Schantz Road	547651078042	R2	Residential	6.97	16	16 - Single Family	2045	3,568
	5383 Cetronia Road	547640516674	R2	Residential	9.42	21	21 - Single Family	2045	4,683
	5148 Schantz Road	547650089963	R2	Residential	15.05	33	33 - Single Family	2045	7,359
	9058 Hamilton Boulevard	545433245589	R2	Residential	11.70	40	40 - Single Family	2045	8,920
	7051 Cetronia Road	546575017948	R2	Residential	35.06	80	80 Lot Subdivision	2045	17,840
	6718 Ruppsville Road	546652186858	R3	Residential	2.00	4	4 - Single Family Homes	2045	892
	7974 Hamilton Blvd	546437335092	R3	Residential	28.37	113	Twins	2045	25,199
	9521 Hamilton Blvd	545437189821	RT	Residential	26.77	60	Twins, Single Homes	2045	13,380



Legend

- Proposed Force Main Alignment

Soil Classes

- Class I
- Class II
- Class III
- Class IV

Trexlertown Special Study

NRCS Soil Capability Classes

0 750 1,500 3,000 Feet

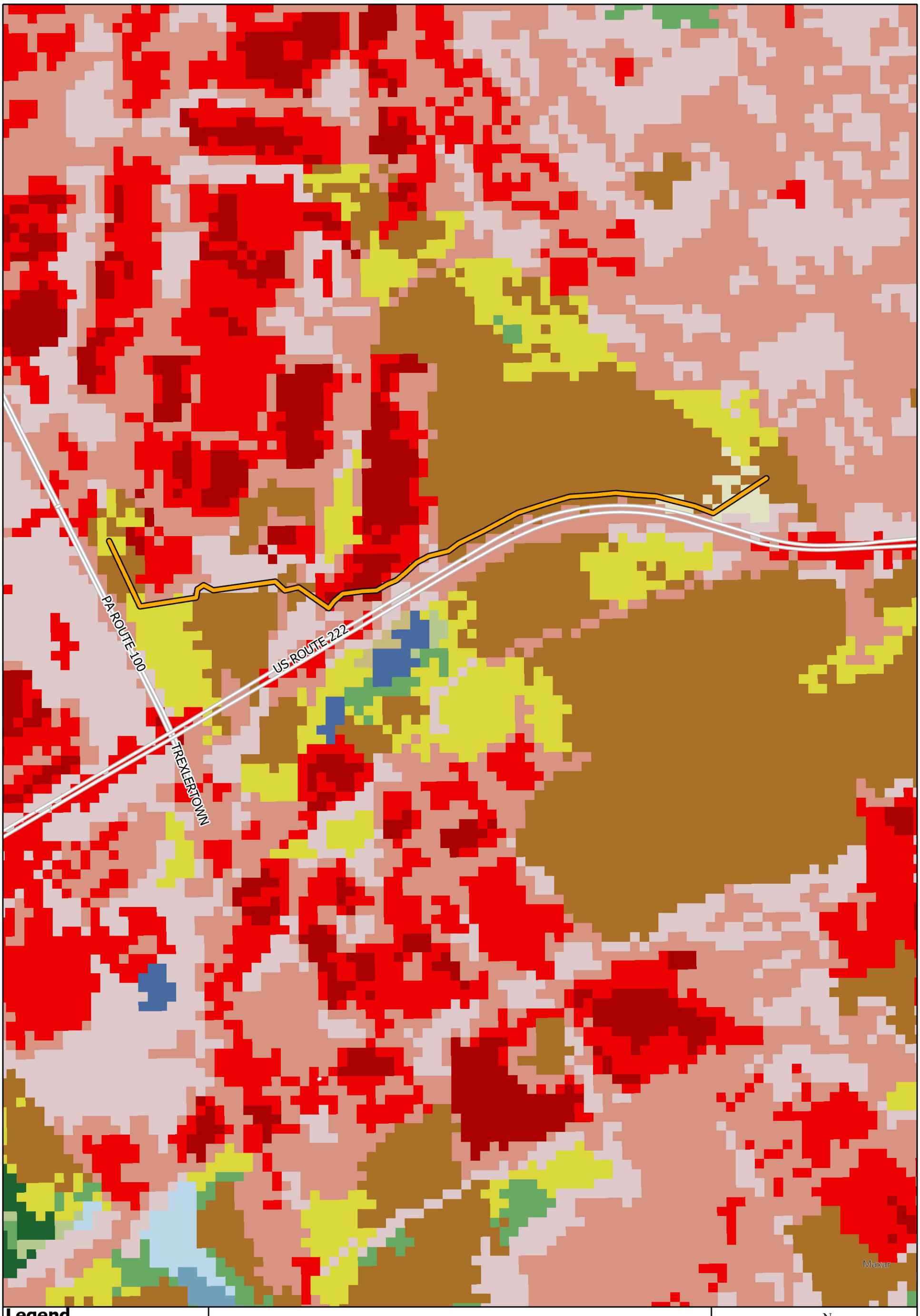
1 inch = 1,250 feet

N W E S

ARRO

Updated 12/20/2021

USA Soils Map Units July 2021 Source: USDA NRCS, Esri



Legend

- Interim Force Main Alignment
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Deciduous Forest
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Woody Wetlands
- Cultivated Crops
- Mixed Forest
- Shrub/Scrub
- Hay/Pasture
- Open Water

Trexlertown Special Study
Landcover

0 750 1,500 3,000 Feet

1 inch = 1,250 feet

N W E S

ARRO

Updated 12/20/2021

NLCD 2011 Land Cover (2011 Edition) U.S. Geological Survey

1. PROJECT INFORMATION

Project Name: **Trexlertown Sanitary Sewer Main**
Date of Review: **10/25/2021 09:40:31 AM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewer line (new - construction in new location)**
Project Area: **12.28 acres**
County(s): **Lehigh**
Township/Municipality(s): **UPPER MACUNGIE TOWNSHIP**
ZIP Code:
Quadrangle Name(s): **ALLENTOWN WEST**
Watersheds HUC 8: **Lehigh**
Watersheds HUC 12: **Liebert Creek-Little Lehigh Creek; Spring Creek**
Decimal Degrees: **40.564019, -75.599009**
Degrees Minutes Seconds: **40° 33' 50.4672" N, 75° 35' 56.4334" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

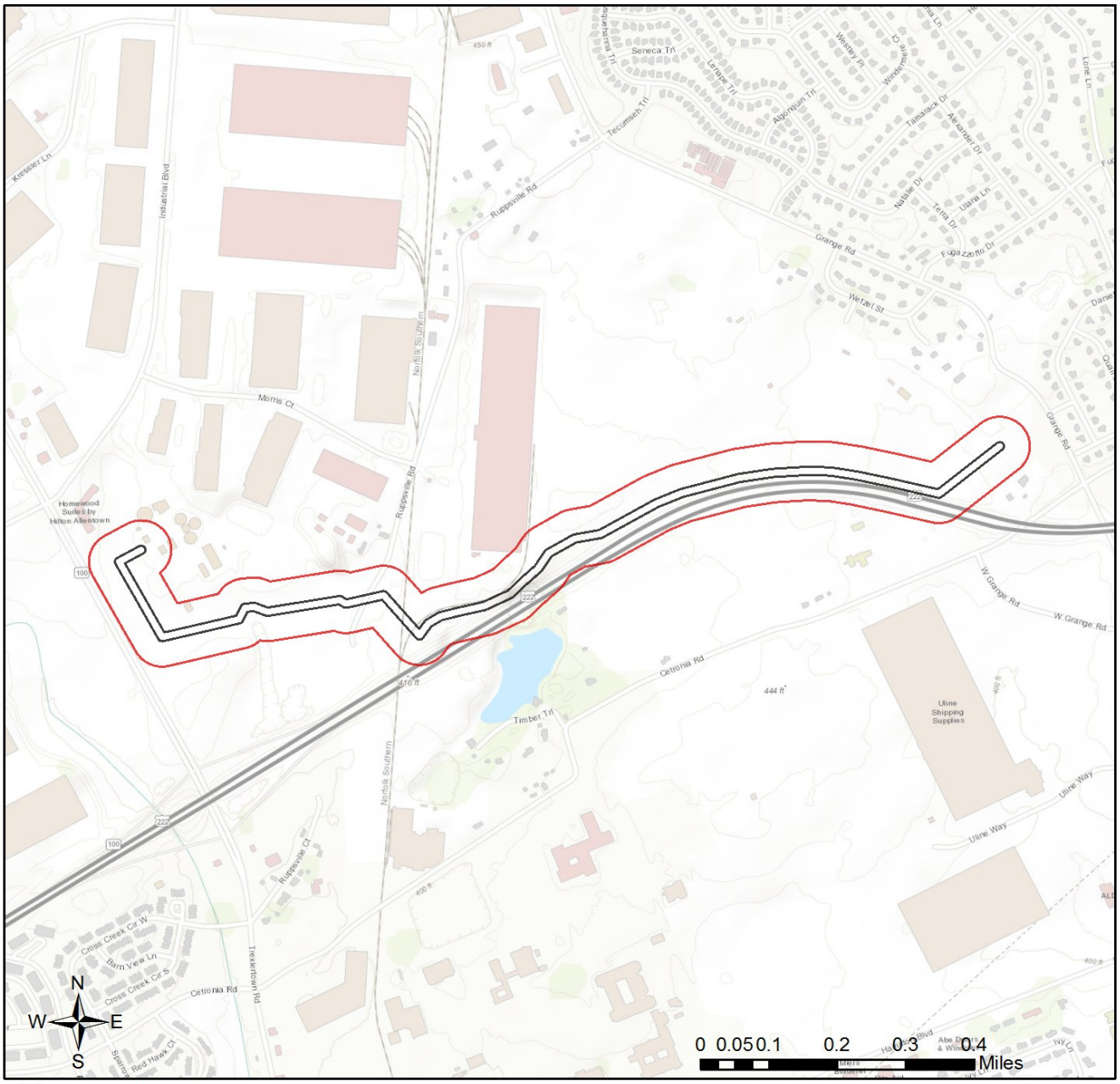
Trexlertown Sanitary Sewer Main

Project Boundary

Buffered Project Boundary

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Trexlertown Sanitary Sewer Main



Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Michael A. Schober, PE
Company/Business Name: ARRO Consulting, Inc.
Address: 108 West Airport Road
City, State, Zip: Lititz, PA 17543
Phone:(717) 205-4550 Fax:(717) 560-2778
Email: michael.schober@arroconsulting.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

October 25, 2021
date