CENTRAL SUSQUEHANNA VALLEY TRANSPORTATION (CSVT) PROJECT
ASH BASIN FOCUS AREA

ENVIRONMENTAL TECHNICAL REPORT

MONROE TOWNSHIP AND SHAMOKIN DAM BOROUGH, SNYDER COUNTY, PENNSYLVANIA

PREPARED FOR

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 3-0

PREPARED BY

SKELLY AND LOY
ENGINEERING - ENVIRONMENTAL CONSULTANTS

JANUARY 2018
UPDATED MARCH 5, 2018
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UPDATED MARCH 5, 2018
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R95-0129.000

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1.0 INTRODUCTION

1.0 INTRODUCTION

This Environmental Technical Report is provided to characterize the environment of the Central Susquehanna Valley Transportation (CSVT) Project Ash Basin Focus Area (Attachment 1, Project Mapping; Figure 1). The Pennsylvania Department of Transportation (PennDOT) has determined that a roughly two-mile-long portion of the Southern Section alignment (between Fisher Road and Sunbury Road) must be modified to avoid constructing the new highway on two existing fly ash waste basins, as previously planned (Attachment 1, Project Mapping; Figure 2). To accomplish this, the project team developed and evaluated avoidance alternatives within an Ash Basin Focus Area (Attachment 1, Project Mapping; Figure 3).

Through the alternatives development and analysis process described in the Supplement Environmental Assessment (EA), the project team, the public, local officials, and environmental agencies collaborated to develop the best solution to avoid the ash basins while minimizing impacts. The Western and Central Alternatives were dismissed from further considerations based on the engineering and environmental considerations. The Eastern Alternative was selected as the Preferred Alternative (Attachment 1, Project Mapping; Figure 4).

This report addresses the natural, cultural, and socioeconomic components of the project setting. The different environmental topics are addressed here under the following headings.

2.0 Natural Environment
- 2.1 Soils and Geology
- 2.2 Groundwater Resources
- 2.3 Surface Water and Aquatic Resources
- 2.4 Floodplains
- 2.5 Wetlands
- 2.6 Vegetation and Wildlife
- 2.7 Threatened and Endangered Species
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3.0 Cultural Environment
- 3.1 Archaeology
- 3.2 Historic Resources

4.0 Socioeconomic Environment
- 4.1 Municipal, Industrial, and Hazardous Waste Facilities
- 4.2 Land Use
- 4.3 Planned Development
- 4.4 Community Facilities and Services
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- 4.6 Residential Displacements (Housing)
- 4.7 Tax Base Impacts
- 4.8 Noise

4.9 Secondary and Cumulative Impacts
4.10 Utilities
4.11 Air Quality
4.12 GHG Emissions Analyses and Climate Change Assessment
4.13 Construction Impacts

The methodology of assessment, existing conditions, impacts, and mitigation for each of the different environmental topics is addressed as follows. The impact sections compare the Preferred Eastern Alternative and the No Change DAM Alternative within the limits of the Ash Basin Focus Area. Additional supporting information is provided and referenced from the CSVT Final Environmental Impact Statement (FEIS; Federal Highway Administration [FHWA] 2003).

2.0 NATURAL ENVIRONMENT

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2.1 SOILS AND GEOLOGY

2.1.1 Methodology

Soil and geologic information pertaining to the study area was obtained primarily from the Pennsylvania Bureau of Topographic and Geologic Survey (Survey) and county-specific soil surveys published by the Soil Conservation Service. Supporting information specific to sinkhole formation was obtained from Survey; Eastern Industries, Inc.; and Point Township Municipal Authority. Information related to pyritic rock formations was derived from core borings completed in 2017.

2.1.2 Existing Conditions

The Ash Basin Focus Area begins at Fisher Road in the Trimmers Rock Formation and passes through an area primarily underlain by the Irish Valley Member of the Catskill Formation near the ash basins. The northern end of the focus area is characterized by a region of low relief hills underlain by the Sherman Creek Member of the Catskill Formation. These formations are described in detail below. A map illustrating the extent of the geologic formations is provided in Attachment 1, Project Mapping (Figure 5). These formations are not anticipated to pose unusual complications to construction efforts.

2.1.2.1 Trimmers Rock Formation

The Trimmers Rock Formation consists of olive-gray and medium-gray siltstone and silty shale with some very fine-grained sandstone in its upper part. The cut slope stability is fair in siltstone and shale and good in sandstone while excavation of bedrock from the Trimmers Rock Formation is reported as moderately difficult.

2.1.2.2 Irish Valley Member of the Catskill Formation

The Irish Valley Member is a heterogeneous unit consisting of interbedded red and non-red claystone, shaly siltstones, and sandstones arranged in repetitive sequences of marine and non-marine units. Cut slope stability is poor to fair due to rapid disintegration of shale and siltstone

and fractured sandstone and claystone. Excavation of bedrock from the Irish Valley Member is reported as moderately easy.

2.1.2.3 Sherman Creek Member of the Catskill Formation

The Sherman Creek Member consists predominantly of grayish-red to brownish-gray interbedded silty mudstone, siltstone, and fine-grained sandstone. Cut slope stability is poor to good in areas with highly weathered and fractured zones. Excavation of bedrock from the Sherman Creek Member is difficult except for highly fractured rock, which is moderately easy.

2.1.2.4 Soils

The different soil series and the engineering characteristics associated with each soil series encountered within the focus area were analyzed to outline locally, highly erodible soils. Natural erosion is the process by which the land surface is altered by the physical actions of air, water, wind, gravity, or a material's chemical breakdown. Accelerated erosion occurs when man's activities cause the surface of the land to be worn away faster than it would have been by natural processes alone. Clearing and grubbing is one operation associated with road construction activities which could have the potential to accelerate soil erosion. Other activities (such as structure construction, stockpiling of soils, and the spreading of soils on the final grades) also have the potential to create erosion.

Accelerated soil erosion could impact the quality, quantity, and stability of receiving water courses if not properly mitigated. In addition, accelerated soil erosion has the potential of causing ecological and physical damage to streams, rivers, lakes, and ponds. The close proximity of accelerated erosion to receiving water courses is an important consideration during the construction process.

2.1.2.5 Carbonate Terrain

The Ash Basin Focus Area contains the Trimmers Rock Formation, Irish Valley Member of the Catskill Formation, and Sherman Creek Member of the Catskill Formation. These formations are not considered carbonate terrain and are not susceptible to sinkhole development.

2.1.2.6 Potential Acid-Producing Formations

Based on Survey's Open-File Miscellaneous Investigation OFMI-05-01.1, none of the geologic formations underlying the Ash Basin Focus Area is identified as potential acidic rock units. However, during the final design subsurface exploration program, pyrite was observed within the matrix of rock samples obtained from the Trimmers Rock Formation to the southwest of the Ash Basin Focus Area. Since pyrite was observed within rock that would be exposed due to the proposed construction of CSVT, additional borings and an extensive laboratory testing program were performed on rock obtained from southwest of the Ash Basin Focus Area to determine its potential to produce acid. The laboratory results indicate that there is potential for acidic rock conditions to the southwest of the Ash Basin Focus Area.

Since pyrite was observed and the laboratory test results indicate that potential acid rock conditions are feasible adjacent to the Ash Basin Focus Area, a preliminary assessment of acid rock potential within the Ash Basin Focus Area was performed in areas where the Trimmers Rock Formation would be exposed due to proposed construction. Pyrite was not observed in any of the Trimmers Rock Formation rock samples obtained from the borings conducted along the No Change DAM or Eastern Alternatives. Furthermore, the laboratory test results on the Trimmers Rock Formation samples do not indicate that there is potential for acid rock conditions to occur along the No Change DAM or Eastern Alternatives.

Rock samples from the borings conducted in the Sherman Creek and Irish Valley Members of the Catskill Formation were reviewed for indicators of potential acid-bearing rock (i.e., dark gray/black shale and minerals such as pyrite). No dark gray/black shale or minerals such as pyrite were observed in the rock samples obtained from the Sherman Creek and Irish Valley Members of the Catskill Formation.

2.1.3 Impacts

The Irish Valley Member and the Sherman Creek Member of the Catskill Formation can exhibit poor cut-slope stability properties, especially in areas where the rock is weathered or fractured. Both the Preferred Eastern Alternative and the No Change DAM Alternative encounter these formations. In addition, there are some highly erodible soils in the focus area. Both alternatives would require cut and fill construction activities through these formations and soil series, and the impact in the non-ash basin areas would be similar. The No Change DAM Alternative would require fill impacts over the ash basins, and the increased load could result in impacts to the subsurface geology. The ash basins are unlined. The Preferred Eastern

Alternative avoids the ash basins and therefore would avoid any potential geologic or subsurface impacts associated with fills and loads from the ash basins.

2.1.4 Mitigation/Minimization

A comprehensive geotechnical and soils testing program will be implemented on the Preferred Eastern Alternative during the final design phase to determine the actual physical characteristics of the soils to be disturbed. From this testing, soil thicknesses and suitable uses (as construction and embankment materials) will be determined. Erodibility factors will also be determined from the testing program.

Erosion and sedimentation pollution control practices will be used to minimize impacts to receiving watercourses. A detailed Erosion and Sediment Pollution Control Plan (E&S Plan) will be prepared during final design. The E&S Plan will be included in the National Pollutant Discharge Elimination System (NPDES) Permit(s) required by the Pennsylvania Department of Environmental Protection (PA DEP). Guidelines provided by PA DEP and U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) will be followed for control of erosion and sedimentation.

The geotechnical drilling program will also determine information related to the rock underlying the soil. The program will determine rock type, delineate contacts between formations, establish dip angles, locate voids, and look for evidence of potential acid-bearing rock. All drill holes will be sealed using bentonite grout shortly after completion to prevent future problems.

The comprehensive geotechnical and soil testing program will identify soil and geologic constraints with respect to adequate structure and stability for construction. These additional studies will be completed throughout the final design phase of the project to ensure the appropriate measures are incorporated into the project design. PennDOT will further evaluate the need for incorporating special provisions within the construction contract to address encountered soil and geologic stability concerns.

The following design and construction considerations are also recommended.

- Alternatives that traverse areas underlain by limestone bedrock should be carefully investigated for the presence of solution features.
- Roadway boring coverage should be relatively dense in both the lateral and vertical dimensions to provide an adequate confidence level.
- Approved engineering methods should be used to address any solution features encountered during construction efforts.

- Stormwater detention structures should be designed and located so as to prevent aquifer degradation via sinkholes.

- Road cuts in all areas should be designed according to the characteristics of the local lithology.

2.2 GROUNDWATER RESOURCES

2.2.1 Methodology

Both public water services (i.e. public water) and domestic supply wells (i.e. private wells) exist in the focus area. Information pertaining to water supplies in the focus area was obtained through correspondence with PA DEP and the Pennsylvania Department of Conservation and Natural Resources (PA DCNR). The Pennsylvania Groundwater Information System (PaGWIS) was used as the primary database for obtaining well information. Since 1966, well drillers have been required to submit well reports that are kept on file by the PA DCNR. In some instances, however, these reports are not submitted or do not contain sufficient information. It is important to note that the domestic/private water supply well information is not comprehensive.

2.2.2 Existing Conditions

Shamokin Dam Borough operates its own public water supply for areas within the Borough (Attachment 1, Project Mapping; Figure 6). Shamokin Dam draws its drinking water from the Susquehanna River utilizing a raw water intake system which is located in the river at Fabridam Park. The raw water intake is a concrete-encased structure that pumps water from the river through a screen drain and up Fifth Avenue to Helen Street where the line connects with the municipal water treatment plant. The water is run through a silt settling basin which filters out impurities. The Shamokin Dam Borough water system consists of a 1,000,000-gallon concrete-encased reservoir located along Sunbury Road just outside the Ash Basin Focus Area. A gravity-fed system consisting of an 8-inch asbestos concrete (A.C.) pipe and a 10-inch A.C. pipe feed water from the reservoir to a 250,000-gallon elevated steel water tank. The elevated tank is located within the ramps at the west end of the Veterans Memorial Bridge.

The areas outside of Shamokin Dam Borough within the Ash Basin Focus Area are not serviced by public water. The data extracted from the PaGWIS system identified two domestic/ private supply wells and two industrial monitoring (Talen Energy) wells within the focus area as well as two private wells along the periphery of the focus area. It is important to note that the

domestic/private water supply information obtained from the PaGWIS is not complete. All the residential structures outside the public water supply are assumed to have a private water supply. Approximately 78 residential structures are located within this area and are assumed to have private wells servicing the properties.

Talen Energy (formerly owned by PPL) has a series of monitoring wells around the Southern Ash Basin, including the two industrial monitoring wells obtained from PaGWIS. Seven monitoring wells were installed, and groundwater degradation associated with the Southern Ash Basin was noted during its operation and closure. These wells are used for monitoring only, and yearly reports are prepared for PA DEP.

2.2.3 Impacts

Seven domestic/private water wells (each associated with a residential displacement) and one Talen Energy monitoring well are directly affected by the Preferred Eastern Alternative within the focus area. Acquisition of the residential structures required for construction of this alternative results in impacts to the wells that supply water to the residences. The No Change DAM Alternative would impact four domestic wells, each associated with a residence to be displaced within the limit of disturbance (LOD). PennDOT's coordination with PA DEP indicates that construction of the No Change DAM Alternative on the existing ash basins could result in potential impacts to the surrounding groundwater resources. The existing basins are not lined, and the weight of the highway on the saturated ash could result in ash water being directed beyond the limits of the basin.

Domestic wells in close proximity to construction areas outside the LOD are also susceptible to impact. Factors that may contribute to degraded water supplies include interception of the groundwater table in cut areas, introduction of sediments and other contaminants, surface runoff and sedimentation around well heads, entrainment of fine sediment as a result of blasting, and alteration of fractures as a result of blasting. Even after construction is completed, the presence of the highway can still influence the groundwater supply by altering surface drainage and infiltration patterns.

Concern for safe residential water supply is paramount, and several mitigation measures are recommended to protect public health.

2.2.4 Mitigation

The primary goal with regard to mitigation measures for impacts to private wells and public water supplies is to ensure a continued supply of safe drinking water to all users. Avoidance and minimization efforts include testing water wells at pre-construction, during construction and post-construction event intervals. If impacts occur as a result of construction, PennDOT will ensure the maintenance of water supplies for homes and properties not acquired as part of the right-of-way areas by any one of the following:

- providing connections to public water systems,
- redrilling existing wells to another water-producing zone at a greater depth within the same formation,
- relocating a well within an adjacent water-producing formation undisturbed by construction activities,
- providing water treatment, and/or
- acquiring the property.

Sampling will be completed for wells that are located within 0.25 mile of blasting operations. The data collected during this monitoring will be used to assess potential impacts to groundwater resulting from the construction. The groundwater quality monitoring plan will be implemented prior to construction, during construction, and one year post-construction.

2.3 SURFACE WATER AND AQUATIC RESOURCES

2.3.1 Methodology

Surface water resources were identified through a combined use of secondary source information and field reconnaissance. Secondary source information included U.S. Geological Survey (USGS) quadrangle mapping, soil survey, and PA DEP stream Geographic Information System (GIS) mapping.

2.3.2 Existing Conditions

The landscape of the Ash Basin Focus Area is characterized by rolling hills with small, relatively narrow stream valleys that drain to the Susquehanna River. The land cover/land use consists of a mix of forest land, agricultural lands, old fields, residential developments, wetlands, and streams. This focus area is located within the headwater reaches of numerous small named and unnamed tributaries to the Susquehanna River. The water uses for all of these tributaries are protected for warm water fishes (WWF) and migratory fishes (MF) in accordance with PA DEP Chapter 93 Water Quality Regulations. There are 25 watercourses within the focus area; of those, 6 are perennial, 17 are intermittent, and 2 are ephemeral streams. Table 1 summarizes the different streams within the focus area. A map illustrating the streams in the focus area is provided in Attachment 1, Project Mapping (Figure 7).

Table 1
Existing Streams

Stream Type	Number	Length (ft)
1	2	13,057
2	4	7,216
3	17	7,034
4	2	900
Total	25	28,207

Summary descriptions of the stream types referenced in Table 1 above (perennial, intermittent, and ephemeral streams) are provided below.

- **Type 1 Resources** possess perennial flow, fin fish, and macroinvertebrate communities. These types of watercourses consist of the major rivers and higher order (larger) streams within the focus area. These channels typically have a drainage area greater than 0.5 square mile and are generally greater than 5 feet in width.

- **Type 2 Resources** possess perennial flow during most years, possess macroinvertebrate communities, and possibly support fin fish populations. These types of watercourses consist of moderately sized streams within the focus area. These channels typically possess a drainage area between 0.5 and 0.25 square mile and generally range from 4 to 5 feet in width.

- **Type 3 Resources** possess intermittent flow and macroinvertebrate communities. These types of watercourses consist of the small order

drainages which are probably not capable of supporting fish communities due to the loss of flow seasonally. These channels typically possess a drainage area between 50 to 150 acres and generally range from 2 to 4 feet in width.

- **Type 4 Resources** possess intermittent/ephemeral flow and support fewer than two taxa of macroinvertebrates. These types of watercourses are characterized as the very small channels which contain flow only during storm events or runoff periods. These channels typically possess a drainage area of less than 50 acres and are generally 2 feet in width.

Because of the small size of the drainages and unnamed nature of many of the streams, there was not much existing information available on the watercourses in the focus area. As part of the environmental studies completed for the CSVT Project, stream assessments were completed on several of the main tributary channels within the CSVT Project area, including the streams that drain from the PPL/Talen Energy Ash Basins:

- Station 9 - Shreiners Creek CHN-024 (2,000 feet downstream of the Southern Ash Basin),
- Station 10 - Shreiners Creek CHN-025 (along 11th Avenue), and
- Station 11 - Shreiners Creek CHN-026 (1,500 feet downstream of the Northern Ash Basin).

The CSVT stream assessments were completed in 1998 during the development of the FEIS and included the evaluation of the chemical, physical, and biological conditions of each stream. Because the ash basins remain vegetated and the land use/land cover surrounding the basins remain similar, the CSVT FEIS stream assessment information was considered to be representative of the conditions for the streams within the focus area.

The chemical conditions were evaluated by collecting grab samples for analytical laboratory analysis for the following parameters: total hardness, aluminum, iron, alkalinity, chlorides, nitrate-nitrogen, phosphorus, sulfates, and pH. Field parameters evaluated included pH, temperature, specific conductance, and dissolved oxygen. The water quality and macroinvertebrate sampling efforts were conducted in the spring of 1998. The macroinvertebrate investigation included conducting three one-minute kick net samples. Benthic macroinvertebrates are routinely utilized as biological indicators of short-term and long-term water quality conditions. The fin fish survey included electro-shocking using a direct current backpack shocker. The fin fish sampling was conducted in the summer of 1998.

The results of the stream assessment efforts for CHN-024, CHN-025, and CHN-026 are described as follows. The water quality results are provided in Table 2 and include the laboratory and field results for identified parameters and the PA DEP Chapter 93 water quality standards for each parameter as related to the WWF designation.

Table 2
Water Quality

Chemical Parameter	CHN-024 Southern Ash Basin	CHN-025 Along 11th Avenue Between Ash Basins	CHN-026 Northern Ash Basin	PA DEP Standards
Temperature (°F)	59.2	52.3	48.9	46-53*F[1]
Specific Conductance (µmhos)	470	200	160	----------
Dissolved Oxygen (mg/l)	9.74	11.54	11.04	4.0 mg/l (min)
Total Hardness (mg/l)	190.0	74.0	91.0	150 mg/l (m/m)
Total Aluminum (mg/l)	0.87	ND	ND	0.1 LC 50
Total Iron (mg/l)	0.70	0.18	ND	1.5 mg/l (daily)
Total Alkalinity (mg/l)	54.0	10.0	26.0	20 mg/l (min)
Total Chlorides (mg/l)	12.0	24.0	6.0	150 mg/l
Nitrate-Nitrogen (mg/l)	1.70	3.0	2.90	10 mg/l
pH (s.u.)	6.99	7.49	7.27	6.0-9.0
Total Phosphorus (mg/l)	0.14	ND	ND	----------
Total Sulfates (mg/l)	160.0	31.0	65.0	250 mg/l

1 Warm Water Fishes Criteria; ---- : limit not listed min; minimum m/m : maximum monthly mean daily : daily average of total iron LC50 : 0.1 in 96 hour L.C. 50

2.3.2.1 CHN-024 at Station 9 Downstream of Southern Ash Basin

Station 9 is located on Shreiners Creek (CHN-024), 2,000 feet downstream of the Southern Ash Basin. Shreiners Creek is a small headwater tributary to the Susquehanna River which originates from discharges from the northern and southern PPL/Talen Energy ash basins. The stream is approximately five feet wide with one-foot deep banks. The stream flows through a mix of farmlands, woodlands, and residential development. There is a large farm operation (Hummel Brothers) located between the ash basin and the sample station. This farm operation includes a large field on Shreiners Creek that is exposed to pasturing use. Historically, the physical stream habitat at this station has been exposed to water quality impairments associated with streambank

degradation and sedimentation. However, over the more recent past, streambank fencing has been installed to limit the agri-trafficing in the creek and promote the development of riparian vegetative cover.

The water quality results identify the presence of iron and aluminum. The hardness and alkalinity reflect elevated levels for each parameter. In addition, the detected sulfate levels reflect the highest levels identified in the focus area. The macroinvertebrate sampling identified 6 different taxa with a total abundance of 71 individuals and an EPT index of 1. The EPT index is the number of macroinvertebrate taxa from the orders of Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). EPT taxa are generally considered to be pollution-sensitive organisms, and the presence of several to numerous EPT taxa is indicative of better water quality conditions.

The collected community consists of a mix of organisms generally considered to be facultative or pollution-tolerant. The facultative taxa include Tipulidae (craneflies) and Hydro-psychidae caddisflies, which is also the lone EPT taxa identified. The pollution-tolerant taxa include Chironomidae, Simulidae (black flies), and Oligocheates (roundworms).

2.3.2.2 CHN-025 at Station 10 Along 11th Avenue

Station 10 is located on Shreiners Creek (CHN-025), along 11th Avenue upstream of the confluence from the Shreiners Creek tributary (CHN-026) from the Northern Ash Basin. This segment of Shreiners Creek is a small headwater tributary that is located between the two ash basins. The stream is approximately five feet wide with one-foot-deep banks. The stream flows through a mix of farmland, woodlands, and residential development. The stream contains a mix of small riffles and shallow pools.

The water quality results report low levels for metals. The hardness and alkalinity reflect average levels for the project area. The nutrient levels (sulfates, phosphates, chlorides, and nitrates) also reflect low levels for the project area. The detected chemical levels are below the PA DEP Chapter 93 water quality standards for protected uses. The macroinvertebrate sampling identified 8 different taxa with a total abundance of 64 individuals and an EPT index of 2. Common taxa included Hydropsychidae caddisflies and Chironomidae midges.

2.3.2.3 CHN-026 at Station 11 Downstream of Northern Ash Basin

Station 11 is located on Shreiners Creek (CHN-026), 1,500 feet downstream of the Northern PPL/Talen Energy Ash Basin. Shreiners Creek is a small headwater tributary to the

Susquehanna River with discharge from and along the PPL/Talen Energy ash basins. The stream is approximately five to ten feet wide with one-foot-deep banks. The stream flows through a mix of farmland, woodlands, and residential development. The Northern Ash Basin is closed and capped. Station 11 is located downstream of the old dam breast and in the wooded riparian area. The stream contains a mix of small riffles and shallow pools.

The water quality results report non-detectable limits for metals, iron and aluminum. The hardness and alkalinity reflect average levels for the project area. The nutrient levels (sulfates, phosphates, chlorides, and nitrates) also reflect low levels for the project area. The detected chemical levels are below the PA DEP Chapter 93 water quality standards for protected uses. The macroinvertebrate sampling identified 16 different taxa with a total abundance of 167 individuals and an EPT index of 10. Common taxa included Heptagenidae and Ephemerellidae mayflies, Peltaperlidae stoneflies, Hydropsychidae and Rhyacophilidae caddisflies, and Tipulidae craneflies. The EPT index of 10 reflects the presence of taxa generally regarded as pollution-sensitive taxa.

The stream assessment efforts also included a qualitative fish survey along Shreiners Creek. The fin fish survey identified an abundance of Creek Chubs and Blacknose Dace, which are regarded as common for the small headwater tributary streams in the focus area. To that end, there are no wild trout streams, trout-stocked waters, or Class A trout waters within the focus area.

2.3.3 Impacts

Construction of the Preferred Eastern Alternative or the No Change DAM Alternative would result in impacts to stream resources within the project area. Impacts to streams associated with transportation improvement projects can be categorized as construction or operational impacts. Construction impacts refer to the permanent and temporary disturbances of the resource due to the installation of crossing structures (i.e., bridges, culverts, etc.), relocation of the resource, or loss of the resource due to the alteration of its hydrologic source. Operational impacts refer to the effects of roadway maintenance activities and the altered hydrologic regime characteristics of the drainage basin.

2.3.3.1 Construction Impacts

An assessment of potential direct permanent impacts was completed for each highway alternative using preliminary engineering for the project. The permanent impacts included the

total length and surface area of existing watercourses located within the proposed limits of disturbance of the project alternative. The surface area impacts were determined by multiplying the average width of the existing stream by the proposed length of impact. The permanent impacts would include stream crossing structures (bridges/culverts), relocation, and/or permanent hydrologic alteration. Given the small size of the watercourses, limited drainage areas, and facultative nature of the biological communities associated with a majority of the perennial watercourses, culverts are proposed for most crossings. It is anticipated that the crossings at Stetler Avenue (Channel 24) and 11th Avenue (Channel 25) will be bridges.

The alternatives are designed to cross each stream valley perpendicular to the flow and valley slope, thereby reducing the longitudinal encroachment on each stream. The majority of the proposed impacts are associated with stream crossings. The primary stream encroachment is the stream crossing and relocation associated with CHN-026 in the area of the Northern Ash Basin. CHN-026 extends along the eastern border of the Northern Ash basin and impacts are unavoidable for either alternative. With both the No Change DAM Alternative and the Preferred Eastern Alternative, crossings would be planned to the extent needed to accommodate the new roadway alignment and the remaining impacted channels would be relocated to the extent practical. Table 3 itemizes the different stream impacts for each alternative. Table 4 provides a summary of impacts by stream type (Types 1 and 2 = perennial; Type 3 = intermittent; Type 4 = ephemeral).

Table 3
Stream Impacts

Alternative			No Change DAM Alternative		Preferred Eastern Alternative	
Name	Stream Type	Impact Type	Impact Length (LF)	Impact Area (SF)	Impact Length (LF)	Impact Area (SF)
CHN-09	4	culvert	188	564	604	1,812
CHN-12	3	culvert	0	0	711	2,133
CHN-13	3	culvert	0	0	549	1,647
CHN-14	3	culvert	292	876	400	1,200
CHN-15	3	culvert	452	1,356	454	1,362
CHN-23	2	culvert	282	846	215	645
CHN-24	1	bridge	0	0	1,154	11,540
CHN-25	2	bridge	583	5,830	610	6,100
Shreiners Creek - CHN-26	1	culvert and relocation	3,647	36,470	1,376	13,760
Total			**5,444**	**45,942**	**6,073**	**40,199**

In addition to permanent direct impacts, temporary impacts would be associated with the installation of each stream crossing and reductions in water quality. The types and extent of temporary impacts will be quantified during the final design phase of the project. However, the

Table 4
Stream Impacts by Type

Type	No Change DAM Alternative		Preferred Eastern Alternative	
	Impact Length (LF)	Perennial Stream Total (LF)	Impact Length (LF)	Perennial Stream Total (LF)
1	3,647	4,512*	2,530	3,355*
2	865		825	
3	744		2,114	
4	188		604	
Total	**5,444****		**6,073****	

* *Perennial Streams include Types 1 and 2*
** *Based on the impact comparison, the Preferred Eastern Alternative results in a slightly higher total of stream impacts; however, the No Change DAM Alternative has higher impacts (+1,157 linear feet [LF]) to perennial stream (Types 1 and 2).*

discussion on mitigation measures describes recommendations to minimize impacts (permanent, temporary, and reductions in water quality) to the surface water resources.

Bridge and culvert installation have the potential to affect the fluvial geomorphic and physical characteristics of a channel by altering the sediment transport and energy dynamics. These structures will be designed to maintain the existing fluvial geomorphic characteristics of the channel and its associated floodplain, thus maintaining the available physical aquatic habitat, including riffle-pool complex areas. This will be accomplished by maintaining an effective channel cross-sectional area and depressing the bottom of the culvert 6 to 12 inches, depending on the size of the stream, to maintain aquatic movement through the crossing.

2.3.3.2 Operational Impacts

Operational impacts associated with pollutant loading, changes in flow, and increased thermal loading can be evaluated in an overview and comparative fashion by investigating changes in watershed characteristics associated with the various alternatives. The design of the project alternatives has been developed to traverse the different stream drainages perpendicular to the flow, thereby reducing the overall encroachment and surface area of new roadway associated with each respective stream crossing. A preliminary Stormwater Management Plan has been developed to adequately collect and treat the stormwater runoff for the project. The Stormwater Management Plan will be further developed and detailed as part of the NPDES permitting process to be completed during the final design phase of the project. The stormwater facilities will be positioned to avoid encroachment or impact to the ash basins or other sensitive resources within each respective drainage area.

An additional operational impact concern is related to the water quality concerns with the ash basins. The No Change DAM Alternative would cross both the Southern and Northern Ash

Basins. Based on the recent geotechnical investigations, PennDOT has determined that the subsurface ash material remains saturated within the basins. Because the ash remains saturated, there is a potential with the No Change DAM Alternative for increased seepage of leachate into the bedrock aquifer and receiving surface waters due to highway construction and the related loading on the ash basins with the anticipated increased pore water pressure. As part of the project development process, the project team completed a review of the ash basins and documented the findings in the S.R. 0015-088 PPL Ash Basin No. 1, Ash Basin No. 2, and Ash Basin No. 3 Technical Memorandum. This report references that the water quality of the downstream groundwater and surface water resources was impacted by the ash basins during their time of operation. With PennDOT's project agency consultation, PA DEP has expressed concern that construction of the CSVT Project across the ash basins could result in potential water quality impacts to downstream groundwater and/or surface water resources. With the development of the Preferred Eastern Alternative, ash basin crossings and potential ash leachate water quality concerns are avoided. The Preferred Eastern Alternative is located to the south and east of the Southern and Northern Ash Basins, thereby avoiding potential concerns related to ash basin discharges to the downstream waters.

2.3.3.3 Impact Summary

The Preferred Eastern Alternative results in a slight increase in overall stream impacts, but the No Change DAM Alternative impacts more perennial streams. The increase in the overall stream impacts for the Preferred Eastern Alternative is associated with the small stream crossings around the eastern side of the Northern Ash Basin. These streams consist of small, single-thread channels that convey intermittent or ephemeral flow to Channel 26, an unnamed tributary to Shreiners Creek. The Preferred Eastern Alternative does avoid the ash basins and therefore avoids the potential water quality concerns raised by PA DEP during final design coordination for the No Change DAM Alternative.

2.3.4 Mitigation

Impacts to surface water quality and aquatic resources would occur with construction of the project. Both construction and operational impacts associated with these alternatives would occur. Construction impacts would include permanent impact of aquatic habitat from installation of a crossing structure or alteration of the headwaters and in-stream disturbances which occur during installation of a crossing structure. Operational impacts result from highway runoff which

could chronically degrade the quality of the receiving water and the aquatic habitat. In order to properly develop potential mitigation measures for surface water resources, three components of a mitigation strategy must be evaluated to offset the surface water impacts. The three components of the mitigation strategy include the following sequence of activities.

2.3.4.1 Avoidance

To satisfy the purpose and need of the project, a new roadway on a new alignment is proposed. Total avoidance of aquatic resources is not possible given the project purpose and scope.

2.3.4.2 Minimization

Minimization measures include both design and construction options to minimize construction and post-construction impacts. Design minimization measures include the following.

- Consider bridges rather than culverts, where practicable and feasible, to reduce the direct loss of aquatic habitat. However, based on the limited amount of drainage area and limited biological communities associated with a majority of the perennial watercourses, culvert structures are anticipated for most of these crossings.
- Proposed culvert crossing structures will employ fish passage strategies developed by PennDOT, the Pennsylvania Fish and Boat Commission (PFBC), and PA DEP. The design of box culverts will utilize standardized construction details including depression below streambed and baffle geometry to allow for fish passage (if applicable and reasonable).
- Separate highway stormwater runoff from the clean upslope runoff. A comprehensive E&S Plan and Stormwater Management Plan will be developed as part of the NPDES permitting process during final design.
- The length of required stream relocations will be minimized to the extent possible. Where stream relocations are unavoidable, the most current methodologies (including fluvial geomorphology and natural stream design) will be used, as practical and feasible, to design the relocated stream.
- In accordance with PA DEP's Chapter 105 regulations, efforts will be made to repair, rehabilitate, and/or restore impacted waterways.

2.3.4.3 Compensation

The CSVT Project's impact of aquatic habitat associated with perennial resources has been mitigated through a compensatory plan developed with the natural resource regulatory agencies at the Center Mitigation Site in Snyder County. Mitigation for natural resources (including wetlands, surface water resources, and terrestrial habitat) has been provided at this location.

Watercourse impacts for the Northern Section of the CSVT Project totaled 14,528 LF, including direct and temporary impacts. Stream mitigation has been provided for the entire CSVT Project through the completion of the Center Mitigation Site stream improvements project to provide compensation for permanent direct impacts to perennial streams (Type 1 and 2) associated with pipe and enclosure impacts. Of the 14,528 LF of watercourse impacts, 2,617 LF were associated with the enclosure of watercourses with perennial flow. The Center Mitigation Site stream mitigation included improvement and stabilization of 6,320 LF of perennial stream. The Center Mitigation Site stream mitigation area was reviewed by the permitting agencies in August 2014 and was determined to be complete. The stream improvements and stabilization thereby provided the compensatory stream mitigation for the 2,617 LF of impacts associated with ongoing construction of the CSVT Northern Section. The remaining balance of 3,703 LF of available stream mitigation created at the Center Mitigation Site (6,320-2,617 LF) will offset the perennial stream impacts associated with the CSVT Southern Section, including the Preferred Eastern Alternative which impacts less perennial streams than the No Change DAM Alternative. All stream impacts will be coordinated through the U.S. Army Corps of Engineers (USACE) as part of the federal Section 404 permitting and through PA DEP as part of the state Chapter 105 permitting for the project.

2.4 FLOODPLAINS

There are no mapped Federal Emergency Management Agency (FEMA) floodplains within the focus area; therefore, there will be no impact by either the No Change DAM Alternative or the Eastern Alternative.

2.4.1 Methodology

The FEMA website was reviewed to determine the extent of mapped floodplains within the project area. FEMA Flood Map Service Center – Panel 42097C0255D covers the project area.

2.4.2 Existing Conditions

There are no mapped FEMA floodplains along the tributary streams within the focus area. Much of the Ash Basin Focus Area is identified as Zone X with no specific limits. Zone X represents areas determined to be outside the 0.2% annual chance floodplain. There is a small area of Zone A Special Flood Hazard identified within a portion of the Northern Ash Basin. Currently, the Northern Ash Basin does not impound surface water. Upslope drainage is diverted around the Northern Ash Basin in Channel 26 (unnamed tributary to Shreiners Creek). The flood hazard designation may be related to the area's former use when it impounded water.

2.4.3 Mitigation Measures

The focus area is located outside of the mapped FEMA floodplains. As part of the PA DEP Chapter 105 permitting, each regulated stream will have an assumed floodway in accordance with Chapter 105 regulations.

2.4.3.1 Avoidance

FEMA floodplains are avoided within the focus area. PA DEP assumed that the floodway for all of the small tributary streams cannot be avoided.

2.4.3.2 Minimization

Minimization measures include both design and construction options to minimize construction and post-construction impacts. Design minimization measures include the following.

- Proposed stream crossing structures will be designed to maintain current flow conditions and avoid downstream and upstream impacts associated with increased velocities or flooding.
- Separate highway stormwater runoff from the clean upslope runoff. A comprehensive E&S Plan and Stormwater Management Plan will be developed as part of the NPDES permitting process during final design.
- The length of required stream relocations will be minimized to the extent possible. Where stream relocations are unavoidable, the most current methodologies (including fluvial geomorphology and natural stream design) will be used, as practical and feasible, to design the relocated stream.

- In accordance with PA DEP's Chapter 105 regulations, efforts will be made to repair, rehabilitate, and/or restore impacted waterways and their assumed floodways.

2.4.3.3 Compensation

No compensatory floodplain mitigation is anticipated for the project.

2.5 WETLANDS

2.5.1 Methodology

Wetlands were identified through the use of secondary source information and field delineation. Wetlands were delineated in accordance with the USACE 1987 Wetland Delineation Manual and conform with the Eastern Mountain and Piedmont Regional Supplement.

2.5.2 Existing Conditions

The landscape of the Ash Basin Focus Area is characterized by rolling hills with small, relatively narrow stream valleys that drain to the Susquehanna River. The land cover/land use consists of a mix of forest land, agricultural lands, old fields, residential developments, wetlands, and streams. This project area is located within the headwater reaches of numerous small named and unnamed tributaries to the Susquehanna River. There are 68 wetlands totaling over 7.5 acres within the Ash Basin Focus Area. A map illustrating the extent of wetlands is provided in Attachment 1, Project Mapping (Figure 7). The wetlands are located along the floodplain/riparian and hillside landscape positions and include palustrine emergent (PEM), scrub-shrub (PSS), and open water (POW) vegetative components. Table 5 identifies the different wetland vegetative types within the focus area.

Table 5
Wetland Vegetative Type Distribution Summary

Wetland Vegetative Type	Number	Size (acres)
PEM	49	5.83
PEM/PSS	16	1.20
PEM/POW	1	0.13
POW	2	0.36
Total	**68**	**7.52**

2.5.3 Wetland Functional Assessment

2.5.3.1 Hydrogeomorphic and Functional Characterization of Wetlands

The functional assessment for the wetlands within the CSVT Project area considered hydrogeomorphic and functional characteristics. The Hydrogeomorphic and Functional Characterization (HFC) of wetlands evaluated the different functions and values provided by each wetland coupled with the hydrologic regime and landscape positions. Over 500 wetlands were identified and delineated within the overall CSVT Project study area. Many of these wetlands contain similar functional and hydrologic characteristics. Based on the large number of wetlands, coupled with their similar characteristics, completing an individual HFC on each wetland would be redundant and impractical. Therefore, the HFC divided the wetlands into different HFC types. The following describe the functions and values for each HFC Category. Additional details regarding the development of the HFC are provided within the CSVT FEIS.

2.5.3.2 Hydrogeomorphic Functional Characterization Descriptions

2.5.3.2.1 Riparian/Flooded (RPF)

Headwater riparian wetlands are located in and along small headwater stream hollows. These areas are temporarily flooded and characterized by surface water collecting in topographic low areas. These areas are saturated during the spring and typically dry out by mid-summer. Surface water hydrology is provided by runoff from the adjacent valley slopes and possibly occasional high-water stream flooding.

The floodplain position provides a high opportunity for floodflow alteration. The flooding potential also provides a moderate opportunity for sediment/toxicant retention and nutrient removal transformation. The depressed topographic position, coupled with the restricted or no outlets topography, provides a high effectiveness for retention and alteration. The vegetative communities in these wetlands are dominated by a mix of silky dogwood, spicebush, skunk cabbage, late goldenrod, and jewelweed. The hydrologic inputs to these wetlands consist of the collection of surface water runoff. The hydrologic inputs are of a low velocity and low energy. The low-velocity hydrology and the skunk cabbage and spicebush community provide for a moderate effectiveness for sediment stabilization. The flooding hydrologic regime of these wetlands typically creates a saturated soil condition for the early portion of the growing season. There are only limited areas of inundation, and standing water is typically less than 0.5 foot. This saturated soil condition provides

seasonal wildlife and aquatic habitat for reptiles, amphibians, and small mammals. The saturated soil condition does not provide the ponded water condition beneficial to waterfowl. Surface water runoff from the adjacent valley slopes provides the hydrology to these wetlands. Seasonal high-water stream flooding may provide seasonal inputs. The temporary seasonal presence of hydrology limits the effectiveness for discharge. The relatively flat and/or depressed topography, coupled with an absent or constricted outlet, provides a moderate effectiveness for groundwater recharge. The limited outlet characteristics limits the production export potential. The uniqueness and heritage value is limited due to the absence of a threatened or endangered species in the project study area.

2.5.3.2.2 Riparian/Saturated (RPS)

Headwater riparian wetlands are located in and along small headwater stream hollows. These areas contain seep discharge hydrology and are typically saturated throughout the year. The floodplain position provides a high opportunity for floodflow alteration. The flooding potential also provides a moderate opportunity for sediment/toxicant retention and nutrient removal transformation. The depressed topographic position, coupled with the restricted or no outlets topography, provides a high effectiveness for retention and alteration. The vegetative communities in these wetlands are dominated by a mix of silky dogwood, spicebush, skunk cabbage, late goldenrod, and jewelweed. The hydrologic inputs to these wetlands consist of groundwater discharge. The dense vegetation and low velocities provide a moderate effectiveness for sediment stabilization. This saturated soil condition provides seasonal wildlife and aquatic habitat for reptiles, amphibians, and small mammals. The saturated soil condition does not provide the ponded water condition beneficial to waterfowl. The groundwater hydrology provides a high effectiveness for groundwater discharge. The relatively flat and/or depressed topography, coupled with an absent or constricted outlet, provides a moderate effectiveness for groundwater recharge during the drier portion of the growing season. The discharge hydrology provides a moderate effectiveness for production export. The uniqueness and heritage value is limited due to the absence of a threatened or endangered species in the project study area.

2.5.3.2.3 Hillside/Saturated (HS)

Hillside wetlands are located along the rolling hill terrain that lies upslope of the many headwater tributary hollows in the project study area. These areas contain seep discharge hydrology and are typically saturated throughout the year. Saturated wetlands can contain either sloping or flat topography. The geographic location on the rolling hill portion of the project area limits the opportunity for floodflow alteration. This hillside location also limits the opportunity for

sediment/toxicant retention and nutrient removal transformation. The hillside landscape position limits the retention properties of the wetlands. The vegetative communities in these wetlands are dominated by a mix of red maple trees, silky dogwood, spicebush, skunk cabbage, late goldenrod, and jewelweed. The hydrologic inputs to these wetlands consist of groundwater discharge. The groundwater hydrology provides a high effectiveness for groundwater discharge. The groundwater discharge limits the groundwater recharge potential. The dense vegetation and low velocities provide a moderate effectiveness for sediment stabilization. This saturated soil condition provides seasonal wildlife and aquatic habitat for reptiles, amphibians, and small mammals. The discharge hydrology provides a moderate effectiveness for production export. The uniqueness and heritage value is limited due to the absence of a threatened or endangered species in the project study area.

2.5.3.2.4 Hillside/Temporarily Flooded (HF)

Hillside wetlands are located along the rolling hill terrain that lies upslope of the many headwater tributary hollows in the project study area. These areas are typically temporarily flooded surface waters collecting in topographic low areas. These areas are saturated during the spring and typically dry out by mid-summer. The geographic location on the rolling hill portion of the project area limits the opportunity for floodflow alteration. This hillside location also limits the opportunity for sediment/toxicant retention and nutrient removal transformation. The depressed and flat topographic position provides moderate effectiveness for retention. The vegetative com-munities in these wetlands are dominated by a mix of red maple trees, silky dogwood, spicebush, skunk cabbage, late goldenrod, and jewelweed. The hydrologic inputs to these wetlands consists of surface water runoff, direct precipitation, and limited groundwater discharge. The limited groundwater hydrology inputs reduce the effectiveness for groundwater discharge. The flat and depressed topography provides a moderate effectiveness for groundwater recharge. The dense vegetation and low velocities provide a moderate effectiveness for sediment stabilization. This retention of surface water provides a seasonal wildlife and aquatic habitat for reptiles, amphibians, and small mammals. The depressed topography and limited retention qualities reduces the pro-duction export potential. The unique-ness and heritage value is limited due to the absence of a threatened or endangered species in the project study area.

Table 6 provides a summary of the number of wetlands per functional type.

Table 6
Wetland Functional Type Distribution Summary

Wetland Functional Type	Number	Size (acres)
RPS	41	3.94
RPF	8	1.31
HS	15	0.87
HF	4	1.39
Total	**68**	**7.52**

2.5.3.2.5 PA DEP's Updated Functional Assessment Protocol

PA DEP's July 2017 – PA Wetland Condition Level 2 Rapid Assessment Protocol was used to assess Riparian and Hillside wetland HFC categories, listed above. The assessment provides a representative Overall Condition Index score for the types of wetlands within the focus area, including riparian and hillside. The Overall Condition Index score for riparian-floodplain wetlands is 0.79, and the score for the hillside wetlands is 0.72. The breakdown of the assessment scores is provided in Table 7. The Level 2 assessment provides a numeric score from 0 to 1.0 for the different conditions (including roads, proximity to development, vegetative cover, hydrologic modifications, sediment stressors, and water quality stressors) that may be of influence. Each condition is given a numeric score, then all of the individual scores are tallied and averaged to determine the Overall Condition Index.

Table 7
Rapid Assessment of Wetland Condition

Level 2 Rapid Assessment Summary		
Project Name	CSVT – Riparian Saturated Wetlands – Floodplain wetlands along Channel 26 downstream of Northern Ash Basin (Functional Group RPS)	CSVT – Hillside Saturated Wetlands in agricultural/field landscape setting with adjacent forest landscape (Functional Group HS)
Condition Index (CI)	**CI Score**	**CI Score**
Wetland Zone of Influence	0.86	0.32
Roadbed Presence	0.83	0.85
Vegetation	0.7	0.63
Hydrologic Modification	0.8	0.8
Sediment Stressor	0.8	0.8
Water Quality Stressor	0.73	0.9
Overall Wetland Level 2 Condition Index	0.79	0.72

2.5.4 Impacts

The construction of the Preferred Eastern Alternative or the No Change DAM Alternative would result in impacts to wetland resources within the focus area. Impacts to wetlands associated with transportation improvement projects can be categorized as permanent or temporary. Permanent impacts refer to the direct and permanent fill/excavation disturbances associated with the construction of the proposed roadway. Temporary impacts are associated with construction encroachments that would be temporary in nature and restored back to pre-construction conditions before completion of construction. Wetlands located within the anticipated right-of-way for each

alternative were considered direct impacts. During final design, the impact profile will be reevaluated to determine if additional minimization efforts could be implemented to reduce the direct impacts and/or determine if any of the encroachments could be temporary and restored upon the completion of the project. Table 8 summarizes the wetland impacts by alternative. Table 9 summarizes the impacts by vegetative classification.

Table 8
Wetland Impact Summary

No Change DAM Alternative			Preferred Eastern Alternative		
Wetland Name	**Vegetation**	**Size (acres)**	**Wetland Name**	**Vegetation**	**Size (acres)**
BTB-200	PEM	0.14	PJD-081	PEM	0.02
DMG-026	PEM	0.00	DMG-001	PEM/PSS	0.07
DMG-027	PEM	0.00	DMG-003	PEM	0.02
DMG-028	PEM	0.00	AMB-016	PEM 60%/PSS 40%	0.02
DMG-100	PEM	0.08	AMB-014	PEM	0.11
DMG-101	PEM	0.06	MSC-017	PEM	0.30
LTZ 1	PEM	0.04	RLI-008	PEM/PSS	0.11
PJD-078	PEM	0.01	RLI-009	PEM/PSS	0.02
PJD-079	PEM	0.03	RLI-007	PEM/PSS	0.03
PJD-080	PEM/PSS	0.04	RLI-006	PEM/PSS	0.02
PJD 503	PEM	0.13	RLI-005	PEM	0.07
RLI-008	PEM/PSS	0.02	RLI-011	PEM	0.01
RLI-009	PEM/PSS	0.02	PJD-175	PEM	0.02
RLI-013	PEM	0.89	PJD-176	PEM	0.00
RLI-014	PEM	0.01	PJD-177	PEM	0.01
RLI-015	PEM	0.02	DMG-030	PEM	0.00
RLI-016	PEM	0.06	DMG-029	PEM	0.00
Total		**1.55**	DMG-028	PEM	0.01
			DMG-027	PEM	0.00
			DMG-026	PEM	0.00
			PJD 503	PEM	0.11
			PJD 504	PEM	0.10
			Total		**1.05**

Table 9
Summary of Wetland Impacts by Vegetative Classification

	No Change DAM Alternative	Preferred Eastern Alternative
Total PSS Impacts (acres)	0.04	0.10
Total PEM Impacts (acres)	1.51	0.95
Total Wetland Impacts (acres)	1.55	1.05

In general, the majority of the wetlands impacted by the project alternatives consist of small emergent areas located along the riparian area of small tributary streams or within a hillside

landscape position. The project alternatives have been developed to avoid the larger wetland areas within the project area. The Preferred Eastern Alternative would impact approximately 0.5 acre of less wetlands when compared with the No Change DAM Alternative.

2.5.5 Mitigation

The mitigation policy contained in the Council of Environmental Quality's National Environmental Policy Act (NEPA) of 1969 regulations [40 CFR 1508.20 (a-e)] defines mitigation to include avoidance, minimization, and compensation. The development of each project alternative considered each type of mitigative measure.

2.5.5.1 Avoidance

The construction of any build alternative results in unavoidable wetland impacts. Measures were implemented in the design of the alternatives to avoid impacts where practicable. Minor shifts in the alternatives were considered to avoid impacts. The Stormwater Management Plan for the project will be designed to avoid encroachment to regulated wetlands and streams to the extent practical.

2.5.5.2 Minimization

The minimization measures implemented address potential impacts from the project. Minimization measures include the following.

- Minimization of the width of the roadway footprint, where practicable, to reduce encroachments
- Implementation of a Stormwater Management Plan to avoid water quality impacts
- Implementation of an approved E&S Plan to avoid and minimize indirect impacts to adjacent wetland areas

2.5.5.3 Compensation

Construction of the Preferred Eastern Alternative or the No Change DAM Alternative would result in unavoidable wetland impacts. In accordance with both state and federal

regulations, wetland replacement has been provided for the project impacts at the Center Mitigation Site in Snyder County. The Center Mitigation Site included the creation of 6.9 acres of wetlands as outlined in Table 10.

Table 10
Center Mitigation Site 2017 Wetland Mitigation Summary

Basin	PEM	PSS	PFO	POW	TOTAL
1	1.660			0.034	1.694
2	0.745			0.023	0.768
5	0.814				0.814
7	1.100				1.100
9	2.220	0.335			2.555
TOTAL	**6.539**	**0.335**	**0.000**	**0.057**	**6.931**

Based on the established amount of PEM and PSS habitat that has been created at the Center Mitigation Site, there is adequate wetland mitigation to offset unavoidable wetland impacts for the project. The required wetland replacement for the Preferred Eastern Alternative would include 0.95 acres of PEM and 0.15 acre of PSS (0.10 acre impacted x 1.5 multiplier for PSS). The created wetland mitigation will adequately provide functional replacement and lift for the proposed wetland impacts. The PA DEP Level 2 Rapid Assessment scores for the impacted riparian and hillside wetlands are 0.79 and 0.72, respectively. The PA DEP Rapid Assessment score for the Center Mitigation Site wetlands is 0.85, thereby providing a functional lift for the area wetlands. Table 11 provides the PA DEP Rapid Assessment scoring for the Center Mitigation Site wetland mitigation.

Table 11
Rapid Assessment of Wetland Condition

Level 2 Rapid Assessment Summary	
Project Name	CSVT Center Mitigation Site Wetland Mitigation
Condition Index (CI)	
Wetland Zone of Influence	0.70
Roadbed Presence	0.95
Vegetation	0.68
Hydrologic Modification	0.95
Sediment Stressor	0.90
Water Quality Stressor	0.95
Overall Wetland Level 2 Condition Index	0.85

The impacted wetlands and the created wetlands provide similar functions and values. The landscape position provides the opportunity for floodflow alteration, sediment/toxicant retention, and nutrient removal transformation. The depressed topographic position, coupled with the restricted outlet topography, provides an effectiveness for retention. The vegetative communities in these wetlands are dominated by a mix of shrubs and emergent species. The hydrologic inputs to these wetlands consist of groundwater discharge and surface water runoff. The dense vegetation and low velocities provide a moderate effectiveness for sediment stabilization. The saturated soil condition provides seasonal wildlife and aquatic habitat for reptiles, amphibians, and small mammals. The groundwater hydrology provides an effectiveness for groundwater interaction. Though the impacted wetlands and the created wetlands share similarities in the different functions and values provided, the mitigation site provides an overall functional lift to the wetlands in the region. The mitigation site creates a larger ecological unit within a relatively undeveloped landscape and watershed position that will remain and be protected through conservation measures in perpetuity.

2.6 VEGETATION AND WILDLIFE

2.6.1 Methodology

Terrestrial communities were mapped through a combination of secondary source aerial mapping and field reconnaissance.

2.6.2 Existing Conditions

Terrestrial communities found within the Ash Basin Focus Area were grouped into two major categories: forested land and non-forested land. The major categories consisted of microhabitats that were identified based on the density and type of vegetation that was present. Microhabitats within the two categories included mature forest habitat, successional forest habitat, old field habitat, agricultural land habitat, developed habitat, and barren land habitat. Subgroups within the microhabitats were also defined as needed, based on the landscape position and changes in the vegetation's species and age.

Forested communities consisted of microhabitats including mature forest habitat, successional forest habitat, and hedgerow habitats, each of which is described below.

- **Mature forest habitat** is located on the ridge tops and sides as well as the valley floors of the focus area. A variety of tree species (including oak, maple, and ash hardwoods as well as coniferous softwoods) was present within the habitats, and their ages ranged from pole stage tree to mature trees. Seven subgroups were identified within the focus area and were broken out based on the landscape position, changes in the species, and age of the vegetation present. Typically, mature forest habitat within the focus area contained sparse to moderate understory densities. Pole stage trees were defined as trees with a diameter at breast height (DBH) between three and ten inches that were not large enough to be considered sawable timber. Mature age trees were defined as those having a DBH of greater than ten inches. Mature forest covered the largest amount of land when compared with the other microhabitats in the focus area.

- **Successional forest habitat** is located throughout the focus area on lands that typically had some evidence of previous management, such as logging or prior agricultural practices. Trees within the successional forest habitat were generally in the sapling to pole stages (less than ten inches DBH). Dominant species included pioneer tree species such as maples, poplar, and locust. Successional forest habitat within the focus area typically contained a mixed understory of shrubs and herbaceous cover having varying density. Five subgroups were identified within the focus area and were broken out by changes in the species and age of the vegetation.

- **Hedgerow habitat** is typically found dividing agricultural or developed areas within the focus area. Hedgerow habitat contained an aggregate of different age classes of trees mixed with shrub understories. Dominant tree species within the hedgerow habitat included locust, walnut, and maple. The shrub layer contained a dominance of honeysuckles and multi-flora rose. Two subgroups with differing vegetation types were identified within the focus area.

Non-forested type communities consisted of microhabitats including old field habitat, agricultural habitat, developed habitat, and barren land habitat, each of which is described below.

- **Old field habitat** is spread throughout the focus area. The ash basins account for a large portion of the land in this community. Old field habitats consist of lands that were previously used for agriculture or other enter-prises that required the land to be cleared. Old field habitats within the focus area were divided into four subgroups depending on the vegetative growth (herbaceous or shrub) and whether or not the lands were mowed regularly. Herbaceous cover found within the old field areas consisted largely of upland grasses with herbaceous wetland vegetation in the wetland areas. Typical vegetation in old field communities containing a dominance of shrubs included autumn olive, honeysuckles, and multiflora rose.

- **Agricultural habitat** is prevalent within the Ash Basin Focus Area and was broken into two microhabitats (pasture lands and croplands). Pasture

lands were used to support livestock and generally contained upland grasses. Croplands were used to grow a variety of crops including corn, hay, wheat, soy bean, potatoes, and tomatoes.

- **Developed habitats** are scattered throughout the Ash Basin Focus Area and were broken into two subgroups (forested and non-forested). Developed habitats consisted of residential homes, mowed yards, businesses, fill areas, utility rights-of-way, and cemeteries. Only one area was considered to be within the developed forested category. This area is a large orchard and tree nursery that is no longer managed.

- **Barren land** is present in one location within the Ash Basin Focus Area and is devoid of all vegetative growth.

Table 12 shows the existing terrestrial vegetative communities that were identified and their total coverages within the Ash Basin Focus Area. A map illustrating the extent of the vegetative communities is provided in Attachment 1, Project Mapping (Figure 8).

Table 12
Existing Vegetative Conditions

Terrestrial Community Type	Existing Total (Acres)
F1 - Oak/Hardwood – Mature (Ridge Top/Ridge Side)	219.71
F2 - Oak/Hardwood – Mature (Valley Floor)	1.62
F3 - Oak/Hardwood – Pole Stage (Ridge Top/Ridge Side)	0.84
F4 - Red Maple/Hardwood	7.91
F6 - Mesic Ash/Hardwood	3.47
F7 - Mesic Oak/Hardwood	0.29
F10 - Softwood/Coniferous	2.01
Mature Forested Habitat Subtotal	**235.85**
SF1 - Successional Forest/Hardwood – Mature	12.78
SF2 - Successional Forest/Hardwood – Sapling to Pole	35.42
SF3 - Successional Forest/Mix – Sapling to Pole	41.37
SF4 - Successional Forest/Mix – Mature	19.6
SF5 - Successional Forest/Coniferous	48.52
Successional Forest Habitat Subtotal	**157.69**
HR1 - Upland Tree Hedgerow	0.97
HR3 - Upland Equal-Mixed Tree and Shrub Hedgerow	1.70
Hedgerow Habitat Subtotal	**2.67**
Forested Habitat Total	**396.21**

Table 12 (continued)	
Terrestrial Community Type	**Existing Total (Acres)**
OF1 - Old Field/Shrub Dominated	9.51
OF2 - Old Field/Herbaceous Dominated – Not Mowed Regularly	145.03
OF3 - Old Field/Herbaceous Dominated – Mowed Regularly	7.11
OF4 - Old Field/Equal Shrub and Herbaceous Dominated	36.12
Old Field Habitat Total	**197.77**
AG1 - Agricultural Land – Row Crops/Hay Fields	190.28
AG2 - Agricultural Land – Pasture	91.81
Agricultural Land Habitat Total	**282.09**
DEV1 - Developed Land – Non-Forested	144.31
DEV2 - Developed Land – Forested	5.11
Developed Land Total	**149.42**
Barren Land (BAR) Total	**3.73**
Total Area	**1029.22**

2.6.2.1 Invasive and Noxious Plants

In addition to the terrestrial habitat mapping, a review of invasive and/or noxious plants was completed for the CSVT Project. A composite list of all plant species was developed as part of the environmental studies for the CSVT Project and compared with the PA DCNR Bureau of Forestry, Pennsylvania Natural Diversity Inventory (PNDI) titled "Invasive Plants in Pennsylvania." An "invasive plant" is defined by PNDI as a noxious environmental weed, pest, or plant that grows aggressively, spreads, and displaces other plants. Invasive plants tend to appear in disturbed ground, and the most aggressive can invade other ecosystems. The following species were found in the focus area, and they are on the current PNDI list of invasive species.

- **Trees.** Norway Maple (*Acer platanoides*), Tree-of-Heaven (*Ailanthus altissima*)
- **Shrubs.** Japanese Barberry (*Berberis thunbergii*), Autumn Olive (*Elaeagnus umbellata*), Common Privet (*Ligustrum vulgare*), Morrow's Honeysuckle (*Lonicera morrowii*), Tartarian Honeysuckle (*Lonicera tatarica*), Multiflora Rose (*Rosa multiflora*)

- **Vines.** Japanese Honeysuckle (*Lonicera japonica*)

- **Flowers and Grasses.** Garlic Mustard (*Alliaria petiolata*), Canada Thistle (*Cirsium arvense*), Bull Thistle (*Cirsium vulgare*), Crown-vetch (*Coronilla varia*), Day Lily (*Hemerocallis fulva*), Dame's Rocket (*Hesperis matronalis*), Purple Loosestrife (*Lythrum salicaria*), Star-of-Bethlehem (*Ornithogallum umbella tum*), Reed Canary Grass (*Phalaris arundinacea*), Common Reed (*Phragmites australis*), Japanese Knotweed (*Pofygonum cuspidatum*)

2.6.3 Impacts

The alternatives within the Ash Basin Focus Area will have impacts to vegetation and wildlife habitat. Alterations affecting habitat availability and connectivity will occur across the area, further contributing to the existing fragmented landscape. Terrestrial community impacts in the Ash Basin Focus Area were assessed using GIS and were calculated when community types occurred within the anticipated right-of-way for the proposed alternatives. The impact evaluation addresses potential effects upon vegetative communities and wildlife habitats as well as potential concerns regarding state and federal threatened and endangered species.

Potential impacts to the terrestrial communities within the Ash Basin Focus Area were determined by comparing existing vegetative community conditions affected by the No Change DAM Alternative and the Preferred Eastern Alternative. Impacts to these various types of terrestrial communities are reported in Table 13. Throughout the focus area, terrestrial community types most commonly impacted by the No Change DAM Alternative and the Preferred Eastern Alternative include mature forest, agricultural land, successional forest, and old field habitats.

Table 13
Ash Basin Focus Area Habitat Impacts

Terrestrial Community Type	No Change DAM Alternative (Acres)	Preferred Eastern Alternative (Acres)
F1 - Oak/Hardwood - Mature (Ridge Top/Ridge Side)	29.02	71.81
F3 - Oak/Hardwood - Pole Stage (Ridge Top/Ridge Side)	0.41	0.04
F4 - Red/Maple/Hardwood	3.38	2.28
F6 - Mesic Ash/Hardwood	0.33	1.49
Mature Forest Impacts Subtotal	**33.14**	**75.62**

Table 13 (continued)		
Terrestrial Community Type	**No Change DAM Alternative (Acres)**	**Preferred Eastern Alternative (Acres)**
SF2 - Successional Forest/Hardwood - Sapling to Pole	12.28	8.03
SF3 - Successional Forest/Mix – Sapling to Pole	13.96	2.70
SF4 - Successional Forest/Mix – Mature	3.93	7.63
SF5 - Successional Forest/Coniferous	0.44	0.00
Successional Forest Subtotal	**30.61**	**18.36**
HR3 - Upland Equal-Mixed Tree and Shrub Hedgerow	0.00	0.40
Hedgerow Impacts Subtotal	0.00	0.40
Total Forest Habitat Impacts (Mature, Successional, Hedgerow)	**63.75**	**94.38**
OF1 - Old Field/Shrub Dominated	0.34	2.29
OF2 - Old Field/Herbaceous Dominated - Not Mowed	46.18	2.30
OF3 - Old Field/Herbaceous Dominated - Mowed Regularly	0.45	0.00
OF4 - Old Field/Equal Shrub and Herbaceous Dominated	3.87	8.15
Total Old Field Habitat Impacts	**50.84**	**12.74**
AG1 - Agricultural Land – Row Crops/Hay Fields	29.25	22.26
AG2 - Agricultural Land – Pasture	7.59	16.11
Total Agricultural Lands Habitat Impacts	**36.84**	**38.37**
Total Barren Land (BAR) Habitat Impacts	**0.40**	**3.41**
DEV1 - Developed Land – Non-Forested	7.90	15.41
DEV2 - Developed Land – Forested	0.65	0.78
Total Developed Habitat Impacts	**8.55**	**16.19**
TOTAL	**160.38**	**165.09**

Wildlife species, habitats, and terrestrial communities were also evaluated to characterize the habitat quality. The assessment involved review of the terrestrial community mapping and qualitative in-field assessment of wildlife species and habitat characteristics. General wildlife impacts associated with various terrestrial community types are described below.

- **Agricultural land.** Impacts to agricultural cropland and pasture land may result in the loss of seasonal cover, food sources, and breeding habitat for songbirds (including neotropical migrants), game birds, mammals, and reptiles. Agricultural pasture land represents the greatest diversity of wildlife observed within agricultural communities. The Preferred Eastern Alternative will have a decreased impact to croplands (AG1) when

compared to the No Change DAM Alternative, while the Preferred Eastern Alternative will affect a larger amount of pasture land (AG2) when compared to the No Change DAM Alternative.

- **Oak/hardwood forest.** Impacts would result in the loss of available mature forested habitat that provides a food source (hard mast, soft mast, browse), nesting cavities, and understory cover habitat for a variety of wildlife species such as birds (including neotropical migrants), mammals, reptiles, and amphibians. In the Ash Basin Focus Area, this type of forest is dominated by oak species, and it ranges in stand age from pole stage to mature. Of the different forested community types, the Oak/Hardwood Mature (F1) forests, Mesic Ash/Hardwood (F6), and Mesic Oak/Hardwood (F7) forests were the community types possessing the greatest diversity of wildlife species observed within the forest community types. Of these three forested communities, the Preferred Eastern Alternative affects the greatest amount of F1 and F6 communities when compared with the No Change DAM Alternative. However, the Preferred Eastern Alternative would have a decreased impact on red maple/hardwood communities (F4) when compared to the No Change Alternative.

- **Successional hardwood forests.** Impacts would result in the reduction of forest habitat that provides wildlife habitat value in terms of a food source (primarily soft mast, browse, seeds), canopy habitat for songbirds (including neotropical migrants), and conifer habitat for year-round cover and shrub cover in the understory. In the focus area, this type of forest habitat is dominated by a mixture of oaks and other species (including white ash, Scotch pine, and Virginia pine), and stand age ranges from sapling to mature. Of the five types of successional forest habitats, the Successional Forest/Hardwood (SF2) and Successional Forest Mix (SF3 and SF4) communities represented the greatest diversity of wildlife species within the successional forest community type. The No Change DAM Alternative affects the greatest amount of successional forest, including microhabitats SF2, SF3, and SF5. The Preferred Eastern Alternative affects the greatest amount of Mature Successional Forest (SF4) but affects the least amount of successional forest overall.

- **Hedgerow habitats.** Impacts would result in a minimal loss of some marginal cover habitat and breeding habitat for wildlife that is provided by the limited hedgerow habitat present within the focus area. Hedgerow habitat provides limited food sources but does provide additional cover habitat between open agricultural lands as well as breeding habitat for many wildlife species including songbirds (including neotropical migrants), game birds (i.e., turkey), and small mammals. Hedgerow habitats within the Ash Basin Focus Area are comprised of upland trees or an equal mix of upland trees and shrubs. The No Change DAM Alternative affects no hedgerow habitat within the focus area, while the Preferred Eastern Alternative affects a small amount of hedgerow habitat.

- **Old field habitats.** Impacts would result in the loss of small, fragmented old field habitat that provides a food source (insects, seeds), cover habitat, and breeding habitat for many wildlife species including songbirds

(including neotropical migrants), game birds (i.e., turkey), small mammals, and reptiles. Old field habitats may be comprised of herbaceous land (grasses and/or forbes) or shrubland, or a mixture of both communities. Old field herbaceous-dominated and old field/equal shrub and herbaceous communities represented the greatest diversity of species within the old field community types. The No Change DAM Alternative affects the greatest amount of old field habitat with the largest impact being to herbaceous lands that are not mowed regularly (OF2). The Preferred Eastern Alternative will affect the least amount of old field habitat, with the greatest impact being to old field habitat that is a mix of herbaceous and shrub vegetation (OF4).

- **Barren land habitats.** Impacts would result in the loss of a small amount of barren land habitat which provides negligible habitat value to any wildlife species. Barren land habitat consists of land with little to no vegetative growth and does not provide suitable cover, food sources, or nesting locations for wildlife species such as birds, mammals, reptiles, and amphibians. The No Change DAM Alternative affects the least amount of barren land habitat. The Preferred Eastern Alternative affects the greatest amount of barren land habitat.

- **Developed land habitats.** Impacts would result in the loss of developed land habitat. Non-forested developed land (DEV1) provides minimal value to any wildlife species for food sources, nesting locations, and suitable cover. Developed land that is forested (DEV 2) offers additional amounts of food, nesting locations, and cover but is still undergoing changes due to human management of the land. Both the No Change DAM Alternative and the Preferred Eastern Alternative will have minimal impacts to developed forested lands. The Preferred Eastern Alternative will have the greatest impacts to non-forested developed land.

Overall, the total amount of impacts to wildlife habitat within the Ash Basin Focus Area is very similar between the Preferred Eastern Alternative (165.09 acres) and the No Change DAM Alternative (160.38 acres). The largest differences in the impacts of the two alternatives are the changes in the impact sizes of the mature oak/hardwood (F1) and the old field/herbaceous dominated – not mowed regularly (OF2) micro habitats.

The existing stream valleys within the project area serve as wildlife corridors. Bridges will be used at Stetler Avenue and 11th Avenue to maintain wildlife movements through the focus area. Other proposed culvert crossings will be further evaluated during the final design phase to review the opportunities for potential openings or connectivity measures.

2.6.4 Mitigation

Mitigation includes avoidance, minimization, restoration, replacement, and preservation measures. Unavoidable terrestrial impacts will be considered for mitigation and evaluated in

terms of feasibility, relevancy, and reasonableness. In addition, FHWA and PennDOT have agreed to utilizing an environmental monitor on the project.

2.6.4.1 Avoidance and Minimization

Total avoidance of terrestrial resources is not possible for any of the proposed build alternatives. As part of the mitigation efforts, steps to minimize unavoidable impacts to terrestrial resources will be considered during the final design and construction phases of the project. Minimization efforts would include reviews during final design and construction by a qualified environmental monitor. The environmental monitor's responsibilities would include overseeing terrestrial mitigation activities and issues during the final design and construction phases of the project to ensure implementation of mitigation goals and minimization of terrestrial impacts. Final design measures to be considered to minimize adverse impacts to terrestrial resources may include the following.

- Consider minor alignment shifts to minimize terrestrial habitat impacts in final design.
- Consider final design modifications to stormwater management facilities.
- Consider opportunities for potential openings or connectivity measures at the proposed culvert crossings during final design, where appropriate.
- PennDOT and/or the environmental monitor will review all contractor proposed off-site areas required during construction, such as access roads, staging areas, waste disposal areas, and borrow areas.
- Project design and construction will incorporate measures to limit, control, and prevent the spread of invasive species.

2.6.4.2 Mitigation Measures

At the Center Mitigation Site, the creation of 7 acres of wetlands, restoration of 6,320 LF of stream, provision of 55 acres of old field mitigation, and provision of 54 acres of forestland mitigation have already been completed/implemented as part of the mitigation commitments for the CSVT Project overall. PennDOT will evaluate the potential for incorporating additional landscaping/plantings into the post-construction Stormwater Management Plan for the project, where feasible. No additional mitigation is warranted or needed.

2.7 THREATENED AND ENDANGERED SPECIES

2.7.1 Methodology and Existing Conditions

The PA DCNR's Pennsylvania Natural Diversity Index – Heritage Geographic Information System (PNDI-HGIS) database was accessed to determine if the project area supports threatened or endangered species or their habitats. The PNDI search acts as a coordination effort with the PA DCNR (Bureau of Forestry), Pennsylvania Game Commission (PGC), PFBC, and United States Fish and Wildlife Service (USFWS). The November 2, 2017, review (PNDI-603833) of the Preferred Eastern Alternative determined that there were three potential conflicts, involving the PFBC, PA DCNR, and USFWS. Additional project information and mapping was provided to PA DCNR and PFBC, and those agencies subsequently cleared the project of threatened and endangered species conflicts. The PGC indicated that there are potential impacts to state and federally listed species which are under the jurisdiction of both the PGC and the USFWS. As a result, the PGC defers comments on potential impacts to federally listed species to the USFWS. No further coordination with the PGC was therefore required.

Through the development of the CSVT Project, the USFWS has identified concerns regarding potential impacts to Indiana Bats and Northern Long-Eared Bats. The FHWA and PennDOT consulted with the USFWS for the Southern Section of the CSVT Project and implemented the National Programmatic Biological Opinion (BO) to address the potential concerns regarding the Northern Long-Eared Bat. Implementation of the National Programmatic BO concluded that the proposed CSVT Project is likely to adversely affect Northern Long-Eared Bats but is not likely to jeopardize the continued existence of the species. The USFWS originally approved the use of the National Programmatic BO for the CSVT Project in October 2016. Updated consultation regarding the use of the National Programmatic BO for the Preferred Eastern Alternative was submitted to the USFWS for concurrence on January 23, 2018, and the USFWS issued its concurrence on February 28, 2018. Under the terms and conditions of the National Programmatic BO, tree clearing can occur from November 1 to March 31; limited tree clearing (10% of the project) can occur from April 1 to May 31 and from August 1 to October 31. No tree clearing can occur from June 1 to July 31.

In addition to the consultation regarding the Northern Long-Eared Bat, the USFWS, in its October 20, 2016, letter, also identified potential concerns regarding the Indiana Bat in the Southern Section. FHWA and PennDOT, in consultation with the USFWS, performed a mist net survey in the summer of 2017 to address the potential Indiana Bat concerns. The mist net survey was completed in July and August 2017, and no state or federal threatened or endangered bats

were captured, including Indiana Bats. A summary of the results of the mist net survey effort was forwarded to the USFWS in the fall of 2017, and a formal report was provided in January 2018 as part of the consultation efforts. Additionally, there is no critical bat habitat or hibernaculum within the CSVT Project area. Based on the survey results, the USFWS concluded in its February 28, 2018, letter that the Southern Section may affect, but is not likely to adversely affect, the Indiana Bat.

2.7.2 Impacts

The vegetation and wildlife section details the different habitats that exist and would be impacted within the focus area. Forest land is considered to be potential habitat for the Northern Long-Eared Bat and Indiana Bat. Forest land impacts total 94.0 acres for the Preferred Eastern Alternative and 63.7 acres for the No Change DAM Alternative.

2.7.3 Mitigation Measures

Mitigation can include avoidance, minimization, and compensation measures. Unavoidable forest land impacts will be considered for mitigation and evaluated in terms of feasibility, relevancy, and reasonableness. In addition, FHWA and PennDOT have agreed to utilizing an environmental monitor on the project.

2.7.3.1 Avoidance

Forest lands cannot be avoided within the focus area. The project is designed to avoid forest land impacts, to the extent practical.

2.7.3.2 Minimization

Minimization measures include both design and construction options to minimize construction and post-construction impacts. The minimization measures include the following.

- Consider implementing a post-construction landscaping plan designed to reestablish the native riparian plant community and discourage invasive plant species for disturbed areas, where practical.
- Consider incorporating roadway drainage measures into the design to control runoff that may affect vegetative growth.

- Consider revegetating disturbed areas with native species, where applicable and feasible, to benefit wildlife.

2.7.3.3 Compensation

FHWA and PennDOT have implemented the use of the National Programmatic BO to address the potential concerns regarding the Northern Long-Eared Bat. Implementation of the National Programmatic BO concludes that the proposed CSVT Project is likely to adversely affect Northern Long-Eared Bats but is not likely to jeopardize the continued existence of the species. The USFWS originally approved the use of the National Programmatic BO for the CSVT Project in October 2016 and specifically approved its use for the Preferred Eastern Alternative in February 2018. No compensatory habitat mitigation is anticipated for the CSVT Southern Section.

2.8 AGRICULTURAL RESOURCES

Additional detail related to the impact on agricultural resources is located in the project's Farmland Assessment Report (FAR).

2.8.1 Methodology and Existing Conditions

Productive agricultural land is defined by PA Acts 43/100 as land used for commercial production of crops, livestock, and livestock products (including processing and marketing facilities, provided that at least half of the processed or marketed products originates from the same operation). Crops, livestock, and livestock products include horticultural specialties such as nursery stock, ornamental shrubs, ornamental trees, and flowers. Farmer interviews were completed in 2017 for the operations within the Ash Basin Focus Area. A map illustrating the extent of the agricultural resources is provided in Attachment 1, Project Mapping (Figure 9). A summary of the farming operations is provided below.

2.8.1.1 Stump Valley Farms – 183 Shaffer Lane, Selinsgrove, Pennsylvania, 17870

Mr. LaVere Stump owns and operates an organic milking farm located just outside of the Ash Basin Focus Area. Mr. Stump has owned and operated his farm for 5.5 years and plans to continue raising dairy cattle at his main location and farming his leased land as long as it is available. In total, Mr. Stump farms 361 acres of land, of which he owns 57 acres at his base of operations on Shaffer Road, just outside the Ash Basin Focus Area. The properties that are

farmed by Mr. Stump within the Ash Basin Focus Area are leased properties. These properties include the tillable land at the Shaffer farm off of Park Road and other tillable lands off of Sunbury Road. The locations of the referenced Stump Valley Farms productive agricultural land are provided in Attachment 1, Project Mapping (Figure 9).

At the base of Mr. Stump's farming operation are many farm buildings, but within the Ash Basin Focus Area there are no buildings on the properties that Mr. Stump leases. The largest piece of equipment that is used by Mr. Stump is his tractor (11 feet tall) with a 24-foot-wide disc.

The main product of Stump Valley Farms is organic milk. Crops that are grown by Mr. Stump within the Ash Basin Focus Area are organic grains that are used as feed to support his dairy cattle at the main farm. Crops that are grown include corn, wheat, soy, and hay. Milk is picked up at the base of operations and distributed to organic milk buyers. Seed for the grain that is grown by Mr. Stump is purchased from local feed mills, and his milking supplies are bought from Fisher and Thompson and IBA Dairy Supplies.

2.8.1.2 Mr. Jason Godek – 104 Fire Stone Lane, Middleburg, Pennsylvania, 17842 (Main Farm – 916 Furnace Road, Middleburg, Pennsylvania, 17842)

Mr. Godek does not own any farmland of his own. He leases all of the property that he farms. The main farm is located in Middleburg, approximately 16 miles from the Shaffer property that he leases within the Ash Basin Focus Area. In total, Mr. Godek farms 950 acres with approximately 57 acres of the total being leased properties within the Ash Basin Focus Area. The largest piece of equipment that Mr. Godek uses for his farming operations is his combine (13 feet tall and 16 feet wide). The locations of the referenced productive agricultural land on Mr. Godek's leased farm properties are provided in Attachment 1, Project Mapping (Figure 9).

At the Shaffer farm, Mr. Godek raises 200 head of replacement dairy heifers. He uses the cattle barn, manure shed, and pasture at the Shaffer farm. All other tillable land at the Shaffer farm is farmed by Mr. Stump. Mr. Godek also leases two other properties off of Sunbury Road within the Ash Basin Focus Area that are farmed for different grains. These grains are sold to local feed mills or kept for cattle feed. Farm supplies needed for Mr. Godek's operation are normally purchased from the local feed mills and private livestock sales.

2.8.1.3 Hummel Brothers Farms – 653 Stetler Avenue, Selinsgrove, Pennsylvania, 17870

Messrs. John and Kyle Hummel are the seventh generation of their family to farm on their land within the Ash Basin Focus Area. They also own another farm east of the project area in

Northumberland County. The base of their operations within the Ash Basin Focus Area is located off Stetler Avenue and has been farmed since 1803.

The base of operations west of the Susquehanna River on Stetler Avenue consists of a workshop, barn, equipment storage buildings, grain bins, chemical storage, and truck scales. New grain storage bins have been permitted by Monroe Township and are planned to be located just north of the existing grain storage. The largest pieces of equipment that are used on the Hummel brothers' farm are the combine (18 feet wide and 21 feet tall) and semi-trucks (95,000 pounds) that drop off or pick up grain and seed. The locations of the referenced Hummel brothers' productive agricultural land are provided in Attachment 1, Project Mapping (Figure 9).

In total, the Hummel brothers farm approximately 1,000 acres across both of their farms. At their operation on Stetler Avenue, the Hummels farm approximately 323 acres, 190 acres of which they own and 133 acres of which they lease from other local landowners and corporations. The main products of the western operation are cow/calf pairs, fat cattle, show cattle, goats, rabbits, and crops. Crops grown within the western operation are sold and not used for feed. Crops grown include corn, hay, soy, wheat, small grains, tomatoes, and potatoes. Vegetables are sold to Furmans and Sterman Masser, and corn is sold to Wenger Feed, Kramer Feed, and K&L Feed. Beans are sold to Boyds Station, and wheat and other grains are sold to local feed mills between Clintondale and Harrisburg. Livestock is sold at auction or through private sales. Additionally, the Stetler Avenue operation of the Hummel brothers' farm is the base of operations for their Pioneer Seed dealer business.

2.8.1.4 Mike Thomas – 1104 Stetler Avenue, Selinsgrove, Pennsylvania, 17870

Mr. Mike Thomas is a farmer who raises hogs and chickens primarily for subsistence, though he sells what he doesn't need at auction. Mr. Thomas also grows and sells vegetables to customers who stop at his residence. He also uses his facility to board horses. All of the agricultural activities are contained within his property on Stetler Avenue.

2.8.2 Impacts

As outlined in Table 14, the No Change DAM Alternative would impact 65.2 acres of productive agricultural land. The Preferred Eastern Alternative would impact 50.1 acres of productive agricultural land.

Table 14 Productive Agricultural Impacts		
	No Change DAM Alternative	Preferred Eastern Alternative
Productive Agricultural Land		
Direct Impact	42.6 acres	50.1 acres
Indirect Impact (Inaccessible/Uneconomic)	18.5/4.1 acres	0 acres
Total Productive Agricultural Land Impacts	65.2 acres	50.1 acres
Agricultural Operations		
Agricultural Operations (Total/Full-Time)	4/4	3/3
Impacts Critical to Operation Viability	0	0

Based on farmer interviews, Mr. Stump does not see the CSVT Project causing any major impacts to his operation other than losing some of the leased ground that he farms within the project area. As long as he can continue to access his leased fields off Sunbury and Park Roads, he will continue to farm them.

Coordination with Mr. Godek confirmed that if the pasture is still accessible to his cattle, as anticipated with the Preferred Eastern Alternative, then he will have no major concerns. However, if it is inaccessible, there will be added feed costs to his operation. Additionally, Mr. Godek raised a concern about the additional amount of trash that is possible with the roadway and the effects that this could have on his cattle.

The Hummel brothers feel that the CSVT Project will cause logistical problems for their business due to the possibility of decreased accessibility to their fields and pastures, causing problems for them when moving livestock and equipment, particularly during construction. They also feel that the project will decrease their ability to grow their business and the ability to sell their farm due to the decreased farmable areas and the property being boxed in and segmented by roadways. The Hummel brothers prefer the No Change DAM Alternative since it is located further from their base of operations, though they understand the engineering challenges and environmental risks associated with building on the ash basins. In regard to the Ash Basin Focus Area realignment alternatives, they seem to prefer the Preferred Eastern Alternative since it has the least impact on their crop production.

2.8.2.1 Prime Agricultural Land – ALPP

The Agricultural Land Preservation Policy (ALPP), 4 Pa Code Chapter 7, §7.301 et seq./ Prime Agricultural Land Policy as amended, protects the Commonwealth's "prime agricultural land"

from irreversible conversion. Compliance with the ALPP is required for all agencies under the jurisdiction of the governor. The policy applies to prime agricultural land that has been actively farmed, not including the growing of timber, for at least the preceding three years. PennDOT cannot permanently convert prime agricultural land to nonagricultural use if other feasible alternatives to the conversion are available. The policy classifies prime agricultural land into five priority categories:

- **Preserved Farmland** – Land preserved for agricultural use through easements and deed restrictions
- **Agricultural Security Area (ASA)** – Special areas created at the municipal level comprised of at least 250 acres of viable agricultural land
- **Clean and Green or Preferential Tax Assessments** – Properties enrolled in the Clean and Green program or other preferential tax assessments
- **Agricultural Zoning District –** Agricultural zoning created at the municipal level
- **Unique Farmland or Soil Capability Classes I, II, III, or IV** – Land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary of Agriculture.

Agricultural Zoning, ASAs, and Soil Capability Classes within the Ash Basin Focus Area are shown on the project mapping (Attachment 1, Project Mapping; Figures 10-12). Aerial mapping and field reconnaissance were used to determine existing locations of agricultural land in production. Tax parcel data containing ASA and zoning designations were obtained from Snyder County. Soil mapping units were obtained from the USDA NRCS - Soil Data Mart for the land capability classes. Mapping analysis was completed through the use of GIS to calculate the acreage under production for each of the five ALPP categories.

Coordination completed with project area municipalities revealed no Preserved Farmland or Clean and Green enrolled properties. ASAs, Agricultural Zoning, and Soil Capability Classes I-IV are present within the anticipated limit of disturbance for the No Change DAM Alternative and the Preferred Eastern Alternative. All of the agricultural zoned parcels, ASAs, and Land Capability Classes I-IV are currently under production.

Due to the nature of this project and the widespread extent of the agricultural resources, no alternative would completely avoid agricultural resources. Both the Preferred Eastern Alternative and the No Change DAM Alternative would have impacts to prime agricultural land as shown in Table 15. The No Change DAM Alternative would directly impact 42.6 acres of prime agricultural land, and the Preferred Eastern Alternative would directly impact 50.1 acres.

Table 15 Prime Agricultural Land (ALPP)/Direct Impacts – Ash Basin Focus Area		
	No Change DAM Alternative	Preferred Eastern Alternative
1st Priority. Preserved	N/P*	N/P*
2nd Priority. ASAs	8.2 acres	25.6 acres
3rd Priority. Clean and Green	0.0 acres	0.0 acres
4th Priority. Agricultural Zoned	34.4 acres	21.9 acres
5th Priority. Land Capability Class I-IV	0.0 acres	2.6 acres
Total Prime Agricultural Land:	**42.6 acres**	**50.1 acres**

* *Not present in the project study area.*

2.8.2.2 Farmland Soils - FPPA

The Federal Farmland Protection Policy Act of 1981 (FPPA) defines "farmland" as prime farmland soils and farmland soils of statewide importance. These are considered areas with soil conditions that produce the highest yields with few erosion concerns and require little need for the implementation of soil conservation management practices. Soil mapping units were obtained from the USDA NRCS - Soil Data Mart. Mapping analysis was completed through the use of GIS to calculate the area of prime farmland soils and farmland soils of statewide importance that would be directly converted to a non-agricultural use due to the anticipated right-of-way for each alternative. Farmland soils already converted to urban use or existing transportation use were not included in the assessment.

The No Change DAM Alternative would directly impact 18.9 acres of prime farmland soils and 59.1 acres of Statewide Important Farmland Soils, for a combined total of 78.0 acres of FPPA soils impacted. The Preferred Eastern Alternative would directly impact 42.3 acres of prime farmland soils and 71.8 acres of Statewide Important Farmland Soils, for a combined total of 114.1 acres of FPPA soils impacted. Table 16 outlines the impacts to FPPA resources.

Table 16 FPPA Farmland/Direct Impacts*		
	No Change DAM Alternative	Preferred Eastern Alternative
Prime Farmland Soils	18.9 acres	42.3 acres
Statewide Important Farmland Soils	59.1 acres	71.8 acres
FPPA Farmland Total:	78.0 acres	114.1 acres
FCIR (Site Assessment + Land Evaluation) = Total	152.55	156.71

* *Ash Basin Focus Area*

The Farmland Conversion Impact Rating (FCIR) was completed by the project team in conjunction with the USDA NRCS. When the FCIR total rating is below 160 points, the area is considered already effectively committed to urban development and no further studies are necessary to comply with the FPPA. When the FCIR rating is 160 or more, the FPPA requires the agencies to consider alternatives that would avoid, minimize, or mitigate the conversion of FPPA farmland.

The Site Assessment Criteria resulted in 87 points within Part VI of the FCIR corridor assessment points, and the NRCS staff calculated 69.71 points within Part VII, for a total of 156.71 points for the Preferred Eastern Alternative. The Site Assessment Criteria resulted in 84 points within Part VI of the FCIR corridor assessment points, and the NRCS staff calculated 68.55 points within Part VII, for a total of 152.55 points for the No Change DAM Alternative.

2.8.3 Summary

Due to the nature of this project and the widespread extent of the agricultural resources, no alternative would completely avoid agricultural resources. The Preferred Eastern Alternative results in the least overall impacts to the productive farmland within the Ash Basin Focus Area.

2.8.4 Minimization/Mitigation

Commonwealth Law (PA Act 100, PA Act 43) and policy (ALPP) as well as federal policy (FPPA) mandate the study of efforts to avoid, minimize, and mitigate impacts upon agricultural resources. Due to the nature of the project and the widespread extent of agricultural resources, no alternative that would meet the project need would completely avoid agricultural resources. The study team conducted interviews with farm operators to gather information and input regarding alternatives to minimize direct and indirect (e.g., lands rendered inaccessible or unfarmable due to resultant size/geometry) impacts to the respective operations.

Minimization and mitigation measures have been, and will continue to be, investigated to reduce the degree of impact upon agricultural land. Planned future efforts include investigating measures to minimize the required right-of-way and measures to control runoff/erosion damages. The study team will evaluate replacement of disrupted water supplies necessary for continued operations.

Mitigation for the Preferred Eastern Alternative will include tractor access under the proposed bridge over Stetler Avenue to a portion of the Hummel Brothers Farm leased pasture north of this alternative. The referenced access would also provide access to the Southern Ash

Basin for Talen Energy. Provisions for cattle access under the alignment will be studied and implemented, if feasible and reasonable.

PA Acts 100 and 43 require PennDOT to obtain approval from the Agricultural Lands Condemnation Approval Board (ALCAB) prior to condemnation of productive agricultural land for highway purposes. An ALCAB hearing is anticipated to be held and a detailed FAR will be produced after the FHWA concurs with the Preferred Eastern Alternative (e.g., after a Finding of No Significant Impact [FONSI] is issued) but prior to completion of final design. Avoidance, minimization, and mitigation efforts for impacts to individual farm operations and specific farm units would be presented to the ALCAB and addressed in the FAR.

Financial compensation to landowners and long-term (signed, committed) leaseholders of agricultural land would provide mitigation for direct damages. Additional compensation may be provided for indirect damages such as the diminution of value of land rendered un-farmable or inaccessible and/or loss of business viability. The Department and its design team will continue efforts to avoid, minimize, and mitigate impacts upon agricultural resources during final design.

3.0 CULTURAL ENVIRONMENT

3.0 CULTURAL ENVIRONMENT

3.1 ARCHAEOLOGY

3.1.1 Methodology and Existing Conditions

In order to compare the potential for archaeological resources within the Ash Basin Focus Area, impact areas with the potential for archaeological sites were calculated via GIS using the original pre-contact period predictive model (Duncan and Schilling 1999) and historic period archaeological sensitivity mapping that were created to assess potential archaeological site locations. The resultant impact areas represent land area within the Ash Basin Focus Area for the No Change DAM Alternative and the Preferred Eastern Alternative.

In 2016 the Pennsylvania State Historic Preservation Office (SHPO) mandated the use of its Pennsylvania statewide archaeological site location predictive model; however, because the CSVT Project was ongoing at that time, PennDOT, in consultation with the SHPO, determined that the existing CSVT Project-specific archaeological site location predictive model and historic sensitivity mapping (Duncan and Schilling 1999) would continue to be used. GIS analysis of the pre-contact period predictive model and historic period archaeological sensitivity mapping shows that there are no appreciable differences in the potential for impacts to either pre-contact or historic period archaeological resources between the two alternative routes. In addition to the GIS impact calculations, additional research on the SHPO Cultural Resources GIS (CRGIS) was conducted to identify any archaeological resources that may have been recorded in the interim time period between the CSVT FEIS (2003) and the Ash Basin Focus Area Supplemental Environmental Assessment (EA). Only one pre-contact period isolated find is located within, immediately adjacent to, or very close by the portion of the Preferred Eastern Alternative that is located within the Ash Basin Focus Area (SHPO 2017). The No Change DAM Alternative was previously cleared for archaeology.

3.1.2 Impacts

3.1.2.1 Pre-Contact Period Archaeological Resources

The surface area for pre-contact period archaeological site potential classes (very low to very high) is presented in Table 17 for the No Change DAM Alternative and Preferred Eastern Alternative. In determining the route with the greatest potential impacts, review of the table indicates

Table 17 Impacts to Pre-Contact Period Archaeology in Acres					
Alternative*	Site Potential				
	None to Very Low	Low	Moderate	High	Very High
No Change DAM Alternative	88.05	54.86	18.85	0.00	0.00
Preferred Eastern Alternative	51.04	82.39	30.40	1.94	0.00
* Portion of alternative within Ash Basin Focus Area					

that the No Change DAM Alternative and Preferred Eastern Alternative have virtually the same total acreage with a difference of less than five acres. However, the Preferred Eastern Alternative has slightly more acreage within the high and very high potential classes and less in the very low potential class, giving it a slightly higher potential to impact as-yet unidentified pre-contact period archaeological resources. Because the two routes within the Ash Basin Focus Area do not share large portions of their routes, any homogenizing effect that might be caused by the routes overlapping does not appear to be present, emphasizing the small differences in the overall higher potential of the Eastern Alternative route.

When comparing the No Change DAM Alternative with the Eastern Alternative solely on their potential to impact known pre-contact period archaeological sites, there is only one pre-contact period isolated find mapped within either alternative route. The isolated find has not been evaluated for National Register of Historic Places (NRHP) eligibility.

Based on the results of predictive modeling in concert with potential impacts to known archaeological sites, the No Change DAM Alternative and Preferred Eastern Alternative appear to demonstrate virtually the same levels of potential impacts to both as yet unknown pre-contact period archaeological resources and previously identified pre-contact period archaeological resources.

3.1.2.2 Historic Period Archaeological Resources

The potential impacts on historic period archaeological resources by the No Change DAM Alternative and the Preferred Eastern Alternative are presented in Table 18 by potential surface area and by the approximate number of potential loci associated with historically mapped or extant

Table 18 Impacts to Historic Period Archaeology in Acres				
Alternative*	Resource Potential			
	Low	Moderate	High	Potential Loci
No Change DAM Alternative	12.63	2.29	0.14	0 high, 3 moderate, 4 low
Preferred Eastern Alternative	11.84	2.29	0.00	0 high, 3 moderate, 4 low
* Portion of alternative within Ash Basin Focus Area				

structures/properties. In determining the alternative with the greatest potential impacts, review of the table indicates that there is essentially no difference between the two. Both routes impact mainly low-probability areas and have the potential to impact seven historically mapped or extant structure/properties. Despite the fact that the No Change DAM Alternative and Preferred Eastern Alternative only slightly overlap geographically, the results of the review for historic period archaeological resource impacts are virtually the same between the two.

3.1.3 Mitigation

The Programmatic Agreement (PA) for Section 106 issues was initially signed by the FHWA and SHPO, with concurrence by PennDOT, in October 2003. It was valid for five years, was included in the FEIS, and expired in October 2008. The FHWA undertook additional coordination with the SHPO and federally recognized tribes to extend the PA; it was amended and signed by the FHWA and SHPO in 2009. The expiration date for completing the work discussed in the Amended PA was April 2016. The Second Amendment for the PA was recently executed to cover further final design and construction modifications and expires on December 22, 2026. The Original PA from 2003, the Amended PA from 2009, and the Executed PA Second Amendment from 2015 are located in Attachment 2. The No Change DAM Alternative was previously cleared for archaeological resources, as documented in the 2010 Phase I/II Archaeological Report. The Preferred Eastern Alternative will require additional archaeological investigations to clear the anticipated limit of disturbance (LOD). Consistent with the terms of the project-specific PA, the LOD for the Preferred Eastern Alternative will undergo Phase I archaeological testing after issuance of the FONSI and will be included in an addendum to the Phase I/II Archaeological Report.

3.2 HISTORIC RESOURCES

3.2.1 Methodology

Historic resource documentation for the project includes Historic Contexts and Summary of Historic Resources Windshield Survey Report (Andrzejewski, et al. 1997), Historic Resources Survey and Determination of Eligibility Report (Andrzejewski, et al. 1998), and Determination of Effect Report (Holst 2000a) and Determination of Effect Addendum (Holst 2000b).

The *Historic Resources Survey and Determination of Eligibility Report* evaluated the NRHP eligibility of 254 properties in the study corridors according to the criteria set forth in

National Register Bulletin 15 "How to Apply the National Register Criteria for Evaluation" (National Park Service 1991a). Four additional properties were surveyed following the completion of the Eligibility Report due to the enlargement of the study corridor and were discussed in an addendum to the Eligibility Report. The NRHP recommendations outlined in the Eligibility Report and Addendum were concurred with by the SHPO, which confirmed that 24 out of the 258 resources surveyed were either already deemed eligible for the NRHP or met the eligibility criteria. None of these 24 resources fall within the Ash Basin Focus Area boundary. A map illustrating the extent of historic resources is provided in Attachment 1, Project Mapping (Figure 13).

Since completion of the Determination of Effect Report Addendum in 2000 and completion of the FEIS in 2003, PennDOT has periodically updated information on NRHP-eligible resources, evaluating those that have turned 50 years of age since 2003 and noting which have been demolished or otherwise lost.

3.2.2 Existing Conditions

The two alternatives, the No Change DAM Alternative (black) and the Preferred Eastern Alternative (green) are illustrated on the project mapping in Attachment 1, Project Mapping (Figure 13). Included is the location of Shreiners Evangelical Church and Cemetery, which has been deemed not eligible for the NRHP. No NRHP listed or eligible resources fall within the Ash Basin Focus Area.

3.2.3 Impacts

No NRHP listed or eligible aboveground historic resources fall within the Ash Basin Focus Area boundary. Therefore, there will be no impacts to such resources.

3.2.4 Mitigation

No mitigation measures are necessary since neither project alternative will have an Adverse Effect on any NRHP-eligible resource.

3.2.5 Programmatic Agreement

The original PA for Section 106 issues was signed in October 2003 by the FHWA and Pennsylvania SHPO, with PennDOT as a concurring party. The PA was included in the FEIS.

The PA was valid for five years and expired in October 2008. The FHWA undertook additional coordination with the SHPO and the federally recognized tribes to extend the PA, which was amended and signed by the SHPO in January 2009 and the FHWA in April 2009, with PennDOT once again a concurring party. The expiration date for completing the work discussed in the Amended PA was April 2016. The Second Amendment for the PA was recently executed to cover further final design and construction modifications with the anticipated construction schedule. The current expiration date is December 22, 2026. The Original PA from 2003, the Amended PA from 2009, and the Executed PA Second Amendment from 2015 are located in Attachment 2.

4.0 SOCIOECONOMIC ENVIRONMENT

4.0 SOCIOECONOMIC ENVIRONMENT

4.1 MUNICIPAL, INDUSTRIAL, AND HAZARDOUS WASTE FACILITIES

A Waste Site Evaluation (WSE) involving a Preliminary Waste Site Assessment (PWSA) level of study in accordance with the PennDOT Waste Site Evaluation Publication No. 281 was completed for the Preferred Eastern Alternative. The purpose of the PWSA was to reevaluate the Ash Basin Focus Area and update waste-related issues since the FEIS was completed in 2003. A WSE level of investigation is performed for large projects and uses a broad scope with a limited level of detail to identify potential areas with waste-related concerns. The information obtained during this level of study can then be incorporated into a Phase I Environmental Site Assessment (ESA). The information obtained during the WSE, which included background research efforts and a visual inspection, is further described below.

4.1.1 Methodology

The background research tasks involved to identify properties of concern included a review of federal and state databases provided by Environmental Data Resources, Inc. (EDR), the PA DEP Activity Use and Limitations (AUL) website, and interviews. The findings of the background research efforts are summarized below.

- **Database Search**

  Environmental lists reviewed for the project area included available U.S. Environmental Protection Agency (U.S. EPA) Region III databases and the solid and hazardous waste databases available from PA DEP. This information was obtained from EDR, the EDR DataMap® Area Study. The databases searched included the federal and state databases referenced in PennDOT Publication 281 (December 2012), The Transportation Project Development Process, Waste Site Evaluation Procedures Handbook, Volume II, Appendix C, Phase I Site Assessment Checklist as well as several other databases provided by EDR. No mapped sites were found in EDR's search of available ("reasonably ascertainable") government records within the study area with the exception of the ash basins themselves. There were 86 orphan summary sites included in the EDR report; these are sites that could not be mapped due to insufficient information. A cursory review of these lists revealed that a majority of the sites were not within the Ash Basin Focus Area. The locations of some of these sites were unable to be determined.

- **Agency Online Records**

  A review of the PA DEP AUL website identified no AUL sites within the Ash Basin Focus Area. The closest AUL site was identified approximately 0.70 mile to the southwest (at 713 Bridge Street in Selinsgrove) and was listed under the name of "Tyco Electronics Corp."

- **Interviews**

  In conjunction with the visual inspection, interviews were conducted with Monroe Township and Shamokin Dam Borough officials. Ms. Michelle Shaffer, Secretary/Treasurer of Monroe Township, was interviewed. Ms. Shaffer was not aware of any environmental concerns within the study area. She recommended interviewing Monroe Township road crew employees, who may have more information. Mr. Tom Smith, Road Crew Supervisor of Monroe Township, was interviewed. Mr. Smith was not aware of any environmental concerns associated with the study area. Mr. Russel Hummel of Monroe Township was interviewed and specifically asked about the fill area on Talen Energy property (adjacent to the ash basin) that the Hummels may lease and/or operate as pasture land. Mr. Hummel indicated that the fill was placed at the location in the 1970s by PPL and was a soil stockpile that was used as a cap material to cover the ash basin. The soil was leftover and eventually graded and grass was planted over the top. Mr. Ed Hovenstine, Borough Manager of Shamokin Dam, was interviewed. He was not aware of any environmental concerns associated with the study area.

In addition to the background research, visual inspections of the project area were completed on August 23, September 6, and September 20, 2017. The visual inspections included a "windshield survey" from accessible roads throughout the project area and focused on sites with the following potential areas of concern: underground storage tanks (USTs); aboveground storage tanks (ASTs); commercial/industrial land uses that involve the storage, handling, and disposal of hazardous substances and/or petroleum products; railroad tracks; waste disposal areas; stained soils, gravel, or pavement; air emission sources; collection ponds/pits/lagoons; discolored water/ seeps/discharges; and stressed vegetation.

4.1.2 Existing Conditions

The project area consists primarily of agricultural and wooded land with residential development and limited commercial operations. The methodology presented above was used to identify all of the potential areas of concern within the Ash Basin Focus Area. Seven potential areas of concern were identified within the focus area and are summarized in Table 19. A map identifying potential waste concerns is provided in Attachment 1, Project Mapping (Figure 14). Five potential waste sites were previously identified in the 2003 FEIS (Site Nos. 22, 23, 40, 44, and 46).

Table 19 Potential Waste Sites			
Site No.	**Site Name**	**Potential Concern(s)**	**Recommendation**
22	Tax ID No 12-08-023A (Leroy Brugger Residence)	Four 55-gallon drums of fuel oil and one 275-gallon fuel oil AST on-site	No further action at this time. Area of concern is outside of the Preferred Eastern Alternative LOD.
23	Tax ID No 12-08-014 (Hummel Brothers Farm)	Three USTs (two 500-gallon gasoline tanks and one 800-gallon diesel tank) and two ASTs (one 10,000-gallon and one 12,000-gallon tank containing fertilizer) on-site; also reported use of oils and other chemicals and petroleum products on-site	No further action at this time. Area of concern is outside of the Preferred Eastern Alternative LOD.
40	Talen Energy Southern Ash Basin	Leachate from basin, groundwater and surface water contamination, geotechnical issues/constructability with construction	Avoid the ash basins. PA DEP recommended total avoidance. The No Change DAM Alternative impacts this site.
44	Talen Energy Northern Ash Basin	Leachate from basin, groundwater and surface water contamination, geotechnical issues/constructability with construction	Avoid the ash basins. PA DEP recommended total avoidance. The No Change DAM Alternative impacts this site.
46	Tax ID No 12-05-146 (Talen Energy)	Farm dump	No further action at this time. Area of concern is outside of LOD. The No Change DAM Alternative impacts this site.
47	Tax ID No 12-08-027 (Talen Energy)	Unknown fill material and potential for soil contamination	Phase I ESA; the Preferred Eastern Alternative impacts this site.
48	Tax ID No 16-06-004 (David M. Bobb)	Unknown fill material and potential for soil contamination	No further action at this time. Area of concern is outside of the Preferred Eastern Alternative LOD

4.1.3 Impact

Based on the information obtained during this level of investigation, seven potential areas of concern were identified within the focus area (summarized in Table 19). These sites are also included on the project mapping in Attachment 1, Project Mapping (Figure 14). Five potential waste sites were identified in the 2003 FEIS (Site Nos. 22, 23, 40, 44, and 46), and two new sites were identified as part of this update (Site Nos. 47 and 48). Site No. 47 is the only potential waste site associated with the Preferred Eastern Alternative; all of the other sites identified are out of the LOD. Site No. 47 consists of unknown fill material located on the Talen property. Based on interviews with the local farmer who leases this land for his operations, PPL stockpiled topsoil at this location when closing the ash pond.

The No Change DAM Alternative has direct impacts to the Southern and Northern Ash Basins. In addition, a farm dump has been identified at the northern end of Northern Ash Basin (Site No. 46) that would be affected by the No Change DAM Alternative.

4.1.4 Minimization/Mitigation

If excavation associated with construction activities will be completed on any of these potential waste sites, additional studies involving a Phase I ESA level of study should be completed during final design. Additionally, structures noted in the project area during the visual inspection included bridges and billboards. These structures (along with buildings, if any, to be demolished in association with this transportation project) should be inspected for asbestos-

containing material prior to demolition activities. Utilities (electrical lines, transformers, and natural gas lines) were not evaluated as part of this assessment nor were residential properties evaluated for the potential for heating oil tanks.

4.2 LAND USE

4.2.1 Methodology

Land use within the Ash Basin Focus Area was identified by a combination of map analysis, field reconnaissance, and GIS assessment of digital tax parcel data. At the outset of the study, both Bing and Google aerial imagery were used to provide an initial overview of land use within the Ash Basin Focus Area. The initial land use assessment was later confirmed via field reconnaissance. Finally, the land use attribute code within the county's GIS tax parcel layer was used to create a parcel-specific land use map for the entire Ash Basin Focus Area.

4.2.2 Existing Conditions

Land use within the Ash Basin Focus Area consists of a diverse and scattered mixture of rolling agricultural land, single-family residential properties, undeveloped woodlands, utility infrastructure (i.e., high-tension power lines and an underground natural gas pipeline) and two Talen Energy (former PPL) ash basins. One institutional land use (i.e., the Susquehanna Valley Baptist Church/Cemetery) was identified along Shreiners Road near the intersection of 11th Avenue and Park Road. A map identifying land uses is provided in Attachment 1, Project Mapping (Figure 15).

4.2.3 Impacts

Impacts to land use within the defined study limits of the Ash Basin Focus Area are summarized in Table 20.

4.2.4 Minimization/Mitigation

Mitigation for the proposed impacts to land use will be limited to the payment of fair market value for the required right-of-way acquisitions. Temporary impacts will be mitigated by restoring the site to pre-construction conditions at the conclusion of the project.

Table 20 Land Use Impacts		
Land Use Type	**No Change DAM Alternative (Acres)**	**Preferred Eastern Alternative (Acres)**
Agriculture	96	92
Commercial	0	0
Industrial	0	0
Institutional	0	0
Residential	14	13
Undeveloped/Wooded	45	54
Utility	6	5
Total	**160**	**165**

4.3 PLANNED DEVELOPMENT

4.3.1 Methodology

The identification of planned developments within the Ash Basin Focus Area was completed by way of coordination with various local, county, and regional planning entities. Specifically, coordination was completed with Monroe Township, Shamokin Dam Borough, the Snyder County Planning Department, SEDA-COG, and the Greater Susquehanna Valley Chamber of Commerce (GSVCC) for the express purpose of identifying any known residential, commercial, or industrial land development projects within the defined study limits of the Ash Basin Focus Area. Mapping of these planned developments was completed by using digital tax parcel data collected at the county level or through the acquisition of local subdivision/land development plans (Attachment 1, Project Mapping; Figure 16).

4.3.2 Existing Conditions

Within the Ash Basin Focus Area, two approved residential developments (Attachment 1, Project Mapping; Figure 16) were identified within Shamokin Dam Borough. No planned developments were identified within the Ash Basin Focus Area within Monroe Township. The following approved residential developments were identified within Shamokin Dam Borough:

1) Weatherfield Development along Weatherfield Drive and Woodridge Lane on the south side of the PA Route 61 Connector, and

2) Broscious Development in the area of the PA Route 61 Connector.

The Weatherfield Development, which has been approved and is already partially built along Weatherfield Drive, is to consist of approximately 55 single-family units upon full buildout. The Broscious Development, which was originally approved in 1970 and never built, is to consist of approximately 50 single-family units upon full buildout. Locations of these planned residential developments in relation to the Ash Basin Focus Area are illustrated on the project mapping (Attachment 1, Project Mapping; Figure 16).

A preliminary development plan has been submitted to Shamokin Damn Borough for the Grayston property, which has only been presented in the concept phase at this point in time. This conceptual plan consists of a mixed residential development containing single-family homes, condominiums, and townhouses, totaling upward of 250 units.

4.3.3 Impacts

Impacts to the approved Weatherfield and Broscious developments, as well as the conceptual Grayston property plan, are summarized in Table 21.

Table 21
Planned Development Impacts

Development		No Change DAM Alternative	Preferred Eastern Alternative
Weatherfield (Approved)	Parcels Affected	0	3
	Acres Affected	0	1.1
Broscious (Approved)	Parcels Affected	49	46
	Acres Affected	13.6	12.8
Grayston (Conceptual)	Parcels Affected	0	TBD
	Acres Affected	0	3.5

4.3.4 Minimization/Mitigation

Efforts were made to minimize impacts to the planned residential developments in Shamokin Dam Borough during the development of detailed alternatives to avoid the ash basins. Specifically, the Preferred Eastern Alternative was shifted slightly to the west, reducing the impacts to the Grayston property from 10.7 acres to 3.5 acres of impact. Similarly, impacts to the Weatherfield Development were reduced from 2.8 acres to 1.1 acres by modifying the adjacent ramp design. Mitigation for the proposed impacts to these planned residential developments will be limited to the payment of fair market value for the required right-of-way acquisitions.

Temporary impacts will be mitigated by restoring the site to pre-construction conditions at the conclusion of the project.

4.4 COMMUNITY FACILITIES AND SERVICES

4.4.1 Methodology

The identification of community facilities and services within the Ash Basin Focus Area was completed by way of a combination of map analysis, field reconnaissance, and local planning document review. Both Bing and Google map imagery were used to perform an initial review of the Ash Basin Focus Area for the express purpose of identifying potential community facilities and services. Prior to conducting any project-specific field reconnaissance, the map analysis phase was supplemented by reviewing various local and regional planning documents. Specifically, the Monroe Township Comprehensive Plan (2016); Shamokin Dam Borough Comprehensive Plan (2016); Snyder County in the 21st Century Comprehensive Plan (2001); and The Parks, Recreation and Open Space Plan for Eastern Snyder County (2008) were analyzed for the locations of all potential community facilities and services. Finally, field reconnaissance was used to verify and confirm the locations/absence of community facilities and services within the entirety of the Ash Basin Focus Area.

4.4.2 Existing Conditions

Within the Ash Basin Focus Area, only one community facility was identified: the Susquehanna Valley Baptist Church/Cemetery. The Susquehanna Valley Baptist Church/ Cemetery is located in Monroe Township along Shreiners Road near the intersection of 11th Avenue and Park Road. No other community facilities or services were identified within the defined study limits of the Ash Basin Focus Area.

4.4.3 Impacts

Neither the No Change DAM Alternative nor the Preferred Eastern Alternative would impact the Susquehanna Valley Baptist Church/Cemetery. Therefore, no direct impacts to community facilities or services are anticipated from the roadway construction within the Ash Basin Focus Area. Temporary/short-term lane restrictions, if any, along Stetler Avenue, 11th Avenue, and Sunbury Road during construction of the proposed highway would have the potential

to negatively impact local student busing operations and emergency response service times. However, any such impacts would be anticipated to be minor and of extremely short duration.

4.4.4 Minimization/Mitigation

Advance notification to the local school district and emergency response service providers as part of the standard, pre-construction Maintenance and Protection of Traffic (MPT) notifications would be expected to effectively minimize any temporary/short-term impacts.

4.5 ENVIRONMENTAL JUSTICE – EXECUTIVE ORDER (EO) 12898

As described in the project's FEIS (dated 2003) and subsequent FEIS/ROD Revaluations, the CSVT Project is not exempt from Environmental Justice (EJ) analysis because right-of-way acquisition is not minor and the project does not meet any of the exempt project types. The analysis conducted for the project has been completed in accordance with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and current USDOT, FHWA, and PennDOT directives and guidelines.

EO 12898 was issued in 1994 and directs federal agencies, to the greatest extent practicable, to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. The U.S. EPA defines EJ as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Federal agencies must consider EJ in their activities under the NEPA. In 1997, the U.S. Department of Transportation (USDOT) issued an Order to address EJ in minority populations and low-income populations to summarize and expand upon the requirements of EO 12898. The FHWA issued its own EJ Order in 1998 (Order 6640.23).

To meet their obligations under EO 12898 and create consistency in implementation, the USDOT, FHWA, and PennDOT have participated in the development of and published a series of orders, memoranda, and other guidance documents. Current USDOT, FHWA, and PennDOT directives and guidance documents include:

- USDOT Environmental Justice Strategy (March 2012);
- USDOT Order 5610.2(a) Final DOT Environmental Justice Order (May 2012);

- FHWA Order 6640.23A, FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (June 2012);
- PennDOT Publication 737, *Every Voice Counts* (July 2012);
- PennDOT Publication 746, *Project Level Environmental Guidance* (May 2015); and
- Federal Interagency Working Group on Environmental Justice (EJ IWG), *Promising Practices for EJ Methodologies in NEPA Reviews* (March 2016).

The FHWA articulates three fundamental EJ principles:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects including social and economic effects on minority and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

FHWA and PennDOT must also comply with Title VI of the Civil Rights Act of 1964 that prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance. This EJ analysis has been conducted in order to identify potential minority or low-income populations present within the Ash Basin Focus Area. The CSVT Project is not exempt from EJ Analysis because right-of-way acquisition is not minor, and the project does not meet any of the exempt project types.

The Draft EIS and the Final EIS impact evaluations used U.S. Census 1990 and 2000 data, respectively, to identify potential EJ issues. It was determined that there would be no disproportionate impact to minorities or low-income populations associated with the No Change DAM Alternative, as documented in the FEIS and associated memorandum in the project Technical File.

Particular to the No Change DAM Alternative, it was determined that the project would require the acquisition of nine residential displacements within the Ash Basin Focus Area, five of which have been previously acquired for the project (see Supplemental EA Section 3.16, Residential Displacements). Both the 1990 and 2000 census data indicated that, at the local level, minority populations within the study area were well below the Pennsylvania minority population percentages and there was no evidence of disproportionate impacts to minority populations. The FEIS did identify a potentially low-income population in Shamokin Dam Borough; however, the No

Change DAM Alternative would only impact a small portion of the borough, with three additional displacements. Given the lack of 2000 poverty and public assistance data, the FEIS evaluation included a review of estimated housing values available through the tax assessment data as an indicator of approximate income levels. Using the housing unit market values as an indicator of income levels for the displaced residential units, the No Change DAM Alternative displacements appeared to be fairly random through the various income levels, indicating no disproportionate impacts to low-income populations.

4.5.1 Methodology

Demographic data were compiled for the focus area block groups to identify the characteristics of the population within the geographic proximity of the focus area. This effort included data provided by the U.S. Census Bureau, American Community Survey 2011-2015, 5-Year Estimates. Data were also compiled for the state (Pennsylvania), county (Snyder), and municipalities (Monroe Township and Shamokin Dam Borough) as a whole to allow comparison of the focus area's characteristics to those of a larger reference area. These data are summarized in tabular format (see Table 22).

Table 22
Environmental Justice Populations

		Total Population	Per Capita Income	Total Households	Minority Population	Low-Income Population		65+ Years Population	Less than High School Education Population (for those 25+ years)	Linguistically Isolated Households**
						Below Poverty Level	Below 200% Poverty Level*			
Pennsylvania		12,779,559	$29,291	4,958,859	2,799.81	13.50%	30.60%	2,084,386	950,001	197,705
					21.90%			16.30%	10.80%	4.00%
Snyder County		40,046	$23,836	14,442	1,818	10.80%	34.60%	6,565	4,647	216
					4.50%			16.40%	17.60%	1.50%
Monroe Township		4,017	$42,186	1,559	92	2.70%	22.90%	721	408	0
					2.30%			17.90%	13.20%	0%
Shamokin Dam Borough		1,664	$25,803	823	146	10.00%	31.20%	500	118	5
					8.80%			30.00%	9.30%	0.60%
Census Tract 701		5,681	$37,465	2,382	238	4.80%	25.30%	1,221	526	5
					4.20%			21.50%	12.10%	0.20%
BG***	1	709	$29,573	263	65	0%	63.60%	30	136	0
					9.20%			4.20%	27.00%	0%
BG	5	1,113	$26,589	524	84	15.00%	31.90%	359	74	5
					7.50%			32.30%	8.40%	1.00%

* *Individuals with income below 200% of the federal "poverty level"*
** *Households in which no one 14 and over speaks English "very well" or speaks English only*
*** *BG = Block Group*

The demographic profile indicators are listed below.

- **Low-Income Population**

  The number and percent of persons with income levels below the federal "poverty level." Note: To determine a person's poverty status, the person's total family income is compared with the poverty threshold appropriate for that person's family size and composition. If the total income of that person's family is less than the threshold appropriate for that family, then the person is considered "below the poverty level," together with every member of his or her family.

  The number and percent of persons with income below 200% of the federal "poverty level." This additional indicator is intended to help identify low-income populations who are sometimes referred to as the "working poor." Government programs often set eligibility criteria using a percentage multiple of the poverty level, and the 200% multiple would encompass most, if not all, low-income persons qualifying for public assistance and/or subsidies.

- **Minority**

  The number and percent of individuals who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino. That is, all people other than non-Hispanic white-alone individuals. The word "alone" in this case indicates that the person is of a single race, not multiracial.

Title VI of the Civil Rights Act and the EO 12898 do not provide specific guidance to evaluate EJ issues within a region's transportation planning process nor a project's study area. Therefore, for the purposes of this analysis, the threshold for EJ significance within the focus area block group has been defined as the average concentration of minority and low-income populations across the county as a whole. This means any block group with an EJ population/ households percentage higher than the county average percentage is considered to have a significant EJ population to be addressed.

4.5.2 Existing Conditions

The Ash Basin Focus Area is located in a rural portion of Snyder County that includes open space and farmlands interspersed with small areas of residential development (see Section 4.2 for additional information on the local community in proximity to the project area). Subsequently, there are no defined neighborhoods nor major concentrations of populations, including EJ populations, within the focus area. Only two block groups of Census Tract 701

extend within the focus area: Block Group 1 (which lies within Monroe Township) and Block Group 5 (which lies within Shamokin Dam Borough). Table 22 provides a summary of the demographic characteristics for the block groups of the focus area and the larger political jurisdictions (state, county, and municipalities) of the focus area for comparison. The thresholds used in this assessment for EJ significance within the focus area block groups have been defined as the average concentration of populations across Snyder County as a whole for the various demographic indicators. According to U.S. Census Bureau, American Community Survey 2011-2015 (5-Year Estimates), these thresholds for Snyder County are as follows.

- County Minority Population rate = 4.5%
  - Both block groups exceed the county rate with BG 1 at 9.2% and BG 5 at 7.5%
- County Low-Income Population rates = 10.8% below poverty level and 34.6% below 200% poverty level
  - BG 1's poverty level rate is 0% and is therefore below the county rate; however, its 200% poverty level rate is 63.6%, which is almost twice the county rate. This could be due to the BG 1 population being younger (lower percentage over 65 years) and less educated (greater percentage with less than high school education) than the county average and therefore having a greater percentage of "working poor" families.
  - BG 5's poverty level rate is 15.0%, which is slightly higher than the county rate; however, its 200% poverty level rate is 31.9%, which is slightly below the county rate.

In addition to the evaluation of U.S. Census data, a review of the Pennsylvania Housing Finance Agency's (PHFA) Inventory of Affordable Housing was conducted, and it was determined that there is no housing within the vicinity of the focus area providing subsidized PHFA financing for low-income households (includes Section 8 Subsidies, Federal HOME funding, and Low-Income Housing Tax Credits).

4.5.3 Impacts

The Preferred Eastern Alternative will displace seven currently existing residential properties within the Ash Basin Focus Area. None of these displacements includes minority households. This alternative would not directly impact the five properties that were already acquired by PennDOT (i.e., the five previously acquired properties of the nine total displacements associated

with the No Change DAM Alternative). These previously acquired displacements are located just north of the newly required displacements along 11th Avenue and included three displacements in Monroe Township and two in Shamokin Dam Borough (11th Avenue is the municipal border in this portion of the focus area). It is possible PennDOT will sell these parcels in the future since they are not anticipated to be needed for the Preferred Eastern Alternative. The No Change DAM Alternative would require the acquisition of nine total residential displacements within the Ash Basin Focus Area (see Section 4.6, Residential Displacements, for additional information). None of these displacements includes minority households.

While minority and low-income populations have been identified at the block group level as exceeding the county levels, there are no defined low-income and/or minority neighborhoods in the rural landscape. However, based on one-on-one meetings with PennDOT staff, it appears that none of the displacements will include a minority household. Income data are not readily or reasonably available at the individual household level (the U.S. Census Bureau recognizes the need for privacy on this issue and limits the availability of income data for small geographical units, including individual households). In addition, PennDOT is only permitted to use visual inspections and readily available secondary data during the conceptual stage survey of preliminary engineering. During the Relocation Assistance Interviews, PennDOT Right-of-Way staff may ask about income to facilitate the estimation of relocation assistance payments; even then, the public can withhold this personal information (PennDOT Right-of-Way Manual, Publication 378, February 2013). Given the inability to obtain household-level income data and therefore precisely identify the locations of low-income populations in this rural project area, a review of the estimated housing values available through tax assessment data was conducted to obtain an indication of approximate income levels for the displaced households. Using the information on Table 23, Replacement Housing Summary, the market values for the seven displacements required for the Preferred Eastern Alternative appear to be fairly random through the various market value levels, with two in the low market value range, four in a middle range, and the seventh within a higher-end range. This indicates a fairly random distribution of displacements for various income levels and no apparent disproportionate impact to low-income households. Also as previously noted, no properties in the focus area have been identified as housing that provides subsidized PHFA funding.

As is the case for many transportation projects, this project includes positive benefits to the local communities in addition to meeting the transportation needs of regional vehicular traffic. Specific to this project, these benefits include improvements in mobility and expanded connectivity for the local roadway system. The proposed improvements of a new highway with interchanges

at select locations included as part of the project will improve mobility for the local residences and businesses by introducing new and safe access to a major highway for regional and statewide travel that will also remove existing through traffic that currently creates congestion and safety issues on roadways extending through the CSVT Project area communities, including Shamokin Dam Borough. Lastly, the Preferred Eastern Alternative was developed to specially avoid the inactive fly ash waste basins that served as disposal facilities for fly ash generated from burning coal at a former coal power plant in Monroe Township. It was recently determined that construction of a highway over the ash basins would present a risk of groundwater contamination in nearby wells and aquifers. Therefore, the Preferred Eastern Alternative protects the local community from potential exposure to hazardous waste conditions. As described in the Supplemental EA (Section 3.11, Municipal, Industrial, and Hazardous Waste Facilities), only one potential waste site consisting of unknown fill material (e.g., stockpiled topsoil) would be encroached. During construction, the contractor will be directed to properly and safely manage and dispose of any waste at this site, and no adverse impacts are anticipated.

PennDOT conducted additional public outreach during the development of alternative alignments for the Ash Basin Focus Area, as described in the Supplemental EA (Section 4.1, Public and Public Officials Meetings). The outreach targeted the residential communities within the affected focus area. All residents within the project area received notices of upcoming meetings, and the CSVT Project website included information on meetings, including meeting materials, along with an opportunity to provide comments using an online comment form. In addition, the residents identified for displacement were provided an opportunity to meet one-on-one with PennDOT staff to discuss the project and the right-of-way acquisition process. This public outreach effort was conducted in compliance with PennDOT Publication No. 746 (Project Level Environmental Justice Guidance) and Publication No. 295 (Project Level Public Involvement Handbook).

Complete avoidance of residential displacements is not possible. However, none of the impacted properties serves an especially important social, religious, or cultural function for the EJ community, no public parks or communities facilities are impacted, and no substantial number of displacements occurs within any one community. The determination of potentially disproportionately high and adverse impacts is based on determining if:

1. the adverse direct, indirect, and cumulative effects are predominately borne by EJ populations and/or

2. the effects borne by EJ populations are appreciably more severe or greater than those effects borne by non-EJ populations.

The evaluation of impacts did not identify any adverse project impacts on the general local community, including potential EJ households, that could not be mitigated, including impacts related to displacements, air emissions, noise, water quality, human health, and traffic congestion. In addition, the proposed improvements and associated benefits will be provided and accessible to the entire community in a non-discriminatory manner. Specific to displacements and the potential for disproportionately high and adverse impacts on EJ populations, the relative distribution of adverse impacts between EJ and non-EJ populations is import. In summary, the seven displacements result in impacts to 2.3% of total households in BG 1 and 0.2% of total households in BG 5. Since none of the displacements includes minority households (based on one-on-one meetings with PennDOT staff), it was determined that there are no disproportionately high and adverse effects on minorities. Since the incomes of the affected households are not known, it could be conservatively assumed that all displaced households are below the 200% poverty level. In this case, that would result in impacts to 3.6% of low-income households in BG 1 (as opposed to an impact to 2.3% of total households) and 0.6% of low-income households in BG 5 (as opposed to an impact to 0.2% of total households). While assuming that all affected households are low-income, the insignificances of the total number of displacements within the rural community associated with a major new roadway means that the impact would neither be high nor adverse to the dispersed EJ community as a whole. In addition, when considering the estimated market value of the seven displaced properties, the displacements indicate a fairly random distribution for various income levels and no apparent disproportionate impact to low-income households. Therefore, it has been determined that there are no disproportionately high and adverse effects on EJ populations associated with these displacements and community impacts and the project has met the provisions of EO 12898.

4.5.4 Minimization/Mitigation

Efforts were taken to minimize not only displacements but also the disruption of community cohesion within the rural landscape while weaving the alignment of the Preferred Eastern Alternative between the ash basins and the more developed areas of the CSVT Project area. All project displacements have been, and will continue to be, handled in full compliance with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Act and Title VI of the Civil Rights Act.

4.6 RESIDENTIAL DISPLACEMENTS (HOUSING)

4.6.1 Methodology and Existing Conditions

Project-related impacts to the housing of the project area would consist of direct and indirect residential displacements. Direct residential displacements are those residential structures that are located entirely or partly within the footprint of any project alternative and would require demolition in order to construct the proposed roadway. Indirect residential displacements are those residential structures that would be functionally impaired by the footprint of any project alternative.

As part of any displacement analysis, it is customary to conduct an online search of available replacement housing using a publicly available real estate database. In the case of the CSVT Project, www.realtor.com was utilized to identify currently available replacement housing within Monroe Township and Shamokin Dam Borough at a wide range of listed asking prices. It is important to note that, while this replacement housing methodology is widely accepted for environmental studies, it is highly variable and changes frequently as houses are sold and new houses are put on the market. As such, the replacement housing identified at any one point in time is meant to be reflective of the local real estate sales trend and should not be interpreted as an exact count of future available housing units.

4.6.2 Impacts

The No Change DAM Alternative would require the acquisition of nine residential properties within the Ash Basin Focus Area. Project mapping identifying the residential impacts is provided in Attachment 1, Project Mapping (Figure 16). This alternative results in nine residential displacements. Right-of-way acquisition was underway prior to the discovery of the engineering and environmental risks associated with the ash basins and the need to analyze avoidance alternatives; therefore, five of these properties have already been acquired as right-of-way for the project and are currently owned by the Commonwealth of Pennsylvania. The houses were raised, and the residents have been relocated for the five properties. Four properties are currently occupied and would require acquisition and relocation for the No Change DAM Alternative.

The Preferred Eastern Alternative will displace 12 residential properties within the Ash Basin Focus Area. Six of these properties are newly required displacements, and one of the properties has been considered a required displacement since the FEIS and ROD (though it has not been acquired). In addition, this alternative would not directly impact the five properties that

were already acquired by PennDOT (i.e., for the No Change DAM Alternative) and those properties have therefore been added to the overall displacement count for this alternative (e.g., 7 residences + 5 acquired properties that are not anticipated to be needed to construct the Preferred Eastern Alternative).

4.6.3 Mitigation

Seven currently existing single-family residential homes will be displaced by the Preferred Eastern Alternative. Of these seven homes, five are located in Monroe Township and two are located in Shamokin Dam Borough. In addition, this alternative would not directly impact the five properties that were already acquired by PennDOT (i.e., for the No Change DAM Alternative). These properties could be sold and new housing units constructed. Table 23 identifies the approximate market values (as derived by dividing the current assessed value by the common level ratio) of these seven residential properties. The table also lists the available replacement housing at comparative price ranges. Analysis of the table suggests that adequate replacement housing exists at all comparative price ranges in Monroe Township, while the available housing stock in Shamokin Dam Borough is, as expected, more limited.

Table 23
Replacement Housing Summary

Current Market Value	Preferred Eastern Alternative Displaced Housing		Available Replacement Housing*	
	Monroe Township	Shamokin Dam	Monroe Township	Shamokin Dam
$60,000 - $85,000	1	1	7	1
$85,000 - $125,000	0	0	9	0
$125,000 – $175,000	3	1	18	2
$175,000 - $225,000	0	0	15	2
$225,000 – $275,000	1	0	8	0
$275,000 - $350,000	0	0	11	1
≥ $350,000	0	0	10	0

* *Source. www.realtor.com (7/28/2017)*

All properties acquired by PennDOT for construction of the project will be paid just compensation through the PennDOT Relocation Assistance Program. Property will be acquired in accordance with the civil requirements of the Uniform Relocation Assistance and Real Property

Acquisition Act and Title VI of the Civil Rights Act. Under this legislation, PennDOT assures that no person shall be displaced as a result of a PennDOT construction project unless at least one comparable dwelling has been made available to the person displaced. In addition, no person will be required to relocate without at least 90 days written notice. Qualified PennDOT staff and/or private licensed real estate brokers will perform property appraisals to determine fair market value to assure equitable reimbursement of just compensation to the recipient. Last resort housing will be used to accomplish the residential relocation if absolutely necessary. If an agreement is not made in a timely manner, residents are ensured that accommodations will be made available to them until such an agreement is made.

In regard to the five properties that had been acquired for the No Change DAM Alternative, it is possible these parcels may be put back on the market after completion of the project (and verification that they are not needed).

4.7 TAX BASE IMPACTS

4.7.1 Methodology and Existing Conditions

Implementation of the Preferred Eastern Alternative is anticipated to require the acquisition of private land that is currently taxed by municipalities, the county, school district, and one local fire department based on assessed value assigned to each parcel. This land acquisition will remove several parcels and sections of parcels from the local tax base and would essentially decrease the local tax revenues. An assessment of impacted acreage was completed through GIS impact analysis and the percentage of the parcel impacted was based on the anticipated permanent right-of-way. This preliminary evaluation did include both total displacements and partial acquisitions in which only portions of the property would be acquired.

Reductions to the tax base were calculated for Monroe Township and Shamokin Dam Borough, Shamokin Dam Fire Company, Selinsgrove Area School District, and Snyder County. Coordination with the Snyder County Tax Assessment Office was completed to obtain tax parcel data, millage rates, and total annual tax revenue. The tax parcel data were acquired by Snyder County on June 27, 2017. The Assessment Office confirmed the millage rates and total annual tax revenue on September 14 and 19, 2017.

The methodology used to calculate real estate tax base impacts consisted of using the GIS impact assessment to measure the amount of land area in each tax parcel impacted by the Preferred Eastern Alternative's anticipated permanent right-of-way. This impacted land area was then converted to a percentage by dividing it by the total size of the parcel. All proposed

displacements assumed a 100% acquisition of the property. The percent acquisition was then multiplied by the assessed value for that property and the applicable millage rate to calculate lost revenue of the municipality, municipal fire company, county, and school district. The lost revenues were then tallied to generate the total lost revenue and divided by the most recent annual real estate tax revenue. As part of this assessment, the most current fiscal year of total annual tax revenue was fiscal year 2016.

4.7.2 Impacts

The No-Change Alternative would have a higher tax base reduction only to Shamokin Dam Borough and the Shamokin Dam Area Fire Department when compared with the Preferred Eastern Alternative (see Table 24). Monroe Township, Selinsgrove Area School District, and Snyder County would all experience reduced lost revenue when compared with the Eastern Alternative. The primary reason for this difference is because of the specific parcels that were previously acquired by the Commonwealth of Pennsylvania for the No Change DAM Alternative. However, all proposed tax base reductions would be less than 1% for all taxable entities, resulting in a reduction of taxable income.

Table 24
Tax Base Impacts

	Monroe Township		Shamokin Dam Borough		Shamokin Dam Area Fire Department		Selinsgrove Area School District		Snyder County	
Current Revenue*	$185,795		$235,960		$70,788		$17,159,078		$9,529,028	
No Change DAM Alternative	$261	0.14%	$2,102	0.89%	$630	0.89%	$22,141	0.13%	$7,431	0.08%
Preferred Eastern Alternative	$740	0.40%	$1,184	0.50%	$355	0.50%	$31,737	0.19%	$10,652	0.11%

* *Current revenues as reported by the Snyder County Tax Assessor in Fiscal Year 2016.*

The Preferred Eastern Alternative would result in a minimal tax base reduction to Monroe Township, Shamokin Dam Borough, Shamokin Dam Area Fire Department, Selinsgrove Area School District, and Snyder County (see Table 24). The Preferred Eastern Alternative would have a higher tax base reduction to Monroe Township, Selinsgrove Area School District, and Snyder County when compared with the No Change DAM Alternative. All tax base revenue reductions would be less than 1% of the total tax revenue generated for fiscal year 2016.

4.7.3 Minimization/Mitigation

No mitigation is proposed to offset the impacts to local tax revenues.

4.8 NOISE

The Traffic Noise Analysis presented below for the No Change DAM Alternative was summarized from the CSVT Project's FEIS (dated July 2003). More detailed discussion can be found within the FEIS, located on the CSVT Project website (http://csvt.com/resources/pdfs/final-eis-volume-1.pdf).

4.8.1 Methodology

Assessment of the effects of the traffic noise from the Preferred Eastern Alternative on future noise levels at receptors within the study area was conducted to determine if and where consideration of noise abatement is warranted, and to provide the acoustical basis for the design of feasible and reasonable noise abatement measures. PennDOT Noise Abatement Criteria (NAC) for specific land use activities were used in the evaluation of traffic noise impacts. These criteria are based on criteria established in Title 23 Code of Federal Regulations, Part 772, USDOT, FHWA, Procedures for Abatement of Highway Traffic Noise and Construction Noise, and guidelines for "increase over existing" noise levels as set forth in the PennDOT Publication #24, dated November 2015. Predicted noise levels were determined using Version 2.5 of the FHWA Traffic Noise Model (FHWA TNM).

The noise level descriptor used for this project is the hourly equivalent sound level [$L_{eq}(h)$]. $L_{eq}(h)$ is the steady-state, A-weighted sound level which contains the same amount of acoustic energy as the actual time-varying A-weighted sound level over a one-hour period.

4.8.2 Existing Conditions

For noise analysis purposes, the focus area was divided into three noise study areas (NSAs). Ambient noise measurements were conducted throughout the project study area in September 2016. Seven short-term (typically 20 minutes in length) noise readings were taken through the NSAs along with concurrent traffic counts at different measurement locations using American National Standards Institute (ANSI) Type I noise meters. Due to changes to the alternative alignment, an additional seven short-term noise readings were taken along with concurrent traffic counts in June 2017. For purposes of verifying peak noise hour conditions, 24-hour noise measurements were conducted at one location within the project study area.

Measurement sites were positioned in order to enable validation of the noise prediction model. As such, in certain locations, noise measurement sites did not exactly correspond with

receiver points used in the FHWA TNM modeling process. Measurements were used strictly for purposes of noise model validation. Using the concurrent traffic data, noise levels were modeled and compared to measured noise levels. Existing peak hour traffic volumes (Year 2017) were used in the prediction of worst-case existing noise levels. It was determined that none of the receivers exceed the NAC under the existing traffic model.

4.8.3 Impacts

The model used to predict worst-case existing and future noise levels and to evaluate noise abatement options was the FHWA's Traffic Noise Model (FHWA TNM Version 2.5, released in February 2004). The FHWA TNM predicts noise levels at selected locations based on traffic data, proposed roadway design, topographic features, and the relationship of the receivers to the roadway. The noise levels predicted for the future year were compared to the absolute NAC levels of 66 dB(A) and to increases over existing year noise levels using PennDOT's NAC to determine if there would be any noise impacts. Noise analyses were performed individually for each NSA to help determine the extent of noise impacts and the effectiveness of various noise barrier options. Based on the noise analysis, it was determined that noise impacts existed in all NSAs for both alternatives analyzed. Construction of the Preferred Eastern Alternative results in 48 impacts within the Ash Basin Focus Area. The No Change DAM Alternative as documented in the CSVT FEIS (FHWA 2003) resulted in 54 impacts within the focus area.

4.8.4 Minimization/Mitigation

For all warranted NSAs, noise abatement measures were evaluated for feasibility and reasonableness. Feasible noise barriers are those that provide at least 5 dB(A) of noise reduction to the majority of impacted receptors and pose no safety, engineering, or access restrictions. For a barrier to be reasonable based on current PennDOT criteria, it must be cost-effective (not require more than 2,000 square feet [SF] of barrier per benefited receptor) and maintenance, constructability, drainage, and utility impacts, as well as the desires of the affected residents must be considered. Any receptor receiving 5 dB(A) of insertion loss (abatement) is considered to be benefited. PennDOT has also established a Noise Reduction Design Goal (NRDG) of 7 dB(A). This NRDG must be met or exceeded for at least one benefited receptor for a barrier to be determined to be reasonable. PennDOT also requires the evaluation of a line-of-sight (LS) barrier that breaks the LS between trucks on the highway and receptors.

For the Preferred Eastern Alternative, each NSA analyzed was determined to warrant consideration of noise abatement due to noise levels of 66 dB(A) or higher. Several areas exhibited substantial increases in noise levels of ≥10 dB(A) according to the PennDOT NAC. Based on the evaluation of noise levels, impacts, and abatement options for each alternative, the recommendation for noise abatement was found to be feasible and reasonable for NSA 14. This barrier would be designed for noise impacts in the Weatherfield and Gunter neighborhoods (see Figure 17 in Attachment 1, Project Mapping for preliminary noise wall locations). Additional analysis will be conducted for the final design component of the project where final barrier locations and dimensions will be determined.

The 54 residential noise impacts noted for the No Change DAM Alternative are scattered along the alignment with no densely developed areas. Noise mitigation was preliminarily evaluated in the FEIS though exceeded the 2,000 SF reasonableness criteria stipulated by PennDOT guidelines; therefore, no sound barriers were recommended.

4.9 SECONDARY AND CUMULATIVE IMPACTS

4.9.1 Methodology

The following Secondary and Cumulative Impacts Methodology was summarized from the CSVT Project's FEIS (dated July 2003). More detailed Secondary and Cumulative Impacts information can be found in the FEIS (July 2003), located on the project's website (http://csvt.com/resources/pdfs/final-eis-volume-1.pdf) and in the FEIS Technical Support Data Files.

Guidelines prepared by the Council on Environmental Quality (CEQ) for implementing NEPA broadly define secondary effects as those that are "…caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable" (40 CFR 1508.8). Thus, secondary impacts for transportation projects generally include land development activity occurring due primarily to improved area access. The development activity may cause changes in land use, population density, and economic conditions; impacts to natural resources; and impacts to cultural resources.

More specifically, secondary impacts involve increased development pressures that lead to development of property that may not occur without the increased accessibility brought by the transportation project or development that occurs on a quicker schedule than without the transportation project. The development of the property must be determined to be directly related to the proposed transportation project and not dependent on the actions of others, such as the

provision of water or sewer service or a rezoning. The increase in development pressure is identified through a combination of map analysis and field reconnaissance based on professional judgement and confirmed through coordination with local planners.

While secondary impacts can be negative, a well-designed transportation project, combined with local growth management controls, may accommodate housing or business displacements and a reasonable portion of the area's normal growth with limited impact on the environment.

The CEQ guidelines define cumulative impacts as those "…impacts which result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time." (CFR 1508.7). As is the case with secondary impacts, cumulative impacts are not necessarily negative, as awareness of the actions that result in cumulative impacts can result in a growth management plan that can accommodate housing or business displacements with limited impact on the environment.

Cumulative impacts can include unrelated activities of others in the immediate project area that may affect the same types of resources impacted by the project or larger scale projects over a broader region whose impacts can be demonstrated to affect project area resources (i.e., have a demonstrable effect in the project area). These impacts are identified through professional judgement and confirmed through coordination with local planners. For the purposes of the CSVT Project, coordination was completed with the following local and regional entities to identify other ongoing and planned future development projects:

- Monroe Township,
- Shamokin Dam Borough,
- Snyder County Planning Department,
- SEDA-COG, and
- the GSVCC.

4.9.2 Existing Conditions

Current land uses within the Ash Basin Focus Area consist of a diverse and scattered mixture of rolling agricultural parcels, rural single-family residential properties, undeveloped woodlands, utility infrastructure (i.e., high-tension power lines, underground natural gas pipeline), and two Talen Energy (formerly PPL) ash basins. One institutional land use (i.e., the Susque-

hanna Valley Baptist Church/Cemetery) was identified along Shreiners Road near the intersection of 11th Avenue and Park Road. The parcel-specific land uses identified within the Ash Basin Focus Area are provided on the project mapping (Attachment 1, Project Mapping; Figure 15).

In regard to future land uses, three planned residential developments (Attachment 1, Project Mapping; Figure 16) were identified within Shamokin Dam Borough. No planned developments were identified within the Ash Basin Focus Area within Monroe Township. The three planned residential developments identified within Shamokin Dam Borough include the Weatherfield Development (along Weatherfield Drive and Woodridge Lane on the south side of the PA Route 61 Connector), the Broscious Development (in the area of the PA Route 61 Connector), and the Grayston Development (extending from Baldwin Boulevard to Sunbury Road on the north side of the PA Route 61 Connector). The Weatherfield Development, which has been approved and is already partially built along Weatherfield Drive, is to consist of approximately 55 single-family units upon full buildout. The Broscious Development, which was originally approved in 1970 and never built, is to consist of approximately 50 single-family units upon full buildout. The Grayston Development, which has only been presented in the concept phase at this point in time, is to consist of a mixed residential development containing single-family homes, condominiums, and townhouses totaling upward of 250 units.

It is important to note from a Secondary and Cumulative Impact perspective that all or portions of these three developments were previously identified as potential Secondary and Cumulative Impact Areas (SCIAs) in the CSVT FEIS. Specifically, the land area of the Weather-field Development was previously identified as SCIA #20, a portion of the Broscious Development was previously identified as SCIA #21, and portions of the planned Grayston Development were either all or part of SCIAs #24, #25, and #26. Interestingly, these developments (namely Weatherfield and Grayston) have advanced to construction and preliminary planning (respectively) without the implementation of the CSVT Project. Along with the UGI pipeline, which was constructed through the northern portion of the Ash Basin Focus Area, these land development projects constitute the most significant past actions since the publication of the FEIS in 2003 that would be considered reasonably applicable to the Secondary and Cumulative Impact Assessment for the Ash Basin Focus Area.

Further, coordination with the GSVCC revealed the planned future development of Sunbury Generation, LLC's proposed 220-acre Greater Susquehanna Valley Energy Park in the area of the former PPL coal-fired power plant. This high-energy demand commercial/industrial park is adjacent to the new Sunbury Generation Electric Plant and would supply uninterrupted

power to high-end energy users. No other significant land development projects were identified within the general vicinity of the CSVT Project.

4.9.3 Impacts

Within the Ash Basin Focus Area, both the No Change DAM Alternative and the Preferred Eastern Alternative would be constructed as an entirely limited access roadway. The proposed highway would therefore be a "closed system" with no direct access to any of the project area parcels. Even the interchange with the PA Route 61 Connector would be an entirely limited access facility within the boundaries of the Ash Basin Focus Area. Consequently, it is reasonable to conclude that there would be no increased development pressures on adjacent properties brought about by construction of the highway. Therefore, there would be no reasonably foreseeable secondary impacts associated with the proposed project. If any of the farmland or wooded parcels adjacent to the proposed highway get developed in the future, they would do so based on normal growth patterns independent of the inaccessible highway.

In regard to cumulative impacts, construction impacts associated with the existing Weatherfield Development and UGI pipeline, along with the potential future construction impacts of the Broscious Development, Grayston Development, and Greater Susquehanna Valley Energy Park, were identified and evaluated in conjunction with the proposed construction impacts of the CSVT Project (specifically the Preferred Eastern Alternative within the Ash Basin Focus Area) in order to identify the significance of potential cumulative impacts to like resources (i.e., wetlands, farmland, forestland, and streams). Table 25 summarizes the potential cumulative impacts of the Preferred Eastern Alternative in combination with the other past and reasonably foreseeable future actions in the project area.

Table 25
CSVT Ash Basin Focus Area Cumulative Impacts

Activity	Wetland Impacts (Acres)	Farmland Impacts (Acres)	Forestland Impacts (Acres)	Stream Impacts (LF)
CSVT Eastern Alternative	1.1	50.1	94.0	6,073
UGI Pipeline	0.01	0	14.3	400
Weatherfield Development	0	0	27.0	0
Grayston Development	0	0	109.0	0
Broscious Development	0	0	8.5	0
Greater Susquehanna Valley Energy Park	0	0	0	0
Total Cumulative Impacts	1.11	50.1	252.8	6,473

Beyond these cumulative impacts to resources, it is reasonably foreseeable that construction of the Preferred Eastern Alternative, in combination with the planned future development of Sunbury Generation, LLC's proposed Greater Susquehanna Valley Energy Park, could lead to an overall positive economic impact for the region as a whole. The improved regional mobility brought about by construction of the CSVT Project, combined with what would likely be a major new employer(s) in the Central Susquehanna Valley, would be considered a positive cumulate impact for the economy of the region. While the future development of the Greater Susquehanna Valley Energy Park remains uncertain at this point in time, it is reasonable to conclude that the transportation improvements associated with the construction of the CSVT Project could serve as a potential attractor for major businesses and industries to consider relocating to the Energy Park. If successful, a cumulative impact of this manner would benefit both the mobility and the economy of the region well into the future.

4.9.4 Minimization/Mitigation

Analysis of Table 25 indicates that the estimated cumulative impacts to wetlands, farmland, and streams do not rise to the level of being significant. Therefore, no mitigation is proposed for these cumulative impacts. Cumulative impacts to forestland do increase when considering the UGI pipeline and other existing/planned developments in the area, but these impacts are not regulated by any federal, state, or local entity, and no mitigation is proposed. Similarly, no mitigation is proposed for the potentially positive cumulative economic impacts associated with the construction of the Preferred Eastern Alternative within the Ash Basin Focus Area.

4.10 UTILITIES

4.10.1 Methodology

This section identifies impacts to public utilities associated with the physical construction of the Preferred Eastern Alternative and the No Change DAM Alternative. Initial coordination with the owners has been completed to determine preliminary anticipated relocation routes. The anticipated replacement right-of-way for the major utility relocations has been included in the overall LOD and included in the impact calculations. While some resources will likely remain when overhead transmission lines are relocated (e.g., wetlands, farmlands, etc.), the impact

assessment presented in this document assumed that 100% of the resource within the anticipated utility right-of-way for the Preferred Eastern Alternative was impacted.

4.10.2 Existing Conditions

Public utilities located in the Ash Basin Focus Area include high-tension electric transmission power lines (PPL), electric distribution lines (PPL), public water supply lines within Shamokin Dam, and the recently completed UGI Sunbury Pipeline (natural gas). PPL Electric Utilities has 69 kV and 230 kV high-tension transmission lines that are contained within the same right-of-way, bisecting the Ash Basin Focus Area. Project mapping identifies the location of the major transmission lines and the UGI gas line (Attachment 1, Project Mapping; Figure 4).

The Sunbury Pipeline is a 35-mile transmission pipeline which is owned and operated by UGI Sunbury, LLC, a subsidiary of UGI Energy Services, LLC. The pipeline serves Panda Hummel Station (a natural gas-fueled power plant at the existing site of the coal-fired Sunbury Generation facility) as well as UGI Central Penn Gas (a local natural gas distribution company). The Panda Hummel Station power plant is scheduled to begin commercial operations in 2018.

4.10.3 Impact

The No Change DAM Alternative crosses the PPL 69 kV/230 kV transmission lines between Stetler Avenue and 11th Avenue. Slight adjustments to the power lines would be required, as the highway passes underneath the lines. The Preferred Eastern Alternative crosses the lines just south of Stetler Avenue and requires relocation and replacement right-of-way to accommodate the relocated lines. A small section of replacement right-of-way is necessary west of Stetler Avenue near the Hummel farm (approximately 3,230 LF of relocation are required).

The Preferred Eastern Alternative requires approximately 3,500 feet of the UGI gas line to be relocated to accommodate the CSVT mainline and northbound ramps for the PA Route 61 Connector. The No Change DAM Alternative does not impact the gas line.

4.10.4 Mitigation

Replacement right-of-way will be obtained, if the utility has a property interest, for the PPL transmission lines as well as the UGI gas line. During construction, approximately 1,600 feet of each of the two power lines will be rerouted to cross the CSVT mainline roughly perpendicular to the highway, continuing along the same right-of-way. The UGI gas line will be relocated adjacent

to the highway and cross under the PA Route 61 Connector and northbound ramps. To minimize the duration of impact associated with taking the pipeline offline, the majority of the relocated pipeline will be constructed first and then reconnected to the existing line. Relocation of all other affected utility facilities will also be coordinated with the associated utility companies prior to the start of the highway construction.

4.11 AIR QUALITY

4.11.1 Methodology/Existing Conditions

An overview of the project was conducted in accordance with PennDOT Publication 321 *Project-Level Air Quality Handbook* to determine the likelihood for future air quality impacts. While this report documents the impact to resources solely within the Ash Basin Focus Area, air quality impacts and benefits are discussed for the overall project/region as compared to a no-build scenario. Localized air quality impacts are not an issue on free-flow limited access roadways and the effects on air quality for the No Change DAM Alternative and the Preferred Eastern Alternative would be very similar. Both alternatives would meet the project need in regard to reducing congestion on U.S. Routes 11/15 and other primary roadways in the project area by providing a limited access bypass of the heavily congested areas. Less congestion equates to better air quality.

Based on the most recent U.S. EPA classifications and pursuant to 40 CFR 93.102(b), Snyder County has been designated attainment for all criteria pollutants and therefore the CSVT Project does not require a project-level or regional conformity determination. The CSVT does not meet the thresholds (e.g., Average Annual Daily Traffic (AADT), county non-attainment status, etc.) for requiring a quantitative assessment of any criteria pollutants. Therefore, the potential air quality impacts were assessed qualitatively.

4.11.2 Impacts

4.11.2.1 Carbon Monoxide (CO)

The project does not include or directly affect any roadways for which the 20-year forecasted daily volume will exceed the established threshold level of 125,000 vehicles per day. The CSVT daily traffic is projected to be approximately 64,000 vehicles in 2044. It can therefore be concluded that the project will have no significant adverse impact on air quality as a result of CO emissions.

4.11.2.2 Particulate Matter

The proposed project is located in an attainment area for the PM2.5 and PM10 standards and therefore does not require a project-level conformity determination. According to the PM2.5 and PM10 hot-spot analysis requirements established in the March 10, 2006, final transportation conformity rule (71 FR 12468), no further project-level air quality analysis for this/these pollutant(s) is required. Therefore, the CSVT Project has met all current state and federal air quality requirements.

4.11.2.3 Mobile Source Air Toxics

The purpose of this project is to reduce congestion on U.S. Routes 11/15 and other primary roadways in the project area by providing a limited access bypass to the heavily congested areas. This project has been determined to generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special mobile source air toxic (MSAT) concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause a meaningful increase in MSAT impacts of the project.

Moreover, U.S. EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with U.S. EPA's MOVES2014 model forecasts a combined reduction of over 90 percent in the total annual emissions rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 45 percent (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, FHWA, October 12, 2016). This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

4.12 GHG EMISSIONS ANALYSES AND CLIMATE CHANGE ASSESSMENT

4.12.1 Introduction and Background

Under NEPA, federal agencies (such as the FHWA) are required to consider and disclose the potential effects of their actions and decisions on the environment. Within the NEPA context, PennDOT has established a framework to address climate change and greenhouse gas (GHG) emissions. This framework includes a GHG emissions analysis as a proxy for the project's impact

to climate change and an assessment of the effects climate change may have on the proposed action and its environmental impacts considering available research and data. The purpose of this assessment is to provide decision makers and the public an overview of potential climate impacts for each of the project alternatives, and in turn, assist agencies in considering the need for measures to mitigate the impacts of climate change.

According to the U.S. EPA, GHG emissions from the transportation sector account for about 26 percent of total United States GHG emissions, making it the second largest contributor after the electricity sector. To date, no national standards have been established regarding GHGs, nor has the U.S. EPA established criteria or thresholds for ambient GHG emissions. However, a considerable body of scientific literature exists addressing the sources of GHG emissions and their potential impacts on climate change, including reports from the Inter-governmental Panel on Climate Change (IPCC), National Academy of Sciences, U.S. EPA, and other federal agencies. Transportation projects have the potential to contribute to climate change by producing GHG emissions. GHG emissions typically result from direct sources (e.g., vehicular "tailpipe" emissions, fuel refining, etc.) and construction/maintenance activities (e.g., roadway construction and maintenance).

Historic changes in the climate have been documented by researchers including changes in temperature, precipitation, storm activity, sea level, and wind speeds. When climatic activity results in an effect on the human and/or natural environments, they are often referred to as climate "stressors." Since transportation infrastructure is designed to withstand locally expected climate stressors of the magnitude and frequency that have historically been experienced, the risks from climate change can come from an amplification of existing stressors.

4.12.2 Methodologies

This project assessment on GHG emissions and climate change has been conducted based on the procedures and methods provided in PennDOT's Project-Level Air Quality Handbook (Pub 321). A qualitative GHG analysis has been conducted per the screening criteria provided in Pub 321. The project is not expected to have significant impacts on regional vehicle miles of travel (VMT), and a main purpose of the project is to alleviate congestion by allowing regional traffic to bypass the heavily congested areas in Shamokin Dam, Northumberland, and the rest of the Central Susquehanna Valley. The project's impact on GHG emissions was assessed based on expected project outcomes and the results of available traffic analyses.

A qualitative assessment of climate change effects on the project was also considered using the data sources provided in Pub 321 including the 2015 Climate Change Action Plan

Update, Pennsylvania Climate Impacts Assessment, National Oceanic and Atmospheric Administration (NOAA) Climate Explorer Tool, Pennsylvania Climate Adaptation Planning Report, and the PennDOT Extreme Weather Vulnerability Study.

The Pennsylvania Climate Change Act (PCCA), Act 70 of 2008, required PA DEP to conduct a study of the potential impacts of global climate change on Pennsylvania over the next century. The study resulted in two reports: 1) Pennsylvania Climate Change Action Plan and 2) Climate Impacts Assessment (both updated in 2015). A complementary study prepared by PA DEP (the Pennsylvania Climate Adaptation Planning Report) focused on identifying adaptation strategies to increase the resiliency of the state's infrastructure and resources and will be integrated into future updates of the Climate Change Action Plan. The NOAA Climate Explorer Tool offers customizable graphs and maps of observed and projected temperature, precipitation, and related climate variables for every county in the contiguous United States. PennDOT's Extreme Weather Vulnerability Study focuses on the evaluation of historic vulnerabilities, development of a framework for addressing climate change impacts, and an initial assessment of risks and priorities related to the identified vulnerabilities. The study's analyses and mapping products are focused primarily on the flooding impacts on state-owned roads and bridges.

It should be noted that there are several major sources of uncertainty inherently included in the data source projections regarding climate change, such as the effects of natural variability, future human emissions, sensitivity to GHG emissions, and natural climate drivers.

4.12.3 Project GHG Emissions Assessment

According to the 2015 Climate Change Action Plan Update, emissions attributed to the transportation sector result from fuels combusted to provide transportation for various types of vehicles within the Commonwealth including gasoline, diesel, jet fuel, and natural gas. Several factors will have an effect on the future amount of a fuel consumed including VMT, modal shifts, vehicle efficiency, and the price and availability of a particular fuel. According to the study projections, the transportation sector GHG emissions will decrease by approximately 13% between 2015 and 2030.

As summarized in Table 26, the primary objectives and expected outcomes of the CSVT Project would support the reduction of GHG emissions over the infrastructure's life span. GHG emission reductions will also be supported through national strategies including USDOT's more stringent fuel economy and GHG emissions standards starting in 2012 model year vehicles. Under the "No-build" alternative, the traffic operations would continue to deteriorate and operate at a deficient Level of Service (LOS) during peak periods for many locations in the study area. A

Table 26 Project Outcomes that Support Reduction in GHG Emissions	
Outcomes of the Project	**Benefits to GHG Emissions**
Reduction in traffic congestion in Hummels Wharf, Shamokin Dam, Northumberland, and Lewisburg	The project alleviates poor levels of service at signalized intersections in Hummels Wharf, Shamokin Dam, Northumberland and Lewisburg. Allowing regional traffic to bypass these congested areas using the CSVT will be a benefit from a GHG emissions standpoint. Based on emission rates from the U.S. EPA's MOVES2014 model, GHG emissions will be reduced as compared to the "no-build" conditions.

full accounting of the GHG emissions over the lifecycle of transportation facilities requires consideration of ongoing construction and rehabilitation needs. It is anticipated that the maintenance activities under the "Build" alternatives would not be significantly higher than that for the existing roadway. It is also anticipated that construction emissions would be offset by significant benefits to vehicle operation over the facility life.

4.12.4 Assessment of Climate Change Effects on Project

The Pennsylvania Climate Impacts Assessment indicates that the state has undergone a long-term warming of more than 1.8°F over the past 110 years, interrupted by a brief cooling period in the mid-20th century. Pennsylvania shows a decreasing number of very dry months and an increasing number of very wet months, which reflects an overall wetting trend.

According to future modeling, by the middle of the 21st century Pennsylvania will be about 5.4°F warmer than it was at the end of the 20th century. The corresponding annual precipitation increase is expected to be 8 percent with a winter increase of 14 percent. The likelihood for meteorological drought is expected to decrease while months with above-normal precipitation are expected to increase. In addition, models suggest modest but significant increases in annual-mean runoff and small changes in annual-mean soil moisture. The NOAA Climate Explorer provides observed and projected temperature, precipitation, and related climate variables for every county in the contiguous United States. Table 27 summarizes data derived from these resources for the project area.

Climate change vulnerability or risk assessments conventionally focus on the direct impacts of climate change on human or natural systems (such as transportation infrastructure). The vulnerability of the system depends on the climate change to which the system is exposed, the sensitivity of the system to the exposure, and the adaptation of the system to ameliorate harms or exploit opportunities. The costs (and possible benefits) of climate change to Pennsylvania's

Table 27 Pennsylvania Climate Projections	
Source	**Data or Statements from Resource**
Pennsylvania Climate Change Impacts Assessment (2016)	• Pennsylvania's current warming and wetting trends are expected to continue at an accelerated rate. • This report adopts the Representative Concentration Pathway 8.5 (RCP 8.5), one of the four GHG concentration trajectories adopted by the IPCC for its fifth Assessment Report (AR5) in 2014. • Under RCP 8.5, it is projected that by the middle of the 21st century, Pennsylvania will be about 5.4°F warmer than it was at the end of the 20th century. The corresponding annual precipitation increase is expected to be 8%, with a winter increase of 14%. The likelihood for meteorological drought is expected to decrease while months with above-normal precipitation are expected to increase.
NOAA Climate Explorer (2016)	• The number of days per year when locations receive more than one inch of precipitation is an indicator of how often heavy precipitation events occur. This measurement may also be used as an indicator of flood risk. Comparing values at a single location over time can indicate a trend of increasing or decreasing flood risk. Under RCP 8.5, models project an increase in days with higher than one inch of rainfall between 2017 and 2070. • The total number of days per year with maximum temperature above 95°F is an indicator of how often very hot conditions occur. These higher temperature days may also impact infrastructure and construction activities. Under RCP 8.5, models predict an increase in days with temperatures above 95°F between 2017 and 2070.

transportation infrastructure have not been systematically investigated and are thus highly uncertain. However, the presence of certain climate stressors may result in impacts to infrastructure as well as changes in operations/maintenance of the facility. Based on the changes in temperatures and precipitation predicted in the state of Pennsylvania, applicable examples of these include:

- Maximum temperature increases resulting in premature deterioration of infrastructure, buckling/rutting, and thermal expansion of bridge joints
- Greater changes in precipitation levels causing changes in soil moisture levels and accelerated deterioration, road embankment upheaval, and flooding resulting in increased road closures
- Increased winter precipitation can result in increased deterioration of infrastructure due to snow/ice removal and salting use
- Increased intensity of storms can result in damage to culverts and roads near flood zones, increased scour potential for bridges, high-wind events causing more infrastructure vulnerability

PennDOT's recently completed Extreme Weather Vulnerability Study focuses on an evaluation of historic flooding vulnerabilities, development of a framework for addressing climate change impacts, and an initial assessment of risks and priorities related to the identified vulnerabilities. The existing U.S. Routes 11/15 corridor through Shamokin Dam has been identified as a high risk historic flooding vulnerability.

4.12.5 Mitigation

The CSVT Project is not expected to negatively impact GHG emissions; as such, specific mitigation measures are not warranted. In addition, national fuel economy standards including the GHG emission standards established by USDOT and U.S. EPA are expected to provide further reductions in transportation sector emissions.

There are a number of national research projects underway that are aiming to identify how climate stressors may impact current transportation design, construction and maintenance activities. PennDOT has initiated a multi-phase effort aimed to better anticipate the consequences and impacts of extreme weather events and to identify funding priorities and strategies to improve transportation system resiliency. The CSVT Project will include significant improvements to the stormwater infrastructure as part of the roadway reconstruction. These changes are expected to improve the resiliency of the roadway and bridge infrastructure to storm events. Additional improvements to ensure infrastructure resiliency may also be addressed in post-NEPA design activities.

4.13 CONSTRUCTION IMPACTS

This section identifies likely impacts which will result from the activities associated with the physical construction of the new highway. The construction impacts and mitigation for the Preferred Eastern Alternative would be similar to the No Change DAM Alternative. The construction of a four-lane limited-access highway on new alignment is a major construction project and has the potential for construction impacts. Although project construction may temporarily increase erosion during construction, disturb soils, and produce construction-related vibration and noise, these effects would be temporary. Once construction is complete, there would be no effect to soils, geology, groundwater, or noise/air nuisances to nearby residences.

Typical construction impacts for a project with the scope of the CSVT Project would include the following.

- 4.13.1 Air Quality
- 4.13.2 Noise
- 4.13.3 Water Quality
- 4.13.4 Blasting

4.13.1 Air Quality

Potential air quality impacts associated with roadway construction are generally the result of one of three distinct construction activities.

- Direct exhaust emissions from the construction equipment
- Dust generated by vehicle movements within the construction area
- Wood smoke associated with open burning of grubbed woody material

Impacts to air quality associated with direct exhaust emissions can be minimized through the use of air pollution control devices on the exhausts of construction vehicles. The contractor will be directed to locate vehicle staging and holding areas away from residential areas to the extent possible. Dust associated with roadway construction is a common construction problem that has effectively been dealt with by PennDOT and all reputable roadway construction contractors. The contractor will be under strict contract guidelines regarding the control of dust. The direct application of water is the most common form of dust suppression used in roadway construction projects. However, winter construction activities sometimes require the use of chemical dust suppression agents. The PennDOT Construction Managers will constantly monitor dust levels and take corrective action where necessary.

Excessive wood smoke associated with the open burning of woody grubbed material (trees, stumps, roots, etc.) can occasionally result in air quality impacts. However, PennDOT District 3-0 does not permit the burning of wood material on roadway construction projects. Additionally, the recent high price of timber and the advent of “super chippers” has reduced the frequency of burning grub material on highway projects in general. Often, the woody material from the roadway area is “salvaged” as some type of saleable wood product and removed from the site rather than burned. PennDOT will encourage the contractor to make wise use of the wood resources within the roadway area.

4.13.2 Noise

A variety of noise generation sources are common in roadway construction projects. These include the following.

- Routine operation of heavy construction equipment
- Use of power hammering equipment to set piles, break rock, and concrete pavement
- Sawing of existing pavement
- Operation of drilling equipment (pre-split and shot charge holes, etc.)
- Blasting of rock.

Construction noise impacts can be mitigated to some degree by limiting construction activities to daylight hours. However, this contract limitation can lengthen the overall construction schedule. PennDOT is committed to working with the contractor to minimize construction noise impacts to the extent possible.

- The contractor shall use only equipment adapted to operate with the least possible noise and shall conduct the work so that annoyance to occupants of nearby property and the general public will be reduced to a minimum.
- The contractor shall construct noise abatement measures at the initial stages of construction when feasible to protect against construction noise.

4.13.3 Water Quality

Heavy construction and surface disturbances associated with a highway project can greatly impact groundwater in a number of ways discussed earlier. Prior to construction and during final design activities, PennDOT will undertake a detailed assessment of potentially affected individual domestic, industrial, institutional, and public water supply wells to determine background water quality conditions. Sampling will be completed for water supply wells that are located within ¼ mile of blasting operations. The data collected during this monitoring will be used to assess potential impacts to groundwater resulting from the construction. The groundwater quality monitoring plan will be implemented prior to construction, during construction, and one year post-construction.

The primary goal with regard to mitigation measures for impacts to domestic wells and public water supplies is to ensure a continued supply of safe drinking water to affected residents. If impacts occur as a result of construction, PennDOT will ensure the maintenance of water supplies for homes and properties not acquired as part of the right-of-way for the project by any one of the following:

- providing connections to public water systems;
- redrilling existing wells to another water-producing zone at a greater depth within the same formation;
- relocating a well within an adjacent water-producing formation undisturbed by construction activities;
- providing water treatment; or
- acquiring the property.

4.13.4 Blasting

Construction of the Preferred Eastern Alternative may require drilling and blasting to remove rock not removable by other means of excavation. In instances when blasting is required, residents of structures and dwellings located within ¼ mile of proposed blasting operations will be notified in writing a minimum of 30 days prior to the start of blasting. The notification will contain a request to enter the property in order to conduct a pre-blasting survey. The pre-blast survey will be conducted in accordance with PennDOT's Publication 408, Specifications, and the Pre- and Post-Blasting Survey Special Provision. If no structures are within ¼ mile of the proposed blasting operation, a pre-blasting survey will still be conducted on the closest structure(s) in all directions (approximately north, south, east, and west) within 0.5 mile of blasting operations. If no structures lie within 0.5 mile of blasting operations, at least one survey may be performed on the closest structure within one mile. The purpose of the pre-blast survey is to assess the integrity of existing structures. This information establishes a baseline for future damage determinations. No impacts due to blasting are anticipated; however, PennDOT will monitor blasting activities during construction to ensure that no impacts occur and, if necessary, address any concerns.

Sampling will be completed for water supply wells that are located within ¼ mile of blasting operations. The data collected during this monitoring will be used to assess potential impacts to groundwater resulting from the construction. The groundwater quality monitoring plan will be implemented prior to construction, during construction, and one year post-construction.

5.0 REFERENCES

5.0 REFERENCES

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ATTACHMENTS

ATTACHMENT 1 -
PROJECT MAPPING

central Susquehanna Valley transportation project

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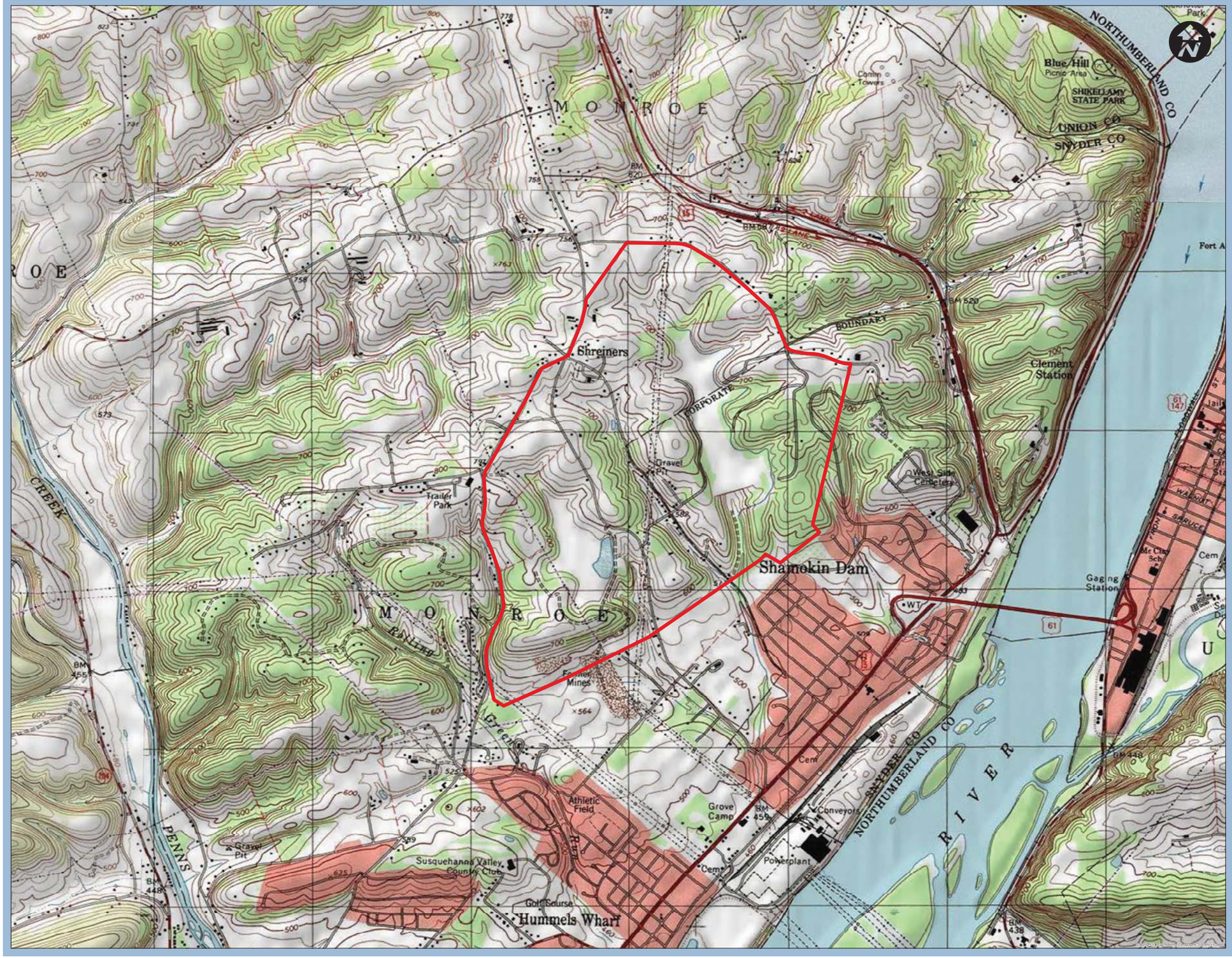
CSVT | Southern Section | SR 0015 Section 088 | May 2018

FIGURE 1

LOCATION MAP

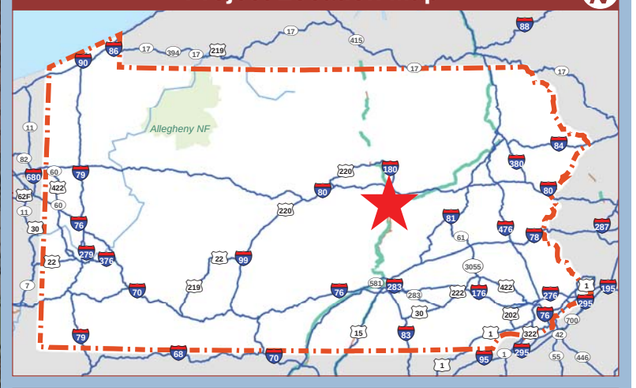


Legend

Ash Basin Focus Area

0 2,000 4,000 6,000 8,000
Feet

Project Location Map



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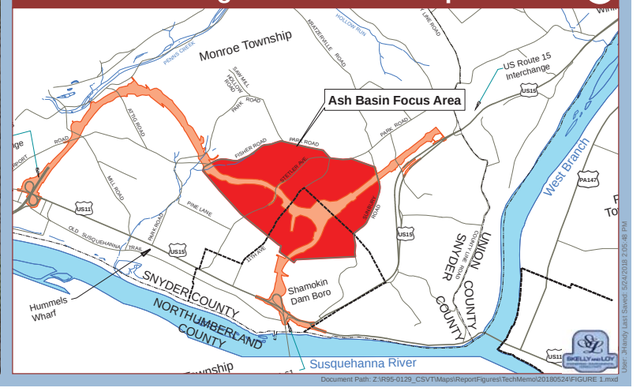

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central Susquehanna Valley transportation project

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FIGURE 2
ASH BASIN FOCUS AREA

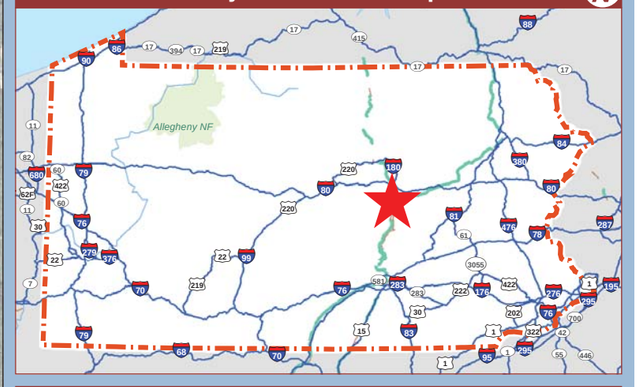
PARK RD
PARK RD
FISHER RD
SOUTHERN ASH BASIN
ELECTRIC TRANSMISSION LINES
11th AVE
CROFT VALLEY LN
ELECTRIC TRANSMISSION LINES
SUNBURY RD
MILLERS DR
ASH DAM VIEW
STEITLER AVE
NORTHERN ASH BASIN
SUNBURY RD
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
20" GAS LINE
ASH BASIN FOCUS AREA BOUNDARY
WEATHERFIELD DR
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH

Legend

- Ash Basin Focus Area
- No Change DAM Alternative
- Power Lines
- Gas Pipeline
- Ash Basin

0 300 600 900 1,200
Feet

Project Location Map



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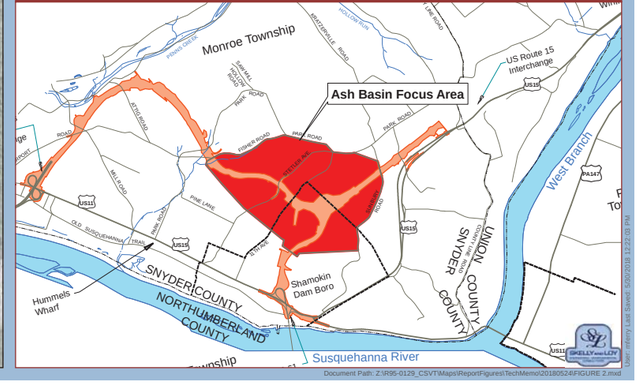

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FIGURE 3
ASH BASIN FOCUS AREA ALTERNATIVES

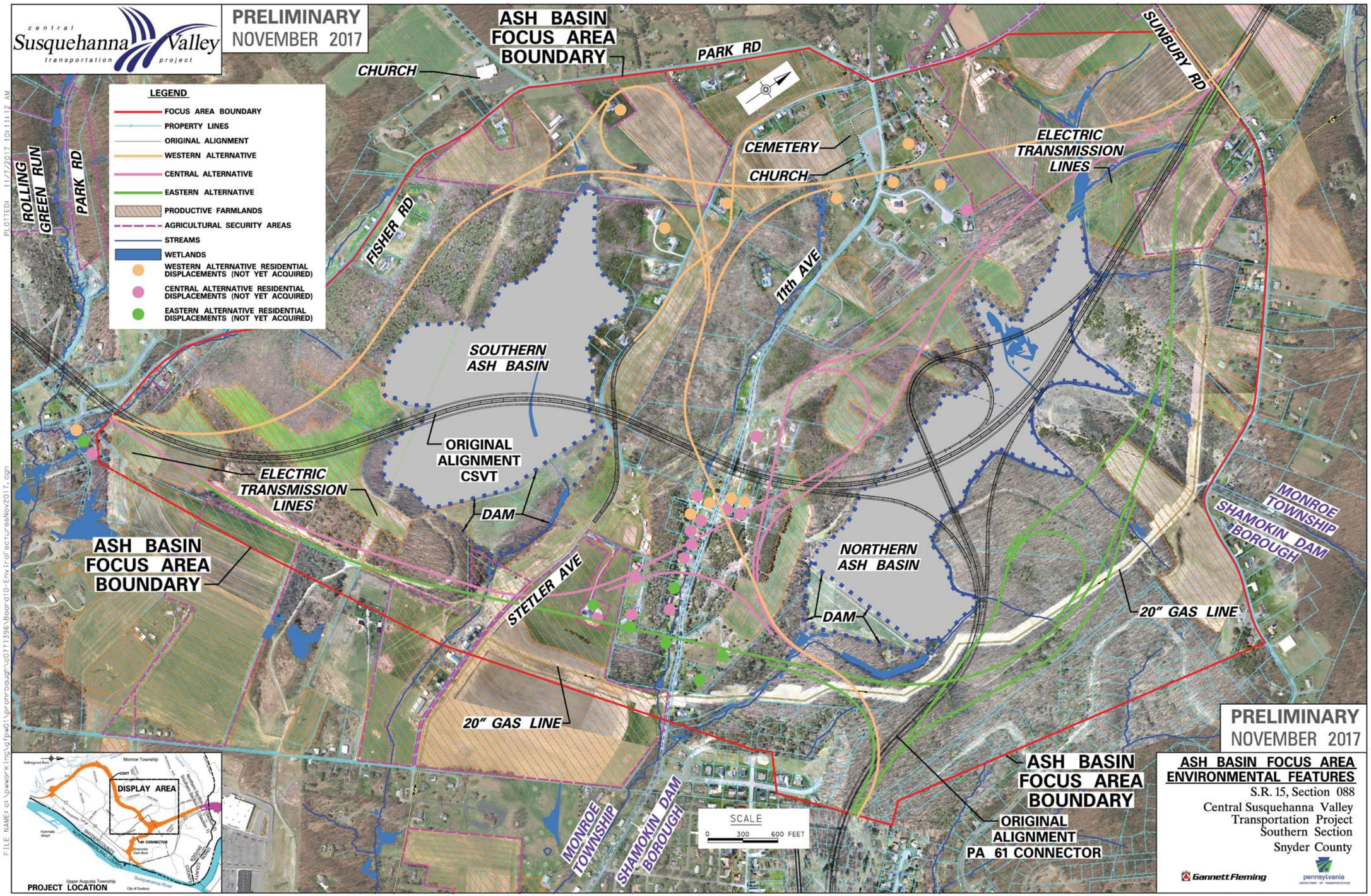

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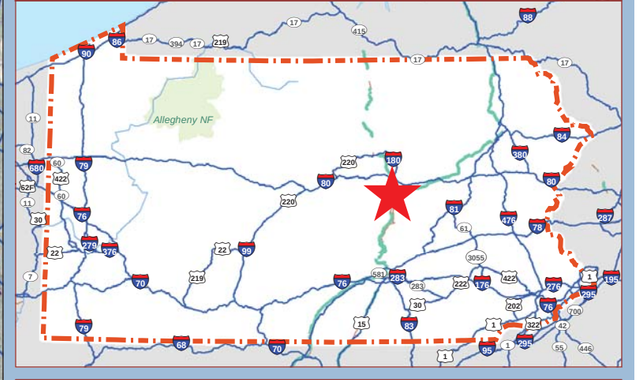
FIGURE 4
NO CHANGE DAM ALTERNATIVE AND EASTERN ALTERNATIVE

Legend

- Ash Basin Focus
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- Eastern Alternative
- Cut
- Fill
- Stormwater Management Area
- Municipalities
- Ash Basin
- Gas Pipeline

0 300 600 900 1,200
Feet

Project Location Map



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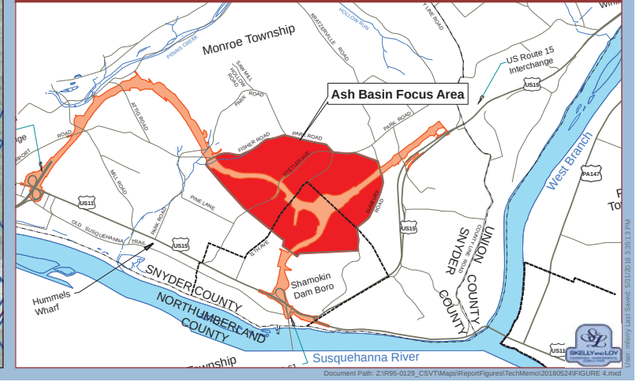

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FIGURE 5

GEOLOGY

PARK RD

PARK RD

FISHER RD

SOUTHERN ASH BASIN

ELECTRIC TRANSMISSION LINES

CROFT VALLEY LN

11th AVE

SUNBURY RD

ELECTRIC TRANSMISSION LINES

MILLERS DR

ASH DAM VIEW

NORTHERN ASH BASIN

STETLER AVE

20" GAS LINE

MONROE TOWNSHIP

SHAMOKIN DAM BOROUGH

SUNBURY RD

MONROE TOWNSHIP

SHAMOKIN DAM BOROUGH

WEATHERFIELD DR

ASH BASIN FOCUS AREA BOUNDARY

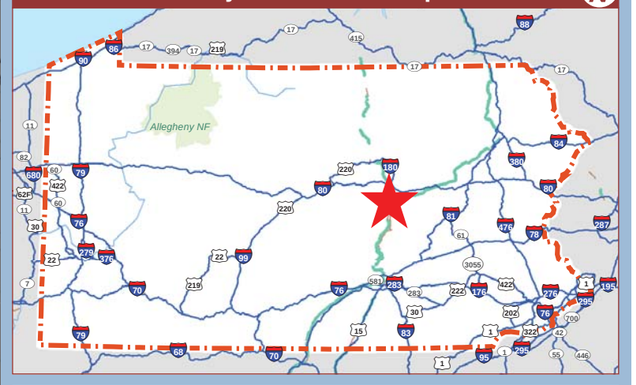
Legend

- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- Stormwater Management Area
- No Change DAM Alternative
- Eastern Alternative
- Power Lines
- Gas Pipeline
- Municipalities
- Ash Basin
- Irish Valley Member of Catskill Formation
- Sherman Creek Member of Catskill Formation
- Trimmers Rock Formation

0 300 600 900 1,200

Feet

Project Location Map



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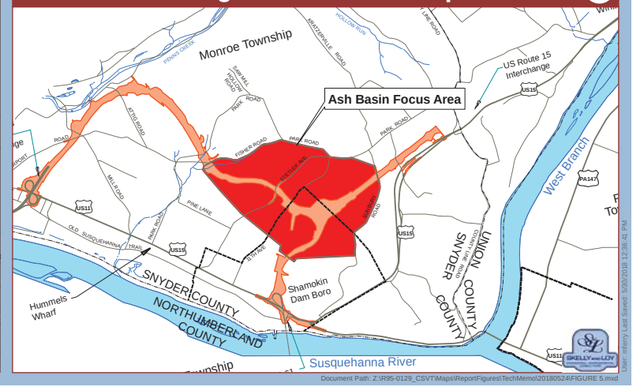

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central Susquehanna Valley transportation project

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DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA

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FIGURE 6

WATER SUPPLY

PARK RD

FISHER RD

PARK RD

SUNBURY RD

ELECTRIC TRANSMISSION LINES

CROFT VALLEY LN

11th AVE

SOUTHERN ASH BASIN

ELECTRIC TRANSMISSION LINES

MILLERS DR

ASH DAM VIEW

STETLER AVE

NORTHERN ASH BASIN

MONROE TOWNSHIP

SHAMOKIN DAM BOROUGH

SUNBURY RD

SHAMOKIN DAM RESERVOIR

20" GAS LINE

ASH BASIN FOCUS AREA BOUNDARY

WEATHERFIELD DR

MONROE TOWNSHIP

SHAMOKIN DAM BOROUGH

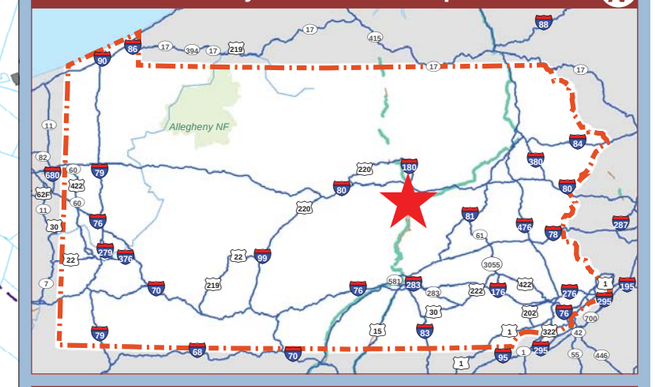
Legend

- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- Power Lines
- Eastern Alternative
- Cut
- Fill
- Stormwater Management Area
- Municipalities
- Ash Basin
- Water Wells (PaGWIS Database)
- Public Water Service Areas
- Gas Pipeline

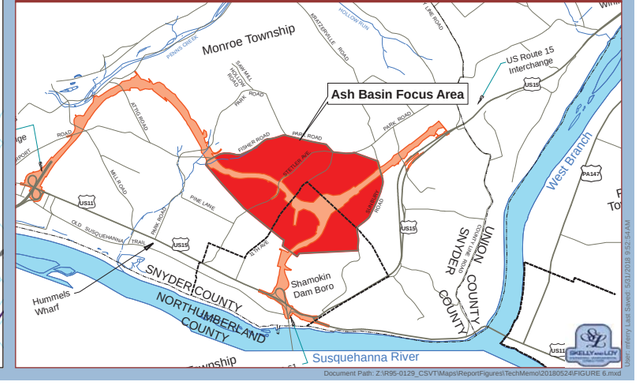
0 300 600 900 1,200

Feet

Project Location Map



Regional Location Map



Document Path: Z:\IR95-0129_CSVT\Maps\ReportFigures\TechMemo\20180524\FIGURE 6.mxd

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FIGURE 7
WETLANDS AND WATERCOURSES

PARK RD
FISHER RD
PARK RD
SUNBURY RD
ELECTRIC TRANSMISSION LINES
CROFT VALLEY LN
SOUTHERN ASH BASIN
ELECTRIC TRANSMISSION LINES
ASH DAM VIEW
NORTHERN ASH BASIN
MILLERS DR
SUNBURY RD
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
STELLER AVE
20" GAS LINE
ASH BASIN FOCUS AREA BOUNDARY
WEATHERFIELD DR
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH

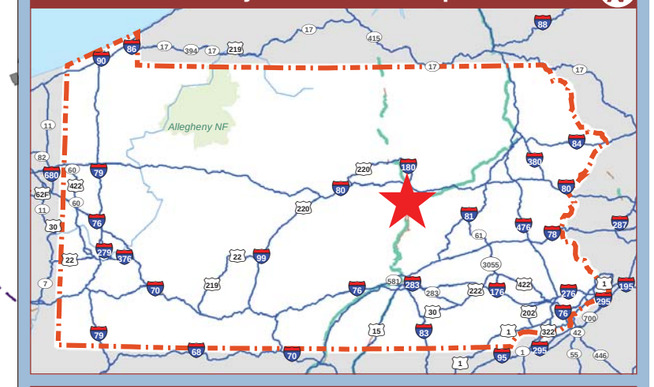
AMB-067 BTB-052 MSC-044 MSC-045 BTB-053 BTB-043 BTB-054 AMB-068 BTB-044 AMB-064 DMG-088 PJD-197 PJD-194 Stream - CHN-23 CHN-22 CHN-23 DMG-027 PJD-024 BTB-046
DJW 04 DJW 03 DJW 01 MCD CHN-700 MCD CHN-700A
PJD 502 DJW 06 POND DJW CHN-706 DJW 14 CHN-25 CHN-705 CHN-703 CHN-25 CHN-705 CHN-711 DJW 16 DJW 18 LTZ 19 Stream - Shreiners Creek - CHN-25 LTZ 1 DMG-101 DMG-100 BTB-200 PJD-199 DMG-079 Stream - CHN-24 PJD-175 PJD-176 PJD-177 PJD-178 Stream - Shreiners Creek - CHN-25 DMG-032 DMG-031 PJD-174 RLI-008 RLI-007 RLI-006 RLI-005 RLI-004 RLI-011 RLI-010 RLI-003 Stream - Shreiners Creek - CHN-25 MSG-017 PJD-077 PJD-060 PJD-061 Stream - Shreiners Creek - CHN-26 IMP PJD-059 PJD-058 PJD-057 PJD-056 PJD-055 PJD-054
DJW 7 PJD 503 Stream - CHN-15 RLI-016 PJD-080 DJW 8 UPLAND RLI-013 RLI-015 PJD-078 PJD-079 AMB-017 AMB-016 DMG-001 Stream - CHN-13 PJD 504 Stream - CHN-26 IMP Stream - CHN-12 AMB-014 Stream - CHN-09 PAA 1 CHN-PAA1 CHN-PAA2 DJW 20 AMB-063 DMG-050 RLI-012 BTB-036 Stream - Monroe Creek - CHN- BTB-037 DMG-052
Stream - CHN-24 PJD-083 Stream - Monroe Creek - CHN- Stream - Monroe Creek - CHN- DMG-083 DMG-082 DMG-080 Stream - CHN-14

Legend

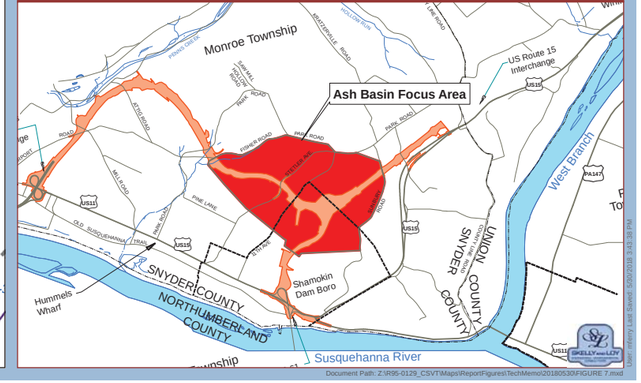
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- PowerLines
- Eastern Alternative
- Cut
- Fill
- Gas Pipeline
- Stormwater Management Area
- Municipalities
- Ash Basin
- Streams
- Wetlands

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\IR95-0129_CSVT\Maps\ReportFigures\TechMemo\20180530\FIGURE 7.mxd

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FIGURE 8

TERRESTRIAL COMMUNITIES

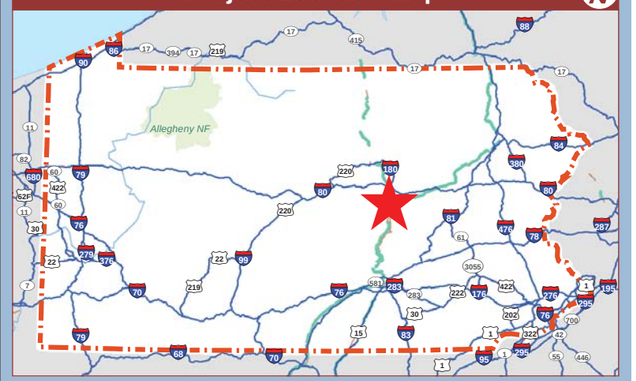
PARK RD
FISHER RD
SUNBURY RD
CROFT VALLEY LN
11th AVE
MILLERS DR
ASH DAM VIEW
STETLER AVE
WEATHERFIELD DR
ELECTRIC TRANSMISSION LINES
20" GAS LINE
SOUTHERN ASH BASIN
NORTHERN ASH BASIN
ASH BASIN FOCUS AREA BOUNDARY
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH

Legend

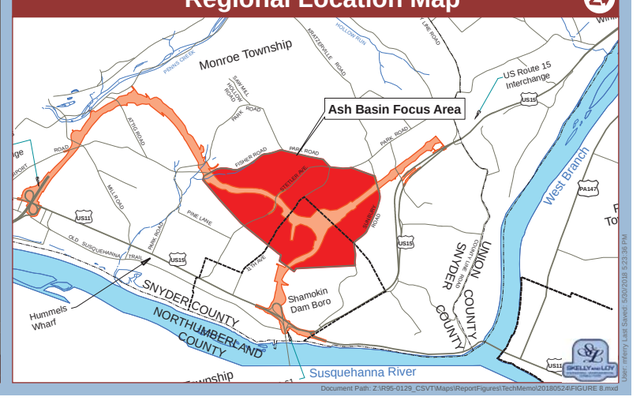
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- AG1, Agricultural Land - Row Crops/Hay Fields
- AG2, Agricultural Land - Pasture
- BAR - Barren Land
- DEV1, Developed Land (Nonforested)
- DEV2, Developed Land (Forested)
- F1, Oak/Hardwood, Mature
- F2, Oak/Hardwood, Mature
- F3, Oak/Hardwood, Pole Stage
- F4, Red Maple/Hardwood
- F6, Mesic Ash/Hardwood
- F7, Mesic Oak/Hardwood
- F9, River Floodplain Forest
- F10, Softwood/Coniferous
- HR1, Upland Tree Hedgerow
- HR3, Upland Equal-Mixed Tree and Shrub Hedgerow
- HR5, Riparian Shrub Hedgerow
- HR6, Riparian Equal-Mixed Tree and Shrub Hedgerow
- OF1, Old Field/Shrub Dominated
- OF2, Old Field/Herbaceus Dominated, Not Mowed Regularly
- OF3, Old Field/Herbaceous Dominated, Mowed
- OF4, Old Field/Equal Shrup and Herbaceous Dominated
- OF4/BAR, Old Field/Equal Shrub and Herbaceous Dominated
- SF1, Successional Forest/Hardwood, Mature
- SF2, Successional Forest/Hardwood, Pole to Sapling
- SF3, Successional Forest Mix, Sapling to Pole
- SF3 /OF1, Old Field/Equal Shrub and Herbaceous Dominated
- SF3/OF4, Old Field/Equal Shrub and Herbaceous Dominated
- SF4, Successional Forest/Mix, Mature
- SF5, Sucessional Forest/Coniferous
- SW, Surveyed Wetlands

0 300 600 900 1,200 Feet

Project Location Map



Regional Location Map



Document Path: Z:\IP\95-0129_CSVT\Maps\Report\Figures\TechMemo\20180524\FIGURE 8.mxd

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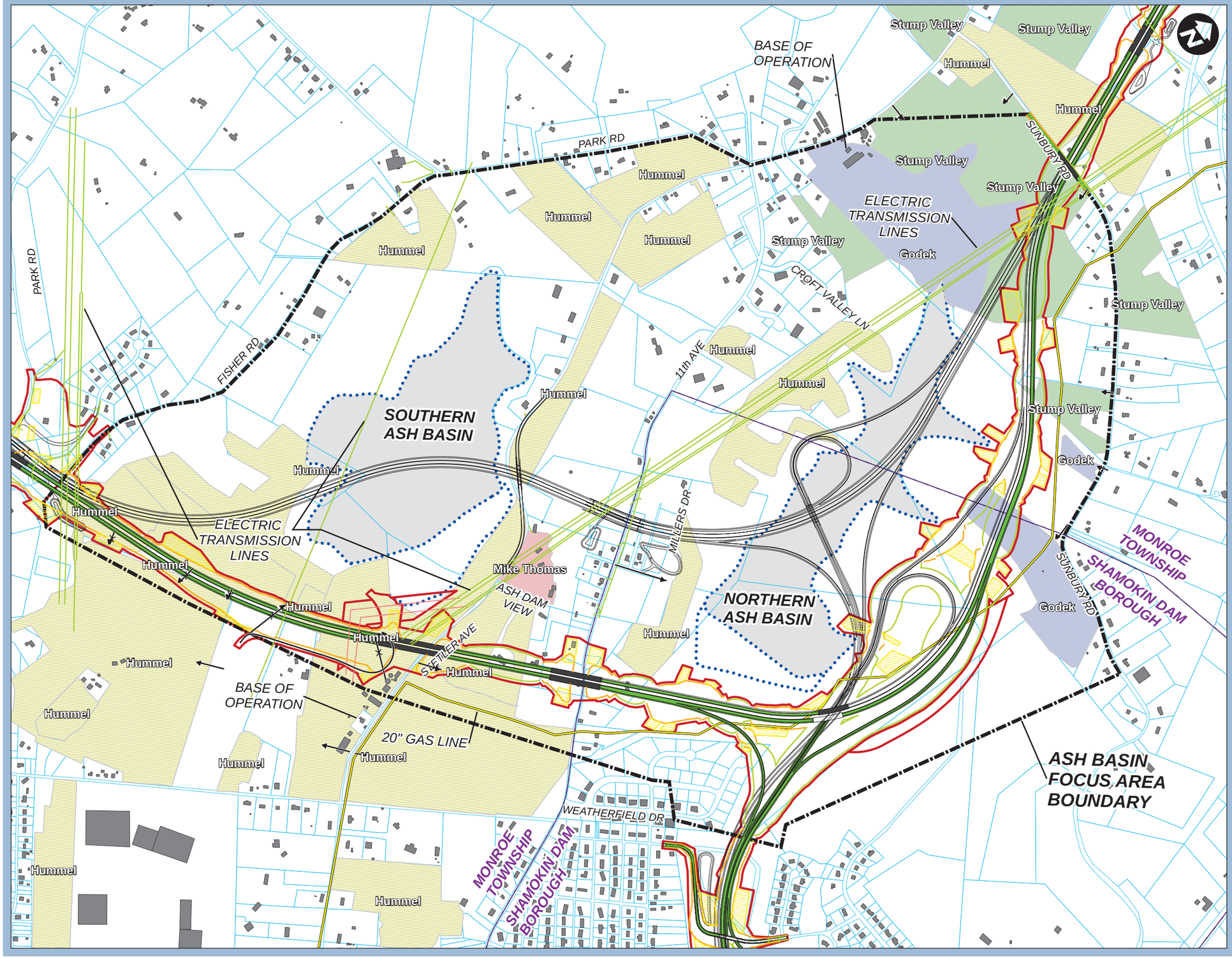
FIGURE 9
PRODUCTIVE AGRICULTURAL LAND AND FARM OPERATORS

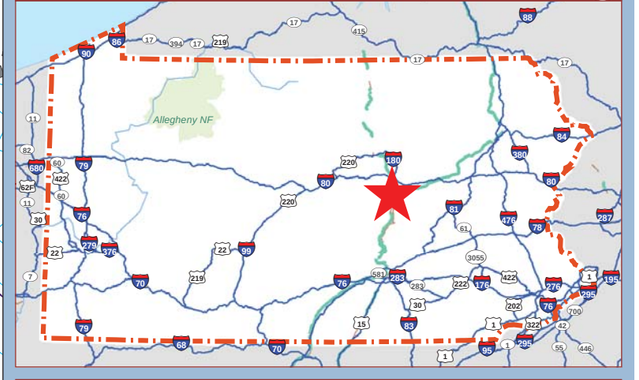


Legend

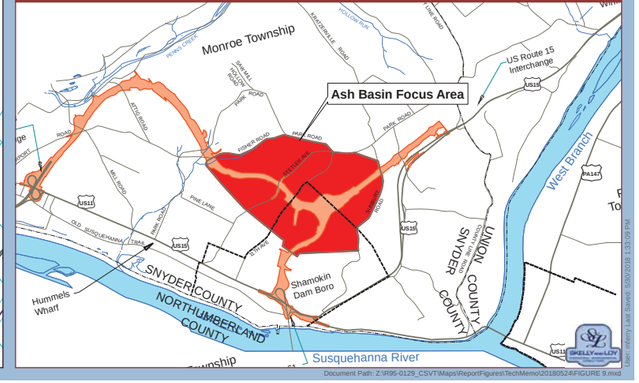
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- Stormwater Management Area
- Eastern Alternative
- Cut
- Fill
- Hummel
- Stump Valley
- Godek
- Mike Thomas
- Productive Farmland
- Tractor Paths

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\R95-0129_CSVT\Maps\ReportFigures\TechMemo\20180524\FIGURE 9.mxd

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FIGURE 10
AGRICULTURAL ZONING AND AGRICULTURAL SECURITY AREAS

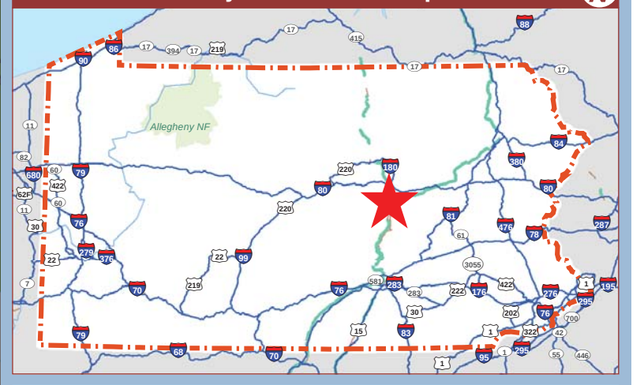
PARK RD
PARK RD
FISHER RD
SOUTHERN ASH BASIN
ELECTRIC TRANSMISSION LINES
ELECTRIC TRANSMISSION LINES
CROFT VALLEY LN
11th AVE
SUNBURY RD
MILLERS DR
ASH DAM VIEW
STETLER AVE
20" GAS LINE
NORTHERN ASH BASIN
SUNBURY RD
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
ASH BASIN FOCUS AREA BOUNDARY
WEATHERFIELD DR
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH

Legend

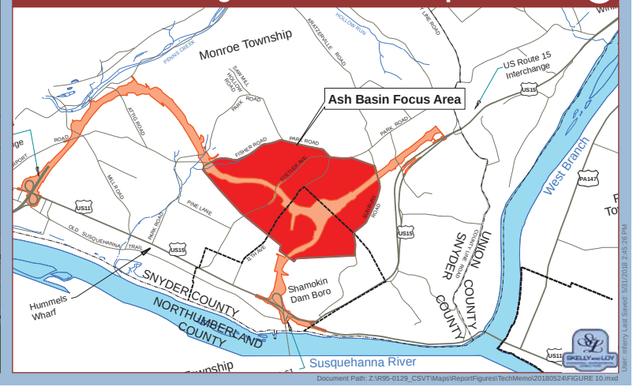
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- Eastern Alternative
- Stormwater Management Area
- No Change DAM Alternative
- Cut
- Fill
- Agricultural Security Areas
- Agricultural Zoning

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\R95-0129_CSVT\Maps\Report\Figures\TechMemo\20180524\FIGURE 10.mxd

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FIGURE 11
PRIME FARMLAND AND STATEWIDE IMPORTANCE SOILS

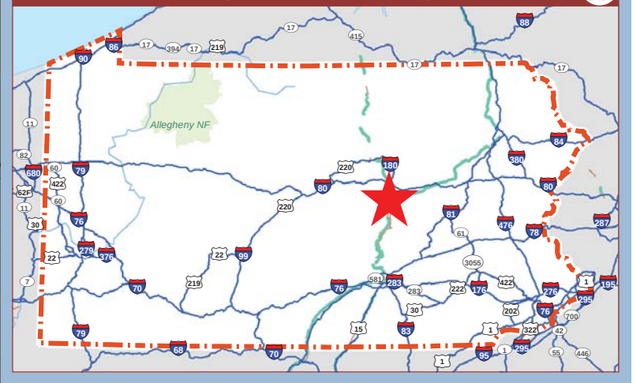
PARK RD
FISHER RD
SOUTHERN ASH BASIN
ELECTRIC TRANSMISSION LINES
PARK RD
SUNBURY RD
ELECTRIC TRANSMISSION LINES
CROFT VALLEY LN
11th AVE
MILLERS DR
ASH DAM VIEW
STETLER AVE
NORTHERN ASH BASIN
SUNBURY RD
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
20" GAS LINE
WEATHERFIELD DR
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
ASH BASIN FOCUS AREA BOUNDARY

Legend

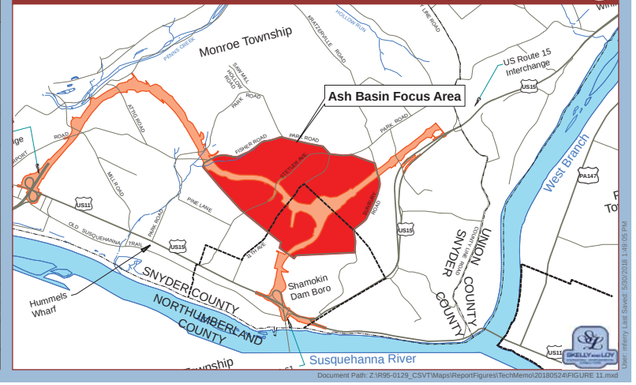
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- Power Lines
- Eastern Alternative
- Cut
- Fill
- Stormwater Management Area
- Prime Farmland Soils
- Farmland Soils of Statewide Importance

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\R95-0129_CSVT\Maps\ReportFigures\TechMemo\20180524\FIGURE 11.mxd

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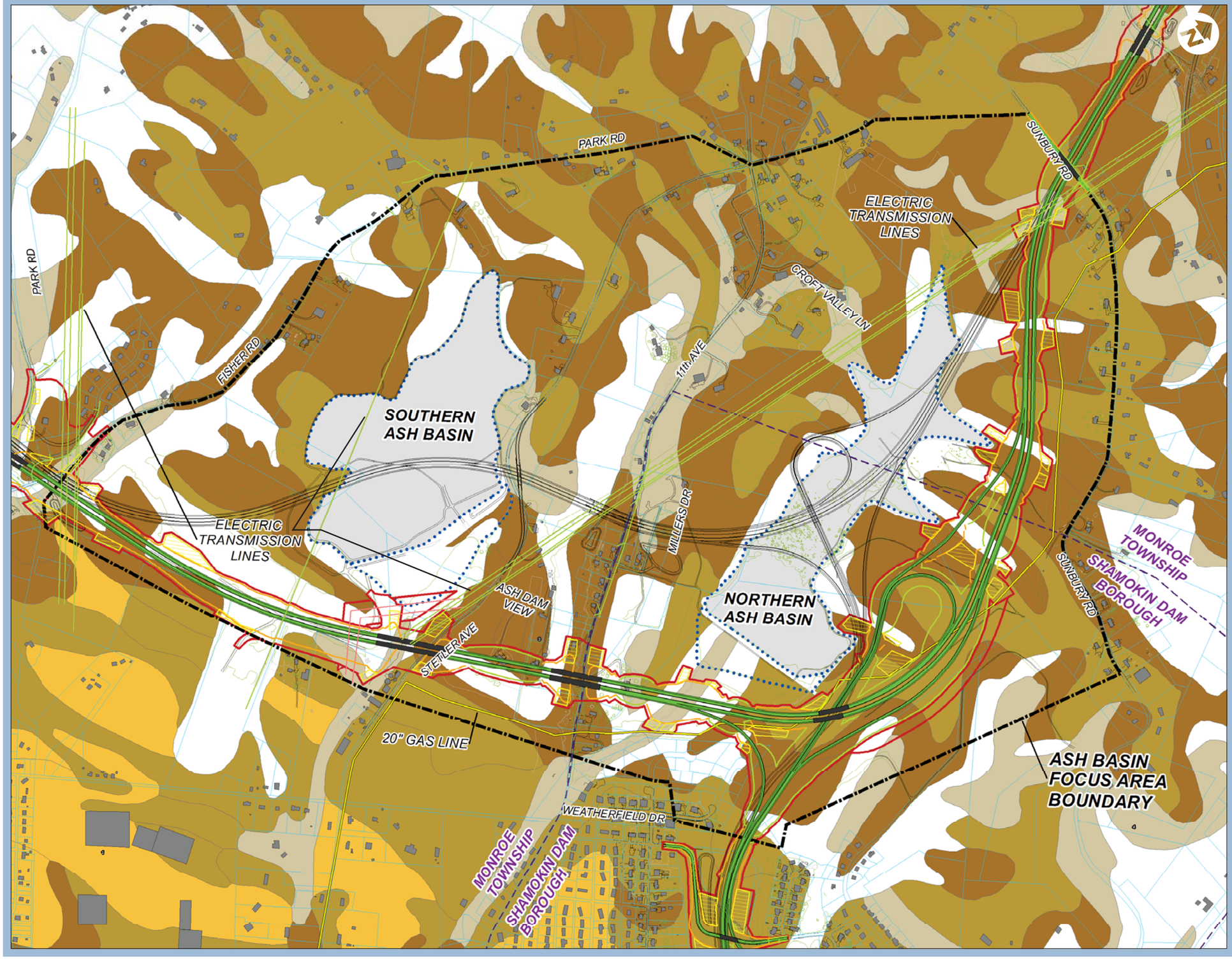
FIGURE 12
SOIL CAPABILITY CLASSES

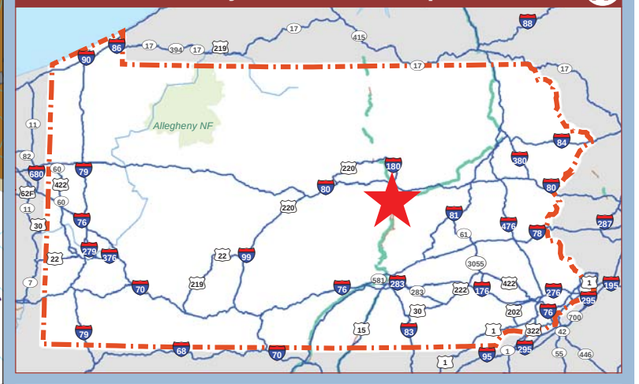


Legend

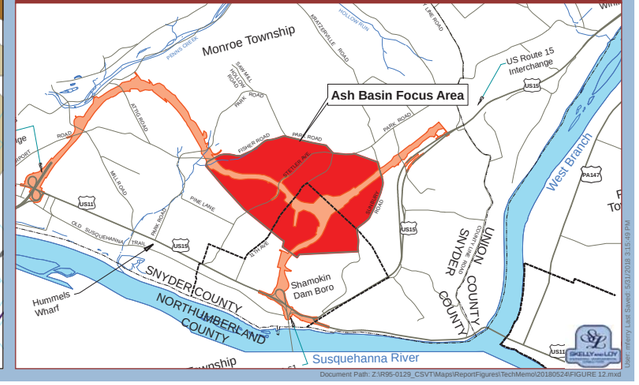
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- Power Lines
- Eastern Alternative
- Cut
- Fill
- Stormwater Management Area
- Municipalities
- Ash Basin
- Gas Pipeline
- Class I Soil
- Class II Soil
- Class III Soil
- Class IV Soil

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\R95-0129_CSVT\Maps\Report\Figures\TechMemo\20180524\FIGURE 12.mxd

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FIGURE 13
HISTORIC RESOURCES

JACOB HOCH FARM PROPERTY (110830)

SHREINERS EVANGELICAL CHURCH AND CEMETERY (206493)

PARK RD

SUNBURY RD

ELECTRIC TRANSMISSION LINES

CROFT VALLEY LN

11th AVE

FISHER RD

SOUTHERN ASH BASIN

NORTHERN ASH BASIN

MILLERS DR

ASH DAM VIEW

STETLER AVE

20" GAS LINE

WEATHERFIELD DR

MONROE TOWNSHIP

SHAMOKIN DAM BOROUGH

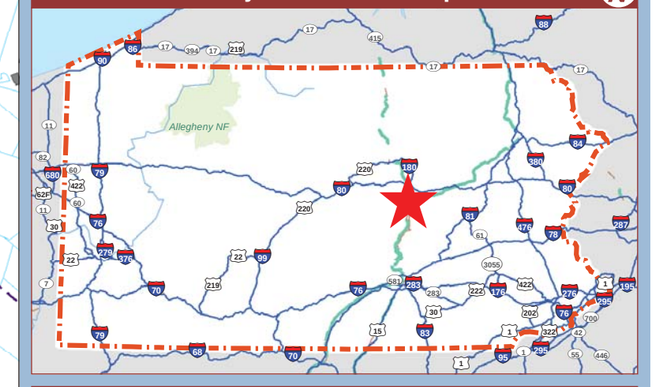
ASH BASIN FOCUS AREA BOUNDARY

Legend

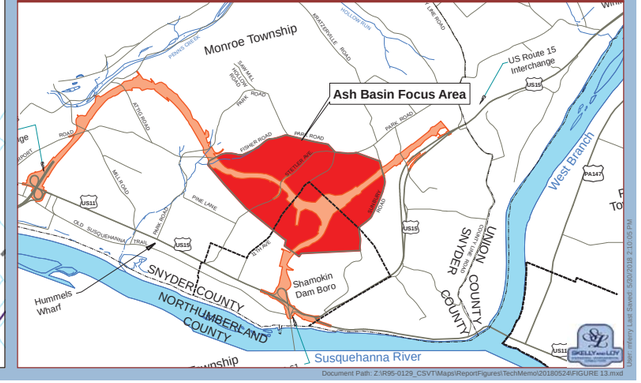
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- Eastern Alternative
- No Change DAM Alternative
- Power Lines
- Cut
- Fill
- Gas Pipeline
- Stormwater Management Area
- Municipalities
- Ash Basin
- Planned Development
- Historic Resource (Recommended NRHP - Not Eligible)
- Historic Resource (NRHP - Eligible)

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\R95-012\9_CSVT\Maps\ReportFigures\TechMemo\20180524\FIGURE 13.mxd

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FIGURE 14
POTENTIAL WASTE LOCATIONS

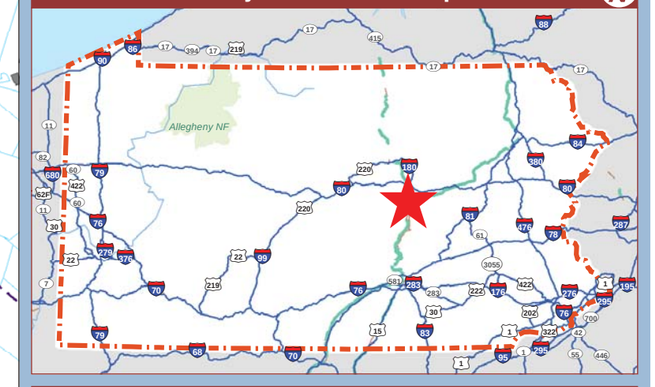
PARK RD
FISHER RD
PARK RD
SUNBURY RD
ELECTRIC TRANSMISSION LINES
CROFT VALLEY LN
11th AVE
SOUTHERN ASH BASIN
40
46
47
48
MILLERS DR
ELECTRIC TRANSMISSION LINES
ASH DAM VIEW
STETLER AVE
22
23
NORTHERN ASH BASIN
44
SUNBURY RD
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
20" GAS LINE
ASH BASIN FOCUS AREA BOUNDARY
WEATHERFIELD DR
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH

Legend

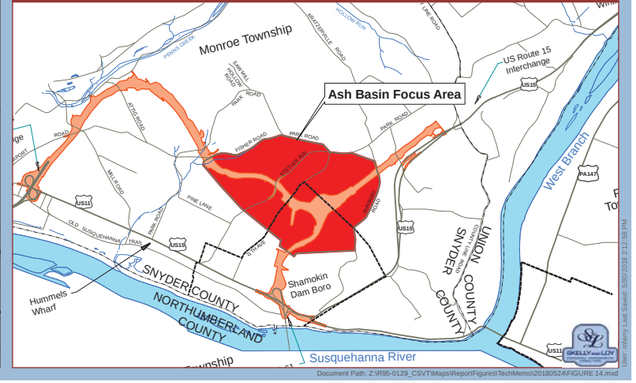
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- PowerLines
- Eastern Alternative
- Cut
- Fill
- Stormwater Management Area
- Gas Pipeline
- 1 Potential Waste Site

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\R95-012\9_CSVT\Maps\ReportFigures\TechMemo\20180524\FIGURE 14.mxd

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FIGURE 15

LAND USE

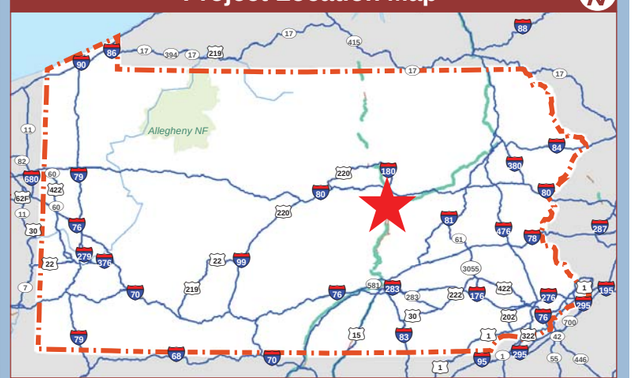
PARK RD
FISHER RD
PARK RD
SUNBURY RD
ELECTRIC TRANSMISSION LINES
CROFT VALLEY LN
11th AVE
SOUTHERN ASH BASIN
ELECTRIC TRANSMISSION LINES
MILLERS DR
ASH DAM VIEW
STEILER AVE
NORTHERN ASH BASIN
SUNBURY RD
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
20" GAS LINE
ASH BASIN FOCUS AREA BOUNDARY
WEATHERFIELD DR
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH

Legend

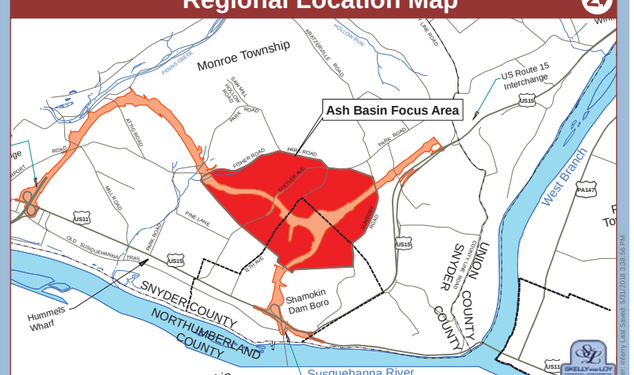
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- Power Lines
- Eastern Alternative
- Cut
- Fill
- Stormwater Management Area
- Municipalities
- Ash Basin
- Gas Pipeline
- Agriculture
- Commercial
- Industrial
- Institutional
- Residential
- Services
- Undeveloped/Wooded
- Utility

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\RS\S-0129_CSVT\Maps\ReportFigures\TechMemo\2018\05\24\FIGURE 15.mxd

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FIGURE 16
PLANNED DEVELOPMENT AND DISPLACEMENTS

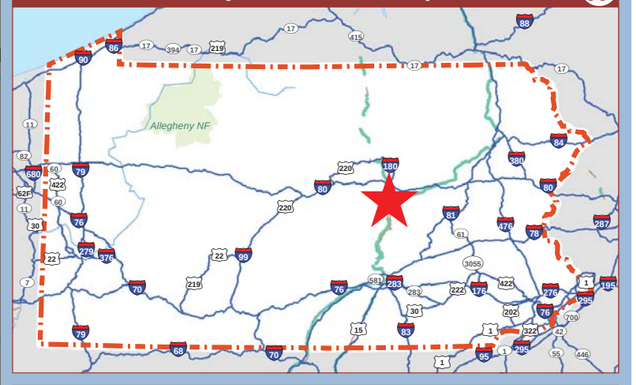
PARK RD
FISHER RD
PARK RD
SUNBURY RD
ELECTRIC TRANSMISSION LINES
CROFT VALLEY LN
11th AVE
SOUTHERN ASH BASIN
MILLERS DR
ELECTRIC TRANSMISSION LINES
ASH DAM VIEW
NORTHERN ASH BASIN
SUNBURY RD
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
STETLER AVE
20" GAS LINE
WEATHERFIELD (APPROVED)
WEATHERFIELD DR
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
ASH BASIN FOCUS AREA BOUNDARY
GRAYSTON (CONCEPTUAL)
BROSCIOUS (APPROVED)

Legend

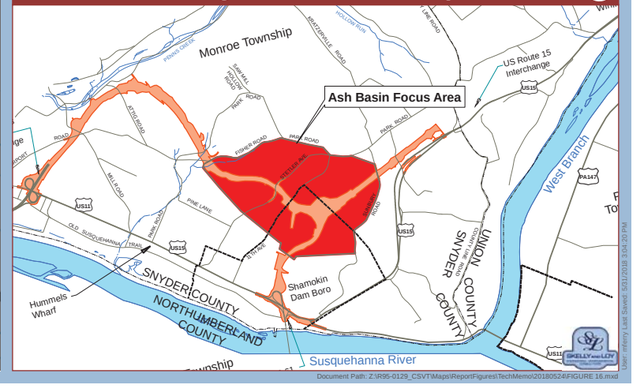
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- Power Lines
- Eastern Alternative
- Cut
- Fill
- Stormwater Management Area
- Municipalities
- Ash Basin
- Gas Pipeline
- Displacements (Already Acquired)
- Displacements (Not Yet Acquired)
- Planned Development

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\SR95-0129_CSVT\Maps\Report\Figures\TechMemo\20180524\FIGURE 16.mxd

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FIGURE 17
EASTERN ALTERNATIVE NOISE IMPACTS

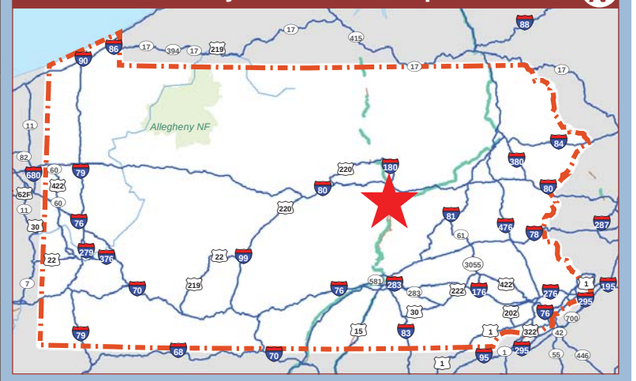
PARK RD
FISHER RD
PARK RD
SUNBURY RD
ELECTRIC TRANSMISSION LINES
CROFT VALLEY LN
11th AVE
NSA 11
NSA 9
SOUTHERN ASH BASIN
MILLERS DR
ELECTRIC TRANSMISSION LINES
ASH DAM VIEW
NORTHERN ASH BASIN
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
SUNBURY RD
STETTLER AVE
20" GAS LINE
NSA 14
WEATHERFIELD DR
MONROE TOWNSHIP
SHAMOKIN DAM BOROUGH
ASH BASIN FOCUS AREA BOUNDARY

Legend

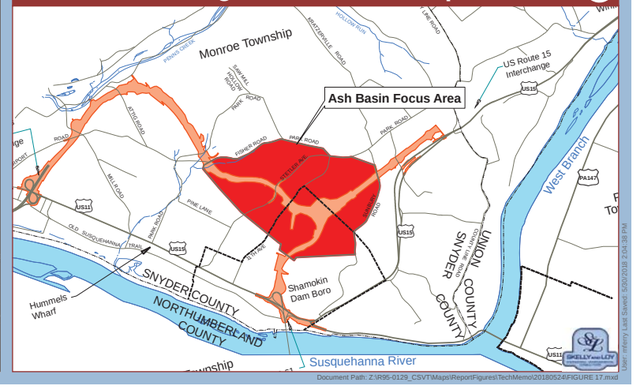
- Ash Basin Focus Area
- Eastern Alternative Limit of Disturbance
- No Change DAM Alternative
- Power Lines
- Eastern Alternative
- Municipalities
- Ash Basin
- Gas Pipeline
- Preliminary Noise Barriers
- Impacted Noise Receptor
- Non-Impacted Noise Receptor

0 300 600 900 1,200
Feet

Project Location Map



Regional Location Map



Document Path: Z:\R95-0129_CSVT\Maps\Report\Figures\TechMemo\20180526\FIGURE 17.mxd

ATTACHMENT 2 -
CULTURAL RESOURCE
PROGRAMMATIC AGREEMENT

U. S. DEPARTMENT
OF TRANSPORTATION

**Federal Highway
Administration**

Pennsylvania Division

JAN 8 2015

228 Walnut Street, Room 508
Harrisburg, PA 17101-1720

In reply refer to:
HPD-PA

Snyder, Union, Northumberland Counties,
Pennsylvania
Central Susquehanna Valley Transportation
(CSVT) Project
Executed Programmatic Agreement
2nd Amendment

Mr. Reid J. Nelson
Office of Federal Agency Programs
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, NW, #803
Washington, DC 20004

Dear Mr. Nelson:

Please find enclosed a copy of the executed 2nd amendment to the Programmatic Agreement (PA) with copies of the 1st amendment and the original agreement for the above referenced project. The original agreement expired on October 6, 2008, and the first amendment will expire on April 14, 2016. This second amendment extends the PA until December 22, 2026. This amendment was necessary in response to funding limitations and associated construction delays. Several of the *WHEREAS* clauses have been updated, and the time-to-complete the project has been extended. To date, all stipulations have been met.

If you have any questions, please contact Deborah Suciu Smith at deborah.suciu.smith@dot.gov or 717-221-3785 for assistance.

Sincerely,

Camille A Otto for

Deborah Suciu Smith
Environmental Specialist

Enclosure

ec: Christine Spangler, P.E., PennDOT BOD (w/enclosure)
Christine Kula, PennDOT BPD (w/enclosure)
Andrea MacDonald, PHMC/SHPO (w/enclosure)
Matthew Beck, P.E., PennDOT 3-0 (w/enclosure)

OS-600 (3-89)

pennsylvania
DEPARTMENT OF TRANSPORTATION

DATE: December 21, 2015

SUBJECT: Snyder, Union, Northumberland Counties
Central Susquehanna Valley Transportation (CSVT) Project
Second Amendment to the Programmatic Agreement
MPMS 7588

TO: Deborah Suciu Smith
Pennsylvania Division
Federal Highway Administration

FROM: Brian Thompson, PE
Director
Bureau of Project Delivery

Christine Kula

Enclosed for your signature is the Second Amendment to the Programmatic Agreement (PA) for the above referenced project. The original PA was executed in 2003, the First Amendment in 2009. The 2009 amendment extended the time to complete mitigation commitments until April 14, 2016. The project was on hold for several years due to lack of funding, and PennDOT will not be able to complete the mitigation by the expiration date.

The Second Amendment extends the time to complete all commitments until 2026, an additional ten years. Several WHEREAS clauses were also added to document progress since 2009.

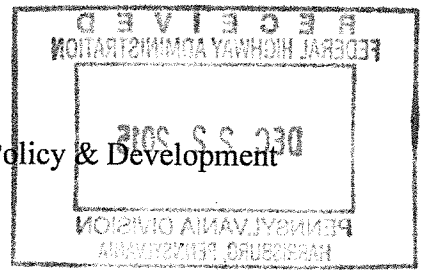
The PA Amendment has been signed by PennDOT and the SHPO. Please sign and distribute copies to the signatories and the ACHP.

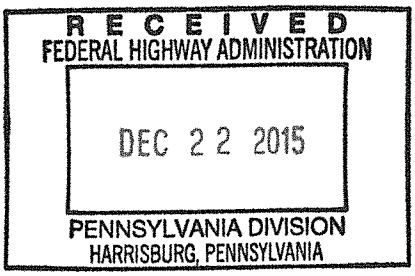
If you have any questions, please contact Christine Kula at 783-9700 or ckula@pa.gov.

Enclosure

4843/CAK/ck

Cc: Scott Shaffer, District 2-0
Matt Hamel, District 3-0
Christine Kula, Bureau of Project Delivery, Environmental Policy & Development

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FEDERAL HIGHWAY ADMINISTRATION
DEC 22 2015
PENNSYLVANIA DIVISION
HARRISBURG, PENNSYLVANIA

SECOND AMENDMENT TO THE PROGRAMMATIC AGREEMENT BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) AND THE PENNSYLVANIA STATE HISTORIC PRESERVATION OFFICER (SHPO)

REGARDING THE S.R.0015, SECTION 088, CENTRAL SUSQUEHANNA VALLEY TRANSPORTATION (CSVT) PROJECT SNYDER, UNION, AND NORTHUMBERLAND COUNTIES, PENNSYLVANIA

WHEREAS, a Programmatic Agreement (PA) was executed for the Central Susquehanna Valley Transportation (CSVT) Project on October 6, 2003, and an Amendment to the PA was executed on April 14, 2009; and

WHEREAS, the duration of the effective period of the Amendment to the Programmatic Agreement (PA) will expire on April 14, 2016; and

WHEREAS, the Central Susquehanna Valley Transportation Project (Project) has not been completed and an extended duration for the PA is required; and

WHEREAS, archaeological studies were conducted for the DAM/RC5 Alternative's Area of Potential Effect (APE) per Stipulation 1 of the original PA; and

WHEREAS, a Phase I Archaeology and Phase II Archaeological Investigation of Site 36UN16 was submitted to the PA SHPO in May 2010; and

WHEREAS, PA SHPO has concurred that through a regimen of site encapsulation, preservation in place, there will be no adverse effect to Site 36UN16; and

WHEREAS, the Phase I/II Report indicates impacts to all identified archaeological sites in the APE will be avoided and the FHWA received no concerns from the PA SHPO with these findings, and

WHEREAS, design modifications made during final design of the DAM/RC5 Alternative have resulted in modifications to the APE, and

WHEREAS, archaeological studies continue to be completed on the modified APE in order to recommend NRHP eligibility which will be made by FHWA in consultation with the SHPO and Tribe(s), and

WHEREAS, these additional studies have been transmitted via Phase I/II addendums to the federally recognized Tribes and to the PA SHPO, and will continue to be as final design continues if additional modifications to the DAM/RC5 APE are necessary, and

WHEREAS, no new historic resources listed or eligible for listing on the NRHP have been identified in the DAM/RC5 Alternative's APE during a review in 2014 for any new potentially eligible historic properties, and

WHEREAS, the FHWA and PA SHPO agreed a new impact (pier foundation) to a previously identified eligible resource (Sunbury-to-Erie Division of the Pennsylvania Railroad) will not adversely affect the property, and

WHEREAS, the FHWA's responsibility to carry out all actions under the PA, not altered through execution of the first or this amendment, shall remain unchanged.

NOW THEREFORE, for and in consideration of the foregoing premises and mutual promises set forth below, the parties agree, with the intention of being legally bound, to amend the original Agreement as follows:

1. Administrative Condition G is amended to read:

   This Agreement is designed to implement final design and construction of the preferred alternative, DAM/RC5 or modifications thereto. Should this alternative not be selected or should FHWA not otherwise approve Federal funding for this alternative, this Agreement shall be null and void. Further, if the stipulations have not been implemented within seven (7) years after execution of this Amendment, the parties to this agreement shall review the Agreement to determine whether revisions are needed. Periodic status reports will document implementation. If revisions are needed, the parties to this Agreement shall consult in accordance with 36 CFR § 800 to make such revisions.

2. Administrative Condition H is amended to read:

   If the terms of this Agreement have not been implemented by ten (10) years from date of signed Amendment, or if no significant action has taken place on the project in at least five (5) years, this Agreement shall be considered null and void. In such event the FHWA shall so notify the parties to this Agreement, and if it chooses to continue with the undertaking, shall reinitiate review of the CSVT Project in accordance with 36 CFR §800.

FEDERAL HIGHWAY ADMINISTRATION

By: _____ Date: 12-22-2015

PENNSYLVANIA STATE HISTORIC PRESERVATION OFFICER

By: Andrea L. MacDonald Date: 12/18/2015

CONCUR:

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

By: _____ Date: 12/14/15

AMENDMENT TO THE PROGRAMMATIC AGREEMENT BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) AND THE PENNSYLVANIA STATE HISTORIC PRESERVATION OFFICER (SHPO)

REGARDING THE S.R.0015, SECTION 088, CENTRAL SUSQUEHANNA VALLEY TRANSPORTATION (CSVT) PROJECT SNYDER, UNION, AND NORTHUMBERLAND COUNTIES, PENNSYLVANIA

WHEREAS, the duration of the effective period of the Programmatic Agreement (PA) expired on October 6, 2008; and

WHEREAS, the Central Susquehanna Valley Transportation Project (Project) has not been completed and an extended duration for the PA is required; and

WHEREAS, a Phase I Archaeological survey was conducted for the DAM/RC5 Alternative mitigation per Stipulation 1 of the original PA; and

WHEREAS, the FHWA's responsibility to carry out all actions under the PA, not altered through execution of this amendment, shall remain unchanged.

NOW THEREFORE, for and in consideration of the foregoing premises and mutual promises set forth below, the parties agree, with the intention of being legally bound, to amend the original Agreement as follows:

1. Administrative Condition G is amended to read:

   This Agreement is designed to implement final design and construction of the preferred alternative, DAM/RC5 or modifications thereto. Should this alternative not be selected or should FHWA not otherwise approve Federal funding for this alternative, this Agreement shall be null and void. Further, if the stipulations have not been implemented within five (5) years after execution of this Amendment, the parties to this agreement shall review the Agreement to determine whether revisions are needed. Periodic status reports will document implementation. If revisions are needed, the parties to this Agreement shall consult in accordance with 36 CFR § 800 to make such revisions.

2. Administrative Condition H is amended to read:

   If the terms of this Agreement have not been implemented by seven (7) years from date of signed Amendment, or if no significant action has taken place on the project in at least five (5) years, this Agreement shall be considered null and void. In such event the FHWA shall so notify the parties to this Agreement, and if it

chooses to continue with the undertaking, shall reinitiate review of the CSVT Project in accordance with 36 CFR §800.

3. Administrative Condition J is added as follows:

   If at any time during the course of the Project, should the Project be cancelled, or PennDOT's request for federal funding is withdrawn, PennDOT will so notify the FHWA. The FHWA will notify the other signatories to the Amendment and the Advisory Council on Historic Preservation that it is terminating the agreement. The FHWA, in consultation with those parties, will consider the effects of any project related activities undertaken to date and will assess its responsibilities and obligations pursuant to 36 CFR 800 and determine steps to terminate the Agreement.

FEDERAL HIGHWAY ADMINISTRATION

By: David W Cox Date: 4/14/09

PENNSYLVANIA STATE HISTORIC PRESERVATION OFFICER

By: Jean H Cutler Date: 1/30/2009

CONCUR:

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

By: Bruce E Thyp Date: 1/16/09

OFETC - J. McDonald
C - OJA
OFC → KLR - FILE

U. S. DEPARTMENT
OF TRANSPORTATION

**Federal Highway
Administration**

Pennsylvania Division

*228 Walnut Street, Room 508
Harrisburg, PA 17101-1720*

OCT - 7 2003

In reply refer to:
HEV-PA.1

Snyder, Union and Northumberland
Counties, Pennsylvania
Central Susquehanna Valley
Transportation Project
S.R. 0015, Section 088
Programmatic Agreement
FPN: 315-X030-002

Mr. Dean Schreiber, P.E.
Acting Chief Engineer for Highway Administration
Pennsylvania Department of Transportation
Harrisburg, Pennsylvania

Dear Mr. Schreiber:

The enclosed Programmatic Agreement has been executed in accordance with 36 CFR 800 for the above referenced project. Copies are being provided to the Pennsylvania State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) per copy of this letter. Please ensure the undertaking of the stipulations during final design and construction.

If you have any questions, please contact Deborah Suciu Smith at (717) 221-3785.

Sincerely yours,

James A. Cheatham
Division Administrator

RECEIVED
OCT 09 2003
BUREAU OF DESIGN
Contract Management Div.

Enclosure

cc: S.L. McDonald, PENNDOT
Karen Theimer Brown, ACHP (w/enclosure)
Jean Cutler, PA SHPO (w/enclosure)

PROGRAMMATIC AGREEMENT
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION
AND
THE PENNSYLVANIA STATE HISTORIC PRESERVATION OFFICER
PURSUANT TO 36 CFR § 800.14(b)(1)

REGARDING THE S. R. 0015, SECTION 088, CENTRAL SUSQUEHANNA VALLEY TRANSPORTATION PROJECT
SNYDER, UNION, AND NORTHUMBERLAND COUNTIES, PENNSYLVANIA

WHEREAS the Federal Highway Administration (FHWA), in order to relieve traffic congestion and to improve safety, proposes to construct a new highway along the existing S.R. 0015, S.R. 0011, S.R. 0011/0015, and S.R. 0147 roadways in Snyder, Union, and Northumberland Counties, Pennsylvania; and

WHEREAS, the FHWA has involved and will continue to involve the public and Native American Tribes with cultural affiliations to the project area, as stipulated under the National Environmental Policy Act (NEPA) of 1969, as amended, in a manner consistent with Pennsylvania Department of Transportation's (PENNDOT) Public Involvement Procedures and the National Historic Preservation Act (NHPA) as amended [16 U.S.C. § 470], and its implementing regulations (36 CFR § 800); and

WHEREAS the FHWA has established that the S.R. 0015, Section 088, Central Susquehanna Valley Transportation (CSVT) Project's area of potential effect (APE), as defined at 36 CFR § 800.16(d), includes all potential direct or indirect impacts to historic resources located within audible and visual distance of the proposed construction area. This is an area extending south from the existing S.R. 0147 and S.R. 0045 Interchange (the northern terminus) to the end of the existing Selinsgrove Bypass (the southern terminus). The Selinsgrove Bypass is where the existing S.R. 0011/0015 changes from a four-lane, limited access expressway to a five-lane (four lanes plus center turn lane), free access facility; and

WHEREAS the FHWA, pursuant to 36 CFR § 800.4(c), has determined that the Simon P. App Farm, an historic property located within the APE, is eligible for inclusion in the National Register of Historic Places; and

WHEREAS the FHWA has determined that the CSVT Project's preferred alternative in Section 1, the DA Modified Avoidance Alternative (DAMA), will have no adverse effect on the Simon P. App Farm, the only historic architectural resource that could potentially be affected by the preferred alternative, as detailed in the Determination of Effect Report (April 2000) prepared for the project; and

WHEREAS the FHWA has determined that there are no architectural resources listed in or eligible for inclusion in the National Register of Historic Places adversely affected by the proposed CSVT Project's preferred alternatives DAMA in Section 1 and River Crossing 5 (RC5) in Section 2; and

WHEREAS for purposes of this agreement, the term 'Tribe(s)' shall mean any Federally Recognized Tribe that may attach religious and/or cultural significance to historic properties that may be located within the project APE; and

WHEREAS Tribes that may attach religious and/or cultural significance to historic properties that may be located within the project APE have been invited to consult on this undertaking; and

WHEREAS the FHWA has consulted with the Pennsylvania State Historic Preservation Officer (SHPO) to develop and test a predictive model for archaeological resources (August 1999); and

WHEREAS the model was applied to a large study area, through which a range of reasonable alternatives meeting the needs of the Project passed; and

WHEREAS the areas identified by the predictive model as having a high sensitivity for archaeological resources were avoided, where possible, during the development of the alternatives; and

WHEREAS the FHWA has requested the comments of the Tribes on the proposed predictive model for archaeological resources;

WHEREAS the FHWA has determined that the Project may have an effect on NRHP-eligible archaeological sites; and

WHEREAS archaeological studies have not been completed for the CSVT Project and the FHWA has elected to comply with the NHPA through execution and implementation of a Programmatic Agreement (Agreement) pursuant to 36 CFR § 800.14; and

WHEREAS the FHWA has invited the Tribes to participate in the consultation and to concur in this Programmatic Agreement (Agreement); and

NOW, THEREFORE, the FHWA, the Tribes and the SHPO agree that, upon FHWA's decision to proceed with the CSVT Project, the project shall be administered in accordance with the following stipulations so as to take into consideration potential effects to archaeological sites eligible for inclusion in the National Register of Historic Places.

Stipulations

The FHWA shall ensure that the following stipulations are carried out:

1. PENNDOT shall conduct an archaeological identification survey of the Selected Alternative of the CSVT project in a manner consistent with the *Secretary of the Interior's Standards and Guidelines for Identification* (46 FR 44720-23), also taking into account the National Park Service's publication *The Archaeological Survey: Methods and Uses* (1978: GPO stock #024-016-00091) and the Bureau for Historic Preservation (BHP)/Pennsylvania Historical and Museum Commission's (PHMC) *Cultural Resource Management in Pennsylvania: Guidelines for Archaeological*

Investigations (July 1991). The archaeological predictive model developed for the CSVT Project (*Archaeological Predictive Model Development and Testing, August 1999*) as presented and/or amended through consultation with Tribes and other consulting parties will be used as a guide in conducting field investigations and subsequent site analysis.

2. PENNDOT will evaluate archaeological resources identified within the APE in accordance with 36 CFR § 800.4(c), in order to recommend NRHP eligibility which will be made by FHWA in consultation with the SHPO and Tribe(s). If any archaeological sites are determined to be eligible for listing in the NRHP, PENNDOT will consider design alternatives that would avoid or minimize the project impacts on these resources. If eligible archaeological sites cannot be avoided the FHWA will ensure that they are treated in accordance with Stipulation 3.

3. If eligible archaeological sites cannot be avoided, PENNDOT, in consultation with the SHPO and the Tribe(s) will apply the Criteria of Adverse Effect in accordance with 36 CFR § 800.5. If it is determined that the CSVT project will have an adverse effect on archaeological resources important chiefly for the information it contains and does not warrant preservation in place, PENNDOT will develop a data recovery plan or a plan for alternative mitigation in consultation with the SHPO and Tribe(s). The views of the public will be considered in the development of the plan. Any data recovery plan will be consistent with the *Secretary of the Interior's Standards and Guidelines for Archaeological Documentation* (48 FR 44734-37) and the BHP/PHMC's *Cultural Resource Management in Pennsylvania: Guidelines for Archaeological Investigations (July 1991).* If archaeological resources are important chiefly for values other than for the information contained and do warrant preservation in place, then PENNDOT shall comply with 36 CFR § 800.6.

4. If eligible archaeological sites cannot be avoided, PENNDOT, in consultation with the SHPO and the Tribe(s) may develop additional creative mitigation options. The views of the public will be considered in the development of any creative mitigation options.

5. If archaeological data recovery or other alternative mitigation is necessary, PENNDOT will ensure that the mitigation plan includes dissemination of the results to the public and the Tribe(s). The materials for public distribution will be determined individually for each archaeological site and may include pamphlets, brochures, artifact displays, lectures, or exhibits. Drafts of all public education materials will be submitted to FHWA, the Tribe(s) and SHPO for comment during development and prior to distribution.

6. PENNDOT will ensure that any human remains and grave-associated artifacts encountered during the archaeological investigations are brought to the immediate attention of the FHWA, the ACHP, the Tribe(s) and the SHPO. Notification will be within 24 hours of the discovery. A field view of the site will take place within 72 hours of notification. No activities that might disturb or damage the remains will be conducted until the FHWA, in consultation with the appropriate parties, has determined whether excavation is necessary and/or desirable. All procedures will take into account the guidance outlined in the National Park Service publication *National Register Bulletin 41: Guidelines for Evaluating and Registering Cemeteries and Burial Places,* the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (PL 101-601) and the Pennsylvania Historical and Museum Commission's *Policy for the Treatment of Burials and Human Remains*

(1993).

7. PENNDOT shall insure that all archaeological reports and public information materials resulting from actions pursuant to this Agreement will be provided to the FHWA, the Tribe(s) and the SHPO for review and comment. The review period will be 30 days. Reports may include a Phase I Identification Report, an Identification and Evaluation (Phase I & II) Report, a Mitigation Plan, a Data Recovery Report, and Management Summaries, as appropriate. Draft Data Recovery reports shall be submitted for review within two years of completion of archaeological fieldwork. All final Data Recovery reports will be completed and provided to FHWA, the Tribe(s) and SHPO within three years of the completion of the archaeological fieldwork.

8. PENNDOT shall ensure that all records and materials resulting from the archaeological investigations that are not privately-owned shall be curated in accordance with 36 CFR 79 and the curation guidelines developed by the Pennsylvania State Museum. Curation will be arranged at an appropriate facility, after consultation with the FHWA, the Tribe(s), the SHPO and the public. For artifacts recovered from privately owned land, PENNDOT shall ask the property owner to donate the artifacts to the Pennsylvania State Museum.

Administrative Conditions

A. Personnel Qualifications

PENNDOT shall ensure that all archaeological investigations carried out pursuant to this Agreement will be by or under the direct supervision of a person or persons meeting at a minimum the *Secretary of the Interior's Professional Qualification Standards for Archaeologists* (48 FR 44738-9).

B. Archaeological Sites

If an archaeological site is encountered during the project, an effort will be made to determine the cultural affiliation of any artifacts recovered from the site. Should cultural affiliation be linked with any federally recognized Native American tribes that might attach religious and cultural significance to the property, those tribes will be contacted.

C. Late Discovery

If any unanticipated discoveries of historic properties or archaeological sites are encountered during the implementation of this undertaking, work shall be suspended in the area of the discovery and the FHWA shall comply with 36 CFR 800.13 by consulting with the Tribe(s) and the SHPO. The FHWA will notify the SHPO and the Tribe(s) within twenty-four (24) hours of the discovery. The FHWA will invite the SHPO and the Tribe(s) to meet at the location within seventy-two (72) hours of the initial notification to determine appropriate treatment of the discovery prior to the resumption of construction activities in the area of the discovery.

D. Amendments

Any party to this Agreement may propose to the FHWA that the Agreement be amended, whereupon the FHWA shall consult with other parties to this Agreement to consider such an amendment in accordance with 36 CFR § 800.6(c)(7).

E. Resolving Objections by the Signatory Parties

1. Should any party to this Agreement object in writing to the FHWA regarding any action carried out or proposed with respect to the Project or implementation of this Agreement, the FHWA shall consult with the objecting party to resolve the objection. If after initiating such consultation, the FHWA determines that the adequately justified objection cannot be resolved through consultation, the FHWA shall forward all documentation relevant to the objection to the ACHP including the FHWA's proposed response to the objection. Within thirty (30) days after receipt of all pertinent documentation, the ACHP shall exercise one of the following options:

- Advise the FHWA that the ACHP concurs in the FHWA's proposed response to the objection, whereupon the FHWA shall respond to the objection accordingly; or

- Provide the FHWA with recommendations, which the FHWA shall take into account in reaching a final decision regarding its response to the objection; or

- Notify the FHWA that the objection will be referred for comment pursuant to 36 CFR 800.7, and proceed to refer the objection and comment. The FHWA in accordance with 36 CFR 800.7(c) (4) and Part 110(1) of the NHPA shall take the resulting comment into account.

2. Should the ACHP not exercise one of the above options within thirty (30) days after receipt of all pertinent documentation, the FHWA may assume the ACHP's concurrence in its proposed response to the objection.

The FHWA shall take into account any ACHP recommendation or comment provided in accordance with this stipulation with reference only to the subject of the objection; the FHWA's responsibility to carry out all actions under this Agreement that are not the subjects of the objection shall remain unchanged.

F. Resolution of Objections by the Public

Should an objection pertaining to historic preservation or implementation of the terms of this Agreement be raised by a member of the public in a timely and substantive manner, the FHWA shall notify the parties to this Agreement and take the objection into account, consulting with the objector and, should the objector so request, with any of the parties to this Agreement to resolve the objection.

G. Review of Implementation

This Agreement is designed to implement final design and construction of the preferred alternative, DAMA/RC5 or modifications thereto. Should this alternative not be selected or should FHWA not otherwise approve Federal funding for this alternative, this Agreement shall be null and void. Further, if the stipulations have not been implemented within three (3) years after execution of this PA, the parties to this agreement shall review the Agreement to determine whether revisions are needed. Periodic status reports will document implementation. If revisions are needed; the parties to this Agreement shall consult in accordance with 36 CFR 800 to make such revisions.

H. Sunsetting/Duration

If the terms of this Agreement have not been implemented by five (5) years from date of signed Agreement, or if no significant action has taken place on the project in at least three (3) years, this Agreement shall be considered null and void. In such event the FHWA shall so notify the parties to this Agreement, and if it chooses to continue with the undertaking, shall reinitiate review of the CSVT Project in accordance with 36 CFR § 800.

I. Termination

1. If the FHWA determines that it cannot implement the terms of this Agreement or SHPO opinions that the Agreement is not being properly implemented, the FHWA or the SHPO may propose to the other parties to this Agreement that it be terminated.

2. The party proposing to terminate this Agreement shall so notify all parties to this Agreement, explaining the reasons for termination and affording them at least thirty (30) days to consult and seek alternatives to termination. The parties shall then consult.

3. Should consultation fail, the FHWA or the SHPO may terminate the Agreement by so notifying all parties.

4. Should this Agreement be terminated, the FHWA shall either:

a) Consult in accordance with 36 CFR § 800.6(a)(1) to develop a new Agreement; or

b) Request the comments of the ACHP pursuant to 36 CFR § 800.7(a)(1). The ACHP shall have forty-five (45) days to respond with comments.

5. The FHWA and the ACHP may conclude the Section 106 process with an Agreement between them if the SHPO terminates consultation in accordance with 36 CFR § 800.7(a)(2).

Execution of this Agreement by the FHWA and the SHPO, and implementation of its terms, evidence that the FHWA has taken into account the effects of the undertaking on historic properties and fulfilled its responsibilities under Section 106 of the 1966 National Historic Preservation Act (as amended).

FEDERAL HIGHWAY ADMINISTRATION

By: David W Gough Date: 10-6-03

PENNSYLVANIA STATE HISTORIC PRESERVATION OFFICER

By: Jean A Cutler, DSHPO Date: 5/28/03

CONCUR:

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

By: Dean A. Schulz Date: 5/19/03