Final Letter Report
Phase IA Cultural Resources Reconnaissance of PPL Lands in the Vicinity of Susquehanna Steam Electric Station Luzerne County, Pennsylvania for UniStar Nuclear Development, LLC

Abstract

GAI conducted a Phase IA cultural resources reconnaissance of PPL Corporation (PPL) land in the vicinity of the Susquehanna Steam Electric Station (SSES), in Luzerne County, Pennsylvania being evaluated for potential location of a new nuclear generating unit, by UniStar Nuclear Development, LLC (UniStar) under an endeavor currently termed Project Leo. The areas of interest consist of potentially suitable lands west of the North Branch Susquehanna River, termed the West Alternative (subdivided into Alternatives #1A, #1B, and #1C) and potentially suitable lands east of the river, termed the Southeast Alternative, totaling approximately 760 acres. [Although no strict boundaries and acreages were established for the alternatives by UniStar, GAI has established approximate boundaries and acreages for convenience of descriptions in this report and any site alternatives comparisons based on information in this report.] In addition, GAI conducted a brief field view of potential cooling water intake and discharge structure locations on the east and west banks of the North Branch Susquehanna River, the likely source and receiving water body for cooling water. Phase IA studies included preliminary background, a geomorphological and archaeological reconnaissance and an architectural review. Field investigations were performed between June 18 and 20, 2007.

West Alternative

Phase IA background research documented no previously recorded archaeological sites or architectural resources within the area comprising the West Alternative. GAI's architectural review identified six potentially significant architectural resources over 50 years of age within this alternative's viewshed. These resources would require National Register evaluation and documentation during a subsequent architectural survey.

Alternative #1A (assumed to be approximately 160-acres for this report) includes approximately 90 acres of moderate to high archaeological potential that would require subsequent subsurface archaeological investigations to identify cultural resources. The remaining area (approximately 70 acres) consists of low potential wetlands and steep slopes that would not require systematic subsurface testing during subsequent investigations. Phase IA archaeological reconnaissance identified one possible unrecorded historic archaeological resource in the area of potential effect (APE) that may require further investigation. Sites within this upland parcel are likely to be near-surface in nature.

Alternative #1B (approximately 260-acres) contains approximately 140 acres of moderate to high archaeological potential that would require subsequent subsurface archaeological investigations to identify cultural resources. Approximately 60 acres of this alternative are considered low potential due to the presence of wetlands or steep slopes; these low potential settings would not require systematic subsurface testing during subsequent investigations. An area of approximately 60 acres area in the parcel's northeast corner has been disturbed by a landfill and has no archaeological potential. Phase IA archaeological reconnaissance identified two possible unrecorded historic archaeological resources in the APE that may require further investigation. Sites within this upland area are most likely to be near-surface in nature.

The 410-acre (approximate) Alternative #1C (combined Alternatives #1A and #1B) consists of approximately 230 acres of moderate to high archaeological potential that would require subsequent subsurface archaeological investigations to identify cultural resources. A total of approximately 120 acres of wetlands or slopes in excess of 15 percent in this alternative have low archaeological potential and would not be subject to systematic subsurface testing during subsequent investigations. The 60-acre (approximate) landfill in the parcel's northeast corner has no archaeological potential. Phase IA reconnaissance identified three possible unrecorded historic archaeological resources in Alternative #1C that may require further investigation. Sites within this parcel are likely to be near-surface in nature.

The potential location of cooling water intake/discharge structures and pipelines on the west bank floodplain/low terrace of the Susquehanna River has a high to moderate potential for both near-surface and deeply-buried archaeological sites.

Southeast Alternative

The Southeast Alternative consists of approximately 350 acres, including approximately 100 acres of moderate to high archaeological potential requiring subsequent subsurface testing. The remainder of this alternative consists of approximately 250 acres of low archaeological potential, not subject to systematic subsurface testing, and about five acres of disturbance that would be excluded from subsequent archaeological investigations. Background research documented two previously recorded architectural resources within this alternative. Phase IA archaeological reconnaissance identified one possible historic archaeological resource in the project APE that may require further investigation. Sites within the majority of this alternative are likely to be near-surface in nature. The northwestern portion of this parcel, on the low terrace adjacent to Little Wapwallopen Creek has a potential for both near-surface and deeply buried archaeological sites.

GAI's architectural review identified four potentially significant architectural resources over 50 years of age within the project viewshed, including the Old River Church. These resources would require National Register evaluation and documentation during subsequent architectural survey. In addition, GAI identified one potential cultural property (Council Cup) within the viewshed of the Southeast Alternative. This property, which represents a Native American meeting place and overlook, would require evaluation and documentation during subsequent archaeological investigations.

The potential location of cooling water intake/discharge structures and pipelines on the east bank floodplain/low terrace of the Susquehanna River has a high to moderate potential for both near-surface and deeply-buried archaeological sites. One previously recorded archaeological site lies within the area of interest.

Project Description

The area under review for Project Leo (project area) consists of PPL Corporation (PPL) land situated along the North Branch Susquehanna River in the vicinity of their Susquehanna Steam Electric Station (SSES) just north of the river's Bell Bend, approximately 4.8 kilometers (3 miles) northeast of the town of Berwick and 1.6 kilometers (1 mile) north of the community of Beach Haven (Figure 1). UniStar is evaluating potential suitability of this area for development of a new nuclear generating unit(s). The Phase IA study area comprises two proposed development alternatives, designated the West Alternative and the Southeast Alternative. The West Alternative is an approximately 408-acre parcel lying immediately west of the existing SSES facility and 1.6 kilometers (1 mile) west of the river (see Photograph 1). The West Alternative has been further subdivided by UniStar into three alternatives—Alternative #1A (Southwest 1 Unit), Alternative #1B (West 1 Unit), and Alternative #1C (West 2 Units).

Photograph 1. Overview of West Alternative, Facing Northeast.

The Southeast Alternative consists of an approximately 353-acre area located on the opposite side of the river, 0.6 kilometers (0.4 miles) east of the riverbank (see Photograph 2). Two additional proposed development alternatives (the Northwest and Northeast Alternatives), bordering the northern edge of the current project area, have been excluded from consideration by UniStar and are outside the scope of this study. Also associated with the West and Southeast Alternatives are potential locations of cooling water intake and discharge structures and associated pipelines, situated on/through the floodplain to the east and west banks of the Susquehanna River.

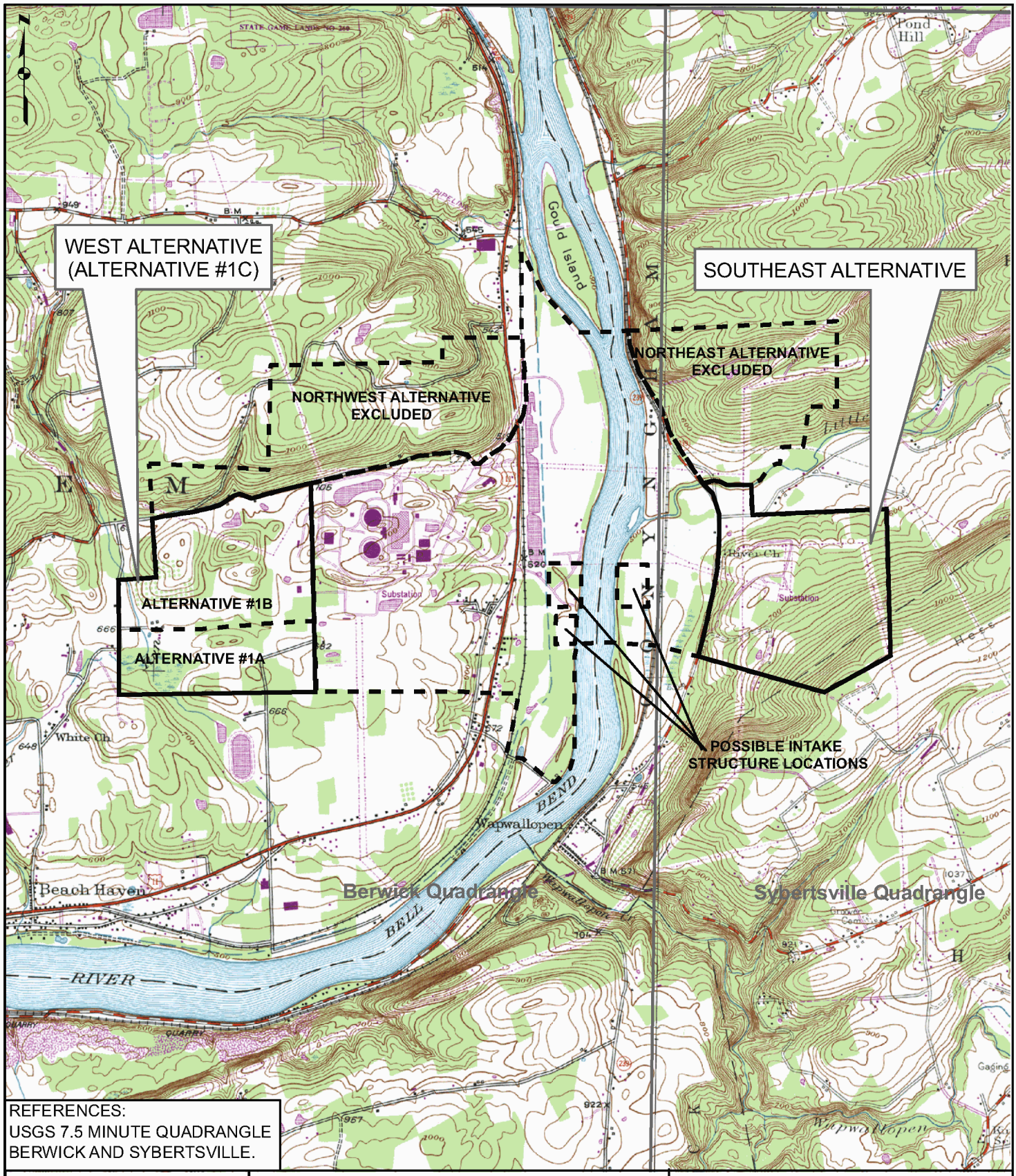
Photograph 2. Overview of Southeast Alternative and Council Cup (background) from River Lands Park, Facing Southeast

The goals of the Phase IA investigation were to identify previously recorded cultural resources within the West and Southeast Alternatives and to characterize the potential of each alternative to contain unrecorded archaeological sites and architectural resources, in order to provide guidance in rating these locations for subsequent development.

Phase IA tasks consisted of preliminary background research, a geomorphological and archaeological reconnaissance and an architectural review. This study was conducted in accordance with the standards and guidelines of the Pennsylvania Historical and Museum Commission/Bureau for Historic Preservation (PHMC/BHP 1991) (State Historic Preservation Office, SHPO.

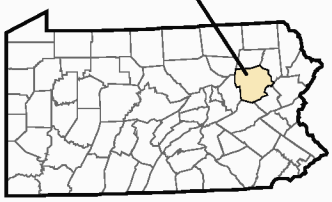
Area of Potential Effect

The Area of Potential Effect (APE) for GAI's Phase IA archaeological reconnaissance is defined as the footprints of the West Alternative and Southeast Alternative, totaling approximately 761 acres. For architectural resources, the APE consists of the 761-acre project footprint plus the surrounding viewshed. The viewshed is variable in size due to differences in topography, but extends at least 1,000 feet beyond the project footprint.



REFERENCES:
USGS 7.5 MINUTE QUADRANGLE
BERWICK AND SYBERTSVILLE.

PROJECT LOCATION



LEGEND

- UNSURVEYED PROJECT AREAS
- PHASE IA PROJECT AREA
- QUADRANGLE BOUNDARY

ALL BOUNDARIES APPROXIMATE

0 1,500 3,000 6,000 Feet

FIGURE 1
PROJECT LOCATION

gai consultants

UNISTAR NUCLEAR
DEVELOPMENT, LLC.

DRAWN BY: AML DATE: 7/25/2007
CHECKED: APPROVED:

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Background Research

GAI conducted preliminary background research including a review of Pennsylvania Archaeological Site Survey (PASS) files, historic structure files, and National Register available through the PHMC/BHP's on-line Cultural Resources Geographic Information Services (CRGIS). Data was collected on previously recorded archaeological sites and historic/architectural resources located within the two proposed project alternatives (West Alternative and Southeast Alternative) and in the immediate project vicinity [approximately 1.6 kilometer (1-mile) radius]. GAI also examined reports on cultural resource studies of the project vicinity provided by UniStar. The purpose of this task was to 1) identify previously recorded cultural resources in the vicinity of the study area and 2) assess the project area's potential for unrecorded cultural resources.

Background research identified a total of 24 archaeological sites and 4 architectural resources within the project vicinity (Figure 2). The majority of the archaeological sites occur on floodplains east and west of the North Branch Susquehanna River. The following section summarizes the results of background research for the West Alternative (resources west of the river) and the Southeast Alternative (resources east of the river).

This Phase IA background research represents a preliminary review of previously recorded cultural resources. Additional work for a selected facility location would include a review of PASS forms, Historic Resource Survey Forms, and National Register forms at the PHMC/BHP in Harrisburg as well as an examination of historic maps of the project vicinity.

West Alternative: Background Research Results

Previously Identified Cultural Resources

Background research identified no previously recorded cultural resources within the footprint of the 408-acre West Alternative. However, 13 archaeological sites (12 prehistoric and 1 prehistoric/historic) and 2 architectural resources have been mapped in the project vicinity, west of the Susquehanna River (see Figure 2).

All 13 archaeological sites are open air habitations located on the floodplain or low terraces adjacent to the North Branch Susquehanna River (see Figure 2, Table 1). Ten of the sites are clustered along the riverbank between the existing SSES intake structure and Gould Island, 2.1 kilometers (1.3 miles) to the north. They are predominantly multicomponent sites ranging in age from the Early Archaic to Late Woodland periods; one site also contains an historic component (see Table 1). Late Archaic (n=8), unspecified Archaic (n=8), Transitional (n=6), and Late Woodland (n=5) components are most common. Of these 13 sites, four are NRHP-listed or eligible, two have been recommended as NRHP-eligible by the SHPO, two are recommended as not eligible and five have insufficient data to make a recommendation.

The two architectural resources recorded in the vicinity of the West Alternative consist of the North Branch Pennsylvania Canal (141673) and a bridge (135820) (see Figure 2, Table 2). The North Branch Canal, located on the floodplain/low terrace of the Susquehanna River, parallels the river and extends further north and south of the current project area. Built between 1828 and 1831, this canal is represented by the remains of the canal prism, towpath, locks and associated features. A Historic Resource Survey Form prepared for a section of the canal and canal locks between Beach Haven and Berwick recommended that this resource is eligible to the NRHP.

The recorded bridge (135820) is situated along North Market Street, 91 meters (300 feet) north of the West Alternative. This stone structure was built in 1937 and is recommended Not Eligible to the NRHP.

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Table 1. West Alternative: Previously Recorded Archaeological Sites in Project Vicinity

Site Number	Name	Landform	Site Type	Age	Within APE?	Recommended NRHP Status
36LU0015	--	Floodplain	Prehistoric Open Habitation	A, LA, LW	No	Listed or Eligible
36LU0016	--	Floodplain	Prehistoric Open Habitation	A, LA, EW, MW, LW	No	Listed or Eligible
36LU0017	--	Floodplain	Prehistoric Open Habitation	LA, A, Tr, LW	No	Insufficient Data
36LU0048	SES-16	Floodplain	Prehistoric Open Habitation	Unknown Prehist	No	Insufficient Data
36LU0049	SES-8	Floodplain	Prehistoric Open Habitation	A, LA, Tr, W, EW, LW	No	Listed or Eligible
36LU0050	SES-10	Floodplain	Prehistoric Open Habitation	A, LA	No	Not Eligible
36LU0051	SES-11	Floodplain	Prehistoric Open Habitation	W, LW	No	Listed or Eligible
36LU0052	SES-14	Floodplain	Prehistoric Open Habitation, Historic	A, LA, Tr, EW, Historic	No	Insufficient Data
36LU0056	--	Floodplain	Prehistoric	Unknown Prehist	No	Insufficient Data
36LU0105	Ruben	Floodplain/ Island	Prehistoric Open Habitation	A, Tr, W, EW, MW, LW	No	Insufficient Data
36LU0183	Baluski	Terrace	Prehistoric Open Habitation	A, EA	No	Not Eligible
36LU0191	--	Terrace	Prehistoric Open Habitation	LA, Tr	No	Rec. Eligible by SHPO
36LU0270	Beach Haven I	Terrace	Prehistoric Open Site	MA, LA, Tr	No	Rec. Eligible by SHPO

A=Archaic; EA=Early Archaic; MA=Middle Archaic; LA=Late Archaic; W=Woodland; EW=Early Woodland; MW=Middle Woodland; LW=Late Woodland; Tr=Transitional

Table 2. West Alternative: Previously Recorded Architectural Resources in Project Vicinity

Resource Number	Name	Resource Type	Date	Township	Within APE?	Recommended NRHP Status
135820	SR 7228 Bridge	Bridge	1937	Salem	No	Not Eligible
141673	North Branch Canal; Wyoming Canal Co.; Pennsylvania Canal Co.	Canal and Locks	1828, 1831	Salem	No	Eligible

Prior Cultural Resources Investigations

A review of CRGIS data indicates that five prior cultural resource investigations have been conducted within the vicinity of the West Alternative, west of the river. Phase I and II investigations of proposed Salem Township sewage facilities in Berwick and Beach Haven was performed by Pan Cultural Associates, Inc., in 2005 (Reinbold 2005). This survey recorded the remains of a portion of the North Branch Canal, identified one prehistoric site (36LU270) and tested previously recorded Site 36LU191. All resources are located on low terraces along the North Branch Susquehanna River.

A Phase I survey of three lots on a terrace east of Beach Haven was conducted by Richard Grubb & Associates in 1994. This study identified one small, undated, prehistoric site (site number not available) and recommended additional Phase II investigations of the locality.

Eight prehistoric sites were identified within the project vicinity by a Phase I survey of the SSES floodplain conducted by Commonwealth Associates Inc. in 1980 (Schuldenrein 1981; Hays et al. 1981). This project area is located immediately east of the existing SSES facility. The eight identified sites are all located adjacent to the riverbank and include 36LU15, 36LU16, 36LU17, 36LU48, 36LU49, 36LlU50, 36LU51, and 36LU52. These sites range in age from Late Archaic through Late Woodland and Historic. This study indicated that floodplain/low terrace settings along the river have a high potential for both near-surface and deeply buried prehistoric archaeological sites.

In 1995, AAR performed a Phase I survey of the Baluski Fill Area located on the riverbank near Gould Island north of the current project area (Bohlin 1995). This study identified one prehistoric site, 36LU183.

A Phase I survey of the Williams-Transcontinental Gas Pipeline Corporation Leidy to Long Island Expansion was conducted by BHE Environmental Inc., in 2005. This investigation studied two proposed loops, one of which (the Berwick Loop) is located in an upland setting north of the present study area. Twenty-three cultural resources were identified within the Berwick Loop, including 18 stone wall remnants, two wells, a schoolhouse foundation, a cement wall foundation and a bridge. Three of these resources (the schoolhouse foundation and the two wells) were recommended as potentially eligible to the NRHP.

Southeast Alternative: Background Research Results

Previously Identified Cultural Resources

Phase IA background research indicated that 11 archaeological sites (nine prehistoric and two prehistoric/historic) and two architectural resources have been previously recorded in the vicinity of the Southeast Alternative (see Figure 2). The two architectural resources (Old River Church and a bridge) are both located within the boundary of the proposed Southeast Alternative. The eleven archaeological sites are all located in proximity to this parcel. (Note also that one of these sites lies within the possible intake structure locality on the east bank of the river.) A summary of these resources is presented in Tables 3 and 4.

The 11 archaeological sites in the project vicinity are all situated in floodplain or low terrace settings along the east bank of the North Branch Susquehanna River (see Figure 2). Nine of these sites are recorded as prehistoric open habitations. The site type for one (36LU43/Knouse Site) is identified as specialized prehistoric/historic/contact and one type is prehistoric/historic. The majority of sites are multicomponent, with prehistoric components dating from the Early Archaic through Late Woodland and Contact period. Unspecified Archaic (n=8), Late Woodland (n=6), unspecified Woodland (n=5), and Early Woodland (n=5) components are most common at these sites.

Of special interest is the Knouse Site (36LU43), located on the floodplain approximately 304 meters (1000 feet) west of the Southeast Alternative (see Figure 2). Excavations of this Late Woodland/Historic/Contact period site in 1978 yielded 21 Native American burials and 14 features as well as associated artifacts including lithics, ceramics, bone, glass seed beads, and metal (McIntyre 1979).

The CRGIS database indicates that all 11 sites have yielded insufficient data to make recommendations as to their NRHP eligibility.

Table 3. Southeast Alternative: Previously Recorded Archaeological Sites in Project Vicinity

Site Number	Name	Landform	Site Type	Age	Within APE?	Recommended NRHP Status
36LU0018	Yorkoski	Floodplain	Prehistoric Open Habitation	A	No	Insufficient Data
36LU0019	Stone Crusher	Floodplain	Prehistoric Open Habitation	A, EA, LA, Tr, W, EW, LW	No	Insufficient Data
36LU0020	--	Floodplain	Prehistoric Open Habitation	A, Tr	No	Insufficient Data
36LU0021	S. Wapwallopen	Floodplain	Prehistoric and Historic	A, W, EW, MW, LW, Hist	No	Insufficient Data
36LU0022	--	Floodplain	Prehistoric Open Habitation	A, MA, LA, W, EW, LW	No	Insufficient Data
36LU0023	Smith	Floodplain	Prehistoric Open Habitation	A	No*	Insufficient Data
36LU0024	Kibler	Floodplain	Prehistoric Open Habitation	Unknown Prehistoric	No	Insufficient Data

Site Number	Name	Landform	Site Type	Age	Within APE?	Recommended NRHP Status
36LU0025	Heller	Terrace	Prehistoric Open Habitation	A	No	Insufficient Data
36LU0043	Knouse (Wapwallopen)	Floodplain	Prehistoric Specialized (burials), Historic	LW, Historic, Contact	No	Insufficient Data
36LU0090	Sapphire	Floodplain	Prehistoric Open Habitation	LA, Tr, W, EW, MW, LW	No	Insufficient Data
36LU0188	Barn Field (B1)	Terrace	Prehistoric Open Habitation	A, EA, MA, LA, Tr, W, EW, LW	No	Insufficient Data

A=Archaic; EA=Early Archaic; MA=Middle Archaic; LA=Late Archaic; W=Woodland; EW=Early Woodland; MW=Middle Woodland; LW=Late Woodland; Tr=Transitional

* 36LU23 located within possible east bank intake structure locality

As noted above, the two previously recorded architectural resources in the project vicinity east of the river are both located within the footprint of the Southeast Alternative (see Figure 2). These resources consist of the Union Reformed & Lutheran Church (known as the Old River Church) and a bridge (135679) (see Table 4). The Old River Church, built in 1833, lies in the northwest corner of the Southeast Alternative, along Rt. 239. It consists of a frame structure and associated cemetery. Its NRHP status is undetermined. The bridge (135679) is located in the northwest corner of the Southeast Alternative and carries Rt. 239 over Little Wapwallopen Creek. This structure was built in 1940 and is recommended Not Eligible to the NRHP.

Table 4. Southeast Alternative: Previously Recorded Architectural Resources in Project Vicinity

Resource Number	Name	Resource Type	Date	Township	Within APE?	Recommended NRHP Status
135679	SR 239 Bridge	Bridge	1940	Conyngham	Yes	Not Eligible
086527	Union Reformed & Lutheran Church (Old River Church)	Church	1833	Conyngham	Yes	Undetermined

Prior Cultural Resource Investigations

A review of the CRGIS database indicates that a series of cultural resource investigations have been undertaken by BHE Environmental, Inc., in association with the Williams Gas Pipeline-Transco corridor, located north of the current project area. Phase I survey of the corridor identified two prehistoric sites, 36LU90 and 36LU105. Subsequent Phase II and III studies were conducted of these sites between 1985 and 1988.

In 1978, salvage excavations of Site 36LU43 (the Knouse Site) were conducted in advance of Pennsylvania Power and Light's proposed development of a parcel on the east side of the Susquehanna River floodplain (McIntyre 1979). As noted above, this site is located on the floodplain directly west of the Southeast Alternative and yielded burials, features and associated artifacts.

Phase IA Field Methods

GAI conducted Phase IA field investigations of the project area, consisting of a geomorphological and archaeological reconnaissance and an architectural review, on June 18-20, 2007.

Geomorphological and Archaeological Reconnaissance

GAI's in-house professional soil scientist and the project's archaeological field director performed a reconnaissance of the West and Southeast Alternatives in order to characterize the potential of each of

the two project areas to contain unrecorded cultural resources. Specific goals of the geomorphological and archaeological reconnaissance were to:

- Evaluate surface disturbances and landform age;
- Assess the potential for buried archaeological sites; and
- Refine preliminary estimates of archaeological sensitivity derived from background research.

During the *Geomorphological Reconnaissance*, GAI's soil scientist performed a walk-over of the project area to identify the extent of surface disturbances. In conjunction with the geomorphological assessment, GAI's project archaeologist conducted an *Archaeological Reconnaissance* to ground-truth preliminary assessments of archaeological potential based on background research.

This field reconnaissance also included a cursory inspection of possible proposed intake structure locations on the east and west banks of the Susquehanna River and of the Northwest Alternative and the Northeast Alternative, already excluded from consideration by the client.

Based on the results of the field reconnaissance, GAI characterized the project APE in terms of its archaeological potential: high to moderate potential, low potential, and disturbed/no potential. Relatively undisturbed, level to gently sloping uplands settings as well as floodplains and low terraces along the Susquehanna River and Little Wapwallopen Creek were determined to have high to moderate archaeological potential. Steep slopes (slopes in excess of 15 percent), poorly drained/wetland areas, and highly eroded fields were considered to have low archaeological potential. Areas disturbed by grading, landfill and recent construction activities were determined to have no archaeological potential. Figure 3 depicts archaeological potential within the West and Southeast Alternatives and in potential cooling water facility locations along the river.

Architectural Review

In order to conduct a preliminary assessment of the potential of the West Alternative and Southeast Alternative to contain historic/architectural resources GAI compiled digital photographs of standing structures located within and in the immediate vicinity (view shed) of these parcels. These photographs were subsequently reviewed by GAI's Senior Architectural Historian in order to identify structures that are over 50 years of age and provide a preliminary assessment of their eligibility to the NRHP. Figure 3 depicts the locations of these architectural resources.

In accordance with the scope of work for this Phase IA investigation, no Pennsylvania Historic Resource Survey (PHRS) forms were completed for these structures

Phase IA Field Results: West Alternative

The West Alternative (Alternative #1) is an approximately 408-acre parcel situated in an upland setting west and southwest of the existing SSES facility. It is bounded by Beach Grove Road to the north, North Market Street to the west and Confers Lane to the east. Walker Run and an unnamed tributary of the North Branch Susquehanna River extend into the western edge of the APE; a wetland is mapped between these two streams. Land use within the APE includes woodlands, agricultural fields and orchards. A power line row-of-way extends through the northeast portion of the APE. The northeast corner is covered by a large landfill associated with the existing power plant. Elevations range from 201 meters (660 feet) along the streams in the southwest portion of the parcel to 244 meters (800 feet) on a series of upland knobs in its northern half.

Geomorphological reconnaissance indicated that nearly all of the West Alternative consists of high Pleistocene terraces and isolated knobs (terrace straths). The parcel has been cultivated and fields along its southern edge are highly eroded, with B horizon exposed on the surface. Wetlands, mapped on the U.S.G.S. topographic quadrangle and identified in the field by wetland vegetation, were observed in the southwestern portion of this alternative. It is possible that this area may have a perched water table due to the existence of fragipan subsoils. Due to its upland setting, soils within the West Alternative are expected to be shallow in nature. This area has no potential for deep soils.

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Based on information provided by UniStar during Phase IA fieldwork, the West Alternative has been subdivided into Alternative #1A (Southwest 1 Unit), Alternative #1B (West 1 Unit) and Alternative #1C (West 2 Units). Alternative #1A is an approximately 153 acre parcel comprising the southern portion of the West Alternative, in the southwest corner of the PPL land. Alternative #1B, an approximately 255 acre parcel, encompasses the northern portion of the West Alternative. The former Kisner Farmstead (see Figure 3) marks the approximate boundary between the Alternatives #1A and #1B. Alternative #1C represents the entire 408-acre West Alternative (Alternatives #1A and #1B combined).

The following sections present the results of archaeological reconnaissance by subsections: Alternative #1A, Alternative #1B and Alternative #1C.

Alternative #1A—Archaeological Potential

Based on the results of Phase IA archaeological reconnaissance, the approximately153-acre Alternative #1A (southern portion of the West Alternative) includes 86.5 acres of high to moderate archaeological potential and 67.1 acres of low archaeological potential (see Figure 3). This alternative contains no significant areas of disturbance/no archaeological potential.

Areas of high to moderate archaeological potential within Alternative #1A consist of relatively level woodland uplands as well as relatively level agricultural fields both in uplands along the streams (Photograph 3). These areas are concentrated in the eastern portion of this alternative.

Photograph 3. Overview of Alternative #1A, Showing High—Moderate Potential in the Wooded Uplands and Agricultural Fields, Facing North.

Wetlands identified in the western portion of this alternative and along its northern border have a low archaeological potential (see Photograph 4).

Photograph 4. Overview of Alternative #1A, Showing Low Potential in a Wetland Setting, Facing Southwest.

Archaeological reconnaissance identified one possible unrecorded historic archaeological sites within the Alternative #1A—the Sink House Site. The Sink House Site is represented by a fieldstone wall observed along Confers Lane in the eastern portion of this section, in a locality described as the location of the former Sink residence (see Photograph 5). This stone wall may represent the remains of a foundation or a field wall.

Photograph 5. Overview of Alternative #1A, Showing Stone Wall Associated with the Sink House Site, Facing North.

Another possible archaeological resource, the Shortz House Site is located immediately east of the APE along Confers Lane. This possible site represents the location of the former Shortz House, identified by PPL (see Figure 3). No surface remains were observed in this locality during field reconnaissance.

Due to the project area's upland setting, it is expected that archaeological resources will be near-surface in nature. No deeply buried archaeological sites are expected in this area.

Alternative #1B—Archaeological Potential

GAI's Phase IA reconnaissance indicates that the approximately 255-acre Alternative #1B (the northern portion of the West Alternative) encompasses 138.2 acres of high to moderate archaeological potential, 55.0 acres of low archaeological potential and 61.5 acres of disturbance/no archaeological potential (Figure 3). Areas of high to moderate archaeological potential in this section include woodlands and apple orchards situated on uplands south of Beach Grove Road (see Photograph 6) as well as agricultural fields associated with the former Kisner farmstead in its south central portion.

Photograph 6. Overview of Alternative #1B, Showing High—Moderate Potential in Upland Agricultural Fields, Facing South.

Steep side slopes within Alternative #1B have low archaeological potential. Wetlands identified in fields and woodlands along the southern edge of this section also have a low potential for archaeological sites.

The northeast corner of this section, adjacent to Confers Lane and the existing SSES facility, has been extensively disturbed by grading and landfill activities and is considered to have no archaeological potential (see Photograph 7).

Photograph 7. Overview of Alternative #1B, Showing Low Potential on Steep Slopes (Background) and High-Moderate Potential in Agricultural Fields (Foreground), Facing North.

Based on Phase IA archaeological reconnaissance and information provided by PPL regarding former structures, two possible unrecorded historic archaeological resources—the Kisner Farmstead and the Johnson/Folk Barn—occur within Alternative #1B. The former Kisner Farmstead, located east of North Market Street, consists of piles of rubble and gravel; no foundations were identified. Photographs of the former farmstead, provided by PPL, indicate that this complex included a dwelling and associated agricultural outbuildings (see Photograph 8).

Photograph 8. Overview of Kisner (Alternative #1B) Prior to Demolition, Facing East.

The former Johnson/Folk Barn, situated at the northern edge of Alternative 1B along Beach Grove Road, is represented by an earthen ramp. No structural remains were observed on the ground surface in this locality.

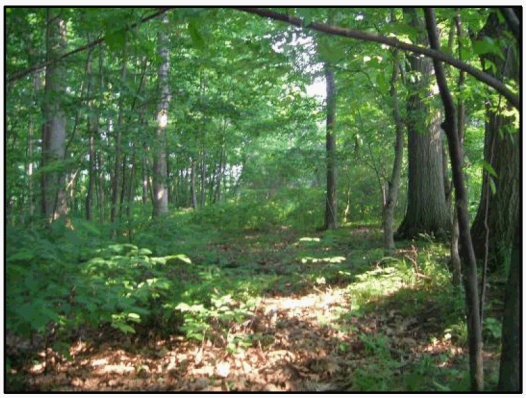
Due to the project area's upland setting, it is expected that archaeological resources will be near-surface in nature. No deeply buried archaeological sites are expected in this locality.

Alternative #1C—Archaeological Potential

Alternative #1C represents the entire 408-acre West Alternative (Alternatives #1A and #1B combined). Based on the results of Phase IA reconnaissance, Alternative #1C consists of 225 acres of high to moderate archaeological potential, 122 acres of low archaeological potential and 61 acres of disturbance/no potential. In addition, this alternative includes three possible unrecorded archaeological resources (the Kisner Farmstead, the Johnson/Folk Barn, and the Sink House) all representing the location of former structures. (These possible archaeological resources are described above for Alternatives #1A and #1B.)

Intake Structure -- West Alternative

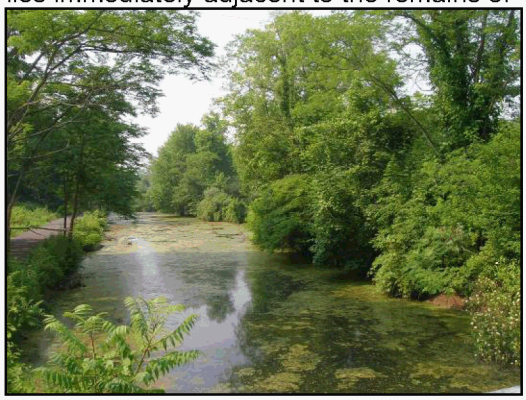
Although it is located outside the APE for the current Phase IA study, at the request of UniStar GAI conducted a brief field view of the proposed intake structure location for the West Alternative. Based on preliminary information provided by UniStar, this structure would be situated on the west bank floodplain/low terrace of the Susquehanna River either north or south of the existing SSES intake structure (see Photograph 9).



Photograph 9. Overview of Possible Intake Structure Location, West Bank of the Susquehanna River, Facing North.

The potential location for cooling water facilities consists of relatively level woodlands and agricultural fields with a high to moderate potential for both near-surface archaeological sites and for deeply buried archaeological sites. As noted in the previous background research section, 13 previously recorded archaeological sites are located on the west bank floodplain in the project vicinity.

In addition, the potential location for cooling water facilities lies immediately adjacent to the remains of the previously recorded North Branch Pennsylvania Canal (141763). Portions of this resource or associated features may exist within this area (Photograph 10). The Norfolk Southern/Pennsylvania Railroad is located 183 meters (600 feet) to the west of the this location and it is possible that archaeological remains associated with this resource may also occur within the parcel.



Photograph 10. Overview of the North Branch Pennsylvania Canal, Facing South.

Phase IA Field Results: Southeast Alternative

Archaeological Potential

The Southeast Alternative consists of a 352-acre parcel located in a predominantly upland setting east of the Susquehanna River. Route 239 forms its western boundary and Little Wapwallopen Creek, which flows westward to empty into the Susquehanna River, lies just to its north. The northwest corner of this parcel extends to the creek itself. Land use within the Southeast Alternative includes woodlands, agricultural fields, and utility developments. An existing PP&L substation is located on an upland bench in the southwest portion of the parcel; an access road leads from Route 239 to the substation (Photograph 11). One electric utility right-of-way bisects its western half and a second right-of-way cuts through its eastern and northern portions. The Old River Church, a recorded architectural resource, is located along Route 239. Elevations within the Southeast Alternative range from 152 meters (500 feet) along Little Wapwallopen Creek to 305 meters (1000 feet) on the upland side slope in its southeast corner.

Photograph 11. Overview of the Existing Substation (Disturbed/No Potential), Facing South.

Phase IA geomorphological reconnaissance confirmed that the Southeast Alternative encompasses an upland setting characterized by steep side slopes, benches and high terraces. Soils on upland benches and slopes are likely to be shallow. In the northwest corner of this alternative the low terrace adjacent to Little Wapwallopen Creek may have deep soils with a potential for deeply buried archaeological deposits. Disturbances in the APE include construction of the substation and installation of the associated power lines as well as limited logging.

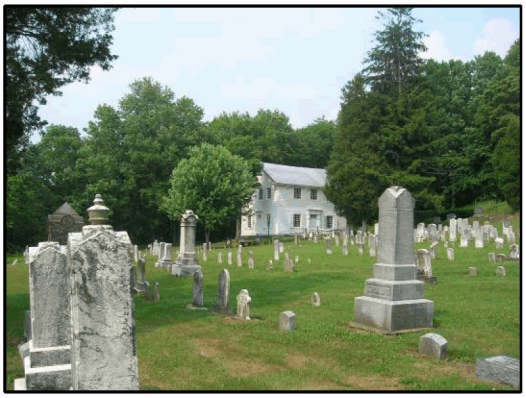
Based on the results of GAI's Phase IA reconnaissance the Southeast Alternative consists of 102 acres of high to moderate archaeological, 246 acres of low potential, and 5.0 acres of disturbance/no potential. Woodlands and agricultural fields on upland benches, located primarily in the west central portion of the APE, have a high to moderate potential for near surface archaeological sites (see Figure 3 and Photograph 12). The low terrace along Little Wapwallopen Creek in the northwest corner of the parcel has a high to moderate potential for both near-surface and deeply buried archaeological sites.

Photograph 12. Overview of the Southeast Alternative, Showing High—Moderate Potential in a Wooded Upland Setting, Facing South.

Steep side slopes (in excess of 15 percent slope) found throughout the southeast half of the parcel and along its northern and western edges have a low archaeological potential (see Figure 3).

The area of the existing substation has been heavily disturbed by construction activities and is considered to have no archaeological potential (see Figure 3 and Photograph 11).

The previously recorded Old River Church and Cemetery (086527), noted above, is located within the APE of the Southeast Alternative (Photograph 13). Although archaeological reconnaissance did not identify surface evidence of foundations or cultural features in this locality, it is possible that archaeological remains associated with this architectural resource may also be present.



Photograph 13. Overview of the Old River Church and Cemetery, Facing Southeast.

Other Cultural Resource

Also identified during the course of the architectural review of the project viewshed, GAI identified one potential traditional cultural property, Council Cup (see Photograph 14). Council Cup represents a Native American meeting place and overlook. It is situated on a knoll approximately 610 meters (2000 feet) south of the footprint of the Southeast Alternative. With an elevation of 1200 feet, this locality is one of the highest points in the area and commands an extensive view of the surrounding river valley and ridges. A placard describing the site is currently located on the top of the knoll. Based on information provided by PPL, a foundation observed on the knoll represents the remains of a structure (possible picnic pavilion) built in the 1930s and demolished in the 1960s.

Photograph 14. Overview from Council Cup, Facing North.

Intake Structure – Southeast Alternative

GAI performed a brief field view of the potential location of cooling water intake and discharge structures and associated piping on the east bank floodplain/low terrace of the Susquehanna River, directly west of the Southeast Alternative APE (see Figure 3 and Photograph 15).

The proposed location encompasses level agricultural fields and woodlands between the riverbank and the Canadian Pacific Railway (former Delaware and Hudson Railway). This location has a high to moderate potential for both near-surface and deeply buried archaeological sites (see Figure 3).

Photograph 15. Overview of Possible Intake Structure Location, East Bank of the Susquehanna River, Facing North.

As documented by background research, 11 previously recorded archaeological sites have been recorded on the east bank floodplain in the project vicinity, between Wapwallopen Creek and Gould Island. One of these sites, 36LU23—an Archaic period prehistoric site, lies within the proposed intake structure locality. This previously recorded site may be impacted by construction of the cooling water facilities in this area. In addition, the Canadian and

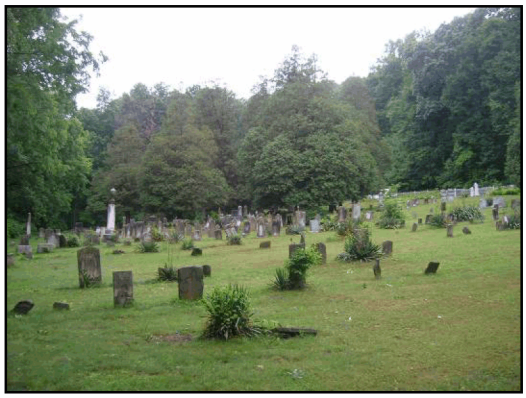
Pacific Railway located 152 meters (500 feet) to the east and it is possible that unrecorded archaeological remains associated with this railroad may occur in this location.

Results of Architectural Review

West Alternative

Based on the results of GAI's architectural review, six potentially significant architectural resources are situated within the viewshed of the West Alternative. These include the "Beach Grove" cemetery, an unnamed residence, an unnamed farmstead, the Valley Pike, Norfolk Southern/Pennsylvania Railroad Sunbury Division, and the North Branch Canal (see Figure 2). All of these resources are located outside the footprint of the West Alternative. The view shed of each of these resources would potentially be affected by the development of the West Alternative.

The Beach Grove cemetery, located along Beach Grove Road northeast of the West Alternative, consists of internments, some of which date from the nineteenth century (Photograph 16).



Photograph 16. Overview of the "Beach Grove" Cemetery, Facing West.

The unnamed residence is located at the intersection of North Market and Beach Grove Road. It is framed and weatherboarded. It stands two stories high with the eave wall fronting the roadway (Photograph 17).

The unnamed farmstead, situated along North Market Street, consists of a front-gable, two-story, framed and weatherboarded dwelling, along with ancillary agricultural outbuildings, some of which date from the 1980s (Photograph 18).

Photograph 17. Overview of the Unnamed Residence at the Intersection of North Market St. and Beach Grove Rd., Facing North.

The North Branch Canal is located on the floodplain/low terrace of the Susquehanna River east of the existing SSES facility. Built in 1828, this resource consists of the canal prism and towpath (see Photograph 10).

The Valley Pike (U.S. Route 11), also located on the floodplain/low terrace of the Susquehanna River, is a contemporary roadway built above the alignment of the Susquehanna and Tioga Turnpike, a historic Pennsylvania turnpike dating from circa 1810.

Photograph 18. Overview of the Unnamed Farmstead Along North Market St., Facing South.

The Norfolk Southern/Pennsylvania Railroad Sunbury Division is a railway dating from the 1870s. It was built to haul coal from the anthracite fields of the Wyoming Valley.

GAI's architectural review indicates that six potentially significant architectural resources over 50 years of age occur within the viewshed of the West Alternative. If no formal Determination of Eligibility exists for the resources, or if Pennsylvania Historic Resource (PHRS) forms have not been completed, these forms would need to be prepared as part of future cultural resource work. GAI recommends a reconnaissance-level field evaluation of the resources to determine their eligibility for listing in the NRHP and to prepare a PHRS Form for each resource

Southeast Alternative

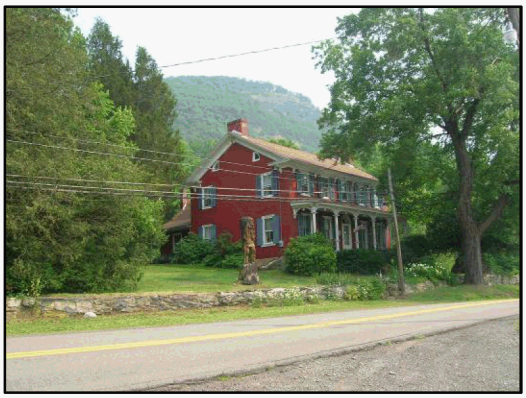
GAI's architectural review indicates that the viewshed of the Southeast Alternative includes four potentially significant architectural resources. The architectural resources include the Old River Church and Cemetery (Union Reformed and Lutheran Church at Wapwallopen), the Hess Farmstead, an unnamed farmstead and the Canadian Pacific/Delaware & Hudson Railway. The view shed of these resources would potentially be affected by the development of the Southeast Alternative.

The Old River Church and Cemetery (Union Reformed and Lutheran Church at Wapwallopen), located within the footprint of the Southeast Alternative, is a house of worship dating from 1833 (see Photographs 13 and 19). This frame building features the workmanship of skilled master carpenters.

Photograph 19. Overview of the Old River Church, Facing Southeast.

The Hess Farmstead, which was not photographed, is a potentially significant architectural resource with agricultural associations. This farmstead is located within the footprint of the Southeast Alternative.

The unnamed farmstead is situated east of Route 239 south of the Southeast Alternative (Photographs 20-23). It consists of two primary residences and ancillary agricultural outbuildings (a barn, a garage, and a shed).



Photograph 20. Overview of Unnamed Farmstead on Rt. 239, Residence, Facing Northeast.

The Canadian Pacific/Delaware & Hudson Railway was built to haul coal from the anthracite fields of the Wyoming Valley. This railway dates from the 1870s. It is located along the east bank of the Susquehanna, west of this alternative.

Photograph 21. Overview of Unnamed Farmstead on Rt. 239, Tenant House, Facing Northeast.

GAI's architectural review indicates that four potentially significant architectural resources over 50 years of age occur within the viewshed of the Southeast Alternative. If no formal Determination of Eligibility exists for the resources, or if Pennsylvania Historic Resource (PHRS) forms have not been completed, these forms would need to be prepared as part of future cultural resource work. GAI recommends a reconnaissance-level field evaluation of the resources to determine their eligibility for listing in the NRHP and to prepare a PHRS Form for each resource.

Photograph 22. Overview of Unnamed Farmstead on Rt. 239, Barn, Facing Northeast.

Photograph 23. Overview of Unnamed Farmstead on Rt. 239, Garage, Facing Northeast.

Northwest Alternative -- Excluded

The proposed Northwest Alternative, currently excluded from development consideration by UniStar, is situated north of the West Alternative and the existing SSES facility. GAI's brief field view of this alternative indicates that it occupies an upland setting north of Beach Grove Road. It consists largely of steep wooded side slopes as well as relatively level to gently sloping knoll tops and benches (Photograph 24).

Photograph 24. Overview of Northwest Alternative, Facing West.

Northeast Alternative -- Excluded

The proposed Northeast Alternative, also currently excluded from development consideration by UniStar, lies immediately north of the Southeast Alternative and Little Wapwallopen Creek. Based on GAI's brief field view, this alternative lies in an upland setting consisting almost entirely of steep side slopes (Photograph 25). Relatively level to gently sloping knoll tops occur in the northeast portion of this alternative.

Photograph 25. Overview of Northeast Alternative, Facing North.

Summary and Conclusions

West Alternative

Phase IA background research documented no previously recorded archaeological sites or architectural resources within the footprint of the West Alternative. GAI's architectural review of the West Alternative identified six potentially significant architectural resources over 50 years of age within the project viewshed, five of which have not been previously documented. These resources ("Beach Grove" Cemetery, an unnamed residence, an unnamed farmstead, Valley Pike, Norfolk Southern/Pennsylvania Railroad, and the North Branch Canal) would require National Register evaluation and documentation during a subsequent architectural survey.

The possible location of cooling water facilities on the west bank floodplain/low terrace of the Susquehanna River has a high to moderate potential for both near-surface and deeply-buried archaeological sites. Thirteen previously-recorded archaeological sites have been identified on this landform in the project vicinity, nine of which are clustered between the existing SSES facility and Gould Island.

Alternative #1A

GAI's Phase IA study indicates that the 153-acre Alternative #1A includes 86 acres of moderate to high archaeological potential that would require subsequent subsurface archaeological investigations to identify cultural resources (Table 5). The remaining 67 acres of this alternative consist of settings with slopes in excess of 15 percent or wetlands, considered to have a low archaeological potential. These low potential settings would not require systematic subsurface testing during subsequent investigations. GAI's geomorphological reconnaissance indicates that due to its upland setting, sites within this parcel are likely to be near-surface in nature.

Phase IA archaeological reconnaissance identified one possible unrecorded historic archaeological resource (the Sink House Site) in the project APE that may require further investigation.

Table 5. Phase IA Summary of West and Southeast Alternatives[a]

Alternative	Total Acres	High-Moderate Potential (acres)	Low Potential (acres)	Disturbed/ No Potential (acres)	Previously Recorded Cultural Resources in APE	Possible Unrecorded Sites in APE	Potentially NRHP eligible Structures in Viewshed	Other Unrecorded Cultural Resources in Viewshed
Southeast	353	102	246	5	2	1	4	1
West								
#1A	153	86	67	0	0	1	NA	--
#1B	255	138	55	61.5	0	2	NA	--
#1C	408	224	122	61.5	0	3	6	0

[a] All acreages are approximations to facilitate discussion and comparison of alternatives.

Alternative #1B

Based on the results of GAI's Phase IA investigation Alternative #1B is a 255-acre parcel containing 138 acres of moderate to high archaeological potential that would require subsequent subsurface archaeological investigations to identify cultural resources (see Table 5). Of the single alternatives examined (exclusive of the combined Alternative #1C), Alternative #1B has the greatest acreage of high to moderate archaeological potential. Fifty-five acres of this alternative are considered low potential due to the presence of wetlands or slopes in excess of 15 percent. Settings of low archaeological potential would not require systematic subsurface testing during subsequent investigations. A 61-acre portion in the parcel's northeast corner has been heavily disturbed by a

landfill and has no archaeological potential. Geomorphological reconnaissance indicates that due to its upland setting, sites within this parcel are most likely to be near-surface in nature.

Phase IA archaeological reconnaissance identified two possible unrecorded historic archaeological resources (the Kisner Farmstead Site and the Johnston/Folk Barn Site) in the project APE that may require further investigation.

Alternative #1C

GAI's Phase IA study indicates that the 408-acre Alternative #1C (combined Alternatives #1A and #1B) consists of 225 acres of moderate to high archaeological potential that would require subsequent subsurface archaeological investigations to identify cultural resources. A total of 122 acres of wetlands or slopes in excess of 15 percent in this alternative have low archaeological potential and would not require systematic subsurface testing during subsequent investigations. As noted for Alternative #1B, a 61-acre portion in the parcel's northeast corner has been heavily disturbed by a landfill and has no archaeological potential. Geomorphological reconnaissance indicates that due to its upland setting, sites within this parcel would be near-surface in nature.

Alternative #1C contains three possible unrecorded historic archaeological resources (the Kisner Farmstead Site, the Johnston/Folk Barn Site and the Sink House Site) in the project APE that may require further investigation.

Southeast Alternative

Based on the results of GAI's Phase IA study, the 353-acre Southeast Alternative contains 102 acres of moderate to high archaeological potential that would require subsequent subsurface archaeological investigations to identify unrecorded cultural resources (see Table 5). The remainder of this alternative consists predominantly of settings with slopes in excess of 15 percent (246 acres) which would not require systematic subsurface testing. The parcel also includes five acres of disturbance; in accordance with state guidelines, these portions of the project area would be excluded from subsequent archaeological investigations. GAI's geomorphological reconnaissance indicates that sites within the majority of this alternative will be near-surface in nature. The northwestern portion of this parcel, on the low terrace adjacent to Little Wapwallopen Creek has a potential for both near-surface and deeply buried archaeological sites.

Background research documented two previously recorded architectural resources within this alternative (Old River Church and a bridge). The Phase IA archaeological reconnaissance identified one possible historic archaeological resource (associated with the Old River Church) in the project APE that may require further investigation.

Phase IA investigations also identified four potentially significant architectural resources over 50 years of age within the project viewshed, three of which have not been previously documented. These resources (Old River Church and Cemetery, Hess Farmstead, unnamed farmstead, and the Canadian Pacific/Delaware and Hudson Railway) would require National Register evaluation and documentation during the subsequent architectural survey.

In addition to the architectural resources, GAI identified one potential cultural property (Council Cup) within the viewshed of the Southeast Alternative. This property, which represents a Native American meeting place and overlook, would require evaluation and documentation during subsequent archaeological investigations.

The possible intake structure locality on the east bank floodplain/low terrace of the Susquehanna River has a high to moderate potential for both near-surface and deeply-buried archaeological sites. One previously recorded archaeological site lies within the footprint of this proposed locality. Eight additional previously recorded archaeological sites are located on the floodplain between Wapwallopen Creek and Gould Island.

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