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ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences associated with the alternatives presented in “Chapter 2: Alternatives.” It is organized by impact topic, which distills the issues and concerns into distinct subjects for discussion analysis. NEPA requires consideration of context, intensity, and duration of adverse and beneficial impacts (direct, indirect and cumulative) and measures to mitigate for impacts. NPS policy also requires that impairment of resources be evaluated in all environmental documents; therefore, impairment is addressed in the “Conclusion” section at the end of this chapter. The CEQ regulations that implement NEPA require assessment of impacts to the human environment, which includes natural and cultural resources.

METHODOLOGY FOR ASSESSING IMPACTS

As required by NEPA, potential impacts are described in terms of type (beneficial or adverse, direct or indirect), context (site-specific, local or regional), duration (short-term or long-term), and level of intensity (negligible, minor, moderate, or major). These terms are defined below. Overall, these impact analyses and conclusions were based on the review of existing literature and Valley Forge NHP studies, information provided by on-site experts and other agencies, professional judgments and park staff insight, and federal agencies. The impact analyses presented in this document are intended to comply with both NEPA and Section 106 of the NHPA; therefore, Section 106 summaries for each cultural resource topic are also included.

Type

- Beneficial:** A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
- Adverse:** A change that moves the resource away from a desired condition or detracts from its appearance or condition.
- Direct:** An impact that is caused by an action and occurs at the same time and place.
- Indirect:** An impact that is caused by an action but is later in time or farther removed in distance, but still reasonably foreseeable.

Context

Context is the setting within which an impact is analyzed.

Site-specific: The impact would affect the project site.

Local: The impact would affect the park and immediate neighborhood.

Regional: The impact would affect localities, cities or towns surrounding the park.

Duration

Short-term: Impacts that occur only during construction or last less than one year.

Long-term: Impacts that last longer than one year.

Level of Intensity

Because level of intensity definitions (negligible, minor, moderate, or major) varies by impact topic, they are provided separately for each impact topic.

Cumulative Impacts

The CEQ regulations that implement NEPA require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as impacts which result when the impact of the proposed action is added to the impacts of other present and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7).

To determine the potential cumulative impacts, existing and anticipated future projects at Valley Forge NHP and in the surrounding area were identified. These included lands administered by the NPS, the Commonwealth of Pennsylvania, Chester and Montgomery Counties, and Tredyffrin Township. Potential projects identified as cumulative actions included any planning or development activity currently being implemented or expected to be implemented in the reasonably near future. The projects and conditions identified as contributing to cumulative impacts on the resources addressed by this EA/AOE include the widening of the Pennsylvania Turnpike, and the general growth of traffic volumes in the region.

Widening of the Pennsylvania Turnpike

The section of the Pennsylvania Turnpike between milepost 326 (Valley Forge) and westward to milepost 320 was originally built in the 1950s. The Pennsylvania Turnpike Commission plans a total reconstruction of this section, including widening from four to six lanes. The turnpike commission also is soliciting requests for proposals for the design, construction, financing, operation, management and maintenance of the 21 service plazas along the turnpike, including the existing rest stop adjacent to the southern boundary of the park.

This project could potentially impact the following project resources: geologic resources, soil, topography, air quality, soundscapes, visual resources, and drainage.

General Increase in Traffic Volume in the Region

Regional traffic is projected to grow in the absence of any controlling actions. The DVRPC predicts that traffic on Gulph Road between PA 23 and County Line Road will grow to 5,700 average annual daily trips (AADT) by 2030, a 97% increase over 2001. One alternative in the park's upcoming general management plan will propose closing Gulph Road between PA 23 and Thomas Road. This would effectively eliminate through-traffic not only from the park, but also from the Glen Hardie neighborhood. This proposal has not yet been formally released or reviewed by agencies or the public. No prediction can be made at this time as to whether it will be possible to close the road. The general increase in traffic volume in the region could affect the following project resources: air quality and soundscapes, and safety, accessibility, and circulation.

These cumulative actions are evaluated in the cumulative impact analysis in conjunction with the impacts of particular resources. Because both of these cumulative actions are in the early stages, the evaluation of cumulative impacts was based on a general description of the action. Cumulative impacts are considered for all alternatives, and are presented at the end of each impact topic discussion. In defining the contribution of each alternative to cumulative impacts, the following terminology is used:

- Imperceptible:** The incremental effect contributed by the alternative to overall cumulative impacts is such a small increment that it is impossible or extremely difficult to discern.
- Noticeable:** The incremental effect contributed by the alternative, while evident and observable, is still relatively small in proportion to the overall cumulative impacts.
- Appreciable:** The incremental effect contributed by the Alternative Constitutes a large portion of the overall cumulative impact.

Impairment

In addition to determining the environmental consequences of the preferred and other alternatives, *NPS Management Policies 2001* (NPS 2000) and DO #12 require analysis of potential impacts to determine whether or not actions would impair park resources.

A fundamental purpose of the NPS, as provided for in its Organic Act (1916) and reaffirmed by the General Authorities Act (1970), as amended in 1978, begins with a mandate to conserve park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of the park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirements that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS

manager, would harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources and values. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

1. Necessary to fulfill specific purposes identified in establishing legislation or proclamation of the park;
2. Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
3. Identified as a goal in the park's general management plan or other relevant planning documents.

Impairment may result not only from activities in managing the park, but also visitor activities or activities undertaken by others operating in the park. An impairment determination is provided for at the end of this chapter in the "Conclusion" section.

GEOLOGIC RESOURCES

Methodology

All available information on geologic resources potentially impacted was compiled. Where possible, map locations of sensitive geologic resources were compared with locations of proposed development and modifications of existing facilities. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar geology. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impacts to geologic resources would be below or at the lower levels of detection.
- Minor:** The impacts to geologic resources would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.
- Moderate:** The impacts on geologic resources would be readily apparent and result in a change to geology in a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful.
- Major:** The impacts on geologic resources would be readily apparent and would substantially change the character of the geologic resources over a large area in and out of the park. Mitigation measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

Impacts of Alternative A (No-Action)

Under the No-Action Alternative, there would be no new development within the project area. Geologic resources would remain unchanged.

Overall, the No-Action Alternative would have **no impact** to geologic resources.

Cumulative Impacts

Because the No-Action Alternative would have no impact on geologic resources, no analysis of cumulative impacts is required.

Impacts of Elements Common to the Action Alternatives

Both of the action alternatives include elements that could alter existing geologic resources. These projects include the demolition, alteration or construction of structures at the project site. Grading and back-filling with clean fill would occur. The existing one-story 2,000-square foot shed on the back of the barn would be demolished and a 4,700-square foot addition to the barn would be constructed. Digging and installation of new utilities would occur on previously disturbed ground. All existing overhead and any new electric lines would be placed underground.

Structures to manage stormwater runoff would be added, including low check berms to slow and infiltrate runoff uphill of the immediate project site. Although ponding behind the berms would be infrequent and short in duration, there is a potential for additional sinkholes to open in the area. This potential exists with or without the new structures, however. Additionally, in approximately 2010, stormwater runoff from the Pennsylvania Turnpike no longer will run through the park, reducing the amount of ponded and infiltrated water, and reducing the potential for sinkholes in the park.

The project would have a **long-term, minor and adverse** impact on geology.

Impacts of Alternative B

Alternative B would include developments that could impact geologic resources. These actions include the installation of a new driveway 200' north of the existing David Walker Farmstead driveway. A new 20-vehicle parking lot would also be constructed between the barn and existing hedgerow at the northern extent of the project site. Infiltration strips would be constructed adjacent to the parking lot for stormwater management. These actions, in addition to the actions described above, would result in a **long-term, minor, adverse impact** to geologic resources

Cumulative Impacts

Present and reasonably foreseeable future actions have and would continue to contribute impacts to geologic resources in and around the project site. The Pennsylvania Turnpike reconstruction and widening project includes the expansion of the roadway from four to six

lanes, addition of a median and shoulders, construction of stormwater management structures, and replacement of the bridge over Thomas Road. This project would result in a long-term, minor, adverse impact to geologic resources in the area. This project, with Alternative B, would have a **long-term, minor and adverse** cumulative impact on geologic resources. Alternative B would contribute an **imperceptible, adverse** increment to the cumulative impact.

Impacts of Alternative C (NPS Preferred Alternative)

Alternative C also would include the “Impacts of Elements Common to the Action Alternatives” described above, as well as demolition of the Evans house and garage to facilitate the installation of a parking lot and stormwater strips, widening of the driveway to the Evans house to serve as the entrance to the school, and construction of a sheltered drop-off area. The overall impact on geologic resources under Alternative C would be **long-term, minor, and adverse**.

Cumulative Impacts

Present and reasonably foreseeable future actions that would contribute to cumulative impacts to geologic resources in and around the David Walker farmstead area are discussed under the “Cumulative Impacts” for Alternative B. This project, with Alternative C, would have a **long-term, minor and adverse** cumulative impact on geologic resources. Alternative C would contribute an **imperceptible, adverse** increment to the cumulative impact.

SOIL

Methodology

All available information on soils potentially impacted was compiled. Map locations of sensitive soils were compared with locations of proposed development and modifications of existing facilities. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar soils. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts to soil would be below or at the lower levels of detection.

Minor: The impacts to soil would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.

Moderate: The impacts on soil would be readily apparent and result in a change to soils a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful.

Major: The impacts on soil would be readily apparent and would substantially change the character of the soil over a large area in and out of the park. Mitigation

measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

Impacts of Alternative A (No-Action)

Under the No-Action Alternative, there would be no new development within the project area. Soil currently developed would remain impervious. There would continue to be 21,958 square feet (approximately one half acre) of impervious surface within the project area. The existing drainage system would prevent erosion problems.

Overall, the No-Action Alternative would have **no impact** to soils.

Cumulative Impacts Because the No-Action Alternative would have no impact on soils, no analysis of cumulative impacts is required.

Impacts of Elements Common to the Action Alternatives

Both of the action alternatives include elements that could alter existing soils. These projects include the demolition, alteration or construction of structures at the project site. Grading and back-filling with clean fill would occur. The existing one-story 2,000-square foot shed on the back of the barn would be demolished and a 4,700-square foot addition to the barn would be constructed. Additional impervious surfaces would be installed for parking and access roadway. Approximately 22,000 square feet of impervious surface would be added for a new total of approximately 44,000 square feet. Digging and installation of new utilities would occur on previously disturbed ground. All existing overhead and any new electric lines would be placed underground. West of the immediate project site, four low berms for stormwater management would be added. Demolition and construction equipment would be used at the project site, resulting in some compaction of soils. As a result, the project would have a **long-term, minor and adverse impact** on soils.

Impacts of Alternative B

Alternative B would include the impacts described above, as well as additional developments that could impact soils. These actions include the installation of a new driveway, 200' north of the existing David Walker farmstead driveway. It would be two lanes wide to accommodate vehicles. A new 20-vehicle parking lot and stormwater infiltration strips would also be constructed between the barn and existing hedgerow at the northern extent of the project site. The overall impact on soils under Alternative B would be **long-term, minor and adverse**.

Cumulative Impacts

Present and reasonably foreseeable future actions have and continue to contribute impact to soils in and around the project site. The Pennsylvania Turnpike reconstruction project includes the widening of the highway from four to six lanes, addition of a median and shoulders, construction of stormwater management structures, and replacement of the bridge over Thomas Road. This project, with Alternative B, would have a **long-term, minor and adverse** cumulative impact on soils. Alternative B would contribute a **noticeable adverse** increment to the cumulative impact.

Impacts of Alternative C (NPS Preferred Alternative)

Alternative C would include the “Impacts of Elements Common to the Action Alternatives” described above, as well as demolition of the Evans house and garage to facilitate the installation of a parking lot and infiltration strips, widening of the driveway to the Evans house to serve as the entrance to the school, installation of vegetative screening, and construction of a sheltered drop-off area. The overall impact on soils under Alternative C would be **long-term, minor and adverse**.

Cumulative Impacts

Present and reasonably foreseeable future actions that would contribute to cumulative impacts to soils in and around project site are discussed under the “Cumulative Impacts” for Alternative B. Those projects, with Alternative C, would have a **long-term, minor and adverse** cumulative impact on soils. Alternative C would contribute a **noticeable adverse** increment to the cumulative impact.

TOPOGRAPHY

Methodology

All available information on topographic resources potentially impacted in various areas of the park was compiled. Mapping of existing topographic conditions was compared with locations of proposed development and modifications of existing facilities. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar topography. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impacts to topography would be below or at the lower levels of detection.
- Minor:** The impacts to topography would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.
- Moderate:** The impacts on topography would be readily apparent and result in a change to topography over a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful.
- Major:** The impacts on topography would be readily apparent and would substantially change the character of the topography over a large area in and out of the park. Mitigation measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

Impacts of Alternative A (No-Action)

Under the No-Action Alternative, there would be no new development within the project area. Current topography would remain intact. Based on the presence of appropriate drainage structures and secure vegetation, as well as the lack of off road pedestrian or vehicular traffic, erosion would not threaten current conditions.

Overall, the No-Action Alternative would have **no impact** to topography.

Cumulative Impacts

Because the No-Action Alternative would have no impact on soils, no analysis of cumulative impacts is required.

Impacts of Elements Common to the Action Alternatives

Both of the action alternatives include elements that would alter existing topography. These projects include the demolition, alteration or construction of structures at the project site. Grading and back-filling with clean fill would occur. The existing 2,000-square foot shed on the back of the barn would be demolished structures and a 4,700-square foot addition to the barn would be constructed. Low stormwater control berms would be installed uphill from the immediate project site. Their low height (24" and 30"), as well as their location in the tall-grass meadow and in woodland, would mean that they are visually imperceptible. The project would have a **long-term, negligible and adverse impact** on topography.

Impacts of Alternative B

Alternative B would include the impacts described above, as well as additional developments that could impact topography. These actions include the installation of a new driveway, 200' north of the existing David Walker Farmstead driveway. It would be two lanes wide to accommodate vehicles. A new 20-vehicle parking lot and infiltration strips would also be constructed between the barn and existing hedgerow at the northern extent of the project site. The overall impact on topography under Alternative B would be **long-term, negligible and adverse**.

Cumulative Impacts

Present and reasonably foreseeable future actions have and continue to contribute impacts to topography in and around the David Walker farmstead area. The Pennsylvania Turnpike reconstruction project includes the expansion of the roadway from four to six lanes, addition of a median and shoulders, construction of stormwater management structures, and replacement of the bridge over Thomas Road. This project would result in a **long-term, minor and adverse impact** to topography in the southern portion of the park. This project, with Alternative B, would have a **long-term, minor and adverse** cumulative impact on topography. Alternative B would contribute a **negligible adverse** increment to the cumulative impact.

Impacts of Alternative C (NPS Preferred Alternative)

Alternative C would include the “Impacts of Elements Common to the Action Alternatives” described above, as well as demolition of the Evans house and garage to facilitate the installation of a parking lot and infiltration strips, widening of the driveway to the Evans house to serve as the entrance to the school, installation of vegetative screening, construction of a sheltered drop-off area. The overall impact on topography under Alternative C would be **long-term, minor and adverse**.

Cumulative Impacts

Present and reasonably foreseeable future actions that would contribute to cumulative impacts to topography in and around the project site are discussed under the “Cumulative Impacts” for Alternative B. This project, with Alternative C, would have a **long-term, minor and adverse** cumulative impact on topography. Alternative C would contribute a **negligible adverse** increment to the cumulative impact.

AIR QUALITY

Methodology

All available information on air quality potentially impacted in the project site vicinity was compiled. Predictions about short- and long-term site impacts were based on recent studies and previous projects with similar topography. To assess a level of impact on air quality related values from airborne pollutants, both the emissions of each pollutant related to the proposed activity and the background air quality must be evaluated then considered according to the thresholds defined below:

Negligible: An action that would result in no increase or reductions in pollution level when compared to the No Action Alternative. Pollution levels would remain below the National Ambient Air Quality Standards (NAAQS). The results of such actions would have no noticeable effect on air quality.

Minor: Minor impacts would result from actions with relatively small increases in pollution levels when compared to the No Action Alternative. Pollution levels would remain below the NAAQS. The results of such actions would have no noticeable effect on air quality.

Moderate: An action that would increase pollution levels by 10% or greater when compared to the No Action Alternative. However, the total pollution levels would remain below the NAAQS. The results of such actions would have no noticeable effect on air quality.

Major: An action that would increase pollution levels by an amount under the action alternative that would result in pollution levels that exceed the NAAQS. The results of such actions would have substantial effect on air quality.

Impacts of Alternative A (No-Action)

Under the No-Action Alternative, there would be no new development within the project area. Current air quality conditions would remain unchanged.

Overall, the No-Action Alternative would have **no impact** on air quality.

Cumulative Impacts

Because the No-Action Alternative would have no impact on air quality, no analysis of cumulative impacts is required.

Impacts of Elements Common to the Action Alternatives

Both of the action alternatives include elements that could alter existing air quality. These projects include the demolition, alteration or construction of structures at the project site. Demolition and the use of construction equipment will result in **short-term, negligible and adverse impact** on air quality. The proposed action includes shifting traffic associated with the Montessori school from its prior location beyond the park to a location within the south-central portion of the park. There would be no net degradation of air quality in the Philadelphia-Wilmington-Trenton airshed. The proposed shift in the traffic will result in a **long-term, negligible and adverse impact** on air quality in the project site vicinity.

Impacts of Alternatives B and C

Alternatives B and C would include no additional activities or impacts beyond those described above. The overall impact on air quality under Alternatives B and C would be **long-term, negligible and adverse**.

Cumulative Impacts

Present and reasonably foreseeable future actions have and continue to contribute impacts to air quality in and around the project site. The Pennsylvania Turnpike reconstruction project will enable expansion of traffic from approximately 32,000 vehicles (average annual daily traffic) at present to an estimated 65,000 by 2015, with a concomitant effect on the emissions that affect to air quality in and around the project site. The general increase of traffic in the region, which could increase Thomas Road traffic by 97% by 2030, also would increase emissions. These developments, along with Alternatives B and C, would have a **long-term, major and adverse** cumulative impact on air quality. Alternatives B and C would contribute an **imperceptible, adverse** increment to the cumulative impact.

SOUNDSCAPE

Context, time and intensity together determine the level of impact for an activity. It is usually necessary to evaluate all three factors together to determine the level of soundscape impact. In some cases, an analysis of one or more factors may indicate on impact level, while an analysis of another factor may indicate a different impact level, according to the criteria below. In such cases, best professional judgment based on a documented rationale must be used to determine which impact level best applies to the situation being evaluated. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impacts to the soundscape would be below or at the lower levels of detection.
- Minor:** The impacts to the soundscape would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.
- Moderate:** The impacts on the soundscape would be readily apparent and result in a change in a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful.
- Major:** The impacts on the soundscape would be readily apparent and would substantially change the character of the soundscape over a large area in and out of the park. Mitigation measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

Impacts of Alternative A (No-Action)

Under the No-Action Alternative, there would be no new development or change of use within the project area. Current soundscape conditions would remain unchanged. Maintenance of the structures and resulting generation of noise would occur on an ad hoc basis as funds would be available. Therefore, the current soundscape of the property would remain unchanged.

Overall, the No-Action Alternative would have **no impact** to soundscapes.

Cumulative Impacts

Because the No-Action Alternative would have no impact on soundscapes, no analysis of cumulative impacts is required.

Impacts of Elements Common to the Action Alternatives

Both of the action alternatives include elements that could alter existing soundscapes. These projects include the demolition, alteration or construction of structures at the project site. Demolition and construction equipment will result in **short-term, negligible and adverse**

impact on soundscapes. The proposed action includes shifting traffic associated with the Montessori school in from its prior location beyond the park to within the south-central portion of

the park. The noise from the traffic will result will result in a **long-term, minor and adverse impact** on soundscapes. The proposed action also includes a change in property use from vacant to a preschool. When children are outside, they will play in designated areas adjacent to the barn and at the back of the site. It is unlikely that the noise of children's voices will be heard beyond the project site, given the current level of ambient noise from the turnpike. Noise generated by children playing could result in a **long-term, negligible and adverse impact** on soundscapes.

Impacts of Alternative B

Alternatives B and C would include no additional activities or impacts beyond those described above. The overall impact on soundscapes under Alternatives B and C would be would be **long-term, minor and adverse**.

Cumulative Impacts

Present and reasonably foreseeable future actions have and continue to contribute impacts to soundscapes in and around the project site. The Pennsylvania Turnpike widening project includes the expansion of the roadway from four to six lanes. The general increase of traffic in the region could increase traffic by 97% on Thomas Road by 2030. Both developments would increase noise, resulting in a **long-term, major and adverse impact** to soundscapes in the project area.

Regional traffic is projected to increase in the absence of any controlling actions. Volume on Gulph Road within the park will increase to 5,700 AADT by 2030, a 97% increase over 2001. This increase would result in a **long-term, moderate and adverse impact** to soundscapes.

These developments, with Alternatives B and C, would have a **long-term, major and adverse** cumulative impact on soundscapes. Alternatives B and C would contribute an **imperceptible, adverse** increment to the cumulative impact.

VISUAL RESOURCES

Methodology

For this EA/AOE, visual resources are defined as what visitors see from within the park, what users of the site see, and what is seen by Glen Hardie neighbors and passers-by on Thomas Road.

Information on viewsheds potentially impacted in this area was compiled. Proposed development and modifications of existing facilities were studied on maps and in site visits.

Predictions about short- and long-term site impacts were based on previous projects with similar results. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impacts to the visual quality of the landscape would be at or below the level of detection, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the visitor experience.
- Minor:** Impacts to the visual quality of the landscape would be detectable, although the impacts would be localized and would be small and of little consequence to the visitor experience. Mitigation measures, if needed to offset adverse impacts, would be simple and likely successful.
- Moderate:** Impacts to the visual quality of the landscape would be readily detectable and localized, with consequences at the regional level including localities, cities, or towns. Mitigation measures, if needed to offset adverse impacts, would be extensive and likely successful.
- Major:** Impacts to the visual quality of the landscape would be obvious and would have substantial consequences to the visitor experience in the region including localities, cities, or towns. Extensive mitigation measures would be needed to offset any adverse impacts, and their success would not be guaranteed.

Impacts of Alternative A (No-Action)

Under Alternative A, no changes would be made to the site that would affect visual resources, but the features of the site would continue to deteriorate. The David Walker main house, root cellar, barn, and tenant house, and the Evans house and garage would remain and would receive maintenance on an emergency basis. The property would be mowed, but not on a regular basis. Trees would not be maintained, but would be removed if they became hazardous.

Walls and fences would be removed as they deteriorated. From the interior of the park, no changes to visual quality would be apparent, as the site is well screened by an existing hedgerow. Because the site is not occupied, there would be no impacts to site users. Site neighbors would see continuing deterioration. The overall impact to visual resources would be **long-term, minor, and adverse**.

Cumulative Impacts

Present and reasonably foreseeable future actions have and continue to contribute impacts to visual resources in and around the project area. To widen the Pennsylvania Turnpike, the existing bridge over Thomas Road will be removed and reconstructed, and the vegetation surrounding it will be removed to enable construction. Depending on the design of the bridge, it may present a more obtrusive appearance than the current bridge. Depending on how the immediate area is replanted, a number of years could pass before new vegetation screens the highway from Thomas Road. The impacts to visual quality would be **long-term, moderate, and adverse**.

Widening of the turnpike also will require the destruction of much of the tree screen that buffers the highway from the project site. It will take a number of years for a new screen to match the effectiveness of the current screen. This will have **long-term, major, adverse** impacts to visual quality.

This project, combined with Alternative A, would have a long-term, major, adverse cumulative impact on visual resources. The No-Action Alternative would contribute an **imperceptible adverse** increment to this impact.

Impacts of Elements Common to the Action Alternatives

Under the action alternatives, several elements would remain constant. These include rehabilitation of the David Walker main house and root cellar, construction of an addition to the rear of the barn, renovation of the tenant house, and demolition of the Evans house and garage.

Rehabilitation of the exterior of the main house, tenant house, and root cellar would have a long-term, minor, beneficial impact to visual resources, as perceived by site users and by neighbors.

Construction of an addition to the rear of the barn would not be visible from Thomas Road, and would have no impact to visual resources for neighbors. The addition would be somewhat visible from the interior of the park, and the impact to visual resources would be long-term, minor, and adverse. The overall impact to visual resources would be **long-term, minor, and beneficial**, and **long-term, minor, and adverse**.

Impacts of Alternative B

In addition to the “Impacts of Elements Common to the Action Alternatives,” under Alternative B, the hedgerow north of the barn would be removed to enable construction of a parking lot. Although it would be replaced, it would take a number of years for the plantings to reach the same size as the current plants, and would affect views from the interior of the park and from Thomas Road. Some large and/or specimen trees would be removed to enable construction, including the fern-leaved beech adjacent to the barn. Construction of a new entrance drive and parking north of the hedgerow would break the existing strong, visual line of this old boundary. Although new screening would be planted, it would be in a different location. These changes would be visible from the interior of the park and from Thomas Road, and would have a long-term, minor, adverse impact to visual quality. Other important trees, including the Kentucky Coffee Trees along Thomas Road, would receive needed horticultural care, resulting in a long-term, minor, beneficial impact.

The overall impact to visual resources would be **long-term, minor, and adverse**, and **long-term, minor, and beneficial**.

Cumulative Impacts

Present and reasonably foreseeable future actions that would contribute to cumulative impacts to visual resources in and around the project area are described under the “Cumulative Impacts” for Alternative A. This project, along with Alternative B, would have a **long-term, moderate to major, adverse cumulative impact** to visual resources. Alternative B would contribute **imperceptible, adverse and beneficial increments** to the cumulative impact.

Impacts of Alternative C (NPS Preferred Alternative)

In addition to the “Impacts of Elements Common to the Action Alternatives,” under Alternative C, a drive and small parking lot would be constructed in the rear yard of the David Walker main house. Although the form and enclosed nature of the yard would be preserved, the change would result in a long-term, minor, adverse impact to visual quality for users of the site. Some large and/or specimen trees would be removed to enable construction. Although they would be replaced, it would take some years for them to achieve the same size as the original trees, a long-term, minor, adverse impact. Other important trees, including the Kentucky Coffee Trees along Thomas Road, would receive needed horticultural care, resulting in a long-term, minor, beneficial impact.

The overall impact to visual resources would be **long-term, minor, and adverse**, and **long-term, minor, and beneficial**.

Cumulative Impacts

Present and reasonably foreseeable future actions that would contribute to cumulative impacts to visual resources in and around the project area are described under the “Cumulative Impacts” for Alternative A. This project, along with Alternative C, would have a **long-term, moderate to major, adverse cumulative impact** to visual resources. Alternative C would contribute **imperceptible adverse and beneficial increments** to the cumulative impact.

CULTURAL RESOURCES

In this EA/AOE, impacts to cultural resources are described in terms of type, context, duration, and intensity, as described above, which is consistent with CEQ regulations. These impact analyses are intended, however, to comply with the requirements of both NEPA and Section 106 of the NHPA. In accordance with the ACHP regulations implementing Section 106 of the NHPA (36 CFR Part 800 *Protection of Historic Properties*), impacts to cultural resources were also identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that are either listed on or eligible for listing on the national register; (3) applying the criteria of adverse effect to affected cultural

resources either listed on or eligible for listing on the national register; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the ACHP's regulations, a determination of either *adverse effect* or *no adverse effect* must be made for affected, national register listed or eligible cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural

resource that qualifies it for inclusion in the national register, e.g. diminishing the integrity (or the extent to which a resource retains its historic appearance) of the resource's location, setting, design, feeling, association, workmanship, or materials. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance, or be cumulative (36 CFR Part 800.5 *Assessment of Adverse Effects*). A determination of *no adverse effect* means that there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the national register.

CEQ regulations and NPS DO #12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Cultural resources are non-renewable resources, and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resources that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

A Section 106 summary is included in the impact analysis sections for cultural resources under the action alternatives. The Section 106 summary is intended to meet the requirements of Section 106 and is an assessment of the effect of the undertaking (implementation of the alternative) on cultural resources, based upon the criteria of effect and the criteria of adverse effect found in the ACHP regulations.

Archeological Resources

Methodology

Certain research questions about human history can only be answered by the actual physical material of cultural resources. Archeological resources have the potential to answer, in whole or in part, such research questions. An archeological site can be eligible for listing on the national register if the site has yielded, or may be likely to yield, information important in prehistory or history. An archeological site can be nominated to the national register in one of three historic contexts or levels of significance: local, state, or national (NPS 1990.)

Impact analysis in this document is based on research conducted to date. Additional testing in areas of potential effect is required prior to construction. For purposes of analyzing impacts to archeological resources, thresholds of change for the intensity of an impact are based upon the potential of the site to yield information important in prehistory or history, as well as the probable historic context of the affected site. The intensity thresholds are defined as follows:

Negligible: Impact is at the lowest level of detection with neither adverse nor beneficial consequences. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Adverse impact – Disturbance of a site(s) results in little, if any, loss of integrity. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact – Maintenance and preservation of a site(s). For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: Adverse impact – Disturbance of a site (s) results in loss of integrity. For the purposes of Section 106, the determination of effect would be *adverse effect*. A Memorandum of Agreement (MOA) is executed among the NPS and applicable state historic preservation officer and, if necessary, the ACHP in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.

Beneficial impact – Stabilization of a site(s). For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Major: Adverse impact – Disturbance of a site(s) results in loss of integrity. For the purposes of Section 106, the determination of effect would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state or tribal historic preservation officer and/or ACHP are unable to negotiate and execute a MOA in accordance with 36 CFR 800.6(b).

Beneficial impact – Active intervention to preserve a site(s). For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Impacts of Alternative A (No-Action)

Under Alternative A, no project-related ground disturbance would occur that would result in disturbance of known archeological resources. Continued visitor use would not impact known archeological resources.

Overall, there would be **no impact** to archeological resources under Alternative A.

Cumulative Impacts

Because the No-Action Alternative would have no impact on soils, no analysis of cumulative impacts is required.

Impacts of Elements Common to the Action Alternatives

Several elements are common to the action alternatives. Ground disturbance would occur as a result of the proposed construction of the addition, roadways and parking areas, and by the grading required to construct them. Although ground-disturbing activities have the potential to impact unknown archeological resources, for the most part, the project would be designed to avoid known archeological resources. All recovered artifacts and soil samples taken during Phase I and II archeological testing on the site were collected and are currently being curated to NPS standards using the Automated National Catalog System (ANCS+).

Impacts of Alternative B

There are no additions to the “Impacts of Elements Common to the Action Alternatives,” under Alternative A.

The overall impact to archeological resources would be **long-term, minor, and adverse**.

Section 106 Summary

After applying the Advisory Council on Historic Preservation’s criteria of adverse effects (36 CFR 800.5 *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative B would have an **adverse effect** on archeological resources at the project site. The NPS is consulting with the Pennsylvania SHPO to minimize or mitigate adverse impacts.

Cumulative Impacts

Present and reasonably foreseeable future actions have and would continue to contribute impacts to geologic resources in and around the project site. The Pennsylvania Turnpike reconstruction and widening project includes the expansion of the roadway from four to six lanes, addition of a median and shoulders, construction of stormwater management structures, and replacement of the bridge over Thomas Road. This project would result in a long-term, minor, adverse impact to geologic resources in the area. This project, with Alternative B, would have a **long-term, minor and adverse** cumulative impact on geologic resources. Alternative B would contribute an **imperceptible, adverse** increment to the cumulative impact.

Impacts of Alternative C (NPS Preferred Alternative)

In addition to impacts described under “Impacts Common to the Action Alternatives,” above, Alternative C proposes that a parking area would be constructed at the rear of the David Walker main house, which would disturb the probable outdoor cooking area.

The overall impact to archeological resources would be **long-term, minor, and adverse**.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5 *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative C would have an **adverse effect** on archeological resources at the David Walker farmstead. The NPS is consulting with the Pennsylvania SHPO to minimize or mitigate adverse impacts.

Cumulative Impacts

Present and reasonably foreseeable future actions that would contribute to cumulative impacts to archeological resources in and around the project area are described under the "Cumulative Impacts" for Alternative B. This project, along with Alternative C, would have a **long-term, moderate, adverse cumulative impact** to archeological resources. Alternative C would contribute a **noticeable, adverse increment** to the cumulative impact.

Historic Structures

Methodology

In order for a structure or building to be listed on the national register, it must be associated with an important historic context, i.e. possess significance – the meaning or value ascribed to the structure or building, and have integrity of those features necessary to convey its significance, i.e. location, setting, design, feeling, association, workmanship, and materials (NPS 1990.) For purposes of analyzing potential impacts to historic structures/buildings, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact(s) is at the lowest level of detection, with neither adverse nor beneficial consequences. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Adverse impact – Alteration of a feature(s) would not diminish the overall integrity of the resources. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial Impact – Stabilization/preservation of character-defining features in accordance with the *Secretary of the Interior Standards for the Treatment of Historic Properties*. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: Adverse impact – Alteration of a feature(s) would diminish the overall integrity of the resource. For the purposes of Section 106, the determination of effect would be *adverse effect*. A MOA is executed among the NPS and applicable state and/or tribal historic preservation offices and if necessary, the ACHP in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.

Beneficial impact – Rehabilitation of a structure or building in accordance with the *Secretary of the Interior Standards for the Treatment of Historic Properties*. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Major: Adverse impact - Alteration of a feature(s) would diminish the overall integrity of the resource. For the purposes of Section 106, the determination of effect would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state and/or tribal historic preservation officer and/or the ACHP are unable to execute a MOA in accordance with 36 CFR 800.6(b).

Beneficial impact – Restoration of a structure of building in accordance with the *Secretary of the Interior Standards for the Treatment of Historic Properties*. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Impacts of Alternative A (No-Action)

Under Alternative A, no rehabilitation or restoration would take place that would impact historic structures. Maintenance and preservation would continue as funding became available.

Because completion of repairs would be prolonged, there would be potential for further building deterioration. This deterioration could continue to the point that the integrity of the character-defining features of the national register-contributing David Walker main house and root cellar was diminished and historic fabric lost. This would result in a **long-term, moderate to major, adverse impact** to the historic structures.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5 *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative A would have an **adverse effect** on historic structures at the project site.

Cumulative Impacts

No present or reasonably foreseeable future actions have or continue to contribute impacts to historic structures in and around the project site. Therefore, there is no cumulative impact.

Impacts of Elements Common to the Action Alternatives

David Walker Main House

The main house would be rehabilitated for future use by the school or for lease as a residence or professional office. All exterior work would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. The interior, unlike the exterior, lacks cohesive integrity to any one period, with the exception of the interior masonry bearing walls and floor structure. Any interior work not affecting these features would be accomplished with sensitivity to the compartmentalization of the building. Any other interior, minor feature modifications would not be subject to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, since the interior features do not possess the level or scope of integrity represented by the contributing status of the National Register Nomination of the exterior envelope. Rehabilitation of the house would have a long-term, moderate, beneficial impact.

Root Cellar

The above-ground portion of the root cellar would be rehabilitated. The below-ground vault would be filled with sand or similar material to prevent collapse. Rehabilitation would have a long-term, moderate, beneficial impact.

Impacts of Alternative B

There are no additions to the "Impacts of Elements Common to the Action Alternatives" for this alternative.

The overall impact to historic structures would be **long-term, moderate, and beneficial**.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5 *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative B would have **no adverse effect** on historic structures at the project site.

Cumulative Impacts

No present or reasonably foreseeable future actions have or continue to contribute impacts to historic structures in and around the project site. Therefore, there is no cumulative impact.

Impacts of Alternative C (NPS Preferred Alternative)

There are no additions to the "Impacts of Elements Common to the Action Alternatives" for historic structures under this alternative.

The overall impact to historic structures would be **long-term, moderate, and beneficial**.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5 *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative C would have **no adverse effect** on historic structures at the project site.

Cumulative Impacts

No present or reasonably foreseeable future actions have or continue to contribute impacts to historic structures in and around the project site. Therefore, there is no cumulative impact.

Cultural Landscapes

Methodology

Cultural landscapes are the result of the long interaction between people and the land, and the influence of human beliefs and actions over time upon the natural landscape. Shaped through time by historic land-use and management practices, as well as politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past, as well as a visual chronicle of its history. The dynamic nature of modern human life, however, contributes to the continual reshaping of cultural landscapes making them a good source of information about specific times and places, but at the same time, rendering their long-term preservation a challenge.

In order for a cultural landscape to be listed on the national register, it must possess significance (the meaning or value ascribed to the landscape) *and* have integrity of those features necessary to convey its significance. The character-defining features of a cultural landscape include spatial organization and land patterns; topography; vegetation; circulation patterns; water features; and structures/buildings, site furnishings and objects (NPS 1996.) For the purposes of analyzing potential impacts to cultural landscape, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact(s) is at the lowest level of detection with neither adverse nor beneficial consequences. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Adverse impact – Alteration of a pattern(s) or feature(s) of the landscape would not diminish the overall integrity of the landscape. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact – Preservation of landscape pattern(s) or feature(s) in accordance with the *Secretary of the Interior's Standards for the Treatment of*

Historic Properties with Guidelines for the Treatment of Cultural Landscapes. For the purposes of Section 106, the determination would be *no adverse effect*.

Moderate: Adverse impact – Alteration of a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. For the purposes of Section 106, the determination of effect would be *adverse effect*. A MOA is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the ACHP in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA for major to moderate.

Beneficial impact – Rehabilitation of a landscape or its pattern(s) or feature(s) in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Treatment of Cultural Landscapes*. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Major: Adverse impact – Alteration of a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. For the purposes of Section 106, the determination of effect would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state or tribal historic preservation officer and/or ACHP are unable to negotiate and execute a MOA in accordance with 36 CFR 800.6(b).

Beneficial impact – Restoration of a landscape or its pattern(s) or feature(s) in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

Impacts of Alternative A (No-Action)

At the project site, the cultural landscape reflects the park's agricultural context, although only a few elements contribute, and these are found only on the David Walker Farmstead. Under Alternative A, no changes would be made to the landscape. Maintenance would occur on an ad hoc basis. Plantings would continue to deteriorate, and would be removed if they become hazardous.

The overall impact to cultural landscapes would be **long-term, moderate, and adverse**.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5 *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative B would have an **adverse effect** on cultural landscapes at the project site.

Cumulative Impacts

Present and reasonably foreseeable future actions have and continue to contribute impact to cultural landscapes in and around the project site. The Pennsylvania Turnpike reconstruction project includes the widening of the highway from four to six lanes, addition of a median and shoulders, construction of stormwater management structures, and replacement of the bridge over Thomas Road. The destruction of most or all surrounding vegetation to enable construction would mean that this project, with Alternative A, would have a **long-term, moderate and adverse** cumulative impact on soils. Alternative A would contribute an **imperceptible adverse** increment to the cumulative impact

Impacts of Elements Common to the Action Alternatives

No elements common to the action alternatives would have the potential to impact cultural landscapes.

Impacts of Alternative B

Under Alternative B, the hedgerow north of the barn would be removed to enable construction of a parking lot. Although it would be replaced, it would take a number of years for the plantings to reach the same size as the current plants, resulting in a long-term, minor, adverse impact to the cultural landscape. Construction of a new entrance drive and parking north of the hedgerow would break the existing strong, visual line of this old boundary. Although new screening would be planted, the impact would be long-term, moderate, and adverse. Some large and/or specimen trees would be removed to enable construction, including the fern-leaved beech adjacent to the barn, resulting in a long-term, minor, adverse impact. Other important trees, including the Kentucky Coffee Trees along Thomas Road, would receive needed horticultural care, a long-term, minor, beneficial impact.

The overall impact to cultural landscapes would be **long-term, minor to moderate, and adverse**, and **long-term, minor, and beneficial**.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5 *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative B would have an **adverse effect** on cultural landscapes at the project site. The site would be photographically recorded prior to disturbance to mitigate these effects.

Cumulative Impacts

Present and reasonably foreseeable future actions that would contribute to cumulative impacts to archeological resources in and around the project area are described under the "Cumulative Impacts" for Alternative A. This project, along with Alternative B, would have a **long-term,**

moderate, adverse cumulative impact to archeological resources. Alternative C would contribute an **imperceptible, adverse** increment to the cumulative impact.

Impacts of Alternative C (NPS Preferred Alternative)

Under Alternative C, a drive and small parking lot would be constructed in the rear yard of the David Walker main house. Although the enclosed nature of the yard would be preserved, the change in use would result in a long-term, minor, adverse impact to the cultural landscape. Some large and/or specimen trees would be removed to enable construction. Although they would be replaced, it would take some years for them to achieve the same size as the original trees, resulting in a long-term, minor, adverse impact to the cultural landscape. Other important trees, including the Kentucky Coffee Trees along Thomas Road, would receive needed horticultural care, a long-term, minor, beneficial impact. Primary parking would be constructed out of view from the park and Thomas Road on the site of the Evans house and garage, rather than in the more prominent location proposed by Alternative B.

The overall impact to cultural landscapes would be **long-term, minor, and adverse**, and **long-term, minor, and beneficial**.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5 *Assessment of Adverse Effects*), the NPS concludes that implementation of Alternative C would have an **adverse effect** on cultural landscapes at the project site. The site would be photographically recorded prior to disturbance to mitigate these effects.

Cumulative Impacts

Present and reasonably foreseeable future actions that would contribute to cumulative impacts to archeological resources in and around the project area are described under the "Cumulative Impacts" for Alternative A. This project, along with Alternative B, would have a **long-term, moderate, adverse** cumulative impact to archeological resources. Alternative C would contribute an **imperceptible, adverse** increment to the cumulative impact.

SAFETY, ACCESSIBILITY, AND CIRCULATION

Methodology

The project site is served by Tredyffrin Township roads.

A comparison of traffic volumes adjacent to the project area is the basis for characterizing the level of impact for this project. Comparisons are given for existing traffic volumes, for projected year 2030 volumes, and for volumes if the park is successful in working with local and state

governments to close Gulph Road between PA 23 and Thomas Road. The following parameters were used to identify the level of intensity for the transportation elements in this analysis:

- Negligible:** Changes to circulation and site access would be at the lowest levels of detection and would have an imperceptible impact on vehicular traffic flow. For purposes of this analysis for the action alternatives, changes would be less than a 5% increase over No Action traffic volumes (2001 Average Annual Daily Traffic [AADTs])
- Minor:** The change to circulation and access would be detectable but would be of a magnitude that would not have an appreciable impact on vehicular traffic flow. Traffic volume increases would be between 5% and 10% over 2001 AADTs
- Moderate:** The impacts would be readily apparent and would result in a substantial change in circulation patterns, congestion, and/or site accessibility in a manner noticeable to the public. Traffic volume increases are anticipated between 10% and 25% over 2001 AADTs.
- Major:** The impacts would be readily apparent and would result in a substantial change in circulation in a manner noticeable to the public and be markedly different from the present circulation patterns and site accessibility. Traffic volume increases are anticipated that are greater than 25% over 2001 AADTs.

Impacts of Alternative A (No Action)

Under Alternative A, no new uses would be made of the project site, and no additional traffic would be generated. There would be **no impact** to safety, accessibility, circulation, or traffic volume.

Cumulative Impact

Because the No-Action Alternative would have no impact on safety, accessibility, or circulation, no analysis of cumulative impacts is required.

Impacts of Alternatives B and C

Establishment of the MCHVF at the project site would add traffic to Thomas and Roberts Roads in the form of daily travel to and from the site by staff and by parents of students. It is projected that at full enrollment of 136 students, 310 additional trips would be generated. A trip is defined as the movement of a vehicle to or from the site.

This prediction was developed by using current travel patterns for the school as a model to calculate the number of trips for maximum future enrollment. For students, four trips per day are assumed. The school enrolls 76 students. There is an average of 1.23 students from each family at the school, and 30% of students travel in carpools. Total enrollment is projected to rise to 136 students. Assuming that the number of families with more than one child and the number of children who travel in carpools stays constant, 310 trips per day would be generated.

310 trips would represent a 14.5% increase over current Thomas Road traffic. This would represent a **long-term, moderate, adverse** impact to traffic volume.

Within the project site, all pedestrian circulation would be handicapped accessible. Dedicated drop-off area would separate this function from moving vehicles. Play areas are proposed to be located well away from moving traffic.

Cumulative Impact

Due to general regional growth, the year 2002 AADT of 2,900 on Gulph Road in the park is predicted to increase to 5,700 by 2030 (DVRPC, 2005). The year 2001 AADT of 2,136 on Thomas Road could be expected to increase commensurately, to approximately 4,200, a **long-term, major, adverse** impact. Alternative B would contribute a 5.4% increase to projected year 2030 Thomas Road traffic, a **noticeable** increment. (*N.B.*, If the park is successful in working with local and state governments to close Gulph Road between PA 23 and Thomas Road, volume on Thomas Road would drop to a few hundred AADT—traffic generated by neighborhood itself, in addition to traffic generated by MCHVF.)

PARK OPERATIONS

Methodology

Park operations, for the purpose of this analysis, refers to the ability to adequately maintain the cultural and natural resources of the park and provide for an effective visitor experience. This includes an analysis of the condition of facilities and developed features. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impacts to park operations would be at low levels of detection and would have little impact on park operations.
- Minor:** The impact would be detectable but would be of a magnitude that would not have a substantial impact on park operations. If mitigation was needed to offset adverse impacts, it would be simple and likely successful.
- Moderate:** The impacts would be readily apparent and would result in a substantial change in park operations in a manner noticeable to staff and the public. Mitigation measures would be necessary to offset adverse impacts and would likely be successful.
- Major:** The impacts would be readily apparent, would result in a substantial change in park operations in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse impacts would be needed, would be extensive, and their success could not be guaranteed.

Impacts of Alternative A (No-Action)

Under the No-Action Alternative, no changes would be made to structures and landscapes that would either burden or streamline current operations at the project site. Structures and landscapes would continue to be maintained on an ad hoc basis. Law enforcement rangers would patrol occasionally and would respond to emergencies.

There would be **no impact** to park operations.

Cumulative Impacts

Because the No-Action Alternative would have no impact on park operations, no analysis of cumulative impacts is required.

Impacts of Elements Common to the Action Alternatives

Under the action alternatives, maintenance and security would become the responsibility of MCHVF. Park staff would no longer provide these services to the project site, resulting in a long-term, minor, beneficial impact to park operations. The park would be responsible for maintenance of stormwater management berms, a long-term, minor, adverse impact to park operations. Overall, the impacts would balance, and there would be **no impact** to park operations.

Impacts of Alternatives B and C

Under Alternatives B and C, there would be no additions to the “Impacts of Elements Common to the Action Alternatives.” There would be **no impact** to park operations.

Cumulative Impacts

Because there would be no impact on park operations, no analysis of cumulative impacts is required.

GAME ANIMAL HUNTING

Methodology

Game animal hunting is prohibited within Valley Forge NHP, and none of the alternatives described in this EA/AOE will result in a change in game animal management on Federal land. Legal hunting of game animals (primarily white-tailed deer but possibly coyotes, raccoons, opossums, small game birds and other mammals) does occur on private properties adjacent to the park, however, and is known to occur at private properties along Thomas Road.

According to Pennsylvania hunting regulations (Pennsylvania Game and Wildlife Code, Title 34 Chapter 25), it is unlawful to hunt for, shoot at, trap, take, chase or disturb animals within the safety zone of an occupied structure, school or playground without the permission of the occupants. Hunting within a safety zone is legal if the occupants of the structure have authorized the hunter and hunting activities. Therefore, hunters must acquire the permission of privately-owned property occupants to hunt outside of or within the safety zones. The safety zone for archery hunting and crossbow is defined as within 50 yards of any occupied residence, camp, industrial or commercial building, farm house or farm building.

The proposed action would result in the establishment of a new, 150-yard safety zone around the school.

Impacts of Alternative A (No-Action)

Under the No-Action Alternative, there would be no new development within the project area. Existing safety zones associated with the privately-owned properties would remain unchanged.

Overall, the No-Action Alternative would have **no impact** to game animal hunting on privately-owned properties in the vicinity of the project site.

Cumulative Impacts

Because the No-Action Alternative would have no impact on game animal hunting, no analysis of cumulative impacts is required.

Impacts of Elements Common to the Action Alternatives

Both of the action alternatives include elements that could alter existing hunting safety zones. The proposed action would result in the establishment of a new, 150-yard safety zone around the preschool. (See Figure 7.) The safety zone for any weapon used in hunting is defined as within 150 yards of playgrounds, schools, nursery schools or day-care centers. By state law, permission to hunt within the new, 150-yard safety zone must be acquired from the occupants of the preschool.

Ten privately-owned properties could be affected by establishment of a 150-yard safety zone. As a result, the project would have a **long-term, adverse** impact on game animal hunting on privately-owned properties in the vicinity of the project site.

Impacts of Alternatives B and C

Alternatives B and C would include the elements described above. Alternatives B and C would result in a **long-term, adverse impact** on game animal hunting on privately-owned properties in the vicinity of the project site.

Cumulative Impacts

No present or reasonably foreseeable future actions contribute impacts to park operations in and around the project site. There would be no cumulative impact.

CONCLUSION

Alternative A (No-Action)

Under Alternative A, there would be no impacts to geologic resources, soils, topography, air quality, soundscapes, archeological resources, safety/accessibility/circulation, park operations, or game animal hunting. There would be a long-term, minor, adverse impact to visual resources. There would be a long-term, moderate to major, adverse impact to historic structures and a long-term, moderate, adverse impact to the cultural landscape. The cumulative impacts would range from none to long-term, moderate to major, and adverse.

Analysis of impacts identified the potential of major impacts to historic structures under Alternative A, posing the threat of impairment of this resource.

Alternative B

Under Alternative B, there would be no impact to park operations. There would be long-term, negligible, adverse impacts to topography; short- and long-term, negligible, adverse impacts to air quality; short-term, negligible, adverse impacts as well as long-term, minor, adverse impacts to soundscapes. There would be long-term, minor, adverse impacts to geologic resources, soils, visual resources, and archeological resources. There would be long-term, moderate, adverse impacts to safety/accessibility/circulation and long-term, adverse impacts to game animal hunting. There would be long-term, minor, beneficial impacts to visual resources; long-term, moderate, beneficial impacts to historic structures; and both long-term, minor to moderate, adverse impacts and also long-term, minor, beneficial impacts to the cultural landscape. The cumulative impacts would range from none to long-term, major, and adverse.

Analysis of potential impacts of Alternative B did not identify any major adverse impacts to these resources. Therefore, implementation of Alternative B is not likely to result in impairment of any park resource or value.

Alternative C (NPS Preferred Alternative)

Under Alternative B, there would be no impact to park operations. There would be short-term, minor, adverse impacts and long-term, negligible, adverse impacts to air quality; short-term,

negligible, adverse impacts as well as long-term, minor, adverse impacts to soundscapes. There would be long-term, minor, adverse impacts to geologic resources, soils, topography, and visual resources. There would be long-term, moderate, adverse impacts to archeological resources, safety/accessibility/circulation and long-term, adverse impacts to game animal hunting. There would be long-term, minor, beneficial impacts to visual resources; long-term, moderate, beneficial impacts to historic structures; and both long-term, minor to moderate, adverse impacts and also long-term, minor, beneficial impacts to the cultural landscape. The cumulative impacts would range from none to long-term, major, and adverse.

Analysis of potential impacts of Alternative C did not identify any major adverse impacts to these resources. Therefore, implementation of Alternative C is not likely to result in impairment of any park resource or value.