IV CHAPTER IV
Environmental Consequences

Chapter IV – Environmental Consequences

This chapter assesses the potential impacts – both positive and negative – of the alternatives on the natural and human environments.

INTRODUCTION

Chapter IV assesses the potential impacts – both positive and negative – of the proposed action and the alternatives described in Chapter II on the natural and human environments. Impacts that could potentially affect the memorial's resource values, as well as the community's infrastructure and socioeconomic conditions, were evaluated for each alternative at a level that would facilitate decisionmaking regarding the appropriate management of the memorial. Further, measures to mitigate adverse effects have been proposed for each alternative.

Chapter III describes the affected environment and provides the context in which the resources exist. Resources found within the Flight 93 National Memorial boundary are representative of a disturbed and fragmented open landscape. Within the context that these resources exist, management of the site by the National Park Service under either alternative will improve site conditions. The National Park Service is required to preserve unimpaired the site's historic, cultural and natural resources, and comply with Federal environmental regulations and National Park Service policies and standards.

Because Flight 93 National Memorial was designated a national park unit by Congress in 2002 through legislation, the analysis contained in this document does not consider the effects of not having a national park on the site. If this area had not been designated a unit of the national park system, the site would have been reclaimed to the standards established in the PBS Coals, Inc. mining reclamation plan, as stipulated by the Pennsylvania Department of Environmental Protection. It is unlikely that the site would have been improved to a comparable level as it would if the National Park Service acquires the land and develops the memorial.

Project-specific issues identified during scoping, agency coordination, public input, and through assessment of legal mandates and resource studies have been evaluated. Each resource category will be evaluated as follows:

- The methodology for assessing these impacts.
- The context in which the resources exist.
- Analysis of each alternative
- A summary of the impacts are presented to identify the potential impairment thresholds and to compare the effects of the alternatives. Appropriate measures to mitigate potential adverse effects are identified.

The impairment thresholds were defined as follows:

- **Negligible** – No measurable effect
- **Minor** – Measurable effect, but with minimal change to resource conditions
- **Moderate** – Changes to resource conditions but not irreversible or can be sustained through mitigation
- **Major** – Resource conditions are significantly altered even with mitigation. These changes could be positive changes or could modify the existing conditions.

An impact can have both positive and negative effects. For example, any new development can have positive impacts in terms of bringing new money into a community, but it can also induce negative impacts in terms of generating traffic and attracting more people to a community, thus placing greater stresses on infrastructure and local services.

Several impact categories were identified to evaluate the effects of the alternatives on the area's resources. The effects of either retaining existing conditions or developing visitor facilities, permanent memorial features and ancillary infrastructure are assessed in this chapter. The cumulative effects of the proposed action—the past, present and reasonably foreseeable future actions—are also assessed. These actions have the potential to affect the memorial's resource values, desired visitor experience, as well as the community's infrastructure and services. A matrix summarizing the impairment thresholds for each impact category is presented at the end of this chapter.

ENVIRONMENTAL FACTORS AND EVALUATION

Table IV-1 presents the impact categories that must be evaluated by Federal law or National Park Service policy. The categories that are relevant to this project are identified, but these are not the only categories that will be evaluated. The impacts that are common to both alternatives and resource-specific impacts are discussed later in this chapter.

Table IV-1: Impact Categories Appropriate to Flight 93 National Memorial Review	
Impact Category	**Relevant to Flight 93 NM**
Possible conflicts between the proposed action and land use plans, policies or controls for the area concerned and the extent to which the Memorial will reconcile the conflict	Yes
Energy requirements and conservation potential	Yes
Natural or depletable resource requirements and conservation potential	Yes
Urban quality, historic and cultural resources and design for the built environment	Yes
Socially or economically disadvantaged populations	No
Wetlands and floodplains	Yes
Prime and unique agricultural lands	Yes
Endangered or threatened species and their habitats	Yes
Important scientific, archaeological and other cultural resources, including historic properties listed or eligible for the National Register of Historic Places	Yes
Ecologically critical areas, Wild and Scenic Rivers or other unique natural resources	No; none exist
Public health and safety	Yes
Sacred sites (as defined in E.O. 13007)	No; none exist
Indian Trust resources	No; none exist
Source: Impact categories cited in CEQ §1502-1508 and National Park Service DO-12.	

IMPACTS COMMON TO BOTH ALTERNATIVES

Impacts that are common to both alternatives are briefly discussed in this section. These impacts would most likely occur regardless of the alternative selected.

Possible Conflicts with Local Plans, Policies and Controls

Somerset County Comprehensive Plan Update. In 2003, the Somerset County Planning Commission released a draft of the Somerset County Comprehensive Plan Update. The update recognized the importance of the Flight 93 National Memorial in having a positive influence on the County's tourism economy, and also recognized the impacts to land use and traffic at the local level.

Under both alternatives, the Flight 93 National Memorial is compatible with the goals of the County's comprehensive plan. As a goal, the County's comprehensive plan update recommends land use controls for commercial development along U.S. Routes 219 and 30. Zoning does exist at the U.S. Route 219 interchange at U.S. Route 30 and along portions of Route 601. Limited zoning also exists in other jurisdictions within the County. As part of the *County Comprehensive Plan Update*, the County acknowledged that Somerset and Stonycreek Townships have the greatest need for land use controls due to growth potential and the Flight 93 National Memorial. To address these needs, the County proposed an action strategy to focus on Stony creek and/or Somerset Township to implement zoning and land use controls, especially regarding the demands of the Flight 93 National Memorial site.[1]

Flight 93 National Memorial Area Corridor Planning Study. Access to Flight 93 National Memorial will be studied in the proposed corridor planning study, which will be funded through grants from the Commonwealth of Pennsylvania, and supported by the National Park Service and the Pennsylvania Environmental Council. The following local jurisdictions have agreed to participate in the study: Somerset Borough and Jenner, Shade, Somerset and Stonycreek Townships.

Comprehensive Economic Development Strategy Six County Southern Alleghenies Region. Flight 93 National Memorial is not in conflict with the recommendations for regional economic development that are presented in this plan.

Southern Alleghenies Rural Planning Organization Long Range Transportation Plan, FY 2003-2023. Flight 93 National Memorial is not in conflict with the region's long-range transportation plan or transportation improvement program for the Johnstown non-MPO area.

[1]Executive Summary – The Key Initiatives. Somerset County Comprehensive Plan Update. p. E-15.

State Implementation Plan-Air Quality Conformity Analysis Report for the Johnstown Non-MPO Ozone Nonattainment Area. The Johnstown non-MPO area is in attainment for ozone. Two significant highway projects were identified in this report as having potential effects on the region's air quality. Neither is located in Stonycreek Township nor are they related to Flight 93 National Memorial. The development of the memorial would not conflict with the State Implementation Plan nor will development of the memorial adversely affect the regional air quality.

Stonycreek Township Act 537 Sewage Facilities Plan. The sewage facilities plan for the Shanksville sewage treatment system recommends that sewerage from properties along Lambertsville Road be conveyed to Shanksville using a combination of gravity sewers and force main. The Flight 93 National Memorial is located within an area that would be consistent with future plans to serve the Lambertsville Road area. Conveyance of sewage from the Flight 93 National Memorial would be consistent with the Stonycreek Township Act 537.

Pennsylvania Statewide Airport System Plan and Somerset County Airport Layout Plan. The Somerset County Airport is located in Somerset Township, approximately 6 miles southwest of the Flight 93 National Memorial, off SR 281 near the town of Friedens. The airport is currently used for corporate aircraft, recreational flying, flight instruction, law enforcement, aerial photography/surveying/ inspections, agricultural purposes and medical support services.

In February 2003, the Penn DOT Bureau of Aviation (BOA) conditionally approved the Somerset County Airport Layout Plan (ALP), which represents BOA's acceptance of the proposed improvements at the airport. A 300-foot extension to Runway 06/24 has been approved, which would allow for a 5,000-foot runway. If the proposed runway extension is constructed, the Somerset County Airport would be able to accommodate corporate or business aircraft operations. As a result, additional operations, particularly business jets, would occur, as well as increased noise disturbance and visual distractions from overflights to the memorial. Thus, the intended quiet, contemplative setting could be disrupted under both alternatives. Further coordination with the airport management and the FAA is required to adequately assess the potential impacts of this expansion, or more importantly, any future expansions on visitors to the memorial.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* requires Federal agencies to avoid actions that could cause disproportionately high and adverse impacts to minority and low-income populations with respect to human health and environment. There are no minority communities within the areas immediately adjacent to the memorial. Therefore, neither alternative would disproportionately affect minority populations or low-income communities.

Floodplains

There are no designated floodplains within the memorial boundary, as defined in Executive Order 11988, *Floodplain Management.*

Prime and Unique Agricultural Lands

The Farmland Protection Policy Act (P.L. 97-98; 7 U.S.C. 4201-4209) directs Federal agencies to minimize unnecessary conversion of farmland to nonagricultural uses and to assure that their programs are compatible with programs and policies designed to protect farmland. For both alternatives, the previous mining activity significantly altered the soil and landscape of the core areas where memorial features and visitor uses are planned. Farming and grazing practices would not occur within these areas of the memorial. However, for both alternatives, existing agricultural practices could continue within the perimeter or buffer area (approximately 907 acres). Agricultural practices (crop cultivation and grazing) would be compatible with the memorial through protection of viewsheds and the existing rural character of the landscape.

Ecologically Critical Areas

Ecologically critical areas are exceptional natural resources, such as National Natural Landmarks, wild and scenic rivers, wilderness areas or other unique natural resources. No ecologically critical areas or National Natural Landmarks exist within the memorial boundary or within Somerset County.

Sacred Sites and Indian Trust Resources

There are no Indian sacred sites, as defined by Executive Order 13007, or Indian Trust resources within the Commonwealth of Pennsylvania.

RESOURCE-SPECIFIC IMPACT CATEGORIES

In addition to the impact categories shown in Table IV-1, resource-specific impacts will be evaluated for each alternative. These impact

The Laurel Highlands
(Jerry Spangler 2004)

categories were determined through consideration of the memorial's fundamental resource values, public input, agency scoping comments and resource studies conducted for this project. The cumulative impacts of the proposed action are also discussed at the end of this chapter. Impact categories that will be evaluated by alternative are—

- Natural Resources
- Historic and Cultural Resources
- Socioeconomic Impacts
- Land Uses
- Transportation
- Energy Requirements and Conservation Potential
- Visual and Aesthetic Resources
- Public Health and Safety

NATURAL RESOURCES

GEOLOGY, SOILS AND TOPOGRAPHY

Methodology

A site inspection and preliminary geotechnical analysis was conducted by Engineering Mechanics, Inc. in July 2004. Follow-up analysis was conducted of the final designs in February 2005. The site conditions, geology of the area, mining history and foundation considerations were evaluated. Figure III-7 (Chapter III) shows the limits of the deep-mining at the site.

Context

The terrain is predominately rolling hills and valleys dominated by a gentle ridge along its east limit, where maximum elevations range from 2,550 feet to 2,600 feet. Minimum grade along the westerly limit of the tract is about 2,260 feet, and the actual crash site lies about 2,350 feet in elevation.[2]

The eastern half of the site had been extensively deep-mined, followed by strip-mining above the deep mines. The predominate mining on the western half was strip-mining. When an area is strip-mined, the overburden is removed down to the coal seam(s) being extracted, the coal is retrieved, and the area is backfilled with the overburden from a succeeding strip cut until mining is completed. In general, the ground is reclaimed to the approximate topographic contours that existed before the mining operations occurred. The strip-mined areas are blanketed with generally loose mixtures of soil and rock overburden that will compact under their own weight over time. Most of the strip-mining occurred at least five years ago and even longer in many areas.

Alternative 1 – No Action

Alternative 1 would not involve extensive construction activities for any major facilities or structures. Only minor roadway and safety improvements would occur if this alternative is selected. As a result, the impact threshold for geotechnical impacts under Alternative 1 would be Negligible.

Alternative 2 – Preferred Design Alternative

Alternative 2 proposes several key development areas: the Tower, the Portal Plaza and visitor center complex; the curving memorial landform around the Bowl; and the Sacred Ground Plaza. Pedestrian trails would extend throughout the site.

The conceptual design proposes a 93-foot-tall concrete tower constructed on a raised platform that is situated on a planted mound which would be located at the memorial entrance. The tower would contain 40 aluminum wind chimes. The Tower will require deeper and more extensive foundation measures than normal for proper support. Based on the small footprint of the Tower, the additional construction costs for the foundation are not expected to be significant.

The main entrance to the Bowl would be through the Portal at the western end of the curving walkway. The Portal would consist of two 30-foot to 40-foot high walls located near the visitor center. In the design concept, these structures would be located in the general area of the existing scrap and recycling operation. The Portal walls would be constructed of concrete and a walkway would lead through the first wall onto the Portal Plaza. Deciduous trees, such as red maples, would be the principal planting. Because of the limited extent of the Portal walls, they are not expected to present difficult construction issues but they would require relatively deep foundations or strip-mined backfill subgrade stabilization. Prior to construction of the Tower and the visitor center, a geotechnical investigation would be conducted to determine stability.

The Portal Plaza transitions to the visitor center, which is integrated into the curving landform. North of the visitor center, the curving landform continues with an allée of deciduous trees and

[2]Engineering Mechanics, Inc. Final Geotechnical Report, July 2004. All elevations are referenced to topographic maps provided by PBS Coals, Inc. for the Diamond T Coal Company Lambert & Farkas-Stahl strip mines, Strip Mine Permits (SMPs) No. 56703124 (on the north) and 56693103 (on the south).

walkway that extends around the Bowl for approximately one mile. The landform is expected to require moderate to extensive foundation subgrade excavation and soil replacement or improvement to provide support for the walkway. Tree plantings and 40 memorial groves would require modifying and improving the soil.

Another plaza would be constructed adjacent to the crash site or Sacred Ground. In the design concept, the plaza would be hard surfaced with a raised landing at its northwest edge that would align with the Portal to define the flight path of Flight 93. Offset walls would frame a gate, which would be opened for family visits or special ceremonies. The names of those honored and the date, September 11, 2001, would be inscribed on the western wall. A stone slab or walkway would extend to the Sacred Ground. The impact threshold for Alternative 2 for geotechnical issues is expected to be Minor, although costs associated with this Alternative 2 would be higher to account for further geotechnical investigations prior to construction, footings and stabilization.

Summary of Impacts

No major geotechnical issues are associated with Alternative 1 as there are no new structures proposed under this alternative. Therefore, the impact threshold for Alternative 1 for geotechnical would be Negligible.

Alternative 2 would involve construction of a memorial expression, visitor facility and associated infrastructure. During the final design of this alternative, consultation with a geotechnical engineer would be conducted to determine appropriate options for constructing these structures. The impact threshold for geotechnical under Alternative 2 is expected to be Minor though costs would be higher than for Alternative 1.

VEGETATION AND WILDLIFE

Methodology

Two natural resource surveys were conducted of the Flight 93 National Memorial site in 2004 and 2005 by qualified botanists, wildlife biologists and water quality specialists. The Pennsylvania Natural Heritage Program database was accessed to supplement and support information collected during these surveys. Topographic maps, geologic maps and aerial photographs were reviewed to determine habitats most likely to be onsite. All rare plant species known to occur throughout the county and within 20 km of the site were assessed for possible occurrence.

A spatial representation of the predicted future range expansion for hemlock woolly adelgid was created by estimating spread rates from historical records and using these estimates to predict future spread. The potential for this species was based upon visual detection of life stages by pest management personnel and through review of historical records.

Context

No rare plant species or species of conservation concern were found during the field surveys. However, biologists determined that limited but significant potential exists for certain plant species of conservation concern to occur within the boundary. One such species, the Appalachian blue violet *(Viola appalachiana)*, a proposed "Pennsylvania Tentatively Undetermined" species, was recommended for further survey in the area of the Sorber Cemetery. The Appalachian blue violet occurs throughout the Allegheny Mountains and in Somerset County. More information on threatened, endangered and species of special concern is provided in the following section on "Federally and State Protected Species."

Of all the areas within the boundary, the hemlock grove has the greatest potential to support viable populations of rare plants. For more information on these species, refer to the following section on "Federally and State Protected Species." Three bird species listed as State Species of Special Concern were observed at the memorial in 2005. These species were northern harrier *(Circus cyaneus)*, a State Candidate-at-Risk Species of Special Concern; Wilson's snipe *(Gallinago delicata)*, a State Threatened Species of Special Concern; and a short-eared owl *(Asio flammeus)*, a State Endangered Species of Special Concern.

Habitats for northern harriers include both uplands and wetlands, such as marshy meadows and pastures, old fields, dry uplands and riparian woodland. Wilson's snipe habitat ranges from wetlands to well-drained grassy uplands. Open country supporting rodents and small mammals offer suitable habitat and food supply for the short-eared owl. Wild turkey *(Meleagris gallopavo)*, also seen on site, was the only species confirmed to be breeding, according to the *Pennsylvania Breeding Bird Atlas*.

The Flight 93 National Memorial site has been severely impacted over time by farming activities and by mining operations. Both of these former activities diminished and fragmented wildlife habitat, severely impacted water quality and

quantity, provided opportunities for the introduction of invasive species and impacted forestland. The site is currently evolving through the reclamation process, which principally involves restoration of the land to grassland and pines.

The PBS Coals reclamation plan included a seed mixture composed of Kentucky fescue #31, clovers, birdsfoot trefoil, crown vetch, orchard grass, timothy, alfalfa and rye grass. Kentucky #31 comprises the bulk of the tall fescue acreage in the United States,[3] and much of the grass planted as part of the mining reclamation plan was fescue. The Pennsylvania Game Commission commented during scoping that fescue is non-native, often has endophytes (fungus) and provides little to no value to wildlife. Further, Kentucky fescue #31 is not a preferred grass due to its low value to birds and wildlife.[4] Tall fescue is a widely adapted, persistent grass that easily establishes, is tolerant of a wide range of management regimes and compares favorably to nutrient levels of many other cool season grasses.

Alternative 1 – No Action

Under Alternative 1, no improvements or enhancements to habitat are planned other than routine maintenance. Revegetation of the site would most likely continue through a successional process. Thus, maintaining existing habitat for a wide range of birds, plants and mammals is proposed for Alternative 1.

Grasslands. Pennsylvania Game Commission commented that native grasses, particularly warm season grasses, such as switch grass (Panicum virgatum), timothy or orchard grass, are preferred. The Pennsylvania Department of Conservation and Natural Resources supports use of the following perennial grasses: big and little bluestem, lurid sedge, bottlebrush grass, riverbank wild-rye, Virginia wild-rye, switch grass and Indian grass.[5]

Alternative 1 would provide low-maintenance, high habitat benefits for grassland bird species and would support meaningful populations of these birds, which would likely nest in the area. Very little management of the area would be needed to support these bird populations given the slow rate of woody succession due to poor soils. Management every 3-5 years in terms of "brush-hogging" would be needed to set back the establishment of woody vegetation. Otherwise, nothing additional needs to be done to the area to retain its value as a conservation area for grassland birds.

The National Park Service natural resource field report stated that the northern area would remain contiguous and undisturbed if the existing Haul Road was used as access from U.S. Route 30 and development was confined to the lower third of the site. This would provide the park with an opportunity to enhance critical habitat for a group of birds on the "conservation concern" lists. Collectively referred to as "obligate grassland birds," these species require grasslands to breed and reproduce.

Many of these bird species nest in grasslands, including reclaimed surface mine sites. Reclaimed bituminous coal fields are beneficial to grassland birds and play a significant role in their global conservation by providing critical habitat. Widespread surface mining and subsequent reclamation in western Pennsylvania has resulted in an extensive patchwork of reclaimed sites among forests, woodlots and agricultural fields. These fields have a slow rate of ecological plant succession and are ideal for short-eared owls, bobolinks, grasshopper sparrows, Henslow's sparrows, upland sandpipers, savannah sparrows and vesper sparrows, among others.[6]

Forested Areas. The forest patch situated on the eastern edge of the core area of the memorial exhibits the most intact example of the northern hardwoods forest type within the memorial boundary. The hemlock grove to the south also offers possibility for rare plant species. For both alternatives, recommendations have been made in this section to restore damaged areas and to maintain the health of the hemlock grove. Fencing around the crash site would be maintained, which would provide some protection to the hemlocks from human disturbance and from wildlife browsing.

Hemlocks naturally do not have extensive root systems, and given the site's high-water table and rocky soils, the trees have problems establishing deep root systems. Individual trees, even in aged stands, are likely to devote resources to shoot

[3]Ball, Donald M., et al. "The Tall Fescue Endophyte Story." Extension Forage Crop Agronomists, Auburn University, University of Kentucky & University of Georgia.
[4]Telephone conversation with Barry Zaffuto, Pennsylvania Game Commission, and Eileen Carlton, Environmental Management Collaboration, Ltd., July 2005.
[5]Pennsylvania DCNR website: www.dcnr.state.pa.us/forestry/wildplant/grasses.aspx
[6]National Park Service. May 18, 2005. Flight 93 National Memorial Trip Report.

growth at the expense of root development in areas where competition for light is high. The fire that followed the crash of Flight 93 damaged and destroyed more than 100 trees (Lewandowski, 2004 pers. com). When the buffer was destroyed by fire, the trees that had been protected in the interior of the hemlock stand were exposed to severe weather. Since September 11, 2001, several large hemlock trees have fallen from exposure to high winds and heavy snow. Although over time trees will naturally establish along the edge, it is expected that additional trees will most likely fall until a buffer re-establishes and forms to protect the core again.

To maintain the health of the hemlock grove, the following actions have been recommended[7]:

- Plant a wind-break using local hemlock saplings along the newly created forest edge to protect recently exposed forest trees.
- Ensure adequate soil moisture and monitor conditions of planted trees in June through September.
- Do not use or allow run-off of any salts, e.g. road salt, in the vicinity of hemlock stands, as hemlocks are extremely vulnerable to salt stress.
- Prevent soil compaction by installing boardwalks or platforms in (or immediately adjacent to) the hemlock stand anywhere a substantial amount of pedestrian traffic is expected.
- Maintain hemlock regeneration and monitor deer or other browsers that may prevent hemlock regeneration.
- Leave downed trees and branches on the forest floor to retain moisture and nutrients, prevent invasions by alien plants, and support hemlock regeneration.

The impact threshold to vegetation and wildlife for Alternative 1 would be Minor.

Invasive Species and Pests. The National Park Service natural resource specialists recommended that a survey of invasive plant species be undertaken as soon as possible. Invasive woody species, such as tree of heaven and autumn olive, should be removed and treated. Any seed mixtures used within the park should be monitored to avoid the introduction of problematic invasive or exotic plant species.[8]

A number of non-native birches, including European white birch *(Betula pendula),* an ornamental, non-native species, were observed at the site. *Betula pendula* and other varieties of birch can be invasive, but if the trees are deemed desirable, a reasonable course of action would be to observe the areas around the trees for several years to determine if this species shows potential to become invasive. If so, appropriate management practices could be implemented before the populations become unmanageable.

Bristly locust *(Robinia hispida)* is not native to Pennsylvania, and black locust *(Robinia pseudoacacia)* is only native in the southeast and southwest corners of the state, and probably not as far north as the memorial (especially at the high elevations of the site). Black locust can be a serious invasive in prairies, so if grassland maintenance is going to be part of the management plan, removal of black locust should be given serious consideration.

Narrow-leaved cattail *(Typha angustifolia)* is often reported as being native to eastern North America, but Stuckey and Salamon (1987) provide evidence that it is an early introduction from Europe. This species is aggressive, and forms monocultures in Pennsylvania wetlands, displacing native species.

The hemlock woolly adelgid *(Adelges tsugae),* a pest that threatens eastern hemlocks, was not discovered within the hemlock grove onsite, though it has been in Somerset County since 2002. Hemlock woolly adelgid is an insect that feeds on the xylem tissue of hemlock trees causing loss of vitality, defoliation and death. This pest is easily identified by the white cottony masses on the twigs and at the base of the needles. The adelgid was not apparent in the hemlock stand during the site visit. Since it is dispersed passively in spatially "patchy" manner by birds, mammals (including people), and wind, it is difficult to predict with any precision when it will attack a particular hemlock stand. The National Park Service's natural resource report projects that hemlock woolly adelgid will probably occur at the memorial within 3 to 4 years. [9]

At an elevation of ca. 2,500 ft, cold winter temperatures at the crash site could prevent high adelgid populations from infecting the hemlock grove. Low or dramatically fluctuating winter temperatures at the memorial are likely to significantly suppress populations most years, and this will, in turn, significantly slow the rate of hemlock decline. The rate and extent of hemlock

Hemlock Grove (OCLP 2003)

[7]Ibid.
[8]Ibid.
[9]Ibid.

Wildflowers in the Bowl
(Jason Cohn 2004)

decline following adelgid infestation is highly variable and is difficult to predict. Droughts, soil moisture and nutrient conditions (particularly nitrogen), and the presence of other hemlock insect pests, can all significantly affect the rate of hemlock decline (in addition to the effects of winter temperatures). Much of the hemlock stand seems to have good hemlock site conditions (soil moisture), and no evidence of other hemlock pests was found during the site visit.

Other important hemlock pests include elongate hemlock scale *(Fiorinia externa)*, hemlock looper *(Lambdina fiscellaria fiscellaria)*, spider mite *(Oligonychus ununguis)* and hemlock borer beetle *(Melanophila fulvogutta)*. In the absence of other stressors, most adelgid infested hemlock trees at the memorial could reasonably be expected to live seven or eight years or more, without treatment. However, appropriate measures should be used to maintain the health of the hemlock trees as long as possible following infestation. While no method (or combination of methods) for adequately controlling adelgid infestations is available at the present time, research and development of new biocontrol agents and other techniques is continuing and making progress. Given that the Sacred Ground hemlock stand is in good condition and is on a site with generally favorable conditions, best management practices could lead to maintaining this stand successfully over a fairly long-term (several years to many decades).

In addition to hemlock woolly adelgid, Pennsylvania has been experiencing a threat called "maple die-back" or "sugar maple decline" to its sugar maples *(Acer saccharum)*. This threat is due in part to soil fertility problems and insect defoliation. This condition does not affect red maples. Red maples, however, are susceptible to fusarium canker, which results in long, narrow lesions on the bark. This problem occurs whenever maples are planted in high densities and when the trees are about 20-40 years old. Red maples are tolerant species of poor soil conditions and sugar maple decline should not be a concern under either alternative.[10]

Alternative 2 – Preferred Design Alternative

Alternative 2 considers maturity of the site over a 75-year period. The alternative focuses on an enhanced and extended natural and ornamental landscape, composed of seasonal grasses, bulbs, wildflowers, and deciduous trees, such as maples, American beech, red twig dogwood, yellow birch and green ash, as well as a variety of ground covers and shrubs. The principal element of this design is a curving landform lined with groves of maple trees.

The design proposes to introduce buffalograss *(Buchloe dactyloides)*, a low-growing (8 to 10 inches high), warm season perennial grass, which is durable, fast-growing and drought tolerant, and supported by the Pennsylvania Game Commission. Buffalograss is one of the true native grasses and considered ideal for "native" landscapes. This grass is not adapted to shaded sites or to sites that typically receive heavy traffic. In fact, according to Duble, excessive traffic is one of the pressures that lead to the deterioration of buffalograss. However, its tolerance to drought conditions and extreme temperatures, together with its seed producing characteristics, enable buffalograss to survive in extreme conditions. [11]

Alternative 2 is based upon a successional landscape of woodlands and fields. Scattered trees and shrubs, including red twig dogwood, fire cherry, witchhazel, red maple, white pine and red oak are proposed for the site, except at the tower, where a designed landscape of evergreens, such as white pines, is proposed. Open fields, combined with existing successional plantings, would enhance wildlife habitat. A successional meadow seed mixture of wildflowers is proposed in the approach to the visitor center.

Under Alternative 2, specific plantings will be selected during the design phase. Native plants that are compatible with local habitat requirements will be given primary consideration due to the site's conditions. Plant selection will be based upon mixed communities of low pH and/or metal-tolerant species with capabilities for high-volume groundwater consumption during the rain season.

Native grasses are recommended where possible and fescue grasses are not preferred even though they quickly establish and help control erosion. Herbaceous perennial grasses recommended by Pennsylvania Department of Conservation and Recreation include big and little bluestem, lurid sedge, bottlebrush grass, riverbank and Virginia wild rye, switch grass and Indian grass.[12] Depending on the variety, the use

[10]Telephone conversation between Tom Hall, Forest Pathologist, Pa Dept. of Forestry, and Eileen Carlton, Environmental Management Collaboration, Ltd., Sept. 28, 2005.
[11]Duble, Richard L. "Buffalo Grass." Texas Cooperative Extension. http://aggie-horticulture.tamu.edu/plantanswers/turf/publications/buffalo.html
[12]DCNR website: http://www.dcnr.state.pa.us/forestry/wildplant/grasses

of any mustard species must be coordinated with the Pennsylvania Department of Conservation and Recreation and with Department of Environmental Protection. Garlic mustard is listed as an invasive species and a serious threat in Pennsylvania. Proposed changes to the existing vegetation and wildlife by management zone under Alternative 2 are described as follows:[13]

Gateway. The area for the tower, a major component of the memorial design, would be regraded and encircled with a ring of evergreens. A mixed woodland buffer between U.S. Route 30 and the park would be planted to partially screen the Tower, to mitigate highway noise and to create continuity with the existing woodlands.

Approach/Return. Areas of the mining landscape, especially areas with higher toxicity levels, would be remediated through a phytostabilization process, which uses plants, such as poplars, sunflowers and mustards to draw out toxins. Other plantings in this zone include red twig (red osier) dogwood, fire cherry and witch hazel, and red maples, white pines and red oaks.

Bowl. The principal component of the memorial design for this management zone is a curving walkway and allée of mixed maples and hardwoods that would formally define the edge of the Bowl. The allée would cross through the wetlands to the crash site. Behind the walkway, 40 groves of sugar and red maples and a ring road would lead to parking near the crash site. Low-maintenance native grasses, such as buffalograss, would be planted under the maples with wildflowers. A ring road, encircling the maple design, would be tree-lined with a mixture of evergreens and deciduous trees that also protect and serve as a backdrop to the maple groves.

Sacred Ground. Native and ornamental species are proposed for the designed landscapes at the crash site. Species such as yellow birches, green ash and red-twig dogwoods are proposed as well as grasses such as Chewings, blue, hard, osprey hard, creeping red, Dawson red fescues that are low-growing, low-maintenance and do not require irrigation. Blue camassia is also suggested as a planting in the crash site, though this species is not native to this region. In addition to the grasses, seasonal bulbs would be planted in the crash site to provide beauty for three seasons. Plantings for the slope leading down to the crash site would include red twig dogwood below the plaza wall and purple love grass on the slope behind the wall. The hemlock grove would be preserved. A cluster of American beech trees at the walls and benches would provide shade and shelter in this area.

Perimeter/Viewshed. Existing tree coverage along the perimeter would be preserved to maintain views to and from the Sacred Ground and to provide a buffer to minimize disturbance from outside the park. This treatment would facilitate an appreciation of the Laurel Highlands landscape. The northern perimeter would include woodland buffers to preserve a planted context for the park's entrance. The southern viewshed preserves the rural backdrop to the hemlock grove and the crash site.

The feasibility of establishing the maple plantings depends on the level of maturity selected for the tree and the extent to which soils are modified. Tree plantings will take time to establish and mature, and the need for replacement trees, particularly in the first few years, will be considered.

Based on the proposed improvements through the development of the preferred design alternative, the impact threshold for vegetation and wildlife would be Minor. Mitigation proposed for this alternative will provide many significant benefits and enhancements to the site, both aesthetically and in terms of the environment. In addition to the increase in visitors to the area, the principal impact under Alternative 2 would be the conversion of the site from a more natural habitat to a formal landscape design for portions of the site.

Mitigation

The Western Pennsylvania Conservancy recommended several measures to manage the site's natural resources. These measures include: (1) conducting further surveys for rare plant and animal species known to occur near the site, (2) protecting and enhancing the hemlock forest within the crash site, (3) enhancing the ecological viability of forest patches by increasing size and restoring site connectivity, (4) controlling non-native invasive plant species, and (5) maintaining the reclaimed strip mine portion of the core area as habitat for grassland-dependent species, particularly birds.

National Park Service natural resource specialists further recommended that an invasive plant survey be undertaken as soon as possible for either alternative. These specialists also

[13]Paul Murdock Architects, Inc., June 2005. Management Matrix.

Hemlock Grove (NPS 2003)

requested that non-invasive, native plant species be used in plantings whenever possible.[14]

The following mitigation measures were recommended to prevent introduction of hemlock woolly adelgid to the hemlock grove:[15]

- Prohibit any hemlock material – whether living trees, or wreaths, etc. – that may be infested.
- Do not use bird feeders in or near hemlock stands (e.g. at the cabin); birds are known to transport adelgid.
- Do not go into an uninfected hemlock stand after being in an infested stand especially between March and June when eggs and crawlers are present.
- Maintain awareness and provide information about hemlock woolly adelgid to staff, family members, local community, and visitors; use posters, flyers, available publications (examples from the USDA Forest Service in references below).
- Survey/monitor for hemlock woolly adelgid, other hemlock pests, and hemlock tree health
- Survey annually for adelgid, other hemlock pests [especially elongate hemlock scale *(Fiorinia externa),* and hemlock tree health. These surveys do not need to be exhaustive or scientifically rigorous, but should be standardized and documented.
- If hemlock woolly adelgid or elongate hemlock scale (EHS) is found, start an annual monitoring program. In accord with general Integrated Pest Management (IPM) procedures, monitoring data should be used to inform and guide decisions to apply certain chemical treatments, or not (pest treatment thresholds).

Recommended Management After Hemlock Woolly Adelgid Infestation

- Follow general Integrated Pest Management process.
- Release biocontrol beetles: Currently, three species are available: *Sasajiscymnus tsugae* (from Japan), *Scymnus sinuanodulus* (from China), and *Laricobius nigrinus* (from British Columbia). S. *tsugae* has been available for release for about 7 or 8 years now, and many hundreds of thousands of have been released in about a dozen states to date (including several hundred thousand in Pennsylvania). S. *tsugae* continues to be the most readily available biocontrol.
- Use chemical suppression judiciously. A variety of chemical formulations and application methods are available to suppress hemlock woolly adelgid on selected trees or limited areas of forest. Limited vehicle access and the presence of surface water (and perhaps the cabin) constrain the options at this site.

  (1) "Drenching" trees with horticultural oil or insecticidal soap (both very low toxicity in general) is effective, but should not be done if spray may "drift" into surface waters. Drenching trees (>40 ft. tall) requires access for a tanker truck equipped with high pressure hoses to reach upper crowns. Saplings, however, can be drenched with a back-pack sprayer – if not too close to surface water.

  (2) Imidacloprid is an effective systemic insecticide that is widely used and can be applied several different ways. An imidacloprid solution can be applied directly as a "soil drench" around the base of individual trees; it's possible to treat hundreds of trees this way, because it is very quick and easy. The imidacloprid solution can also be injected into the soil; this method is also fairly quick and easy. However, these two methods can not be used near surface or shallow ground water. Where water is an issue, imidacloprid can be injected directly into tree trunks, although this application method damages the tree and is vastly more complicated, time consuming, and expensive.

Summary of Impacts

Both alternatives involve issues concerning habitat fragmentation, increased human disturbance, non-native plant species, degraded water quality, lack of forest regeneration and indirect habitat degradation. However, with Alternative 1, many of these issues occurred before the site was designated a unit of the national park system. Alternative 1 would involve low site maintenance and high habitat benefits for grassland bird species. The impact threshold for vegetation and wildlife under Alternative 1 would be Minor.

Alternative 2 would involve the impacts of supporting increased visitation to the site annually, but would also provide for the distribution these

[14]National Park Service. May 18, 2005. *Flight 93 National Memorial Trip Report.*
[15]Ibid.

visitors throughout nearly twice the land mass over Alternative 1. This additional land would also allow for more habitat than for Alternative 1. Plantings associated with the design, augmented with the phytostabilization process, would provide overall environmental benefits to the site's vegetation and wildlife, but they would not restore a contiguous habitat or regenerate forest habitat. Alternative 2 may also introduce some exotic species, though final plant selection will be conducted during design. Contiguous forested areas and grasslands should be preserved to improve habitat and support wildlife migration corridors where practicable.

Coordination with the Pennsylvania Game Commission, U.S. Fish and Wildlife Service, and Pennsylvania Department of Conservation and Natural Resources would be needed to determine species and their habitat for preservation and protection.

Plant species of special concern may exist within the hemlock grove and in the vicinity of the Sorber Cemetery. A follow-up plant survey during the growing season is recommended to determine the presence of rare species and species of special concern. Refer to "Federally and State Protected Species" for information on species of concern.

Because the National Park Service is committed to preserving and protecting its resources, the overall effect of Alternative 2 is expected to be Minor.

FEDERALLY AND STATE PROTECTED SPECIES

Methodology

Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543, as amended) requires Federal agencies to ensure that "any action authorized, funded or carried out by such agency…is not likely to jeopardize the continued existence of any endangered species of threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary to be critical, unless such agency has been granted an exemption for such action…". For both alternatives, clearance from the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act is required (refer to **Appendix B** and **Chapter V** for more information on consultation).

A supplemental natural resource survey was conducted in March 2005 by the Western Pennsylvania Conservancy. Fieldwork focused on evaluating habitats to determine the potential for occurrence of rare species. No bat hibernacula were discovered on the site. Based on knowledge of the natural history of the species and evaluation of the available habitats, estimates were made regarding the probable occurrence of each target species at the site. A listing of species can be obtained from the National Park Service office in Somerset, PA.

Context

The following State-listed species of special concern were observed at the memorial in 2005:

- northern harrier *(Circus cyaneus)*, a State candidate at-risk species of special concern;
- Wilson's snipe *(Gallinago delicata)*, a State-threatened species of special concern; and
- short-eared owl *(Asio flammeus)*, a State-endangered species of special concern.

The northern harrier uses both upland and wetland habitats, including marshy meadows; wet, lightly grazed pastures; old fields; freshwater and brackish marshes; dry uplands; and riparian woodland. The Wilson's snipe uses wetlands to well-drained grassy uplands and marshy edges of streams, though it appears to avoid tall, dense vegetation and cattails. Short-eared owls prefer large expanses of grassy, upland habitats similar to the Flight 93 National Memorial site for all or part of its life cycle. Nests are usually located on dry sites and ridges with enough vegetation to conceal incubating females.[16]

The hemlock grove, located south of the crash site, has the highest potential to support viable populations of rare plants, such as weak rush *(Juncus debilis)*, proposed Pennsylvania Tentatively Undetermined, kidney-leaved twayblade *(Listera smallii)*, Pennsylvania Endangered, and heart-leaved twayblade *(Listera cordata)*, Pennsylvania Endangered. A field inspection during the growing season is recommended to determine whether these species occur within the boundary.

The Appalachian blue violet *(Viola appalachiana)*, a proposed Pennsylvania Tentatively Undetermined species that could occur in the vicinity of the Sorber Cemetery, was also identified for survey. This species is endemic to the Allegheny Mountains, mainly in Somerset County and in adjacent areas of Maryland and

[16]Western Pennsylvania Conservancy, April 2005. "Rapid Inventory and Assessment of the Ecological and Biodiversity Resources of the Flight 93 National Memorial in Somerset County, Pennsylvania."

West Virginia. Because the species is considered to be vulnerable to extinction (global conservation rank of G3) and because it responds positively to certain kinds of disturbance, it was identified for further investigation.

Alternative 1 – No Action

Alternative 1 would involve little development and visitor use within the boundary, with the possible exception of the hemlock grove where family members may gather. Follow-up natural resource surveys during the growing season that target the rare plant species noted above should be conducted to determine their occurrence onsite. If these species are found, consultation with the National Park Service's resource specialists should be conducted immediately to develop appropriate measures to protect these plant communities.

Alternative 1 provides good habitat for grassland bird species and other types of birds. However, other than tall fescue grasses, re-establishment of warm season grasses would improve habitat conditions for grassland species, such as the northern harrier, Wilson's snipe and short-eared owls.

All former mine portals and openings have been sealed shut, and no known bat hibernacula exists within eight kilometers of the site. The impact threshold for Alternative 1 would be Negligible for federally and State protected species.

Alternative 2 – Preferred Design Alternative

Alternative 2 would involve significantly more land acquisition than proposed for Alternative 1, and therefore would provide greater habitat protection. The additional land would provide a larger contiguous area for habitat protection and would allow for enhanced improvements, such as planting of trees, shrubs and grasses. The grasses proposed by this alternative include a variety of fescues because they are low-growing, low-maintenance and would not require irrigation. Although fescue is hardy and tolerant of disturbance, it is a non-native species and is not recommended by the Pennsylvania Game Commission because of its low value to wildlife. Warm season grasses, such as switchgrass, buffalograss, timothy and orchard grass, are preferred over fescues.

As with Alternative 1, follow-up natural resource surveys during the growing season that target the rare plant species identified are recommended for Alternative 2. If rare species are found, consultation with the National Park Service's resource specialists should be immediately conducted to develop appropriate measures to protect these plant communities.

Alternative 2 would also encourage and support more visitation to the site, thus more perturbation to wildlife would occur. Although this alternative would not adversely affect any federally or State protected species or critical habitat, it also would not enhance critical habitat for rare bird species or plants.

In its comments regarding the potential occurrence of the endangered Indiana bat (August 3, 2005), the Fish and Wildlife Service recognized that there were no openings or caves on the property and tree clearing for this project would be minimal. The Fish and Wildlife Service concluded that implementation of the proposed action would not likely affect the Indiana bat. The agency further stated that if any natural caves or abandoned mine Portals are discovered in the future, or if additional forest removal is proposed, further consultation with this office would be required (refer to **Appendix B** for agency comments).

Because no known federally of State protected species or critical habitat has been found within the boundary, the impact threshold for federally or State protected species is Minor for Alternative 2.

Summary of Impacts

Follow-up surveys for rare plant communities are needed in the vicinity of the Sorber Cemetery and in the hemlock grove to determine the presence of these species within the boundary. Based on available information, no known critical habitat exists on the site, even though sightings of State listed bird species were recorded in March 2005.

There are no bat hibernacula within the memorial boundary or within eight kilometers of the site. The impact threshold for federally or State protected species for Alternatives 1 would be Negligible and would be Minor for Alternative 2.

WATER RESOURCES

This section evaluates the potential effects on wetlands and surface waters. Potable water and sewage disposal are addressed under Utilities. Chapter III-Affected Environment describes the wetlands and surface streams that flow through the site.

Methodology

Wetlands are defined in Executive Order 11990, *Protection of Wetlands,* as those areas that are inundated by surface or groundwater with a frequency sufficient to support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soils for growth and reproduction. NPS Director's Order 77-1, *Wetland Protection,* establishes NPS policies, requirements and standards for implementing Executive Order 11990. Based on DO 77-1, if adverse impacts to wetlands occur on parkland, a "Statement of Findings" must be prepared documenting compliance with this DO and with its implementing procedures. NPS policy applies to all wetlands regardless of agency jurisdiction and further requires that avoidance, minimization and compensation for any losses must be demonstrated.

Section 404(b)(1) of the Clean Water Act of 1977, as amended, is the Federal statute upon which wetlands are regulated and under which Federal agencies must comply. In Pennsylvania, Code Title 25, Chapter 105, is the statute through which permitting, wetland mitigation and replacement requirements for wetlands occur. If wetlands are impacted, a Water Obstruction and Encroachment Permit would be required from the Pennsylvania Department of Environmental Protection and coordination with the U.S. Fish and Wildlife Service pursuant to the Fish and Wildlife Coordination Act would be required.

Nationwide Wetlands Inventory maps were reviewed to determine wetlands onsite. These maps were used for planning purposes only and if Alternative 2 is selected, a wetlands delineation and function assessment will be conducted. The goals of the State's wetlands protection programs is to ensure that the many functions and values provided by wetlands related to water quality, wildlife habitat and public safety (flood storage) are preserved. In order to meet that goal, regulatory programs require that wetlands lost as a result of Federal or State permitting actions be replaced by creating new wetlands.

Context

Soils in this area are classified as Gilpin Silt Loam, which have a slow infiltration rate, are well-drained, and have intermediate water-holding capacity. These soil types do not meet the characteristics of hydric soils.[17]

Approximately 25 acres of replacement wetlands are located below the core area of the memorial and 1.9 acres of wetlands are listed in the Nationwide Wetlands Inventory. Other wetlands that were not included in the Nationwide Wetlands Inventory maps include about 1.0-1.5 acres that were constructed for the National Resource Conservation Service Lamberts Run AMD Remediation Project.

An estimated 107 artificially constructed sediment, treatment and retention ponds are scattered throughout the site. Around many of these artificial ponds, peripheral wetlands have established, including within the crash site where settling from the crash has occurred. Of these treatment ponds, the Pennsylvania Department of Environmental Resources has indicated that, if necessary, the following ponds could be closed in the future:

- Rox Coal area (SMP 56911302) U.S. Route 30 entrance to site, ponds ES-1 and ES-2 can be closed.
- Diamond T (56703124) U.S. Route 30 south to the draglines, ponds ES-16, ES-17, ES-18, ES-19, ES-20 and ES-21 can be closed.
- Diamond T (56693103) south of the draglines to the crash area and the viewshed, ponds ES-1, ES-AB, ES-CD can be closed.

Alternative 1 – No Action

There would be no impacts to any wetlands under Alternative 1. Therefore, the impact threshold for Alternative 1 would be Negligible. Existing wetlands and treatment ponds would continue to function as they currently do.

Alternative 2 – Preferred Design Alternative

Alternative 2 would retain most of the existing sediment and treatment ponds and would provide additional screening around them. Alternative 2 proposes to utilize the process of phytostabilization to stabilize and remediate areas with higher toxicity. Specific plants, such as poplars, sunflowers and mustards, would be used to extract metals and other toxins from the soil.

One of the principal features of the design, an allée of maple trees, proposes to extend the walkway through a wetland located in the Bowl. The design of the memorial should be implemented to ensure that surface and groundwater flows are not significantly changed from current conditions. Surface water flows toward the 25-acre replacement wetlands area would be

Wetlands in the Bowl
(Jason Cohn 2004)

[17]RT Environmental Services. Phase I Environmental Site Assessment. "EDR Report."

maintained and not be disturbed without Department of Environmental Protection approval. Where appropriate, wetlands within the Bowl would be enhanced with additional native wetland plant species, and for all wetlands onsite, buffers around the wetlands would be specified and surface water flows into the wetlands area would not be significantly altered.

Due to land constraints, the design for the memorial expression would impact wetlands, as the allée is proposed to be constructed through wetlands in the Bowl. Construction of the proposed allée and planting of the trees would be conducted to minimize discharges into the wetlands. The use of erosion and sediment control measures to prevent or contain runoff would be employed. Best Management Practices would be employed when operating heavy equipment near wetland areas.

If Alternative 2 is selected, close coordination with the Department of Environmental Protection, the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, the Natural Resources Conservation Service and the U.S. Environmental Protection Agency would be required during the Section 404 permit process. This permit and a mitigation plan would be required if any discharges or fill material occurs to the wetlands. Coordination with the U.S. Fish and Wildlife Service pursuant to the Fish and Wildlife Coordination Act would be required due to the effects on water resources.

The impact threshold for Alternative 2 would be Moderate if the proposed mitigation plan is implemented.

Mitigation

As a form of mitigation, consideration would be given to working closely with these agencies and the local watershed groups to develop replacement wetlands that could possibly capture and treat some of the unregulated AMD located onsite. Such a mitigation plan would require close cooperation from the watershed groups and from the agencies to develop.

Summary of Wetland Impacts

No impacts and no enhancement to wetlands or the site's water resources would occur with Alternative 1. Therefore, the impact threshold would be Negligible based on minimal changes to existing conditions.

Alternative 2 would involve construction of an allée of maples through the wetlands in the Bowl. Permits would be required to fill any wetlands or to construct the allée through wetlands. If the impacts of extending the allée through the wetlands are mitigated through the creation of additional wetlands, the impact threshold would be Moderate.

Under Alternative 2, the process of phytostabilization, stabilizing the toxicity of the site through specific plantings, would be implemented.

SURFACE WATERS AND WATER QUALITY

Methodology

Coordination with the Pennsylvania Department of Environmental Protection, the Natural Resource Conservation Service and the Somerset County Conservancy was conducted throughout 2004-2005 to obtain data on the quality of streams that flow through Flight 93 National Memorial. Information was also collected from agency websites and from information posted on the Stonycreek-Conemaugh River Improvement Project (SCRIP) website concerning Lamberts Run and the Stonycreek River and Little Conemaugh River Watersheds. Review of publications, including those published by the U.S. Geological Survey on the effects of coal mine discharges on the Stonycreek River and the watershed restoration action strategy on the Stonycreek River was also conducted.

In March 2004, a preliminary natural resource survey was conducted of the site by Schmid & Associates and Cahill Associates. During this survey, SCRIP and the Natural Resource Conservation Service personnel were consulted. Review of early data from laboratory samples that characterized surface water quality during the early 1990s in the vicinity of the Flight 93 National Memorial study area, and data obtained from the Pennsylvania Bureau of Abandoned Mine Reclamation were obtained and reviewed.

In June 2005, follow-up consultation was conducted with the Pennsylvania Department of Environmental Protection, Somerset County Conservancy and the Natural Resource Conservation Service to obtain updated water quality data on Lamberts Run. Data that had been collected between May 1996 and June 2005 at monitoring point A-1 was given to the Natural Resource Conservation Service by the Department of Environmental Protection, and then plotted by the Natural Resource Conservation Service. The baseline and updated data are shown in Chapter III.

Context

Chapter III discusses the watershed context in which Flight 93 National Memorial is located. Flight 93 National Memorial lies in the upper Stonycreek River Watershed. Stonycreek River joins the Little Conemaugh at Johnstown to form the Conemaugh River, which discharges into the Kiskiminetas, which is the largest tributary of the Allegheny River.

Prior to 1945, a former mine, called the Heinemeyer mine, was actively mined on the northern portion of the site. During this time (before 1964), there were no laws or regulations in Pennsylvania requiring treatment of AMD or discharges from mines. Regulation of mine drainage in Pennsylvania became effective under the Clean Streams Act in April 1966, and holds landowners responsible for the pollution coming off their land. Because the Heinemeyer mine was active before mining reclamation laws became effective in Pennsylvania, drainage from this mine is not regulated or controlled.[18] Drainage from this mine flows into Lamberts Run and then into Stonycreek River. Liability for the drainage from the former Heinemeyer mine, which was in operation before mining reclamation laws were enacted, is not assumed by any party.

AMD naturally seeps from underground where the former mines were filled with water. PBS Coals pumps the water out into a pond to lower the mine pool. The seepage is then pumped into a holding pond, treated and then discharged into Lamberts Run, a process that will continue through perpetuity. Originally, the discharge was pumped into Grove Run.[19] Lambert Run, a small headwaters tributary of the Stonycreek River, has suffered from a low pH caused by AMD, which adversely impacts the upper gorge of the Stonycreek River.

In 2001, monitoring results for Lamberts Run showed that the pH ranged between 3.25 and 5.00, and alkalinity was 0 mg/l. In January 2002, the pH returned to 6.0. Most pH values reported during 2003 and 2004 were within the acceptable range.[20] In April 2004, a rapid bioassessment of benthic invertebrates was performed at four stations on Lamberts Run for the Southern Alleghenies Conservancy. The overall characterization of Lamberts Run is that of an impaired but recovering stream.

In 2002, the Lamberts Run AMD Remediation Project was completed by the Natural Resource Conservation Service and trout were stocked above Lamberts Falls. This showed the progress in the recovery of this stream. Refer to Chapter III for information describing the changes to this stream based on 2005 data.

In September 2003, a Watershed Restoration Action Strategy for the Stonycreek River and Little Conemaugh River Watersheds (Subbasin 18E) was published with updated data. This action strategy listed the streams within the subbasin that were impaired based on EPA's section 303d and 305b criteria. Lamberts Run, which flows through the Flight 93 National Memorial, is listed as a tributary to Stonycreek River and was shown as impaired with AMD. The drainage area for Lamberts Run is 3.77 square miles, of which 3.07 miles are impaired, based on older 303d/305b lists.[21]

Based on data from the Department of Environmental Protection and the Natural Resource Conservation Service, as well as from the local watershed groups monitoring Lamberts Run, a significant amount of iron occurs in the headwaters of Lamberts Run and nearly none at the mouth. Iron deposited into streams smothers habitat for macroinvertebrates and produces acid. The increased acidity allows previously precipitated aluminum to go back into solution, so there is an increased aluminum level at the mouth of the stream. **Appendix E** presents the water quality data for this area.

In 2005, the Natural Resource Conservation Service, explained that, based on the updated results of the Department of Environmental Protection's water quality monitoring tests, the alkalinity of Lamberts Run started out high (60.8) in the headwaters because of the active treatment of the mine water, but then decreased to (12.9) at the mouth of the stream due to the acid production of the precipitation reaction of the iron. The acidity increased from (11.8) in the headwaters to (30.1) at the mouth, and the pH decreased with the increase in acidity. With treatment, acidity in the raw water is being reduced from 334 mg/l to 0 mg/l in the treated outflow during periods of normal flow volume, producing an average alkalinity of 77 mg/l. The excess alkalinity helps neutralize acidity down-

The Stonycreek below the Glessner Covered Bridge
(Jerry Spangler 2004)

[18]Telephone conversation between John Wilk, DEP and Eileen Carlton, Environmental Management Collaboration, Ltd., May 24, 2005.
[19]Telephone conversation between Wade Gallaher, PaDEP, and Eileen Carlton, Environmental Management Collaboration, Ltd., Feb. 25, 2004.
[20]Schmid & Company and Cahill Associates, 2004.
[21]Watershed Restoration Action Strategy (WRAS) State Water Plan Subbasin 18E, Stonycreek River and Little Conemaugh River Watersheds, Somerset and Cambria Counties, updated 9/2003.

stream in Lamberts Run and in the Stonycreek River.

Alternative 1 – No Action

Under both alternatives, the National Park Service will not acquire the subsurface rights to the land and will not assume liability for AMD, its treatment or the cleanup caused by previous mining activities. The pumping and treatment of AMD from the Diamond T mine would continue to be monitored by DEP and operation and maintenance of the treatment ponds would continue to be the responsibility of PBS Coals, Inc., through perpetuity.

Under Alternative 1, there would be no direct impacts to surface waters within the boundary as a result of National Park Service activities or improvements. Minor improvements, such as parking areas, access roads and supporting visitor facilities would be made, but none of these improvements are expected to be located adjacent to or cause runoff into surface streams.

The National Park Service will work with the Department of Environmental Protection, the Department of Conservation and Natural Resources, and the Bureau of Surface Mining, as well as with the local watershed groups, to cooperatively identify solutions to AMD discharging from unregulated sources. National Park Service will also participate in and support efforts to improve regional water quality where possible.

The threshold impact to surface waters for Alternative 1 would be Negligible.

Alternative 2 – Preferred Design Alternative

As discussed in Alternative 1, the Department of Environmental Protection would continue to monitor the water quality of Lamberts Run and PBS Coals, Inc. would be responsible for the treatment of AMD from their former mines on the site through perpetuity.

The proposed design for Alternative 2 would involve extensive grading and construction and would require measures that would prevent and mitigate potential erosion, sedimentation and runoff into surface waters. The Bowl would receive the most intense human disturbance and visitation, facilities, and paved and impervious surfaces. Alternative 2 proposes construction of a paved parking area, plaza and visitor center at the western edge of the Bowl and a second parking area at the eastern terminus of the curving walkway around the Bowl. A hard surface public plaza would be located adjacent to the Sacred Ground and would require mitigation.

Grove Run flows through the hemlock grove south of the crash site. The crash site has begun to subside over time, and the depression supports ponding and hydrophytic vegetation. Due to the hydrology of the site, a wetland will establish over time.

The threshold impact for Alternative 2 to surface waters is expected to be Minor with appropriate mitigation and containment of runoff and sedimentation.

Summary of Impacts

Under both alternatives, the Department of Environmental Protection would continue to monitor the water quality of Lamberts Run and Grove Run, and PBS Coals would continue treating AMD from the Diamond T mine. The National Park Service will work with the agencies and watershed associations to develop plans to address water quality issues in the region.

Alternative 1 would not involve extensive construction of facilities or regrading of the site and, as a result, would result in a negligible impact to surface waters. Alternative 2 proposes development and construction of facilities, roadways, parking areas and regrading of the site. Construction of hard, impervious surfaces will induce runoff and will need to be contained to prevent discharges into Lamberts Run and Grove Run. The overall effect of Alternative 2 is expected to be Minor. Use of phytostabilization under Alternative 2 would improve some areas of higher toxicity within the boundary.

HISTORIC AND CULTURAL RESOURCES

Methodology

The National Environmental Policy Act of 1969, Sections 106 and 110 of the National Historic Preservation Act of 1966 (P.L. 89-665, as amended), and *Protection of Historic Properties* (36 CFR Part 800) require Federal agencies to preserve and protect historic and archeological resources and to take into account the effects of their actions on historic properties.

Because of the events that occurred on September 11, 2001, and the enabling legislation, P.L. 107-223, which designated the site a national memorial and a unit of the national park system, the site was automatically listed in the National Register of Historic Places on November 8, 2002. Flight 93 National Memorial is a historic site that is commemorative in nature. National memorials frequently consist wholly or partly of agency created resources that are historic because they are commemorative.

The boundaries of an historic area are not necessarily coterminous with the boundaries of a park, although until documented the boundaries of an historical area are the authorized park boundaries *(CRM Guideline, Appendix Q)*. Non-historic buffer zones are usually excluded. No formal nomination process or study was conducted; therefore, little documentation on the listing is available. Specific resources within the boundary have not yet been evaluated to determine whether they contribute to the significance of the national memorial, based on the National Register criteria.

As part of this process, the National Park Service is required to coordinate with the State Historic Preservation Office (SHPO) early in the planning process (see **Appendix B**), if a proposed action has the potential to affect historic or archeological resources. Consultation with the Pennsylvania Historical and Museum Commission, Bureau for Historic Preservation was initiated on November 28, 2003. In its response, dated December 30, 2003, the SHPO responded that there were no archeological resources or historic structures recorded within the Flight 93 area. However, the SHPO noted that there is a high probability for significant prehistoric archaeological resources to be located adjacent to the wetland area just south of the crash site and on the saddle just east of the reclaimed area.

In March 2005, the National Park Service submitted to the SHPO updated information on an environmental review form. On March 23, 2005, the SHPO responded and recommended that an archeological survey be conducted in areas where mining had not previously occurred and where construction activities and ground disturbance are proposed. Specifically, the Bureau stated that there is a "high probability for significant prehistoric archaeological resources to be located adjacent to the wetland area just south of the crash site and on the saddle just east of the reclaimed area." No further concerns were expressed.

Section 110 of the National Historic Preservation Act requires that National Park Service identify and nominate all eligible resources under its jurisdiction to the National Register of Historic Places. Conversations with the Pennsylvania Bureau for Historic Preservation and the National Park Service National Register staff regarding the crash site nomination to the National Register were conducted. On March 23, 2005, the Bureau submitted a letter stating that there may be historic buildings and or structures eligible for the National Register of Historic Places within the project area. However, due to the nature of the proposed action, the Bureau's opinion was that there will be no effect on these properties.

On April 29, 2005, the National Park Service consulted again with the Bureau for Historic Preservation to advise the office of the discovery of a mid-19th century family cemetery within the Flight 93 National Memorial boundary and to acknowledge the listing of the Flight 93 crash site on the National Register of Historic Places. In August 2005, consultation occurred with the Office of the National Register in Washington, DC, regarding the possibility of future removal of the mining structures on the site and to obtain guidance on the ability of the designs to modify the area within the crash site.

Consultation with the SHPO and the Keeper of the National Register will continue. If the National Park Service determines that any resources within the national memorial boundary are eligible for inclusion in the National Register or contribute to the significance of the national memorial, the agency will provide for the long-term preservation of these resources.

Cabin in the Hemlock Grove
(OCLP 2003)

Context

The site acquired its historic significance both from the events that occurred on September 11, 2001, and from the enabling legislation, P.L. 107-223, which designated the site a national memorial and a unit of the national park system and automatically listed it in the National Register of Historic Places. Its designation as an historic site is commemorative in nature. Because the significance of individual features of the site has not been determined, in 2004, the National Park Service prepared a draft *Cultural Landscapes Inventory* (CLI) to document conditions at the site.

The Bureau for Historic Preservation noted that there is a high probability for significant prehistoric archaeological resources to be located adjacent to the wetland area just south of the crash site and on the saddle just east of the reclaimed area. The National Park Service has contracted archeologists from Indiana University of Pennsylvania to provide an overview of the park explaining the mining history and providing a brief overview of any potential resources at the crash site. This study will begin in 2006. No earth disturbing activities or visitor accesses are planned for these areas.

Three seasonal log cabins and one ashlar stone residence that were constructed between 1930

The mining landscape looking south towards the draglines from U.S. Route 30 (Jason Cohn 2004)

and 1940 exist within the hemlock grove. These structures are described in detail in the *Cultural Landscapes Inventory*. The CLI noted that the log cabins were constructed by a member of a locally prominent family (Lambert) of Stonycreek Township. These seasonal structures (c. 1930-1940s) may have local significance as examples of vernacular architecture for this region of southwest Pennsylvania.[22] Because the hemlock grove is the final resting place of the passengers and crew members of Flight 93, the National Park Service plans to acquire these lands and the associated structures in the hemlock grove for either alternative. Due to the inherent sensitive nature of this area, no development or visitor access is planned for this area during the life of this plan.

The site also includes mining structures and an industrial scrap and recycling operation that existed at the site on September 11, 2001. These structures are described in detail in the *Cultural Landscapes Inventory* but their significance has not been determined. Many of the mining buildings on the site are in poor condition and the surrounding ground is contaminated from the former mining operations. Many of these structures have already been removed or are planned to be removed as part of the PBS Coal's reclamation plan. The scrap and recycling facility will be relocated to continue operating. Several mining companies have expressed interest in purchasing and retrofitting the draglines and returning them to operation.

The National Park Service has no immediate plans to acquire these structures under either alternative as the acquisition, clean-up, stabilization, and maintenance costs are prohibitively high for structures that are not central to the mission of the memorial, which is to commemorate the actions of the passengers and crew of Flight 93. These structures are not integral to the designed landscape presented in Alternative 2. However, should the National Park Service determine that these structures are National Register eligible or contribute to the significance of the national memorial, it will provide for their long-term preservation.

In March 2005, a small family cemetery, dating from the mid-19th century (1856 through 1892) was found within the boundary at the north end of the site. This cemetery, located on PBS Coals, Inc. property south of U.S. Route 30 and west of the Camp Allegheny property line in a grove of trees, is locally referred to as the Sorber Cemetery. On April 29, 2005, the National Park Service advised the SHPO about the discovery of this mid-19th century family cemetery, which is located within the memorial boundary (refer to Chapter V – Consultation, Coordination and Compliance). The cemetery has not been evaluated and any National Register significance determined, but no development is planned for the area under either alternative.

Alternative 1 – No Action

The significance of many of the site's structural resources, such as the mining and industrial buildings, the draglines and the cabins in the hemlock grove have not been fully evaluated for their significance. Continued consultation with the Pennsylvania Bureau for Historic Preservation and the Keeper of the National Register will be conducted to determine the eligibility of the draglines and mining structures for inclusion in the National Register of Historic Places. Should the National Park Service determine that these structures are National Register eligible or contribute to the significance of the national memorial, it will provide for their long-term preservation. Under Alternative 1, the area in which the Sorber cemetery is located has not yet been confirmed for land acquisition due to funding constraints. If this area is not acquired as part of the memorial, the cemetery would receive less protection than it would with Alternative 2.

Alternative 1 would not alter, modify or adversely affect the site's existing resources. Continued consultation with the Pennsylvania Bureau for Historic Preservation and the Keeper of the National Register would be conducted to determine the eligibility of the draglines and mining structures for inclusion in the National Register of Historic Places. Under Alternative 1, the area in which the Sorber cemetery is located has not yet been confirmed for land acquisition due to funding constraints. If this area is not acquired as part of the memorial, the cemetery would receive less protection than it would with Alternative 2.

An archeological assessment of the undisturbed areas of the site is expected to be completed in the spring 2006. Because there would be limited improvements proposed for Alternative 1, no known historic, archeological or cultural resources would be affected.

The construction and installation of any monument, memorial, table, structure, planting or other commemorative installation would be prohibited within the boundary unless approved

[22]National Park Service, 2004. Draft Cultural Landscapes Inventory.

by the Superintendent and authorized by the Director of the National Park Service (36 CFR 2.62). The Superintendent will develop evaluation criteria and a process for reviewing any requests submitted for installation of these features with the Partners. This process will be described in the Superintendent's Compendium. Placement of Temporary Memorial tributes by family members and invited guests at the crash site would be permitted. Placement of tributes by visitors would continue to be allowed at the existing Temporary Memorial. These restrictions are intended to ensure that the mission and integrity of the national memorial are not compromised.

The Superintendent may allow recovered remains to be returned to the Sacred Ground, if requested by family members. All other burials would be prohibited. Section 8.6.10.2, "Family Cemeteries," of National Park Service Management Policies and Director's Order #19, *Records Management*, provide park guidance regarding actions related to family cemeteries. Access to the Sorber Cemetery would be maintained for family members and National Park Service personnel only.

The impact threshold for Historic and Cultural resources for Alternative 1 is expected to be Minor.

Alternative 2 – Preferred Design Alternative

As explained in Alternative 1, the significance of many of the site's structural resources, such as the mining and industrial buildings, the draglines and the cabins in the hemlock grove have not been fully evaluated for their significance. Many of the impacts expected under this alternative would be similar to those for Alternative 1. The treatment of the Sacred Ground, the buildings in the hemlock grove, and the mining and industrial structures would be the same.

Continued consultation with the Pennsylvania Bureau for Historic Preservation and the Keeper of the National Register will be conducted to determine the eligibility of and remaining mining or industrial structures for inclusion in the National Register of Historic Places. Should the National Park Service determine that these structures are National Register eligible or contribute to the significance of the national memorial, it will provide for their long-term preservation.

Implementation of Alternative 2 would not adversely affect the Sorber cemetery, and would offer a greater degree of protection for this resource than would Alternative 1. Access would be permitted to park personnel and to family members of those buried in this cemetery. However, within the Gateway zone, in which the cemetery is located, Alternative 2 proposes to develop a pedestrian trail, which would pass close to the cemetery and would lead to an overlook at the northeast corner of the site.

In December 2003, the SHPO commented that although no archeological sites have been recorded for this area, all areas that have not been disturbed due to mining should be evaluated for archeological potential prior to construction and ground-disturbing activities. The SHPO commented that there is a high probability for significant prehistoric archeological resources to be located adjacent to the wetland area just south of the crash site and on the saddle east of the reclaimed area. The National Park Service proposes to conduct an archeological assessment, which is expected to be completed in the spring 2006.

Based on the existing information from the regulatory agencies, there would be no effect on historic or cultural resources for Alternative 2, and therefore, the impact threshold would be Minor for this alternative.

Summary of Impacts

Under both alternatives, consultation and coordination with the Office of the National Register will continue to determine the significance of the draglines and remaining mining structures on the site. This consultation will culminate in a determination as to whether these resources are significant and are eligible for inclusion in the National Register of Historic Places. An archeological assessment of undisturbed areas will also be conducted of undisturbed areas to determine the possible presence of any prehistoric archeological resources.

Only minor improvements to the site are proposed for Alternative 1. As a result, no adverse impacts to resources at the site are projected to occur. In addition, acquisition of land in the area of the Sorber Cemetery has not yet been confirmed. Therefore, the status of protection of this resource cannot be determined. The design proposed for Alternative 2 includes development of a pedestrian pathway that would pass by the cemetery. Access to the cemetery would be restricted to family members of the deceased and to National Park Service personnel. The impact threshold for Historic and Cultural resources for both Alternatives 1 and 2 would be Minor.

Tribute left at the Temporary Memorial by Shanksville-Stonycreek School students
(NPS 2004)

The Town of Shanksville
(Jerry Spangler 2004)

SOCIOECONOMIC IMPACTS

Methodology

The Somerset County's website, historic and existing U.S. Bureau of Census data, *A Socioeconomic Atlas for Flight 93 National Memorial and its Region,* and the draft County Comprehensive Plan were used to extract data concerning the regional population, demographic trends and employment characteristics for the county.

In June 2004, visitation projections were prepared for the memorial by Dr. Bruce E. Lord, economist, from Penn State University. To establish these projections, visitor counts were obtained from The Ambassadors, who record the number of visitors to the Temporary Memorial. Visitor surveys were not conducted to gather information on visitor spending and patterns. To supplement the estimates recorded by The Ambassadors, visitation estimates at two regional National Park Service sites were used to project the pattern of increasing attendance at the memorial.

The economic impact of a new national park on its surrounding region has three main components: 1) construction of the park, 2) annual operations of the park and 3) expenditures of people from outside the area. Construction impacts are typically spread over several years and provide a significant stimulus to the local economy. Park operations are primarily represented by staffing and employment to maintain and operate the facility.

Expenditures by visitors to the area are often the largest component of the economic impacts. The addition of "new money" into a region in the form of Federal expenditures or as tourism dollars creates an economic stimulus upon the economy. The value of the goods and services purchased by this stimulus is identified as direct impacts. In the course of production, manufacturers may use intermediate inputs from other regional sectors as an input into their production process, which create added economic activity and are called indirect impacts.

The assembly of direct and indirect sales within a region supports a certain volume of employment, which, in turn, provides salaries and wages to regional households. The expenditure of employment income on regional products and services generates induced impacts. Within this study, indirect and induced impacts were combined as secondary impacts. Direct and secondary impacts comprised total impacts.

Construction is assumed to begin in mid-decade (2008 or 2009), and extend through 2011. Estimates of construction expenditures were provided by the National Park Service-Denver Service Center from the National Park Service Facility Planning Model. These expenditures were assumed to be spread evenly over the construction phase. It was further assumed that the proportion of construction contracts going toward local businesses would follow the typical pattern for the region.

The 5th and 10th anniversaries of the 9/11 events correspond to 2006 and 2011 and are considered significant milestones. Peak visitation to the memorial is expected to occur during the 10th anniversary of the event. Therefore, visitation to FL 93 National Memorial is currently estimated at 130,000 annual visitors, is projected to peak to 400,000 by 2011, and then is expected to decline and stabilize to approximately 230,000 annual visitors.

The National Park Service provided estimates of wages and employment associated with the operations of the memorial, when completed in 2011. Additional impacts would accrue from the purchases of supplies and services in the local region. It was assumed that these impacts would increase in a linear fashion between 2006 and 2011, and then stabilize thereafter.

Two regional input-output models were built for the Flight 93 National Memorial economic impact analysis. The first encompassed a nine-county region identified in the *Socioeconomic Atlas for Flight 93 National Memorial and its Region* (National Park Service, McKendry et al. 2004). A second model was constructed that focused on Somerset County and determined potential impacts to local government in the immediate region.

Information on the size and nature of visitor spending in the region was extracted from the Money Generation Model (MGM2) developed by the National Park Service and by Stynes and Propst at Michigan State University (Stynes et al. 2000). Previous studies of other park units in the region were also used to determine the proportion of visitors who were non-residents of the region, the estimated length of stay, and what proportion of their visit might be attributable to visiting the memorial (Strauss et al. 2002). Because the memorial commemorates events that resonate on a national scale, the proportion of non-resident visitors may be higher than observed elsewhere in the region.

The economic impacts of the Flight 93 National Memorial were generated through the Impact Analysis for Planning (IMPLAN) system, which is a computerized database and modeling system that establishes the regional input-output characteristics of economic activity (Olson and Lindall 1996). The version of IMPLAN used in this study is based on 2002 economic data. The impacts were further processed with the Community Impact Model of Penn State University (CIM-PSU), which was used to determine the economic impacts at the township, school board and County levels (Shields et al. 1999).

Gains in revenues and increased demands for services were identified. Payments in Lieu of Taxes were presented separately, as these payments are a function of Federal ownership and are not related to the development of a memorial. Finally, an analysis of the wage rates in impacted industries was compared with regional averages.

Impacts are reported in terms of total sales value, employment (annual equivalent of full and part time jobs), and value added. Within IMPLAN, value-added represents the portion of the total sales directed to employee income, taxes, rent, and profit.[23] It should be qualified that technically the addition of total sales from any two sectors could involve a double count where one sector's output becomes another sector's input. Value-added excludes the cost of intermediate inputs, and as such, is a better measure of the net economic gain to the region. Tables IV-2 to IV-5 found at the end of this section provide data on the projected economic impacts as a result of both alternatives. Appendix G presents a series of tabular data showing the projected economic impacts on the services and industries within the nine-county region.

Context

Chapter III-Affected Environment describes the social, demographic and economic environment of a nine-county region in southwestern Pennsylvania. The nine counties considered in the context of the Flight 93 region are Bedford, Blair, Cambria, Fayette, Indiana, Somerset and Westmoreland Counties, Pennsylvania; and Allegany and Garrett Counties, Maryland.

Alternative 1 – No Action

Alternative 1 involves continuation of current management practices at the memorial. The site would be promoted as a national memorial with limited facilities. Because a memorial feature

[23]Value-added is perhaps the best measure of impact as it represents the total accumulation of benefits to residents of the region. The sum of the value added by each industry in a region is the Gross Regional Product and is the best measure of the size of the region's economy.

Table IV-2: Alternative 1 – Estimated Economic Impact of No Action on the Nine-County Region, 2005-2020

Year	2005-2013	2014	2015	2016	2017	2018	2019	2020	Total
Number of Visitors	**802,697**	**87,065**	**87,065**	**87,065**	**87,065**	**87,065**	**87,065**	**87,065**	**1,412,153**
Visitation Impacts									
Sales	$ 44,919	$ 4,872	$ 4,872	$4,872	$ 4,872	$ 4,872	$ 4,872	$ 4,872	$ 79,024
Employment	817	89	89	89	89	89	89	89	1,438
Value-Added	$ 29,195	$ 3,167	$ 3,167	$3,167	$ 3,167	$ 3,167	$ 3,167	$ 3,167	$ 51,361
Construction Impacts									
Sales	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Employment	0	0	0	0	0	0	0	0	0
Value-Added	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Operations Impacts									
Sales	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Employment	0	0	0	0	0	0	0	0	0
Value-Added	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Total Impacts									
Sales	$ 44,919	$ 4,872	$ 4,872	$ 4,872	$ 4,872	$ 4,872	$ 4,872	$ 4,872	$ 79,024
Employment	817	89	89	89	89	89	89	89	1,438
Value-Added	$ 29,195	$ 3,167	$ 3,167	$ 3,167	$ 3,167	$ 3,167	$ 3,167	$ 3,167	$ 51,361

Nine-county region: Bedford, Blair, Cambria, Fayette, Indiana, Somerset and Westmoreland Counties, PA, and Allegany and Garrett Counties, MD.

Source: Bruce E. Lord, Ph..D., Final Economic Impacts, Flight 93 National Memorial, May 27, 2005.

and visitor facilities would not be constructed under Alternative 1, significantly lower economic benefits/impacts would be expected.

Under Alternative 1, visitation is expected to decline to 87,000 annual visitors. Total regional sales resulting from associated tourism would dip below $5 million a year. The value-added contribution to the region's gross revenue product (GRP) would be just over $3 million. This economic activity is expected to support an estimated 89 jobs in the nine-county region that did not exist prior to the 9/11 events. Total regional impacts for the 16-year planning period would fall from $331 million in total sales to only $79 million. Similarly, value-added is expected to decline from $212 million to $51 million. The impact threshold for Alternative 1 for economic impacts would be Major, due to low economic benefits.

Alternative 2 – Preferred Design Alternative

Construction Impacts. Based on National Park Service estimates, an estimated $51 million[24] would be needed for the construction of the memorial feature, a visitor center and associated infrastructure. The design and construction phases of developing the memorial and infrastructure are projected to take six years (2006-2011) and result in an additional $39 million in sales by business and industry throughout the nine-county region. The total sales impact is expected to be $90 million. The value-added contribution to the region's economy would be more than $46 million, of which about $30 million would be wages and salaries supporting more than 1,134 jobs[25].

The principal impacts would occur in the construction industry, where $52 million in sales would support an estimated 666 jobs in the region. Retail trade (114 jobs), professional/scientific/ technical services (62 jobs), and health and social services (58 jobs) would all experience job gains. Another significant impact is expected to occur in government and other non-classified industries. Although the employment impact was only three jobs, a high level of value-added benefits is expected to result from the gains in equity to homeowners who are employed in businesses affected by construction.

Operation Impacts. The primary impacts of the operation of the fully built memorial would stem principally from jobs that the memorial itself supports, as well as from operational monies spent in the region. The National Park Service estimates that the memorial could be staffed by as many as 14 people generating a payroll of $800,000, including benefits. An additional $200,000 in supplies and services would be required to operate the memorial. The expenditures by National Park Service employees, as well as supplies and services purchased in the region, would result in an annual direct impact of $741,000 in sales by regional businesses. Secondary impacts of $231,000 per year will bring the resulting annual regional sales impact to $972,000 per year. When the wages and benefits of the National Park Service employees are included, the total annual value-added to the region will amount to $1.2 million. Of this total, $1 million will be in the form of wages and salaries supporting an estimated additional 22 jobs in the region.

The economic impacts of operating the memorial is expected to have the greatest impact on the retail trade industry, supporting just over two jobs and capturing over $82,000 of value-added annually. The next most significant impact would occur in health and social services, with an estimated 1.4 annual jobs and a $57,000 value-added contribution to the region's economy. Further gains to the region's economy again are expected to occur in the government and non-classified industries, as those employed directly in support of the memorial's operations register their gains in home equity.

Visitation Impacts. Visitation to the Flight 93 National Memorial is expected to increase throughout the construction phase and peak on the 10th anniversary of the 9/11 events. Thereafter, it is anticipated that visitation will stabilize at about 230,000 per year. The distribution of visitors by origin and type of trip was modeled after other National Park Service sites in the region.[26]

Expenditure levels were taken from the MGM2 model,[27] which includes National Park Service estimates for groups visiting historic sites of this

[24]Gross construction for the memorial feature was estimated by National Park Service at about $29.38 million, construction of the visitor center was estimated at $9.2 million and associated infrastructure was estimated at $12.87 million for the planning budget used in the competition. Those figures have since been revised.

[25]Care must be taken to bear in mind that these are the total impacts and, in particular, the employment impacts would occur over the entire six-year design and construction period, and would not all occur in any one year. The average employment impact would be an estimated 189 jobs a year over the constructions period.

[26]Because of the national significance of the 9/11 events and the continued heightened awareness due to the ongoing war in Iraq, these estimates may be conservative.

size. Once the system stabilizes, $9.6 million in direct sales to visitors, plus and additional $4.3 million in multiplier effects, are expected to result in a total of $13.6 million in additional sales by regional businesses and industries each year. The annual value-added contribution to the Gross Regional Product (GRP) was over $8 million. Half of this GRP ($4.2 million) are expected to occur as wages and benefits supporting an estimated 234 annual jobs in the region.[28]

Most of the visitor impacts are expected to occur in accommodation and food services sectors (150 jobs, $4.6 million of value-added). The retail trade sectors would gain an additional estimated 38 jobs and contribute over $1.2 million of value-added to the region's economy. These impacts were largely supported by the direct spending of visitors to the region. However, an examination of the secondary sales impacts illustrates that the total effects of the tourism spending would have broad economic impacts across the nine-county region, touching all sectors.

As mentioned in Chapter III, Socioeconomic Characteristics, Somerset County assesses a 3-percent hotel tax that generates from $500,000 to $700,000 per year.[29] It can be expected that as the memorial is developed and visitation increases to about 230,000 visitors per year revenue generated from this tax will also increase, thus producing positive economic benefits to the county and the region.

Businesses serving tourists, such as lodging, restaurants and bars, will experience many of the benefits from tourism. In addition, opportunities will also be created for the establishment of new enterprises in the region.

Most of these changes are likely to occur around the Somerset interchange where this type of development currently exists. However, depending upon the final selected access route to the memorial, additional economic development could occur. The most logical place for such development would be along U.S. Route 30, near the proposed park entrance. The type of development that may occur could resemble small "mom and pop" stores, such as the Duppstadt Country Store, offering food, drink and some souvenirs. However, since Stonycreek Township has no zoning ordinances in effect, the exact nature of such development can only be speculated.

Local Government Impacts

Local government impacts were calculated for key components of county, township, and school district in the region surrounding the memorial. These impacts are based upon annual operations and visitation once the site is developed and operating, and will most likely be higher during construction.

Somerset County. After 2012, the Somerset County government is expected to gain an additional estimated $154,955 of revenue annually from memorial-related activity, while benefiting from an additional estimated $140,960 in increased expenditures for services (Table IV-4).

Real property taxes are expected to grow by $51,177 annually; other miscellaneous county revenues are expected to grow by $52,519 per year. Miscellaneous expenditures are expected to rise $38,421 annually. Expenditures for human services, including mental health, children, and veterans affairs, would also increase. In total, the county government should experience a modest net gain of $13,995 per year. Total sales impacts during the 15-year planning period for Somerset County were estimated at $273 million, with a value-added of $176 million. During the steady operations phase, annual sales impacts were estimated at $11.5 million, with a value-added of $8.3 million after 2012. An estimated 235 jobs were projected to occur during this period.

Municipal. Municipalities in the region, especially Stonycreek Township, are expected to realize a $209,375-increase in expenditures once the memorial is fully developed by 2011 (Table IV-5). The projected $184,959-increase in revenues would offset most of these increases, but would leave the township with a $24,959-shortfall attributed to memorial visitation and operations.

The largest itemized increase in expenditures would be $54,564 for road maintenance, followed by $18,487 in administrative costs. Expenditures for police protection are expected to increase by $14,238.[30]

Country store at intersection of Buckstown Road and U.S. Route 30 (Flight 93 National Memorial Area: Design and Development Concepts 2004)

[27]National Park Service Money Generation Model (MGM).

[28]Bruce E. Lord, Ph.D. Feb. 17, 2005. Final Flight 93 NM Visitation Estimates.

[29]Bruce E. Lord, Ph.D. Economist. Email, Oct. 28, 2005.

[30]These impacts are spread among municipal governments throughout the region. Stonycreek Township, in particular, does not have a police force. However, the Flight 93 National Memorial extends into Shade Township, which has a local police force. These estimated costs will be shared by other municipalities and by the Pennsylvania State Police, which has primary responsibility for policing rural townships that do not have their own police force.

In terms of revenue, an additional estimated $24,633 from property taxes and $132,301 from miscellaneous sources, such as fees and permitting, are expected to occur.

Although the Pennsylvania State Police provides protection to Stonycreek Township and the fire response service is provided by local volunteer fire companies, municipalities usually fund their volunteer companies through appropriations, such as a special fire tax, fire hydrant rental fees or a combination of all of these funding sources. Volunteer fire companies still require funds for equipment purchases and maintenance, station maintenance, workers compensation, liability insurance and other operating expenses.

National Park Service law enforcement staff have police authority on park land and would manage problems that might occur within the memorial boundary. The majority of the State Police responsibilities would most likely occur from accident investigations associated with increased traffic generated by visitors to the memorial.

Starting in 2001 after completion of the memorial, the Shanksville-Stonycreek School District is projected to realize $478,018 annually in increased expenditures, while gaining an additional $444,676 in revenues. These increased revenues will offset all but $33,341 of the increased expenses. The largest increase in expenditures is projected for instruction ($270,162). Revenue gains are expected to occur primarily from property taxes ($125,240) and from State aid ($275,101).

Regional Impacts. Development of a permanent memorial and a visitor center will increase economic activity within the region. This activity will place increased demands upon local government for services such as road maintenance and fire and police protection. At the same time, the increased economic activity will result in additional revenues accruing to Somerset County, Stonycreek Township, and the Shanksville-Stonycreek School District. Overall, County government should see a modest net increase in revenues, while municipal government and school districts will incur a slight loss due to the memorial's operations and visitations.

Over the 15-year planning horizon, memorial operations are expected to gradually grow until they reach $698,000 in sales by 2011 and have a $1.2 million value-added impact on the economy. By this time, 22 people would be employed in the region as a result of the memorial's operations. The total impact for the planning period would be an estimated $8.7 million in sales and $15.2 million in regional value-added.

During the first eight years of the project, total regional sales impacts from visitation are estimated at $129 million, followed by $13 million in annual sales thereafter. Total sales impacts from visitor spending for the entire period are expected to equal $232 million. Value-added would follow a similar pattern totaling $84 million in the first eight years and then stabilizing to a steady $8.4 million per year for a total of $151 million during the planning period. Employment impacts are expected to reach more than 2,300 jobs during the first eight years for an average of 293 per year and then decline to 234 jobs per year thereafter. The total tourism impacts over the 16-year planning period are expected to amount to $232 million in regional sales and $151 million in value-added.

Overall, total regional sales impacts are expected to amount to $222 million over the first 8 years of the project and then stabilize to $23.6 million per year from 2013 onward. Value-added followed a similar pattern, totaling $135 million during the build and growth phase, and then reach a steady state of $10 million annually in the later years of the project. Employment is expected to total 3,580 jobs during the first years (an average of 447 jobs per year) and then fall to 256 positions annually through 2013 onward. The total regional sales impact of the memorial over the 16-year planning horizon is expected to reach $331 million. A $212 million value-added gain would be realized in the region during this same period.

Township. Alternative 2 would bring increased demands upon local government services, such as road maintenance and fire and police services. At the same time, increased economic activity would result in additional revenues accruing to Somerset County, Stonycreek, Somerset, Jenner, Shade and Quemahoming Townships, as well as and the Shanksville-Stonycreek School District. Overall, the County government should see a modest net increase in revenues, while municipal government and school districts will incur a slight loss due to the memorial's operations and visitations. These impacts do not include improvements in infrastructure that will be required to serve visitors, the largest of which is likely to be for the construction and improvement of roads to the memorial.

Payments in Lieu of Taxes. Whenever loss of taxable land occurs due to significant Federal property ownership, the government compensates local governments for the loss of the tax base under the Payment in Lieu of Taxes Program. Payments under this program are fixed

by Congress, and a maximum per capita payment is also set by legislation. Payments in Lieu of Taxes for the land acquired by National Park Service for the memorial would be modest, and are expected to equal a maximum $1.65 per acre. Therefore, if National Park Service acquires an estimated 1,355 acres for the core portion of the memorial, an additional $2,236 ($1.65 x 1,355 acres) could be provided to County government from Payments in Lieu of Taxes to compensate for loss of the tax base on this land.

Summary of Impacts

Alternative 1 is projected to support an estimated 89 new jobs in the nine-county region that had not existed prior to September 11, 2001. This compares with more than 2,300 jobs, averaging 293 jobs per year during the first eight years for Alternative 2 after a permanent memorial is constructed. The economic benefits of Alternative 1 would be minor, whereas the economic difference between Alternative 1 and Alternative 2 would be $252 million in total sales within the nine-county region over the 15-year planning period.

The projected sales revenue for the nine-county region is expected to amount to $79 million for Alternative 1, compared with $331 million for Alternative 2. Similarly, the value-added component for Alternative 1 would be slightly more than $51 million, compared with a $212 million value-added gain in the region over this same period if a permanent memorial is constructed.

The long-term economic impacts of the memorial will principally accrue to lower paying industries in the region. This situation is normal for tourism-based development. While some higher paying jobs are also a component on the memorial's impact, in the long-term, the memorial by itself would not provide substantial economic development for the county. However, if visiting the memorial is successfully promoted and packaged with other tourist sites in the region, additional economic benefits could be realized. A possible side effect of the memorial is to increase the profile of Somerset County and thereby attract the attention of potential employers who may be looking for a place to relocate or establish businesses.

The impact threshold for Alternative 1 would be Major because of the anticipated low economic benefits that would result from this alternative. Conversely, with full development of a memorial and associated infrastructure, Alternative 2 would result in a Moderate economic impact, as the economic benefits to the community are expected to increase.

Table IV-3: Estimated Total Impacts of Flight 93 National Memorial Design and Construction on the Nine-County Region, 2006-2011

Industry	Direct Sales	Secondary Sales	Total Sales	Value-Added	Wages	Employment
Ag, Forestry, Fish & Hunting	$0	$267,995	$267,995	$109,099	$28,261	4
Mining	$0	$184,093	$184,093	$104,591	$30,935	1
Utilities	$0	$904,109	$904,109	$575,744	$171,069	2
Construction	$51,450,000	$319,004	$51,769,004	$23,001,504	$17,970,446	666
Manufacturing	$0	$4,265,695	$4,265,695	$1,385,520	$958,769	25
Wholesale Trade	$0	$2,101,074	$2,101,074	$1,521,170	$773,242	19
Transportation & Warehousing	$0	$2,193,062	$2,193,062	$1,139,728	$755,413	21
Retail trade	$0	$5,862,744	$5,862,744	$4,401,560	$2,207,573	114
Information	$0	$1,285,807	$1,285,807	$690,614	$296,889	8
Finance & insurance	$0	$2,371,304	$2,371,304	$1,323,433	$606,463	17
Real estate & rental	$0	$1,566,475	$1,566,475	$944,044	$157,389	12
Professional/scientific/technical Services	$0	$4,386,291	$4,386,291	$3,172,245	$2,066,115	62
Management of companies	$0	$502,879	$502,879	$347,850	$237,544	3
Administrative & waste services	$0	$1,158,338	$1,158,338	$632,067	$467,822	26
Educational services	$0	$257,701	$257,701	$134,058	$120,823	6
Health & social services	$0	$3,815,325	$3,815,325	$2,228,897	$1,766,145	58
Arts- entertainment & recreation	$0	$330,161	$330,161	$161,311	$96,733	8
Accommodation & food services	$0	$1,590,463	$1,590,463	$692,034	$509,526	44
Other services	$0	$1,912,246	$1,912,246	$903,365	$624,974	34
Government & non-NAICs	$0	$3,543,533	$3,543,533	$2,760,904	$106,434	3
Institutions	$0	$0	$0	$0	$0	0
Total	**$51,450,000**	**$38,818,298**	**$90,268,298**	**$46,229,737**	**$29,952,566**	**1,134**

Source: Bruce E. Lord, Ph.D., Final Economic Impacts, Flight 93 National Memorial, May 27, 2005.

Table IV-4: Potential Long-Term Changes in Somerset County Expenditures and Revenues, Flight 93 National Memorial

County Government Expenditures	Baseline	Direct, Indirect and Induced Effects	Percent of Total
Elderly human services	$316,666	$2,267	0.7%
Other human services	$6,142,057	$35,034	0.6%
Corrections	$3,585,711	$20,938	0.6%
Judicial	$3,320,632	$18,974	0.6%
Administration	$4,388,885	$25,325	0.6%
Other	$6,031,740	$38,421	0.6%
Total County government expenditures	**$23,785,691**	**$140,960**	**0.6%**
County Government Revenues	**Baseline**	**Direct, Indirect and Induced Effects**	**Percent of Total**
Real property tax	$8,809,515	$51,177	0.6%
State aid	$8,174,595	$46,177	0.6%
Federal aid	$199,206	$2,608	1.3%
National Park Service Payments in Lieu of Taxes		$2,475	
Other	$8,769,039	$52,519	0.6%
Total County government revenues	**$25,952,355**	**$154,955**	**0.6%**

Source: Bruce E. Lord, Ph.D., Final Economic Impacts, Flight 93 National Memorial, May 27, 2005.

Table IV-5: Potential Long-Term Changes in Municipal Government Expenditures and Revenues with the Flight 93 National Memorial

Municipal Government Expenditures[1]	Baseline	Direct, Indirect and Induced Effects	Percent of Total
Government administration	$3,247,616	$18,487	0.6%
Police[2]	$2,391,267	$14,238	0.6%
Fire	$621,428	$3,612	0.6%
Road maintenance	$9,571,419	$54,564	0.6%
Waste and sewer	$590,476	$3,661	0.6%
Water	$1,805,554	$10,329	0.6%
Other	$18,227,760	$104,483	0.6%
Total municipal government expenditures	**$36,455,519**	**$209,375**	**0.6%**
Municipal Government Revenues	**Baseline**	**Direct, Indirect and Induced Effects**	**Percent of Total**
Property tax	$4,121,424	$24,633	0.6%
Earned income tax	$3,976,187	$22,180	0.6%
All other taxes	$1,106,348	$5,844	0.5%
All other revenue	$23,068,231	$132,301	0.6%
Total municipal government revenues	**$32,272,189**	**$184,959**	**0.6%**

[1]Includes municipalities within the region.

[2]These impacts are spread among municipal governments throughout the region. Stonycreek Township in particular does not have a police force and these estimated costs will be shared by other municipalities in the county and by the Pennsylvania State Police, which has primary responsibility for policing rural townships which do not have their own police force. Includes school districts within the region.

Source: Bruce E. Lord, Ph.D., Final Economic Impacts, Flight 93 National Memorial, May 27, 2005.

POTABLE WATER SUPPLY AND SEWAGE CONTAINMENT

Methodology

In April 2005, The EADS Group, Inc. conducted a potable water supply and sewerage feasibility study for the Flight 93 National Memorial. The following four water supply options evaluated were—

1. Develop a Deep Well Onsite
2. Connect to Indian Lake Borough's Water System (Public Supply)
3. Connect to the Shanksville School Well (Private Supply)
4. Connect to Camp Allegheny's Water System (Private Supply)

The three options assessed for sewage containment were—

1. Onsite Sewage Disposal
2. Convey to Shanksville Borough's Sewage Treatment Plant (Public System)
3. Convey to Camp Allegheny's Sewage Treatment Plant (Private System)

The National Park Service provided projected visitation estimates and information concerning the most likely locations for a new visitor center within the boundary. An estimated 5 gallons of water per visitor per day was assumed. The local climate and an assumption that memorial visitation would be most pronounced over 274 days (nine months) were considered. Based on an annual estimated visitation of 230,000 visitors per year using 5 gallons per day over 274 days, the average daily water demand was projected at 4,200 gallons per day. At least a 3-day water supply was recommended for domestic water storage, which amounted to 12,600 gallons, which was rounded up to 15,000 gallons.[31]

Other factors affecting water demand included an automatic sprinkler system, an outside hydrant hose stream flow for a new visitor center and possible use of water from a pond onsite for fire trucks. A fire flow of 1,500 gallons per minute (gpm) for a 2-hour duration was estimated, resulting in the need to store 180,000 gallons of water for fire protection. The fire flow requirement of 1,500 gpm was based on the Fire Suppression Rating Schedule. The factors used to determine the Needed Fire Flow included the construction type and area of the building, the occupancy combustibility class, and the influence of exposed and communicating buildings around the subject building. When a final memorial design is selected and all facilities are defined, the Needed Fire Flow will be revisited to determine actual needs.

Casselberry and Associates identified six (6) locations suitable for exploratory drilling for a production well **(Appendix F).** A yield capacity of at least 10 gpm (gallons per minute) or more was projected to adequately serve the needs of the memorial. Water quality from these test wells is expected to be excellent, requiring no treatment other than required treatment to meet DEP requirements.[32] To determine the locations of test well sites, several aerial photographs were analyzed for fracture traces. Based upon fracture-trace mapping, three potential test well sites in the headwaters of both Lamberts Run and Grove Run were identified. Appendix F shows the locations for these test wells.

From the domestic water demand calculations, the daily sewage flow and the design daily demand year were both projected at 4,200 gpd. In sizing facilities for hydraulic loading, a peak daily flow rate of at least 250 percent of the average daily flow was calculated, and the peak daily flow rate recommended for design was 10,500 gpd.[33]

Context

Potable Water Supply. The only existing potable water supply within the memorial boundary is located at the Diamond T shower house. The current yield and water quality of the existing well indicated that it is unlikely that this well could be developed to accommodate projected demand.

Although connection to the Indian Lake Borough's water system was determined feasible, Indian Lake Borough has opposed any new or additional discharge of treated sewage effluent to the lake due to the impacts that it would have to Indian Lake. Further, the Borough has indicated that it is not interested in selling water to the park. The western system, the system closest to the memorial, is reserved for the growing Indian Lake community and is not for sale. The eastern system, which serves the east side of Indian Lake Borough, does not have capacity to accommodate the future demand for the memorial. Further, the operator reported that the iron and manganese levels in the raw water exceeded DEP's requirements and would require treatment.

[31]The EADS Group, Inc. and Casselberry and Associates. May 2005. Final Flight 93 National Memorial Water and Sewerage Study. pp. 2-3.
[32]Ibid., p. 6.
[33]Ibid.

Village of Lambertsville
(Jerry Spangler 2004)

Although connection to the Shanksville School well is feasible, the school's water needs would take precedence and could not be interrupted or adversely affected. The Shanksville School well is a private supply source, and modifications to the well pump controls would be required so that water could be pumped to the memorial without pumping to the school. This option would require waterlines to be routed through Shanksville Borough into Stonycreek Township to the memorial. Selection of this option would also enable the service of water to residents and businesses located along the waterline.

Connection to Camp Allegheny's water treatment system would be feasible, although the quantity and quality of this water supply could change radically because the wells at the camp draw from the mine pool water down in the coal measures. However, conveyance of sewage from the memorial to Camp Allegheny would also require the camp update its NPDES permit and expand its discharge limits, which would require approval by DEP.

During the mid 1990's to 2000, a persistent drought, coupled with mining operations, occurred that caused these wells to decline to less than 5 gpm. The decline in the capacity of these wells may also have been related to subsidence fracturing and de-watering activities associated with a large deep mine complex that underlies the entire Flight 93 National Memorial site. Therefore, both the quality and yield of these wells could be subject to fluctuations driven by management of the mine pool water. Camp Allegheny is also a private supplier, which means that the current owners and policies could change at any time. This water source would not offer the park a long-term reliable supply.

Sewage Disposal. Currently, sewage containment from visitors to the Flight 93 National Memorial is conducted through the use of portable toilets. The memorial has two areas within the core lands where sewage disposal systems had formerly operated. These systems are listed below and were determined unsuitable:

- Diamond T Mine Shop and Warehouse – utilized a "gravel pit" that was not permitted and is not suitable for the memorial's use.
- Diamond T Mines "C" and "D"– utilized a sewage treatment plant, which is currently not operating. This plant is estimated to have a 2,500 gpd capacity and is not considered suitable for the memorial's use.

The Rollock scrap and recycling operation utilizes a sewage holding tank, which has to be periodically dewatered and the liquid hauled to a sewage treatment plant. This system is also not suitable for the memorial.

If an on-lot sewage system is constructed, the average daily design flow would accommodate 4,200 gpd, and the on-lot system would be designed to treat 16,800 gpd (400 percent of this average daily flow). A 17,000-gallon septic tank and a 17,000-gallon dosing tank would be selected.

Conveyance of sewage to the new Shanksville Borough Sewer System and Sewage Treatment Plant, which is expected to be constructed and operational in the fall of 2005, would involve installation of a 6,900-foot gravity sewer line that would extend toward Lambertsville Road on the west side of the memorial. At Lambertsville Road, the force main would continue south about 6,300 feet along the right-of-way to Lambertsville Road.

Conveyance of sewage to Shanksville Borough is feasible and would be consistent with the Stonycreek Township Act 537 Sewage Facilities Plan. If this option is selected, residents and businesses located within this area along Lambertsville Road would also benefit from the extended sewage service, although residents would be required to pay for their connection. The Shanksville sewage facility is estimated to have a design flow capacity of 50,000 gpd. In total, 112 properties, including the Shanksville School, would be connected to the system, equaling 131 EDUs (equivalent dwelling units).

Using 2000 Census data and conforming to the Shanksville Borough's DEP-approved Act 537 Sewage Facilities Plan, the corresponding average daily sewage flow to the plant would be as follows:

- Shanksville Borough Customers:
  102 EDU's x 2.55 persons/EDU
  x 100 GPD/person = 26,010 GPD
- Stonycreek Township Customers:
  29 EDU's x 2.71 persons/EDU
  x 100 GPD/person = 7,859 GPD
- Total existing sewage flow = 26,010 + 7,859
  = 33,869 GPD

Based on these projections, reserve capacity in the Shanksville Borough Sewage System = 50,000-33,869 = 16,131 gpd, or about 60 EDUs.

Alternative 1 – No Action

Water Supply. Under Alternative 1, the park would not develop a potable water source, such as a deep well onsite nor would the park connect to an offsite water supply. The vault toilets proposed for visitors would contain chemical cleanser for hand washing.

During scoping in 2003, the Bureau of Abandoned Mine Reclamation, PA DEP, Cambria office, offered the National Park Service an opportunity to partner in a program to extend public drinking water services. This program provides drinking water to residents whose drinking water had been adversely affected by mining activities.

Sewage Disposal. Alternative 1 would involve continued use of vault toilets at the Temporary Memorial parking area. Costs would involve continued maintenance of existing toilet facilities.

The impact threshold for Alternative 1 would be Negligible.

Alternative 2 – Preferred Design Alternative

Water Supply. Four options for potable water sources were considered for Alternative 2: 1) a deep well onsite, 2) connection to Indian Lake Borough's public supply, 3) connection to the Shanksville School well private supply, and 4) connection to Camp Allegheny's private supply. The costs for these possible water supplies are shown in Table IV-6.

Table IV-6: Alternative Potable Water Supplies, Flight 93 National Memorial

Potable Water Source Option	Estimated Construction Cost	Estimated Annual Operation & Maintenance Cost
Deep Well Onsite	$941,000	$11,000
Indian Lake Borough	$1,343,000	$11,600
Shanksville School Well	$1,603,000	$14,200
Camp Allegheny	$1,058,000	$8,500

Source: The EADS Group, April 2005.

Sewage Disposal. Alternative 2 considers three sanitary sewage service options. These options and their costs are outlined in Table IV-7.

Table IV-7: Alternative Sanitary Sewage Service Options, Flight 93 National Memorial

Sewage Service Option	Estimated Construction Cost	Estimated Annual Operation & Maintenance Cost
Onsite Sewage Disposal	$811,000	$10,000
Convey to Shanksville Borough's Treatment Plant	$1,123,000	$10,500
Convey to Camp Allegheny	$1,074,000	$10,700

Source: The EADS Group, April 2005.

Use of gravity sewers and a force main to convey sewage from the memorial to the Shanksville Sewage Treatment Plant was considered. To implement this option, a gravity sewer would be installed beginning at the proposed visitor center, parallel to the existing driveway leading west toward Lambertsville Road. At a point about 500 feet from Lambertsville Road, a low point in the line would require a pumping station to pump the flow to Lambertsville Road. The force main continue south within the right-of-way of Lambertsville Road about 6,300 feet, as it descends down to a low point in the profile at Grove Run. It would then climb uphill to a location where it can transition back to gravity flow. At this point, a gravity sewer of about 6,900 feet in length would reach the Shanksville Sewage Treatment Plant. The final 2,000 feet would extend outside the PennDOT right-of-way.

Conveyance of sewage from the memorial to Shanksville would conform to the Stonycreek Township Act 537 Sewage Facilities Plan. This plan recommends that public sewer service from the Lambertsville area be conveyed using a combination of gravity sewers and force main to the Shanksville Borough sewage treatment plant. The Flight 93 National Memorial is located within this area and is consistent with the Act 537 plan to include Lambertsville within the service area.

If this option for conveying sewage from the memorial is selected, about 30 properties along Lambertsville Road would be required to connect to the new sewer system, per the Stonycreek Township Mandatory Connection Ordinance. Each property owner connecting to a proposed line would be responsible for the cost

of constructing a new sewer lateral from their structure to their property line. Based on 2005 estimates, this cost would be approximately $500 per connection. Although there would be an economic impact caused by the connection fee, the long-term environmental benefits to the community and the region's water resources would be significantly improved. The municipality would be responsible for providing a wye connection on the new sanitary sewer or force main, and extending a lateral to each property served. Properties connecting along the force main would also be required to install a sewage grinder pump. If the Stonycreek Township Act 537 Sewage Facilities Plan recommendation to extend public sewer to Lambertsville is implemented, these same 30 properties would be required to connect to the new system even if the memorial is not developed.

Based on estimates calculated by The EADS Group, the memorial's design flow was estimated to be 4,200 gpd, which equals 16 EDUs. Combined with the 30 private EDUs, a total of 46 EDUs would be conveyed into the Shanksville System. The feasibility study determined that the Shanksville sewage plant would have at least 60 EDUs of available capacity and would be able to accommodate the memorial's sewage disposal needs, as well as the private properties along Lambertsville Road. If there are lengthy delays in connecting the memorial to the Shanksville Borough sewage system and growth resulting in more than 14 new EDUs occurs in the township, expansion of the Shanksville Sewage Treatment Plant would be needed.

Future expansion of the Shanksville Borough Sewage Treatment Plant is included in both the Shanksville Borough's and Stonycreek Township's Act 537 Sewage Facilities Plans. Key components of the Shanksville Borough Sewage System, such as interceptor sewers and force mains, are being constructed to accommodate future public sewer service expansion into Stonycreek Township. The estimated cost for the proposed sewage system is $1,123,000, with an annual operation and maintenance cost of $10,500.

A final decision selecting the option for sewage disposal would be made during design development. The impact threshold for potable water supply and a sewage containment system for Alternative 1 would be Minor. Depending on the option selected, the impact threshold for Alternative 2 for water and sewage service would be Minor.

Summary of Impacts

The same options for a potable water supply and a sanitary sewage system were considered for both alternatives based on a feasibility study conducted by The EADS Group. Alternative 1 does not propose to develop a potable water supply or an onsite sewage disposal system, or connect to a public sewage line. Alternative 1 would involve use of vault toilets. The impact threshold is expected to be Negligible for water and sewerage for Alternative 1.

Given the projected visitation to the memorial for Alternative 2 (230,000 annual visitors) and the full development of the site, construction of the Shanksville Borough's sewage system could be extended to the memorial along Lambertsville Road. The national memorial lies within the Shanksville sewage area. If selected, this option would result in a Minor impact threshold, as extension of the Shanksville Borough's sewage lines along Lambertsville Road would require that 30 additional homes relinquish their existing septic systems and connect to the public sewer service. However, if Stonycreek Township implemented its Act 537 Sewage Facilities Plan recommendation to extend public sewer to Lambertsville, these same 30 properties would be required to connect to the new system even if the memorial was not developed. The ability for these homes to connect to a public sewer service may cause a short-term economic impact to the residents, but would create long-term environmental benefits.

Property values could also be expected to increase as the availability of public sewer and water services usually generates additional development in rural areas. A final determination on the selection of the preferred options for potable water supply and sewage disposal at Flight 93 National Memorial will be made during design development.

LAND USES

Methodology

The area surrounding the memorial was investigated numerous times during the planning phase to determine existing land uses and to understand areas where potential changes could occur and affect the intended visitor experience at the memorial. Coordination with the Somerset County Planning Commission was conducted and reference to the draft Somerset County Comprehensive Plan and county ordinances was made throughout the process.

Context

Somerset County has adopted limited resolutions to 1) regulate and restrict the height of structures in the vicinity of the Somerset County Airport (Ordinance No. 3, adopted in 1992), 2) to regulate the types of buildings and development around the Somerset interchange with Route 219, and 3) guide the growth in the county through the Subdivision and Land Development Ordinance of 1998, as amended. The subdivision ordinance also guides the location of wind farms and cell towers in the county. No land use controls exist in Stonycreek or Shade townships.

A coal strip mine, owned by Berwind Corporation and currently under reclamation, is located on the north side of U.S. Route 30, across from the proposed memorial entrance and within the memorial boundary. To the west of the proposed entrance is Costagna's restaurant. In 2003, a communications cell tower was installed on the north side of U.S. Route 30 directly across from the memorial. To the west along U.S. Route 30 toward Stoystown, a salvage yard, a restaurant and an adult bookstore are located within several miles of the memorial.

Camp Allegheny, a United Methodist church camp, lies east of the memorial adjacent to the boundary and just south of U.S. Route 30. The Duppstadt Country Store is located on the southeast corner of the intersection of Buckstown Road and U.S. Route 30. Heading south along Buckstown Road, Buckstown Canoe and Kayak is located on the west side about 0.5 miles from Skyline Road. Other small businesses and home-based operations are also located along this road. The perimeter viewshed contains residences, wood lots, and small farms. The Lambert farm stretches across a hillside, southeast of the memorial, creating a picturesque backdrop to the view of the landscape from most points inside the memorial.

Skyline Road extends east-west through the southern portion of the site between Buckstown Road on the east and Lambertsville Road on the west, and currently serves as the direct entrance route to the memorial. Several residences and wooded areas lie immediately south of the memorial. Most of the property located to the west of the memorial boundary is residential with open fields. Highland Tank & Manufacturing Co., Inc. is situated to the west of the intersection of Lambertsville Road and U.S. Route 30.

In 2004-2005, a privately owned game preserve opened for hunting wild boar and deer. This preserve, open year-round, lies about 600-800 feet from the crash site and is adjacent to the hemlock grove. There are two pens, one 62 acres and the other 18 acres.

Alternative 1 – No Action

Alternative 1 would involve the continued approach to the memorial from the west using U.S. Route 30 to Lambertsville Road. Highland Tank & Manufacturing Co., Inc., located on the south side of the intersection of Lambertsville Road and U.S. Route 30, presents turning and sight distance safety issues for buses and for other vehicles. The buildings and vegetation on the southwest and southeast corners obstruct drivers' views to the east and west when attempting to exit onto U.S. Route 30. Lambertsville Road is narrow at this intersection and presents difficulty when turning south from U.S. Route 30. Residences are situated along both sides of Lambertsville Road and are very close to the edge of the road pavement and are adversely affected by buses and vehicular traffic, including motorcycles, as well as noise and exhaust fumes. Necessary roadway improvements to create a safe environment for visitors and residents could severely impact businesses and residences along Lambertsville Road.

In 2004, Somerset County and five local jurisdictions agreed to conduct the Flight 93 National Memorial Area Corridor Planning Study. Land uses along access routes to the memorial will be studied to determine land use compatibility with the desires of residents, business owners, and county plans. Results of this study will aid in ensuring that future land uses are compatible and retained and incompatible development is discouraged.

The proliferation of wind farms in Somerset County presents a concern to the visual and aesthetic values of the memorial. A new wind farm has been proposed for Reels Corner in Shade Township, north of U.S. Route 30, though it has not yet been approved. Several other wind farms in Stonycreek Township have been approved (Chapter III). The wind turbines, some more than 380 feet high, would most likely present visual intrusions from the memorial.

Although high-quality fencing was constructed around the perimeter of the game preserve adjacent to the southwest side of the memorial, wild boars are known to escape fenced areas and become major problems. The Pennsylvania Game Commission believes the fence was installed underground to eliminate the potential for animals to escape. Periodic patrol of the fence to monitor for evidence of digging is

Rural Somerset County
(Jerry Spangler 2004)

advised. Boars, in particular, present threats not only to the memorial's resources, but if they escape from the farm, they could present threats to the safety of park employees and visitors.[34]

Shooting of high-powered hunting rifles in the game preserve near areas accessed by family members and park employees is also a safety concern. Impacts to the intended visitor experience at the memorial can be expected to occur. The park should work with the preserve landowner to ensure that a sound and safety zone is established for visitor protection.

Although a perimeter viewshed buffer zone is proposed for Alternative 1, the impact threshold for adjacent land uses would be Major. Areas along US Route 30 within the boundary would experience heavy development pressures. These lands are not proposed for acquisition. Without a memorial feature or fully developed park, the public is less likely to support land use planning for the areas surrounding or leading to the memorial. Furthermore, if roadway improvements are necessary, the residences and businesses along Lambertsville and Buckstown roads could be significantly impacted.

Alternative 2 – Preferred Design Alternative

Alternative 2 would create a new entrance directly from U.S. Route 30 and close entrances from Lambertsville and Buckstown Roads. This new entrance would remove visitor traffic from local roads and dramatically improve conditions for local residents. This new entrance would also create development pressures near the park entrance on U.S. Route 30. However, the memorial boundary includes lands across from the entrance as well as visible from the entrance to help limit incompatible development in this area.

In 2004, Somerset County and five local jurisdictions agreed to conduct the Flight 93 National Memorial Area Corridor Planning Study. Land uses along access routes to the memorial will be studied to determine land use compatibility with the desires of residents, business owners, and county plans. Results of this study will aid in ensuring that future land uses are compatible and retained and incompatible development is discouraged.

Two principal areas of visitor concentration are proposed for Alternative 2: the tower, a 93-foot tower, which would be located at the entrance of U.S. Route 30, and the memorial features within the Bowl. Depending on approval and location of new wind farms in the county, the setting for the tower may be compromised if wind turbines are permitted near the entrance to the memorial. The county's Subdivision and Land Development regulations are used to guide the appropriate location of wind farms within the County. Visual intrusions to the memorial, as well as sounds emitted from the wind turbines, are concerns that could adversely affect intended visitor experience.

As mentioned in Alternative 1, the private game hunting preserve is only about 600-800 feet from the crash site and adjacent to the hemlock grove. Visitor areas would be located about 1,200-1,500 feet from the edge of the game preserve property. Family members and authorized personnel would be even closer at the crash site. Not only would noise from rifle fire be a disturbance to visitors in this area, but human safety is a principal concern. The potential for boars to escape, as well as errant bullets, could present possible threats to the safety of park and employees and visitors.

The Somerset County Airport lies about 5.5 miles southwest of the Flight 93 National Memorial off Route 281 in Friedens. In 1992, the County adopted an airport zoning ordinance to regulate and restrict the height of structures and objects in the vicinity of the airport. Specific height restrictions were established in zones around the airport to prevent obstructions to the airspace and to protect approaches to the airport. The airport layout plan identifies the future airport elevation at 2,275 feet. The estimated elevation for the tower is 2,430 feet agl, and given a height of 93 feet for the tower, the total height for the tower is estimated at 2,513 feet. Based on a 34:1 approach to the runway, and the distance between the memorial and the runway, aircraft should be approximately 3,207 feet above the memorial.

Consultation with the Pennsylvania Bureau of Aviation was conducted in August 2005 to determine if the 93-foot tower would present an airspace issue with the Somerset County Airport and to determine if obstruction lighting of the tower would be required. The Bureau of Aviation ran estimated elevations and locations of the tower through the FAR 77 Obstruction Analysis model and determined that the tower did not penetrate required airspace for either the Somerset County Airport or the Indian Lake Airport and that it would not be necessary to install obstructions lighting on the tower.[35]

[34]John Karish, National Park Service. May 18, 2005. "Flight 93 NM Trip Report."
[35]Email from Robert Betz to Mike Kolesar, PennDOT Bureau of Aviation, Aug. 30, 2005.

The impact threshold for adjacent land uses for Alternative 2 would be Moderate. The perimeter viewshed would buffer adjacent land uses and the entrance from U.S. Route 30 would improve conditions for area residents, but the increased visitation would create increased development demands.

Summary of Impacts

The land use of the memorial would be converted from reclaimed mining to parkland within the core portion of the memorial for both alternatives. Adjacent land uses, such as farms and single-family residences, would be retained and incompatible land uses surrounding the memorial would be discouraged. The National Park Service would continue to work cooperatively with landowners, the county and the township to preserve land uses that maintain the rural character of the area. The traffic impacts on the local communities are discussed in greater detail in the following section. The impact threshold for adjacent land uses for Alternative 1 would be Major and the impact threshold for Alternative 2 would be Moderate.

TRANSPORTATION

Methodology

In 2004-2005, a transportation and traffic study of the Flight 93 National Memorial area was conducted by Trans Associates to evaluate the following: 1) four access routes from the Pennsylvania Turnpike; 2) the potential impacts of local road closures; 3) the feasibility of an in-park shuttle service; and 4) State accident data within the vicinity of the memorial. Data were collected regarding the existing roadway network surrounding the memorial to determine the conditions of the area roadways and existing traffic.

Field reconnaissance was conducted of the major approach routes from the Pennsylvania Turnpike (Interstate 70/76) to the proposed entrance to the memorial from U.S. Route 30. These approaches included U.S. Route 30 via State Route 281; U.S. Route 219 to U.S. Route 30 via State Route 601; U.S. Route 219 to U.S. Route 30 via State Route 281; and U.S. Route 30 east of the memorial from the Bedford area. Information was collected on horizontal and vertical geometry, posted speed limits, number of lanes, obstructions and school zones. For the routes evaluated, the access points to/from major traffic generators, such as major employment centers, shopping centers, mining companies, trucking companies, schools and any other locations that significantly influence traffic flow, were also identified. Routes used by emergency services were also identified.

Automatic traffic recorder (ATR) counts, which collect data on traffic volumes and heavy vehicle percentages, were installed on U.S. Route 219 between State Route 601 and U.S. Route 30 for seven days (five weekdays, one Saturday and one Sunday) in April 2005. These ATR counts were conducted for a typical (non-holiday, no unusual events, and no unusual weather conditions) period. Existing traffic conditions, including average daily traffic (ADT) volumes and percentages of trucks, were determined.

A travel time study was conducted from the Pennsylvania Turnpike (Interstate 70/76) to the proposed Memorial entrance on U.S. Route 30 for each of the approach routes in both directions during off-peak periods on a typical weekday.

The potential impacts of one or more roadway closures in the vicinity of the national memorial on local traffic, emergency services, as well as on residential and commercial access and uses, were evaluated. Potential road closures include Skyline Road (T613), Stauffer Road (T708) and Sturtz Road (T615). If constructed at the termination points, cul-de-sacs would be designed, based on local requirements, to accommodate emergency vehicles, school buses and other service trucks. The number of affected residences and businesses has been determined for each route. Based on the potential roadway terminations, a discussion on the loss of the local liquid fuel tax is presented later in this section.

An internal park shuttle was evaluated, but was determined to be infeasible for the site due to the high operating costs and the need to either assess a fare or a significant operating subsidy. Under Alternative 2 – Preferred Design Alternative, a shuttle system was also determined to be infeasible except for large events. Total capital cost for bus acquisition would be about $2.1 million, and annual operating costs would be approximately $286,600.

In addition to vehicular transportation and circulation patterns, the potential impacts to the memorial from overflights were also addressed. Coordination was conducted with PennDOT's Bureau of Aviation concerning proposed improvements to the Somerset County Airport, located about 6 miles southwest of the memorial. Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303) was

Buckstown Road approaching Skyline Road (NPS 2005)

Village of Lambertsville (NPS 2005)

considered. This act states that Department of Transportation projects shall not directly or indirectly affect publicly owned land from a public park of national, state or local significance, or any land from an historic site of national, state or local significance unless a) there is no feasible and prudent alternative to its use, and b) all possible planning to minimize harm is made part of the project." These effects include increased noise, visual and aesthetic impacts, and impacts affecting the intended use of the park. Planning for the airport began prior to the events of 9/11.

Coordination with BOA was also conducted concerning potential impacts from the tower to the surrounding airspace. BOA conducted computer modeling of the Tower and the Part 77 airspace surfaces around Somerset County Airport and Indian Lake Airport. The tower would not adversely affect the airspace and would not require obstruction lighting.[36]

Context

Flight 93 National Memorial is located in Stonycreek Township, about 10 miles northeast of Somerset Borough and 2 miles north of Shanksville Borough. An interchange (Exit 110) off Interstate 70/76 (the Pennsylvania Turnpike) is located in Somerset Borough, approximately 18 miles west of the memorial. U.S. Route 30 extends through the northernmost portion of the site.

In addition to the Temporary Memorial, the existing visitor area consists of a viewing area with a small shelter, a 40-foot chain-link fence where visitors can leave and view tributes, and two parking lots (one adjacent to the memorial and one west of Skyline Road). A third parking area for large events is located farther east on Skyline Road. Currently, the Temporary Memorial is accessed from Skyline Road, which extends between Lambertsville Road and Buckstown Road, both of which are signed approach routes to the memorial.

Four approach routes from the Pennsylvania Turnpike (Interstate 70/76) to a potential entrance to the memorial from U.S. Route 30 were evaluated. Although visitors may use other local routes to access the memorial, these major routes are expected to receive most of the visitor traffic. Approach Routes A-C connect with the Pennsylvania Turnpike at Exit 110 (Somerset); Approach Route D connects with the Turnpike at Exit 146 in Bedford.

- Approach Route A: Pennsylvania Turnpike (Exit 110) to Proposed Site Entrance via State Route 281/U.S. Route 30
- Approach Route B: Pennsylvania Turnpike (Exit 110) to Proposed Site Entrance via State Route 601/U.S. Route 219/U.S. Route 30
- Approach Route C: Pennsylvania Turnpike (Exit 110) to Proposed Site Entrance via State Route 281/U.S. Route 219/U.S. Route 30
- Approach Route D: Pennsylvania Turnpike (Exit 146) to Proposed Site Entrance via U.S. Route 30 East of Site

Approach Route A directs visitors through a school zone and three traffic signals. Alignments and sight distances are generally good. However, drivers must pass over a railroad crossing and through a narrow underpass. The average time to and from the memorial ranges from approximately 17 to 18 minutes.

Approach Route B directs visitors to use S.R. 601, which is one of the most congested arterials in the county and lacks proper facilities to handle the increase in turns in many areas. Numerous traffic signals, access points, and businesses make this route undesirable, including a 22-24 minute travel time to and from the memorial.

Approach Route C involves use of similar roadways used for Approach Route B, although drivers would use S.R. 281 to access U.S. Route 219. Travel time to and from the memorial is estimated at 21-22.6 minutes. For this portion of State Route 281, drivers must also use Pleasant Avenue (S.R. 4055) between the Pennsylvania Turnpike (Interstate 70/76) and S.R. 281. Pleasant Avenue is wide, has a center turn lane and has a posted speed limit of 25 miles per hour. A railroad crossing occurs on S.R. 0281 at Pleasant Avenue and a narrow underpass of the Pennsylvania Turnpike is also located in this area. A single traffic light is installed at the intersection of S.R. 4055 and S.R. 281. Approach C would involve the longest driving distance and travel times, but it would be the safest and have the least negative impacts on local residents.

Approach Route D provides access to the memorial from the east along U.S. Route 30 beginning at the Bedford interchange. The route is used by many logging and mining trucks and has steep hills and some poor sight distances. Travel time to and from the memorial is about 34 minutes from Exit 146 off the turnpike.

[36]Telecon with Mike Kolesar, PennDOT BOA, and Eileen Carlton, emc, Aug. 30, 2005.

The selection of an approach route to the memorial will be the responsibility of PennDOT, Somerset County, and local officials.

In 2003, an estimated 130,000 people visited the memorial and visitation projections show that a peak of about 400,000 annual visitors is expected to occur by 2011. This peak is expected to decline and then stabilize to an estimated 230,000 visitors annually through the planning period. Assuming that the increase in visitors follows the same daily and seasonal variations as the existing data indicate, the number of daily visitors could reach a maximum of 1,500 on weekdays and a maximum of 2,600 on weekends during the summer.

Assumptions were made that some visitors will follow routes other than the signed or designated route, and most vehicles will have more than one occupant. The daily two-way traffic volumes on the designated route can be expected to increase by 1,000 to 2,000 vehicles on peak weekdays, and by 4,000 to 5,000 on peak weekend days. Peak volumes will not occur every day or throughout the year, but can be anticipated during the peak visitation period(s).

Temporary signs directing visitors to the memorial have been installed on adjacent roadways by Stonycreek Township and Somerset County. Permanent National Park Service signs will be installed once the memorial development is underway and will be located in partnership with PennDOT, Somerset County and local officials.

Local officials and PennDOT will determine the most appropriate route for visitor to the memorial. Alternative C is likely to be the safest and have the least negative impact on local residents.

Airports. The Somerset County Airport has plans to extend its runway to 5,000 feet, which would enable corporate aircraft, such as turboprops and business jets, to use the airport. The extended runway would make the facility more attractive to businesses desiring to locate their businesses to the County. However, the greatest potential disturbance to the memorial under both alternatives would be from news and police helicopters, and sight-seeing aircraft.

In addition to the Somerset County Airport, other nearby airports include the Indian Lake Airport, a privately owned, public general aviation airport with a 4,490-foot runway, located about 4 miles southeast of the memorial. This facility is currently closed. Seven Springs Airport, located in Seven Springs, about 25 miles west of the memorial near the border of Fayette and Somerset Counties, is a privately owned airport, open from April through the end of November. Two other airports within about an hour driving time from the memorial are Arnold Palmer Regional Airport in Latrobe and the Johnstown-Cambria County Airport in Johnstown.

Alternative 1 – No Action

Roadways. Current PennDOT travel brochure, National Park Service site brochure and online driving directions encourage visitors to follow Approach Route A from the Somerset interchange (Exit 110) of the Pennsylvania Turnpike to the memorial. Average travel time to the memorial along this route is 17.3 minutes, and average travel time back from the memorial to the turnpike is 18.1 minutes. Both times are based on a one-way driving distance of 14.2 miles.

The greatest transportation impacts occur along Lambertsville and Buckstown roads. Visitors would continue to use these narrow, local roadways to access the site. These routes were never designed to accommodate high visitation levels as well as bus traffic associated with visitors to the memorial. In some instances, homes are located at the pavement edge. Long-term use of these roadways would require improvements to these roads including widening the travel lanes, replacing bridges, improving vertical alignments, and expanding the intersection of Lambertsville Road and U.S. Route 30. These improvements could result in the need to condemn properties that are adjacent to the roadway. Somerset County and PennDOT are initiating a study of roadway improvements necessary throughout the travel corridor.

Under Alternative 1, residences along Lambertsville and Buckstown Road would continue to be significantly impacted by visitor traffic and possibly by necessary roadway improvements. Disturbance from helicopters and sightseeing aircraft could occur.. Under Alternative 1, the impact threshold is expected to be Major for transportation.

Alternative 2 – Preferred Design Alternative

Roadways. PennDOT, Somerset County, and local officials will determine which route to the memorial is most appropriate. The major differences between the alternatives relates to the entrance to the memorial and internal circulation.

In Alternative 2, visitors would enter and exit at a new entrance at U.S. Route 30. This entrance would remove visitors from Lambertsville and Buckstown roads and significantly improve

conditions for residents living along these routes. This entrance is proposed in the general location of the current Haul Road but the specific location would be determined through design development and traffic engineering with PennDOT to ensure safe access for visitors and traffic along U.S. Route 30. Somerset County and PennDOT are initiating a study of roadway improvements necessary throughout the travel corridor.

An assessment of the impacts due to the possible termination or closure of one or more of the roadway segments within the memorial boundary on local traffic and emergency services, as well as residential and commercial accesses, was conducted. Under Alternative 2, the entrance to the memorial would be accessed from U.S. Route 30, most likely near the existing Haul Road. Road closures have been considered for Skyline Road (T-613), Stauffer Road (T-708) and Sturtz Road (T-615) as a measure to mitigate traffic impacts on local roads and neighborhoods. Before any road closures occur, coordination and consultation with PennDOT, local townships, and area residents would be required.

Skyline Road (T-613) would be terminated at its intersection with Lambertsville Road. A cul-de-sac would be constructed farther to the east, just to the west of the homes located on the eastern end of Skyline Road at the intersection with Buckstown Road. Skyline Road had been closed to traffic for many years during strip mining operations. Cul-de-sacs would also be constructed for Sturtz Road (T-615) west of Stauffer Road (T-708) and for Stauffer Road (T-708) west of the Haul Road.

Six residences exist along the eastern end of Skyline Road. The creation of a cul-de-sac on Skyline Road would require that these residents take Buckstown Road to U.S. Route 30 or Buckstown Road to Lambertsville Road to access Somerset Borough, the turnpike or locations west of the memorial. A typical trip from one of these residences to the intersection of Lambertsville Road and U.S. Route 30 currently takes approximately 6.5 minutes to travel the 3.3 miles along Skyline Road through the National Memorial. If the roadway is terminated and a cul-de-sac is constructed, it would take approximately 9 minutes to travel the 5.2 miles to reach the same location by following Buckstown Road to Lambertsville Road and 10.5 minutes to travel 6.5 miles minutes by following Buckstown Road to U.S. Route 30. The site proposed for a cul-de-sac is currently used as a school bus turnaround. No homes are located on the western end of Skyline Road.

Six residences are located along Sturtz Road and four along Stauffer Road. Constructing a cul-de-sac along Sturtz Road would restrict access to Stauffer Road, which is an unpaved road in this area. Its primary use was to provide access for workers at the mining operations. Now that mining operations have ceased, traffic on this road is minimal. Through-access on both of these roads is seasonal. Stonycreek Township often stops plowing snow during the winter just about the location of the proposed cul-de-sacs and school buses use these same locations as turnarounds. If these roads are terminated, impacts to residents living on Sturtz Road and Stauffer Road would be minimal.

The proposed cul-de-sacs would be designed in accordance with the American Association of State Highway and Transportation Official's (AASHTO's) and the Pennsylvania Department of Transportation's design criteria. Specific design criteria for these cul-de-sacs, such as size, materials, locations, etc., will be addressed during the design phase, if road closures are selected. The purpose of the cul-de-sacs would be to minimize traffic impacts on local residents while maintaining access to existing properties.

Liquid Fuels Tax. Terminating or closing portions of roadways would result in the loss of revenue to Stonycreek Township from the Liquid Fuels Tax. These are funds reimbursed by PennDOT to assist local municipalities with the cost of maintaining local roadways. Based upon data provided by PennDOT's Bureau of Municipal Services, Stonycreek Township is reimbursed at a rate of $1,906 per mile, and $11.00 per capita. The proposed cul-de-sacs could close as much as 6,600 feet of Skyline Road, 7500 feet of Stauffer Road, and 600 feet of Sturtz Road, totaling an estimated 14,100 feet, or 2.67 miles of roadway. This would result in an estimated loss of $5,306.48 in Liquid Fuels Tax revenues to Stonycreek Township annually, based on 2005 rates.

Emergency Response Services. Based on consultation with Somerset County 9-1-1 and local emergency response personnel, the proposed road terminations would not adversely affect local emergency service routes. Emergency response personnel from the Shanksville and Stoystown Boroughs and the village of Friedens were contacted concerning any potential impacts that could occur to local emergency responders and their response times. The residences along

Skyline Road are serviced by the Shanksville Volunteer Fire Company, and the residences along Sturtz and Stauffer Roads are serviced by the Stoystown Volunteer Fire Company. The potential roadway closures would not affect emergency access along these roadways. Proposed cul-de-sacs would be designed with sufficient radii to accommodate emergency response vehicles, as well as passenger vehicles.

Based on conversations with the Somerset 9-1-1 office, access to the memorial via U.S. Route 30 is essential, and the most desirable route for vehicles traveling to the memorial. Regarding potential road closures for Skyline Road, Stauffer Road and/or Sturtz Road, the Somerset 9-1-1 office stated that the memorial would be the only property whose emergency access could be affected. The County 9-1-1 office also advised that emergency response to the memorial would be provided by the Stoystown Volunteer Fire Company from the north and by the Shanksville Volunteer Fire Company from the south. Figure III-16, Chapter III, shows the two emergency service response areas for the memorial.

Both the Stoystown and the Shanksville Volunteer Fire Companies expressed concerns regarding maintenance of access routes to the memorial from U.S. Route 30 and from Skyline Road. As Skyline Road is proposed for closure, a security gate that could be activated by emergency services personnel was recommended. As Shanksville and Stoystown Volunteer Fire Companies provide dual coverage to this area, this access would be available to these emergency responders and any other appropriate response personnel. The Shanksville Volunteer Fire Company said that in case of wildfires or other emergencies, access to the memorial from Buckstown Road would be beneficial. The Shanksville Volunteer Fire Company uses a pond within the boundary to fill trucks with water, and has requested that access to this water supply be maintained.

The Shanksville Volunteer Fire Company also noted that during mining operations, several vehicle accidents had occurred on U.S. Route 30 near the entrance to the Haul Road. These collisions seemed to occur when slower trucks would exit the site and vehicles traveling faster along U.S. Route 30 collided with them. Development of the memorial will include redesigning the intersection of the entrance road and U.S. Route 30.

Airports. Under both alternatives, the visitor experience at the memorial could be impacted by additional overflights to the memorial as the airport extends its primary runway and operations increase. Disturbance from helicopters and sightseeing aircraft could also occur.

Under Alternative 2, the impact threshold for transportation is expected to be Moderate. Although many new visitors would be introduced to the area, safe and efficient access would be provided and the local communities would no longer experience the traffic and unsafe conditions associated with visitors using Lambertsville and Buckstown roads to access the site.

Village of Lambertsville (NPS 2005)

Summary of Impacts

Four approach routes were evaluated to the memorial: three from the turnpike exit (Exit 110) and one from the Bedford area to the east. This analysis was conducted to identify major constraints or issues. Approach Route A is currently used to access the memorial from the turnpike.

Of the approach routes from Exit 110 in Somerset, Approach Route B is expected to generate the least impacts to local communities and would offer the best sight distances and grades. However, S.R. 0601 runs through extensive strip commercial development and is heavily congested at times. Portions of U.S. Route 30 have moderately steep grades.

Approach Route C, which uses State Route 281 (S.R. 0281), is estimated to offer a faster time and a safer route than S.R. 0601. This route utilizes roads that are also described in Approach Routes A and B with minor exceptions.

Approach Route D, which accesses the memorial from the east using U.S. Route 30 from Bedford offers a shorter travel time than Alternatives A and B. However, parts of the geometry of U.S. Route 30 between Bedford and Somerset are poor and could present safety hazards to visitors unfamiliar with the roadway, especially for tour buses and recreational vehicles.

The final determination of an appropriate route to the memorial will be determined by Somerset County, PennDOT, and other local officials.

The impact threshold for transportation for Alternative 1 is projected to be Major as visitors would continue to travel along Lambertsville and Buckstown Roads to the site. Local residents would continue to be affected by visitor traffic. Costly road improvements would likely be necessary to safely accommodate visitor and resident traffic. Furthermore, such improve-

ments could dramatically alter the appearance of these communities and possibly require the condemnation of some homes. Alternative 1 would also require Stonycreek Township to upgrade and maintain Skyline Road to accommodate visitor and public traffic. These improvements are estimated to cost $2.1 million.

The impact threshold for transportation for Alternative 2 is projected to be Moderate. Although visitor projections are higher for Alternative 2, the National Park Service would go to great lengths to minimize impacts on the local communities and create safer roadway conditions. A new entrance would be developed directly off U.S. Route 30 and the small roads leading into the site would be terminated. These actions would contain all visitor traffic within the site and remove it from the neighboring communities.

ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Methodology

During its NEPA analysis, a Federal agency is required to consider the environmental effects of a project's energy requirements and conservation potential (40 CFR 1502.16(e)). A broad-scale analysis that relates to changes in demand for energy supplies supporting stationary facilities and increased fuel consumption by vehicles has been conducted. The data presented in this analysis are speculative and not quantifiable, but are presented to give a general idea of increased energy use.

Context

Flight 93 National Memorial attracts thousands of visitors every year. Chapter III shows the current and projected visitation estimates for the memorial. The potential impact that these visitors would have on local fuel suppliers can only be estimated. Use of energy, such as electricity for lighting and fuel for heating, is also discussed.

Flight 93 National Memorial is located in distance and time from the following major metropolitan areas:

- From Pittsburgh: 75 miles/2 hours
- From Harrisburg: 125 miles/ 2.5 hours
- From Philadelphia: 250 miles/4.5 hours
- From Washington, D.C.: 185 miles/3.5 hours
- From New York City: 300 miles/5.5 hours

Alternative 1 – No Action

Alternative 1 projects that visitation to the memorial could be expected to decline from about 139,000 annual visitors to approximately 87,000 annual visitors over time.

Under Alternative 1, there would be no visitor facilities to light, heat or cool and no lighting to enhance a memorial. The degree of energy usage is expected to be minimal. Currently, a small temporary shelter is available to the Ambassadors and visitors as a respite from inclement weather conditions.

Construction activity associated with Alternative 1 would be minimal, with the focus on safety and limited facility improvements. As a result, the impact threshold for energy requirements for Alternative 1 would be Negligible.

Alternative 2 – Preferred Design Alternative

Energy requirements for Alternative 2 assume that a peak of 400,000 visitors to the memorial would occur by 2011, followed by a slight decline in visitation and then a steady estimate of 230,000 visitors annually thereafter. In addition to a memorial feature, ancillary facilities, such as a visitor center, would require energy to operate and maintain. The visitor center is intended to serve as the interpretive and education hub of the park and would be open year-round.

In addition to heating, cooling and electricity needs for operational purposes, the design concept for the memorial may include extensive lighting and evening illumination. For example, the visitor center is expected to present a lantern-like image. Night-time illumination of the tower, recessed lighting of the allée of maples, illumination of the pathway through the allée and pole-mounted downlights through the maple groves are also proposed. The Flight Path would be illuminated with recessed in-grade linear lines of light that are perpendicular to the path flow to foster orientation. Several smaller memorial features such as plaques may be lighted. In addition to the visitor facilities, energy supplies would also be required for maintenance needs, such as mowing and snow removal.

Implementation of this alternative would require close coordination with the PennDOT Bureau of Aviation. Due to the proximity of the memorial to the Somerset County Airport, PennDOT has requested restrictions on vertical light beams aimed up at night.

Implementation of Alternative 2 is expected to attract nearly three times the number of visitors

annually to the site than is projected for Alternative 1, thus inducing higher regional fuel consumption. The impact threshold for Alternative 2 would be Minor due to increased lighting, heating and cooling, maintenance and energy usage, Energy requirements could be reduced through the incorporation of green and energy saving techniques in the design of the visitor center and other features of the site.

Summary of Impacts

Energy consumption, both in terms of projected vehicular fuel usage, as well as energy for lighting, heating, cooling and maintenance usage would be Negligible for Alternative 1.

The type of heating/cooling system that would be installed in the facilities at the memorial is unknown and cannot be quantified. Green building and energy conservation measures could be incorporated into the design development phase. Although, by comparison, Alternative 2 will require greater supplies of energy resources than Alternative 1, the overall demands would not be significant. The impact threshold for Alternative 2 would be Minor.

VISUAL AND AESTHETIC RESOURCES

Methodology

A visual analysis was conducted between March and October 2004 by The Office of Merlyn Paulson, Inc. Viewshed maps were generated by applying a three-dimensional surface, represented by a uniform lattice of elevations spread over the earth, and a map containing the location of a view point. The viewshed was calculated based upon the location and height of the view point, or observer, in relation to all elevations in the lattice, or targets.

Using a combined topographic surface and landscape surface, the ARC/INFO visibility algorithm (ESRI, 2004) generated a view transect from the view point to each lattice cell within the study area. The process accounted for the combined elevation of each intervening cell along the transect to determine if any of the elevations were tall enough to block the line of site between the viewpoint cell and the target cell. In order to establish points of reference for a visual analysis, the following steps were conducted:

1) critical view points, specified by the National Park Service, were located on maps and digitized in GIS;
2) a generalized digital terrain model was developed in GIS to determine the broadest possible view extents of the study area; and
3) data collected were ground-proofed using photography and GPS during site visits.

The topographic surface was constructed by merging very precise (2-foot contour interval) LIDAR contours in the project area with the surrounding, significantly coarser (10-meter horizontal grid cell resolution) USGS Digital Elevation Models (DEMs). The DEMs constituted the periphery of the project area out to the far edges of the study area. Manual adjustments (cell by cell) were performed to correct discontinuities between adjacent 10-meter DEMs and the inaccuracies at interfaces between the LIDAR and DEM data.

Based upon USGS Digital Orthophoto[37] Quarter Quadrangles (DOQQs), the locations and heights of existing trees were digitized and assigned height attributes in a polygon format. In order to replicate the complete three-dimensional landscape surface, the tree cover polygon surface was converted to lattice cells for overlay/integration with lattice cells in the topographic surface.

Based upon field estimations and onsite photography, landscape surface heights and extents were adjusted (cell by cell) near view points. Onsite photography of "leaf-off" conditions was conducted in March 2004. Onsite photography of "leaf-on" conditions was conducted in October 2004. Horizontal and vertical ground surveying was not conducted as part of this study.

The database of view points in ARC/INFO was modified by adding an observer height item in INFO and applicable height in each view point record under each item. The observer height at each view point was approximately 6 feet agl. Viewshed maps were prepared for the "leaf-on" condition, utilizing ARC/INFO's visibility algorithm to document the actual visible extents of the visual region from each view point. Visible extents would likely increase during "leaf-off" conditions, when it becomes possible to see through and beyond bare tree branches.

Appendix I illustrates the visible extent of each visual region. The views shown in Appendix K include topography and tree pattern, as well as views from the FBI Headquarters/Welding Shop

View south from draglines to the Temporary Memorial and the crash site (Jason Cohn 2004)

[37] An orthophoto is a digital image of an aerial photograph in which displacements caused by the camera and terrain have been removed. It combines the image characteristics of a photograph with the geometric and measurement qualities of a map.

Complex, the dragline and the dragline knoll, the Temporary Memorial, and the intersection with U.S. Route 30. Onsite, eye-level photography of the view from each view point is valuable for verifying accuracy of viewshed maps.

Two site visits were conducted (March 18-19, 2004 and October 21-23, 2004) for the purpose of taking eye-level photographs from the ground and using a hand-held GPS unit for verifying the accuracy of the viewshed data. The composite visibility map illustrates the cumulative views of all six view points (Figure IV-1). Green colors on the map represent magnitudes of visibility. The darker colors illustrate areas that can be seen from multiple view points. The lightest shade of green on the map shows areas seen from only one of the six view points. Analyses of environmental consequences were based upon detailed 3D drawings and/or simulations of alternative futures. Impact values show the degree of change in the landscape, where negative values represent degradation and positive values indicate enhancement. Thus, both positive and negative aesthetic impacts (enhancement as well as degradation) are analyzed and documented. In cases where the proposed development indicates neither an enhancement nor a degradation to aesthetic resources, a value of neutral was assigned.

Context

The project area is located on the Central City and Stoystown USGS 7.5´ quadrangles. The regional landscape is widely known for its pastoral patterns of hills and valleys of fields, farms, and villages surrounded by mesophytic groves of tall, broadleaf hardwoods and softwoods. The reclaimed coal mine landscape and two draglines situated at the ridgeline are among the predominant landscape features of the site. The character of the mined areas, associated mine-related buildings, and recycling operation is industrial, while the character of remaining portions of the project area is natural.

The site's topography is comprised of flat lowlands in the bowl area surrounding the crash site and along the Stauffer Road near U.S. Route 30, flat to moderately sloping (10-15 percent) landforms at the edges of the bowl and north of Stauffer Road, and moderately sloping to steeply sloping (15-25 percent) landforms in the eastern portions and edges of the mined area. Some road-related embankments along Stauffer Road are sloped at approximately 3:1 and afford roadway viewers substantial vistas over the landscape. The site's water features include mine-related treatment and sediment ponds. They are typically geometric in shape and industrial in character.

The hemlock grove adjacent to the crash site presents a mature landscape. Small areas of wet soils and very small pockets of standing water occupy portions of the reclaimed crash site and are beginning to exhibit the rich species composition and character of a wetland. The characteristic vegetation of the uplands and mine edges consists of mixed northern hardwoods and softwoods in the forested areas. Native and non-native shrubs occupy the edges of fields and roadways. Rectangular patterns of grasses and rows of immature pines characterize inclined portions of mined areas. Farm fields contribute substantially to the region's agricultural character, which are layered with organic patterns of hay and grain crops.

Alternative 1 – No Action

Alternative 1 would involve only minor changes to the landscape and built environment to accommodate visitor safety and minor improvements. The impact threshold for visual impacts is expected to be Negligible.

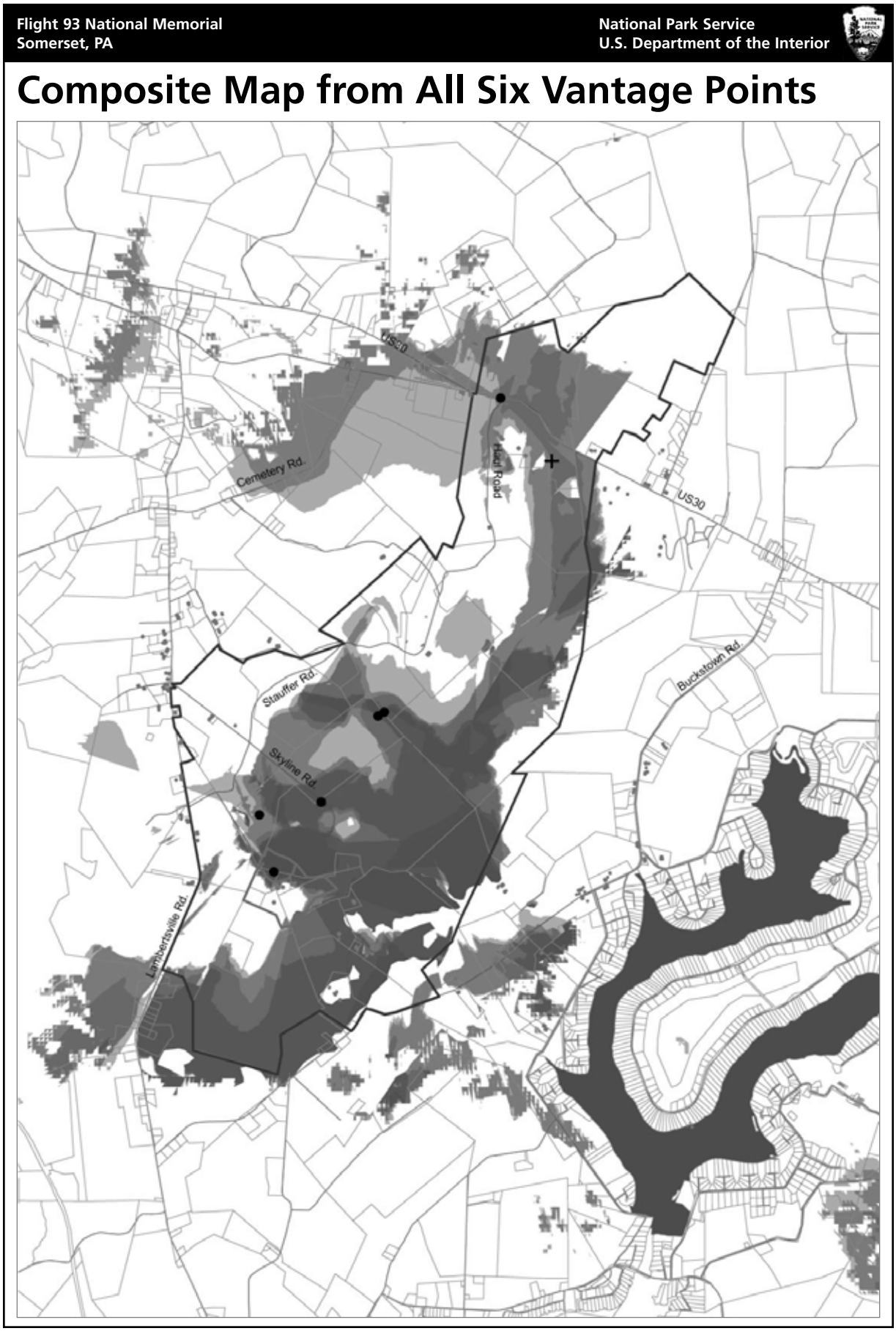
Alternative 2 – Preferred Design Alternative

A 93-foot tall tower, which would be located in the Gateway zone near the entrance to the park south of U.S. Route 30, is proposed under Alternative 2. Figure IV-2 shows the surrounding areas that can be viewed from the Tower. In addition to the Tower, a visitor center and plaza would be located near the western edge of the Bowl. A walkway and memorial tree groves would extend around the Bowl to a plaza at the Sacred Ground.

The Tower would be constructed of concrete and in the design concept, is proposed to be covered with white glass mosaic tiles, creating a reflective, ephemeral quality. At night, the Tower is proposed to be lighted and the exterior illuminated as a beacon. The intent of the Tower is to provide a landmark for the memorial. Its monolithic form would present a major contrast against the open, rural landscape, and its visual effect would be powerful.

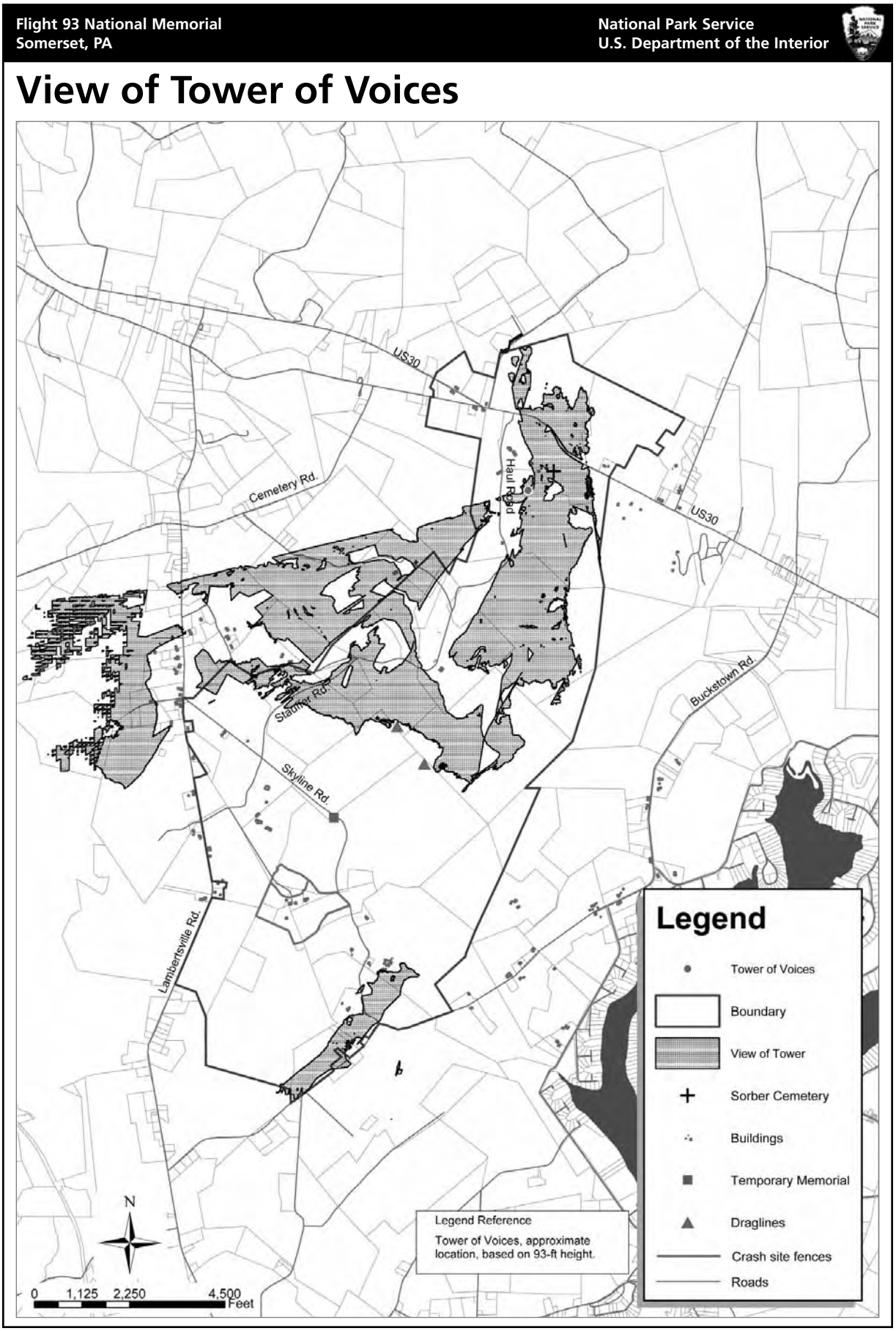
The large portal walls at the western edge of the Bowl would present a powerful statement and contrast to the rural landscape. By creating a designed memorial landscape and introducing features such as the tower, the portal and the visitor center, the impact threshold for Alternative 2 would be Moderate.

Figure IV-1: Composite View from Six Vantage Points, Flight 93 National Memorial



Source: The Office of Merlyn Paulson, Inc., 2005

Figure IV-2: View of Tower, Flight 93 National Memorial



Source: The Office of Merlyn Paulson, Inc., 2005

Summary of Impacts

Alternative 1 proposes to maintain the open, rural landscape as it currently exists. The impact threshold for Alternative 1 would be Negligible.

Alternative 2 creates a designed landscape. It introduces significant design elements such as a 93-foot tower, a visitor facility, viewing platform and plaza, a tree-lined curving walkway along the Bowl, and a plaza near the Sacred Ground. While a significant change from the existing landscape, the design enhances the topography and character of the site and the impact to the built environment for Alternative 2 would be Moderate.

PUBLIC HEALTH AND SAFETY

Methodology

In April 2004, RT Environmental Services conducted a site-specific Phase I environmental site investigation of 1,355 acres within the boundary of Flight 93 National Memorial. A review of aerial photographs, a database search, a site inspection, soil sampling, and interviews with representatives from National Park Service, State and local agencies and PBS Coals, Inc. were conducted. The purpose of this assessment was to identify any environmental constraints to development and public access. The Phase I assessment was conducted in accordance with the ASTM Environmental Assessment Standard E 1527-00.

A deed search of the core area resulted in the review of approximately 30 parcels. Many of the deeds obtained showed that the rights to coal underlying the properties belonged to PBS Coals, Inc. Some deed searches were incomplete. Because land purchase negotiations are underway, information on the condition of the properties is considered proprietary pursuant to The Privacy Act of 1974 (5 U.S.C. 552a).

As part of the Phase I environmental assessment, historical aerial photographs, (1952, 1967, and 1990), were reviewed at the Somerset County Planning Commission to identify possible environmental concerns at the site or on adjacent properties. RT Environmental Services coordinated with Environmental Data Resources, Inc. (EDR) concerning Sanborn Fire Insurance Map coverage for the subject property and surrounding areas. No historic map coverage was available for the subject property.

The FEMA flood insurance rate map (1999) was reviewed to determine the flood zone for the site, and the subject property was found to lie outside the 500 year floodplain.

Radon potential information for the subject property was also reviewed. The EDR Report lists four (4) statistical summaries concerning radon potential in the core area. Each listing indicates that more than 50 percent of the sites tested had average radon levels less than 4.0 pCi1L. Since the planned use of the subject property is not residential, radon does not appear to a concern at this time.

A computerized search of relevant Federal and State databases for the entire property was conducted. Three radius map reports with geocheck were obtained in order to gain information pertaining to subsurface conditions across the property. These radius map reports with geocheck were produced to identify subsurface conditions, and not surrounding sites of potential concern.

Context

Based on a review of data collected, health and safety issues were identified within the memorial boundary and are described in Chapter III-Affected Environment.[38] Of the 10 soil samples collected within the boundary, three samples confirmed the presence of arsenic. One (SS-8) sample showed the arsenic level was 14 ppm, which exceeds the residential Statewide Health Standard (rSHS) of 12 ppm. SS-6 showed arsenic at a concentration of 10 ppm and SS-7 revealed concentrations of 12 ppm, which is equal to the rSHS. Appendix I-1 shows the locations of these soil samples.

Other issues, some of which have been corrected as part of site reclamation since the investigations were conducted, include the presences of transformers, staining, buckets of leaking lubricating oil, aboveground and underground storage tanks, production wells located near the blue shower building in the Diamond-T B and C mine area and the Diamond-T shop area, numerous 55-gallon drums, and a burn pit in proximity to the truck wash garage in the Diamond-T area. The type of materials burned in this area was not identified. Some surface staining was observed inside the bucket shop/welding shop which has a dirt floor. This staining is most likely a result of equipment use and maintenance.

[38]RT Environmental Services, May 2004. Phase I Environmental Site Assessment, Flight 93 Memorial Site. Shanksville, Somerset County, Pennsylvania.

Although localized excavation can be conducted, sediment and treatment ponds should not be disturbed unless approval by Department of Environmental Protection is received. No new detention basins should be created on the surface. If any major earthwork is planned, care should be taken to ensure that it will not significantly change general overburden conditions and groundwater flow. The Department of Environmental Protection has indicated that many of the treatment ponds onsite will need to remain for perpetual treatment.

All contaminants, unnecessary buildings, drums and tanks, and the Rollock recycling operation would be removed and remediated before any land is acquired by the National Park Service for either alternative. The National Park Service would not purchase subsurface rights where acid mine drainage exists. In accordance with State and Federal laws, liability for treatment of AMD would remain with PBS Coals. National Park Service would work with the Department of Environmental Protection, other agencies and local watershed groups to identify and pursue solutions to AMD and would support efforts to improve regional water quality.

In April 2004, the Department of Environmental Protection updated its Clean Fill Policy guidance for areas with substantially contaminated soils. This guidance takes a revised approach for determining "clean fill" and "regulated fill," based on numerical limits derived from the *Act 2 Land Recycling Statewide Health Standards* (SWHS). "Clean fill" is defined as material that has not been mixed and meets unregulated fill concentration limits. Regulated fill includes material impacted by a spill or chemical release. This fill this cannot exceed non-residential SWHS limits.

The 2004 Clean Fill Policy requires due diligence at most sites to check historical and other information to determine if soils at a site might be contaminated from—

- tank and other spills
- historic use of herbicides\pesticides historic coal burning in the area historic use of leaded gasoline.

A general permit from the Department of Environmental Protection would be required before fill material could be moved, and restrictions on which sites the materials could be placed would be made. The origin of the fill material is required to be documented and included in the Policy Document. If waste is illegally moved or received, landowners could be subjected to penalties, including criminal penalties, by the Department of Environmental Protection.

Alternative 1 – No Action

Alternative 1 would involve only minor construction activities and some potential ground disturbance which would result from site improvements. Under this alternative, only 657 acres would be acquired in fee, which would mean that the remaining area may not be remediated to the same level as the area acquired by the Federal government standards. Ground disturbance or movement of soils would be minimal and no discharges would occur. It is not anticipated that materials would need to be moved offsite or redeposited onsite. Prior to any excavation of more than 125 yards, appropriate due diligence and site testing would be conducted, as required by State law.

Testing is recommended prior to ground disturbance to determine whether or not excavated materials meet the Department of the Environmental Protection's Clean Fill Policy Criteria. No materials would be moved offsite or redeposited onsite unless soil contaminants meet State levels.

The impact threshold for hazardous materials for Alternative 1 would be Minor mainly because visitors would be restricted to the temporary memorial. The National Park Service would acquire only about half the land (657 acres) in fee under this alternative and the remaining area may not be remediated as thoroughly as it would with Federal acquisition.

Alternative 2 – Preferred Design Alternative

Alternative 2 would involve more land acquisition (1,355 in fee) and more extensive ground disturbance than for Alternative 1. Testing, as recommended in Alternative 1, would be required prior to ground disturbance.

Earth removal, tree plantings and construction activities are proposed for Alternative 2. No underground facilities are proposed. Any occupied structures should be installed with a reverse radon-type gas collection and elimination system. Rather than evacuate air from the vented space, final design of any occupied structures should include mechanisms to pump air into the porous drainage material subgrade beneath the structure.

Pedestrian trails and areas where visitors are expected to gather should be tested and paved or covered if necessary. Paved surfaces are

recommended more than wood chips along trails where visitors will walk. The visitor facility and the maple allée are proposed within the area where arsenic was detected in soils. Health concerns for maintenance staff include inhalation of dust and direct contact with contaminated soils. When possible, areas that are not paved should be dampened to keep dust at a minimum.

Prior to any ground disturbance, soils testing should be required to determine the area and extent of contamination, and to determine whether excavated materials meet the Department of Environmental Protection's Clean Fill Policy Criteria. No materials should be moved offsite or redeposited onsite unless contaminant levels meet State requirements. A general permit from the Department of Environmental Protection would be required before fill material could be moved and the origin of the fill material would be documented and included in the required Policy Document.

Design of any proposed structures would include drainage away from buildings. Pedestrian paths would be paved and sewerage pipes would be installed using high-density polyethylene pipeline in areas with high contaminant levels. As stated in Alternative 1, relocation and cleanup of the Rollock recycling operation would occur prior to National Park Service acquisition. The impact threshold for hazardous materials for Alternative 2 would be Moderate because of the level of contamination suspected to occur throughout the site and because visitors would have access to a larger portion of the site than they would with Alternative 1.

A Phase II Environmental Site Assessment has been recommended to determine the actual extent of contamination on this site. Although this impact threshold was ranked Moderate for Alternative II, it is recognized that with Federal acquisition, the level of remediation for contaminants would be higher for Alternative 2 than it would be for Alternative 1.

Mitigation

The following recommendations have been made concerning hazardous material and their potential effects on human health and safety:

- Movement of earth and construction must adhere to the requirements of the 2004 Clean Fill Policy.
- Transformers should be tested to determine the presence of PCBs and then properly removed.
- The water quality in the wells on site should be tested to confirm potability.
- A Phase II Geoprobe investigation should be conducted to determine whether the historical operation and/or the presence of USTs have impacted soils at the subject property. USTs must be properly closed and removed in accordance with DEP requirements. A copy of the closure report for the USTs previously closed should be obtained.
- An Access Agreement or a Pre-Purchase Consent Decree or a similar document should be established between the Seller, the Buyer, and the Department of Environmental Protection to clearly define responsibilities among all parties.
- Appropriate geotechnical investigations should be conducted prior to or as part of the design for any structures planned at the site.

Summary of Impacts

For both alternatives, movement of earth and construction activities must be conducted in accordance with Pennsylvania's Clean Fill Policy. Most sites will require testing before the soil is determined to be contaminated. Alternative 1 would involve minimal ground disturbance and construction. Some of the land not acquired by National Park Service may not receive the same level of remediation as the Federal standards for clean up require.

Alternative 2 would involve more land acquisition, and without a Phase II environmental site assessment to determine the extent of contamination, it is uncertain what that contaminant level may be. It is certain, however, that contaminants occur throughout the site.

A Phase II site assessment is recommended for either alternative to determine the extent of contamination throughout the site and necessary remediation, and to determine the presence of underground storage tanks (USTs). This assessment would include soil sampling to determine the extent of impact to soils. Preplanning and further due diligence and testing prior to initiating any excavation with a quantity of more than 125 yards.

Prior to land acquisition, the National Park Service would conduct further contaminants surveys. Based on the Department of the Interior policy, property can be acquired if no evidence of hazardous substances or other environmental liability is found. If evidence of hazardous substances is found, the Federal government would incur little or no additional cost. The impact threshold for Alternative 1 would be Minor and the impact threshold for Alternative 2 would be Moderate with cleanup and remediation.

Cumulative impacts are the effects on the environment that result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions

CUMULATIVE IMPACTS

Cumulative impacts are the effects on the environment that result from the incremental impact of the proposed action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The crash of Flight 93 threw this once quiet community into the national and international spotlight and introduced a steady flow of visitors to the site. Although many positive changes have occurred in terms of community support, other effects, such as infrastructure improvements and the influx of visitors to the region and site have stressed local services, roadways, and sometimes, local patience. Most of these adverse effects have been borne by the local residents, particularly those adjacent to the memorial, and local governments have had to bear the costs. An estimated 87,000 visitors per year have been projected to visit the memorial under Alternative 1, compared Alternative 2, which projects a peak of 400,000 visitors by the year 2011 and an average of 230,000 visitors per year thereafter.

The cumulative effect of incompatible land uses in the vicinity of the memorial would disrupt the intended visitor experience and significantly change the local character of the area. With the exception of limited land use controls around the U.S. Route 219 interchange and in some municipalities, Stonycreek and Shade Townships do not utilize zoning as a tool to guide development or control incompatible land uses. A corridor planning study is being conducted by the County for the area along U.S. Route 30. Without some planning and regulatory control, pressures for development along the corridors to the memorial are likely to grow. In addition, unplanned proliferation of wind farms or any visually intrusive structures will impact the scenic quality of the area.

The influx of tourists has caused changes in the peaceful, rural ambience of the region. Over time, the influx of new people into the area may affect the lifestyles and attitudes of county residents and place increased demands on local services and infrastructure. From a positive side, the increase in consumer demand related to tourism in general has brought new money and new jobs into the area, mainly in the service sector.

Other development within the county presenting long-range cumulative effects includes the proliferation of wind farms. These wind farms are concentrated along ridges throughout the Laurel Highlands region. These wind farms produce electric power, but cumulatively, also endanger bird and bat populations and change the visual characteristics of the hillsides and the quiet of the area.

For decades, southwestern Pennsylvania has withstood the cumulative stresses of mineral extraction, logging, farming and resort tourism. As byproducts of these economic generators, the environment has long suffered from sustained abuses. The land on which the Flight 93 National Memorial is located was once forestland, then farmland. Prior to 1964, Pennsylvania did not require treatment of AMD from mines, but in 1966, mine drainage came under regulation when the Clean Streams Act was passed. The old Heinemeyer mine, a former bituminous coal mine that operated on site prior to 1945, has emitted AMD for years into Lamberts Run. Because this discharge began before the Surface Mining Reclamation Act and the Clean Streams Act, it is not subject to regulations and no one is liable for the discharge. Cumulatively, this drainage has been discharging without treatment into Lamberts Run for years.

The Wells Creek Watershed Association has expressed concerns not only about the health of the local streams suffering from AMD, but the unsightly appearance as seen by visitors to the memorial. Treatment and remediation using anoxic limestone is not an option because of the high iron content of the water. Vertical flow reactors may be a possibility, but the treatment ponds would need to be enormous in size. A recommendation presented by the watershed association is to possibly consider re-mining the Heinemeyer Mine.[39]

Mining at the memorial has disturbed naturally occurring arsenic in the soil. Numerous containers and tanks are scattered or buried throughout the site and require remediation. Cleanup of this site to meet public health standards will be conducted prior to National Park Service acquiring the land.

Changes in property values are another cumulative effect. Although the Federal Government may compensate the township for a loss in its tax base through payment in lieu of taxes, this loss of revenue could impact the townships

[39]Daily American, July 16, 2005. "AMD Threatens Lamberts Run," Vicki Rock.

budget and be offset by the improvements that are necessary to roads and services. However, studies show that real property values have a tendency of rising near parks, open spaces and greenways, particularly in instances where the property is located near or adjacent to open spaces.[40]

When the proposed runway extension at the Somerset County Airport is constructed, the extension will allow for larger business aircraft to use the airport. The most significant concern facing the park regarding aviation is overflights of helicopters, business jets, and sight seeing ventures. These aircraft create noise disturbance and interfere with the intended visitor experience at the memorial.

If the memorial is connected to the public sewer system, development is likely to occur along Lambertsville Road. This development will likely take the form of single-family homes fronting on Lambertsville Road if this route is no longer the entrance to the memorial. In many cases, sewage is not treated in some areas and is dumped in its raw form into streams or into the ground without treatment. Public sewerage will enhance the community health and environmental quality through proper treatment. The incremental costs to the residents will also be a cumulative effect, as over time these public service costs rise.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The National Park Service is required to comply with Federal environmental standards as well as the agency's own environmental policies. As steward of the Flight 93 National Memorial, the National Park Service would implement environmental improvements and site enhancements that otherwise would not occur under non-Federal land management. As a result of this analysis, Alternative 2 – Preferred Design Alternative – is the agency's preferred alternative and the environmentally preferred alternative. Table IV-8 compares the relative magnitude of the impacts by alternative.

Table IV-8: Summary of Environmental Consequences by Alternatives, Flight 93 National Memorial

Impact Category	Alternative 1 – No Action Alternative	Alternative 2 – Preferred Design Alternative*
Natural Resources:		
Geology, Soils & Topography	Negligible	Minor
Vegetation & Wildlife	Minor	Minor
Federally & State Protected Species	Negligible	Minor
Water Resources:		
Wetlands	Negligible	Moderate
Surface Waters & Water Quality	Negligible	Minor
Historic and Cultural Resources	Minor	Minor
Socioeconomic Impacts:	Major	Moderate
Potable Water Supplies and Sewage Containment	Negligible	Minor
Land Uses	Major	Moderate
Transportation	Major	Moderate
Energy Requirements and Conservation Potential	Negligible	Minor
Visual and Aesthetic Resources	Negligible	Moderate
Public Health & Safety	Minor	Moderate

*Represents the Agency's Preferred Alternative and the Environmentally Preferred Alternative.

Note: Negligible=No or minor effect; Minor=Measurable but with minimal effect to resources; Moderate=Changes to resource conditions but not irreversible or can be mitigated; and Major=Resource conditions are changed irreversibly even with mitigation.

Source: Compiled by National Park Service, 2006.

[40]National Park Service, Rivers, Trails and Conservation Assistance.