National Park Service
U.S. Department of the Interior

Cuyahoga Valley National Park, Ohio

Environmental Assessment

M&M Royalty, LTD. Plan of Operations for Astorhurst Nos. 1, 2 & 3D Prinios No.1

Prepared by:

Cuyahoga Valley National Park
15610 Vaughn Road
Brecksville, Ohio 44141

March 2009

In 1916, Congress created the National Park Service in the Department of the Interior to:

…promote and regulate the use of the Federal areas know as national parks, monuments, and reservations…by such means and measures as to conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. (NPS Organic Act, 16 U.S.C. § 1)

Prepared by
United States Department of the Interior • National Park Service

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Summary

In accordance with National Park Service (NPS) regulations for nonfederal oil and gas rights, M&M Royalty, Ltd. (M&M) has submitted a Plan of Operations to the NPS to produce existing Astorhurst # 1 well and to drill and produce the Astorhurst # 2, Astorhurst #3D and Prinios #1 wells from a surface location on Cuyahoga Valley National Park (the Park) in Cuyahoga County, Ohio.

This Environmental Assessment evaluates two alternatives for M&M to drill and produce the Astorhurst #2 and #3D wells and Prinios #1. Alternative A, No Action, evaluates baseline conditions in which the wells would not be drilled; therefore, there would be no new impacts on the environment. Alternative B, Proposed Action, evaluates M&M's proposal to drill and produce up to three wells. Impacts on geology and soils, and visitor use and experience would be localized and long-term; with direct and indirect, adverse impacts ranging from negligible to moderate. Alternative A is the environmentally preferred alternative.

Public Comment

A notice of availability of the Plan of Operations and Environmental Assessment will be published in the Federal Register and local newspapers. If you wish to comment on the documents, you may mail comments to the name and address below or post comments online at http://parkplanning.nps.gov/. These documents will be available for public review for 30 days from the date of publication in the Federal Register. Our practice is to make comments, including names, home addresses, home phone numbers, and email addresses of respondents, available for public review. Individual respondents may request that we withhold their names and/or home addresses, etc., but if you wish us to consider withholding this information you must state this prominently at the beginning of your comments. In addition, you must present a rationale for withholding this information. This rationale must demonstrate that disclosure would constitute a clearly unwarranted invasion of privacy. Unsupported assertions will not meet this burden. In the absence of exceptional, documentable circumstances, this information will be released. We will also make submissions from organizations and businesses, and from individuals identifying themselves as representatives of or officials of organizations or businesses, available for public inspection in their entirety.

Superintendent
Cuyahoga Valley National Park
15610 Vaughn Road
Brecksville, Ohio 44141

Purpose and Need

This environmental assessment has been prepared to comply with the National Environmental Policy Act of 1969 and will be used as a framework for agency decision-making to approve the use of parklands for M&M Royalty, Ltd. (M&M) to explore and develop its mineral interests, while protecting and preventing impairment to park resources and values, and allowing for a safe visitor experience. It evaluates the environmental impacts of the No Action alternative and M&M's plan of operations to produce the existing Astorhurst #1 well and to drill and produce Astorhurst wells #2 and #3D and Prinios #1 within the boundary of Cuyahoga Valley National Park (the Park).

The resources of the Park are protected under the authorities of the National Park Service Organic Act of 1916 (16 U.S.C. § 1), the National Park System General Authorities Act (16 U.S.C. §§ 1a-1 et seq.), Part 36 of the Code of Federal Regulations (CFR), and the Park's enabling legislation (Public Law 93-555).

Cuyahoga Valley National Recreation Area was established by Public Law 93-555 on December 27, 1974 and was renamed Cuyahoga Valley National Park on October 11, 2000. The Park was created "for the purpose of preserving and protecting the historic, scenic, natural, and recreational values of the Cuyahoga River and the adjacent lands of the Cuyahoga Valley and for the purpose of providing for the maintenance of needed recreational open space necessary to the urban environment, the Cuyahoga Valley National Recreation Area…. In the management of the recreation area, the Secretary of the Interior shall utilize the recreation area resources in a manner which will preserve its scenic, natural, and historic setting while providing for the recreational and educational needs of the visiting public."

The Park serves as a refuge for flora and fauna, gives a sense of times past, and provides recreation and solitude for Ohio's residents and visitors. The Park includes and protects several areas of recreational, cultural, educational, and historic significance, including the Cuyahoga Valley Environmental Education Center, the Blossom Music Center, the Porthouse Theater, Brandywine Golf Course, Shawnee Hills Golf Course, Astorhurst Golf Course, Brandywine and Boston Mill Ski Resorts, the Ohio & Erie Canal and Towpath Trail and the Cuyahoga Valley Scenic Railroad.

The Park is located between the Ohio cities of Akron and Cleveland, in Cuyahoga and Summit counties (fig 1). The study area lies entirely within Cuyahoga County in the northern end of the Park. The location of the proposed project is in the Village of Walton Hills on the Astorhurst Golf Course, 7000 Dunham Road and the adjacent Prinios parcel at 6890 Dunham Road. The project site is 2.2 miles southeast of the Canal Visitor Center, which is one of the Park's three main visitor contact facilities.

The right to conduct oil and gas operations in units of the National Park system is based on ownership rights and obtaining NPS authorization to conduct the operation (36.CFR §9.30 (a)). Because oil and gas rights remain outstanding in some parks, the NPS

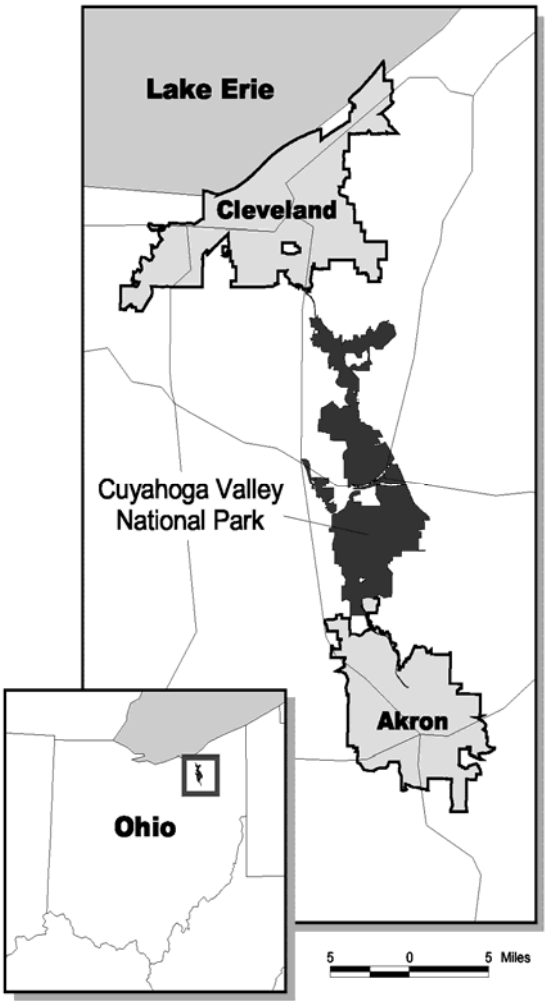


Fig. 1 Location of Cuyahoga Valley National Park

must recognize those private property rights. However, the NPS is required by its laws, policies, and regulations to protect the Park from any actions, including gas operations that may adversely impact or impair park resources and values.

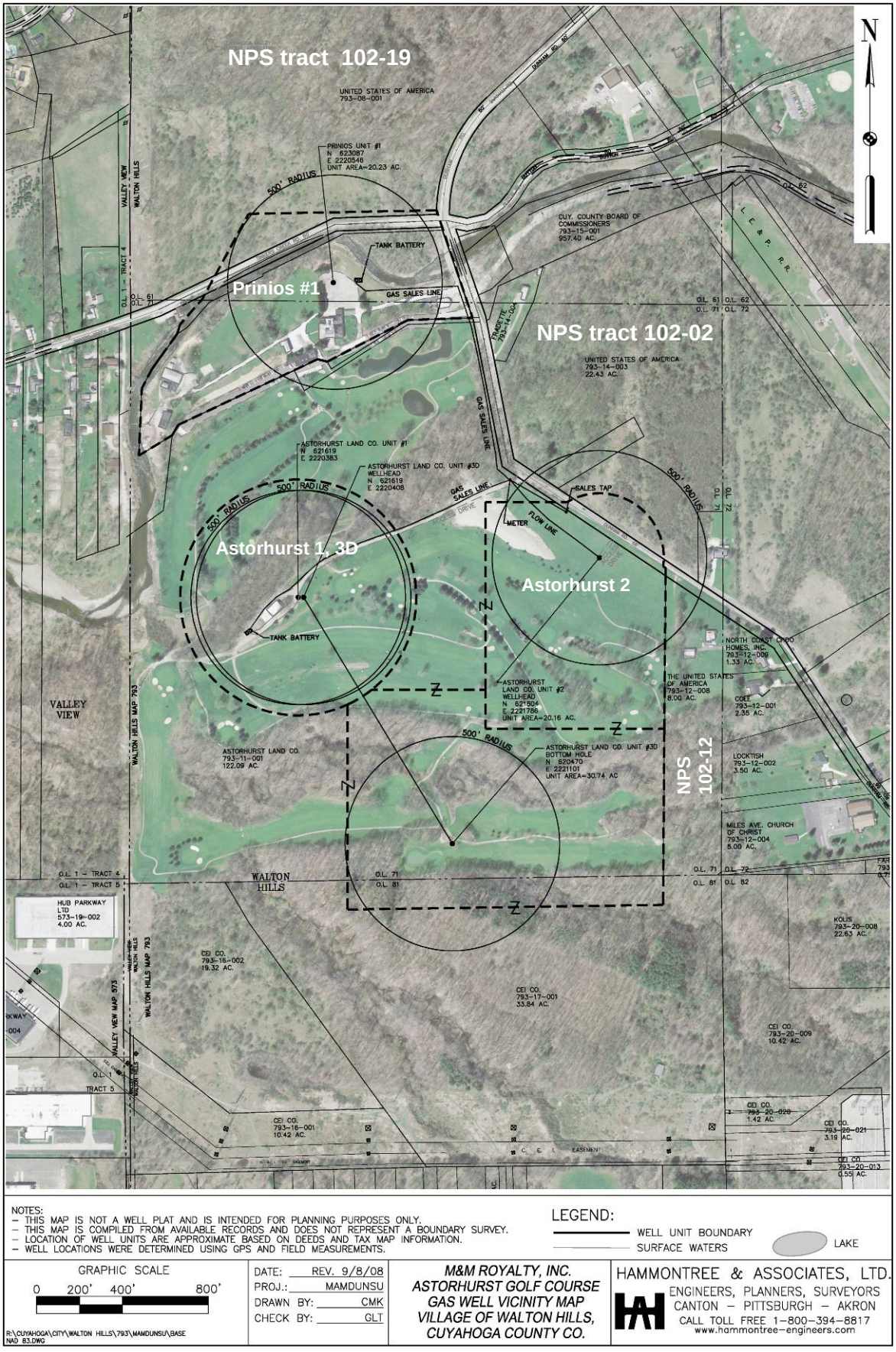
Currently there are 90 active non-federal oil/gas operations occurring within the Park and hundreds of operations in areas surrounding the Park.

On September 9th, 2008 M&M submitted a draft plan of operations to the Park for review. M&M revised the plan of operations to include all NPS recommendations and the NPS accepted the plan as substantially complete on February 5th, 2009. The NPS must decide whether to approve the plan and if so, if additional mitigation measures are needed.

Access to the Astorhurst #1 well and proposed #3D will be via an existing 1400 feet long gravel driveway from Dunham Road into the Astorhurst Golf Course maintenance yard. A new gravel access road approximately 100 feet long and 14 feet wide will be built to access Astorhurst #2. A new flow line corridor 600 feet long and 8 feet wide will connect Astorhurst # 2 to the existing gas sales line at Dunham Road. All three Astorhurst wells will be produced into the existing Astorhurst #1 tank battery facility located behind the golf course maintenance garage. An existing two inch steel flow line buried three feet deep along an 8 foot wide corridor travels alongside the existing access road and connects to an existing sales pipeline located on Dunham Road. A sales meter is located at the end of the access drive near Dunham Rd.

The third proposed well, Prinios #1, located in a commercial business parking lot at 6890 Dunham Road, would produce into a separate tank battery facility (1800 square feet in size) located 100 feet from the wellhead with a flow line travelling 594 feet alongside an existing commercial asphalt driveway to the existing sales line on Dunham Road (fig 2). Operations, including temporary work areas, related to the drill pads, new access roads, tank battery facilities and flow line corridors would result in approximately 1.4 acres of temporary impacts.

The indirect area of impact for each park resource or value could vary for each impact topic; but generally would not extend 400 feet beyond the wells and a 100-foot corridor around the access roads and flow line corridors.



NOTES:
- THIS MAP IS NOT A WELL PLAT AND IS INTENDED FOR PLANNING PURPOSES ONLY.
- THIS MAP IS COMPILED FROM AVAILABLE RECORDS AND DOES NOT REPRESENT A BOUNDARY SURVEY.
- LOCATION OF WELL UNITS ARE APPROXIMATE BASED ON DEEDS AND TAX MAP INFORMATION.
- WELL LOCATIONS WERE DETERMINED USING GPS AND FIELD MEASUREMENTS.

LEGEND:
WELL UNIT BOUNDARY
SURFACE WATERS
LAKE

GRAPHIC SCALE
0 200' 400' 800'

R:\CUYAHOGA\CITY\WALTON HILLS\793\MAMDUNSU\BASE NAD 83.DWG

DATE: REV. 9/8/08
PROJ.: MAMDUNSU
DRAWN BY: CMK
CHECK BY: GLT

M&M ROYALTY, INC.
ASTORHURST GOLF COURSE
GAS WELL VICINITY MAP
VILLAGE OF WALTON HILLS,
CUYAHOGA COUNTY CO.

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Fig. 2 Site map with adjacent NPS lands

The analysis area for evaluating cumulative impacts on park resources and values may extend beyond the boundaries of the Park.

1.1 Objectives of Taking Action

The objectives of taking action are to:

- Avoid, minimize, or mitigate impacts on park resources and values, visitor use and experience, and human health and safety
- Prevent impairment of park resources and values
- Provide M&M, as the lessee of nonfederal oil and gas mineral interests, reasonable access for exploration and development.

1.2 Special Mandates and Directives

The NPS evaluates project-specific proposals for oil and gas exploration and development on a case-by-case basis by applying a variety of current legal and policy requirements before issuing a permit under the general regulatory framework of the NPS Nonfederal Oil and Gas Rights Regulations (36 CFR 9B). The following discussion is a summary of the basic management direction the NPS follows for permitting nonfederal oil and gas operations in units of the National Park System.

1.2.1 NPS Organic Act and General Authorities Act – Prevention of Impairment

The NPS Organic Act of 1916 (16 U.S.C. § 1, *et seq.*) provides the fundamental management direction for all units of the National Park System. Section 1 of the Organic Act states, in part, that the NPS shall:

> "…promote and regulate the use of the Federal areas known as national parks, monuments, and reservations…by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." 16 U.S.C. §1.

The National Park System General Authorities Act of 1970 (16 U.S.C. § 1a-1 *et seq*.) affirms that while all national park system units remain "distinct in character," they are "united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage." The Act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Subsequently, the 1978 Redwood Act Amendments to the General Authorities Act further clarified Congress' mandate to the NPS to protect park resources and values. The Amendments state, in part: "[t]he authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress." 16 U.S.C. § 1a-1.

Current laws and policies require the analysis of potential effects to determine whether actions would impair park resources. While Congress has given the NPS the

managerial discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement (enforceable by the federal courts) that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise (2006 Management Policies, § 1.4.4).

These authorities all prohibit an impairment of park resources and values. Not all impacts are impairments. **Impairment** is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. The NPS Management Policies explain that an impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

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

NPS Management Policies explain that "resources and values" mean the full spectrum of tangible and intangible attributes for which the parks are established and are being managed, including the Organic Act's fundamental purposes (as supplemented), and any additional purposes as stated in a park's establishing legislation. Park resources and values that are subject to the no impairment standard include: the ecological , biological and physical processes which created the park and that continue to act upon it; scenic features; natural visibility; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures and objects; museum collections; and native plants and animals. Additional resources and values that are subject to the non-impairment standard include the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system.

The Environmental Consequences section of this EA provides an analysis of the potential for impairment for each park resource or value carried forward for further evaluation.

1.2.2 Cuyahoga Valley National Park Enabling Legislation

Cuyahoga Valley National Recreation Area was established by Public Law 93-555 on December 27, 1974 and was renamed Cuyahoga Valley National Park on October 11, 2000. The Park was created "for the purpose of preserving and protecting the historic, scenic, natural, and recreational values of the Cuyahoga River and the adjacent lands

of the Cuyahoga Valley and for the purpose of providing for the maintenance of needed recreational open space necessary to the urban environment."

1.2.3 NPS Nonfederal Oil and Gas Regulations, 36 CFR 9B

The authority to manage and protect federal property arises from the Property Clause of the United States Constitution. The Property Clause provides that "Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States . . ." U.S. Const. Art. IV, § 3, cl. 2.

In 1916, Congress exercised its power under the Property Clause and passed the NPS Organic Act, 16 U.S.C. § 1 *et seq*. Section 3 of the Organic Act authorizes the Secretary of the Interior to "make and publish such rules and regulations as he may deem necessary or proper for the use of the parks…" 16 U.S.C. § 3.

Pursuant to section 3 of the NPS Organic Act and individual park statutes, the Secretary of the Interior promulgated regulations at 36 CFR Part 9, Subpart B ("9B regulations") in 1979. The 9B regulations apply to operations that require access on or through federally owned or controlled lands or waters in connection with non-federally owned oil and gas in all National Park System units (36 CFR § 9.30(a)).

The NPS is legally required to allow access to the minerals while applying resource protection requirements and ensuring adherence to federal and state regulations, policies, and guidelines.

One of the primary rights associated with the mineral interest is the right of reasonable access to explore for and develop the mineral interest. If the mineral interest holder chooses to exercise its right to explore for or develop its mineral interest, the NPS must grant reasonable access to do so. However, access to nonfederal oil and gas which requires access on, across, or through federally owned or controlled lands or waters within the park is subject to the NPS Nonfederal Oil and Gas Rights Regulations.

The NPS Nonfederal Oil and Gas Rights Regulations (36 CFR 9B), and other regulatory requirements, assist park managers in managing oil and gas activities so they may be conducted in a manner consistent with the NPS mandate to protect park resources and values. The application and implementation of these regulations on the ground must be assessed parkwide for each site-specific oil and gas activity to determine if these activities have the potential to impair park resources and values.

1.2.4 NPS Oversight and Monitoring of Nonfederal Oil and Gas Operations

Under 36 CFR § 9.37(f) "[a]pproval of each plan of operations is expressly conditioned upon the Superintendent having such reasonable access to the site as is necessary to properly monitor and insure compliance with the plan of operations." In the event of an accident or spill, M&M will immediately notify park resource managers. All approved plans of operations have a spill contingency plan that is reviewed and approved by the NPS.

Pursuant to 36 CFR § 9.51(a) an **"operator shall be held liable for <u>any</u> damages to federally-owned or controlled lands, waters, or resources, resulting from his failure to comply with…his plan of operations**." Undertaking any operations within the boundaries of a park system unit in violation of the 9B regulations shall be deemed a trespass against the United States and shall be cause for revocation of approval of an operator's plan of operations. If an operator violates a term or condition of its approved plan of operation the Superintendent has the authority to temporarily suspend the operation and give the operator the chance to cure the violation. Section § 9.51(c) outlines the Superintendent's suspension authority and procedure. If an operator fails to correct any violation or damage to federally owned or controlled lands, waters, or resources the operator's approval will be revoked (36 CFR § 9.51(c) (3)).

In addition to the remedies available to the NPS under the 9B regulations, an operator is also subject to the remedial provisions found in all applicable federal, state, and local laws. For instance, under 16 U.S.C. § 19jj, commonly known as the "Park System Resource Protection Act," any person who destroys, causes the loss of, or injures any park system resource is strictly liable to the United States for response costs and for damages resulting from such destruction, loss or injury.

1.2.5 Approved Park Planning Documents

Approved park planning documents also provide a framework for determining how nonfederal oil and gas operations are conducted within the park. The General Management Plan (GMP) is the major planning document for all National Park System units. The GMP sets forth the basic philosophy of the unit, and provides strategies for resolving issues and achieving identified management objectives required for resource management and visitor use. The GMP includes environmental analysis and other required compliance documentation. A GMP was completed along with an Environmental Assessment for Cuyahoga Valley National Park in 1977 (NPS, 1977). A Statement for Management was completed in 1993 (NPS, 1993).

A summary of the statutes, regulations, executive orders, and policies that govern the exercise of nonfederal oil and gas rights in units of the National Park System is located in Appendix 1.

1.3 Issues and Impact Topics Evaluated

Early in the planning and development of the plan of operations by M&M, the NPS met with M&M to identify resources, values, and other concerns that could be potentially impacted by drilling and producing the Astorhurst # 2 and #3D and Prinios #1 wells. In addition, early input from other federal, state, and local agencies was sought. Scoping was performed with the U.S. Fish and Wildlife Service (FWS), U.S. Army Corps of Engineers (ACOE), Ohio Environmental Protection Agency (OEPA), Ohio Department of Health (ODH) and Ohio Department of Natural Resources, Minerals Management Division (ODNR) and involved contacts by telephone and written correspondence. The scoping process involved defining appropriate alternatives, impact determinations, mitigation measures, and identification of issues.

Pursuant to 36 CFR § 9.52(a) a press release of M&M's intent to develop up to three new wells on private property within the boundary of the Park was issued to local

newspapers on August 26, 2008. A public scoping notice was made available by mail and also posted to the NPS planning website at http://parkplanning,nps.gov/ on August 26th giving the public a 30-day period to submit scoping comments. A total of three comments were received during the scoping period.

Based on scoping, the NPS identified the following park resources, values, and other concerns for evaluation in this EA.

- Geology and soils
- Visitor use/experience

Based on the above list of park resources, values, and other concerns identified during scoping, issue statements were developed to define problems or benefits pertaining to the proposal to produce the existing Astorhurst #1 well and to drill and produce Astorhurst #2 and # 3D and Prinios #1 wells. The issue statements in Table 1, below, describe a cause-and-effect relationship between an activity and a resource, value, or concern. The issue statements were used in developing and evaluating alternatives.

Table 1. Issue Statements

Impact Topic	Issue Statement
Geology and Soils	• The potential exists for drainage of 5.5 acres of adjacent federal minerals from production units Prinios #1 and Astorhurst #2. Compensatory Royalty Agreements will be included as mitigation. • The potential exists for reasonably expected spill incidents which would not reach the magnitude of a reportable major spill (greater than 5 barrels) of oil. • The release of hydrocarbons or other contaminating and hazardous substances from vehicles, equipment or flow lines during drilling and production operations could alter the chemical and physical properties of the soil in the immediate vicinity of the oil/gas activity. • Grading and leveling of golf course turf grass to construct well pads and a tank battery facilities, and a 100 foot access road to Astorhurst #2 would result in soil compaction and loss of productivity on a maximum of 1.4 acres of private property for the life of operations until reclamation has been successfully achieved. • Directional drilling from the Astorhurst # 3D (off set 25 feet from existing Astorhurst #1) to the bottom hole would result in less surface disturbance on the golf course. • The use of two existing internal golf course roads to access wells and tank batteries minimizes new impacts. • Construction and operation of proposed facilities would result in impacts to geology and soils on private property at well pad locations and not on NPS surface estate.

Impact Topic	Issue Statement
Visitor Use/experience	• Oil and gas operations could pose a threat to human health and safety from the hazardous equipment at wells and production facilities, and the accidental release of hydrocarbons and hazardous or contaminating substances. Spilled or released hydrocarbons and contaminating or hazardous substances could be inhaled, absorbed, or ingested by human beings. • Visitors may believe that oil/gas operations are inconsistent with the purpose of the park and have potential to compromise park values. • Primary visitor use areas and the heavily visited towpath trail are located more than 1 ½ miles away from the project area. • Very few park visitors, except those using the golf course, would be in the vicinity of the proposed wells. • Golfers may experience a short term increase in noise levels and disruption of traffic flow patterns during drilling operations. • Vehicle use along Dunham Road, particularly from heavy vehicles and equipment used during the drilling operation could cause short term traffic delays.

1.4 Issues and Impact Topics Eliminated from Further Analysis

Impact topics are dismissed from further evaluation in this EA if, for the action alternative:

- they do not exist in the analysis area,
- they would not be affected by the proposal, or
- when through the application of mitigation measures, the impacts would result in "minor or less effects," and there is little controversy on the subject or reasons to otherwise include the topic.

The following topics have been eliminated from further analysis for reasons described below.

- Water Resources
- Wetlands
- Floodplains
- Vegetation
- Special Status Species
- Wildlife
- Air Quality
- Archaeological Resources
- Cultural Landscape
- Lightscape Management

- Socioeconomics
- Environmental Justice
- Prime and Unique Farmlands
- Indian Trust Resources
- Natural Soundscapes
- Catastrophic Incidents, including Well Blowouts, Well Fires or Major Spills
- Human Health and Safety

1.4.1 Water Resources

National Park Service policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States.

The proposed project area is in the vicinity of Tinkers Creek (outside the 100 and 500 year floodplain), a tributary to the Cuyahoga River. Water quality, water quantity, and drinking water are not expected to be affected by the project. The proposed action would result in negligible effects to water resources. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

1.4.2 Wetlands

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Executive Order 11990 Protection of Wetlands requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, §404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. National Park Service policies for wetlands as stated in 2006 Management Policies and Director’s Order 77-1 Wetlands Protection strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 Wetlands Protection, proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings for wetlands.

No jurisdictional wetlands are located in the project area; therefore, a statement of findings for wetlands will not be prepared. Two small wetlands less than 0.1 acres in

size are present on the golf course as part of the course's landscaped water hazards and this project would not directly or indirectly impact these small wet areas. Further, there would be no unacceptable impacts to wetlands; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006) therefore this topic is dismissed from further analysis in this document.

1.4.3 Floodplains

Executive Order 11988 Floodplain Management requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The National Park Service under 2006 Management Policies and Director's Order 77-2 Floodplain Management NPS will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2 Floodplain Management, certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains. The construction of roads used to access oil and gas operations and the siting of oil and gas storage facilities are considered Class II critical actions and should not be located within the 500-year floodplain unless there is no practicable alternative.

According to Federal Emergency Management Agency (FEMA) Special Flood Hazard Area Maps, the location for existing Astorhurst #1 well and the proposed locations for Astorhurst #2 and #3D and Prinios #1 wells do not lie within the 100-year or 500- year floodplain of Tinkers Creek or any of its tributaries; therefore, a statement of findings for floodplains will not be prepared. Further, there would be no unacceptable impacts to floodplains; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because the project is not located within a floodplain there would be no unacceptable impacts, therefore this topic is dismissed from further analysis in this document.

1.4.4 Vegetation

According to the National Park Service's 2006 Management Policies (NPS, 2006) the National Park Service strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants. For the Astorhurst wells the existing vegetation in the project area consists of golf course turf grasses. No native vegetation or trees will be disturbed. The Prinios #1 well will be located in an existing gravel parking lot on commercial property adjacent to the golf course property.

Turf grass would be displaced, disturbed, and/or compacted in the areas of drilling operations. Disturbed areas would be re-vegetated and rehabilitated following drilling; therefore, removal and/or disturbance of vegetation in the project area is expected to result in negligible to minor adverse impacts to vegetation. Further, such minor or negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

1.4.5 Special Status Species

The Endangered Species Act of 1973 requires examination of impacts on all federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the 2006 Management Policies (NPS, 2006) and Director's Order-77 Natural Resources Management Guidelines require the National Park Service to examine the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. For the purposes of this analysis, consultation with the U.S. Fish and Wildlife Service has been initiated as required under the Endangered Species Act.

Cuyahoga Valley is a refuge for a number of rare and endangered species of plants and animals. The federally endangered Indiana bat (*Myotis sodalis*) was found within park boundaries in July 2002, the first instance of that species ever recorded in the Park. This documented bat location is approximately three miles southwest of the proposed project area.

Nesting bald eagles, which are federally protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, successfully fledged young in 2007 and 2008 from one nest in Cuyahoga County along the Cuyahoga River in Brecksville, Ohio. This active nest is approximately two miles southwest of the proposed project area.

Piping plover (*Charadrius melodus*) is a federally listed endangered species that occurs in Cuyahoga County, but is not found within the Park. No suitable breeding habitat for piping plovers exists within park boundaries.

The Park is also within the range of the Eastern massasauga (*Sistrurus catenatus catenatus)* rattlesnake, a candidate species for listing under the Endangered Species Act (ESA) and listed as endangered by the State of Ohio. The species has not been detected within the Park, and a survey to identify those areas which have the highest potential for supporting *S.c.catenatus* was conducted in 2003. The results of the survey indicated that most of the park's small wooded wetland areas have little potential for supporting viable *S.c.catenatus* populations (Lockhart, 2003).

Many state-listed plant and animal species have been recorded in the Park. Forty-one state-listed rare plant species are known to occur. These plants occur in various habitats in the Park. However, none occur within the project area. At least 28 bird species observed in the Park are of conservation concern in Ohio. Most of these species of concern have exhibited steep population declines throughout their range or regionally due to habitat loss and degradation. Three state-listed turtles have been recorded in or near the Park (ODNR, 2008).

Protection under the Migratory Bird Treaty Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition, this act serves to protect environmental conditions for migratory birds from pollution or other

ecosystem degradations. Some migratory birds may be potential transients of the general area, but the immediate project area contains little to no suitable habitat for migratory birds. Construction-related noise could potentially disturb transient bird species, but these adverse impacts would be 1) temporary, lasting only as long as the drilling operation, and 2) negligible, because suitable habitat for transient birds is found throughout the Park and region.

Cuyahoga Valley National Park has no designated critical habitat within the park's boundary for any federally listed species. One species federally listed as endangered or threatened, one federally listed as species of concern, and 56 state protected species occur at Cuyahoga Valley National Park.

The project area for M&M is located on a golf course with no trees being removed for the drilling operation. No state listed plant species are located within the proposed project area. No threatened, endangered, or other species of concern are known to occur in the project area, and impacts to transient bird species would be temporary and negligible. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis.

1.4.6 Wildlife

The 2006 Management Policies (NPS, 2006) and Director's Order-77 Natural Resources Management Guidelines require the National Park Service to maintain all animals native to park ecosystems by minimizing human impacts on native animal populations and ecosystems and the processes that sustain them. Wildlife within the project area is typical deciduous forest assemblages from the Eastern United States. According to park species lists the diverse wildlife assemblages include 246 species of birds, 91 aquatic macroinvertebrates, 61 butterflies, 77 fishes, 44 mammals, 24 amphibians, and 23 species of reptiles.

The existing Astorhurst #1 well is located along the golf course's maintenance road, west of Dunham Road. Routine maintenance and storage occurs in this area for the golf course. Work crews occasionally access the area by pick up truck to inspect surface equipment. However, direct take of wildlife is possible from an animal, such as a deer or squirrel, being run over. Some migratory birds may be potential transients of the general area, but the immediate project area contains little to no suitable habitat for migratory birds. Construction-related noise could potentially disturb transient bird species and other wildlife, but these adverse impacts would be 1) temporary, lasting only as long as the drilling operation, and 2) negligible, because suitable habitat for transient birds and other wildlife is found throughout the Park and region.

Impacts from the continuing operation and maintenance of the flow line within the analysis area would result in localized, short to long-term, negligible to minor, direct and indirect, adverse impacts on wildlife. Astorhurst #1, and proposed Astorhurst # 2 and # 3D wells are located on a privately owned public golf course. The Prinios #1 will be located in an existing gravel parking lot on commercial business property adjacent to

the golf course. There is a potential for the flow line to leak or rupture, releasing hydrocarbon products and contaminating turf grass vegetation and soils in the immediate area. Drilling, production, and maintenance activities could adversely affect wildlife over the short term. These activities could result in avoidance of the area by wildlife due to increased noise and human presence.

The project area provides minimal habitat for wildlife; therefore, drilling of these wells is expected to result in negligible to less than minor adverse impacts to wildlife. Further, such minor or negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document .

1.4.7 Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with National Park Service units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards.

Cuyahoga Valley National Park is situated between two industrialized urban centers with major industries. The Park is a class II air quality area. The Park is an "island" amid an industrial complex with much of the existing air pollution originating outside the park boundary. Air quality sometimes violates federal EPA standards due to the combined effects of land configurations, prevailing winds, and a variety of pollution sources in the heavily industrialized areas north of the Park. The Park is at most risk from air pollutants such as ozone, sulfur dioxide, and sulfate.

Drilling activities such as hauling materials and operating heavy equipment could result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Any exhaust, emissions, and fugitive dust generated from drilling activities would be temporary and localized and would likely dissipate rapidly. Use of vehicles and other machinery, ground-disturbing activities associated with the construction of the access road and well/production pad, drilling and producing the wells, any work over operations on the wells, and eventual plugging/abandonment and reclamation of the wells and operations areas would result in increases in particulate matter, and emissions of nitrogen oxides, volatile organic compounds (VOCs), carbon monoxide, sulfur dioxide, particulate matter and objectionable odors. Emissions would be greatest during the short-term drilling/completion of each well (5 days) and work over activities (1-2 weeks) due to the increased use of vehicles and large gasoline and diesel engines used to power the drill rig, pumps and auxiliary equipment. Overall, the project could result in a negligible degradation of local air quality, and such effects would be temporary, lasting only as long as the drilling phase.

The Class II air quality designation for Cuyahoga Valley National Park would not be affected by the proposal. Further, because the Class II air quality would not be affected, there would be no unacceptable impacts; the proposed actions are consistent with

§1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because there would be negligible effects on air quality, and the proposed actions would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document .

1.4.8 Archaeological/Cultural Resources

The National Park Service, as steward of many of America's most important cultural resources, is charged to preserve cultural resources for the enjoyment of present and future generations. Management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources. The National Park Service will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the 2006 Management Policies (NPS, 2006) and the appropriate Director's Orders.

Section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC 470 et seq.); the National Park Service's Director's Order-28 Cultural Resource Management Guideline; and National Park Service 2006 Management Policies (NPS, 2006) require the consideration of impacts on historic properties that are listed on or eligible to be listed in the National Register of Historic Places. The National Register is the nation's inventory of historic places and the national repository of documentation on property types and their significance. The above-mentioned policies and regulations require federal agencies to coordinate consultation with State Historic Preservation Officers regarding the potential effects to properties listed on or eligible for the National Register of Historic Places.

In addition to the National Historic Preservation Act and the National Park Service 2006 Management Policies (NPS, 2006), the National Park Service's Director's Order-28B Archeology affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the National Park System. As one of the principal stewards of America's heritage, the National Park Service is charged with the preservation of the commemorative, educational, scientific, and traditional cultural values of archeological resources for the benefit and enjoyment of present and future generations. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the National Park System reflect a commitment to the conservation of archeological resources as elements of our national heritage.

The proposed project area is not expected to contain archeological deposits; however, appropriate steps would be taken to protect any archeological resources that are inadvertently discovered during construction. Because the project will not disturb any known archeological sites, the affect of the project on archeological resources is expected to be negligible. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

1.4.9 Ethnographic Resources

National Park Service's Director's Order-28 Cultural Resource Management defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. According to DO-28 and Executive Order 13007 on sacred sites, the National Park Service should try to preserve and protect ethnographic resources.

Ethnographic resources are not known to exist in the proposed project area. In addition, Native American tribes traditionally associated with the Park were apprised of the proposed project during scoping and one response was received from an affiliated tribe. This response confirmed their cultural affiliations with the area, but indicated that no impacts to significant ethnographic resources are expected. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

1.5.0 Cultural Landscapes

According to the National Park Service's Director's Order-28 Cultural Resource Management Guideline, a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. Because no contributing structures are present within the project area, there would be no unacceptable impacts to cultural landscapes; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because there are no impacts from this project to cultural landscapes, this topic is dismissed from further analysis in this document.

1.5.1 Lightscape Management

In accordance with 2006 Management Policies (NPS, 2006), the National Park Service strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light. The Park strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The proposed action would not include any use of artificial lights within the project area resulting in no new impacts on the natural ambient lightscape. Such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because there are no impacts from this project on the natural ambient lightscape, this topic is dismissed from further analysis in this document.

1.5.2 Socioeconomics

Socioeconomic issues include the effect of drilling and possibly producing the Astorhurst wells #2 and #3D and Prinios #1 well on the local and regional economies; and the effects of the proposal on visitation in the Park with associated revenues into the local and regional economies. The following description also provides supporting data to base the cumulative impact analysis for topics carried forward for further evaluation in Section 3.

Cuyahoga Valley National Park is located in Cuyahoga and Summit counties in northeast Ohio. The Ohio Summary of Oil and Gas Activities for 2007 compiled by the Ohio Department of Natural Resources (ODNR), Division of Minerals Resources Management (DMRM) issued 1,332 drilling permits statewide in 2007. The two counties encompassing the Park drilled a total of 91 wells. Cuyahoga County, where the proposed M&M operation is located, is the third most active county (out of 49 counties) in the state for drilling wells (ODNR, 2007).

Oil and gas exploration and production have been actively pursued on Cuyahoga Valley National Park prior to the park's establishment in 1974. A total of 90 active oil/gas operations exist within the current boundaries of the Park with the majority pre-existing the establishment of the Park. No new oil/gas wells have been drilled in the Park since 1996 when Everflow Eastern, Inc. drilled CVNRA #1 and CVNRA #2.

In the rare event that a serious spill event would occur, the public would perceive that the Park is not a desirable place to visit. Tourism could fall, resulting in reduced revenues to the local economy. The likelihood of this happening is very small, considering the precautions and mitigations required of the operators and the amount of existing oil/gas operations within the region.

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a negligible beneficial impact to the local economies due to minimal increases in employment opportunities for the petroleum workforce and revenues for local businesses and governments generated from these additional drilling activities and workers. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as construction. Revenue from oil/gas production of the wells would likely affect only a small number of people and their development would have such a small effect on the local and regional economies, the impacts to the socioeconomic environment would be negligible and this topic was dismissed from further analysis.

1.5.3 Environmental Justice

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed action would not have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Environmental Justice Guidance (1997). Therefore, environmental justice was dismissed from further analysis.

1.5.4 Prime and Unique Farmlands

As a result of a substantial decrease in the amount of open farmland, Congress enacted the Farmland Protection Policy Act (FPPA) (Public Law 97-98). In August 1980, the Council on Environmental Quality directed that federal agencies must assess the effects

of their actions on prime or unique farmland soils classified by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Prime farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, timber, and oil seed. Unique farmland soils are those that produce specialty crops such as fruits, vegetables, and nuts. Prime and unique farmland soils are those that are actively being developed and could be converted from existing agricultural uses to nonagricultural purposes, as described above. Urban or built-up land, public land and water areas cannot be considered prime farmland. Soils inside the Park cannot be considered prime and unique farmland soils because they are public lands unavailable for food or fiber production. Because there are no prime or unique farmlands in the Park, this topic was dismissed from further analysis.

1.5.5 Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources at Cuyahoga Valley National Park. The lands comprising the Park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Because there are no Indian trust resources, this topic is dismissed from further analysis in this document.

1.5.6 Natural Soundscape

In accordance with 2006 Management Policies (NPS, 2006) and Director's Order-47 Sound Preservation and Noise Management, an important component of the National Park Service's mission is the preservation of natural soundscapes associated with National Park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among National Park Service units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The proposed location for the new wells and all construction activity would occur within an existing golf course. Existing sounds in this area are most often generated from nearby heavy suburban/urban vehicular traffic, train traffic, airplanes, people, some wildlife such as birds, and wind. Sound generated by the long-term operation of the wells may include some man-made noises when the wells are serviced, but the long-term operation of the wells is not expected to appreciably increase the noise levels in the general area.

During construction, human-caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and drilling crews. Any sounds generated from

construction would be temporary, lasting only as long as the construction activity is generating the sounds, and would have a negligible to minor adverse impact on visitors to the golf course. Further, such negligible or minor impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006 (NPS, 2006). Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

1.5.7 Impacts from Catastrophic Incidents, such as Well Blowouts, Well Fires or Major Spills

One issue related to the proposed actions is the potential for catastrophic incidents, including well blowouts, well fires, or major spills. The Ohio Department of Natural Resource, Division of Mineral Resources Management oversees the State's oil and gas industry, gas utilities, pipelines, safety in the liquefied petroleum gas industry, and surface mining and reclamation of coal. The DMRM divides the state into three regions for purposes of administering and regulating oil and gas operations under its jurisdiction. The Ohio EPA maintains an emergency response database for tracking crude oil spills.

The Park is located in both Cuyahoga and Summit counties in northeast Ohio and encompasses 15 communities within the two counties. The Ohio Summary of Oil and Gas Activities for 2007 compiled by the Ohio Department of Natural Resources, DMRM issued 1,332 drilling permits statewide in 2007. The two counties encompassing the Park drilled a total of 91 wells; 61 drilled in Cuyahoga County, and 30 drilled in Summit County (ODNR, 2007). Cuyahoga County, where the proposed operation is located, is the third most active county (out of 49 counties) in the state for drilling wells with 228 wells drilled from 2004-2008 (M. McCormac, personal communication December 18, 2008).

Ohio has nearly 64,000 oil and gas wells. The majority of oil and gas wells are drilled and produced in a clean and efficient manner. However, poorly operated well sites can waste energy resources, cause safety concerns and environmental damage. DRMR maintains a highly visible presence through a well qualified staff of inspectors. These individuals witness the crucial aspects of well drilling, to assure that these operations meet the standard set to protect public health, safety and the environment. Inspectors are available to respond immediately to emergencies such as well or tank fires and "blowouts" that may be a threat to public health or safety.

A well "blowout" means the uncontrolled escape of formation fluids (water/brine, gas, oil) from a well. Given present day technology, a well blowout is extremely rare. According to the DMRM inspectors there have been no blowouts associated with oil and gas wells in Summit and Cuyahoga Counties for the last twenty years. Within Region 3 there have been two fires (human caused), and one tank battery fire (lightening strike). Lightening arrestors are now required on all tank batteries per Ohio House Bill 278. (R. Worstall & N. Lowder, personal communication, December 18 & 21, 2008).

From January 2004 to December 2008 there was only one crude oil spill (40 gallons) from a wellhead release in Cuyahoga County, the county where the project site is located. Adjacent Summit County, where the southern portion of the Park is located,

recorded 9 crude oil spills, with releases from 10 gallons to a maximum of 200 gallons. Four of the releases within tank batteries were contained within the bermed areas. Four spills involved pipelines or flow line breaks predominantly caused by corrosion or construction crews hitting buried lines. One spill was a wellhead release (C.Stanwick, personal communication, December 16, 2008).

The Ohio EPA defines the Reportable Quantity (RQ) for the discharge of oil including crude oil into or upon navigable waters is an amount which causes a visible film or sheen upon the surface of the water. The RQ for the release of oil into the environment, excluding navigable waters, is an amount of 25 gallons or more and the RQ for the release of crude oil from an oil and gas extraction storage facility into the environment, excluding navigable waters, is 210 gallons.

Any oil and gas operator that could reasonably be expected to discharge oil in harmful quantities, as defined in 40 CFR 110.3, into navigable waters, as defined in 40 CFR 110.1, is required to have a Spill Prevention, Control, and Countermeasure Plan (SPCC) in accordance with 40 CFR Part 112. Some of the specific requirements that an operator of onshore oil drilling and work over facilities must adhere to under 40 CFR 112.14, SPCC Plan requirements for onshore oil drilling and work over facilities, include:

• Meet the general requirements listed under Sec. 112.7, and also meet the specific discharge prevention and containment procedures listed under this section.
• Position or locate mobile drilling or work over equipment so as to prevent a discharge as described in Sec. 112.1(b).
• Provide catchment basins or diversion structures to intercept and contain discharges of fuel, crude oil, or oily drilling fluids.
• Install blowout prevention (BOP) assembly and well control system before drilling below any casing string or during work over operations. The BOP assembly and well control system must be capable of controlling any well-head pressure that may be encountered while that BOP assembly and well control system are on the well.

Due to these requirements, in the rare event of a major spill consisting of five or more barrels of oil (greater than 200 gallons), the spill would be rapidly contained and removed, so that impacts are short-lived and limited to the immediate area of operations. In the rare event that spilled substances from a well blowout or major spill would be transported onto adjacent park property, or a well fire would spread onto park property, the NPS would seek damages and restoration costs under the Park System Resources Protection Act, 16 U.S.C. § 19jj (2005). While applicability of the Park System Resources Protection Act would be applied only after damages to the park resources or values have occurred, this tool is also an effective deterrent for operators to apply the necessary preventative measures to prevent an incident from affecting the Park.

The application of mitigation measures in the plan of operations would reduce the potential impacts to ground water resources from the proposed drilling operation. Every effort will be in place to protect the zones of usable water from pollution. Blow out prevention plans and spill control and countermeasures plans will be adhered to in order

to prevent escape of oil, gas, or other fluids to the surface or zones of usable quality water and to prevent contamination of the surface from hazardous substances.

Cumulatively, the continuation of the existing Astorhurst #1 well and the addition of up to three new wells in the proposed action would not add more than negligible effects to the regional incident statistics. Based on the frequency of recent occurrences in the area, the likelihood of such incidents is very low, and it is not expected that catastrophic incidents such as well blowouts, well fires and major spills within the Park would result in more than negligible impacts; therefore this topic was dismissed from further analysis.

Analysis of impacts from reasonably expected spill incidents, which would not reach the magnitude of a reportable major spill consisting of five or more barrels of oil, is presented under other impact topics in Sections 1 and 3 of this EA.

1.5.8 Human Health and Safety

Oil and gas operations could pose a threat to human health and safety from the hazardous equipment at wells and production facilities, and the accidental release of hydrocarbons and hazardous or contaminating substances. Spilled or released hydrocarbons and contaminating or hazardous substances could be inhaled, absorbed, or ingested by human beings.

One hazardous substance associated with the petroleum industry is hydrogen sulfide gas. According to ODNR Minerals Management Division, the state has identified specific townships and geologic formations where hydrogen sulfide gas may occur and in those cases they issue permit conditions regarding hydrogen sulfide conditions. The proposed project location has not been identified as one of these areas. Additionally, during the drilling phase, the hydrostatic pressure of the liquid drilling fluid is sufficient to overbalance and control any influx of gas, oil or brine into the well bore.

Additionally, the presence of naturally occurring radioactive material (NORM) occurs throughout our environment and humans have adapted to radiation exposures resulting from normal ambient background concentrations. The petroleum industry is one of several industries that can generate NORM-bearing wastes (see http://norm.iogcc.state.ok.us/). According to ODNR, the presence of NORM is very unlikely in the geologic (Clinton) formations that have been historically and currently produced in Ohio. The operator would have monitoring in place during the drilling phase to detect any possible levels of radiation. The State of Ohio has not had any problems with NORM in produced water. Additionally, the Ohio Department of Health (ODH) does not specifically license oil/gas well operations unless there is a specific reason to do so. Should any sites report or request ODH response to specific quantities of NORM, a determination would be made on a case by case basis (M. McCormac, personal communication, October 2, 2008; S.Helmer, personal communication, October 21, 2008; and N. Lowder, personal communication, December 21, 2008).

A review team representing state environmental regulators, the oil and gas industry and the environmental community completed a comprehensive follow-up and supplemental review of Ohio's oil and gas regulatory program in June, 2005. The review process evaluates the state program against a set of national guidelines developed by the U.S.

Environmental Protection Agency (USEPA) and the Interstate Oil and Gas Compact Commission (IOGCC) to improve state oil and gas regulatory programs and is conducted on a strictly voluntary basis.

The 96-page report concluded that "Ohio has a well-managed and innovative oil and gas environmental regulatory program" and noted that several activities by the Ohio Department of Natural Resources' Division of Mineral Resources Management actually go above and beyond guideline standards that were established in 2000 (Stronger, 2005).

Mitigation measures, including selecting a proposed operations area located away from heavy visitor use areas, providing security and installing a gate during the drilling operations to prevent unauthorized entry into the operations area would result in minimizing impacts on human health and safety. Because the likelihood of hydrogen sulfide gas and NORM being present within the project area is extremely low, it is not expected that drilling these wells would affect the human health and safety of park visitors and this topic was dismissed from further analysis.

2.0 ALTERNATIVES

Two Alternatives are described and evaluated in this EA. Alternative locations and strategies that were considered but dismissed from further analysis are then described. An analysis for selecting the environmentally preferred alternative is also provided. This section concludes with three summary tables comparing the two alternatives.

2.1 Alternative A, No Action

The No Action Alternative is required under the National Environmental Policy Act of 1969 (NEPA) and establishes a baseline or benchmark from which to compare the present management direction and environmental consequences of the action alternative. Under No Action, the Astorhurst #2, #3D and Prinios #1 wells would not be drilled. The existing Astorhurst #1 well would continue to operate.

2.2 Alternative B, Proposed Action

Under Alternative B, Proposed Action, M&M would continue to operate the existing Astorhurst #1 (fig. 3 and 4) and drill and produce up to three wells (Astorhurst #2, #3D and Prinios #1) as proposed in its plan of operations.

Fig. 3 Astorhurst #1 Well

Fig. 4. Existing Astorhurst #1 Tank Battery Facility to be used for Astorhurst #2 and #3D wells.

The proposed surface location of the Astorhurst #2 (fig 5) is located 101 feet west of Dunham Road on the Astorhurst Golf course in Walton Hills, Cuyahoga County, Ohio. The proposed surface location of Astorhurst #3D (fig 6) is off set 25 feet from the existing Astorhurst #1 (located along the existing gravel maintenance road to the golf course maintenance garage). If drilled and produced the Astorhurst #3D will be directionally drilled to a bottom hole approximately 1500 feet away from the surface location. The proposed surface location for Prinios well # 1 (fig 7) is in a commercial parking lot at 6890 Dunham Road, 594 feet west of Dunham Road and 159 feet south of Tinkers Creek.

The global positioning system measurements coordinates (Ohio State Plane/NAD 83) for the wells are as follows:

Well	**Northing**	**Easting**	**Unit Acreage**
Astorhurst #2	621804	2221786	20.16
Astorhurst #3D	621619 620607	2220408 (well head) 2221113 (bottom hole)	30.74
Prinios #1	623087	2220546	20.23

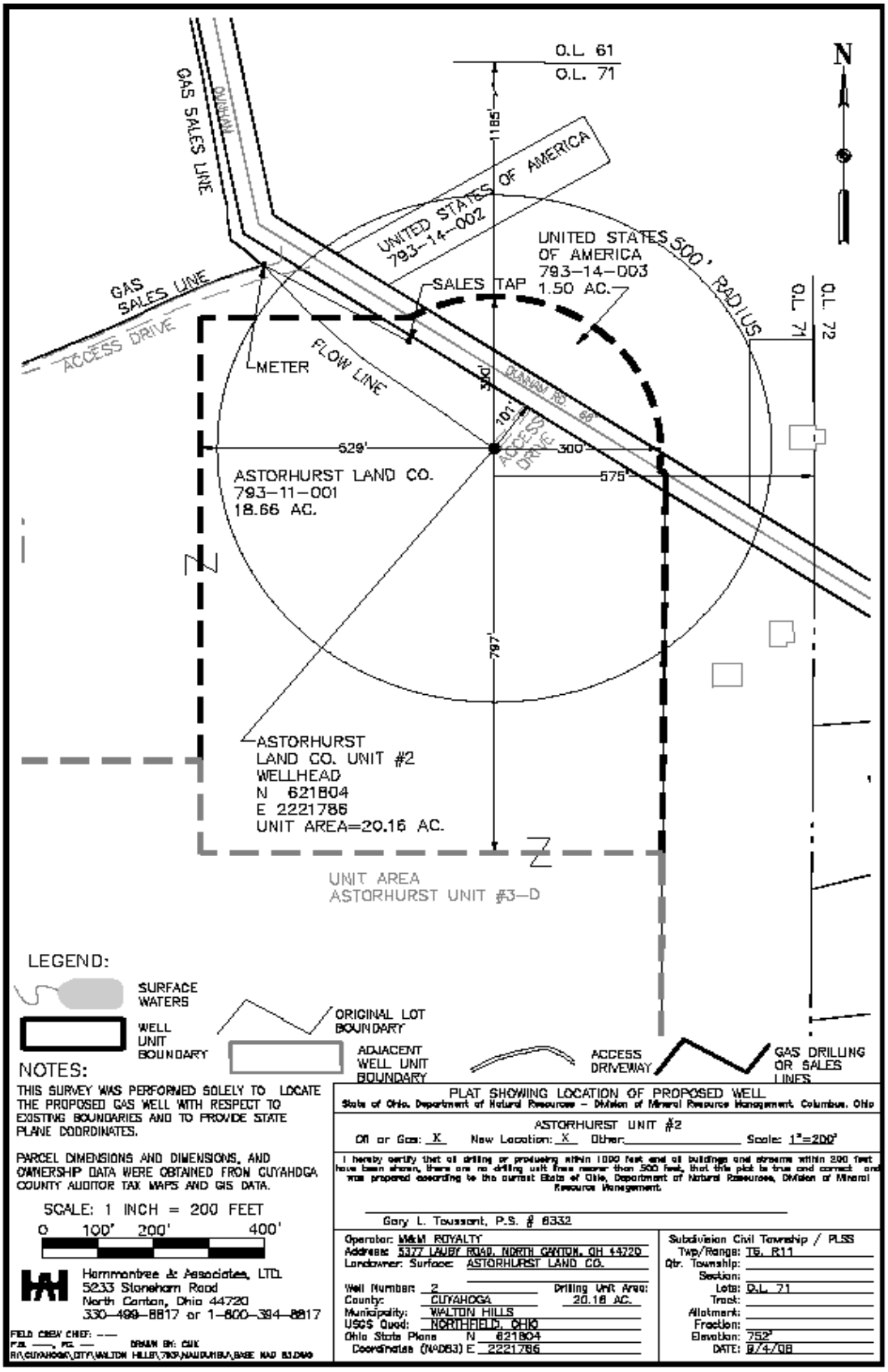

Fig.5 Astorhurst #2

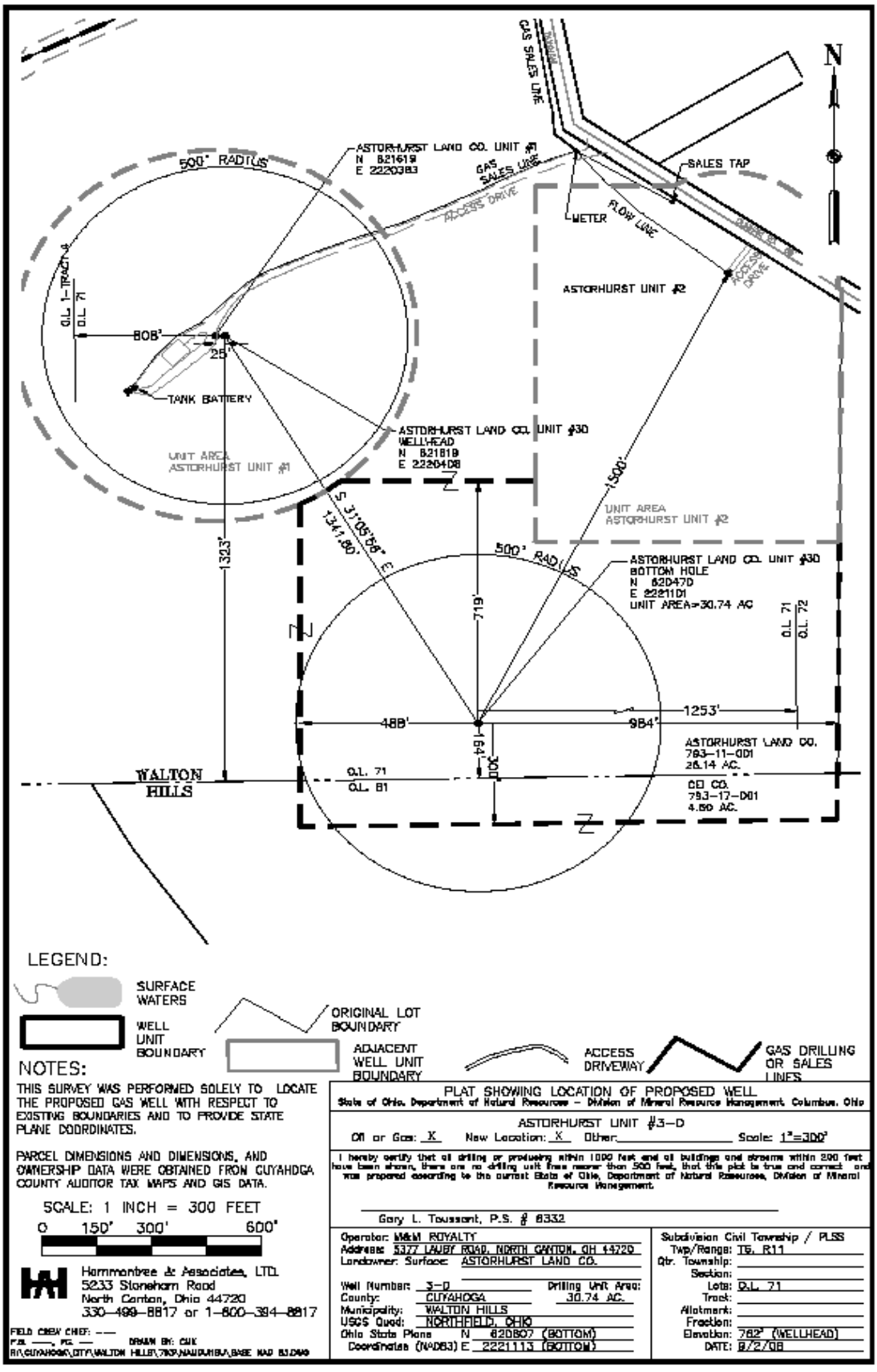

Fig. 6 Astorhurst # 1, #3 D

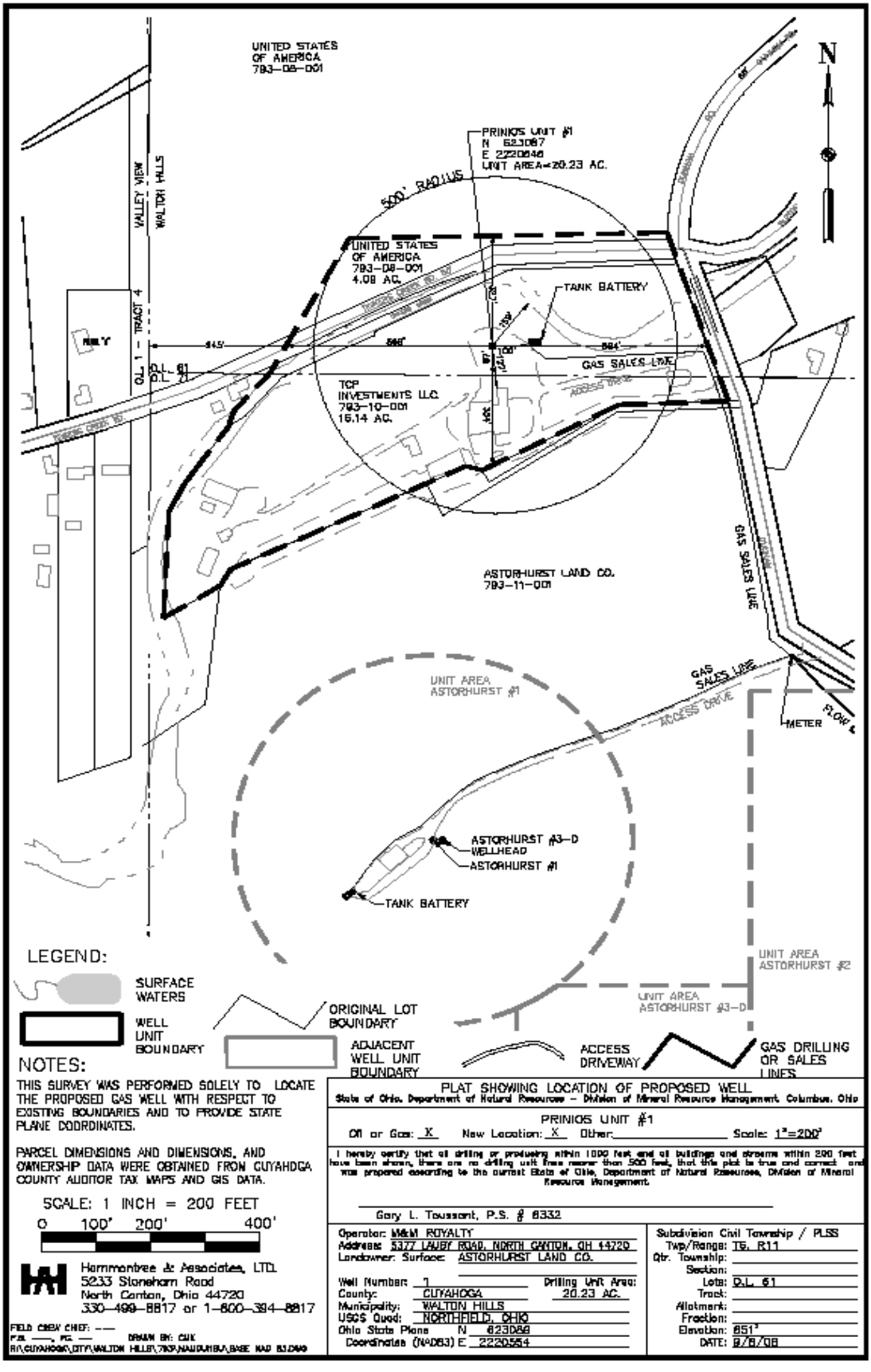

Fig. 7 Prinios #1

Access
All vehicles used during drilling for Astorhurst # 3D and production operations would enter the area via Dunham Road and then proceed approximately 1400 feet along the existing maintenance road to the proposed well location.

Access to Astorhurst #2 will be off of Dunham Road along a proposed new 100 foot long by 14 foot wide gravel access road. Access to Prinios well #1 would be from Dunham Road approximately 594 feet along an existing asphalt driveway to the well location in an existing parking lot.

Surface Location and Wellpad
Each temporary well pad would be approximately 125 feet by 150 feet in size (18,750 square feet). Turf grass vegetation from the golf course would be disturbed. No trees or shrubs will be removed. Sediment control structures (silt fencing) would be installed around the down slope sides of the well sites. Topsoil would be removed and stockpiled on site to be re-used during reclamation. The size of the temporary well pad would be significantly reduced to a smaller footprint similar to Astorhurst #1 (fig 3) once the well is placed into production and drilling equipment removed.

Drilling Operations
No water would be obtained from sources within NPS property. Water needed during drilling would be transported to the site by tank truck.

Wells will be drilled to the Clinton Sandstone formation which is approximately 3,300 feet in total depth. The surface hole is drilled (on fluid) with an 11 inch drilling bit to total depth of approximately 350 feet. This hole will then be cased with 8 5/8 inch casing and cemented to surface to protect the fresh water horizons. This stage of the drilling process takes two days. The main hole is drilled on air unless gas is encountered in the Newburg formation and then conversion to a fluid with a 7 7/8 inch drilling bit to a total depth of approximately 3,650 feet will occur. This hole will be cased to surface and cemented with 375 sacks of cement. This stage of the process will take three days. If the well is successful to the Clinton formation oil and gas prospect, a completion date will be set approximately 6-20 days after drilling is complete. During the production phase of each well, oil will be transported off lease by the use of an oil tanker truck. Final reclamation of the surface area will begin within 10 days after the well is fractured.

Each well will be equipped with a plunger lift system which will utilize no outside supplemental lift gas. Plunger lift is the method of recovering oil using a steel plunger, or swab ‘rabbit’. The plunger is propelled from the lower end of the tubing string to the surface by expanding gas which enters the tubing through the mud anchor, or perforated nipple. As the gas expands, a column of oil is lifted to the surface where it is discharged into the flow line. The force of gravity then pulls the plunger to bottom for another load of oil. A simple valve mechanism makes the operation of the plunger entirely automatic. The plunger ‘rabbit’ is also used for paraffin removal. With each trip of the plunger from the bottom of the tubing string, the plunger scrapes away any accumulated paraffin and discharges it through the flow line to the separator.

During drilling operations, drilling and associated equipment would have impervious liners installed for ground protection. After setting surface casing, blow-out preventors (BOP) would be installed on the wells.

Production Facility

Upon successful completion of Astorhurst # 2 and #3D, the existing tank battery facility currently used for Astorhurst #1 and located behind the golf course maintenance garage will be used to serve proposed wells #2 and #3D. This facility is 60 feet long and 30 feet wide and consists of two 100 barrel (BBL) tanks, one 50 BBL dump tank and one horizontal separator. The facility is surrounded by a two foot high impermeable earthen dike constructed of native material capable of holding a minimum of 1.5 times the volume (265 BBLS) of the largest tank. An impermeable liner with clay overlaying the liner has been installed beneath the storage tanks to prevent the downward movement of fluids through the soil and into the ground water.

Upon successful completion of Prinios #1, a tank battery facility similar to the Astorhurst #1, #2 and #3D (fig 4) will be constructed adjacent to the Prinios #1 well site at the edge of the existing gravel parking lot. The tank battery facility will be 60 feet long and 30 feet wide and consist of one 100 BBL tank, one 50 BBL dump tank and one separator. Brine water will be produced continually in small quantities over the life of the wells. All brine separated from the oil by gravity will be siphoned off and stored in the 50 BBL steel tanks. When full, a water hauling truck capable of holding 80 BBLS of brine will transport the brine off site and outside park boundaries to a state approved disposal well.

Flow lines

All final production, handling, and sales metering facilities would be located at Astorhurst # 1, #2 and # 3D tank battery facility and at the Prinios #1 tank battery facility. The natural gas will be carried by a two inch steel coated pipeline system, equipped with cathode protection, from the well to the separator to the East Ohio Gas System on Dunham Road. The pipeline will be buried three feet deep along the edge of the existing gravel access drives for Astorhurst #1, #3D and Prinios#1. For Astorhurst #2, the buried flow pipeline will travel a distance approximately 600 feet from the well head location to the existing sales line servicing Astorhurst #1 and #3D. With the utilization of coated pipe equipped with property cathode protection, the risk of pipeline degradation and subsequent leaks are reduced.

Reclamation Plan

Within ten days after completion of approved operations, all above ground structures as well as new access roads not used for continuing operations shall be removed. Each drill site location shall be graded to a contour which will conform to contours prior to initiation of the operation. Reclamation will include the addition of topsoil, if needed, to re-establish and encourage native growth and reduce erosion. If successful re-vegetation does not occur after a period of two growing seasons, the operator will take corrective actions to ensure vegetation cover.

Plug and Abandonment

At the completion of production operations (end of the life of the wells), the wells would be plugged and abandoned, and all above ground structures, equipment, and other man-made debris resulting from operations would be removed; and any contaminating substances would be neutralized and removed. Wells will be plugged in accordance with the rules and regulations of the State of Ohio, Department of Natural Resources, Division of Minerals Management and National Park Service Standards. NPS plugging standards are defined in Chapter 7 of the *Operator's Handbook for Nonfederal Oil and Gas Development*, October 2006. The NPS applies the plugging specifications of the *Department of Interior's Onshore Order #2, Section III. G., Drilling Abandonment* for isolation and protection of zones bearing usable water quality. The NPS is not responsible for protecting private mineral interests. Where plugs are set solely to protect nonfederal mineral resources such as oil, gas, coal, potash, etc., the NPS defers to the state requirements.

Mitigation Measures

In order to reduce the impacts to park resources and values, M&M sought the views and advice of NPS personnel. Table 2 includes a list of mitigation measures and a reference where the measure is included in the plan of operations for ease of reference.

Table 2. Mitigation Measures under Alternative B, Proposed Action

No.	Mitigation Measures Proposed Action (Alternative B)	Resource(s) Protected	Reference
	Project Planning and Site Construction		
1	Prepare and comply with a Spill Prevention Control and Countermeasure (SPCC) Plan as part of the Plan of Operations to describe actions to be performed in the event of an oil spill, brine spill, release of drilling fluids, blow-out, or release of any toxic substance.	All natural resources and human health and safety	**Exhibit 1; pg. 7, 11, 15**
2	Use existing access roads to minimize surface impacts. Site tank battery facilities in existing parking lots. Site well heads on existing turf grass golf course to avoid cutting trees/native vegetation.	All natural resources	**Pg. 13, 14, plat maps**
3	Offset Astorhurst #3D and directionally drill from existing well Astorhurst #1 to minimize surface disturbance and avoid additional placement of structures within the golf course.	All natural resources and human health and safety	**Plat maps**
4	Pursue compensatory royalty agreements (CRA) with Bureau of Land Management (BLM) to mitigate potential drainage of adjacent 5.5 acres of federal minerals for Prinios #1 and Astorhurst #2 wells.	Geology	**Pg. 20**
5	The Superintendent of Cuyahoga Valley National Park or his/her representative, shall have reasonable	All natural resources	**36 CFR 9B**

	access to the operations as necessary to properly monitor and insure compliance with the conditions of the plan of operations under the provisions of 36 CFR § 9.37(f).		
6	The approval of the Plan of Operations will be conditioned upon the operator tendering a performance bond not to exceed $200,000 for operations by a given operator within a unit of the National Park System. The regulations limit the liability amount for the operation of a single well to $50,000.	All natural resources	**36 CFR 9B**
	Well Drilling		
7	Use in ground/lined pits and dispose of drilling muds and well cuttings off site. All mud, drill cuttings, produced water, etc. will be collected for disposal at state-approved disposal facilities outside of the park boundaries.	All natural resources located on or adjacent to well pad	**Pg.11**
8	Set surface casing according to State of Ohio regulations	Groundwater	**Pg.6,7,12**
	Production		
9	A thick protective liner will be placed beneath the tank battery facilities to prevent downward movement of fluids.	Soils and groundwater	**Pg.13**
10	A tank battery with a two foot high berm, or “firewall,” will be constructed and maintained to contain 1.5 times the volume of the largest tank in the event of a leak. Off load connections would have a safety drip device below it to catch any dripping fluid lost during hook-up and disconnection.	Groundwater, soils and vegetation	**Pg.13,19**
11	Cathodic protection will be installed at each end of the proposed flow line. All pipe lines from the production facility to the tanks would be buried at a depth of three feet below the surface.	Soils, vegetation	**Pg.13**
12	During construction, M&M will prevent unauthorized visitors from entering the access road by installing a warning sign, and stationing a supervisor at the entrance.	Human health and safety	**Pg. 8,9**
13	An eight foot high chain link fence with a three-strand, barbed-wire will be placed around the perimeter of the tank battery facilities.	Human health and safety	**Pg.8**

14	Signs will be posted at the entrance of the access road, on the well head, and on the tank battery giving operator name, lease name, well number and emergency numbers.	Human health and safety	**Pg.8**
15	Notify regulatory authorities within 24 hours in the event of a release or spill exceeding five barrels.	All natural resources; human health and safety	**Exhibit 1; pg.11**
	Well Plugging		
16	The wells will be plugged in compliance with NPS and State of Ohio standards.	All natural resources	**Pg.14**
	Reclamation		
17	Reclamation of the site will be initiated within 10 days following completion of operations. After removal of access road(s) and well heads, all disturbed areas will be re-contoured to as near as possible to the original contour and re-vegetated.	All natural resources	**Pg. 4,14**

2.3 Alternatives Considered but Dismissed from Further Analysis
During the scoping process for this project, alternative locations and methods were considered for siting the well pads, access roads, flow line, and tank battery production facilities. These alternative locations and methods were discussed in consultation with M&M personnel and NPS staff. For the reasons described below, these alternatives were not subjected to further analysis.

NPS Acquisition of the Mineral Rights that are Part of M&M's Proposal
In the event that a proposed operation cannot be sufficiently modified to prevent the impairment of park resources and values, the NPS may seek to extinguish the associated mineral right through acquisition, subject to the appropriation of funds from Congress. With respect to the M&M proposed plan of operations, mitigation measures were identified and applied, which substantially reduced the potential for adverse impacts to adjacent park resources and values. As a result, the acquisition of mineral rights was dismissed from further consideration in this EA.

Alternative Access
An access route connecting to the golf course from private property southwest of the golf course was considered. This access route would require major construction of a new access road and the acquisition of an easement to cross a public utility corridor. This route was determined to be unacceptable when existing roadways could be used.

NPS staff and M&M personnel concluded that using the two existing internal roads for the proposed access route was the least environmentally damaging alternative.

Alternative Drilling Locations
M&M considered two different surface location alternatives for drilling the Astorhurst #2 and #3D wells. The proposed location was decided upon by NPS staff and M&M personnel to be the most desirable alternative from both an environmental and a drilling point of view. The proposed location provides M&M with sufficient space for multiple well drilling operations and avoids direct impacts to nearby natural areas and adjacent NPS property.

- Alternative no. 1 was located east-northeast of the existing Astorhurst well #1. Although the access route to alternative # 1 was the shortest access option, the location would have been on the edge of a ravine adjacent to an intermittent tributary and several large trees would have been impacted. In addition, M&M geologists determined that the alternative location #1 was not ideal for drilling the subsequent wells.
- Alternative no. 2 was located on the 18th hole of the golf course, close to the tee off green. Alternative no. 2 would have required a separate tank battery facility and flow line. M&M geologists determined that by directionally drilling Astorhurst well # 3D as an offset from existing well # 1 and drilling Astorhurst # 2 closer to # 1 and #3D that the three Astorhurst wells could use the same tank battery and flow line facilities. This would be more efficient and reduce surface area disturbance on the golf course.

M&M and NPS staff concluded that the proposed access route was the least environmentally damaging alternative.

2.4 NPS Environmentally Preferable Alternative
Section 101 of NEPA states that "…it is the continuing responsibility of the Federal Government to…(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice; (5) achieve a balance between population and resource use which would permit high standards of living and a wide sharing of life's amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depleatable resources" [42 U.S.C. § 4321 *et seq.* § 101 (b)].

The environmentally preferable alternative for drilling and producing the wells is based on these national environmental policy goals. Under Alternative A, No Action, up to three new wells would not be drilled. Because there would be no new impacts, Alternative A would provide the greatest protection of area and park resources and values. Alternative A meets five of the six criteria (1 thru 4, and 6) and is therefore the environmentally preferable alternative.

M&M's Proposal, Alternative B, would have greater effects on the environment because of drilling and production operations. Alternative B meets four of the six criteria (1, 2, 4, and 5). Although mitigating measures would reduce effects to park resources and values, there would still be effects, and therefore this alternative would not meet the Park Service's environmental policy goals as well as the No Action Alternative.

2.5 NPS Preferred Alternative

The environmentally preferable alternative is Alternative A because it surpasses Alternative B in realizing the full range of national environmental policy goals as stated in § 101 of NEPA. However, the NPS preferred alternative is Alternative B, Proposed Action, because M&M holds a valid lease right, which, if developed, would not result in an impairment of park resources and values. The NPS believes this alternative would fulfill its park protection mandates while allowing M&M to exercise its property right interest.

2.6 Summary of Alternatives

Table 3 outlines both alternatives and how well each alternative meets the objectives of this project. The actions required for this project and to what extent park resources are impacted are summarized in Tables 4 and 5.

Table 3. Extent that Each Alternative Meets Objectives

Objectives	Does Alternative A: No Action Meet Objective?	Does Alternative B: Proposed Action Meet Objective?
Avoid, minimize, or mitigate impacts on park resources and values, visitor use and experience, and human health and safety.	**Yes** Without drilling the wells, there would be no new impacts.	**Yes** Mitigation measures would avoid and minimize impacts.
Prevent impairment of park resources and values.	**Yes** Without drilling the wells, there would be no potential for park resources and values to be impaired.	**Yes** Mitigation measures would result in no impairment of park resources and values.
Provide M&M, as the lessee of nonfederal oil and gas mineral interests, reasonable access for exploration and development.	**No** Drilling the wells would not be permitted precluding M&M access to develop its nonfederal oil and gas mineral interests.	**Yes** M&M, as lessee, would be provided reasonable access for exploration and development.

Objectives	Does Alternative A: No Action Meet Objective?	Does Alternative B: Proposed Action Meet Objective?

Table 4. Summary of Actions

Actions	Alternative A: No Action	Alternative B: Proposed Action
Access	New access road would not be required because the well(s) would not be drilled. The existing access road for Astorhurst #1 and Prinios #1 would remain.	M&M related traffic would utilize Dunham Road and existing internal roadways on the golf course for Astorhurst #1, #3D and Prinios #1. A new access road for Astorhurst #2 would be constructed.
Well and Tank Batteries	The temporary well pads and Prinios #1 tank battery facility would not be built. The existing tank battery for Astorhurst # 1 would remain in operation.	M&M would construct the temporary well pads for Astorhurst# 2 and #3D and Prinios #1; and a tank battery facility for Prinios #1. The existing tank battery for Astorhurst # 1 would be used for Astorhurst #2 and # 3D wells.
Flow lines	Additional flow line(s) would not be needed because the wells would not be drilled. Existing flow line for Astorhurst # 1 would remain in operation.	If the wells are produced, M&M would construct a new flow line corridor to connect Astorhurst #2 to the exiting flow line and tank battery that serves Astorhurst #1. A flow line corridor would be constructed adjacent to an existing internal road to connect Prinios #1 to its tank battery and sales line. The flow line corridors would be reclaimed and re-contoured as close to its previous state as possible once lines are buried. Lines would be buried three feet deep.

Actions	Alternative A: No Action	Alternative B: Proposed Action
Reclamation Plan	Astorhurst #1 would be plugged and abandoned in accordance with State of Ohio requirements. Reclamation for Astorhurst #1 well head, tank battery facility and flow line corridor would be completed and all surface equipment and facilities removed at time of plugging and abandonment. All surface disturbances would be re-contoured as near as possible to the original contour. No additional reclamation would be needed if proposed wells were not drilled.	All wells would be plugged and abandoned in accordance with State of Ohio requirements. Reclamation for Astorhurst #2, #3D and Prinios#1 well head, tank battery facility and flow line corridors would be completed and all surface equipment and facilities removed at time of plugging and abandonment. All surface disturbances would be re-contoured as near as possible to the original contour.

Table 5. Summary of Impacts

Impact Topic	Alternative A: No Action	Alternative B: Proposed Action
Geology and Soils	Under Alternative A, No Action, up to three new wells would not be drilled, resulting in no new impacts on geology and soils. Existing park uses, commercial and recreational vehicular traffic along Dunham Road, and continued operation of Astorhurst #1 would result in localized, negligible to minor, direct and indirect, adverse impacts on geology and soils within the analysis area.	Under Alternative B, Proposed Action, up to three new wells would be drilled resulting in the short-term disturbance to geology and soils. Surface disturbance would temporarily impact up to 1.4 acres of private property adjacent to NPS property. No surface disturbance on NPS would occur. Maintenance and construction of temporary well pads, drilling and producing the wells, in addition to existing activities within the analysis area, would result in

Impact Topic	Alternative A: No Action	Alternative B: Proposed Action
Geology and Soils	Cumulative impacts from existing and future oil and gas operations including transpark pipelines, in and adjacent to the park, park developments and operations, and visitor uses are expected to result in short to long-term, negligible to minor, direct and indirect, adverse impacts, localized near developments throughout the Park. However, in the event of a major spill from oil and gas operations, impacts could be long-term and widespread, ranging from negligible to moderate, direct and indirect, adverse impacts. No impairment to geology and soils would result from implementation of this alternative.	localized, short to long-term, negligible to minor, direct and indirect, adverse impacts on geology and soils. Cumulative impacts would be similar to those described under Alternative A, No Action, with short- to long-term, negligible to minor, direct and indirect, adverse impacts on geology and soils in the project area. However, in the event of a major spill from oil and gas operations, impacts could be long-term and widespread, ranging from negligible to moderate, direct and indirect, adverse impacts Compensatory royalty agreements would be established for potential drainage of 5.5 acres of federal minerals on adjacent NPS tracts. No impairment to geology and soils would result from implementation of this alternative.
Visitor Use and Experience	Under Alternative A, No Action, new wells would not be drilled, resulting in no new impacts on visitor use and experience. The existing Astorhurst #1 would continue to operate along with routine golf course activities.	Under Alternative B, Proposed Action, up to three new wells would be drilled and may be produced, resulting in the short-term interruption of golfing activities, and long-term occupancy by oil and gas development on 1.4 acres on the private golf course, with localized, short to long-term, negligible to minor, direct and indirect, adverse impacts, on visitor use and experience in the analysis area.

Impact Topic	Alternative A: No Action	Alternative B: Proposed Action
Visitor Use and Experience	Cumulative impacts from existing and future oil and gas operations in and adjacent to the Park, trans park pipelines, park development and operations, and visitor uses are expected to result in short to long-term, negligible to minor, direct and indirect, adverse impacts. In the event of a major spill from oil and gas operations, impacts could be widespread, with negligible to moderate, direct and indirect, adverse impacts on visitor use and experience.	M&M's vehicle access, project construction, and drilling and producing the well would result in localized, short to long-term negligible to minor, direct and indirect, adverse impacts on golf course visitor use and experience. Primary park visitor use areas are located over 1 ½ miles away. Cumulative impacts on visitor use and experience throughout the Park would be similar to those described under Alternative A, No Action, with impacts from existing and future oil and gas operations in and adjacent to the Park, park development and operations, and visitor use, resulting in short to long-term, negligible to minor, direct and indirect, adverse impacts. In the event of a major spill from oil and gas operations, impacts could be widespread, with negligible to moderate, direct and indirect, adverse impacts on visitor use and experiences.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Methodology

During project scoping, it was determined that the following topics would be carried forward for analysis:

- Geology and soils
- Visitor use and experience

This section is organized by impact topic. Under each impact topic, the affected environment is described, the methodology for assessing impacts is presented, the possible impacts under each alternative are given, a cumulative impact analysis provided and a conclusion is stated. The conclusion summarizes all major findings and includes an impairment analysis. Impairment analyses are only performed for park resources and values. A description of the NPS mandate to prevent impairment to park resources and values is provided in Section 1.2.1 of this EA.

This section describes direct, indirect, and cumulative impacts under the two alternatives. Impacts are described in terms of context, duration, and intensity. The context or extent of the impact may be **localized** (affecting the project area but not extending beyond 400 feet from the well/production pad or 100 feet from the access roads and flow line corridors) or **widespread** (affecting other areas of the park and/or the project area). The duration of impacts could be **short-term**, ranging from days to three years in duration, or **long-term**, extending up to 20 years or longer. Generally, short-term impacts would apply to construction activities and long-term impacts would apply to production operations and flow lines. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. Where the intensity of an impact can be described quantitatively, the numerical data are presented. However, most impact analyses are qualitative.

Cumulative Impacts

This section also assesses cumulative impacts. The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq*.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the 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." (40 CFR 1508.7).

The following descriptions of park development and operations, and adjacent land uses provide the basis for analyzing cumulative impacts in this EA. These descriptions should be used in conjunction with the discussion under the heading “socioeconomics” in Section 1 of this EA that describes past, present, and reasonably foreseeable oil and gas development in the analysis area.

Existing Park Development and Operations

The Park is composed of a largely forested landscape bisected by the Cuyahoga River, interspersed with old fields, agriculture, and historic buildings and features. The abundant scenic resources of the Park, within an hour's drive of three cities (Cleveland, Akron and Canton) containing about 4 million people, make it an attractive destination, as well as a respite from the bustle of city life. Evidence of the long history of use by humans is contrasted by large parcels of undeveloped, natural areas. Scenic views and vistas from either side of the valley reveal patterns of nature and of humans. Visitors

also enjoy natural areas of the Park because of what they do not see there - industry, signs, light pollution.

Visitor Uses

Visitors and passers-by can enjoy this landscape from the many roads and highways and more than 100 miles of trails that cross the Park. Hiking and pleasure driving are among the most popular activities. The Cuyahoga River flows for 22 miles through the center of the Park and is fed by many smaller, attractive tributaries. Riverview Road, which is designated on the state and national level as a Scenic Byway, also runs through the entire length of the park. Park operations that could contribute to impacts on park resources and values include routine maintenance of the roads, future development within and adjacent to park boundaries, and increased vehicle use.

Adjacent Land Uses

Drilling and production of oil and gas is expected to continue adjacent to park boundaries and throughout Ohio. According to the State of Ohio's 2007 Summary for Oil and Gas Development (ODNR, 2007), the highlights of oil and gas activities for 2007 include the following:

- Issued 2,429 permits, including 1,322 drilling permits.
- Issued 311 urbanized area permits in 15 counties.
- Drilled an estimated 1,068 oil and gas wells in 49 of Ohio's 88 counties.
- Produced 5,454,629 barrels of crude oil, at an average price of $67.69 per barrel.
- Produced more than 88 billion cubic feet of natural gas, at an average price of $7.40 per mcf.
- The combined market value of crude oil and natural gas production was $1,021,124,854.
- 598 wells were plugged including 49 contracted by the Orphan Well Program.

Additionally, there are over 30 miles of transpark petroleum pipelines carrying both natural and refined petroleum products.

In addition to ongoing development of oil and gas, there are forty-four communities within the watershed that have the potential to impact park resources and values with changes in land use. Although the population of Northeast Ohio has changed little in decades, fewer people live in cities and more people live in what was once countryside. People have expanded human infrastructure, such as roads, housing developments, and shopping plazas, at the expense of nature's green infrastructure. The Park continually works towards better cooperation among communities and government agencies to better steward local land uses within and adjacent to the Park.

3.1 Impacts on Geology and Soils

Affected Environment

Geology

The Park is located within the glaciated portion of the Allegheny Plateau. The bedrock underlying and exposed in the Park is composed of mid-to late- Paleozoic sedimentary rocks representing silts, muds, clays and sands deposited during the Devonian, Mississippian, and Pennsylvanian periods. The Sharon Conglomerate of Pennsylvanian age is the uppermost and youngest of the bedrock formations in the Park while the Devonian age Chagrin Shale member of the Ohio formation represents the oldest rock exposed in the Park. Chagrin Shale is 365 meters thick in eastern Ohio. The best exposures of Chagrin Shale are found within the Tinkers Creek vicinity (Siffrit, 1983).

The second group of geological material is the surficial deposits of unconsolidated material produced directly or indirectly by Pleistocene glaciation. Present surface topography is controlled by the distribution of glacial deposits, by past glacial scouring, or by the erosion of glacial meltwater running off land during the last glacial retreat (Siffrit, 1983). Topography of the Park has been modified by the river and its tributaries since the glaciers retreated 10,000 years ago. Mineral resources such as oil and gas, clay products, cut stone and sand and gravel are found throughout the Park (Manner and Corbett, 1990).

Soils

Park soils have developed on bedrock, glacial deposits, or recent alluvium. There are four basic soil associations or soil groupings within the Park. These soils are grouped primarily by geologic parent material, topographic character, and terrain position, i.e., the valley top or upland; the valley sides with steep slopes and rough broken land; multiple levels of river terraces; and flood plains and bottom land. The emphasis is on broad soil groups of divergent nature that are useful for large-scale, general interpretations. Also listed are the major soil series that occur in each group, i.e., soils that have profiles with horizons that are similar in thickness, arrangement and other important characteristics. Properties of these soils are of special interest because they affect the construction of roads, pipelines, building foundations, water retention facilities, drainage systems, and sewage disposal systems, etc. It is not intended in this section to provide specific information for individual small sites, such information can be obtained from professional field examinations and from soil survey reports for Cuyahoga and Summit counties (at that level there are more than 65 individual soil types in the Park).

Soils in the project area are of the Ellsworth silt loam association (ELB). This deep soil is gently sloping and moderately well drained. The soil is on knolls and side slopes at the head of drainage ways. Most areas of this soil were once farmed but are reverting to natural vegetation or used for recreational activities such as picnic areas or hiking trails. The soil has high potential for building site development, sanitary facilities, and most recreational use is considered to have a medium potential. Lawns and shrubs grow well on this soil and erosion is generally not a problem unless the soil is disturbed and left bare and exposed (USDA, 1980).

Valley Uplands

The top of the valley has well defined soils formed from moderately fine textured Wisconsin glacial tills composed of silty clay loam and clay loam materials with slopes ranging from gentle (2-6%) to steep (18-25%). Soils in this group have extremely variable depths to bedrock as well as extremely varied natural drainage characteristics ranging from excessively well drained (droughty) to very poorly drained conditions. Soils of this grouping tend to be seasonally wet in winter and spring. Also within the uplands are soils in very narrow areas that associated with prominent sandstone escarpments (major soil series: **Ellsworth**, Mahoning, Loudonville, Dekalb, Chili, Wadsworth, Rittman, Carlisle, and Holly).

Valley Sides/Walls

This soil association occupies the very steep (35-70%) valley walls of the Cuyahoga River and its tributaries (entrenched V-shaped ravines, many with unstable soil materials) and are composed of textures ranging from lake deposits of clays and silts to coarse fragments deposited by fast flowing glacial waters. Surface runoff is very rapid and erosion is very active with springs and seeps common. Throughout this association are slip and rotation slump scars with leaning trees as evidence of landslides and major slippage's. Bedrock outcrops are also present in the valley walls (major soil series: Rough Broken Land-Lake Deposits, Rough Broken Land-Silt and Sand, **Ellsworth**, Rittman, Shale Rock Land, Berks, Glenford, Loudonville, and Dekalb).

Valley River Terraces

Flanking the valley's flood plains and bottomlands, just below the valley walls are found the terrace soil associations, with different elevations of soils ranging from nearly level (0-2%) to steep land (18-25%) with varying textural composition. Soils of this grouping have the greatest differential of natural drainage in CVNP covering the entire range from excessively well drained to very poorly drained conditions with water standing at the surface for much of the year. In some areas surface terrace configuration is influenced by ancient bedrock terrace shape. In addition there are two significant sub groups found 1) soils formed from glacial sand and gravel out wash materials with intricate patterns and 2) old lake deposits associated with ponded conditions during glacial times composed of sticky silts. Many of the plowed fields in CVNP are found on the various levels of river terraces. Also, there are many old sand and gravel pits found in the altered landscape (major soil series: Fitchville, Glenford, Chili, Conatton, Oshtemo, Wheeling, Damascus, Sebring, Holly, and Carlisle).

Valley Bottom Lands

The soils in this grouping are found along the Cuyahoga River and are associated with maundering river, steam, and creek channels that change course frequently within the flood plains and recently deposited alluvium. These soils range from somewhat poorly drained to very poor drained conditions. The soils tend to be dark in color, soft in nature,

have some instability problems but are great areas for wetland wildlife habitats (major soil series: Holly, Chagrin, Fitchville, Glenford, Jimtown, Carlisle, and Lobdell).

Methodology

To analyze the impacts on geology and soils, all available information on geological resources in the Park was compiled including: research and previous plans of operations and environmental assessments.

The thresholds of change for the intensity of an impact are defined as follows:

Negligible: an action that could result in a change to a natural physical resource, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: an action that could result in a change to a natural physical resource, but the change would be small and of little consequence.

Moderate: an action that could result in a change to a natural physical resource; the change would be measurable and of consequence.

Major: an action that would result in a noticeable change to a natural physical resource; the change would be measurable and result in a severely adverse or considerable beneficial impact.

Impairment: some of the major adverse impacts described above might be impairment of the park resource if severity, duration and timing resulted in the permanent elimination of the resource.

Impacts on Geology and Soils under Alternative A, No Action

Under Alternative A, No Action, the Astorhurst #2, #3D and Prinios #1 well would not be drilled, resulting in no new impacts on geology and soils. The existing operation of Astorhurst #1 would continue to impact geology and soils within the analysis area for the life of the well (approx. 20 years). On occasion, a backhoe/front-loader would be used to excavate and replace segments of pipe. There is a potential for the existing pipeline to leak or rupture, releasing hydrocarbon products and contaminating soil. Impacts from spills could be localized, with negligible to minor (with a major spill, negligible to moderate), short-term, direct and indirect, adverse impacts on geology and soils; however, with prompt response in the event of a spill, the intensity of impacts would be reduced to negligible to minor, localized, short-term, direct and indirect, adverse impacts. No new impacts to geology and soils would result from the No Action alternative.

Cumulative Impacts

Under Alternative A, No Action, cumulative impacts on geology and soils throughout the Park could result from the continuing operation of 90 nonfederal oil and gas operations and many miles of petroleum pipeline within the 33,000 acre park. Future drilling and

production in and adjacent to the park's boundary is a reasonably foreseeable development scenario based on the state of Ohio's oil and gas summary reports. Spills from oil and gas activities located within and adjacent to the Park may occur. As some oil and gas operations are developed in the Park, others would be plugged, abandoned, and reclaimed; therefore, impacts would be distributed over time.

Cumulative impacts on geology and soils throughout the Park are expected to be localized near developments, with short to long-term, negligible to minor, direct and indirect, adverse impacts; but in the event of a major spill from oil and gas operations impacts could be widespread, with negligible to moderate, direct and indirect, adverse impacts on park geology and soils. It is anticipated that the operator would be able to provide a prompt response in the event of any spill; the intensity of impacts can be reduced with a timely response.

Conclusion
Under Alternative A, No Action, the new wells would not be drilled, resulting in no new impacts on geology and soils. Existing uses, including commercial, and recreational uses within the golf course, and the continuing operation of the Astorhurst #1 well would result in localized, negligible to minor, direct and indirect, adverse impacts on geology and soils within the analysis area. Cumulative impacts from existing and future oil and gas operations and pipelines in and adjacent to the Park, park developments and operations, and visitor uses are expected to result in short to long-term, negligible to minor, direct and indirect, adverse impacts, localized near developments throughout the Park. However, in the event of a major spill from oil and gas operations, impacts could be long-term and widespread, ranging from negligible to moderate, direct and indirect, adverse impacts.

Because there would be no major, adverse impacts to geology and soils whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Cuyahoga Valley National Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the park's geology and soil resources or values.

Impacts on Geology and Soils under Alternative B, Proposed Action
Under Alternative B, Proposed Action, the Astorhurst #2, #3D and Prinios #1 well may be drilled and produced, resulting in short-term disturbance of up to 1.4 acres of golf course property to construct the well/production pad, tank battery facilities, access roads and flow line tie-in to the existing pipeline along Dunham Road. If Astorhurst #2 and Prinios #1 are produced, the potential exists for the federal mineral reservoir on 5.5 acres of adjacent federal lands to be affected.

If the wells are placed into production the new access road for Astorhurst #2 would remain in place for the period of production (approx. 20 years). The other wells are serviced by existing roads used for daily travel within the golf course and Prinios properties – these roads will remain in place regardless of proposed oil/gas operations. The continued use of the site for production operations would result in localized, long-term, negligible to minor, direct and indirect, adverse impacts on geology and soils on

up to 1.4 acres of private property. Temporary displacement of soils would occur while the flow lines are buried and the tank battery facility is constructed. Once the flow lines are buried, soils would be replaced and the corridor would be re-vegetated. Direct and indirect, adverse impacts on geology and soils from flow line placement would be localized, negligible to minor, and short-term during construction and re-vegetation activities.

Mitigation measures to protect soils during the drilling and production phase of operations would include lining the well pad and tank battery facility with impermeable liners to contain any spilled substances and prevent the downward percolation of substances into native soil.

The process of drilling a well begins with a lease agreement between the producing company and one or more landowners who will make up a drilling unit. A drilling unit is the acreage allocated to drill the well. The unit can vary in size from one to forty or more acres depending on the depth of the proposed well. The drilling unit acreage for M&M's proposed plan is approximately 20 acres for each well. Pooling or unitization is a provision that allows the lessor's land to be combined with adjoining lands to form a drilling unit. Often, when adjoining lands cannot be used to form a drilling unit a waiver to the acreage requirement can be granted by the State of Ohio (see http://www.ohiodnr.com/mineral).

If the well is found to be productive, the drilling unit becomes the production unit. The production units for Prinios #1 and Astorhurst #2 (fig 5 and 7) include approximately 5.5 federal fee acres. When acreage is part of a drilling or production unit, it is a given expectation the acreage will be drained by the well. Since the federal acreage is unavailable for leasing as a means of participating in production from these wells, the Bureau of Land Management (BLM) will pursue a Compensatory Royalty Agreements (CRA) with the operator. The BLM is the agency responsible for administering federal oil and gas.

A CRA is an agreement approved by the authorized officer of the BLM when drainage is occurring on unleased lands. The agreement is entered into with the parties who may be draining the unleased lands and ensures compensation to the federal government for drainage of federal minerals but does not provide any right of access on the federal land for conduct of operations associated with the production unit. A compensatory royalty agreement is generally used when for some reason the land being drained is not currently eligible for competitive leasing (such as NPS lands), or there is some other reason that a CRA is more advantageous to the federal government. A CRA will be entered into with M&M to compensate the Park for any potential drainage of federal minerals.

The potential for leaks and spills exists during all phases of oil and gas operations, resulting in impacts that could be localized, with negligible to minor, (with a major spill, negligible to moderate) short-term, direct and indirect, adverse impacts on geology and soils; however, with the mitigation measures and CRA included with this alternative, the intensity of impacts would be reduced to short- to long-term, negligible to minor, direct and indirect, adverse impacts on geology and soils.

When the wells are no longer economically productive, the wells would be plugged according to Federal Onshore Oil and Gas Order #2 and Statewide Regulations, and the well/production pad, flow line corridors and tank battery areas would be reclaimed to their natural contours and re-vegetated.

Cumulative Impacts
Under Alternative B, Proposed Action, cumulative impacts on geology and soils throughout the Park would be similar to those described under No Action, with impacts from existing and future oil and gas operations, including transpark pipelines, in and adjacent to the Park, park developments and operations, resulting in short to long-term, negligible to minor, direct and indirect, adverse impacts localized near developments. In the event of a major spill from oil and gas operations, impacts could be long-term and widespread, ranging from negligible to moderate, direct and indirect, adverse impacts. CRAs would be pursued whenever the potential exists for drainage of unleased federal minerals to compensate the Park.

Conclusion
Under Alternative B, Proposed Action, the wells would be drilled and could possibly produce hydrocarbons, resulting in the short-term disturbance to geology and soils on up to 1.4 acres of private land. Drilling and producing the wells, maintenance and construction of the flow line routes, access road and tank batteries, in addition to existing activities within the analysis area, would result in localized, short to long-term, negligible to minor, direct and indirect, adverse impacts on geology and soils. The BLM will pursue compensatory royalty agreements with M&M for any potential drainage of federal minerals from adjacent NPS property.

Cumulative impacts would be similar to those described under Alternative A, No Action, with short- to long-term, negligible to minor, direct and indirect, adverse impacts on geology and soils throughout the park. However, in the event of a major spill from oil and gas operations, impacts could be long-term and widespread, ranging from negligible to moderate, direct and indirect, adverse impacts.

Because there would be no major, adverse impacts to geology and soils whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Cuyahoga Valley National Park; (2) key to the natural or cultural integrity of the Park; or (3) identified as a goal in the park's General Management Plan or other relevant National Park Service planning documents, there would be no impairment of the park's geology and soil resources or values.

3.2 Impacts on Visitor Use and Experience

Cuyahoga Valley National Park was created by Congress in 1974 as Cuyahoga Valley National Recreation Area for the purpose of "preserving and protecting for public use and enjoyment, the historic, scenic, natural, and recreational values" of the Cuyahoga Valley (Public Law 93-555, 1974). Preservation of the natural and scenic values of the Cuyahoga River valley and adjacent lands is central to the Park's legislative mandate. The term "visitor experience" can be defined as the opportunity for visitors to experience

a park's resources and values in a manner appropriate to the park's purpose and significance, and appropriate to the resource protection goals for a specific area or management zone within that park. In other words, visitor experience is primarily a resource-based opportunity appropriate to a given park or area within a park, rather than a visitor-based desire.

Visitor uses of parks will only be allowed if they are appropriate to the purpose for which a park was established, and if they can be sustained without causing unacceptable impacts to park resources or values (NPS 2006, Sec. 8.1 and 8.2). While the fundamental purpose of all parks also includes providing for the "enjoyment" of park resources and values by the people of the United States, enjoyment can only be provided in ways that leave the resources and values unimpaired for the enjoyment of future generations (NPS 2006, Sec. 1.4.3).

While many visitor activities are allowed or even encouraged in parks consistent with the above policies, virtually all visitor activities are limited or restricted in some way (e.g., through carrying capacity determinations, implementation plans, or visitor use management plans), and on a park- or area-specific basis, some visitor activities are not allowed at all. The degree to which a given activity is consistent with, or moves the condition of a resource or a visitor experience toward or away from a desired condition is one measure of the impact of the activity.

Affected Environment

The Park is composed of a largely forested landscape bisected by the Cuyahoga River, interspersed with old fields, agriculture, and historic buildings and features. The abundant scenic resources of the park, within an hour's drive of three cities (Cleveland, Akron and Canton) containing about 4 million people, make it an attractive destination, as well as a respite from the bustle of city life. Evidence of the long history of use by humans is contrasted by the large tracts of more natural areas. Scenic views and vistas from either side of the valley reveal patterns of nature and of humans. Visitors also enjoy parts of the park because of what they do not experience there - industry, signs, light pollution.

Visitors and passers-by can enjoy this pastoral landscape from the many roads and highways and more than 100 miles of trails that cross the park. The scenic Cuyahoga River flows through the center of the entire 22-mile length of the park and is fed by many smaller, attractive tributaries. Riverview Road, which is designated on the state and national level as a Scenic Byway, also runs through the entire length of the park. Visitor use typically begins to increase in May and peaks in August. Annual park visitation in 2007 was 2.5 million. A 2005 publication, "Cuyahoga Valley National Park Visitor Study" (Le, Meldrum, Littlejohn & Hollenhorst, 2005) indicated the following patterns:

1. The most common primary reasons for visiting CVNP were to bicycle (35%), hike/walk (26%) and jog/run (12%).

2. The most common activities included hiking/walking (55%), bicycling (47%), and taking a scenic drive for pleasure (33%). Most visitor groups (54%) spent two to three hours at the park on this visit.

3. The most used visitor services/facilities by the 834 visitor groups included parking lots (80%) and the Ohio and Erie Canal Towpath Trail (71%).

4. When asked how important the park was to their group, 78% of visitor groups rated the park as "extremely important" or "very important."

The project area encompasses the Astorhurst Golf Course in the northern portion of the Park west of Dunham Road and south of Tinkers Creek Road. Existing Astorhurst #1 and proposed Astorhurst #3D are located adjacent to an existing internal golf course maintenance road. Astorhurst #2 will require a new 100 foot long access road off of Dunham Road. The third well, Prinios #1, is located in an existing parking lot on a property adjacent to the golf course behind a commercial business. Existing roadways will be utilized for access to Prinios #1.

Impacts on the visitor from the M&M project are limited to negative visual impacts on visitor experiences at the golf course due to the presence of drilling and/or production facilities, increased truck traffic, and being subjected to the noise generated by the larger trucks used for hauling drilling and production equipment, to and from the site. Some visitors may feel that oil and gas well drilling is inconsistent with the purposes of the Park and have potential to compromise the values of the Park.

Methodology
Visitor surveys and personal observations of visitation patterns combined with an assessment of services and recreational opportunities available to visitors under current management were used to estimate the effects of the actions in the alternatives.

Negligible: Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short- term. The visitor would not likely be aware of the effects associated with the alternative.

Minor: Changes in visitor use and/or experience would be detectable, although changes would be slight and likely short- term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate: Changes in visitor use and/or experience would be readily apparent and likely long- term. The visitor would be aware of the effects associated with the alternative and would have an option to express an opinion about the changes.

Major: Changes in visitor use and/or experience would be readily apparent and have important long- term consequences. The visitor would be aware of the effects associated with the alternative and would likely

express a strong opinion about the changes. Visitors may avoid using the area.

Impacts on Visitor Use and Experience under Alternative A, No Action
Under Alternative A, No Action, the Astorhurst #2, #3D and Prinios #1 well would not be drilled, resulting in no new impacts on visitor use and experience. However, existing impacts on visitor use and experience in the analysis area would continue as the result of current uses surrounding the golf course and the continuing operation of the existing Astorhurst #1 well.

A main entrance to adjacent Cleveland Metropark's Bedford Reservation is opposite the entrance to the Astorhurst Golf Course. Currently there are vehicles on the nearby roadways that include cars and trucks, recreational vehicles, bicycles and on occasion, larger commercial vehicles. Vehicular traffic associated with the existing oil and gas operations normally consist of pick up trucks visiting once per week; however, larger vehicles, such as a pumper truck may also travel the roadway to access the existing Astorhurst #1 operation in order to off load oil and perform routine maintenance.

Existing uses, including vehicle access and visitor use of the golf course, would result in localized, short to long-term, negligible to minor, direct and indirect, adverse impacts on visitor use and experience within the analysis area.

Cumulative Impacts
Under Alternative A, No Action, cumulative impacts on visitor use and experience throughout the Park could result from the visual impact of human development on the natural scenery associated with the continuing operation of 90 nonfederal oil and gas operations within the Park and over 30 miles of transpark petroleum pipelines. Future drilling and production in and adjacent to the Park is a reasonably foreseeable development scenario. Other park activities that could contribute to impacts include future park development, routine maintenance of park roads, and park and visitor vehicle use. Cumulative impacts could also result from conflicts between visitor uses and over-use of park resources and development. Degradation of park resources and values could affect park visitors' perception of the park and their experience. Major spills from oil and gas activities located in and adjacent to the Park, could cause widespread impacts and result in long-term clean-up and remediation, and areas that would be closed to visitors. Spills of hydrocarbons and other contaminating or hazardous substances could also pose health and safety concerns. Some oil and gas operations and park operations would introduce elevated noise and odors. With the application of mitigation measures incorporated into operators' plans of operations, impacts would be minimized.

Cumulative impacts on visitor use and experience throughout the Park are expected to be localized near development or activities, with short to long-term, negligible to minor, direct and indirect, adverse impacts. In the event of a major spill from oil and gas operations and transpark pipelines, impacts could be widespread, with negligible to moderate, direct and indirect, adverse impacts on visitor use and experience.

Conclusion
Under Alternative A, No Action, the Astorhurst #2, #3D and Prinios #1 well would not be drilled, resulting in no additional impacts on visitor use and experience. Astorhurst #1 well would continue to operate. Existing vehicle use on Dunham and Tinkers Creek Roads would continue resulting in localized, short to long-term, negligible to minor, direct and indirect, adverse impacts on visitor use and experience within the analysis area. Cumulative impacts from existing and future oil and gas operations in and adjacent to the Park, park development and operations, and visitor uses are expected to result in short to long-term, negligible to minor, direct and indirect, adverse impacts. In the event of a major spill from oil and gas operations impacts could be widespread, with negligible to moderate direct and indirect, adverse impacts on visitor use and experience.

Impacts on Visitor Use and Experience under Alternative B, Proposed Action
Under Alternative B, Proposed Action, the Astorhurst #2, #3D and Prinios #1 wells would be drilled and may be produced, resulting in the short-term loss of golf course scenery. The intensity of impacts would be variable, depending on number of vehicles using the roadways on a given day. Impacts would be highest during the primary golfing season period from May through August. Vehicular traffic associated with oil and gas operations normally consists of pick up trucks, however, larger vehicles, such as pumper trucks would travel the roadways to access the existing oil and gas operations in order to off load oil and perform routine maintenance.

Existing impacts on visitor use and experience within the analysis area would be similar to Alternative A, No Action, with localized, short to long-term, negligible to minor, direct and indirect, adverse impacts associated with vehicle use and operation of the existing Astorhurst well #1. Construction of the well sites would result in the short-term loss of golf course scenery. If the wells are placed in production, long-term occupancy by oil and gas developments would be confined on up to 1.4 acres of visual impact on private property. Upon completion of production, which could be up to twenty years, these areas would be restored and surface equipment removed.

M&M would use Dunham Road to enter the access routes to the proposed wells which could create visual impacts to visitors using the golf course. The presence of drilling and/or production facilities, increased truck traffic, increased noise generated by the drilling and production facility and larger trucks used for hauling drilling and production equipment, to and from the site could also temporarily impact the golfing experience.

Visitors may also be affected by the disturbance of golf course scenery where the access road, well pad, and tank battery facility would be visible to all visitors using the golf course. Visitors may also be temporarily affected by possible traffic delays from the increased truck traffic and by noise generated during the drilling and production phase. If the wells are productive, occasional vehicular traffic would be required to perform routine, periodic maintenance that could affect visitor experience through noise due to increased truck traffic.

The potential for leaks and spills exists during all phases of oil and gas operations, resulting in impacts that could be serious on a local level, with negligible to moderate,

short-term direct and indirect, adverse impacts on visitor use and experience. However, with the mitigation measures included with this alternative, the intensity of impacts would be reduced.

Mitigation measures, including selecting a proposed operations area located away from the main visitor and recreational use areas of the Park, and providing security and installing a gate during the drilling operations to prevent unauthorized entry into the operations area, would result in minimizing impacts on visitor use and experience. Fencing the tank battery facilities would minimize visual impacts to the golfers and nearby visitors.

M&M's vehicle access and drilling and producing the well would result in the short-term loss of golf course scenery on up to 1.4 acres of private property, with localized, short to long-term, negligible to moderate, direct and indirect, adverse impacts, on visitor use and experience in the analysis area.

Cumulative Impacts

Under Alternative B, Proposed Action, cumulative impacts on visitor use and experience throughout the Park would be similar to those described under No Action, with impacts from existing and future oil and gas operations, transpark pipelines in and adjacent to the Park, park development and operations, and visitor use, resulting in short to long-term, negligible to minor, direct and indirect, adverse impacts. In the event of a major spill from oil and gas operations, impacts could be widespread, with negligible to moderate direct and indirect, adverse impacts on visitor use and experience. Currently there are 90 active non-federal oil/gas operations occurring within the Park and hundreds of operations in areas surrounding the park. Over 30 miles of transpark petroleum pipelines exist carrying both natural and refined petroleum products across the Park.

Ohio has nearly 64,000 oil and gas wells. The majority of oil and gas wells are drilled and produced in a clean and efficient manner. The Ohio Department of Natural Resources, Division of Mineral Resources, maintains a highly visible presence through a well qualified staff of inspectors. These individuals witness the crucial aspects of well drilling, to assure that these operations meet the standard set to protect public health, safety and the environment. Inspectors are available to respond immediately to emergencies such as well or tank fires that are a threat to public health or safety.

While some park visitors disagree with allowing oil/gas wells to be drilled within the boundaries of a national park, the right to conduct oil and gas operations in units of the National Park system is based on ownership rights. Because oil and gas rights remain outstanding in some parks, the NPS must recognize those private property rights. However, the NPS is required by its laws, policies, and regulations to protect the Park from any actions, including gas operations that may adversely impact or impair park resources and values.

Conclusion

Under Alternative B, Proposed Action, the Astorhurst #2, #3D and Prinios #1 wells would be drilled and may be produced, resulting in the short-term loss of golf course

scenery on up to 1.4 acres of private property, with localized, short to long-term, negligible to minor, direct and indirect, adverse impacts, on visitor use and experience in the analysis area.

Based on the fact that the golf course is not the primary visitor use area of the Park, the lack of complaints relating to oil/gas operations, and the low potential for human health and safety issues, impacts on visitor use and experience are expected to be negligible to minor. In the event of a major spill from oil and gas operations and transpark pipelines, impacts could be widespread, with negligible to moderate, direct and indirect, adverse impacts on visitor use and experience.

M&M's vehicle access and drilling and producing the well would result in localized, short to long-term negligible to minor direct and indirect, adverse impacts on visitor use and experience. Cumulative impacts on visitor use and experience throughout the Park would be similar to those described under Alternative A, No Action, with impacts from existing and future oil and gas operations in and adjacent to the Park, park development and operations, and visitor use, resulting in short to long-term, negligible to minor, direct and indirect, adverse impacts. Based on the mitigations measures that would prevent releases of contaminants and the low chance of a catastrophic release that would reach NPS property, direct and indirect, adverse impacts on visitor use and experience would be negligible to minor.

4.0 CONSULTATION AND COORDINATION

A Notice of Availability for the Plan of Operations and accompanying EA will be published in the *Federal Register* announcing the availability of these documents for a 30-day public review and comment period. These documents will be posted to the NPS' Planning Environment and Public Comment System (PEPC), where the documents can be retrieved, and comments posted. www.parkplanning.gov

Following the 30-day public review and comment period, NPS will consider the written comments received. Additional mitigation measures resulting from the public involvement process may be applied by the NPS as conditions of approval of the Plan of Operations. Copies of the decision document will be sent to those who comment on the Plan of Operations and EA during the public review period, or request a copy.

4.1 Individuals and Agencies Consulted

Persons and agencies contacted for information, or that assisted in identifying important issues, developing alternatives, or analyzing impacts are listed below:

M&M Royalty, Ltd.

Agencies

U.S. Fish and Wildlife Service, Reynoldsburg, Ohio
U.S. Army Corps of Engineers, Buffalo, NY
U.S. Bureau of Reclamation, Milwaukee, WI.
Bureau of Land Management, Eastern State Office, Milwaukee, WI.
Ohio Historic Preservation Office

Ohio Department of Natural Resources
Ohio Department of Health
Ohio Environmental Protection Agency

National Park Service
Midwest Regional Office-Omaha, NE.
Gary Vequist, Associate Regional Director
Nicholas Chevance, Regional Environmental Quality Officer
Anne Bauermeister, Archaeologist

Washington Office, Natural Resource Program Center, Geologic Resources Division, Lakewood, CO
Carol McCoy, Chief, Planning, Evaluation, and Permits Branch
Edward Kassman, Regulatory/Policy Specialist
Pat O'Dell, Petroleum Engineer

4.2 List of Document Recipients

The Plan of Operations and EA will be sent to:

M&M Royalty, Ltd.
Matt Egnotovich, Member
Michael Weinsz, Member

Congressional Delegation
Congressman Dennis Kucinich
Senator Sherrod Brown
Senator George Voinovich

Agencies

U.S. Department of the Interior - Office of the Solicitor

National Park Service
Nicholas Chevance, Midwest Region, Omaha, NE
Carol McCoy, Geologic Resources Division, Denver, CO
Edward Kassman, Geologic Resources Division, Denver, CO
Pat O'Dell, Geologic Resources, Division, Denver, CO

Other Federal Agencies
Jennifer Smith-Castro, U.S. Fish and Wildlife Service, Reynoldsburg, OH.
Rich Ruby, U.S. Army Corps of Engineers, Buffalo, NY.
David La Chance, Bureau of Land Management, Milwaukee, WI.

State Government
Senator Robert Spada
Senator Lance Mason

Representative Armond Budish
Representative Michael DeBose
Representative Josh Mandel
Mike McCormac, Ohio Department of Natural Resources, Division of Mineral Management, Columbus, OH
Norburt Lowder, Ohio Department of Natural Resources, Division of Mineral Management, Uniontown, OH.
Rachel Tooker, Ohio Historic Preservation Officer, Columbus, OH.

Local Governments
Mayor Randall Westfall, Valley View, OH.
Mayor Marlene Anielski, Walton Hills, OH.
Mayor Tom Longo, Garfield Hts., OH.
Patricia Carey, Cuyahoga Valley Regional Council of Governments
Paul Alsenas, Director of Cuyahoga County Planning Commission

Tribal Interest
Jerry R. Dillner, Seneca-Cayuga Tribe of Oklahoma
Ron Sparkman, Shawnee Tribe
Dee Ketchum, Delaware Tribe
Rhonda Fair, Delaware Tribe of Western Oklahoma
Charles Enyart, Eastern Shawnee Tribe of Oklahoma
Floyd Leonard, Miami Tribe of Oklahoma
Leonard Bearskin, Wyandotte Nation
Jennifer Makaseah, NAGPRA Coordinator, Absentee-Shawnee Tribe of Oklahoma
Kathleen Mitchell, Tribal Historic Preservation Office, Seneca Nation
Larry Angelo, Ottawa Tribe of Oklahoma

Environmental Interests
Jim White, Cuyahoga River RAP
Dan Nelson, Sierra Club, Portage Trail Group
Daniel Rice, Ohio and Erie Canal Corridor Coalition
Jeff Ruch, Public Employees for Environmental Responsibility, Washington, D.C
Elaine Marsh, Friends of the Crooked River, Akron, OH.
Nancy Howell, Cuyahoga Soil and Water Conservation District
Mike Johnson, Metro Parks, Serving Summit Co. OH.
John Mack, Cleveland Metropolitan Parks District
Deb Yandala, Cuyahoga Valley National Park Association
Tim Donovan, Ohio Canal Corridor

Local Papers - Press release issued to all local newspapers.

4.3 Preparers/contributors
Meg Plona, Biologist, Division of Resource Management, CUVA, NPS
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Anthony Gareau, GIS Specialist, Division of Resource Management, CUVA, NPS

5.0 References

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APPENDIX 1 Statute, Regulations, Executive Orders and Policies

AUTHORITIES	RESOURCES AND VALUES AFFORDED PROTECTION
National Park Service Laws and Applicable Regulations	
NPS Organic Act of 1916, as amended, 16 U.S.C. §§ 1 *et seq.*	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, endangered and threatened species, visitor use and experience, and visual resources
National Park System General Authorities Act, 16 U.S.C. §§ 1a-1 *et seq.*	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, endangered and threatened species, visitor use and experience, and visual resources
NPS Omnibus Management Act of 1998, 16 U.S.C. §§ 5901 *et seq.*	Any living or non-living resource
NPS Nonfederal Oil and Gas Regulations – 36 CFR Part 9, Subpart B	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, endangered and threatened species, visitor use and experience, and visual resources
Park System Resource Protection Act, 16 U.S.C. § 19jj	Any living or non-living resource that is located within the boundaries of a unit of the National Park system, except for resources owned by a nonfederal entity
Other Applicable Federal Laws and Regulations	
American Indian Religious Freedom Act, as amended, 42 U.S.C. §§ 1996 – 1996a; 43 CFR Part 7	Cultural and historic resources
Antiquities Act of 1906, 16 U.S.C. §§ 431-433; 43 CFR Part 3	Cultural, historic, archeological, and paleontological resources
Archeological Resources Protection Act of 1979, 16 U.S.C. §§ 470aa – 470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7	Archeological resources
Clean Air Act, as amended, 42 U.S.C. §§	Air resources

AUTHORITIES	RESOURCES AND VALUES AFFORDED PROTECTION
7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23	
Coastal Zone Management Act of 1972, 16 U.S.C. § 1451 *et seq.*, 15 CFR Parts 923, 930, 933	Coastal waters and adjacent shoreline areas
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601-9675; 40 CFR Parts 279, 300, 302, 355, and 373	Human health and welfare and the environment
Endangered Species Act of 1973, as amended, 16 U.S.C. §§ 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450	Plant and animal species or subspecies, and their habitat, which have been listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NOAA Fisheries)
Federal Insecticide, Fungicide, and Rodenticide Act, as amended (commonly referred to as Federal Environmental Pesticide Control Act of 1972), 7 U.S.C. §§ 136 *et. seq.;* 40 CFR Parts 152-180, except Part 157	Human health and safety and the environment
Federal Water Pollution Control Act of 1972 (commonly referred to as Clean Water Act), 33 U.S.C. §§ 1251 *et seq.;* 33 CFR Parts 320-330; 40 CFR Parts 110, 112, 116, 117, 230-232, 323, and 328	Water resources, wetlands, and waters of the U.S.
Historic Sites, Buildings, and Antiquities Act (Historic Sites Act of 1935), 16 U.S.C. §§ 461-467; 18 CFR Part 6; 36 CFR Parts 1, 62, 63 and 65	Historic sites, buildings, and objects
Lacey Act, as amended, 16 U.S.C. §§ 3371 *et seq.;* 15 CFR Parts 10, 11, 12, 14, 300, and 904	Fish, wildlife, and vegetation
Migratory Bird Treaty Act, as amended, 16 U.S.C. §§ 703-712; 50 CFR Parts 10, 12, 20, and 21	Migratory birds
National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. §§ 4321 *et seq.;* 40 CFR Parts 1500-1508	The human environment (e.g. cultural and historic resources, natural resources, biodiversity, human health and safety,

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	socioeconomic environment, visitor use and experience)
National Historic Preservation Act of 1966, as amended, 16 U.S.C. §§ 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810	Cultural and historic properties listed in or determined to be eligible for listing in the National Register of Historic Places
Native American Graves Protection and Repatriation Act, 25 U.S.C. §§ 3001-3013; 43 CFR Part 10	Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony
Noise Control Act of 1972, 42 U.S.C. §§ 4901-4918; 40 CFR Part 211	Human health and welfare
Oil Pollution Act, 33 U.S.C. §§ 2701-2761; 15 CFR Part 990; 33 CFR Parts 135, 137, and 150; 40 CFR Part 112; 49 CFR Part 106	Water resources and natural resources
Pipeline Safety Act of 1992, 49 U.S.C. §§ 60101 *et seq*.; 49 CFR Subtitle B, Ch 1, Parts 190-199	Human health, safety, and the environment
Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 *et. seq*.; 40 CFR Parts 240-280; 49 CFR Parts 171-179	Natural resources, human health, and safety
Rivers and Harbors Act of 1899, as amended, 33 U.S.C. §§ 401 *et. seq*.; 33 CFR Parts 114, 115, 116, 321, 322, and 333	Shorelines and navigable waterways, tidal waters, and wetlands
Safe Drinking Water Act of 1974, 42 U.S.C. §§ 300f *et seq*.; 40 CFR Parts 141-148	Human health and water resources
Executive Orders	
Executive Order (E.O.) 11593 – Protection and Enhancement of the Cultural Environment, 36 Federal Register (Fed. Reg.) 8921 (1971)	Cultural resources
E.O. 11988 - Floodplain Management, 42 Fed. Reg. 26951 (1977)	Floodplains and human health, safety, and welfare
E.O. 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977)	Wetlands
E.O. 12088 – Federal Compliance with Pollution Control Standards, 43 Fed. Reg. 47707 (1978)	Natural resources and human health and safety

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E.O. 12630 – Governmental Actions and Interference with Constitutionally Protected Property Rights, 53 Fed. Reg. 8859 (1988)	Private property rights and public funds
E.O. 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, amended by Exec. Order No. 12948, 60 Fed. Reg. 6379 (1995)	Human health and safety
E.O. 13007–Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)	Native Americans' sacred sites
E.O. 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999)	Vegetation and wildlife
E.O. 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)	Migratory birds
E.O. 13212 - Actions To Expedite Energy-Related Projects (2001)	Production, transmission, and conservation of energy
Policies, Guidelines, and Procedures	
NPS Management Policies (2006)	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, endangered and threatened species, visitor use and experience, and visual resources
Department of the Interior (DOI), Departmental Manual (DM) 516 –NEPA policies (1980)	Archeological and prehistoric resources, historic resources, Native American human remains, and cultural objects
DOI, DM 517 - Pesticides (1981)	Human health and safety and the environment
DOI, DM 519 – Protection of the Cultural Environment (1994)	Archeological, prehistoric resources, historic resources, Native American human remains, and cultural objects
DOI, Onshore Oil and Gas Order Number 2, Section III, Drilling Abandonment Requirements, 53 Fed. Reg. 46,810-46,811 (1988)	Human health and safety
NPS Director's Order (D.O.) –12 and Handbook – Conservation Planning, Environmental Impact Analysis, and Decision Making (2001)	All resources, including air resources, cultural resources, human health and safety, socioeconomic environment, visitor use
NPS D.O. - 28 – Cultural Resource Management (1998)	Cultural, historic, and ethnographic resources

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NPS D.O. 28A – Archeology	Clarifies roles and responsibilities for archeological resources management through out the NPS
NPS 66 – Minerals Management Guideline (1990)	Natural resources, human health and safety
NPS Reference Manual 77 – Natural Resources Management (1991)	Natural resources
NPS D.O. and Procedural Manual 77-1 – Wetland Protection (2008)	Wetlands
NPS D.O. and Procedural Manual 77-2 – Floodplain Management (2003)	Floodplains
NPS D.O 47- Soundscape Preservation and Noise Management	Natural sounds
Secretary of the Interior's "Standards and Guidelines for Archeology and Historic Preservation," 48 Fed. Reg. 44716 (1983), also published as Appendix C of NPS D.O. 28 – Cultural Resource Management	Cultural and historic resources
Government-to-Government Relations with Native American Tribal Governments, Presidential Memorandum signed April 29, 1994	Native American Tribal rights and interests
Selected Ohio Laws and Regulations	
Ohio Revised Code Title 15 Conservation of Natural Resources, Chapter 15 (Division of Minerals Resources Management)	Human health and safety, natural resources