2017 FINAL SUPPLEMENTAL REVISED FINAL ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED UNITED STATES PENITENTIARY AND FEDERAL PRISON CAMP

Letcher County, Kentucky

Prepared for:

United States Department of Justice
Federal Bureau of Prisons
Capacity Planning and Construction Branch

September 2017
Abstract

The Federal Bureau of Prisons (Bureau) has prepared this 2017 Final Supplemental Revised Final Environmental Impact Statement (RFEIS) to evaluate the potential environmental impacts of site acquisition and development of a proposed United States Penitentiary (USP) and Federal Prison Camp (FPC) in Letcher County, Kentucky. This 2017 Final Supplemental RFEIS incorporates by reference and builds upon the analyses presented in the published 2016 RFEIS. The 2017 Final Supplemental RFEIS addresses changes in the proposed action and assesses new circumstances or information relevant to potential environmental impacts. The 2016 RFEIS analyzed the No Action Alternative and two build alternatives, Alternative 1 – Payne Gap and Alternative 2 – Roxana, and identified Alternative 2 as the preferred alternative. However, the Bureau was originally considering acquiring approximately 283 hectares (700 acres) at the Roxana site for this project. Following publication of the 2016 RFEIS, the Bureau removed two parcels of land at the Roxana site from acquisition consideration, resulting in a proposed site of approximately 231 hectares (570 acres). This reduction in site size necessitated modifying the facilities layout evaluated for Alternative 2 – Roxana in the 2016 RFEIS. The Modified Alternative 2 – Roxana is the preferred alternative.

The purpose of the proposed federal correctional facility in Letcher County, Kentucky is to develop additional high-security facilities to increase capacity for current inmate populations in the Mid-Atlantic Region based on an identified need for additional bed space. The Bureau has determined that there is a need for additional high-security facilities within this region to reduce the demonstrated overcrowding that compromises the mission of the Bureau.

The 2017 Final Supplemental RFEIS analyzes the direct, indirect, and cumulative impacts of the No Action Alternative and the Modified Alternative 2 – Roxana with regard to land use and zoning; topography, geology, and soils; air quality; noise; infrastructure and utilities; and cultural, water, and biological resources.
EXECUTIVE SUMMARY

The Federal Bureau of Prisons (Bureau) has prepared this document to supplement the March 2016 Revised Final Environmental Impact Statement for Proposed United States Penitentiary and Federal Prison Camp, Letcher County, Kentucky. The 2016 Revised Final Environmental Impact Statement (RFEIS) analyzed the environmental consequences of the No Action Alternative and two action alternatives for acquiring land and constructing and operating a new United States Penitentiary (USP), Federal Prison Camp (FPC), and associated ancillary facilities in Letcher County, Kentucky. The two action alternatives included Alternative 1 – Payne Gap, an approximately 305-hectare (753-acre) site in eastern Letcher County, and Alternative 2 – Roxana, an approximately 283-hectare (700-acre) site in western Letcher County. The 2016 RFEIS identified Alternative 2 – Roxana as the preferred alternative because it best meets the project needs and, on balance, would have fewer impacts to the natural and built environment.

The Bureau was originally considering acquiring approximately 283 hectares (700 acres) at the Roxana site for this project. Following publication of the 2016 RFEIS, the Bureau removed two parcels of land at the Roxana site from acquisition consideration. The Bureau withdrew one parcel because the landowner did not want to sell their property, and withdrew another parcel after determining it was not required for the project. The resulting proposed site is approximately 231 hectares (570 acres). This reduction in site size necessitated modifying the facilities layout evaluated for Alternative 2 – Roxana in the 2016 RFEIS. Consequently, the original site configuration of Alternative 2 – Roxana from the 2016 RFEIS is no longer a feasible alternative. The focus of this 2017 Final Supplemental RFEIS is the evaluation of potential environmental impacts associated with the revised design of Modified Alternative 2 – Roxana adopted by the Bureau after publication of the 2016 RFEIS.

This 2017 Final Supplemental RFEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508), and the U.S. Department of Justice procedures for implementing NEPA (28 CFR 61). Consistent with the guidance provided in 40 CFR 1502.9, this 2017 Final Supplemental RFEIS addresses changes in the proposed action and new circumstances or information relevant to environmental concerns and bearing on the proposed action and its impacts. This 2017 Final Supplemental RFEIS incorporates by reference and builds upon the analyses presented in the 2016 RFEIS, while focusing on new information about the proposed project. The 2016 RFEIS and any other documents incorporated by reference in this 2017 Final Supplemental RFEIS are available on the project website at http://www.fbopletchercountyeis.com.

PURPOSE AND NEED

The purpose of and need for the proposed federal correctional facility in Letcher County, Kentucky, has not changed since the issuance of the March 2016 RFEIS. The purpose of the project is to provide an additional high-security penitentiary and an associated prison camp to increase capacity for current inmate populations in the Mid-Atlantic Region. The need for the proposed facility is that the current inmate populations of the USPs in the Mid-Atlantic Region are exceeding their rated capacity and their associated FPCs are at or near capacity. The Bureau has determined that there is a need for additional high-security facilities within this region to reduce the demonstrated overcrowding in the USPs in the Mid-Atlantic Region that compromises the mission of the Bureau.
SCOPE OF THE SUPPLEMENTAL RFEIS ANALYSIS

For this 2017 Final Supplemental RFEIS, the baseline data and impact analyses focus on eight environmental resource areas, each of which was previously analyzed and discussed in the 2016 RFEIS, but have been updated in this document to address potential changes in analyses or impacts as a result of the proposed modifications to the Bureau’s preferred alternative, Modified Alternative 2 – Roxana. The eight resource areas (and the respective sections in the 2016 RFEIS in which each was discussed) are: land use and zoning (Sections 3.1 and 5.1); topography, geology, and soils (Sections 3.2 and 5.2); air quality (Sections 3.6 and 5.6); noise (Sections 3.7 and 5.7); infrastructure and utilities (Sections 3.8 and 5.8); cultural resources (Sections 3.9 and 5.9); water resources (Sections 3.10 and 5.10); and biological resources (Sections 3.11 and 5.11). The affected environment description for each relevant resource area in this 2017 Final Supplemental RFEIS focuses on current conditions and incorporates new or updated information and analyses that have been developed as a result of the modifications to the preferred Alternative 2 – Roxana since the 2016 RFEIS.

The Bureau determined that there is no significant new information relevant to environmental concerns and no appreciable changes to potential impacts as a result of the modifications to the Roxana site size and facilities layout under Modified Alternative 2 – Roxana regarding four environmental resource areas discussed in the 2016 RFEIS. These resource areas (and the respective sections in the 2016 RFEIS in which each was discussed) are: socioeconomics and environmental justice (Sections 3.3 and 5.3), community facilities and services (Sections 3.4 and 5.4), transportation and traffic (Sections 3.5 and 5.5), and hazardous materials and waste (Sections 3.12 and 5.12). Information in the 2016 RFEIS on these environmental resource areas continues to be relevant and unchanged. As previously noted, the 2016 RFEIS, including the respective material regarding these four resource areas, is incorporated herein by reference.

Table ES-1 summarizes the chapters in the 2016 RFEIS that have been changed or updated in this 2017 Final Supplemental RFEIS, and the 2016 RFEIS chapters in which information remains unchanged and is incorporated by reference.
### Table ES-1: Information from 2016 RFEIS Changed or Incorporated by Reference, by Chapter

<table>
<thead>
<tr>
<th>2016 RFEIS Chapter Number and Title</th>
<th>Summary of Changes Made</th>
<th>Location of Updated Information in 2017 Final Supplemental RFEIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Purpose and Need for the Proposed Action</td>
<td>The project purpose and need remains unchanged; however, most other sections in this chapter have been updated or revised</td>
<td>1.0 Purpose and Need for the Proposed Action</td>
</tr>
<tr>
<td>2.0 – Alternatives</td>
<td>The primary change in this chapter comprises updating Modified Alternative 2 – Roxana to include the proposed modifications to the site size and facilities layout</td>
<td>2.0 Description of the Proposed Action and Alternatives</td>
</tr>
<tr>
<td>3.0 – Definition of Resource</td>
<td>The definitions of land use; topography, geology, and soils; air quality; noise; infrastructure and utilities; cultural resources; water resources; and biological resources are summarized in the 2017 Final Supplemental RFEIS. The definitions of socioeconomics and environmental justice, community facilities and services, transportation and traffic, and hazardous materials and waste remain unchanged and are incorporated by reference.</td>
<td>3.0 Affected Environment and Environmental Consequences</td>
</tr>
<tr>
<td>4.0 Alternative 1 – Payne Gap</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>5.0 Alternative 2 – Roxana</td>
<td>Information on land use; topography, geology, and soils; air quality; noise; infrastructure and utilities; cultural resources; water resources; and biological resources has been updated and revised. Information on socioeconomics and environmental justice, community facilities and services, transportation and traffic, and hazardous materials and waste remains unchanged and is incorporated by reference.</td>
<td>3.0 Affected Environment and Environmental Consequences</td>
</tr>
<tr>
<td>6.0 Relationship Between Short-Term Use of the Environment and the Maintenance and Enhancement of Long-Term Productivity</td>
<td>Chapter updated for Modified Alternative 2 – Roxana</td>
<td>4.0 Relationship Between Short-Term Use of the Environment and the Maintenance and Enhancement of Long-Term Productivity</td>
</tr>
<tr>
<td>7.0 Irreversible and Irretrievable Commitments of Resources</td>
<td>Chapter updated for Modified Alternative 2 – Roxana</td>
<td>5.0 Irreversible and Irretrievable Commitments of Resources</td>
</tr>
<tr>
<td>8.0 Cumulative Impacts</td>
<td>Chapter has been revised and updated to describe potential cumulative impacts of Modified Alternative 2 – Roxana in conjunction with other actions to the resources described in the 2017 Final Supplemental RFEIS</td>
<td>6.0 Cumulative Impacts</td>
</tr>
</tbody>
</table>
# Table ES-1. Information from 2016 RFEIS Changed or Incorporated by Reference, by Chapter

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<tbody>
<tr>
<td>9.0 References</td>
<td>Contains the references cited in the 2017 Final Supplemental RFEIS</td>
<td>7.0 References</td>
</tr>
<tr>
<td>10.0 List of Preparers</td>
<td>Updated to list those primarily responsible for preparing the 2017 Final Supplemental RFEIS</td>
<td>8.0 List of Preparers</td>
</tr>
<tr>
<td>11.0 Distribution List</td>
<td>The 2016 RFEIS distribution list has been updated to include additional interested parties</td>
<td>9.0 Distribution List</td>
</tr>
<tr>
<td>Appendix A Agency Coordination</td>
<td>National Historic Preservation Act (NHPA) correspondence has been moved to a new appendix (Appendix E); U.S. Fish and Wildlife Service (USFWS) Endangered Species Act (ESA) correspondence had been moved to a new appendix (Appendix H)</td>
<td>Appendix E NHPA Correspondence; Appendix H USFWS Endangered Species Act Consultation</td>
</tr>
<tr>
<td>Appendix B Excavation and Grading Calculations</td>
<td>Information remains unchanged and is incorporated by reference as background information for updated excavation and grading calculations included in 3.2 Topography, Geology, and Soils and Appendix A Additional Geotechnical Study in the 2017 Final Supplemental RFEIS</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix C Air Emissions Calculations</td>
<td>Contains the updated air emissions calculations for the Modified Alternative 2 – Roxana and the proposed wastewater treatment plant in Roxana</td>
<td>Appendix C Air Emissions Calculations</td>
</tr>
<tr>
<td>Appendix D Enhanced Utility Report</td>
<td>Information remains unchanged; final report included in an appendix to the 2017 Final Supplemental RFEIS for background information related to Section 3.5 Infrastructure and Utilities</td>
<td>Appendix D Enhanced Utility Report</td>
</tr>
<tr>
<td>Appendix E-1 Responses to Comments on Draft EIS</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix E-2 Comments on Final EIS</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix F Traffic Impact Study</td>
<td>Information remains unchanged and report is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix G Environmental Site Assessments</td>
<td>Information remains unchanged and reports are incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix H Investigation of Rock Rubble Material, Roxana Site</td>
<td>Information remains unchanged; final report included in an appendix to the 2017 Final Supplemental RFEIS for background information related to Sections 3.7.1.1 and 3.7.2.1, Surface Water</td>
<td>Appendix F Investigation of Rock Rubble Material, Roxana Site</td>
</tr>
</tbody>
</table>
PUBLIC INVOLVEMENT

The Bureau published its Notice of Intent to prepare a Supplemental RFEIS in the Federal Register on November 18, 2016. The notice was also published in the Lexington Herald-Leader on November 18, 2016, and the Mountain Eagle on November 23, 2016. There was no formal scoping meeting held for this Supplemental RFEIS; however, the Bureau has considered prior comments received in the development and preparation of the environmental impacts analysis of this 2017 Final Supplemental RFEIS, including comments received during the 30-day review period on the March 2016 RFEIS. Appendix I, Comments on 2016 Revised Final EIS includes all comments received on the March 2016 RFEIS during the 30-day review period.

The Notice of Availability of the Draft Supplemental RFEIS was published in the Federal Register on March 24, 2017. A separate Notice of Public Meeting was also published in the Federal Register on March 24, 2017. A notice of availability of the Draft Supplemental RFEIS and public meeting was also published in the Mountain Eagle on March 22, 2017 and the Lexington Herald-Leader on March 24, 2017. The Bureau also sent postcard and email notices to organizations and individuals who had submitted comments on the March 2016 RFEIS. The notices announced that the Draft Supplemental RFEIS would be available for a 45-day public comment period between March 24 and May 8, 2017. The notices identified the local libraries where hard copies of the document could be reviewed, as well as a project website, www.fbopletchercountyeis.com, where an electronic version of the document could be reviewed.

The public meeting was held on April 12, 2017, between 5:30 p.m. and 8:00 p.m. at the Letcher County Central High School. Approximately 185 members of the public attended the public meeting. Comments received during the public comment period included 123 written comments and two oral comments at the public meeting; 6,986 comments submitted via mail or email; and one petition with 28 signatures. Of the comments in which an opinion on the project was provided, 444 comments plus the petition with 28 signatures were in support of the project and 6,650 comments were in opposition of the project. All comments on the Draft Supplemental RFEIS, and the Bureau’s responses to those comments, are included in Appendix J. There is also a 30-day public review period following release of this Final Supplemental RFEIS and before the Record of Decision is issued on behalf of the Bureau by its Director or Acting Director.

PROPOSED ACTION

The proposed action evaluated in this 2017 Final Supplemental RFEIS is the acquisition of property and the construction and operation of a federal correctional facility in Letcher County, Kentucky. The Bureau proposes to acquire up to 324 hectares (800 acres) to construct a USP (approximately 61,654 square meters or 663,638 square feet) and FPC (approximately 6,063 square meters or 65,262 square feet) in Letcher County. The proposed facilities would house approximately 1,216 total inmates: approximately 960 within the USP and approximately 256 within the FPC. Inmates housed in the USP would be high-security male inmates and those housed in the FPC would be minimum-security male inmates. Operation of the USP and FPC would require approximately 300 full-time staff.

In addition to the USP and FPC, several ancillary facilities necessary for the operation of the USP and FPC would be constructed. The ancillary facilities would include a central utility plant, outdoor firing range, outside warehouse, staff training building, garage/landscape building, access roads, and parking lots. A non-lethal/lethal fence and site lighting would also be installed. The non-lethal/lethal fence would be placed
around the perimeter of the USP between two parallel, chain link and razor wire fences. Site lighting would consist of 30 meter (100 foot) high mast lighting poles placed along the security perimeter road around the correctional facility, in the parking lot, and around the buildings; wall packs; and parking lot and sidewalk light poles. The exterior lighting would have full cutoff fixtures.

The outdoor firing range would be used by Bureau staff on an annual and monthly basis. Annual small arms training would occur five days a week (Monday–Friday) for approximately six weeks during the months of March and April. Monthly firearms training would occur one day each month. All firing would occur during daylight hours.

Project development would begin with acquisition of both surface and mineral rights from multiple owners, and would be estimated to take several months to a year or longer. Project construction would begin after property acquisition is completed, and would take four to five years. Design and construction of the federal correctional facility would implement practical energy efficient and sustainable solutions. The USP and FPC, in particular, would achieve Leadership in Energy and Environmental Design (LEED) Silver certification.

DEVELOPMENT OF ALTERNATIVES

The Bureau conducted an analysis of several alternative sites for the proposed federal correctional facility for their potential to meet the project purpose and need. The Bureau considered the land/facilities it controls in the Mid-Atlantic Region and also looked at other land and facilities it does not control within the Mid-Atlantic Region. No reasonable alternatives (land or existing facilities) not controlled by the Bureau were identified. In addition, no lands/facilities in the Mid-Atlantic Region controlled by the Bureau have sufficient space to accommodate the development of the proposed facilities.

The Letcher County Planning Commission identified potential sites for development for a new USP and FPC in Letcher County, and contacted the Bureau to determine if the Bureau had an interest in developing a new facility at one of the locations. In 2008, the Bureau initiated a site reconnaissance study of the suitability for development of four sites in Letcher County that had been offered to the Bureau by members of the community. The four sites included: Meadow Branch, Payne Gap, Roxana, and Van/Fields. Based on the 2008 study, a second study was conducted in 2010 to rank these sites and verify that issues originally identified in 2008 had not changed. Based on the data collected from both the 2008 and 2010 studies, it was determined that these four sites should be studied in more detail in a feasibility study to identify if there would be constraints associated with the development of the sites.

In 2012, the Bureau completed a feasibility study that evaluated the benefits, challenges, and potential risks associated with development of each site. During the initial phases of the feasibility study, the Meadow Branch site was removed from further consideration due to unavailability of the proposed land; therefore, no detailed analysis of the site was included in the feasibility study. Cultural resources, wetlands, geologic conditions, and utilities were assessed for each of the three remaining sites. The feasibility study determined that there were no constraints that would prevent development of any of the three sites. During the finalization of the feasibility study, the Van/Fields site was likewise removed from further consideration due to unavailability of the proposed land. The remaining two sites, Payne Gap and Roxana, were identified as alternatives to be carried forward for study in an EIS.
Alternatives Evaluated in the 2016 RFEIS

The 2016 RFEIS evaluated the No Action Alternative and two build alternatives: Alternative 1 – Payne Gap and Alternative 2 – Roxana. The 2016 RFEIS identified Alternative 2 – Roxana as the preferred alternative because it best meets the project needs and would have fewer impacts to the human environment. Therefore, Alternative 1 – Payne Gap has been eliminated from further evaluation in this 2017 Final Supplemental RFEIS.

Alternative 1 – Payne Gap

Under Alternative 1, the Bureau would have acquired approximately 305 hectares (753 acres) of land known as the Payne Gap site. The site is located in eastern Letcher County, approximately 7 miles northeast of Whitesburg, along the Kentucky and Virginia border. Surface and deep mining had been conducted on portions of the site.

The Bureau would have required a minimum of 121 hectares (300 acres) for construction of the USP, FPC, and ancillary facilities at this site. The Bureau proposed developing the north half of the Payne Gap site with the USP, FPC, and ancillary buildings, and accessing the site from U.S. Route 119.

Alternative 1 – Payne Gap would have required extensive earthwork to prepare the site for development. All excavated materials, which would include the removal of mine spoil, would be used on-site for structural fill or placed as spoil fill. Approximately 8,342,922 cubic meters (10,912,130 cubic yards) of excavation and 10,568,450 cubic meters (13,823,012 cubic yards) of fill would have been required prior to the beginning of construction activities.

Alternative 2 – Roxana

Under Alternative 2, the Bureau would have acquired approximately 283 hectares (700 acres) of land known as the Roxana site. The site is located 7.5 miles west of Whitesburg, Kentucky. A portion of the site comprises a reclaimed surface mine site.

The Bureau would have required a minimum of 121 hectares (300 acres) for construction of the USP and FPC at this site. The Bureau proposed constructing the FPC in the north portion of the Roxana site and the USP and ancillary buildings in the central portion of the site. The proposed facilities layout included an access road extending along the east side of the facilities from KY 588.

Alternative 2 – Roxana would also have required extensive earthwork to prepare the site for development. Approximately 7,766,032 cubic meters (10,157,586 cubic yards) of material would have needed to have been excavated from the site and approximately 7,188,790 cubic meters (9,402,582 cubic yards) of fill would have been required to prepare the site for construction activities.

Alternatives Evaluated in this Supplemental RFEIS

No Action Alternative

The No Action Alternative does not meet the project purpose and need; however, it represents the existing conditions and is analyzed in the 2017 Final Supplemental RFEIS as a baseline for comparing the proposed action. The purpose for this comparison is to allow the federal agency to assess the effects of taking no action versus implementing the proposed action. Therefore, the assessment of the No Action Alternative is an important component of all NEPA documents.
Modified Alternative 2 – Roxana

Under Modified Alternative 2 – Roxana, the Bureau would acquire approximately 231 hectares (570 acres) of land at Roxana. The size of the proposed Roxana site was reduced by approximately 53 hectares (130 acres) because one property was not available for acquisition because the landowner did not want to sell their property. The Bureau determined another property under consideration was not required for the project. The Bureau conducted a number of detailed studies at the Roxana site and determined this smaller site size would still be a viable alternative for constructing and operating a USP, FPC, and ancillary facilities. In the modified facilities layout under this alternative compared with the 2016 alternative, the FPC would be situated closer to the USP and the access road would extend from KY 588 along the west side of the FPC rather than the east side.

Preparation of the site for construction would require excavating approximately 6,585,085 cubic meters (8,612,966 cubic yards) of spoil material and approximately 557,908 cubic meters (729,716 cubic yards) of rock. All excavated materials, which would include soil, rock, and mine spoil, would be used on-site for structural fill. The amount of structural fill is estimated to be 6,683,976 cubic meters (8,742,310 cubic yards). The excavated material would be compacted to create a structural fill for the building foundations or transported to the valleys adjacent to the northwest of the proposed FPC location and southwest of the proposed USP location and compacted as structural fill.

Preferred Alternative

Modified Alternative 2 – Roxana is the preferred alternative because it best meets the purpose of the proposed action by providing an additional high-security penitentiary and an associated prison camp to increase capacity for current inmate populations in the Mid-Atlantic Region. Modified Alternative 2 – Roxana satisfies the continuing need for additional high-security facilities within this region, despite recent declines in other than high-security inmate population groups, to reduce the demonstrated overcrowding that compromises the mission of the Bureau.

In addition, Modified Alternative 2 – Roxana is the preferred alternative because it would have, on balance, fewer impacts to the human environment as compared with Alternative 1 – Payne Gap evaluated in the 2016 RFEIS. Although both build alternatives would have direct adverse impacts to topography, geology, and soils, much greater site preparation work would be required at the Payne Gap site. Except for the potential impact to the natural gas infrastructure, Modified Alternative 2 – Roxana would have less than significant impacts to infrastructure and utilities, while Alternative 1 – Payne Gap would have significant impacts to potable water capacity, wastewater treatment capacity, and natural gas infrastructure. Under Modified Alternative 2 – Roxana, impacts to streams and forest would be less than those under Alternative 1 – Payne Gap. Development of the proposed action at the Payne Gap site would impact approximately 40 more hectares (100 more acres) of summer habitat of federally listed bat species when compared with the Roxana site. Table ES-2 provides a comparison of these and other potential environmental effects from the alternatives evaluated in this 2017 Final Supplemental RFEIS, the No Action Alternative and Modified Alternative 2 – Roxana, and Alternative 1 – Payne Gap evaluated in the 2016 RFEIS.

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>No Action Alternative</th>
<th>Alternative 1 – Payne Gap</th>
<th>Modified Alternative 2 – Roxana (Evaluated in this 2017 Final Supplemental RFEIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use and Zoning</td>
<td>• No compatibility issues; therefore, no impact on land use</td>
<td>• No significant impact&lt;br&gt;• Changes in land use from forested/reclaimed mining to government institution not incompatible from regulatory perspective&lt;br&gt;• Compatibility issues with adjacent properties minimized by forested buffer that would separate USP/FPC facilities from adjacent land uses</td>
<td>• No significant impact&lt;br&gt;• Changes in land use from forested/reclaimed mining/residential to government institution not incompatible from regulatory perspective&lt;br&gt;• Compatibility issues with adjacent properties minimized by forested buffer that would separate USP/FPC facilities from adjacent land uses&lt;br&gt;• A 125-foot buffer maintained between FPC construction and Whitaker property</td>
</tr>
<tr>
<td>Topography, Geology, and Soils</td>
<td>• No impact to topography, geology, or soils</td>
<td>• Significant impact&lt;br&gt;• Direct topographical changes from cut (10.9 million cubic yards) and fill (13.8 million cubic yards) and grading&lt;br&gt;• Direct impact to geology from blasting and excavation of bedrock&lt;br&gt;• Soil disturbance of approximately 88 hectares (218 acres)&lt;br&gt;• No impact to prime farmland soils</td>
<td>• Significant impact&lt;br&gt;• Direct topographical changes from cut (9.3 million cubic yards) and fill (8.7 million cubic yards) and grading&lt;br&gt;• Direct impact to geology from blasting and excavation of bedrock&lt;br&gt;• Soil disturbance of approximately 73 hectares (181 acres)&lt;br&gt;• Impact to 5 hectares (12.3 acres) of soils classified as farmland of statewide importance&lt;br&gt;• No significant impact to prime farmland soils</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Socioeconomics and Environmental Justice</td>
<td>• No impact; no beneficial socioeconomic impacts</td>
<td>• No significant impact</td>
<td>• No significant impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minor offset in projected 2020 population decrease</td>
<td>• Minor offset in projected 2020 population decrease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minor beneficial employment and income impacts</td>
<td>• Minor beneficial employment and income impacts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No disproportionately high or adverse human health or environmental effects on minority populations and low-income populations</td>
<td>• No disproportionately high or adverse human health or environmental effects on minority populations and low-income populations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No environmental health risks or safety risks that may disproportionately affect children</td>
<td>• No environmental health risks or safety risks that may disproportionately affect children</td>
</tr>
<tr>
<td>Community Facilities and Services</td>
<td>• No impact; no increase in demand on community facilities and services from operation of a new facility</td>
<td>• No significant impact</td>
<td>• No significant impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No significant impacts to state and local law enforcement agencies, fire and emergency services, health care services, or to school services</td>
<td>• No significant impacts to state and local law enforcement agencies, fire and emergency services, health care services, or to school services</td>
</tr>
<tr>
<td>Transportation and Traffic</td>
<td>• No increases in traffic from construction and operation of a new facility; therefore, no impact to transportation and traffic</td>
<td>• No significant impact</td>
<td>• Less than significant impact with planned mitigation measures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No significant impacts to traffic associated with construction activities</td>
<td>• No significant impacts to traffic associated with construction activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Less than significant impacts to level of service of U.S. Route 119 are anticipated from traffic associated with operations of the facility</td>
<td>• No significant impacts to level of service of KY 588 are anticipated from traffic associated with operations of the facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No significant impacts to roadways</td>
<td>• Significant impacts to roadways from truck traffic</td>
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<tr>
<td></td>
<td></td>
<td>• Minor roadway improvement (addition of left turn lane on U.S. Route 119) would be implemented</td>
<td>• Planned improvements to roadway infrastructure reduce impacts to less than significant</td>
</tr>
</tbody>
</table>
### Table ES-2. Summary of Environmental Consequences with Implementation of the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>No Action Alternative</th>
<th>Alternative 1 – Payne Gap</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>• No increases in air emissions; therefore, no impact to air quality</td>
<td>• No significant impact&lt;br&gt;• Temporary increases in air emissions during construction below significance threshold for criteria pollutants&lt;br&gt;• Annual air emissions from facility operation and staff vehicle commuting below significance threshold for criteria pollutants&lt;br&gt;• No direct or indirect significant impacts on the local/regional air quality</td>
<td>• No significant impact&lt;br&gt;• Temporary increases in air emissions during construction below significance threshold for criteria pollutants&lt;br&gt;• Annual air emissions from facility operation and staff vehicle commuting below significance threshold for criteria pollutants&lt;br&gt;• No direct or indirect significant impacts on the local/regional air quality</td>
</tr>
<tr>
<td>Noise</td>
<td>• No construction or operation of a new facility; therefore, no impact from increases in noise</td>
<td>• No significant impact&lt;br&gt;• Temporary construction noise&lt;br&gt;• No significant impacts to ambient noise levels are anticipated from operations of the facility</td>
<td>• No significant impact&lt;br&gt;• Temporary construction noise&lt;br&gt;• No significant impacts to ambient noise levels are anticipated from operations of the facility</td>
</tr>
<tr>
<td>Infrastructure and Utilities</td>
<td>• No impact; no increase in demand on infrastructure and utilities from construction and operation of a new facility</td>
<td>• Significant impact&lt;br&gt;• Demand for natural gas, electricity, telecommunication would not exceed existing capacities&lt;br&gt;• Increase in solid waste met by adequate capacity at Laurel Ridge Landfill&lt;br&gt;• Significant impact to potable water capacity and wastewater treatment capacity&lt;br&gt;• Significant impact to natural gas infrastructure&lt;br&gt;• Direct impact to natural gas owner from closure of gas well and relocation of gas pipeline&lt;br&gt;• Cumulative impacts to wastewater treatment capacity</td>
<td>• No significant impact&lt;br&gt;• Demand for water, natural gas, electricity, and telecommunication would not exceed existing capacities&lt;br&gt;• Increase in solid waste met by adequate capacity at Laurel Ridge Landfill&lt;br&gt;• Direct impact to natural gas owners and lessors from closure of gas wells and compressor station and abandonment and/or relocation of gas pipelines&lt;br&gt;• Cumulative impacts to wastewater infrastructure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>No Action Alternative</th>
<th>Alternative 1 – Payne Gap</th>
<th>Modified Alternative 2 – Roxana (Evaluated in this 2017 Final Supplemental RFEIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Resources</td>
<td>• No construction or operation of a new facility; therefore, no impact to cultural resources</td>
<td>• No significant impact</td>
<td>• No significant impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No adverse effect on cultural resources listed or eligible for listing on the National Register of Historic Places</td>
<td>• No adverse effect on cultural resources listed or eligible for listing on the National Register of Historic Places</td>
</tr>
<tr>
<td>Water Resources</td>
<td>• No construction or operation of a new facility; therefore, no impact to water resources</td>
<td>• Less than significant impact with planned mitigation measures</td>
<td>• Less than significant impact with planned mitigation measures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0.97 hectare (2.40 acres) of wetland impacts</td>
<td>• 0.98 hectare (2.44 acres) of wetland impacts</td>
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<td></td>
<td></td>
<td>• 3,204 meters (10,512 linear feet) of stream impacts</td>
<td>• 1,710 meters (5,610 linear feet) of stream impacts</td>
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<td></td>
<td></td>
<td>• Permitting and mitigation reduce wetland and stream impacts to less than significant</td>
<td>• Permitting and mitigation reduce wetland and stream impacts to less than significant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No significant impacts to surface water quality or groundwater</td>
<td>• No significant impacts to surface water quality or groundwater</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No impact to floodplains</td>
<td>• No impact to floodplains</td>
</tr>
</tbody>
</table>
## Table ES-2. Summary of Environmental Consequences with Implementation of the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>No Action Alternative</th>
<th>Alternative 1 – Payne Gap</th>
<th>Modified Alternative 2 – Roxana (Evaluated in this 2017 Final Supplemental RFEIS)</th>
</tr>
</thead>
</table>
| Biological Resources   | • No construction or operation of a new facility; therefore, no impact to biological resources. | • No significant impact  
- 88 hectares (218 acres) of forest clearing  
- No significant impact to wildlife habitat  
- No significant impact to avian and small mammal species from non-lethal/lethal fence  
- No significant impacts to Indiana and northern long-eared bat summer habitat and potential winter hibernacula considered suitable for use by Indiana, northern long-eared, or gray bat  
- Additional studies of summer and winter bat habitat and a Biological Assessment would be required to further assess potential impacts to federally listed species and potential mitigation | • No significant impact  
- 49 hectares (121 acres) of forest clearing  
- No significant impact to wildlife habitat  
- No significant impact to avian and small mammal species from non-lethal/lethal fence  
- No significant impacts to Indiana and northern long-eared bat summer habitat and winter hibernaculum considered suitable for use by Indiana, northern long-eared, or gray bat  
- No significant impacts to state or federally listed species  
- Under ESA, may affect, likely to adversely affect northern long-eared and Indiana bats; not likely to adversely affect gray bats  
- USFWS section 7 ESA consultation is complete and the Biological Opinion (BO) is included in this Final Supplemental RFEIS (Appendix H); reasonable and prudent measures specified in the USFWS BO would lessen adverse effects to the federally listed northern long-eared and Indiana bats |

*Executive Summary*  
September 2017  
ES-xiii
<table>
<thead>
<tr>
<th>Resource Area</th>
<th>No Action Alternative</th>
<th>Alternative 1 – Payne Gap</th>
<th>Modified Alternative 2 – Roxana (Evaluated in this 2017 Final Supplemental RFEIS)</th>
</tr>
</thead>
</table>
| Hazardous Materials and Waste | • No construction or operation of a new facility; therefore, no impact to human health and safety or the environment from hazardous materials and waste | • No significant impact  
• Procedures would be in place for safe transport, handling, use, and disposal of hazardous substances and waste during construction and operations  
• No significant impact to the environment from firing range operations; Bureau Technical Design Guidelines require incorporating structures to catch lead particles, and a stormwater system to prevent contamination outside of the range itself  
• Facilities intended for human occupancy would be designed to prevent occupant exposures to radon above the USEPA action level | • No significant impact  
• Procedures would be in place for safe transport, handling, use, and disposal of hazardous substances and waste during construction and operations  
• Removal and disposal of contaminated soils in three identified locations on the site would be conducted in accordance with all applicable federal and state standards  
• No significant impact to the environment from firing range operations; Bureau Technical Design Guidelines require incorporating structures to catch lead particles, and a stormwater system to prevent contamination outside of the range itself  
• Facilities intended for human occupancy would be designed to prevent occupant exposures to radon above the USEPA action level |
SUMMARY OF ENVIRONMENTAL EFFECTS

This section summarizes the potential environmental effects from the alternatives evaluated in this 2017 Final Supplemental RFEIS: the Modified Alternative 2 – Roxana and the No Action Alternative.

Modified Alternative 2 – Roxana

Implementation of Modified Alternative 2 – Roxana would have significant impacts to topography, geology, and soils. Under this alternative, there would be direct geologic impacts from blasting and excavation of bedrock, and direct topographic impacts from cut, fill, and grading. Development of the USP and FPC would have a direct impact on soils at the Roxana site as a result of temporary disturbance of approximately 73 hectares (181 acres) from construction activities. In addition, there would be a direct impact to soils classified as farmland of statewide importance.

Except for the existing natural gas infrastructure, there would be no significant impacts to infrastructure and utilities from development of a USP and FPC under Modified Alternative 2 – Roxana. Demand for water, natural gas, electricity, and telecommunication would not exceed existing capacities, and an increase in solid waste would be met by adequate capacity at Laurel Ridge Landfill. Modified Alternative 2 – Roxana would have an adverse impact to natural gas owners and lessors from closure of gas wells and a compressor station and an oil well, and abandonment and/or relocation of gas pipelines. The demand for treatment of wastewater is not estimated to exceed the existing permitted capacity of the Letcher County Water and Sewer District. However, the existing capacity of the Whitesburg wastewater treatment plant could potentially be exceeded by the cumulative flows from implementation of Modified Alternative 2 – Roxana and other reasonably foreseeable future projects.

Development of the USP and FPC under Modified Alternative 2 – Roxana would have direct adverse impacts to wetlands and streams. The Bureau would obtain a permit for wetlands and stream impacts under Clean Water Act Sections 401 and 404, which would require full mitigation of impacts. The implementation of the mitigation measures would reduce the impacts to less than significant. There would be no significant impacts to surface water quality or groundwater, and no impact to floodplains.

In accordance with ESA section 7, the Bureau consulted with the USFWS to address potential impacts to federally listed species with implementation of the preferred alternative (Modified Alternative 2 – Roxana). Under the preferred alternative, with implementation of proposed mitigation measures, the construction and operation of the proposed USP and FPC may affect, is likely to adversely affect, the federally endangered Indiana bat and federally threatened northern long-eared bat; and may affect, is not likely to adversely affect the federally endangered gray bat. The USFWS concurred with these findings in their Biological Opinion and specified reasonable and prudent measures to minimize take to federally listed species and non-discretionary terms and conditions to implement these measures. The conclusions resulting from formal consultation with the USFWS are included in this Final Supplemental RFEIS. There would be no significant impacts to vegetation, wildlife, and threatened and endangered species with implementation of Modified Alternative 2 – Roxana.

Implementation of Modified Alternative 2 – Roxana would have no significant impacts to land use, air quality, or cultural resources. In addition, Modified Alternative 2 – Roxana would have no significant impacts to sensitive noise receptors from construction noise, and no significant impacts are anticipated from firearms training noise because the nearest residences are located well outside of the area predicted for peak noise and the peak noise levels would be considered compatible for residential land use.
No Action Alternative

Under the No Action Alternative, the proposed USP, FPC, and ancillary facilities would not be constructed and no impacts to the natural or built environment would occur. The No Action Alternative would have no environmental impacts, but would not meet the purpose of and need for the proposed action. This alternative is not feasible, but was included in this 2017 Final Supplemental RFEIS to provide a baseline for analysis of the proposed action.
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<tr>
<th>Acronym</th>
<th>Abbreviation</th>
<th>Definition/Description</th>
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<tr>
<td>AMSL</td>
<td>above mean sea level</td>
<td>KGS</td>
</tr>
<tr>
<td>APE</td>
<td>area of potential effects</td>
<td>LCWSD</td>
</tr>
<tr>
<td>BA</td>
<td>Biological Assessment</td>
<td>LED</td>
</tr>
<tr>
<td>BMPs</td>
<td>best management practices</td>
<td>LEED</td>
</tr>
<tr>
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<td>O₃</td>
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<td>A-weighted decibels</td>
<td>OSHA</td>
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<tr>
<td>dBP</td>
<td>peak decibels</td>
<td>PM₂·₅</td>
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<td>Day-Night Average Sound Level</td>
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</tr>
<tr>
<td>Hz</td>
<td>Hertz</td>
<td>µg/m³</td>
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<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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</tr>
<tr>
<td>in/sec</td>
<td>inches per second</td>
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<td></td>
</tr>
<tr>
<td>U.S.</td>
<td>United States</td>
<td></td>
</tr>
<tr>
<td>USACE</td>
<td>U.S. Army Corps of Engineers</td>
<td></td>
</tr>
<tr>
<td>USC</td>
<td>U.S. Code</td>
<td></td>
</tr>
<tr>
<td>USEPA</td>
<td>U.S. Environmental Protection Agency</td>
<td></td>
</tr>
<tr>
<td>USFWS</td>
<td>U.S. Fish and Wildlife Service</td>
<td></td>
</tr>
<tr>
<td>USP</td>
<td>U.S. Penitentiary</td>
<td></td>
</tr>
<tr>
<td>VOC</td>
<td>volatile organic compound</td>
<td></td>
</tr>
<tr>
<td>WWTP</td>
<td>wastewater treatment plant</td>
<td></td>
</tr>
<tr>
<td>yd³</td>
<td>cubic yards</td>
<td></td>
</tr>
</tbody>
</table>
1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The United States (U.S.) Department of Justice, Federal Bureau of Prisons (Bureau) has prepared this document to supplement the Revised Final Environmental Impact Statement for Proposed United States Penitentiary and Federal Prison Camp Letcher County, Kentucky, dated March 2016 and published on April 1, 2016. The 2016 Revised Final Environmental Impact Statement (RFEIS) evaluated the potential environmental impacts of the No Action Alternative and two proposed action alternatives for the acquisition of property and construction and operation of a new United States Penitentiary (USP), Federal Prison Camp (FPC), and ancillary facilities in Letcher County. The 2016 RFEIS analyzed two potential locations: an approximately 305-hectare (753-acre) site in eastern Letcher County (Alternative 1 – Payne Gap), and an approximately 283-hectare (700-acre) site in western Letcher County (Alternative 2 – Roxana). The 2016 RFEIS identified Alternative 2 – Roxana as the preferred alternative because it best meets the project needs and, on balance, would have fewer impacts to the natural and built environment.

The Bureau was originally considering acquiring approximately 283 hectares (700 acres) at the Roxana site for this project. Following publication of the 2016 RFEIS, the Bureau removed two parcels of land at the Roxana site from acquisition consideration. The Bureau withdrew one parcel because the landowner did not want to sell their property, and withdrew another parcel after determining it was not required for the project. The resulting proposed site is approximately 231 hectares (570 acres). This reduction in site size has necessitated modifying the facilities layout evaluated for Alternative 2 – Roxana in the 2016 RFEIS. Consequently, the original site configuration of Alternative 2 – Roxana from the 2016 RFEIS is no longer a feasible alternative. The focus of this 2017 Final Supplemental RFEIS is the evaluation of potential environmental impacts associated with the revised design of Modified Alternative 2 – Roxana adopted by the Bureau after publication of the 2016 RFEIS.

This 2017 Final Supplemental RFEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508), and the U.S. Department of Justice procedures for implementing NEPA (28 CFR 61). Consistent with the guidance provided in 40 CFR 1502.9, this 2017 Final Supplemental RFEIS addresses “substantial changes in the proposed action that are relevant to environmental concerns or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” This 2017 Final Supplemental RFEIS incorporates by reference, and builds upon the analyses presented in, the 2016 RFEIS, while focusing on new information about the proposed project. The 2016 RFEIS and any other documents incorporated by reference in this 2017 Final Supplemental RFEIS are available on the project website at http://www.fbopletchercountyegis.com.

1.1 FEDERAL BUREAU OF PRISONS

The Bureau was established in 1930 to provide more progressive and humane care for federal inmates, to professionalize the prison service, and to ensure consistent and centralized administration of federal prisons. The mission of the Bureau is to protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost efficient, and appropriately secure, and that provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens.
The Bureau accomplishes its mission through the appropriate use of community-correction, detention, and correctional facilities. The Bureau operates correction and detention facilities at various security levels. Each security level is characterized by the type of housing within the institution, internal security features, and staff-to-inmate ratio. Different security levels require particular features such as external patrols, guard towers, security barriers, or detection devices.

The Bureau is proposing to construct a new USP and satellite FPC in Letcher County. A USP is a high-security facility. High-security facilities have highly secure perimeters (e.g., walls or double fences with taut wire fencing, non-lethal/lethal fences), multiple single occupant cell housing, guard towers, close staff supervision, and movement controls. An FPC is a minimum-security facility. Minimum-security facilities are generally characterized by dormitory-style housing, a relatively low staff-to-inmate ratio, and are without fences. Also known as satellite work camps, they are typically associated with a larger institution or military base where inmates can help serve labor needs of the institution or base.

The security level classifications of all of the Bureau’s inmates are reviewed at regularly scheduled intervals during their incarceration. If at the time of the inmate’s classification review the inmate’s security level is no longer appropriate for placement in the current institution, the inmate would be submitted for transfer to a lower or higher security level facility. The classification of inmates is necessary to place each inmate in the most appropriate security level institution that meets their program needs and also ensures and protects society.

1.2 Project Background

Since this project was initiated in 2005, the Bureau has studied the need for additional high-security bed space in the Mid-Atlantic Region. Inmate population totals have been continually updated throughout this process. At the end of Fiscal Year 2016 (September 30, 2016), the Bureau inmate population totaled 192,170; this includes 156,266 inmates being housed in 122 Bureau institutions, 22,650 being housed in privately-managed secure facilities, and 13,254 being housed in other contract care. Of the 156,266 inmates housed in Bureau institutions, 19,845 were high-security male inmates housed in 17 USPs located throughout six regions within the U.S.: the Mid-Atlantic Region, North Central Region, Northeast Region, South Central Region, Southeast Region, and Western Region. Each region provides facilities for housing inmates at all security levels. At the end of Fiscal Year 2016, the 17 USPs were rated for a total capacity of 15,165 high-security inmates. Therefore, the Bureau’s high-security institutions were 31 percent overcrowded and continue to operate at above rated capacity.

The Bureau’s projected inmate population for all security levels in Fiscal Year 2017 is 152,085, and an approximate 12 percent overcrowded rate. The population of high-security male institutions (USPs) in Fiscal Year 2017 is projected to be 19,314, and remain overcrowded at approximately 27 percent. The Fiscal Year 2017 projections reflect a slight decrease from Fiscal Year 2016 numbers. However, the projections for Fiscal Year 2018 reflect an increase in the Bureau’s total population compared to Fiscal Year 2017, with a population of all security levels at 156,256 and approximately 15 percent overcrowded rate. This increase is based on recent U.S. Department of Justice policy changes in prosecution priorities, which also may result in an increase, rather than a slow decrease, in the high-security inmate population.

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1 Inmates housed at the Administrative Maximum Facility in Florence, Colorado and the Administrative USP in Thomson, Illinois were not included in these figures.
The Fiscal Year 2018 high-security level institutions population is projected to increase to 19,844. At this level, the Bureau’s high-security level institutions would be approximately 27 percent overcrowded.

To meet the current and projected bed space needs, the Bureau evaluates the bed space needs of the regions using a geographically balanced program. When making decisions on the placement of an individual, the Bureau considers the origin of the inmate and attempts to place the inmate in an institution that is within the region of the inmate’s origin. Placing inmates within their region of origin provides greater opportunity for visitation with family, which aids in the rehabilitation process. However, an inmate’s region of origin is not the sole factor in determining the inmate’s placement. Other factors that are considered when making placement decisions include, but are not limited to, the level of security and supervision the inmate requires; the level of security and staff supervision the institution is able to provide; the inmate’s program needs; the level of overcrowding at an institution; any security, location or program recommendation by the sentencing court; any additional security measures to ensure the protection of victims/witnesses and the public in general; and any other factor(s) that may involve the inmate’s confinement, the protection of society, and/or the safe and orderly management of a Bureau facility.

One of the regions identified by the Bureau as having an increasing need for additional high-security bed space to reduce overcrowding is the Mid-Atlantic Region. There are currently 18 correctional facilities housing male inmates in the Bureau’s Mid-Atlantic Region. Of these, only four are USPs or high-security facilities: USP Hazelton located in Hazelton, West Virginia, USP Lee located in Jonesville, Virginia, USP Big Sandy located in Inez, Kentucky, and USP McCreary located in McCreary, Kentucky. As of August 8, 2017, approximately 5,029 high-security inmates are housed within the four USPs in the Mid-Atlantic Region (Table 1-1). The current rated capacity for these institutions is 3,821. Therefore, the overcrowding level in the USPs in the Mid-Atlantic Region is currently 32 percent. The Bureau has determined that due to the overcrowding in the Mid-Atlantic Region, specifically within the USPs, construction of a new high-security facility and a FPC for mission support would be warranted in the region.

<table>
<thead>
<tr>
<th>USP</th>
<th>Current Inmate Population</th>
<th>Current Rated Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazelton</td>
<td>1,338</td>
<td>957</td>
</tr>
<tr>
<td>Lee</td>
<td>1,235</td>
<td>960</td>
</tr>
<tr>
<td>Big Sandy</td>
<td>1,105</td>
<td>949</td>
</tr>
<tr>
<td>McCreary</td>
<td>1,351</td>
<td>955</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,029</strong></td>
<td><strong>3,821</strong></td>
</tr>
</tbody>
</table>

1.3 **PROJECT PURPOSE AND NEED**

The purpose of and need for the proposed federal correctional facility in Letcher County, Kentucky, has not changed since the issuance of the March 2016 RFEIS. The purpose of the project is to provide an additional high-security penitentiary and an associated prison camp to increase capacity for current inmate populations in the Mid-Atlantic Region. The need for the proposed facility is that the current inmate populations of the USPs in the Mid-Atlantic Region are exceeding their rated capacity and their associated FPCs are at or near capacity. The overcrowding level in the USPs in the Mid-Atlantic Region is currently 34 percent. Current inmates from the four existing USPs in the Mid-Atlantic Region could be moved from these overcrowded facilities to the proposed Letcher County USP. The Bureau has determined that there is a need for additional high-security facilities within this region to reduce the demonstrated overcrowding that compromises the mission of the Bureau. There is a continuing need for additional high-security facilities within this region despite recent declines in other than high-security inmate population groups.
The Bureau’s mission is to protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, and appropriately secured, and that provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens.

1.4 THE ENVIRONMENTAL REVIEW PROCESS

1.4.1 National Environmental Policy Act

The environmental review process is conducted in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, which requires consideration of environmental issues in federal agency planning and decision-making. The Bureau is the decision-maker with regard to this proposed action. Regulations for federal agency implementation of NEPA were established by the President’s CEQ.

Consistent with the CEQ’s guidance for a supplemental environmental document, which is contained in 40 CFR 1502.9, the purpose of this document is to supplement the impact analyses contained in the 2016 RFEIS in light of current circumstances and information. This 2017 Final Supplemental RFEIS evaluates potential environmental impacts relative to the substantial changes to Alternative 2 – Roxana that have occurred since the issuance of the 2016 RFEIS. By supplementing the 2016 RFEIS, this document advances NEPA’s purpose of informing Bureau decision-makers and the general public about the environmental effects of the government’s proposed action.

1.4.2 Scope of the Analysis

According to CEQ regulations for implementing NEPA, NEPA documents should “concentrate on the issues that are truly significant to the action in question” [40 CFR 1500.1(b)]. Agencies preparing an Environmental Impact Statement (EIS) should discuss impacts “in proportion to their significance” [40 CFR 1502.2(b)] and should “reduce excessive paperwork by discussing only briefly issues other than significant ones” [40 CFR 1500.4(c)]. Applying these guidelines to this 2017 Final Supplemental RFEIS, the baseline data and impact analyses focus on eight environmental resource areas, each of which was previously analyzed and discussed in the 2016 RFEIS, but have been updated in this document to address potential changes in analyses or impacts as a result of the proposed modifications to the Bureau’s preferred alternative, Modified Alternative 2 – Roxana. The eight resource areas (and the respective sections of the 2016 RFEIS in which each was discussed) include: land use and zoning (Sections 3.1 and 5.1); topography, geology, and soils (Sections 3.2 and 5.2); air quality (Sections 3.6 and 5.6); noise (Sections 3.7 and 5.7); infrastructure and utilities (Sections 3.8 and 5.8); cultural resources (Sections 3.9 and 5.9); water resources (surface water, wetlands, groundwater, and floodplains) (Sections 3.10 and 5.10); and biological resources (vegetation, wildlife, and threatened and endangered species) (Sections 3.11 and 5.11).

The affected environment description for each relevant resource area in this 2017 Final Supplemental RFEIS incorporates new or updated information and analyses that have been developed as a result of the modifications of the preferred Alternative 2 – Roxana since the 2016 RFEIS. Specifically, an additional geotechnical study and additional environmental studies of archaeological resources, wetlands, and endangered species were conducted as a consequence of modifying the layout of the facilities at the Roxana site.

For certain environmental resource areas, the Bureau determined there is no significant new information relevant to environmental concerns and no appreciable changes to potential impacts as a result of the modifications to the Roxana site size and facilities layout under Modified Alternative 2 – Roxana. These resource areas include: socioeconomics and environmental justice, community facilities and services,
transportation and traffic, and hazardous materials and waste. A summary of the impacts as discussed in the 2016 RFEIS for these resource areas is provided in Table 1-2. Information in the 2016 RFEIS on these resource areas continues to be relevant and unchanged. As previously noted, the 2016 RFEIS, including the respective material regarding these four resource areas, is incorporated herein by reference. For a detailed description of those environmental conditions that have not changed appreciably since the issuance of the RFEIS on April 1, 2016, the reader is referred to the appropriate sections in the 2016 RFEIS (identified in Table 1-2).

<table>
<thead>
<tr>
<th>Resource Areas with No Appreciable Change in Potential Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>--------------------------------</td>
</tr>
</tbody>
</table>
| Socioeconomics and Environmental Justice (Sections 3.3 and 5.3) | • Minor offset in projected 2020 population decrease  
• Minor beneficial employment and income impacts  
• No disproportionately high or adverse human health or environmental effects on minority populations and low-income populations  
• No environmental health risks or safety risks that may disproportionately affect children |
| Community Facilities and Services (Sections 3.4 and 5.4) | • Less than significant impacts to state and local law enforcement agencies  
• No significant impacts to fire and emergency services  
• No significant impacts to health care services  
• No significant impacts to school services; sufficient capacity in Letcher County School District to accommodate school age children of Bureau employees |
| Transportation and Traffic (Sections 3.5 and 5.5) | • No significant impacts to traffic associated with construction activities; low traffic volumes on roadways have sufficient capacity to accommodate a temporary increase in truck traffic  
• No significant impacts to level of service of KY 588 are anticipated from traffic associated with operations of the federal correctional facility  
• Significant impacts to roadways; truck traffic could exceed maximum weight limits of bridges near the site and lane widths and pavement capacity of KY 588  
• The Bureau would require improvements to roadway infrastructure such as bond roads where vehicle weight limitations may be exceeded and repair any surface damage to roads to avoid or reduce impacts to a less than significant level |
| Hazardous Materials and Waste (Sections 3.12 and 5.12) | • No significant impacts to public health and safety or the environment from hazardous materials and waste; procedures would be in place for safe transport, handling, use, and disposal of hazardous substances and waste during construction and operations  
• No significant impact to human health or the environment from removal of soils contaminated by petroleum in three identified locations on the site; removal and disposal of contaminated soils would be conducted in accordance with all applicable federal and state standards  
• No significant impact to the environment from firing range operations; Bureau Technical Design Guidelines require incorporating safety baffles, berms, and backstops to contain bullets; impoundments, traps, and other structures to catch lead particles; and stormwater systems that gather runoff and allow infiltration within the range bermed area to prevent contamination outside of the range itself  
• No significant impact to human health from exposure to radon as facilities intended for human occupancy would be designed to prevent occupant exposures to radon above the U.S. Environmental Protection Agency action level |
As discussed above, changes were made to the 2017 Final Supplemental RFEIS to describe the modifications to the preferred Alternative 2 – Roxana as well as to update the affected environment and impacts analyses for certain environmental resource areas where changes have occurred since the RFEIS was published in March 2016. This 2017 Final Supplemental RFEIS incorporates by reference those sections of the 2016 RFEIS in which there are no substantial changes or no new information relevant to environmental concerns. Table 1-3 identifies the sections of the 2016 RFEIS that have been changed or updated in this 2017 Final Supplemental RFEIS, and the sections of the 2016 RFEIS in which information remains unchanged and is incorporated by reference.

| Table 1-3. Information from 2016 RFEIS Changed or Incorporated by Reference, by Section |
|---------------------------------|---------------------------------|---------------------------------|
| 2016 RFEIS Section Number and Title | Summary of Changes Made | Location of Updated Information in 2017 Final Supplemental RFEIS |
| Executive Summary | Entire section has been updated with changes made in the 2017 Final Supplemental RFEIS sections | Executive Summary |
| 1.0 – Purpose and Need for the Proposed Action | | |
| 1.0 Purpose and Need for the Proposed Action | The introduction to this chapter has been updated to cover the purpose of this 2017 Final Supplemental RFEIS | 1.0 Purpose and Need for the Proposed Action |
| 1.1 Background | Information remains unchanged | 1.1 Federal Bureau of Prisons |
| 1.2 Security Levels | Information remains unchanged, but has been summarized and re-formatted in the 2017 Final Supplemental RFEIS | 1.1 Federal Bureau of Prisons |
| 1.3 Existing Federal Prison Population | Federal inmate population figures have been updated with Fiscal Year 2016 and 2017 data and Fiscal Year 2018 projections | 1.2 Project Background |
| 1.4 Federal Bureau of Prisons Mid-Atlantic Region | Inmate population figures for the Mid-Atlantic Region have been updated with data as of August 8, 2017 | 1.2 Project Background |
| 1.5 Purpose and Need | One sentence about the continuing need for additional high-security facilities within the Mid-Atlantic Region despite recent declines in other than high-security inmate population groups has been added; the rest of the purpose and need statement remains unchanged. | 1.3 Project Purpose and Need |
| 1.6 Proposed Action | Information on site lighting, use of the outdoor firing range, duration of project construction, and design and construction standards has been added or updated; the rest of the Proposed Action description remains unchanged | 2.1 Proposed Action |
| 1.7.1 National Environmental Policy Act | Section has been revised to describe the purpose of a supplemental environmental document | 1.4.1 National Environmental Policy Act |
| 1.7.2 Related Environmental Documents | Section has been removed; it remains unchanged and is incorporated by reference | Not applicable (N/a) |
### Table 1-3. Information from 2016 RFEIS Changed or Incorporated by Reference, by Section

<table>
<thead>
<tr>
<th>2016 RFEIS Section Number and Title</th>
<th>Summary of Changes Made</th>
<th>Location of Updated Information in 2017 Final Supplemental RFEIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7.3 Agency Coordination</td>
<td>Section has been updated to expand upon current and future agency coordination</td>
<td>1.4.3 Agency Coordination</td>
</tr>
<tr>
<td>1.7.4 Public Involvement</td>
<td>Information on public involvement up through 2016 has been summarized and new information about the public involvement process for the 2017 Final Supplemental RFEIS has been added</td>
<td>1.4.4 Public Involvement in this EIS Process</td>
</tr>
<tr>
<td>2.0 – Alternatives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 No Action Alternative</td>
<td>Information remains unchanged</td>
<td>2.2.3.1 No Action Alternative</td>
</tr>
<tr>
<td>2.2 Alternative Locations-Nationwide</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>2.3 Alternatives Development</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>2.2.1 Development of Alternatives within Geographic Area of Interest</td>
</tr>
<tr>
<td>2.4 Alternative 1 – Payne Gap</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>2.2.2.1 Alternative 1 – Payne Gap summarizes this build alternative</td>
</tr>
<tr>
<td>2.5 Alternative 2 – Roxana</td>
<td>The build alternative evaluated in this 2017 Final Supplemental RFEIS has been updated to include the modifications to the site size and facilities layout</td>
<td>2.2.2.2 Alternative 2 – Roxana summarizes this build alternative as initially proposed and discussed in the 2016 RFEIS; 2.2.3.2 Modified Alternative 2 – Roxana describes the Modified Alternative 2 – Roxana evaluated in this 2017 Final Supplemental RFEIS</td>
</tr>
<tr>
<td>2.6 Preferred Alternative</td>
<td>Section has been revised, and defines Modified Alternative 2 – Roxana as the preferred alternative of the 2017 Final Supplemental RFEIS</td>
<td>2.3 Preferred Alternative</td>
</tr>
<tr>
<td>3.0 – Definition of Resource</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Land Use and Zoning</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>3.1 Land Use and Zoning</td>
</tr>
<tr>
<td>3.2 Topography, Geology, and Soils</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>3.2 Topography, Geology, and Soils</td>
</tr>
<tr>
<td>3.3 Socioeconomics and Environmental Justice</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>3.4 Community Facilities and Services</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>3.5 Transportation and Traffic</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>3.6 Air Quality</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>3.3 Air Quality</td>
</tr>
<tr>
<td>3.7 Noise</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>3.4 Noise</td>
</tr>
</tbody>
</table>
### Table 1-3. Information from 2016 RFEIS Changed or Incorporated by Reference, by Section

<table>
<thead>
<tr>
<th>2016 RFEIS Section Number and Title</th>
<th>Summary of Changes Made</th>
<th>Location of Updated Information in 2017 Final Supplemental RFEIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.8 Infrastructure and Utilities</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>3.5 Infrastructure and Utilities</td>
</tr>
<tr>
<td>3.9 Cultural Resources</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>3.6 Cultural Resources</td>
</tr>
<tr>
<td>3.10 Water Resources</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>3.7 Water Resources</td>
</tr>
<tr>
<td>3.11 Biological Resources</td>
<td>Information remains unchanged and has been summarized in the 2017 Final Supplemental RFEIS</td>
<td>3.8 Biological Resources</td>
</tr>
<tr>
<td>3.12 Hazardous Materials and Waste</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>3.13 Cumulative Impact Analysis</td>
<td>Information remains unchanged</td>
<td>6.0 Cumulative Impacts</td>
</tr>
<tr>
<td>3.14 Assessing Significance</td>
<td>Information remains unchanged</td>
<td>3.0 Affected Environment and Environmental Consequences and 6.0 Cumulative Impacts</td>
</tr>
</tbody>
</table>

### 4.0 Alternative 1 – Payne Gap

| 4.1 Land Use and Zoning             | Information remains unchanged and is incorporated by reference | N/a |
| 4.2 Topography, Geology, and Soils  | Information remains unchanged and is incorporated by reference | N/a |
| 4.3 Socioeconomics and Environmental Justice | Information remains unchanged and is incorporated by reference | N/a |
| 4.4 Community Facilities and Services | Information remains unchanged and is incorporated by reference | N/a |
| 4.5 Transportation and Traffic      | Information remains unchanged and is incorporated by reference | N/a |
| 4.6 Air Quality                     | Information remains unchanged and is incorporated by reference | N/a |
| 4.7 Noise                           | Information remains unchanged and is incorporated by reference | N/a |
| 4.8 Infrastructure and Utilities    | Information remains unchanged and is incorporated by reference | N/a |
| 4.9 Cultural Resources              | Information remains unchanged and is incorporated by reference | N/a |
| 4.10 Water Resources                | Information remains unchanged and is incorporated by reference | N/a |
| 4.11 Biological Resources           | Information remains unchanged and is incorporated by reference | N/a |
| 4.12 Hazardous Materials and Waste  | Information remains unchanged and is incorporated by reference | N/a |

### 5.0 Alternative 2 – Roxana

| 5.1 Land Use and Zoning             | Sections have been supplemented with discussion and analysis on potential indirect impacts to adjacent land uses; added three additional minimization measures | 3.1 Land Use and Zoning |

Table 1-3. Information from 2016 RFEIS Changed or Incorporated by Reference, by Section

<table>
<thead>
<tr>
<th>2016 RFEIS Section Number and Title</th>
<th>Summary of Changes Made</th>
<th>Location of Updated Information in 2017 Final Supplemental RFEIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2 Topography, Geology, and Soils</td>
<td>Additional discussion of Roxana site topography and geology has been added; updated excavation and fill quantities incorporated into impact analysis; discussion of impacts to soils classified as farmland of statewide importance has been added; additional detail of surface water and stormwater control plans added under Mitigation</td>
<td>3.2 Topography, Geology, and Soils</td>
</tr>
<tr>
<td>5.3 Socioeconomics and Environmental Justice</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>5.4 Community Facilities and Services</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>5.5 Transportation and Traffic</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>5.6 Air Quality</td>
<td>Discussion and analysis revised to include updated air emissions calculations, which account for changes in earthwork quantities for the modified facilities layout</td>
<td>3.3 Air Quality</td>
</tr>
<tr>
<td>5.7 Noise</td>
<td>Sections have been supplemented with discussion and analysis of airborne construction-related noise (including blasting), vibrations from blasting and pile-driver activities, and peak noise levels from firing range operations; added an additional minimization measure</td>
<td>3.4 Noise</td>
</tr>
<tr>
<td>5.8 Infrastructure and Utilities</td>
<td>Updated the discussion and analysis of potable water, wastewater, and natural gas</td>
<td>3.5 Infrastructure and Utilities</td>
</tr>
<tr>
<td>5.9 Cultural Resources</td>
<td>Sections updated with results of additional archaeological survey</td>
<td>3.6 Cultural Resources</td>
</tr>
<tr>
<td>5.10 Water Resources</td>
<td>Sections 3.7.1.2 and 3.7.2.2, Wetlands, have been updated with the results of supplemental delineation of wetlands and streams</td>
<td>3.7 Water Resources</td>
</tr>
<tr>
<td>5.11 Biological Resources</td>
<td>Sections 3.8.1.3 and 3.8.2.3, Threatened and Endangered Species, have been updated with results of additional bat habitat assessment and Biological Assessment and additional discussion and analysis of state-listed species; impacts to vegetation (Section 3.8.2.1, Vegetation) have been updated for areas to be cleared for construction of the modified site facilities layout; Section 3.8.4, Mitigation, has been updated with measures specified in the U.S. Fish and Wildlife Service (USFWS) Biological Opinion</td>
<td>3.8 Biological Resources</td>
</tr>
</tbody>
</table>
### Table 1-3. Information from 2016 RFEIS Changed or Incorporated by Reference, by Section

<table>
<thead>
<tr>
<th>2016 RFEIS Section Number and Title</th>
<th>Summary of Changes Made</th>
<th>Location of Updated Information in 2017 Final Supplemental RFEIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.12 Hazardous Materials and Waste</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>6.0 Relationship Between Short-Term Use of the Environment and the Maintenance and Enhancement of Long-Term Productivity</td>
<td>Chapter updated for Modified Alternative 2 – Roxana</td>
<td>4.0 Relationship Between Short-Term Use of the Environment and the Maintenance and Enhancement of Long-Term Productivity</td>
</tr>
<tr>
<td>7.0 Irreversible and Irretrievable Commitments of Resources</td>
<td>Chapter updated for Modified Alternative 2 – Roxana</td>
<td>5.0 Irreversible and Irretrievable Commitments of Resources</td>
</tr>
<tr>
<td>8.0 Cumulative Impacts</td>
<td>Entire section has been revised and updated to describe potential cumulative impacts of Modified Alternative 2 – Roxana in conjunction with other actions to the resources described in this 2017 Final Supplemental RFEIS</td>
<td>6.0 Cumulative Impacts</td>
</tr>
<tr>
<td>9.0 References</td>
<td>Contains the references cited in this 2017 Final Supplemental RFEIS</td>
<td>7.0 References</td>
</tr>
<tr>
<td>10.0 List of Preparers</td>
<td>Updated to list those primarily responsible for preparing the 2017 Final Supplemental RFEIS</td>
<td>8.0 List of Preparers</td>
</tr>
<tr>
<td>11.0 Distribution List</td>
<td>The 2016 RFEIS distribution list has been updated to include additional interested parties</td>
<td>9.0 Distribution List</td>
</tr>
<tr>
<td>Appendix A Agency Coordination</td>
<td>National Historic Preservation Act (NHPA) correspondence has been moved to a new appendix (Appendix E); USFWS Endangered Species Act correspondence had been moved to a new appendix (Appendix H)</td>
<td>Appendix E NHPA Correspondence; Appendix H USFWS Endangered Species Act Consultation</td>
</tr>
<tr>
<td>Appendix B Excavation and Grading Calculations</td>
<td>Information remains unchanged and is incorporated by reference as background information for the updated excavation and grading calculations included in 3.2 Topography, Geology, and Soils and Appendix A Additional Geotechnical Study in the 2017 Final Supplemental RFEIS</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix C Air Emissions Calculations</td>
<td>Contains the updated air emissions calculations for the Modified Alternative 2 – Roxana and the proposed wastewater treatment plant in Roxana</td>
<td>Appendix C Air Emissions Calculations</td>
</tr>
<tr>
<td>Appendix D Enhanced Utility Report</td>
<td>Information remains unchanged; final report included in an appendix to the 2017 Final Supplemental RFEIS for background information related to Section 3.5 Infrastructure and Utilities</td>
<td>Appendix D Enhanced Utility Report</td>
</tr>
<tr>
<td>Appendix E-1 Responses to Comments on Draft EIS</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
</tbody>
</table>
Table 1-3. Information from 2016 RFEIS Changed or Incorporated by Reference, by Section

<table>
<thead>
<tr>
<th>2016 RFEIS Section Number and Title</th>
<th>Summary of Changes Made</th>
<th>Location of Updated Information in 2017 Final Supplemental RFEIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix E-2 Comments on Final EIS</td>
<td>Information remains unchanged and is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix F Traffic Impact Study</td>
<td>Information remains unchanged and report is incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix G Environmental Site Assessments</td>
<td>Information remains unchanged and reports are incorporated by reference</td>
<td>N/a</td>
</tr>
<tr>
<td>Appendix H Investigation of Rock Rubble Material, Roxana Site</td>
<td>Information remains unchanged; final report included in an appendix to the 2017 Final Supplemental RFEIS for background information related to Sections 3.7.1.1 and 3.7.2.1, Surface Water</td>
<td>Appendix F Investigation of Rock Rubble Material, Roxana Site</td>
</tr>
</tbody>
</table>

1.4.3 Agency Coordination

In addition to NEPA, other laws, regulations, permits and licenses may be applicable to the proposed action. During the development of this 2017 Final Supplemental RFEIS, the Bureau conducted the following interagency coordination:

- Formal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding the occurrence of threatened and endangered species in compliance with section 7 of the Endangered Species Act (ESA)
- Coordination with the U.S. Army Corps of Engineers (USACE) regarding the presence/absence of waters of the U.S., which are protected under Section 404 of the Clean Water Act (CWA)
- Consultation with the Kentucky Heritage Council regarding cultural resource findings of effect in compliance with Section 106 of the National Historic Preservation Act (NHPA)

If the Bureau decides to implement the proposed action, acquisition of other permits and compliance under other regulations may also be required prior to construction, including, but not limited to, the following:

- Air quality permit issued by the Kentucky Department for Environmental Protection (KDEP) for air emission sources in compliance with 401 Kentucky Administrative Regulations (KAR) 52:040
- CWA Section 404 permit issued by the USACE for the filling of wetlands
- Section 401 Water Quality Certification issued by KDEP for the USACE Section 404 permit (CWA)
- Kentucky Pollutant Discharge Elimination System permit issued by KDEP to manage stormwater runoff during construction to minimize water pollutant discharges (CWA)
- Development and implementation of a Groundwater Protection Plan in compliance with 401 KAR 5:037

1.4.4 Public Involvement in this EIS Process

The Bureau has provided several opportunities for the public to provide input about the proposed project and submit formal public comments throughout the EIS process. Table 1-4 summarizes these opportunities.
Table 1-4. Summary of EIS Public Involvement, 2013–2016

<table>
<thead>
<tr>
<th>EIS Phase</th>
<th>Formal Comment Period</th>
<th>Number of Comments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoping</td>
<td>30-day scoping period: July 26–August 26, 2013</td>
<td>• 320 individual comments</td>
<td>Scoping meeting was held in Whitesburg on August 13, 2013; 453 people attended. Comments were received from individuals, businesses, and organizations. Local officials and representatives of state and federal agencies participated in a scoping field view with the Bureau on August 13, 2013.</td>
</tr>
<tr>
<td>Draft EIS</td>
<td>45-day public comment period: February 13–March 30, 2015</td>
<td>• 1,169 individual comments, 3 petitions in support of the project (1,001 signatures), 1 petition in support of the project at the Roxana site (155 signatures)</td>
<td>Public meeting was held in Whitesburg on March 15, 2015; 350 people attended. Comment letters, forms, and emails were received from individuals, elected officials, federal and state agencies, businesses, and organizations.</td>
</tr>
<tr>
<td>Final EIS</td>
<td>30-day review period: July 31–August 31, 2015</td>
<td>• 16 individual comments, 1 online petition in opposition to the project (625 signatures)</td>
<td>Comment letters and emails were received from individuals, federal and state agencies, and organizations.</td>
</tr>
<tr>
<td>Revised Final EIS</td>
<td>30-day review period: April 1–May 2, 2016</td>
<td>• 1,078 individual comments, 2 online petitions in opposition to the project (1,007 signatures)</td>
<td>Comment letters and emails were received from individuals, organizations, a federal agency, and an educational institution.</td>
</tr>
</tbody>
</table>

The Bureau published its Notice of Intent to prepare a Supplemental RFEIS in the Federal Register on November 18, 2016. The notice was also published in the Lexington Herald-Leader on November 18, 2016, and the Mountain Eagle on November 23, 2016. There was no formal scoping meeting held for this 2017 Final Supplemental RFEIS; however, the Bureau has considered any comments received in the environmental impacts analysis of this 2017 Final Supplemental RFEIS, including comments received during the 30-day review period on the March 2016 RFEIS. Appendix I, Comments on 2016 Revised Final EIS includes all comments received on the March 2016 RFEIS during the 30-day review period.

The Notice of Availability of the Draft Supplemental RFEIS was published in the Federal Register on March 24, 2017. A separate Notice of Public Meeting was also published in the Federal Register on March 24, 2017. The Notice of Public Meeting provided the date, time, and location of the public meeting to be held on April 12, 2017. A notice of availability and notice of public meeting for the Draft Supplemental RFEIS was also published in the Mountain Eagle on March 22, 2017 and the Lexington Herald-Leader on March 24, 2017. The Bureau also sent postcard and email notices to organizations and individuals who had submitted comments on the March 2016 RFEIS. The notices announced that the Draft Supplemental RFEIS would be available for a 45-day public comment period between March 24 and May 8, 2017. The notices identified the local libraries where hard copies of the document could be reviewed, as well as a project website, www.fbopletchercountyeis.com, where an electronic version of the document could be reviewed. The Bureau also sent hard copies and CDs containing the Draft Supplemental RFEIS to federal, state, and
local elected officials and regulatory agencies, other interested parties, and individuals who had requested a copy at any previous time during the EIS review process.

The public meeting was held on April 12, 2017, between 5:30 p.m. and 8:00 p.m. at the Letcher County Central High School in Whitesburg. The meeting was conducted in an open house format and Bureau representatives were in attendance to answer questions and discuss the project with the attendees. Approximately 185 members of the public attended the public meeting. Attendees were able to provide written comments or give oral comments to a stenographer during the meeting. Attendees were also provided information for mailing their comments to the Bureau. Comments received during the public comment period included 123 written comments and two oral comments given at the public meeting; 6,986 comments submitted via mail or email; and one petition with 28 signatures. Of the comments in which an opinion on the project was provided, 444 comments plus the petition with 28 signatures were in support of the project and 6,650 comments were in opposition of the project. All comments on the Draft Supplemental RFEIS, and the Bureau’s responses to those comments, are included in Appendix J. There is also a 30-day public review period following release of this Final Supplemental RFEIS and before the Record of Decision is issued on behalf of the Bureau by its Director or Acting Director.
2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The proposed action is the acquisition of property and the construction and operation of a federal correctional facility in Letcher County, Kentucky. The Bureau proposes to acquire up to 324 hectares (800 acres) to construct a USP (approximately 61,654 square meters [663,638 square feet]) and FPC (approximately 6,063 square meters [65,262 square feet]) in Letcher County. Inmates housed in the USP would be high-security male inmates and those housed in the FPC would be minimum-security male inmates. The proposed USP and FPC would house approximately 1,216 total inmates (approximately 960 within the USP and approximately 256 within the FPC). Operation of the USP and FPC would require approximately 300 full-time staff.

In addition to the USP and FPC, several ancillary facilities necessary for the operation of the USP and FPC would be constructed. The ancillary facilities would include the following:

- Central Utility Plant (1,217 square meters [13,100 square feet])
- Outdoor Firing Range (96 square meters [1,033 square feet])
- Outside Warehouse (3,279 square meters [35,295 square feet])
- Staff Training Building (910 square meters [9,795 square feet])
- Garage/Landscape Building (653 square meters [7,028 square feet])
- Access Road and Parking

The Bureau has standard design layouts for its correctional facilities. The standard features incorporated into the design of the federal correctional facility in Letcher County include: a single road for controlled access, a parking lot located near the public entrance of both the USP and the FPC for use by employees and visitors, one- to four-story structures, multipurpose activity spaces, and buffer areas around the facility to provide visual and physical setbacks from the site boundaries.

The outdoor firing range would be used by Bureau staff on an annual and monthly basis. Annual small arms training for employees, along with annual qualification/recertification for firearms instructors, would last approximately six weeks per year during the months of March and April. During the annual training, the outdoor firing range would be used Monday–Friday. Each day of annual training would consist of approximately 2–4 hours of firing and 4–6 hours of classroom instruction. Monthly firearms training for special operations response teams would last 8 hours for 1 day per month. All firing would occur during daylight hours.

A non-lethal/lethal fence and lighting would also be installed. The non-lethal/lethal fence would be placed around the perimeter of the USP between two parallel, chain link and razor wire fences. The fence would be approximately 3.7 meters (12 feet) high. The site lighting would consist of 30 meter (100 foot) high mast lighting poles placed along the security perimeter road around the correctional facility, in the parking lot, and around the buildings. An estimated 15 to 25 high mast lights would be around the USP, and 1 to 2 high mast lights at the FPC. The contracted designer-builder would determine the precise number of high mast lights during the design process. The high mast lights would have full cutoff fixtures with a combination of high pressure sodium and metal halide lights or light-emitting diode (LED) lights to provide a minimum of 1.5 footcandles of illumination as required under the Bureau’s Technical Design Guidelines. Other exterior
lighting, including wall packs and parking lot and sidewalk light poles, would also have full cutoff fixtures. The number and mix of light sources used to illuminate the secure compound are selected for the ability to relight the facility quickly in the event of a power outage.

The initial step for project development would be property acquisition. Property acquisition would involve acquisition of both surface and mineral rights from multiple owners, and would be estimated to take several months to a year or longer. Project construction would begin after property acquisition is completed, and would take four to five years.


### 2.2 Alternatives Development

CEQ’s guidelines for implementing the procedural provisions of NEPA establish a number of policies for federal agencies, including “…using the NEPA process to identify and assess reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions on the quality of the human environment” (40 CFR 1500.2[e]). The guidelines also require an exploration and objective evaluation of all reasonable alternatives (40 CFR 1502.14[a]), including those not within the jurisdiction of the lead agency (40 CFR 1502.14[c]). Reasonable alternatives must meet the stated purpose of and need for the proposed action and must be feasible.

The Bureau conducted an analysis of alternatives for implementing the proposed action in accordance with these guidelines. Several alternative sites for the proposed federal correctional facility were evaluated for their potential to meet the project purpose and need, and then screened using a set of criteria established by the Bureau (Table 2-1). The following sections summarize the alternatives that were evaluated and the resulting proposed action alternative carried forward for analysis in this 2017 Final Supplemental RFEIS. A detailed discussion of the alternatives development process is included in Sections 2.2 and 2.3 of the March 2016 RFEIS.
Table 2-1. General Criteria Used by the Bureau for Screening Potential Development Sites

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>The site should have sufficient land area (121 to 142 hectares minimum [300 to 350 acres]) to accommodate the institution and ancillary facilities, provide a buffer zone between the facility and neighboring properties, and allow for future expansion</td>
</tr>
<tr>
<td>Topography</td>
<td>The potential site should be relatively flat (less than 10 percent grade) to provide for minimal site preparation and proper drainage (this can be affected by geographic regions with mountainous terrain)</td>
</tr>
<tr>
<td>Environmental Compatibility</td>
<td>Sites should avoid significant environmental resources (i.e., floodplains, wetlands, threatened and endangered species, cultural and historic resources, etc.)</td>
</tr>
<tr>
<td>Land Use Compatibility</td>
<td>Sites should avoid potential incompatible land use conflicts</td>
</tr>
<tr>
<td>Infrastructure and Community Services</td>
<td>Emergency services, including police and fire protection, and utilities should be able to provide services to the prospective sites</td>
</tr>
<tr>
<td>Transportation</td>
<td>Site should be served by well-maintained state and county roadways to ensure safe commutes for employees, service vehicles, and visitors</td>
</tr>
<tr>
<td>Local Support</td>
<td>Support of key elected officials, community leaders, the public and owners of the sites</td>
</tr>
</tbody>
</table>

2.2.1 Development of Alternatives within the Geographic Area of Interest

The Bureau has a priority need for additional facilities within the Mid-Atlantic Region. No reasonable alternatives (land or existing facilities) outside of the jurisdiction of the Bureau were identified within the Mid-Atlantic Region. In addition, no other lands/facilities in the Mid-Atlantic Region within the jurisdiction of the Bureau have sufficient space to accommodate the development of the proposed facilities.

The Bureau was contacted by the Letcher County Planning Commission with an offer of potential sites for a new USP and FPC in Letcher County, Kentucky. Understanding the needs of the Bureau, the Letcher County Planning Commission identified potential locations for development and brought these sites to the attention of the Bureau to determine if the Bureau had an interest in developing a new facility at one of the locations. The opportunity to provide additional bed space in Letcher County would meet the need for additional capacity within the Mid-Atlantic Region, afford the Bureau continued management of inmates originating from the region, and allow those inmates to remain close to family and friends.

The process to identify potential sites for constructing a USP and FPC in Letcher County began in 2008 with a site reconnaissance study of four sites that had been offered to the Bureau by members of the community. The purpose of the site reconnaissance study was to collect preliminary data on the sites and determine their suitability for development based on site conditions, infrastructure and utilities, and environmental resources. The four sites included: Meadow Branch, Payne Gap, Roxana, and Van/Fields. Based on the 2008 study, a second study was conducted in 2010 to rank these sites and verify that the issues originally identified in 2008 had not changed. Based on the data collected from both the 2008 and 2010 studies, it was determined that these four sites should be studied in more detail in a feasibility study to identify if there would be constraints associated with the development of the sites.

In 2012, the Bureau completed a feasibility study that assessed cultural resources, wetlands, geologic conditions, and utilities. The feasibility study also included the production of aerial and topographic mapping, and a boundary survey. The feasibility study evaluated the benefits, challenges, and potential risks associated with development of each site. During the initial phases of the feasibility study, the Meadow Branch site was removed from further consideration due to changes with the offeror that removed the site from consideration by the Bureau; therefore, no detailed analysis of the site was included in the feasibility study.
study. During the feasibility study for the remaining three sites, wetlands were identified and delineated, archaeological and historic structures surveys were completed, and geotechnical studies were conducted. The feasibility study highlighted potential concerns with development of the sites, as well as estimated costs of infrastructure improvement and site preparation (excavation and/or fill and grading activities) on each site. The feasibility study determined that there were no constraints that would prevent development of the three sites (TEC, Inc. 2012). During the finalization of the feasibility study there were changes with the offeror of the Van/Fields site, and this site was removed from further consideration. The remaining two sites, Payne Gap and Roxana, were identified as alternatives to be carried forward for study in an EIS.

2.2.2 Alternatives Evaluated in the 2016 RFEIS

The 2016 RFEIS evaluated the No Action Alternative and two build alternative sites: Alternative 1 – Payne Gap and Alternative 2 – Roxana (Figure 2-1). Both build alternatives are summarized below. The 2016 RFEIS identified Alternative 2 – Roxana as the preferred alternative because it best meets the project needs and would have fewer impacts to the human environment (refer to Table ES-1 and Section 2.6 in the 2016 RFEIS for a summary of impacts of the two build alternatives). Therefore, Alternative 1 – Payne Gap is eliminated from further evaluation in this 2017 Final Supplemental RFEIS. Consistent with CEQ regulations, a full discussion and evaluation of Alternative 1 – Payne Gap is not repeated in this document, but is contained in the 2016 RFEIS (Section 2.4 and Chapter 4.0), which is incorporated herein by reference.

2.2.2.1 Alternative 1 – Payne Gap

Under Alternative 1, the Bureau would have acquired approximately 305 hectares (753 acres) of land located in eastern Letcher County at Payne Gap, along the Kentucky and Virginia border (Figure 2-1). Located approximately 7 miles northeast of Whitesburg, the proposed site is situated on a gently sloped to steeply sloped upland land form above the Kentucky River at its confluence with the Laurel Fork. The site is largely covered with secondary growth forests. The original topography of portions of the site has been altered by past surface and deep mining and associated mining activities such as spoil piles, roads, and fill piles. In contrast to the preferred Roxana site where only surface mining has been confirmed to have occurred, mining permit applications indicate a combination of surface and underground mining operations occurred within the proposed Payne Gap project site between 1950 and 1990. No active mining is occurring on-site.

The Bureau proposed developing the north half of the Payne Gap site with the USP, FPC, and ancillary buildings, and accessing the site from U.S. Route 119 (Figure 2-2). The site would have required forest clearing and clearing mined area and extensive excavation and fill material to level and prepare the site for construction (Table 2-2). All excavated materials that would have included soil, rock, and mine spoil would have been used for on-site structural fill or placed as spoil fill. The excavated materials would have been compacted to create structural fill for the building pads or filled into the valleys adjacent to the northwest, west, and southeast of the proposed USP location. Due to the steep terrain, large amounts of material would have been moved and placed as spoil fill in order to prepare a level site for construction.
Table 2-2. Estimated Earthwork Quantities for Alternative 1 – Payne Gap

<table>
<thead>
<tr>
<th>Construction Activity</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spoil Excavation</td>
<td>2,794,660 yd$^3$</td>
</tr>
<tr>
<td>Rock Excavation</td>
<td>8,117,470 yd$^3$</td>
</tr>
<tr>
<td>Structural Fill</td>
<td>1,716,095 yd$^3$</td>
</tr>
<tr>
<td>Spoil Fill</td>
<td>12,106,917 yd$^3$</td>
</tr>
<tr>
<td>Clear Mined Area</td>
<td>3 hectares (7 acres)</td>
</tr>
<tr>
<td>Clear Forest Area</td>
<td>85 hectares (211 acres)</td>
</tr>
</tbody>
</table>

Note: yd$^3$ = cubic yards.

2.2.2.2 Alternative 2 – Roxana

Under Alternative 2, as initially proposed and discussed in the 2016 RFEIS, the Bureau would have acquired approximately 283 hectares (700 acres) of land at Roxana, an unincorporated community located 7.5 miles west of Whitesburg (Figure 2-1). The proposed site is forested except for a large open area near the center of the site created from past surface mining activities. Mining permit applications indicate the site was surface mined in the late 1980s to early 1990s. No active mining is occurring on-site.

The Bureau proposed constructing the FPC in the north portion of the Roxana site and the USP and ancillary buildings in the central portion of the site (Figure 2-3). The proposed facilities layout included an access road extending along the east side of the facilities from KY 588. Preparation of the site for construction would have required forest clearing and clearing mined area as well as rock excavation so that excavated materials would have included soil, mine spoil, and rock (Table 2-3). Due to space limitations at the site and to closely balance the cut and fill, all excavated materials would have been used on site to create structural fill for the building pads or transported to the valleys adjacent to the northwest and southwest of the proposed USP location and compacted as structural fill.

Table 2-3. Estimated Earthwork Quantities for Alternative 2 – Roxana

<table>
<thead>
<tr>
<th>Construction Activity</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spoil Excavation</td>
<td>9,204,340 yd$^3$</td>
</tr>
<tr>
<td>Rock Excavation</td>
<td>953,246 yd$^3$</td>
</tr>
<tr>
<td>Structural Fill</td>
<td>9,402,582 yd$^3$</td>
</tr>
<tr>
<td>Spoil Fill</td>
<td>0</td>
</tr>
<tr>
<td>Clear Mined Area</td>
<td>33 hectares (81 acres)</td>
</tr>
<tr>
<td>Clear Forest Area</td>
<td>44 hectares (110 acres)</td>
</tr>
</tbody>
</table>

Note: yd$^3$ = cubic yards.
Figure 2-1. Build Alternatives Evaluated in 2016 RFEIS
2.0 Proposed Action and Alternatives

Figure 2-2. Conceptual Layout for Alternative 1 – Payne Gap, 2016 RFEIS
Figure 2-3. Conceptual Layout for Alternative 2 – Roxana, 2016 RFEIS
2.2.3 Alternatives Evaluated in this Supplemental RFEIS

The alternatives evaluated in this 2017 Final Supplemental RFEIS include the No Action Alternative and Modified Alternative 2 – Roxana. Under Modified Alternative 2 – Roxana evaluated in this 2017 Final Supplemental RFEIS, the Bureau removed from acquisition consideration two parcels of land that were part of the proposed Roxana site evaluated in the 2016 RFEIS, and as a consequence, made changes to the layout of the proposed new correctional facilities. Modified Alternative 2 – Roxana is the preferred alternative of this 2017 Final Supplemental RFEIS.

2.2.3.1 No Action Alternative

The option of the Bureau taking no action to develop the proposed USP and FPC in Letcher County or other locations is considered in the 2017 Final Supplemental RFEIS. Under the No Action Alternative, the Bureau would not acquire property or construct and operate a new USP or FPC. The No Action Alternative would not fulfill the project purpose and need to provide additional high-security facilities within the Mid-Atlantic Region to reduce the demonstrated overcrowding. Existing USPs in this region would remain overcrowded and prevent the Bureau from meeting its mission. The No Action Alternative would avoid potential impacts associated with the development of a USP and FPC. The No Action Alternative does not meet the project purpose and need and therefore, is not considered a viable alternative. The No Action Alternative is discussed in this 2017 Final Supplemental RFEIS because it serves as a baseline against which to compare the current and future environmental conditions with or without the development of the USP and FPC.

2.2.3.2 Modified Alternative 2 – Roxana

The major differences of the Modified Alternative 2 – Roxana evaluated in this 2017 Final Supplemental RFEIS as compared with the Alternative 2 – Roxana evaluated in the 2016 RFEIS include the site size, the locations of the FPC and access road, and the amounts of excavation and fill required for construction. Under Modified Alternative 2 – Roxana, the Bureau would acquire approximately 231 hectares (570 acres) of land at Roxana (Figure 2-4). The size of the proposed Roxana site was reduced by approximately 53 hectares (130 acres) because one property was not available for sale and the Bureau determined another property was not required for the project. The Bureau conducted a number of detailed studies at the Roxana site and determined this smaller site size would still be a viable alternative for constructing and operating a USP, FPC, and ancillary facilities as described in Section 2.1, Proposed Action. In the modified facilities layout under this alternative compared with the 2016 alternative, the FPC would be situated closer to the USP and the access road would extend from KY 588 along the west side of the FPC rather than the east side (Figure 2-5).

Preparation of the site for construction would require forest clearing and clearing mined area, and extensive excavation of lesser amounts of rock, including some mine spoil (Table 2-4). All excavated mine spoil and rock would be used on-site for structural fill. The excavated soil and rock would be compacted to create a structural fill for the building foundations or transported to the valleys adjacent to the northwest of the proposed FPC location and southwest of the proposed USP location and compacted as structural fill. The modified site layout would necessitate approximately 5 more hectares (11 acres) of forest to be cleared compared with the 2016 alternative; however, the amount of excavation and structural fill to prepare the site for construction would be reduced (Table 2-4).
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spoil Excavation</td>
<td>8,612,966 yd³</td>
<td>9,204,340 yd³</td>
</tr>
<tr>
<td>Rock Excavation</td>
<td>729,716 yd³</td>
<td>953,246 yd³</td>
</tr>
<tr>
<td>Structural Fill</td>
<td>8,742,310 yd³</td>
<td>9,402,582 yd³</td>
</tr>
<tr>
<td>Clear Mined Area</td>
<td>24 hectares (60 acres)</td>
<td>33 hectares (81 acres)</td>
</tr>
<tr>
<td>Clear Forest Area</td>
<td>49 hectares (121 acres)</td>
<td>44 hectares (110 acres)</td>
</tr>
</tbody>
</table>

*Note:* yd³ = cubic yards.
Figure 2-4. Boundary of Reduced Site for Modified Alternative 2 – Roxana
Figure 2-5. Conceptual Layout of Modified Alternative 2 – Roxana
2.3 PREFERRED ALTERNATIVE

Modified Alternative 2 – Roxana is the preferred alternative because it best meets the purpose of the proposed action by providing an additional high-security penitentiary and an associated prison camp to increase capacity for current inmate populations in the Mid-Atlantic Region. Modified Alternative 2 – Roxana satisfies the continuing need for additional high-security facilities within this region, despite recent declines in other than high-security inmate population groups, to reduce the demonstrated overcrowding that compromises the mission of the Bureau.

In addition, Modified Alternative 2 – Roxana is the preferred alternative because it would have, on balance, fewer impacts to the human environment as compared with Alternative 1 – Payne Gap evaluated in the 2016 RFEIS. Although both build alternatives would have direct adverse impacts to topography, geology, and soils, much greater site preparation work would be required at the Payne Gap site. Except for the potential impact to the natural gas infrastructure, Modified Alternative 2 – Roxana would have less than significant impacts to infrastructure and utilities, while Alternative 1 – Payne Gap would have significant impacts to potable water capacity, wastewater treatment capacity, and natural gas infrastructure. Under Modified Alternative 2 – Roxana, impacts to streams and forest would be less than those under Alternative 1 – Payne Gap. Development of the proposed action at the Payne Gap site would impact approximately 40 more hectares (100 more acres) of summer habitat of federally listed bat species when compared with the Roxana site. Table 2-5 provides a comparison of these and other potential environmental effects from the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana.
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### Table 2-5. Summary of Environmental Consequences with Implementation of the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Land Use and Zoning</td>
<td>• No compatibility issues; therefore, no impact on land use</td>
<td>• No significant impact</td>
<td>• No significant impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Changes in land use from forested/reclaimed mining to government institution not incompatible from regulatory perspective</td>
<td>• Changes in land use from forested/reclaimed mining/residential to government institution not incompatible from regulatory perspective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compatibility issues with adjacent properties minimized by forested buffer that would separate USP/FPC facilities from adjacent land uses</td>
<td>• Compatibility issues with adjacent properties minimized by forested buffer that would separate USP/FPC facilities from adjacent land uses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compatibility issues with adjacent properties minimized by forested buffer that would separate USP/FPC facilities from adjacent land uses</td>
<td>• A 125-foot buffer maintained between FPC construction and Whitaker property</td>
</tr>
<tr>
<td>Topography, Geology, and Soils</td>
<td>• No impact to topography, geology, or soils</td>
<td>• Significant impact</td>
<td>• Significant impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Direct topographical changes from cut (10.9 million cubic yards) and fill (13.8 million cubic yards) and grading</td>
<td>• Direct topographical changes from cut (9.3 million cubic yards) and fill (8.7 million cubic yards) and grading</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Direct impact to geology from blasting and excavation of bedrock</td>
<td>• Direct impact to geology from blasting and excavation of bedrock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Soil disturbance of approximately 88 hectares (218 acres)</td>
<td>• Soil disturbance of approximately 73 hectares (181 acres)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No impact to prime farmland soils</td>
<td>• Impact to 5 hectares (12.3 acres) of soils classified as farmland of statewide importance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• No significant impact to prime farmland soils</td>
</tr>
</tbody>
</table>

2.0 Proposed Action and Alternatives
September 2017

2-15
### Table 2-5. Summary of Environmental Consequences with Implementation of the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana

|--------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Socioeconomics and Environmental Justice | - No impact; no beneficial socioeconomic impacts                                         | - No significant impact  
- Minor offset in projected 2020 population decrease  
- Minor beneficial employment and income impacts  
- No disproportionately high or adverse human health or environmental effects on minority populations and low-income populations  
- No environmental health risks or safety risks that may disproportionately affect children | - No significant impact  
- Minor offset in projected 2020 population decrease  
- Minor beneficial employment and income impacts  
- No disproportionately high or adverse human health or environmental effects on minority populations and low-income populations  
- No environmental health risks or safety risks that may disproportionately affect children |
| Community Facilities and Services    | - No impact; no increase in demand on community facilities and services from operation of a new facility | - No significant impact  
- No significant impacts to state and local law enforcement agencies, fire and emergency services, health care services, or to school services | - No significant impact  
- No significant impacts to state and local law enforcement agencies, fire and emergency services, health care services, or school services |
| Transportation and Traffic           | - No increases in traffic from construction and operation of a new facility; therefore, no impact to transportation and traffic | - No significant impact  
- No significant impacts to traffic associated with construction activities  
- Less than significant impacts to level of service of U.S. Route 119 are anticipated from traffic associated with operations of the facility  
- No significant impacts to roadways  
- Minor roadway improvement (addition of left turn lane on U.S. Route 119) would be implemented | - Less than significant impact with planned mitigation measures  
- No significant impacts to traffic associated with construction activities  
- No significant impacts to level of service of KY 588 are anticipated from traffic associated with operations of the facility  
- Significant impacts to roadways from truck traffic  
- Planned improvements to roadway infrastructure reduce impacts to less than significant |
Table 2-5. Summary of Environmental Consequences with Implementation of the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana

|-----------------|-----------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|
| Air Quality     | • No increases in air emissions; therefore, no impact to air quality | • No significant impact  
• Temporary increases in air emissions during construction below significance threshold for criteria pollutants  
• Annual air emissions from facility operation and staff vehicle commuting below significance threshold for criteria pollutants  
• No direct or indirect significant impacts on the local/regional air quality | • No significant impact  
• Temporary increases in air emissions during construction below significance threshold for criteria pollutants  
• Annual air emissions from facility operation and staff vehicle commuting below significance threshold for criteria pollutants  
• No direct or indirect significant impacts on the local/regional air quality |
| Noise           | • No construction or operation of a new facility; therefore, no impact from increases in noise | • No significant impact  
• Temporary construction noise  
• No significant impacts to ambient noise levels are anticipated from operations of the facility | • No significant impact  
• Temporary construction noise  
• No significant impacts to ambient noise levels are anticipated from operations of the facility |
| Infrastructure and Utilities | • No impact; no increase in demand on infrastructure and utilities from construction and operation of a new facility | • Significant impact  
• Demand for natural gas, electricity, telecommunication would not exceed existing capacities  
• Increase in solid waste met by adequate capacity at Laurel Ridge Landfill  
• Significant impact to potable water capacity and wastewater treatment capacity  
• Significant impact to natural gas infrastructure  
• Direct impact to natural gas owner from closure of gas well and relocation of gas pipeline  
• Cumulative impacts to wastewater treatment capacity | • No significant impact  
• Demand for water, natural gas, electricity, and telecommunication would not exceed existing capacities  
• Increase in solid waste met by adequate capacity at Laurel Ridge Landfill  
• Direct impact to natural gas owners and lessors from closure of gas wells and compressor station and abandonment and/or relocation of gas pipelines  
• Cumulative impacts to wastewater infrastructure |
### Table 2-5. Summary of Environmental Consequences with Implementation of the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana

|--------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Cultural Resources | • No construction or operation of a new facility; therefore, no impact to cultural resources | • No significant impact  
• No adverse effect on cultural resources listed or eligible for listing on the National Register of Historic Places | • No significant impact  
• No adverse effect on cultural resources listed or eligible for listing on the National Register of Historic Places |
| Water Resources    | • No construction or operation of a new facility; therefore, no impact to water resources | • Less than significant impact with planned mitigation measures  
• 0.97 hectare (2.40 acres) of wetland impacts  
• 3,204 meters (10,512 linear feet) of stream impacts  
• Permitting and mitigation reduce wetland and stream impacts to less than significant  
• No significant impacts to surface water quality or groundwater  
• No impact to floodplains | • Less than significant impact with planned mitigation measures  
• 0.98 hectare (2.44 acres) of wetland impacts  
• 1,710 meters (5,610 linear feet) of stream impacts  
• Permitting and mitigation reduce wetland and stream impacts to less than significant  
• No significant impacts to surface water quality or groundwater  
• No impact to floodplains |
## Table 2-5. Summary of Environmental Consequences with Implementation of the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana

|---------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Biological Resources | • No construction or operation of a new facility; therefore, no impact to biological resources. | • No significant impact  
• 88 hectares (218 acres) of forest clearing  
• No significant impact to wildlife habitat  
• No significant impact to avian and small mammal species from non-lethal/lethal fence  
• No significant impacts Indiana and northern long-eared bat summer habitat and potential winter hibernacula considered suitable for use by Indiana, northern long-eared, or gray bat  
• Additional studies of summer and winter bat habitat and a Biological Assessment would be required to further assess potential impacts to federally listed species and potential mitigation | • No significant impact  
• 49 hectares (121 acres) of forest clearing  
• No significant impact to wildlife habitat.  
• No significant impact to avian and small mammal species from non-lethal/lethal fence  
• No significant impacts to Indiana and northern long-eared bat summer habitat and winter hibernaculum considered suitable for use by Indiana, northern long-eared, or gray bat  
• No significant impacts to state or federally listed species  
• Under ESA, may affect, likely to adversely affect northern long-eared and Indiana bats; not likely to adversely affect gray bats  
• USFWS section 7 ESA consultation is complete and the Biological Opinion (BO) is included in this Final Supplemental RFEIS (Appendix H); reasonable and prudent measures specified in the USFWS BO would lessen adverse effects to the federally listed northern long-eared and Indiana bats |
### Table 2-5. Summary of Environmental Consequences with Implementation of the No Action Alternative, Alternative 1 – Payne Gap, and Modified Alternative 2 – Roxana

|------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Hazardous Materials and Waste | - No construction or operation of a new facility; therefore, no impact to human health and safety or the environment from hazardous materials and waste | - No significant impact  
- Procedures would be in place for safe transport, handling, use, and disposal of hazardous substances and waste during construction and operations  
- No significant impact to the environment from firing range operations; Bureau Technical Design Guidelines require incorporating structures to catch lead particles, and a stormwater system to prevent contamination outside of the range itself  
- Facilities intended for human occupancy would be designed to prevent occupant exposures to radon above the USEPA action level | - No significant impact  
- Procedures would be in place for safe transport, handling, use, and disposal of hazardous substances and waste during construction and operations  
- Removal and disposal of contaminated soils in three identified locations on the site would be conducted in accordance with all applicable federal and state standards  
- No significant impact to the environment from firing range operations; Bureau Technical Design Guidelines require incorporating structures to catch lead particles, and a stormwater system to prevent contamination outside of the range itself  
- Facilities intended for human occupancy would be designed to prevent occupant exposures to radon above the USEPA action level |
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Chapter 3 presents the affected environment and the environmental consequences of the Bureau’s proposed action to acquire land and develop a USP and satellite FPC and ancillary facilities in Letcher County, Kentucky. The affected environment sections describe currently existing conditions of potentially affected resources and provide additional information relevant to understanding potential effects from the Modified Alternative 2 – Roxana. The environmental consequences analysis evaluates the potential direct and indirect effects on each resource area for Modified Alternative 2 – Roxana and the No Action Alternative. Cumulative impacts are analyzed in Chapter 6. The impact analysis is based on and incorporates the analyses presented in the 2016 RFEIS. However, the analyses have been updated to account for any environmental changes brought about by the proposed changes to the site size and facilities layout under Modified Alternative 2 – Roxana.

After the environmental consequences section for each affected resource is a description of mitigation measures the Bureau would implement to reduce or minimize the potential environmental consequences of construction and operation of the USP and FPC. If the Bureau decides to implement Modified Alternative 2 – Roxana, then these mitigation measures would also be discussed in the Record of Decision.

3.1 LAND USE AND ZONING

Land use often refers to human modification of land for residential or economic purposes. Examples of some typical categories of land use include agriculture (includes livestock production), forest, residential, commercial, industrial, transportation, utilities, mining, and recreation. Land uses are frequently regulated by management plans, land use policies or plans, comprehensive plans, and local zoning and ordinances. These plans and regulations assist in identifying where future development can occur so it is compatible with surrounding land uses and allows for the protection of specially designated or environmentally sensitive uses.

Potential impacts to land use are assessed by comparing the existing land uses with the changes that would occur from implementation of the proposed action, including induced effects. Impacts to land use are evaluated for significance by determining the degree to which proposed development and uses conflict with existing land use and local plans and policies. Under the proposed action, potential temporary and long-term impacts to land use would occur from construction and operation of the USP and FPC.

3.1.1 Affected Environment

Land use associated with the proposed Modified Alternative 2 – Roxana primarily consists of forest and reclaimed land from previous surface mining. Other on-site land uses include an agricultural field, a residential area, oil and gas wells, a bluegrass music pavilion, and a small model airplane airstrip. Land use surrounding the site is also primarily forested, with approximately 10 adjacent residential properties. There are also several state parks, nature preserves, and a national natural landmark within the vicinity of the Roxana site. They include Lilley Cornett Woods (2.1 kilometers [1.3 miles] from site), Bad Branch State Nature Preserve (13.1 kilometers [8.1 miles] from site), Kingdom Come State Park (10.1 kilometers [6.3 miles] from site), and Hensley-Pine Mountain Wildlife Management Area (7.9 kilometers [4.9 miles] from site).
Closest to the Roxana site is Lilley Cornett Woods, one of six National Natural Landmark sites located within Kentucky (U.S. Department of the Interior 2016). Owned by the Commonwealth of Kentucky and managed by Eastern Kentucky University, Lilley Cornett Woods serves as an ecological research station. Eastern Kentucky University describes Lilley Cornett Woods as 224 hectares (554 acres) of mixed mesophytic forest with 102 hectares (252 acres) of old growth forest (Eastern Kentucky University 2016). Coal mining once occurred throughout the area, but currently there are only five active coal mining operations located between 1.6 and 9.7 kilometers (1 and 6 miles) of the Roxana site (Kentucky Mine Mapping Information System 2008). There are no zoning ordinances or land use classifications identified for this area (Letcher County 2013). Land use associated with the Roxana site is depicted in Figure 3-1.

3.1.2 Environmental Consequences

3.1.2.1 Construction

Changes to land use on the 231-hectare (570-acre) modified Roxana site would occur from construction of a USP and FPC. Approximately 49 hectares (121 acres) of the site would be converted from a primarily forested, as well as, reclaimed mining and residential, to a government institution consisting of several facilities, parking lots, and roads. Additionally, the bluegrass music pavilion and model airplane strip would be removed. The oil and gas wells would be plugged and abandoned. These impacts are further discussed in Section 3.5, Infrastructure and Utilities.

Impacts to land use adjacent to the Roxana site, which is primarily forested with some residential, would occur from temporary increases in noise levels during the four- to five-year construction period. An evaluation of projected construction noise levels is presented in Section 3.4, Noise. Measures that would be taken to minimize noise impacts during construction are addressed in Section 3.4.4, Mitigation. One specific mitigation measure would limit construction activities to daytime weekday hours to the extent feasible to minimize impacts to surrounding areas and along the routes of construction vehicle travel.

A forested buffer area would remain around the USP and FPC, separating the federal correctional facility from the adjacent properties. East of the project area, the buffer distance between the USP and FPC facilities and adjacent properties would range from approximately 38 to 671 meters (125 to 2,200 feet). South of the project area, the buffer distance would vary from approximately 152 to 244 meters (500 to 800 feet). West of the project area, the buffer distance would be approximately 183 to 457 meters (600 to 1,500 feet). North of the project area, the buffer distance would be approximately 38 to 91 meters (125 to 300 feet). The forested buffer area would be compatible with the adjacent land uses. The land area impacted by past mining activities would be reused as a government facility. Due to the lack of zoning ordinances and land use classifications, construction of the proposed USP and FPC would not result in incompatible land uses from a regulatory perspective; changes in land use would not be considered significant.

3.1.2.2 Operations

Generally, there would be no direct impacts to adjacent land uses from operation of the USP and FPC, as the federal correctional facility would be separated from adjacent properties by a buffer area. The buffer area would be compatible with adjacent land uses.

Given the revised site layout with relocation of the access road and other facilities, light emission impacts to adjacent land use could occur from exterior security lighting. Exterior lights would consist of 30-meter (100-foot) high mast lighting poles placed along the security perimeter road around the correctional
Figure 3-1. Roxana Land Use
facility, in the parking lot, and around the buildings, wall pack lights on the buildings, and parking lot and sidewalk light poles. Most of the lights would be inside of the forested buffer area. Some light emissions from lighting located along the access road could impact residential properties near the northeast portion of the site. Exterior lighting would include full cutoff fixtures to direct light down (no light emitted at or above horizontal) and minimize adverse off-site impacts of lighting. As a result, potential land use impacts to adjacent residential properties from light emissions are not anticipated to be significant. Furthermore, potential land use impacts to the nearest nature preserve, Lilley Cornett Woods, from light emissions is not anticipated to be significant, due to the 2.1 kilometer (1.3 mile) distance from the Roxana site, intervening topography, and use of full cutoff light fixtures that would not emit direct uplight.

Noise impacts to adjacent land uses would occur from firearms recertification for six weeks each year and from firearms training one day each month. Noise impacts are analyzed in more detail in Section 3.4, Noise. The predicted peak noise contours from the use of small arms at the proposed outdoor firing range are shown in Figure 3-2. Noise contours delineate an area that would experience noise, as measured in decibels, at a distance from the source of the noise. Peak noise represents the highest noise level during a single firing event. Table 3-1 provides small arms peak noise levels and compatibility with noise-sensitive land uses.

<table>
<thead>
<tr>
<th>Small Arms Peak Noise (dBPA)</th>
<th>Compatibility with Noise-Sensitive Land Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;87</td>
<td>Compatible</td>
</tr>
<tr>
<td>87 to 104</td>
<td>Normally Incompatible</td>
</tr>
<tr>
<td>&gt;104</td>
<td>Incompatible</td>
</tr>
</tbody>
</table>

*Notes: Single event peak level exceeded by 15 percent of events. *dBPA = peak decibels.

Source: Department of the Army 2007.

There would be no incompatible land use within the 87 peak decibels (dBPA) noise contour. Land uses within the contour are open space, forested land, and previously mined area that is now open space. The small residential area located on the land within the 87 to 104 dBPA contour zone would be converted to institutional facilities and the Bureau has no plans to reuse the buildings as residences. Because the firing range would typically be used on an annual basis for six weeks and on a monthly basis for one day, during daylight hours, and there are no incompatible land uses within the 87 dBPA noise levels, noise impacts to adjacent land use would not be considered significant. Also, noise levels generated by firing range activity have been estimated to be less than 70 dBPA at the nearest nature preserve in the vicinity of the proposed site, Lilley Cornett Woods. Potential land use impacts to Lilley Cornett Woods from noise is not anticipated to be significant because peak noise levels of less than 70 dBPA are well below the 87 dBPA level for land use incompatibility. This level would likely be barely perceptible at Lilley Cornett Woods, which is 2.1 kilometers (1.3 mile) from the site of the firing range. This distance and the fact that each gunshot sound would last less than one-fourth of a second would introduce negligible noise impacts and would be considered compatible to adjacent land uses.

3.1.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed; therefore, no impacts to land use would occur.
Figure 3-2. Proposed Noise Contours and Existing Land Use for Roxana
3.1.4 Mitigation

Federal agencies are not subject to local/regional zoning or land use development regulations. However, the Bureau would take the following measures to help minimize potential adverse impacts to surrounding land uses:

- provide an open space and vegetative buffer between the USP and FPC to maintain visual compatibility with surrounding properties
- design and locate the facilities to reduce the visual presence of the facility from neighboring properties
- maintain a 125-foot buffer between FPC construction activities and Whitaker property
- maintain a 100-foot buffer between access road construction activities and the Frazier Cemetery
- use full cutoff light fixtures to minimize adverse off-site impacts of lighting

3.2 Topography, Geology, and Soils

Topography describes the surface features of the land and includes elevation, slope, and other general surface features. Geologic resources include the bedrock material underlying the land area. Geologic factors influence soil stability, bedrock depth, and seismic properties. Soil is the unconsolidated material above bedrock. Soil is formed from the weathering of bedrock and other parent materials.

The Farmland Protection Policy Act (FPPA) (7 U.S. Code [USC] 4201 et seq.) was introduced to conserve farmland soil and discourage the conversion of prime farmland soil to a non-agricultural use. The FPPA defines prime farmland soils as those that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and are also available for these uses. Soils of statewide importance are those soils that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. The FPPA is based on the protection of prime farmland soils and not on whether the area is in agricultural use.

The analysis considers the potential impacts to topography and soils from the revised facilities layout under Modified Alternative 2 – Roxana. The impact analysis for geologic resources takes into consideration the changes in the quantities of excavation and fills material for the modified Roxana alternative and information from an additional geotechnical study that was prepared to document additional baseline site conditions and develop revised geotechnical and earthwork plans of the modified facilities layout for the Roxana site (Cardno 2016a).

3.2.1 Affected Environment

The topography at the Roxana site has been significantly impacted by mountaintop removal coal mining. The site is characterized as a wide, gently sloping to flat ridgetop plateau created by surface mine overburden removal and valley filling. The plateau lies in the central portion of the site at an elevation of approximately 465 meters (1,526 feet) above mean sea level (AMSL). To the west, north, and east of the plateau, the mountain slopes drop moderately to steeply to stream valleys situated at elevations of approximately 310 to 330 meters (1,000 to 1,100 feet) AMSL. The plateau created by the surface mining has not been incorporated into the U.S. Geological Survey 7.5' Roxana topographic quadrangle map; however, the highest point and lowest points of the site remain unchanged. The highest elevation is located in the southern portion of the site at an elevation of approximately 549 meters (1,801 feet) AMSL. The
lowest elevation is approximately 315 meters (1,033 feet) AMSL, located in the northwestern portion of the site adjacent to the North Fork of the Kentucky River.

The Roxana site is underlain by the Breathitt Group, which comprises the Pikeville Formation and the Hyden Formation. The geology underlying the Roxana site is primarily the Hyden Formation. The geological rock of the Hyden and Pikeville Formations consists of sandstone, siltstone, claystone, and coal. The Roxana site is also underlain by the Four Corners Formation, which is composed of sandstone, siltstone, claystone, coal, and limestone (Kentucky Geological Survey [KGS] 2015). The surface mining had been conducted in the Fireclay and Fireclay Rider coal seams. Geotechnical studies conducted at the site indicate the mine overburden material was placed on previously surfaced mined areas with little to no compaction, and is highly variable in gradation, depth, and consistency (Cardno 2016a; Marshall Miller and Associates 2012) (refer to Appendix A, Additional Geotechnical Study for more detailed information).

The three most common soils on the Roxana site are the Cloverlick-Kimper-Highsplint complex, (30 to 65 percent slopes), the Kaymine, Fairpoint and Fiveblock soils map unit (2 to 70 percent slopes), and the Shelocta-Highsplint (30 to 65 percent slopes). To a lesser degree the following soils are also on the site: Allegheny Loam (2 to 25 percent slopes), Dekalb-Gilpin-Rayne complex (25 to 65 percent slopes), Fiveblock and Kaymine soils (0 to 30 percent slopes), Gilpin-Shelocta complex (12 to 25 percent), Grigsby sandy loam (occasionally flooded), Grigsby-Urban land complex (0 to 6 percent slopes), Urban land-Udorthents complex (0 to 15 percent slopes), and Urban land-Udorthents-Grigsby complex (0 to 6 percent slopes) (Natural Resources Conservation Service [NRCS] 2016).

The Roxana site contains a small area of soils classified as farmland of statewide importance (NRCS 2016). The soil is Allegheny Loam and is located in the floodplain of the North Fork of the Kentucky River in the northernmost portion of the site. None of the soils associated with the Roxana site are listed as hydric by NRCS.

### 3.2.2 Environmental Consequences

#### 3.2.2.1 Construction

Development of the site would require significant excavation (cut) and fill activities to build the access road and create a level pad for construction of the facilities. A ¼:1 cut slope and a 2:1 fill slope were used in the estimate of cut and fill quantities (Cardno 2016a). As identified in Table 2-4, Estimated Earthwork Quantities for Modified Alternative 2 – Roxana, excavation activities would include 6,585,085 cubic meters (8,612,966 cubic yards) of spoil material and 557,908 cubic meters (729,716 cubic yards) of rock. For the revised facilities layout under Modified Alternative 2 – Roxana, the building foundations of the USP, prison camp buildings, and utility plant would be founded on or in bedrock. Removal of bedrock would require blasting. The excavated soil, rock, and spoil material, including mine spoil, would be compacted to create a structural fill for the facilities in the training center area, the FPC parking lot and recreational facilities, the USP parking lot and portions of the fence, and the road on the east side of the USP. In addition, excavated material would be transported to the valleys adjacent to the northwest of the proposed FPC location and southwest of the proposed USP location and compacted as structural fill to promote free drainage of subsurface water. The amount of structural fill is estimated to be 6,683,976 cubic meters (8,742,310 cubic yards) (Table 2-4). All excavated materials would be used on-site for structural fill. The USP area would be graded to an approximate elevation of 445 meters (1,460 feet), the FPC to an approximate elevation of 421 meters (1,381 feet), and the utility plant and training center areas to an approximate elevation of 447 meters (1,467 feet). At these elevations, the building foundations would be
reliably supported on bedrock or structural fill with bearing capacities that would limit total and differential settlement to less than 2.5 centimeters (1 inch) (Cardno 2016a).

Impacts resulting from the cut and fill activities would include loss of productive soil, erosion, destabilization of slopes, and altered site drainage. As a result of the excavation and fill activities, the topography of the site would change at the maximum cut from 465 meters to 445 meters (1,526 to 1,460 feet) in the USP area and at the maximum fill from 370 meters to 447 meters (1,214 to 1,467 feet) in the staff training center area. Therefore, the maximum cut (excavation) at the Roxana site would be approximately 20 meters (66 feet) and the maximum fill would be approximately 75 meters (246 feet). These geologic and topographic impacts are considered significant.

Development of the USP and FPC would have a direct impact on soils at the Roxana site as a result of temporary disturbance from construction activities. Existing structures, relict foundations, utilities and drainage structures, and some road surfaces within the building area would be removed. No importation of soils or off-site disposal of soils is anticipated. Soil would be either excavated or used as backfill, or landscape material for the construction of the federal correctional facility.

The area of soils to be disturbed would total approximately 73 hectares (181 acres) under Modified Alternative 2 – Roxana. Implementation of Modified Alternative 2 – Roxana would directly impact approximately 5.0 hectares (12.3 acres) of soils classified as farmland of statewide importance. To determine if implementation of Modified Alternative 2 – Roxana would impact prime farmland under the FPPA, a Farmland Conversion Impact Rating Form (AD1006) was completed and submitted to the Natural Resources Conservation Service (NRCS) for evaluation. A copy of the completed form is included in Appendix B, Farmland Conversion Impact Rating Form and Correspondence. NRCS completed the land evaluation portion of the form, scoring the relative value of the soils to be converted at the Roxana site at 4 out of 100. The Bureau completed the site assessment portion of the form, resulting in a score of 53 out of 160. Therefore, the Roxana site had a total score of 57. Scores below 160 do not require further review under the FPPA. As a result, the Bureau has determined that the proposed conversion is consistent with the FPPA. Modified Alternative 2 – Roxana would not have significant impacts on prime farmland.

3.2.2.2 Operations

No further impacts to topography, geology, or soils are anticipated from the operation of the USP and FPC.

3.2.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed; therefore, there would be no impact on topography, geology, or soils.

3.2.4 Mitigation

The Bureau would prepare a soil erosion and sediment control plan and submit it to the Kentucky Division of Water for approval prior to construction. The erosion and sediment control plan would outline the measures and best management practices (BMPs) to be used for controlling on-site erosion and sedimentation during construction. BMPs could include placement of silt fencing adjacent to surface waters and wetlands to prevent the introduction of sediment; the use of hay bales to minimize the spread of sediment off the construction site; stabilization of steep slopes; use of tree clearing plans. In addition, construction-period and permanent surface water and stormwater control plans would be implemented to manage runoff. These plans would include surface water drainage controls in the structural fill areas to
reduce the risk of settlement in these areas. Additionally, construction of the USP, FPC, and ancillary facilities could be phased to occur at different times, resulting in the minimization of disturbed soil by clearing only the area necessary for the current phase of construction. Re-vegetation of disturbed areas following the completion of construction would also occur to minimize the erosion of exposed soil.

3.3 AIR QUALITY

Air quality is defined by ambient air concentrations of specific pollutants determined by the U.S. Environmental Protection Agency (USEPA) to be of concern related to the health and welfare of the general public and the environment and are widespread across the U.S. The primary pollutants of concern, called “criteria pollutants,” include carbon monoxide (CO), sulfur dioxide (SO2), nitrogen dioxide (NO2), ozone (O3), suspended particulate matter less than or equal to 10 microns in diameter (PM10), fine particulate matter less than or equal to 2.5 microns in diameter (PM2.5), and lead. Under the Clean Air Act (CAA), the USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants (40 CFR 50). The NAAQS represent the maximum levels of background pollution that are considered acceptable, with an adequate margin of safety, to protect public health and welfare. Short-term standards (1-, 3-, 8- and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects. The Kentucky Department for Environmental Protection (KDEP) has adopted the NAAQS, which are presented in Table 3-2.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>Primary Standard</th>
<th>Secondary Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>8-hr</td>
<td>9 ppm</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>1-hr</td>
<td>35 ppm</td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>Rolling 3-Month Average</td>
<td>0.15 µg/m³</td>
<td>Same as Primary</td>
</tr>
<tr>
<td>NO2</td>
<td>Annual (arithmetic average) 1-hr</td>
<td>53 ppb</td>
<td>Same as Primary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 ppb</td>
<td>None</td>
</tr>
<tr>
<td>PM10</td>
<td>24-hr</td>
<td>150 µg/m³</td>
<td>Same as Primary</td>
</tr>
<tr>
<td>PM2.5</td>
<td>Annual (arithmetic average) 24-hr</td>
<td>12.0 µg/m³</td>
<td>15.0 µg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35 µg/m³</td>
<td>Same as Primary</td>
</tr>
<tr>
<td>O3</td>
<td>8-hr</td>
<td>0.070 ppm</td>
<td>Same as Primary</td>
</tr>
<tr>
<td>SO2</td>
<td>1-hour</td>
<td>75 ppb</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-hour</td>
<td></td>
<td>0.5 ppm</td>
</tr>
</tbody>
</table>

Notes: ppb = parts per billion; ppm = parts per million; µg/m³ = micrograms per cubic meter.
Source: USEPA 2016a.

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs) which are regulated under Section 112(b) of the 1990 CAA Amendments. Unlike the criteria pollutants, there are no NAAQS for HAPs. The primary control methodologies instituted by federal regulation for mobile source HAPs involve technological improvements for reducing their content in fuel and altering engine operating characteristics to reduce the volume of pollutants generated during combustion. The equipment used during construction would likely vary in age and have a range of pollution reduction effectiveness. Construction equipment, however, would be operated intermittently over a large area and would produce negligible ambient HAPs in a localized area. Therefore, HAP emissions are not considered further in this analysis.
The air quality analysis evaluates projected future emissions, including construction and operations. Air quality impacts would be significant if emissions associated with the proposed action would: 1) increase ambient air pollution concentrations above the NAAQS, 2) impair visibility within federally mandated Prevention of Significant Deterioration Class I areas, 3) result in the potential for any stationary source to be considered a major source of emissions if total emissions of any pollutant subject to regulation under the CAA is greater than 250 tons per year (TPY) for attainment areas, or 4) for mobile source emissions, result in an increase in emissions to exceed 250 TPY for any pollutant. The air quality assumptions and calculations are provided in Appendix C, Air Emissions Calculations.

For criteria pollutant emissions, 250 TPY per pollutant was used as a comparative analysis threshold. This value is used by the USEPA in their New Source Review standards as an indicator for impact analysis for listed new major stationary sources in attainment areas. No similar regulatory threshold is available for mobile source emissions, which are the primary sources for the construction phases, and also a component of operational emissions for the proposed action. Lacking any mobile source emissions thresholds, the 250 TPY major stationary source threshold was used to equitably assess and compare mobile source emissions.

Air emissions were analyzed, where applicable, based on proposed construction activities and on operational emissions that would occur during full operation.

3.3.1 Affected Environment

The study area for the air quality analysis includes the Appalachian Intrastate Air Quality Control Region, which is defined in 40 CFR 81.191, and comprises several counties in Kentucky, including Letcher County. Air quality in the study area is considered good, with the study area designated as unclassifiable, attainment, or better than national standards for all criteria pollutants. Because the study area is in attainment for all criteria pollutants, the CAA General Conformity Rule does not apply and is not addressed in this analysis. Although a conformity analysis is not required, impacts to air quality from emissions associated with construction and operations of Modified Alternative 2 – Roxana are addressed in the following sections. The air emissions calculations were updated to account for the changes in earthwork quantities that have been evaluated for the proposed modifications to the facilities layout. A summary of the analysis is presented below and the complete analysis is provided in Appendix C, Air Emissions Calculations.

3.3.2 Environmental Consequences

The results of the updated air emissions analysis show that construction and operational emissions under Modified Alternative 2 – Roxana would remain well below the significance thresholds and would not have a significant impact on the local or regional air quality.

3.3.2.1 Construction

Direct impacts from emissions from construction would include combustion emissions from fossil fuel-powered equipment and fugitive dust emissions (PM_{10} and PM_{2.5}) during clearing, demolition activities, earth moving activities, foundation work, and operation of equipment on bare soil. Table 3-3 presents estimates for the primary construction activities that would utilize heavy duty diesel equipment for development of the modified site layout at the Roxana site.
Table 3-3. Construction Emission Estimates for Modified Alternative 2 – Roxana

<table>
<thead>
<tr>
<th>Year</th>
<th>VOC² Tons</th>
<th>CO Tons</th>
<th>NO² Tons</th>
<th>SO₂ Tons</th>
<th>PM₁₀ Tons</th>
<th>PM₂.₅ Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.48</td>
<td>14.06</td>
<td>43.62</td>
<td>0.95</td>
<td>158.82</td>
<td>18.16</td>
</tr>
<tr>
<td>2</td>
<td>3.48</td>
<td>14.06</td>
<td>43.62</td>
<td>0.95</td>
<td>158.82</td>
<td>18.16</td>
</tr>
<tr>
<td>3</td>
<td>3.48</td>
<td>14.06</td>
<td>43.62</td>
<td>0.95</td>
<td>158.82</td>
<td>18.16</td>
</tr>
</tbody>
</table>

Notes: 1. Estimates assume heavy equipment operations would conclude by the end of the third year of construction.
2. VOC = volatile organic compound; NOx = nitrogen oxides.

Fugitive dust from land disturbance activities would be the primary source of emissions during construction. PM₁₀ emissions are estimated using wetting and other typical reduction practices to reduce dust release by 50 percent. PM₁₀ emissions are predicted to be approximately 158.82 TPY. These emissions would remain well below the significance threshold of 250 TPY. Construction emissions would not have direct or indirect significant impacts on the region’s air quality.

Direct impacts to air quality may also include emissions from the burning of construction debris, if such an activity were undertaken during construction. Vegetative debris and/or demolition and construction materials would be disposed in accordance with all laws and regulations. Should open burning be necessary, it would be conducted in accordance with 401 KAR 63:005, Open Burning.

3.3.2.2 Operations

Table 3-4 presents the annual emissions based on the site being fully operational. Stationary sources operating on-site would include two 2000-kilowatt diesel-powered emergency generators and three boilers to provide heat and hot water for the site. The boilers have been estimated at 15 MMBtu/hr. One of the boilers would serve as a backup, so air emission calculations evaluated use of two boilers. All of these stationary sources would require an air permit and be regulated by the KDEP, Division for Air Quality. Analysis of permit requirements based on the final stationary source(s) type and design would be performed as design requirements are more fully delineated. This would ensure regulatory permit compliance and that all requisite source registrations would be submitted.

In addition to stationary sources, the emissions from staff commuting to and from work have been estimated at 300 employees and working 365 days per year. The round trip was estimated at 40 miles because of the rural location of the Roxana site.

Table 3-4. Estimated Annual Operational Emissions for Modified Alternative 2 – Roxana

<table>
<thead>
<tr>
<th>Source</th>
<th>VOC TPY</th>
<th>CO TPY</th>
<th>NOₓ TPY</th>
<th>SO₂ TPY</th>
<th>PM₁₀ TPY</th>
<th>PM₂.₅ TPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generators</td>
<td>0.25</td>
<td>2.15</td>
<td>5.09</td>
<td>0.00</td>
<td>0.27</td>
<td>0.27</td>
</tr>
<tr>
<td>Boilers</td>
<td>0.26</td>
<td>3.80</td>
<td>15.2</td>
<td>0.16</td>
<td>0.76</td>
<td>0.19</td>
</tr>
<tr>
<td>Staff Vehicles</td>
<td>0.19</td>
<td>23.38</td>
<td>1.07</td>
<td>0.02</td>
<td>0.12</td>
<td>0.11</td>
</tr>
<tr>
<td>Total</td>
<td><strong>0.70</strong></td>
<td><strong>29.33</strong></td>
<td><strong>21.36</strong></td>
<td><strong>0.18</strong></td>
<td><strong>1.16</strong></td>
<td><strong>0.58</strong></td>
</tr>
</tbody>
</table>

All of the criteria pollutant emissions remain well below the significance threshold of 250 TPY. Based on the emission estimates, operation of the federal correctional facility at the Roxana site would not have direct or indirect significant impacts on the local or regional air quality.
3.3.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed and associated operational activities would not occur. The No Action Alternative would not result in emissions of any air pollutants. Therefore, there would be no significant impact to regional air quality.

3.3.4 Mitigation

Although no significant impacts on regional air quality are anticipated, BMPs would be implemented to reduce air emissions that would occur. They may include, but are not limited to:

- Periodic wetting during clearing, excavation, filling, and grading activities to minimize impacts to air quality from fugitive dust (i.e., PM$_{10}$ emissions)
- Utilization of alternatively fueled equipment
- Utilization of other emission controls that are applicable to the equipment being used on-site
- Reduction of idling time of equipment and construction vehicles

3.4 Noise

Noise is evaluated in this section for potential impacts to nearby noise sensitive receptors, which include housing, schools, and medical facilities. Noise impacts to land use are evaluated in Section 3.1, Land Use and Zoning. Noise impacts to biological resources are evaluated in Section 3.8, Biological Resources.

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual.

Levels of noise are measured in units of decibels (dB). However, a number of factors affect how the human ear perceives sound: the actual level of noise, frequency, period of exposure, and fluctuations in noise levels during exposure. The human ear cannot equally perceive all pitches or frequencies and noise metrics are therefore adjusted or weighted to compensate for the human lack of sensitivity to low- and high-pitched sounds. One commonly used adjusted unit is known as the A-weighted decibel, or dBA. The A-weighted metric, de-emphasizes very low and very high pitched sound and is most often applied to noise generated by motor vehicle traffic and construction equipment.

Most common noises are expressed in dBA and some examples are shown in Figure 3-3. Construction, traffic, and mechanical equipment noise are examples of noise measured in A-weighting because of their long duration. Blasting and gunshots occur very rapidly and the noise lasts just fractions of a second. Perception of some impulsive noises such as blasting and gunshots does not correspond well to A-weighting and Figure 3.3 does not apply because the duration of the noise event is so short. These impulsive noises are expressed as peak noise (dBP). The noise metric Peak Noise PK15(met) is defined as the maximum instantaneous sound level for each unique sound source; i.e., one gun shot. Because weather affects noise propagation and noise levels can vary, PK(15) or dBP levels are those noise levels that are likely to be exceeded only 15 percent of the time (i.e., 85 percent certainty that sound will be within this range).
Table 3-5. Loudness and Noise Levels for Common Sounds

Sound levels that vary over time are expressed in average noise levels that use energy averaging to quantify the overall noise exposure over the specified time period. Day-Night Average Sound Level (DNL) is an average over at least 24 hours and is considered the standard metric by nearly all agencies including the Department of Defense, USEPA, and the Federal Aviation Administration (FAA), for determining noise based upon community annoyance level. DNL applies a night time penalty of 10 dB between the hours of 10:00 p.m. and 7:00 a.m. to account for the fact that night time noise events have a greater annoyance factor than day events. Equivalent noise levels are also average sound levels but are averaged over specified times usually one-hour or eight-hours and expressed as one-hour or eight-hour equivalent noise levels.

3.4.1 Affected Environment

Background, or ambient, noise levels are all sounds present in an environment and are dependent upon land use. Very rural areas with little human activity would be expected to have the lowest levels of background noise, typically on the order of 15 to 20 dBA (USEPA 1982). Noise increases with increased population, as demonstrated in Table 3-5.
The Roxana site is located in a partially developed rural area with coal mines and railroad tracks in the area. Estimated ambient noise levels for rural partially developed areas is 40 dB DNL (USEPA 1982). Areas of the site located immediately adjacent to KY 588 and KY 160 currently experience noise from traffic traveling through the area and truck and rail traffic servicing the nearby mines.

### 3.4.2 Environmental Consequences

Implementation of Modified Alternative 2 – Roxana would result in changes in ambient noise levels as compared to the existing conditions described in Section 3.4.1, Affected Environment because of construction activities, facilities operation, firearms training at the outdoor firing range, and occupational noise exposure. Noise impacts to sensitive receptors are evaluated in this section. The closest sensitive receptors are initially evaluated and if the resulting impacts are less than significant, then all other receptors farther away would be less than significant as well. On the other hand, if significant impacts are determined, then the analyses are expanded to encompass and report all receptors determined to have a significant impact.

#### 3.4.2.1 Construction

Construction activities under Modified Alternative 2 – Roxana would result in temporary increases in noise levels for the duration of construction, which overall is anticipated to occur over a period of four to five years.

Modified Alternative 2 – Roxana would generate varied levels of noise depending upon the activities taking place during the construction phases of the USP and FPC. Phases of construction that would generate noise generally include site preparation, excavation, foundation placement, construction of buildings, infrastructure, and facilities, and exterior/interior finish and cleanup. Noise impacts during these phases would be a function of the noise generated by construction equipment, the equipment location, and the timing and duration of the noise-generating activities. Normally, the order of construction activities follows these steps, but on large projects such as this one, there would be overlap of construction phases. Site preparations would be characterized as clearing and grubbing of vegetation, development of construction access and laydown areas, and access roads. Excavation includes blasting, excavation, and cut and fill of rock material to prepare the laying of foundations. Foundation work also includes placing the final layers of base material and construction forms, conduit and utility placement, and pouring the foundations. The next phase is erection of the buildings, facilities, and infrastructure, which generally takes the longest time to complete. Placement of the exterior and interiors finishes make up the final step. Of all these construction phases, site preparation and earth moving typically would be the noisiest activity, with land clearing and

<table>
<thead>
<tr>
<th>Table 3-5. Sound Levels Estimated by Population Density</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Rural (undeveloped)</td>
</tr>
<tr>
<td>Rural (partially developed)</td>
</tr>
<tr>
<td>Quiet suburban</td>
</tr>
<tr>
<td>Normal suburban</td>
</tr>
<tr>
<td>Urban</td>
</tr>
<tr>
<td>Noisy urban</td>
</tr>
<tr>
<td>Very noisy urban</td>
</tr>
</tbody>
</table>

*Note: DNL is Day-Night Average Sound Level, which is the energy-averaged sound level over a 24-hour period with a 10-dB penalty applied to nighttime levels.*

*Source: USEPA 1982.*
excavations, pile driving, foundation work, and capping. Noise levels at a given receptor location would depend on the type and number of pieces of construction equipment being operated and the receptor’s distance from the construction site. Table 3-6 lists construction related noise emissions, which can range from 74 to 101 dBA when measured 15 meters (50 feet) from the respective piece of equipment. The Federal Highway Administration’s Road Construction Noise Model uses these noise emissions to predict noise levels at various sources generated by multiple pieces of construction equipment. Construction equipment expected at the site would be pile-drivers, graders, dozers, and excavators, but nearly each type of equipment listed would be used at some point during the construction process.

<table>
<thead>
<tr>
<th>Equipment Description</th>
<th>Actual Measured $L_{\text{max}}$ (dBA) at 15 meters (50 feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat Bed Truck</td>
<td>74</td>
</tr>
<tr>
<td>Welder/Torch</td>
<td>74</td>
</tr>
<tr>
<td>Man Lift</td>
<td>75</td>
</tr>
<tr>
<td>Dump Truck</td>
<td>76</td>
</tr>
<tr>
<td>Backhoe</td>
<td>78</td>
</tr>
<tr>
<td>Compressor (air)</td>
<td>78</td>
</tr>
<tr>
<td>Concrete Mixer Truck</td>
<td>79</td>
</tr>
<tr>
<td>Drill Rig Truck</td>
<td>79</td>
</tr>
<tr>
<td>Front End Loader</td>
<td>79</td>
</tr>
<tr>
<td>Rivet Buster/Chipping Gun</td>
<td>79</td>
</tr>
<tr>
<td>Ventilation Fan</td>
<td>79</td>
</tr>
<tr>
<td>Drum Mixer</td>
<td>80</td>
</tr>
<tr>
<td>Vibratory Concrete Mixer</td>
<td>80</td>
</tr>
<tr>
<td>Concrete Pump Truck</td>
<td>81</td>
</tr>
<tr>
<td>Crane</td>
<td>81</td>
</tr>
<tr>
<td>Generator</td>
<td>81</td>
</tr>
<tr>
<td>Pumps</td>
<td>81</td>
</tr>
<tr>
<td>Dozer</td>
<td>82</td>
</tr>
<tr>
<td>Boring Jack Power Unit</td>
<td>83</td>
</tr>
<tr>
<td>Warning Horn</td>
<td>83</td>
</tr>
<tr>
<td>Auger Drill Rig</td>
<td>84</td>
</tr>
<tr>
<td>Scraper</td>
<td>84</td>
</tr>
<tr>
<td>Pneumatic Tools</td>
<td>85</td>
</tr>
<tr>
<td>Vacuum Excavator</td>
<td>85</td>
</tr>
<tr>
<td>Vibrating Hopper</td>
<td>87</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>89</td>
</tr>
<tr>
<td>Concrete Saw</td>
<td>90</td>
</tr>
<tr>
<td>Mounted Impact Hammer (hoe ram)</td>
<td>90</td>
</tr>
<tr>
<td>Sheers (on backhoe)</td>
<td>96</td>
</tr>
<tr>
<td>Impact Pile Driver</td>
<td>101</td>
</tr>
<tr>
<td>Vibratory Pile Driver</td>
<td>101</td>
</tr>
</tbody>
</table>

Source: Federal Highway Administration 2006.

Two locations for construction noise were selected for investigation: the nearest residential area located in Roxana near the intersection of KY 588 and KY 160 and the nearest nature preserve area, Lilley Cornett Woods. The residential area is located approximately 335 meters (1,100 feet) from the closest residence to the approximate center of the FPC. Lilley Cornett Woods is located about 2.1 kilometers (1.3 miles) from the Roxana site. Assuming 20 pieces of construction equipment, including impact pile-driving and blasting activities, eight-hour equivalent noise levels were determined to be 69 dBA at the residential area near
Roxana and 54 dBA at Lilley Cornett Woods. As illustrated in Figure 3-3, the nearest residences would experience noise levels similar or slightly louder than a vacuum cleaner at 10 feet, and noise exposure at Lilley Cornett Woods would be about equivalent to light automobile traffic (2 to 3 cars) at 100 feet. After the site preparation and excavation phases, noise would still be generated by construction activities but at a lower level, approximately 59 dBA. This is because the loudest equipment, such as blasting and impact pile-driving, is used during the initial construction phases; less noisy equipment would be used during subsequent construction phases.

Due to the terrain of the site, blasting would be required to break up bedrock during site preparation. Based on preliminary engineering calculations, the duration of blasting activities would likely be completed in 45 to 75 days for each of the three areas where blasting would occur: FPC, utility plant, and access road. It is anticipated that noise from a blasting event would occur only a few times a day. Prior to the start of blasting activities, a blasting plan would be prepared to document the types of explosives and size of charges in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures to prevent damage to adjacent properties. Blasting mats would be utilized to suppress dust, noise, and fly rock. Because noise generated during a blast lasts a very short time, peak noise levels (in dBP) are more approximate measurements for this type of noise. In accordance with Kentucky regulations governing blasting (805 KAR 4:16), the proposed blasting activities would comply with the 129 dBP maximum noise exposure for the nearest inhabited structure. Various techniques used for quarry and mining operations to suppress blast noise would be used to ensure noise levels remain at or below this maximum level.

Vibration

Vibrations are movement of the ground or air caused by blasting, pile-driving, or other forces causing the earth to move. These vibrational motions are measured in terms of peak particle velocity (PPV). Blasting operations would be considered transient events because each blasting event requires preparation to move the rock effectively and safely between each event. On the other hand, pile-driver operations are continuous until the individual pile is set. Table 3-7 shows various vibration effects and criteria expressed in terms of peak particle velocities (millimeters per second; inches per second)². Transient vibration impacts to buildings vary upon the type and structural integrity of buildings. According to the Swiss Association of Standardization Vibration Damage Criteria, transient vibration limits are a little more than double the continuous vibration limits (California Department of Transportation 2013).

² For pile-driving the following equation is used (California Department of Transportation 2013):

\[
PPV_{\text{Impact Pile Driver}} = PPV_{\text{Ref}} \left(\frac{25}{D}\right)^{n} x \left(\frac{E_{\text{equip}}}{E_{\text{Ref}}}\right)^{0.5} \text{ (in/sec)}
\]

Where:

- \(PPV_{\text{Ref}} = 0.65\ \text{in/sec for a reference pile driver at 25 ft.}\)
- \(D = \text{distance from pile driver to the receiver in ft.}\)
- \(n = 1.1\ is a value related to the vibration attenuation rate through ground\)
- \(E_{\text{Ref}} = 36,000\ \text{ft-lb (rated energy of reference pile driver)}\)
- \(E_{\text{equip}} = \text{rated energy of impact pile driver in ft-lbs.}\)
Table 3-7. Vibration Effects of Continuous and Transient Construction Operations

<table>
<thead>
<tr>
<th>Vibration Amplitude (Peak Particle Velocity)</th>
<th>Human Reaction (Continuous and Transient)</th>
<th>Effect on Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous mm/s in/sec</td>
<td>Transient mm/s in/sec</td>
<td></td>
</tr>
<tr>
<td>0.15–0.30</td>
<td>0.006–0.019</td>
<td>0.90</td>
</tr>
<tr>
<td>2.0</td>
<td>0.08</td>
<td>6.10</td>
</tr>
<tr>
<td>2.5</td>
<td>0.10</td>
<td>22.8</td>
</tr>
<tr>
<td>5.0</td>
<td>0.20</td>
<td>No applicable data</td>
</tr>
<tr>
<td>10–15</td>
<td>0.4–0.6</td>
<td>50.8</td>
</tr>
</tbody>
</table>

Note: mm/s = millimeters per second; in/sec = inches per second
Source: California Department of Transportation 2013.

Under Modified Alternative 2 – Roxana, the nearest residence is 1,100 feet. At this distance, it is anticipated that continuous pile-driver activities would generate a PPV of 0.024 in/sec. This level corresponds to a human reaction just exceeding the threshold of perception, but nearly four times less than levels of vibrations that are readily perceptible by people. At Lilley Cornett Woods, the distance is 6,864 feet resulting in a PPV of 0.0031 in/sec, which corresponds to about half the level of the threshold of perception for continuous vibration.

For blasting operations, vibration effects would be dependent upon numerous variables, including the amount of rock to be moved during a blast, the resulting quantity of explosives necessary to achieve that goal, hardness of the rock, the number and depth of blast holes, and other factors. Certified blasting professionals licensed by the Commonwealth of Kentucky consider these factors on-site to determine a blasting plan. This plan is typically devised once a thorough examination of the conditions is undertaken; conditions are not predicted beforehand. However, Kentucky regulations (805 KAR 4:020) stipulate the “the maximum allowable PPV is 2.0 in/sec at the immediate location of any dwelling house, public building, school, church, commercial or institutional building.” The nearest residence is 1,100 feet, and per KAR 4:020 Section 1(5), the maximum allowable amount of explosives is the distance to the nearest building divided by 50 and the quantity squared \[W = (D/50)^2\], which equals 484 pounds per delay of 8 milliseconds. Using this weight of explosives and the distance to Lilley Cornett Woods of 6,864 feet, a blast PPV of 0.11 in/sec would result, which would be barely perceptible.
In conclusion, short-term noise disturbance would occur during construction. At the nearest residences, average noise levels would be approximately 69 dBA and at Lilley Cornett Woods they would be about 54 dBA. Vibration levels at nearby residences would be slightly above the threshold of perception. Vibration levels at Lilley Cornett Woods would be well below the threshold of perception and would not be felt there. Noise and vibration impacts at the nearest residences would not be considered significant because the highest noise levels would be short-term during blasting and pile driving phases of the project, and implementation of noise attenuation measures described below in Section 3.4.4, Mitigation would reduce potential disturbance from noise. Once the major portions of the earthwork using blasting and pile driving concludes, noise levels would settle to about 59 dBA and would be considered compatible for residential areas. Noise at Lilley Cornett Woods would also be reduced after the loudest construction noise ceases, and the noise level would be considered compatible for any land use and would not be significant. Therefore, implementation of Modified Alternative 2 – Roxana would have no significant impacts to sensitive noise receptors from construction noise. As stated earlier, please refer to Section 3.1, Land Use and Section 3.8, Biological Resources, for noise impacts to those resources.

3.4.2.2 Operations

The operation of the proposed USP and FPC, once construction is completed, is not expected to significantly increase ambient noise levels because the noise sources for the facilities would be heating and air conditioning systems. The distances to the nearest receptors would be too far for facility operations to be perceived by any receptors. No significant impacts to sensitive noise receptors are anticipated from operational noise.

3.4.2.3 Firearms Training at Proposed Outdoor Firing Range

It is anticipated that approximately 300 Bureau staff would use the proposed outdoor firing range (Figure 2-5) to meet their firearms training requirements. Training would involve the firing of small arms weapons, including handgun, shotgun, and rifle. The firing range would typically be used 5 days a week (Monday–Friday), 2–4 hours each day, for six weeks annually and once a month for 8 hours during daylight hours. It is estimated that annual training conducted over a six-week period would involve firing approximately 30,000 rounds 9-mm pistol, 10,500 rounds 12-gauge shotgun, and 11,500 rounds 5.56-mm rifle. It is estimated that monthly training occurring on one day would involve firing approximately 5,000 rounds 9-mm pistol, 400 rounds 12-gauge shotgun, 400 rounds .308 caliber rifle, and 2,000 rounds 5.56-mm rifle.

Weapon-related impulsive noise is often represented as peak noise measured in dBP. The military noise model, Small Arms Range Noise Assessment Model (SARNAM), was used to predict peak noise levels from the proposed firing range. This model does not take into account the topography, which may provide some noise attenuation. However, the noise model assumes 5-meter berms on the left and right of firing lanes and an 8-meter high backstop berm. Table 3-8 provides small arms peak noise levels and compatibility with noise-sensitive land uses. Although peak noise levels are not directly comparable to the DNL average noise levels discussed in Section 3.4.1, Affected Environment, peak noise best represents noise levels from small arms firing.
3.0 Affected Environment & Environmental Consequences

3. Affected Environment & Environmental Consequences

3.1. Small Arms Peak Noise and Compatible Land Use

<table>
<thead>
<tr>
<th>Small Arms Peak Noise (dBP)*</th>
<th>Compatibility with Noise-Sensitive Land Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;87</td>
<td>Compatible</td>
</tr>
<tr>
<td>87 to 104</td>
<td>Normally Incompatible</td>
</tr>
<tr>
<td>&gt;104</td>
<td>Incompatible</td>
</tr>
</tbody>
</table>

*Note: *Single event peak level exceeded by 15 percent of events.

*Source:* Department of the Army 2007.

The SARNAM-predicted peak noise contours for the firearms recertification at the firing range are shown in Figure 3-4. There are no noise sensitive receptors within the 87 to 104 dBP noise contour bands. Therefore, no significant impacts to sensitive noise receptors are anticipated from firearms training noise because the nearest residences are located well outside the 87 dBP noise contour and considered compatible for residential land use.

From an exposure perspective, the elapsed time of exposure to noise from firearms training is very short. Under this alternative, a total of 59,800 rounds would be used annually: 52,000 rounds for annual training and 7,800 rounds for monthly training. During the annual six-week training, firing would occur five days per week (Monday–Friday) for approximately 2–4 hours per day. This equates to 433 rounds per hour during training. Each gunshot lasts only one-quarter of a second, so the elapsed time that gunshot noise would occur is 1.81 minutes per hour during the annual training. For monthly training, the elapsed time of exposure reduces to about one-third of a minute per hour for the one day per month when monthly training occurs.

3.4.2.4 Occupational Noise Exposure

The Occupational Safety and Health Administration (OSHA) regulates noise impacts to workers and sets forth thresholds for a safe work environment. OSHA has set permissible noise exposure limits (codified in 29 CFR 1910.95[b]). Based on these limits, an employee should not be subjected to continuous noise exceeding 90 dBA for durations lasting more than 8 hours per day (Table 3-9). As the level increases, the allowed duration of noise decreases. The maximum limit is 115 dBA for a duration of 15 minutes or less. OSHA standards are the best documented requirements in regards to long-term human noise exposure. In addition, OSHA standards state that exposure to impulsive or impact noise (loud, short duration sounds) is not to exceed 140 dB peak sound pressure level (OSHA 2013).

<table>
<thead>
<tr>
<th>Table 3-9. OSHA Permissible Noise Exposures</th>
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</thead>
<tbody>
<tr>
<td><strong>Duration per Day (hours)</strong></td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>1.5</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>0.5</td>
</tr>
<tr>
<td>0.25 or less</td>
</tr>
</tbody>
</table>

*Source:* 29 CFR 1910.95(b).

All USP, FPC, contract employees, and inmates in a working duty would be required to adhere to these limits or be provided with hearing protection devices in locations where noise levels exceed these limits. As a result, there would be no significant occupational noise impacts.
Figure 3-4. Peak Noise Contours for Outdoor Firing Range
3.4.3 **No Action Alternative**

Under the No Action Alternative, the USP and FPC would not be constructed in Letcher County and associated operational activities would not occur. Therefore, the No Action Alternative would have no noise impacts.

3.4.4 **Mitigation**

A variety of measures would be taken to minimize the impact to noise receptors during construction and operation activities, such as blasting to break up bedrock, operation of pile driving equipment, and small arms firing, including but not limited to:

- Using noise bellows systems on pile driving equipment to provide further noise attenuation
- Scheduling the louder construction activities for less intrusive times (mid-morning to mid-afternoon)
- Limit construction activities to daytime hours to the extent feasible to minimize impacts to surrounding areas and along the routes of construction vehicle travel
- Implement blasting plan and inform local community on dates when blasting activities would occur

3.5 **INFRASTRUCTURE AND UTILITIES**

3.5.1 **Affected Environment**

3.5.1.1 **Potable Water**

The Letcher County Water and Sewer District (LCWSD) purchases water from the Knott County Water and Sewer District, the City of Whitesburg, and the City of Jenkins. LCWSD uses water from Knott County to distribute in the Roxana area. The Bureau reviewed the Consumer Confidence Reports (CCRs or Water Quality Reports) for the LCWSD and the Knott County Water and Sewer District for the past five reporting years of 2012, 2013, 2014, 2015, and 2016.

The LCWSD CCR for 2012 indicated two violations of turbidity levels for water provided to LCWSD by Knott County (LCWSD 2012). The LCWSD discussed the violation for the Knott County turbidity exceedance in its CCR; however, it received a violation in 2013 for failing to mail a required public notice to its customers (LCWSD 2013). LCWSD also had an issue in 2014 for failing to submit reports to the drinking water database on time (LCWSC 2014). In 2015, LCWSD had a violation for exceeding the standard level of haloacetic acid (HAA) (LCWSD 2015a). LCWSD exceeded the standard levels of HAA and total trihalomethanes (TTHM) in 2016 (LCWSD 2016). Both HAA and TTHM are byproducts of chlorine disinfection.

The Knott County Water and Sewer District CCR for 2012 indicates their system exceeded the turbidity standard on two occasions, as mentioned above (Knott County Water District 2012). In 2013, Knott County had no water quality violations; however, they were cited for failing to provide their customers with a CCR (Knott County Water and Sewer District 2013). In 2014, 2015, and 2016, the Knott County Water and Sewer District had no violations (LCWSD 2014; Knott County Water and Sewer District 2015, 2016).

Knott County Water and Sewer District has a withdrawal permit of 4 million gallons per day. Current usage between Knott County and the LCWSD is approximately 2 million gallons per day (LCWSD 2015b).
The LCWSD is planning to extend their water service to the eastern property boundary of the proposed Roxana site. The water main would be 8 inches in diameter and water pressure near the connection point would be approximately 110 pounds per square inch. Potable water would be provided by the LCWSD via this connection at the eastern property boundary (Cardno 2014a). In addition to the water line extensions, the project would also install a 300,000 gallon water storage tank and a booster pump station (Kentucky Infrastructure Authority 2017). The LCWSD anticipates the water line extension, water storage tank, and booster pump station would be funded through the Abandoned Mine Land Reclamation Economic Development Pilot Program (LCWSD 2017b).

Because municipally supplied water in Knott County is drawn from surface waters of the North Fork of the Kentucky River, indirect impacts to public health have the potential to occur if drinking water quality were to be compromised by coal mining or other activities in the watershed (LCWSD 2015a). The water supply would need be treated to meet drinking water standards prior to distribution to consumers. If drinking water standards cannot be met a public health advisory would be issued and consumers would be advised as to how to further treat the water at home (i.e., boiling) or a consumption ban would be implemented and consumers would be provided with bottled water (KDEP 2015).

### 3.5.1.2 Wastewater

The LCWSD provides sanitary sewer service to the Roxana area. As with the water service, the LCWSD is currently extending their wastewater collection service in the area of the Roxana site. The closest existing connection is approximately 2.75 miles from the Roxana site (Figure 3-5). The LCWSD does not currently have plans to extend the sanitary sewer service to the property boundary of the Roxana site (Cardno 2014a). In autumn 2016, the LCWSD began planning for the construction of a new wastewater treatment plant (WWTP) in Roxana, which was determined to be more viable and cost effective than extending existing sanitary sewer infrastructure. LCWSD engineers have surveyed a few sites for the new WWTP, but as of June 2017, no site had been chosen (LCWSD 2017b). The LCWSD has a permitted capacity of 600,000 gallons per day and currently treats approximately 300,000 gallons per day (City of Whitesburg 2015).

### 3.5.1.3 Natural Gas

The Roxana site contains multiple (10) gas wells and transmission lines, a natural gas compressor station, and an oil well. There are multiple owners and lessors (Cardno 2016b). Gas transmission lines and two gas wells are also adjacent to the Roxana site.

### 3.5.1.4 Electricity

American Electric Power lines extend along KY 160 and Big Branch-Tolson Creek Road in the vicinity of the Roxana site (Figure 3-5) and has sufficient capacity to supply power to the Roxana site (Cardno 2014a).

### 3.5.1.5 Telecommunications

Birch Communications provides telecommunications services to the area where the Roxana site is located. The existing infrastructure has the carrying capacity to provide telecommunications service to the Roxana site (Cardno 2014a).
Figure 3-5. Roxana Existing Utilities
3.5.1.6 Solid Waste

Solid waste generated within Letcher County is disposed of at the Laurel Ridge Landfill in London, Kentucky, approximately 90 miles west of Whitesburg (Laurel Ridge Landfill 2014). The Laurel Ridge Landfill has a maximum annual limit of 350,000 tons. The landfill currently receives approximately 320,000 tons annually. Based on their current capacity, the landfill has a 30-year life expectancy.

3.5.2 Environmental Consequences

The utility usage estimated in the following sections is based on the provision of utilities to similar types and sizes of existing Bureau facilities (Cardno 2014a; see Appendix D, Enhanced Utility Report). The Bureau incorporates energy savings in its design to reduce energy and water consumption (refer to Section 2.1, Proposed Action). Therefore, actual usage could be considerably less based on energy efficient considerations that would be evaluated by the Bureau during design. All utility use would be metered and the Bureau would be invoiced based on actual usage.

The Bureau would solicit for utility services to support the day-to-day operations of the institution. Infrastructure improvements associated with the service requirements of the institution would be part of the overall solicitation process. The Bureau would pay the rates and fees assessed by the County for utility services.

3.5.2.1 Potable Water

The LCWSD has assured the Bureau that the Knott County Water and Sewer District, the supplier of potable water to the LCWSD for the Roxana site, has resolved past water quality issues and should not have further violations of drinking water quality standards (LCWSD 2015b). The most recent water quality reports for the Knott County Water and Sewer District (2013–2016) indicate no violations of drinking water standards. Therefore, implementation of Modified Alternative 2 – Roxana would have no significant impacts related to water quality.

The USP and FPC are anticipated to require 214 gallons per day per inmate. Based on an anticipated inmate population of 1,200, a total of 258,000 gallons per day would be required under the proposed action. Additionally, the utility plant, warehouses, and training building would require approximately 6,160 gallons per day. Therefore, operation of the proposed federal correctional facility would require approximately 264,000 gallons of potable water per day. The Knott County Water and Sewer District has a withdrawal permit of 4 million gallons per day. Current usage between Knott County and LCWSD is approximately 2 million gallons per day; therefore, available capacity is 2 million gallons per day. The LCWSD does not have a limit on the amount of water it can purchase (LCWSD 2015b). The proposed action requirement for 264,000 gallons per day is well within the available capacity. Therefore, the additional usage by the USP, FPC, and ancillary facilities would not result in significant impacts to the water supply under Modified Alternative 2 – Roxana.

3.5.2.2 Wastewater

Implementation of the proposed action under Modified Alternative 2 – Roxana would generate approximately 224,000 gallons per day of wastewater. This would increase wastewater treatment at the LCWSD to 524,000 gallons per day, which would not result in the LCWSD exceeding their permitted capacity of 600,000 gallons per day. As planned for by the LCWSD, the new WWTP in Roxana would add 300,000 gallons per day of additional capacity, and could service the new federal correctional facility (Bell
Engineering 2017; Kentucky Infrastructure Authority 2017). Therefore, no significant impacts to wastewater would occur under Modified Alternative 2 – Roxana.

3.5.2.3 Natural Gas

Implementation of the proposed action under Modified Alternative 2 – Roxana may require the closure and plugging of up to 12 gas wells (10 on-site and 2 adjacent) and an oil well, and closure or relocation of associated pipelines and compressor station that are located within or adjacent to the Roxana site. It would take approximately six months to close these wells. Closure of the gas wells would result in significant impacts to the owners and lessors of the gas wells. The Bureau would be able to connect to the natural gas distribution system located adjacent to the Roxana property for the cost of the meter and tap. There is sufficient natural gas available and, therefore, the use of natural gas at the USP and FPC would not significantly impact natural gas availability.

3.5.2.4 Electricity

The existing infrastructure has ample capacity to provide electrical power to the federal correctional facility. The electrical provider would extend overhead lines to a predetermined handoff point to the secure perimeter of the facility, and the Bureau would extend the service on-site to the needed facilities. There would be no charge to extend the overhead lines to the handoff point (Cardno 2014a). As there are no issues with capacity, no significant impacts to electrical capacity would occur under Modified Alternative 2 – Roxana.

3.5.2.5 Telecommunications

Implementation of the proposed action under Modified Alternative 2 – Roxana would not result in significant impacts to the available capacity of the existing telecommunications infrastructure; however, in order to provide the service a new remote terminal would need to be constructed, as well as the installation of approximately 6.4 kilometers (4 miles) of fiber optic cables and 0.8 kilometer (0.5 mile) of copper cable. Construction of the terminal and cables and installation costs would be the responsibility of the Bureau (Cardno 2014a).

3.5.2.6 Solid Waste

The Bureau estimates that an inmate would generate 4 pounds of solid waste per day or 1,460 pounds per year. With an estimated 1,200 inmates, the proposed action would generate 4,800 pounds per day of solid waste, or 1,752,000 pounds per year (876 TPY). The solid waste generated at the federal correctional facility would increase the amount of solid waste taken to the Laurel Ridge Landfill from 320,000 TPY to 320,876 TPY. This increase would not result in the landfill exceeding its current yearly maximum intake of solid waste; therefore, there would be no significant adverse impacts to the Laurel Ridge Landfill from implementation of Modified Alternative 2 – Roxana.

3.5.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed and associated operational activities would not occur. It is anticipated that utility usage would remain similar to existing usage. Therefore, no impacts to utilities would occur.
3.5.4 Mitigation

Mitigation for impacts to the natural gas infrastructure at the Roxana site would require the Bureau to pay the owners for the costs associated with closure, abandonment, and/or relocation of the wells and associated pipelines. All wells required to be closed on the Roxana site would be permanently closed and abandoned and the pipelines closed or relocated according to standards required by federal and state regulations. Groundwater at the Roxana site would not be used for any purpose at the USP or FPC. No other mitigation would be required.

3.6 Cultural Resources

Cultural resources are defined as prehistoric and historic archaeological sites; historic buildings, structures, objects, and districts; or other physical evidence of human activity that are considered important to a culture or community for scientific, traditional, or religious reasons. Cultural resources can be categorized as archaeological resources (prehistoric and historic), architectural resources, and traditional cultural properties (TCPs).

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and as implemented by 36 CFR 800, requires federal agencies to consider the effects of their actions on cultural resources listed in or eligible for listing in the National Register of Historic Places (NRHP) (i.e., historic properties) before undertaking a project that uses federal funds or is located on federal lands. Each state or territory has a State Historic Preservation Officer (SHPO) that is responsible for administering cultural resources programs within a given jurisdiction; the Kentucky SHPO is the Kentucky Heritage Council. NHPA requires federal agencies to consult with the SHPO, Indian Tribes, representatives of local governments, and the public in a manner appropriate to the agency planning process for the planned action, and to the nature of the undertaking and its potential to cause effects on historic properties.

The following sections focus on archaeological resources. The information presented in the 2016 RFEIS concerning architectural resources and TCPs is still applicable. In summary, no architectural resources eligible for listing in the NRHP were identified as a result of previous surveys conducted for the proposed action, and no TCPs have been identified in or near the proposed Roxana site. Therefore, there would be no impacts to architectural resources or TCPs from the Modified Alternative 2 – Roxana.

3.6.1 Affected Environment

The affected environment for cultural resources is also referred to as the area of potential effects (APE). An APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist (36 CFR 800.16[d]). Effects to archaeological resources would be limited to the approximate 73-hectare (181-acre) area where construction (direct ground disturbance) would occur (refer to the approximate clearing and grading limit shown on Figure 2-5).

Mapping, aerial photos, background research, and pedestrian reconnaissance surveys conducted in August 2011 and August 2014 indicated that the Roxana site has been completely disturbed by former surface mining activities. Combined, the APE for both surveys encompassed 70 hectares (174 acres). Photodocumentation was conducted at the site; however, no subsurface testing was completed. Background research indicated that no previously identified archaeological sites are present at the proposed Roxana site. The 2011 and 2014 archaeological reconnaissance surveys did not identify any archaeological resources at...
Additional archaeological survey was conducted between November 29 and December 2, 2016 at the proposed Roxana site to include those portions of the modified site layout that extend outside of the APEs of the 2011 and 2014 surveys. The survey consisted of pedestrian reconnaissance of an additional 20 hectares (50 acres). The survey did not identify any archaeological sites; however, a cemetery located approximately 30.5 meters (100 feet) east of the proposed access road in the northern part of the APE was photo-documented. At the request of the SHPO, a survey form and supplemental documentation on the Frazier Cemetery was prepared and submitted to the SHPO. The cemetery was recommended not eligible to the NRHP. No further work was recommended for the Roxana site (Cardno 2017).

3.6.2 Environmental Consequences

The archaeological surveys for the proposed action did not identify any archaeological sites eligible for inclusion in the NRHP in the APE for the Roxana site. The SHPO concurred the Frazier Cemetery is not eligible for inclusion in the NRHP. Therefore, Modified Alternative 2 – Roxana would have no effect on NRHP-listed or eligible cultural resources. The conceptual design plan for the proposed federal correctional facility includes a 100-foot buffer around the documented cemetery. The Bureau would stipulate maintaining a 100-foot buffer between access road construction activities and the cemetery in the design-build contract. Therefore, Modified Alternative 2 – Roxana would have no effect on historic properties. The SHPO concurred with the finding of No Effect to Historic Properties (Kentucky Heritage Council 2017) (refer to Appendix E, NHPA Correspondence). There would be no significant impacts to cultural resources from implementation of Modified Alternative 2 – Roxana.

3.6.3 No Action Alternative

Under the No Action Alternative, the Bureau would not develop USP and FPC and would not acquire the land at the Roxana site. Therefore, no potential impacts to cultural resources would occur.

3.6.4 Mitigation

Modified Alternative 2 – Roxana would have no impact to NRHP-listed or eligible cultural resources; therefore, no mitigation is required.

3.7 Water Resources

Water resources include both surface and subsurface water. For the purposes of this 2017 Final Supplemental RFEIS, water resources include the following topics: surface water, wetlands, groundwater, and floodplains.

3.7.1 Affected Environment

3.7.1.1 Surface Water

Wetlands, lakes, ponds, impoundments, rivers, and streams compose surface water resources that are important for economic, ecological, recreational, and human health reasons. According to the U.S. Army Corps of Engineers (USACE), streams are drainage features that may contain perennial streams (permanent flows), intermittent streams (flows during much of the year but drying seasonally), or ephemeral streams (flows only after storm events). Ponds are open water bodies (USACE 1987).
Waters of the U.S. are defined as (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries under Section 404 of the CWA, as amended, and are regulated by the USEPA and the USACE.

The U.S. is divided and sub-divided into successively smaller hydrologic units, which are classified into six levels: regions, sub-regions, basins, sub-basins, watersheds, and sub-watersheds. The Roxana site lies in the North Fork Kentucky River Watershed (Hydrologic Unit Code [HUC] 05100201) of the Ohio Region (HUC 05), Kentucky-Licking Subregion (HUC 0510), and Kentucky River Basin (HUC 051002) (USEPA 2013). As a result of surface mining of a portion of the mountain, the hydrology of the site has been greatly disturbed. There are several ephemeral, intermittent, and perennial unnamed, small streams within the proposed project area. Additionally, an open water wetland (pond) comprising approximately 0.17 hectare (0.41 acre) is located along the eastern boundary, north of Rise Branch.

Water quality refers to the suitability of water for a particular use (i.e., potable water, irrigation) based on selected physical, chemical, and biological characteristics. For the purposes of this 2017 Final Supplemental RFEIS, water quality is considered with the statutory requirements regarding water quality conditions. Water quality is regulated under the Federal Water Pollution Control Act, as amended by the CWA. The CWA prohibits spills, leaks, or other discharges of oil or hazardous substances into the waters of the U.S. in quantities that may be harmful. The CWA also requires each state to establish water quality standards for its surface waters derived from the amount of pollutants that can be assimilated by a body of water without deterioration of a designated use. Waters not meeting the water quality standards may require the establishment of a total maximum daily load (TMDL) for the waterbody. Impaired waters requiring a TMDL are called 303(d) listed waters (KDEP 2016).

Water quality of the streams on the Roxana site has not been assessed by the USEPA, and there are no identified impaired waters or TMDLs for the Roxana site (USEPA 2013). The closest assessed water body to the Roxana site is the North Fork of the Kentucky River, located on the opposite side of KY 588 and KY 160. The North Fork of the Kentucky River was assessed for primary contact recreation and was determined to be impaired as a result of elevated levels of fecal coliform. The elevated levels of fecal coliform were believed to be the result of point source discharges from sewage package plants (USEPA 2013).

Mining operations have the potential to affect water quality of the North Fork Kentucky River Watershed. There are five active mining operations in the watershed. These mining operations have no direct impacts on water quality of the Roxana site due to their distance (approximately 1.6 kilometer [1 mile] or greater) and hydrological separation from the site. Because municipally supplied water is drawn from the North Fork in Letcher County, indirect impacts to public health have the potential to occur if drinking water quality were to be compromised by coal mining or other activities in the North Fork watershed. The water supply would need to be treated to meet drinking water standards prior to distribution to consumers. If drinking water standards cannot be met, a public health advisory would be issued and consumers would be advised as to how to further treat the water at home (i.e., boiling) or a consumption ban would be implemented and consumers would be provided with bottled water (KDEP 2015). The potable water supply is discussed further in Section 3.5, Infrastructure and Utilities.

Regular post-mining surface water monitoring was conducted on the Roxana site in the mid-1990s. Results from mining permit-related water quality reports from 1993 to 1995 show the waters exhibited net alkalinity
and moderate pH values, indicating alkaline-rich minerals that neutralize acid production, and low iron and manganese, indicating low dissolved metals concentrations in general (Cardno 2016c). This condition signifies that any acidity generated upon initial exposure of the rock was fully neutralized by the inherent alkalinity, such that acidic and/or metals-rich discharges did not occur.

An investigation of the previous surface mining-related overburden at the Roxana site was conducted in November 2015 and finalized in January 2016 (see Appendix F) to determine the geochemical character of the rock rubble and whether its excavation and on-site relocation for development of the proposed federal correctional facility would be likely to generate material environmental impacts on the site and/or to streams receiving drainage from the redistributed material. The investigation included subsurface sampling of the rubble material itself and sampling of existing water discharges on the site to document existing surface and groundwater quality and determine whether there is likelihood of acid mine drainage, including dissolution of metals of possible health concern.

For the water sampling, water samples were collected from six different locations on the site: the discharges of three hollow fills in the east, southeast, and northwest portions of the site, the eastern hollow fill discharge below the pond, and the mouths of the two small streams flowing westerly from the site. The water samples were analyzed for general chemistry, including metals, to document existing water quality and identify indications of water quality impacts from contact with the mine overburden. Analysis of the water samples shows the existing water in the hollow fill discharges contains elevated levels of total dissolved solids and sulfate, indicating a high degree of weathering has occurred since mining and the continued flushing out of weathering-produced dissolved sulfidic minerals. However, the water also contains substantial acid-neutralizing minerals (principally calcium and magnesium), which fully neutralize any acidic drainage generated during the weathering process. Specifically, the results of the samples indicate there are no concentrations of metals at levels of human health concern in water that has percolated through the rock rubble (Cardno 2016c).

The subsurface sampling of the rock rubble consisted of drilling six boreholes in the areas of past surface mining. Forty-five rock samples from the six borings were tested to determine the acid-production or acid-neutralization potential of the mine overburden material. The results of the boring sample tests indicate the sampled material is relatively low in sulfur content, with very low potential to generate acidic drainage. Additionally, the rock that would be excavated and relocated is generally well-weathered material that contains more acid-neutralizing than acid-generating potential, and thus, is likely to produce neutral or somewhat alkaline drainage upon weathering, rather than acid drainage (Cardno 2016c). That finding is consistent with that of the water sampling program. No significant change in water quality is expected to result from redistribution of the rubble material. A detailed report on the results of the investigation is provided in Appendix F, Investigation of Rock Rubble Material, Roxana Site.

3.7.1.2 Wetlands

According to USACE regulations, wetlands are those areas that are inundated or saturated by surface or groundwater 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 are generally associated with drainages, stream channels, and water discharge areas (natural and built) and are currently regulated by the USACE under Section 404 of the CWA as a subset of all “waters of the U.S.” EO 11990, Protection of Wetlands, directs federal agencies to take action to minimize the destruction, loss, or degradation of wetlands on their property and mandates review of proposed actions on wetlands through
procedures established by NEPA. It requires that federal agencies establish and implement procedures to minimize development in wetlands. Wetlands provide many functions and values such as flood flow alteration, groundwater recharge/discharge, and fish and wildlife habitat.

Site-specific wetland data was collected through on-site field work, aerial photographs, topographic maps, National Wetland Inventory wetland maps, and NRCS soil surveys. Wetland delineations on the Roxana site were conducted in May 2011 and August 2014, and included identification of waters of the U.S. The USACE reviewed the delineation in the field in May 2015 and issued a preliminary jurisdictional determination for the Roxana site in February 2016. A supplemental jurisdictional delineation was completed as an addendum to the 2011 and 2014 delineations to identify potential waters of the U.S. that occur in areas within the current boundary of the Roxana site that were not previously analyzed. The USACE reviewed the supplemental delineation in the field in November 2016, and issued a preliminary jurisdictional determination, which confirms the limits of wetlands and streams identified in the supplemental delineation and the two previous delineations, in January 2017 (Appendix G, *Wetland Delineations and Jurisdictional Determinations*).

Approximately 1.3 hectares (3.1 acres) of wetlands and 21,000 feet of streams were delineated on the Roxana site (Table 3-10). Figure 3-6 depicts wetlands and streams delineated within the Roxana site. The majority of the wetlands are located within the west side of the site and the south-central portion. In addition, several intermittent, perennial, and ephemeral streams were delineated on-site (TEC, Inc. 2011b; Cardno 2014c; Cardno 2016d). Hydrology supporting the wetlands on the Roxana site is a result of surface runoff from the surrounding lands, groundwater, and direct precipitation. Dominant vegetation within the wetlands identified on the Roxana site includes American beech (*Fagus grandifolia*), American sycamore (*Platanus occidentalis*), eastern red cedar (*Juniperus virginiana*), red maple (*Acer rubrum*), tulip tree (*Liriodendron tulipifera*), Christmas fern (*Polystichum acrostichoides*), common jewelweed (*Impatiens capensis*), smallspike false nettle (*Boehmeria cylindrica*), spicebush (*Lindera benzoin*), Nepalese browntop (*Microstegium vimineum*), stinging nettle (*Urtica dioica*), and woolgrass (*Scirpus cyperinus*).

| Table 3-10. Wetlands and Streams Delineated at the Roxana Site (2011, 2014, 2016) |
|-------------------------------|-----------------|-----------------|
| Feature Type                  | Hectares/Acres  | Meters/Linear Feet |
| Wetlands                      |                 |                 |
| Palustrine Emergent           | 0.39/0.97       | N/a             |
| Palustrine Scrub-Shrub        | 0.57/1.41       | N/a             |
| Palustrine Forested           | 0.30/0.73       | N/a             |
| **Total**                    | 1.3/3.1         | --              |
| Streams                       |                 |                 |
| Jurisdictional Stream         | N/a             | 6,361/20,868    |
| Non-Jurisdictional Stream     | N/a             | 55/182          |
| **Total**                    | --              | 6,416/21,050    |

*Notes*: N/a = Not applicable.
Figure 3-6. Roxana Wetlands and Streams
3.7.1.3 Groundwater

Groundwater is water that flows or seeps downward and saturates soil or rock, supplying springs and wells. Groundwater is used for water consumption, agricultural irrigation, and industrial applications. The principal federal regulation concerning the protection of groundwater is the Safe Drinking Water Act of 1974 (42 USC §§ 300 et seq.; amended in 1986 and 1996). This act was set forth to protect the nation’s public water supplies, including groundwater in areas where it is the main potable water source. The USEPA and the KDEP Division of Water enforce Safe Drinking Water Act standards and related legislation to protect public health.

There are no groundwater wells on the Roxana site, but there is a domestic single household well located approximately 76 meters (250 feet) north of the site at an elevation of 366 meters (1,200 feet) with a depth to water of 24 meters (80 feet) (KGS 2015). Groundwater flow tends to follow the sloped topography and is assumed to flow to the north, east, and west towards the North Fork Kentucky River, Kings Creek, and Tolson Branch, respectively. Variations in groundwater conditions are expected based on location and elevation across the site, seasonal conditions, and weather patterns. The Roxana site is underlain by subsurface geology of the Breathitt Group, which is comprised of the Pikeville Formation and the Hyden Formation, and the Four Corners Formation. The Breathitt Group yields more than 500 gallons of groundwater per day in more than three-quarters of the wells drilled in valley bottoms, more than 500 gallons per day in about three-quarters of the wells on hillsides, and more than 100 gallons per day to nearly all wells on ridges within Letcher County (KGS 2015). There are no sole source aquifers underlying the site (USEPA 2016b).

The quality of the groundwater in Letcher County ranges from moderately hard in most of the county to moderately soft south of Pine Mountain. Naturally occurring contaminants present in the groundwater consist of sulfate, salt (sodium chloride), iron, and manganese (KGS 2015). According to the Kentucky Division of Water, Groundwater Branch, Letcher County has areas of moderate and high sensitivity to groundwater pollution. The hydrogeologic sensitivity reflects the ease and speed with which a contaminant can move into and within a groundwater system. The hydrogeologic sensitivity of Letcher County has been assigned a value of three out of five, with five being the most susceptible to groundwater pollution and one being the least susceptible. The region is given a three due to subcutaneous drain and enlarged fractures influence groundwater recharge, fissure networks influence flow, and bidirectional dispersal patterns influence overall dispersion (KDEP 1994).

As described above in Section 5.10.1.1, Surface Water, the rock overburden from previous surface mining consists of well-weathered material with significant amounts of acid-neutralizing minerals. The six water samples from the site confirm that any acid production from the weathering process has been completely neutralized (refer to Appendix F, Investigation of Rock Rubble Material, Roxana Site).

Analysis of the results of the water samples also indicates there has been no impact to groundwater quality from the existing gas wells within the site (refer to Section 5.8.1.3, Natural Gas), as the samples contain very low concentrations of sodium, chloride, and barium, parameters that are often indicators of leakage from gas or oil wells (Cardno 2016c).

3.7.1.4 Floodplains

EO 11988, Floodplain Management, defines floodplains as the lowland and relatively flat areas adjoining inland waters, including at a minimum, that area subject to a 1 percent or greater chance of flooding in any
given year. The area subject to a 1 percent chance of flooding is referred to as the 100-year floodplain. EO 11988 directs federal agencies to avoid construction in floodplains and establishes a process for analysis and public notice if development is unavoidable.

Floodplain delineation maps produced by the Federal Emergency Management Agency indicate the Roxana site is not located in a 100-year floodplain (Environmental Data Resources 2015).

### 3.7.2 Environmental Consequences

#### 3.7.2.1 Surface Water

It is not anticipated that water quality of nearby streams and wetlands would be adversely impacted by on-site construction. BMPs would be implemented based on an approved erosion and sediment control plan, which would minimize sediment and pollutants from the construction site being carried into nearby water courses.

An investigation of the previous surface mining-related overburden at the Roxana site and water discharges at the hollow fills around the perimeter of the reclaimed mine site indicates a very low likelihood that acid mine drainage would be generated by the excavation and on-site relocation of the rock material for development of Modified Alternative 2 – Roxana (Appendix F, Investigation of Rock Rubble Material, Roxana Site). The sampled rock from the deep borings consists of well-weathered, low-reactivity material exhibiting more acid-neutralizing potential than acid-generating potential, and poses no significant risk of producing acidic drainage or drainage with significant levels of dissolved metals of concern to human health in occupancy of the site. Furthermore, there are no concentrations of metals at levels of potential human health concern in water that has drained through the rubble rock material. The water quality of current drainage is similar to that which existed after surface mining operations ended, and would not be substantially affected by the proposed modified site development activities. Therefore, under Modified Alternative 2 – Roxana, construction of the USP and FPC would not result in significant impacts to surface water quality.

#### 3.7.2.2 Wetlands

Implementation of Modified Alternative 2 – Roxana with the revised site layout would result in permanent impacts to approximately 1,710 meters (5,610 linear feet) of stream and 0.98 hectare (2.44 acres) of wetlands (0.26 hectare [0.65 acre] of emergent wetlands, 0.57 hectare [1.40 acres] of scrub-shrub wetlands, and 0.16 hectare [0.39 acre] of forested wetlands). These impacts would be to the streams and wetlands delineated in 2011, 2014, and 2016 (Table 3-10) and would result primarily from the excavation and grading activities that would be required to prepare the site for the development of the USP, FPC, and ancillary facilities. Impacts to approximately 253 linear feet of streams would be minimized by restricting grading and thinning trees (rather than clearing) within the 91-meter (300-foot) buffer area on the west side of the USP.

The Bureau would obtain a permit for streams and wetlands impacts from the USACE under CWA Sections 401 and 404, which would require full mitigation of impacts. Mitigation is discussed in Section 3.7.4. Due to the mitigation planned as part of the proposed action, the adverse impacts to streams and wetlands would be considered less than significant.
3.7.2.3 Groundwater

The Bureau would prepare and implement a groundwater protection plan in accordance with Kentucky regulations (401 K AR 5:037) to protect groundwater quality during construction and operation of the federal correctional facility under Modified Alternative 2 – Roxana. The site-specific groundwater protection plan would describe the activities that have the potential to pollute groundwater and include the measures and practices that would be implemented during construction and operation of the facility such as providing secondary containment for petroleum storage tanks. Groundwater at the Roxana site would not be used for any purpose at the USP or FPC; therefore, there would not be human health impacts associated with groundwater use, nor would there be direct or indirect impacts to groundwater quality. Therefore, construction and operation of the USP and FPC under Modified Alternative 2 – Roxana would have no significant impacts related to groundwater.

As discussed above under Surface Water, an investigation of the previous surface mining-related overburden on the Roxana site and water discharges at the hollow fills (Appendix F, Investigation of Rock Rubble Material, Roxana Site) indicates that the modified site development activities would not impact the quality of water that seeps into groundwater. Therefore, under Modified Alternative 2 – Roxana, construction of the USP and FPC would not result in significant impacts to groundwater quality.

As discussed in Section 5.8.2.3, Natural Gas, under Modified Alternative 2 some or all of the gas wells on the Roxana site would be permanently closed and plugged, and associated transmission lines closed or relocated. The test results of the water discharge samples from the Roxana site reveal that the water includes very low concentrations of sodium, chloride, and barium. This finding indicates that there is no significant or detectable impact from deep saline waters that may have been encountered with installation of the gas wells at the site. Their closure would ensure that no such impact is likely to occur in the future.

3.7.2.4 Floodplains

The Roxana site is not located within a 100-year floodplain; therefore, no impacts to floodplains would occur under Modified Alternative 2 – Roxana.

3.7.3 No Action Alternative

Under the No Action Alternative, a USP and FPC would not be developed and no impacts to water resources would occur.

3.7.4 Mitigation

The Bureau would mitigate wetland and stream impacts under Modified Alternative 2 – Roxana by paying a fee into the in-lieu fee mitigation program managed by the Kentucky Department of Fish and Wildlife Resources. The Bureau would contact the Kentucky Department of Fish and Wildlife Resources to determine the current in-lieu fee mitigation rates at the time it prepares the Section 404 permit. The Bureau would also comply with any additional terms and mitigation required by the Section 404 permit.

3.8 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats where they occur. For purposes of this 2017 Final Supplemental RFEIS, these resources are divided into three major categories: vegetation, wildlife, and threatened and endangered species. Vegetation includes terrestrial plant communities. The analysis focuses on vegetation types that are important to the function of the ecosystem or are protected under federal or state law. Wildlife includes all vertebrate animals (i.e.,
mammals, reptiles, amphibians, birds, and fish) and sometimes invertebrate species or species groups such as mollusks or insects. Threatened and endangered species include plant and animal species that are listed or proposed for listing by the USFWS under the ESA. The federal ESA provides for the conservation of threatened and endangered species of plants and animals and the habitats where they are found. Critical habitat is a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

### 3.8.1 Affected Environment

#### 3.8.1.1 Vegetation

A large portion of the Roxana site has been disturbed by historic mining activities, which created a relatively level area on the mountaintop. A site visit indicated a level portion of the site is farmed and portions not under agriculture are routinely bush hogged or are dominated by scrub shrub vegetation (e.g., autumn olive, multiflora rose, etc.) and immature trees. The mountain slopes are primarily forested with the exception of slopes created by fill from mining; these slopes are dominated by invasive species such as autumn olive (*Elaeagnus umbellata*) and paradise tree (*Ailanthus altissima*). Upland vegetation includes northern red oak (*Quercus rubra*), eastern red cedar, sericea lespedeza (*Lespedeza cuneata*), paradise tree, Allegheny blackberry (*Rubus allegheniensis*), Virginia pine (*Pinus virginiana*), bluestem broomsedge (*Andropogon virginicus*), tuliptree, American beech, Virginia creeper (*Parthenocissus quinquefolia*), Ohio buckeye (*Aesculus glabra*), red maple, stinging nettle, and Christmas fern. Wetland vegetation at the Roxana site includes American sycamore, woolgrass, black willow (*Salix nigra*), spicebush, Nepalese browntop, smallspike false nettle, and cinnamon fern (*Osmunda cinnamomea*).

#### 3.8.1.2 Wildlife

Non-avian species likely to be found on the Roxana site include coyote (*Canis latrans*), Virginia opossum (*Didelphis virginiana*), American black bear (*Ursus americanus*), eastern gray squirrel (*Sciurus carolinensis*), southern flying squirrel (*Glaucomys volans*), eastern spotted skunk (*Spilogale putorius*), white tailed deer (*Odocoileus virginianus*), green frog (*Rana clamitans melanota*), American toad (*Bufo americanus*), black rat snake (*Elaphe obsoleta obsolete*), copperhead (*Agkistrodon contortrix*), eastern hognose snake (*Heterodon platirhinos*), and fence lizard (*Sceloporus undulate*) (Kentucky Department of Fish and Wildlife Resources 2014).

The Migratory Bird Treaty Act is the primary legislation established to conserve migratory birds. The act prohibits taking, killing, or possessing migratory birds unless permitted by regulation. Representative migratory bird species potentially occurring in Letcher County and within the project area include red-tailed hawk (*Buteo jamaicensis*), bald eagle (*Haliaeetus leucocephalus*), black-billed cuckoo (*Coccyzus erythropthalmus*), blue-winged warbler (*Vermivora pinus*), cerulean warbler (*Dendroica cerulea*), Kentucky warbler (*Oporornis formosus*), prairie warbler (*Dendroica discolor*), Swainson’s warbler (*Locothlypis swainsonii*), worm eating warbler (*Helmitheros vermivorum*), fox sparrow (*Passerella iliaca*), wood thrush (*Hylocichia mustelina*), Louisiana waterthrush (*Parkesia motacilla*), least bittern (*Ixobrychus exilis*), red-winged blackbird (*Agelaius phoeniceus*), rusty blackbird (*Euphagus carolinus*), willow flycatcher (*Empidonax traillii*), loggerhead shrike (*Lanius ludovicianus*), wild turkey (*Meleagris gallopavo*), and short-eared owl (*Asio flammeus*) (USFWS 2015a).
3.8.1.3 Threatened and Endangered Species

Table 3-11 provides federally and state-listed species documented as potentially occurring in Letcher County.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Status (State/Federal)</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Liverworts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plagiochila caduciloba</td>
<td>Gorge Leafy Liverwort</td>
<td>E/-</td>
<td>Bare rock/talus/scree in mixed hardwood forest</td>
</tr>
<tr>
<td><strong>Mosses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anomodon rugelii</td>
<td>None</td>
<td>T/-</td>
<td>Rocks and tree bases in woodlands and forests</td>
</tr>
<tr>
<td>Brachythecium populeum</td>
<td>Matted Feather Moss</td>
<td>E/-</td>
<td>Rocks and tree trunks in woods and hedge banks</td>
</tr>
<tr>
<td>Cirriphyllum piliferum</td>
<td>None</td>
<td>T/-</td>
<td>Rocks, ground, banks in mixed woodland</td>
</tr>
<tr>
<td>Dicranodontium asperulum</td>
<td>None</td>
<td>E/-</td>
<td>Organic soils in montane heath, gullies, and ledges</td>
</tr>
<tr>
<td>Entodon brevisetus</td>
<td>None</td>
<td>E/-</td>
<td>Bark of hardwood trees, logs or stumps, and rock</td>
</tr>
<tr>
<td>Neckera pennata</td>
<td>None</td>
<td>T/-</td>
<td>Bark of hardwood trees, logs or stumps, and rock</td>
</tr>
<tr>
<td>Oncophorus rauii</td>
<td>None</td>
<td>E/-</td>
<td>Damp acid rocks, mostly on cliffs in the mountains</td>
</tr>
<tr>
<td>Polytrichum pallidisetum</td>
<td>A Hair Cap Moss</td>
<td>T/-</td>
<td>Rocks and tree trunks in mixed woods</td>
</tr>
<tr>
<td>Polytrichum strictum</td>
<td>None</td>
<td>E/-</td>
<td>Organic soils in coastal and montane bogs</td>
</tr>
<tr>
<td>Sphagnum quinquefarium</td>
<td>Five-ranked Bogmoss</td>
<td>E/-</td>
<td>Well-drained soil on banks in woodlands</td>
</tr>
<tr>
<td><strong>Vascular Plants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angelica triquinata</td>
<td>Filmy Angelica</td>
<td>E/-</td>
<td>Hardwood forests, spruce and spruce-fir forests, shrub and grass balds, rock outcrops, and stream banks</td>
</tr>
<tr>
<td>Aralia nudicaulis</td>
<td>Wild Sarsaparilla</td>
<td>T/-</td>
<td>Mixed woodlands, swamps, and bogs</td>
</tr>
<tr>
<td>Baptisia tinctoria</td>
<td>Yellow Wild Indigo</td>
<td>T/-</td>
<td>Grassland, meadows and fields, woodlands</td>
</tr>
<tr>
<td>Botrychium matricariifolium</td>
<td>Matricary Grape-fern</td>
<td>E/-</td>
<td>Deep forests, forest edges, grassy meadows and roadsides</td>
</tr>
<tr>
<td>Boykinia aconitifolia</td>
<td>Brook Saxifrage</td>
<td>E/-</td>
<td>Forested seeps and seepage swamps, rocky stream banks, and crevices of wet cliffs</td>
</tr>
<tr>
<td>Carex appalachica</td>
<td>Appalachian Sedge</td>
<td>T/-</td>
<td>Montane forests, shaded rock outcrops</td>
</tr>
<tr>
<td>Castanea pumila</td>
<td>Allegheny Chinkapin</td>
<td>T/-</td>
<td>Xeric forests and woodlands, generally in fire-maintained habitats</td>
</tr>
<tr>
<td>Cymophyllus fraserianus</td>
<td>Fraser’s Sedge</td>
<td>E/-</td>
<td>Rich mountain woods; cove forests</td>
</tr>
</tbody>
</table>
### Table 3-11. Potentially Occurring State and Federal Threatened and Endangered Species in Letcher County, Kentucky

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Status (State/Federal)</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cypripedium parviflorum</td>
<td>Small Yellow Lady’s-slipper</td>
<td>T/-</td>
<td>Bogs, mossy swamps and woods, rich mesic forested slopes.</td>
</tr>
<tr>
<td>Eupatorium steelei</td>
<td>Steele’s Joe-pye-weed</td>
<td>T/-</td>
<td>Cove hardwood and northern hardwood forests</td>
</tr>
<tr>
<td>Houstonia serpyllifolia</td>
<td>Michaux’s Bluets</td>
<td>E/-</td>
<td>Streambanks, grassy balds, moist forests, seepy rock outcrops, and moist disturbed areas</td>
</tr>
<tr>
<td>Hydrophyllum virginianum</td>
<td>Eastern Waterleaf</td>
<td>T/-</td>
<td>Moist or wet woods, open wet places.</td>
</tr>
<tr>
<td>Juglans cinerea</td>
<td>White Walnut</td>
<td>T/-</td>
<td>Mesic wooded ravines and alluvial forests</td>
</tr>
<tr>
<td>Leucothoe recurva</td>
<td>Red-twig Doghobble</td>
<td>E/-</td>
<td>Moist areas in mountain woods</td>
</tr>
<tr>
<td>Lilium superbum</td>
<td>Turk’s Cap Lily</td>
<td>T/-</td>
<td>Moist meadows and woods including floodplains and coves</td>
</tr>
<tr>
<td>Listera smallii</td>
<td>Kidney-leaf Twayblade</td>
<td>T/-</td>
<td>Humus of damp woods and thickets</td>
</tr>
<tr>
<td>Monotropis odorata</td>
<td>Sweet Pinesap</td>
<td>T/-</td>
<td>Sandstone ridgetops in woodlands</td>
</tr>
<tr>
<td>Orontium aquaticum</td>
<td>Golden Club</td>
<td>T/-</td>
<td>Swamps and shallow water</td>
</tr>
<tr>
<td>Pogonia ophioglossoides</td>
<td>Rose Pogonia</td>
<td>E/-</td>
<td>Open bogs and wet marshy meadows</td>
</tr>
<tr>
<td>Sanguisorba Canadensis</td>
<td>Canada Burnet</td>
<td>E/-</td>
<td>Marshes, wet meadows, and damp prairies</td>
</tr>
<tr>
<td>Saxifraga michauxii</td>
<td>Michaux’s Saxifrage</td>
<td>T/-</td>
<td>Moist or wet ledges and rocky woods in the mountains</td>
</tr>
<tr>
<td>Saxifraga micranthidifolia</td>
<td>Lettuce-leaf Saxifrage</td>
<td>E/-</td>
<td>Wet banks and rocks in mountain streams</td>
</tr>
<tr>
<td>Trillium undulatum</td>
<td>Painted Trillium</td>
<td>T/-</td>
<td>Mesic ravine forests, upper elevation mesic hemlock forests</td>
</tr>
</tbody>
</table>

**Terrestrial Snails**

| Neohelix dentifera               | Big-tooth Whitelip         | T/-                    | Upland, often rocky forest and woodlands                 |

**Crustaceans**

| Cambarus parvoculus              | Mountain Midget Crayfish   | T/-                    | Rocky streams                                            |

**Insects**

| Amphiagrion saucium              | Eastern Red Damsel         | E/-                    | Spring-fed bogs or pond margins                          |
| Papaipema speciosissima          | Osmunda Borer Moth         | E/-                    | Forested wetlands and scrub/shrub wetlands               |
| Stylurus notatus                 | Elusive Clubtail           | E/-                    | Large, clear rivers with moderate current                |
| Stylurus scudderi                | Zebra Clubtail             | E/-                    | Streams and rivers with slight to moderate current        |

**Fishes**
### Table 3-11. Potentially Occurring State and Federal Threatened and Endangered Species in Letcher County, Kentucky

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Status</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Chrosomus cumberlandensis</em></td>
<td>Blackside Dace</td>
<td>T/T</td>
<td>Clear streams with rocky substrates</td>
</tr>
<tr>
<td><em>Etheostoma spilotum</em></td>
<td>Kentucky Arrow Darter</td>
<td>-/T</td>
<td>Upland creeks and streams, generally in headwaters</td>
</tr>
<tr>
<td><strong>Amphibians</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cryptobranchus alleganiensis</em></td>
<td>Eastern Hellbender</td>
<td>E/-</td>
<td>Fast-flowing streams with abundant cover</td>
</tr>
<tr>
<td><em>Plethodon wehrlei</em></td>
<td>Wehrle’s Salamander</td>
<td>E/-</td>
<td>Mixed deciduous and coniferous forests</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Corvus corax</em></td>
<td>Common Raven</td>
<td>T/-</td>
<td>Many, nests on cliffs</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Myotis grisescens</em></td>
<td>Gray Bat</td>
<td>T/E</td>
<td>Caves with domed halls</td>
</tr>
<tr>
<td><em>Myotis leibii</em></td>
<td>Eastern Small-footed Myotis</td>
<td>T/-</td>
<td>Mountainous areas, in or near deciduous or evergreen forest; roosts in caves and mine tunnels</td>
</tr>
<tr>
<td><em>Myotis septentrionalis</em></td>
<td>Northern Long-Eared Bat</td>
<td>E/T</td>
<td>Forests, woodlots, other wooded areas; hibernate in caves and mines</td>
</tr>
<tr>
<td><em>Myotis sodalis</em></td>
<td>Indiana Bat</td>
<td>E/E</td>
<td>Forests, riparian areas, ponds and fields; hibernate in caves and mines</td>
</tr>
<tr>
<td><em>Sorex dispar blitchi</em></td>
<td>Long-tailed Shrew</td>
<td>E/-</td>
<td>Boulder piles on steep mountain slopes</td>
</tr>
</tbody>
</table>

**Notes:** - = not listed, E = Endangered, T = Threatened; *Although not federally listed as threatened or endangered, the common raven is protected under the federal Migratory Bird Treaty Act.

**Sources:** Kentucky Department of Fish and Wildlife Resources 2014; Kentucky State Nature Preserves Commission 2016; NatureServe 2015a, 2015b.

### Federally Listed Species

Based on coordination with the USFWS, four federally listed species have the potential to occur within the Roxana site: gray bat, Indiana bat, northern long-eared bat, and Kentucky arrow darter (USFWS 2014) (see Appendix H, *USFWS Endangered Species Act Consultation*). Although the blackside dace occurs within Letcher County, it is not known to occur within any stream reaches within the Roxana site. There is no federally designated critical habitat on the Roxana site (USFWS 2017a).

Thegray bat is federally listed as endangered and state listed as threatened (Kentucky Department of Fish and Wildlife Resources 2014; USFWS 2014). It roosts in caves throughout the year although suitable caves are rare. For winter hibernacula gray bats require vertical caves with domed halls. The winter caves often have a temperature of 5–9 degrees Celsius (41–48 degrees Fahrenheit). Forested areas along the banks of streams and lakes provide important protection for adults and young. Summer caves are always within 1 kilometer (0.62 mile) of a river or reservoir where the bats forage. Forests provide important feeding areas for young bats, which do not forage in cleared areas (NatureServe 2015a).

The Indiana bat is federally and state-listed as endangered. Indiana bats hibernate in caves; however, maternity sites are generally behind loose bark of dead or dying trees or in tree cavities. They forage in riparian areas, upland forests, ponds, and fields, but forested landscapes are the most important habitat.
They typically hibernate in the coldest area of a cave to ensure a low enough metabolic rate in order to conserve fat reserves throughout the winter; however, they will move away from areas that dip below freezing. Known roost tree species include elm, oak, beech, hickory, maple, ash, sassafras, birch, sycamore, locust, aspen, cottonwood, pine, and hemlock with a preference for trees with exfoliating bark (NatureServe 2015b).

The northern long-eared bat was listed as threatened under the ESA in April 2015 and is listed by Kentucky as endangered (Kentucky State Nature Preserves Commission 2014; USFWS 2015b). The northern long-eared bat hibernates in the small cracks and crevices of caves and mines that have large passages and relatively constant, cool temperatures with high humidity and no air currents. During the summer they roost singly or in colonies underneath bark or in cavities, crevices, or hollows of both live and dead trees within forests, woodlots with dense or loose aggregates of trees, riparian forests, and other wooded corridors. Males or non-reproductive females may also roost in caves or mines. In addition, northern long-eared bats have been observed roosting in structures such as barns and bridges. They are not considered to be a long-distance migrant, as they typically migrate 56–89 kilometers (35–55 miles) between their winter hibernaculum and summer habitat (USFWS 2015b).

Among other threats, the greatest contributor to the decline of many hibernating bat species in the U.S. is a fungal disease called white-nose syndrome. The project area occurs within the white-nose syndrome zone (USFWS 2016a). White-nose syndrome is caused by a fungus (Pseudogymnoascus destructans) that lives in cold environments such as the caves and mines where bats hibernate. The disease was first documented in New York in 2007 and has since spread to 32 states and 5 Canadian provinces (White-nose Syndrome.org 2016). White-nose syndrome has greatly impacted northern long-eared and Indiana bat populations like many other North American bat species. However, gray bats have not shown the same level of mortality as has been recorded for other species affected by white-nose syndrome. It is possible that population declines from white-nose syndrome have yet to be seen (USFWS 2012).

A bat habitat assessment of approximately 82 hectares (203 acres) of the Roxana site was conducted in December 2014. The habitat assessment identified the presence of summer habitat for Indiana and northern long-eared bats, but no potential summer habitat for gray bats and no potential winter habitat (i.e., caves or hibernacula) for Indiana, northern long-eared, or gray bats (Copperhead Environmental Consulting 2015). In addition, the Roxana site is in known P1/P2 swarming habitat for the Indiana bat (USFWS 2016c). The USFWS concurred with the findings of the habitat assessment (USFWS 2015c). In response to the revisions to Modified Alternative 2 – Roxana, a bat habitat assessment of an additional 122 hectares (302 acres) of the Roxana site was conducted in September 2016. This habitat assessment identified suitable summer habitat for Indiana and northern long-eared bats, and one cave-like rock shelter that is considered suitable for use as a hibernaculum (i.e., winter roosting habitat) by Indiana, northern long-eared, and/or gray bats (Copperhead Environmental Consulting 2016). The rock shelter is in the south-central portion of the project site, outside of the cut and fill limits. Based on the information provided by the bat habitat assessment, the USFWS indicated the Bureau should assume the cave-like rock shelter is being used as a winter hibernaculum (USFWS 2016b) (Appendix H, USFWS Endangered Species Act Consultation).

The Kentucky arrow darter was listed as threatened under the ESA in November 2016 (USFWS 2016c). The Kentucky arrow darter is known to exist in the upper Kentucky River basin. Habitat for the species consists of pools and transitional areas between riffles and pools in moderate to high gradient streams (USFWS 2015d). The USFWS published occurrence records for the Kentucky arrow darter in the critical habitat designation for the species (USFWS 2016d). Stream reaches containing all extant populations are considered critical habitat. No extant arrow darter populations are known to occur within Letcher County.

3.0 Affected Environment & Environmental Consequences

September 2017
The closest population measured along watercourses through which fish or pollutants must travel for the project to have effect on the population, is approximately 71 stream kilometers (44 miles) from the project area. Conductivity measurements taken within streams on the project site in June 2015 exceed the threshold (350 microsiemens per centimeter) above which the species abundance sharply declines (USFWS 2016d). Therefore, given the species does not occur within streams on or near the Roxana site, implementation of Modified Alternative 2 – Roxana would have no impact on the Kentucky arrow darter and it is not discussed further.

State-Listed Species

State-listed species with the potential to occur in Letcher County are listed in Table 3-11. Based on the habitat types listed in Table 3-11, it is likely that a number of state-listed species have the potential to occur within the Roxana site.

State-listed liverworts and mosses have the potential to occur on rocks, cliffs, and tree trunks in forested and woodland habitats in the Roxana site. State-listed vascular plant and insect species have the potential to occur in woodland and forested habitats, grasslands, and wetland habitats in the Roxana site.

Wehrle’s salamander occurs in upland forests and woodlands and can be found in rock crevices, under rocks, logs, and leaves, and in caves (at lower elevations). The species requires damp logs, moss, cave crevices, and other protected sites for their eggs (NatureServe 2017). Wehrle’s salamander has the potential to occur in forested and woodland habitats in the Roxana site.

Common ravens occur in a variety of habitats but are most common in hilly or mountainous areas, especially in the vicinity of cliffs, which are their preferred nesting sites (NatureServe 2017). Common ravens could potentially nest and/or forage on the Roxana site.

The eastern small-footed myotis is a small bat that occurs in hilly or mountainous areas, generally in or near deciduous or coniferous forest. The species forages over ponds and streams, riparian forests, upland forests, clearings, strip mines, and ridgetops. Warm-season roosts may be primarily in cracks or crevices of rocky outcrops or talus slopes, but also have been found in buildings, bridges (e.g., in expansion joints, guardrail crevices), towers, hollow trees, spaces beneath the loose bark of trees, road cuts, rocky dams, caves, and mines. In the winter, these bats hibernate in caves and mine tunnels. Therefore, eastern small-footed myotis has the potential to occur in and utilize similar habitats as those previously described for the federally listed bat species that may occur in the Roxana site.

The long-tailed shrew is a small mammal that occurs in the central and southern Appalachian Mountains from West Virginia south to North Carolina and Tennessee. It is most commonly found in moist forested areas along mountain streams and in boulder piles and talus on steep mountain slopes (NatureServe 2017). The long-tailed shrew has the potential to occur in forested portions of the Roxana site that contain high densities of rock/boulders and/or talus slopes.

State-listed animal species that are not likely to occur in the Roxana site because of a lack of habitat include Mountain midget crayfish, which occur in rocky streams with high water quality, and the eastern hellbender, which occurs in fast-flowing streams with abundant cover.

3.8.2 Environmental Consequences

This section analyzes potential direct and indirect impacts to biological resources from implementation of the construction and operational activities of Modified Alternative 2 – Roxana.
Direct impacts are from the immediate result of project activities. Direct impacts may be either temporary (reversible) or permanent (irreversible).

Indirect impacts are caused by or result from project-related activities, but occur later in time and can extend beyond the immediate area.

The significance of potential impacts to biological resources is based on: (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and (4) the duration or ecological ramifications of the impact(s). Impacts to biological resources would be significant if species or habitats of concern were adversely affected over relatively large areas or if disturbances caused reductions in population size or distribution of a rare or protected species.

Project effects have been evaluated herein based upon: (1) an understanding of the methods and equipment that would be used during construction and operations, (2) knowledge of the potential for such methods and equipment to disturb biological resources, and (3) awareness of the types of effects that have resulted from similar actions in the past.

Mitigation measures would be implemented under the preferred alternative (see Section 3.8.4) to avoid and/or minimize potential adverse impacts to biological resources.

3.8.2.1 Vegetation

Direct impacts to vegetation would occur under Modified Alternative 2 – Roxana, as approximately 49 hectares (121 acres) of forested area would be cleared on the site for excavation and grading activities required to prepare the site for development (Figure 3-7). An additional 24 hectares (59 acres) of grassland on mine spoil would be disturbed for construction and was previously cleared for mining. This previously cleared grassland area that would be excavated currently supports grassy areas that are routinely mowed, ground cover plants that are tolerant of disturbance, and scattered shrubs, including invasive species. Upon completion of construction activities, disturbed areas that are not developed would be revegetated and maintained as grassy lawn areas. When considering vegetation removal in context of the undisturbed 157 hectares (389 acres) that would remain in the buffer area (142 hectares [350 acres] forest and 15 hectares [39 acres] grassy/shrub areas), the clearing of vegetation at the Roxana site would be less than significant.

3.8.2.2 Wildlife

Impacts to wildlife under Modified Alternative 2 – Roxana could be direct (e.g., mortality or injury from construction activities) or indirect (e.g., modification of everyday behavior from disturbances and fragmentation of habitat).

Direct impacts to wildlife associated with construction activities under Modified Alternative 2 – Roxana would include temporary and, to a lesser degree, permanent displacement of individual wildlife species from approximately 73 hectares (180 acres) of land that provides wildlife habitat (i.e., 49 hectares [121 acres] of forested area and 24 hectares [59 acres] of grassland habitat that was previously cleared for mining). Individuals of smaller, less mobile species and those seeking refuge in burrows (e.g., rodents and amphibians and reptiles) could inadvertently be killed during construction activities; however, long-term, permanent impacts to populations of such species would not result because these species are abundant in surrounding areas and would rapidly repopulate suitable habitat within the affected area and nearby habitats.
Figure 3-7. Vegetation Communities within the Roxana Site
Approximately 157 hectares (389 acres) of the total 231 hectares (570 acres) of the site would remain undisturbed and continue to provide breeding and foraging habitat for wildlife found on-site. Additionally, the site is surrounded by similar habitat that could accommodate species that are displaced by construction activities. Based on the available habitat that would remain on-site and habitat adjacent to the site (Jefferson National Forest), it is anticipated that these impacts would not adversely affect wildlife populations that are currently present on-site.

Wildlife in the vicinity of construction activities would be exposed to auditory and visual disturbance from human presence and construction equipment. Wildlife responses to human presence are highly varied; however, nearly all species will avoid human presence and/or alter their behavior because of human-induced visual or auditory disturbance (Bowles 1995; Gabrielsen and Smith 1995; Gill et al. 2001; Li et al. 2011). Even in the absence of behavioral changes, human presence may evoke a physiological stress response in wildlife species, with elevated stress levels affecting metabolism, immune response, reproduction and/or survival (Gabrielsen and Smith 1995; Braunisch et al. 2011; Li et al. 2011). As both physiological and behavioral responses entail extra energetic costs, disturbance in temperate environments can have greater impacts in winter, when most wildlife species face higher energetic demands (Braunisch et al. 2011).

Noise that is close, loud, and sudden and that are combined with a visual stimulus produce the most intense reactions in animals (Bowles 1995). While some bird and mammal species appear to habituate (become accustomed to and react less strongly over time) to repetitive noises better than other species (Krausman et al. 1996; Conomy et al. 1998), the likelihood of habituation by different wildlife species is not predictable. Qualitatively, habituation to noise and visual stressors may be expected to occur after some threshold frequency of exposure is reached, but that threshold of exposure is unknown. In addition, the opposite response (i.e., the sensitization of individuals, such that they react more strongly to a recurring stimulus, and ultimately leave the area) can also occur. Intrinsic difference in tolerance among individuals and species, with or without changes in individual behavioral reactions over time, will tend to drive changes in wildlife populations exposed to a recurring stimulus through immigration and emigration. The end result is that wildlife individuals and populations exposed to a regularly recurring stimulus are expected to exhibit an increasing tolerance (lowered reactions) to that stimulus, but this cannot be construed as indicating that no impact has occurred (Bejder et al. 2009). In addition, most of the effects of noise are mild enough that they may never be detectable as variables of change in population size or population growth against the background of normal variation (Bowles 1995). Therefore, wildlife in the vicinity of construction activities and the outdoor firing range are expected to either react strongly to stressors (and leave the area), or, over time, become habituated to the stressors and remain in the area.

Wildlife would be exposed to noise impacts from use of the outdoor firing range. Annual small arms training would last approximately 6 weeks/year and would entail approximately 2–4 hours of range use Monday through Friday. Monthly firearms training for special operations response teams would last 8 hours for 1 day each month. Use of live-fire ranges produces visual and auditory disturbances that may impact wildlife species in the immediate vicinity of ranges, possibly causing wildlife to flush or leave the area. As discussed above, noises that are close, loud, and sudden, such as gunfire, produce the most intense reactions in animals. Wildlife that are not in the immediate vicinity of the firing range would likely become habituated and/or sensitized to recurring gunfire noise, and show increased tolerance over time. As shown in Figure 3-4, peak noise contours for the firing range would not extend into Lilley Cornett Woods. Additionally, as discussed in Section 3.1.2.2, Operations, impacts to Lilley Cornett Woods from noise are not anticipated.
to be significant because peak noise levels of less than 70 dB are well below the 87 dB level for land use incompatibility. This level would likely be barely perceptible at Lilley Cornett Woods, which is 2.1 kilometers (1.3 mile) from the site of the firing range. This distance and the fact that each gunshot sound would last less than 0.25 of a second would introduce negligible noise impacts and would be considered compatible to adjacent land uses.

There is a minimal chance that wildlife (primarily bird species) could be incidentally injured or killed by direct hit from gunfire; however, the outdoor firing range would be relatively small (96 square meters [1,033 square feet] and human presence would likely keep individual birds from flying in front of the relatively short line-of-fire. Although wildlife in the immediate vicinity of construction and firing range activities would experience some level of impact as described above, such impacts would be of limited duration, and with increased exposure, many species, including birds and larger mammals, would likely exhibit an increased tolerance for such a stressor. Therefore, auditory and visual impacts to wildlife associated with construction and use of the outdoor firing range would be less than significant.

Under Modified Alternative 2 – Roxana, site lighting would consist of 30 meter (100 foot) high mast lighting poles placed along the security perimeter road around the correctional facility, in the parking lot, and around the buildings. The lighting would include full cutoff fixtures with a combination of high pressure sodium and metal halide lights or LED lights to provide a minimum of 1.5 footcandles of illumination. Other exterior lighting such as wall packs and parking lot and sidewalk light poles would also have full cutoff fixtures.

Wildlife can be negatively impacted by night lighting primarily through disruption of natural circadian and circannual cycles, which in turn can affect a whole range of species interactions, physiological processes, and behaviors (Rowse et al. 2016). Artificial night lighting can impact wildlife by causing increased orientation or disorientation and attraction to or repulsion from glare, which can affect foraging, reproduction, communication, and other critical behaviors (Longcore and Rich 2004).

Nocturnal hunters and foragers, such as bats, can be adversely affected by artificial lighting. Although lights often attract flying insects and, therefore bats that prey on those insects, there is variation of the effect of artificial lighting among species. While many species of bats frequently forage around lighting, other species appear to avoid it (Jung and Kalko 2010). Stone et al. (2012) found that the activity of Myotis species significantly decreased in areas receiving artificial light. Stone et al. (2009) also found that lit areas delayed the emergence of the lesser horseshoe bat (Rhinolophus hipposideros). Typically, bats emerge at or near dusk in conjunction with prey availability (Jones and Rydell 1994). A delay in emergence due to the presence of artificial light may cause bats to miss the peak abundance of their insect prey, potentially causing reduced foraging effectiveness and longer commutes. Longer travel distances can have a negative impact on growth rates and mass of juvenile bats (Tuttle 1976).

Newer technologies such as LED lights produce more directional light than older light technologies, preventing the horizontal or upward emissions which contribute most to light pollution and impacts to wildlife (Rowse et al. 2016). Additionally, exterior lighting at the facility would utilize full cutoff lights. This type of light fixture does not emit direct uplight from the lamp (no light is emitted above horizontal), thereby minimizing the amount of incidental light reaching the forest, and preventing such light from impacting wildlife in the Lilley Cornett Woods. In addition, the proposed facilities would be completely surrounded by existing forest within the property boundary, which would provide screening and prevent facility lighting from impacting surrounding land uses, particularly Lilley Cornett Woods over 1.6 kilometers (1 mile) to the southwest. Although night lighting may have localized impacts on individual
wildlife, such impacts are not expected to adversely affect the local populations of any wildlife species. Therefore, night lighting would have less than significant impacts on wildlife.

Under Modified Alternative 2 – Roxana, minor increases in vehicular traffic along established roadways (e.g., KY 588) are expected. Wildlife often respond to vehicular disturbance with accelerated heart rates and metabolic function, resulting in energetic costs, impacts to behavior and fitness, and avoidance of otherwise suitable habitat (Taylor and Knight 2003). These responses can lead to increased vulnerability to predators, starvation, and reproductive failure. Additionally, recent research shows that some songbird species might alter their song-communication patterns and volumes in relation to vehicular traffic noise (Gentry et al. 2017).

The roads in the vicinity of the Roxana site have been established for many years, such that wildlife communities have likely adjusted in response to the presence of open habitat and occasional traffic along these corridors, through the loss of individuals within species and learned avoidance by individuals and species that are less tolerant of habitat alteration and disturbance. Some evidence suggests that the general pattern of reduced diversity and abundance of wildlife near roads may be due more to habitat alteration and traffic mortality than noise (Summers et al. 2011). In any case, continuing use of established roads would not alter wildlife use of habitats in the vicinity or significantly impact local wildlife populations.

The Bureau has conducted a prior impact assessment for the installation of a non-lethal/lethal fence at USP Big Sandy in Martin County, Kentucky, especially for potential impacts to avian and small mammal species (Federal Bureau of Prisons 2009). This prior assessment found less than significant impacts; consequently, less than significant impacts are anticipated with the installation of the proposed non-lethal/lethal fence under Modified Alternative – Roxana.

3.8.2.3 Threatened and Endangered Species

Federally Listed Species

ESA section 7(a)(2) (hereafter section 7) imposes upon federal agencies a procedural and substantive obligation whenever they authorize, fund, or implement an action. Federal agencies comply with the legal requirements of section 7 and the implementing regulations, when triggered, by consulting with the USFWS, and avoiding those actions that are likely to jeopardize listed species or adversely modify those species’ designated critical habitat (16 USC § 1536(a)(2)). In fulfilling these requirements, each agency shall use the best scientific and commercial data available.

The consultation process is divided into informal and formal consultation. The informal consultation process: (1) clarifies whether and what listed, proposed species or designated or proposed critical habitats may be in the action area; (2) determines what affect the action may have on these species or critical habitat; (3) explores ways to modify the action to reduce or remove adverse effects to the species or critical habitats; (4) determines the need to enter into formal consultation for listed species or designated critical habitat, or conference for proposed species or proposed critical habitats; and (5) explores the design or modification of an action to benefit the species. If a federal agency determines through the informal consultation process, through its own analysis, or the preparation of a Biological Assessment (BA), that its proposed action is likely to adversely affect listed species or critical habitat, then formal consultation is required. Formal consultation is a process between the USFWS and the federal agency that commences with the federal agency's written request for consultation under ESA section 7 and concludes with the USFWS’ issuance of a Biological Opinion (BO). The BO includes: (1) the opinion of the USFWS as to whether or not a federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse
In accordance with ESA section 7, a BA was prepared to support consultation between the Bureau and the USFWS regarding the likelihood of the preferred alternative (Modified Alternative 2 – Roxana) having an adverse effect (“take”) on the Indiana bat, northern long-eared bat, gray bat, and Kentucky arrow darter. Potential impacts to federally listed species and their habitat from proposed construction activities and operations, based on the analysis in the BA (Copperhead Environmental Consulting 2017), are presented below.

For the purposes of the analysis of potential impacts to federally listed bat species under the preferred alternative, and under consultation with the USFWS, the action area for potential direct and indirect impacts is that area 4.0 kilometers (2.5 miles) from the center of the proposed facilities.

Based on previous consultations as well as review of the Federal Register notice for the listing of each species, the Bureau identified threats to the federally listed bat species associated with the proposed construction and operational activities. Eight potential stressors were identified and are discussed in further detail below (Table 3-12).

<table>
<thead>
<tr>
<th>Stressor</th>
<th>Potential Direct (D) or Indirect (I) Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat Loss</td>
<td>Direct permanent loss of habitat reduces species’ ability to reproduce, find food, find shelter, and survive. (D)</td>
</tr>
<tr>
<td>Stream Sedimentation</td>
<td>Potential temporary impact during construction to streams by covering bed substrates with sediment, potentially degrading drinking resources, and prey insect production. (D, I)</td>
</tr>
<tr>
<td>Noise and Vibration</td>
<td>Disturbance to species from noise depends on the type of noise generated, the proximity to the noise source, duration of the sound, frequency of events, and the past history of exposure to noise events by individuals of a species. (D, I)</td>
</tr>
<tr>
<td>Increased Human Presence</td>
<td>Increased human presence could cause wildlife to avoid the area. (D, I)</td>
</tr>
<tr>
<td>Collisions with Vehicles</td>
<td>Direct mortality due to vehicle strikes during construction and operation of the proposed USP and FPC. (D)</td>
</tr>
<tr>
<td>Invasive Species Introductions</td>
<td>Construction activities could potentially increase the potential for the introduction of invasive species from equipment or fill material. These introductions can degrade habitats by altering native species composition and structure. (I)</td>
</tr>
<tr>
<td>Hazardous Materials Spills</td>
<td>During construction and operation, there is the potential for spills of gas, fuel, oil, or solvents. (I)</td>
</tr>
<tr>
<td>Night Lighting</td>
<td>Artificial lighting may result in abandonment of foraging and roosting areas by bats. (D, I)</td>
</tr>
</tbody>
</table>

Although Indiana bats and northern long-eared bats utilize habitats differently in ways that allow them to coexist, their foraging and roosting habitats closely coincide at the landscape level. While gray bats typically forage along streams and reservoirs rather than upland habitats, Indiana bats and northern long-eared bats also utilize these resources. Gray bat roost habitat (i.e., caves, mines, etc.) differs significantly from Indiana bats and northern long-eared bats, though it often occurs within forested landscapes appropriate for Indiana and northern long-eared bat foraging/roosting. The three species exhibit significant overlap in winter hibernation habitat. Due to the high degree of habitat overlap between the three species, their impact analysis is combined.
Habitat Loss

Under Modified Alternative 2 – Roxana, approximately 73 hectares (180 acres) would be permanently cleared, including approximately 49 hectares (121 acres) of forested habitat and 24 hectares (59 acres) of grassland on mine spoil (Copperhead Environmental Consulting 2015, 2016). Table 3-13 details habitat impacts for each species.

<table>
<thead>
<tr>
<th>Species</th>
<th>49 Hectares of Forested Habitat</th>
<th>24 Hectares of Grassland on Spoil</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indiana Bat</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Utilization</td>
<td>Foraging and Roosting</td>
<td>Foraging</td>
</tr>
<tr>
<td>Habitat Quality</td>
<td>Good – foraging and roosting potential, and prey production</td>
<td>Insignificant – minimal prey production and foraging potential</td>
</tr>
<tr>
<td><strong>Northern Long-Eared Bat</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Utilization</td>
<td>Foraging and Roosting</td>
<td>Foraging</td>
</tr>
<tr>
<td>Habitat Quality</td>
<td>Good – foraging and roosting potential, and prey production</td>
<td>Insignificant – minimal prey production and foraging potential</td>
</tr>
<tr>
<td><strong>Gray Bat</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Utilization</td>
<td>Foraging</td>
<td>Foraging</td>
</tr>
<tr>
<td>Habitat Quality</td>
<td>Insignificant – minimal prey production and foraging potential</td>
<td>Insignificant – minimal prey production and foraging potential</td>
</tr>
</tbody>
</table>

A total of 4,243 hectares (10,484 acres) of potentially suitable Indiana bat and northern long-eared bat habitat occurs within the action area representing 83.4 percent of the total land cover. Implementation of Modified Alternative 2 – Roxana would remove 1.7 percent of the total available Indiana bat and northern long-eared bat habitat within the action area (see Appendix H, Figure 3-4).

USFWS occurrence records indicate one northern long-eared bat summer maternity record within the action area, approximately 0.6 kilometer (0.4 mile) from the project area. An additional non-specified record is documented approximately 4.0 kilometers (2.5 miles) from the project area and is assumed to be within the action area (USFWS 2016g). Forested habitats within the project area provide potential habitat for roosting and foraging northern long-eared bats and could provide habitat for northern long-eared bat maternity colonies. Grasslands on coal mine spoil potentially could support northern long-eared bats in the production of insect prey and as an occasional foraging resource, though impacts to these habitats from the proposed action is considered to have an insignificant and discountable impact on the species.

USFWS correspondence did not identify any records for Indiana bats within the action area (USFWS 2016g). Spring and fall roosts for the species have the potential to occur within the action area and project area. The project area is within known Swarming 1 habitat for Indiana bats (USFWS 2016e). USFWS identified a P1/P2 hibernacula occurring 11.6 kilometers (7.2 miles) from the project area. USFWS classifies Indian bat hibernacula based on the number of bats overwintering there. For reference, P1 hibernacula are those caves that have harbored >10,000 bats and P2 hibernacula have contained 1,000-9,999 bats. Forested areas within the project area could provide potential habitat for roosting and foraging Indiana bats including maternity colonies. Grasslands on mine spoil may potentially support Indiana bats in the production of insect prey and as an occasional foraging resource, though impacts to these habitats from Modified Alternative 2 – Roxana are expected to have insignificant and discountable impacts on the species.
The USFWS did not identify gray bat records within the action area. The closest record was an individual male captured approximately 14.5 kilometers (9 miles) from the project area (USFWS 2017b). While upland habitats support gray bats through production of prey insects and for commuting and occasional foraging, they are not considered key habitats of the species. Impacts to these habitats with implementation of Modified Alternative 2 – Roxana are considered insignificant and discountable to the species and are not included in the analysis. Field surveys of the project area conducted for the habitat assessments did not identify lacustrine or riverine habitats associated with foraging for this species and did not identify potential underground summer roost sites (Copperhead Environmental Consulting 2015, 2016). Direct removal of gray bat habitat is not anticipated under the preferred alternative.

Impacts to spring, summer, and fall habitat for federally listed bat species would be minimized through use of BMPs. Only those trees necessary for construction and maintenance of appropriate line of site for security surrounding the facilities would be removed, and removal of any standing trees would not occur during June and July of any year during construction. Following the guidance provided in the USFWS’s 2016 Revised Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky, or appropriate succeeding document (USFWS 2016f), impacts to summer habitat would be mitigated through contribution to the Imperiled Bat Conservation Fund. Payment into the fund would be based on the acreage and time of year that forested habitat is removed (i.e., 49 hectares [121 acres]). The Imperiled Bat Conservation Fund would then provide the mitigation fees to the Kentucky Natural Lands Trust to support conservation and recovery actions for the species.

One potential hibernaculum for federally listed species was identified within the project area during the 2016 habitat assessment (Copperhead Environmental Consulting 2016). It would not be directly disturbed by proposed construction or operational activities. While use of the potential hibernaculum by federally listed species cannot be ruled out, based on investigation of the feature during the 2016 habitat assessment, it was concluded that if the site is occupied by hibernating federally listed species, it is likely to be used by only a few individuals because of the limited volume of the visible extent, its narrow entrance flyway, the lack of air flow, and no evidence of bat use (e.g. guano, insect parts) (Copperhead Environmental Consulting 2016). All of the 49 hectares (121 acres) of forested habitat would be within the potential swarming area surrounding the potential hibernaculum (8-kilometer [5-mile] radius for priority 3 and 4 hibernacula) if it is occupied by federally listed species.

The potential hibernaculum is located approximately 66 meters (217 feet) south of the proposed edge of tree clearing and ground disturbance. Following USFWS recommendations, forested habitat within 0.8 kilometer (0.5 mile) of the winter habitat feature was calculated. The buffer surrounding the feature is 70.2 percent forested, with a total of 143.1 forested hectares (353.7 acres) within the 203.9-hectare (503.8-acre) buffer (see Appendix H, Figure 5-1). Of the forested habitat within the buffer, 4.7 percent or 16.6 hectares (41.0 acres) would be removed under Modified Alternative 2 – Roxana.

No known hibernacula for any federally listed bat species are known within the action area. The project area was identified as being within Indiana bat Swarming 1 habitat (USFWS 2016e), and swarming activities (i.e., roosting, foraging, mating, etc.) associated with the feature could occur. All of the 49 hectares (121 acres) of forested habitat removed would be within Swarming 1 habitat.

Impacts to swarming habitat would be minimized through use of BMPs. Only those trees necessary for construction and maintenance of appropriate line of site for security surrounding the facilities would be removed. Following the guidance provided in the USFWS’s 2016 Revised Conservation Strategy for...
Forest-Dwelling Bats in the Commonwealth of Kentucky, or appropriate succeeding document (USFWS 2016f), impacts to swarming habitat would be mitigated through contribution to the Imperiled Bat Conservation Fund. Payment into the fund would be based on the acreage and time of year that forested habitat is removed (i.e., 49 hectares [121 acres]). The Imperiled Bat Conservation Fund would then provide the mitigation fees to the Kentucky Natural Lands Trust to support conservation and recovery actions for the species.

Stream Sedimentation

Temporary impacts to water quality could occur during project-related construction and potential sedimentation of streams. Siltation of waterways over which federally listed bats forage could be detrimental to drinking and feeding activities. Stream sedimentation can reduce populations of flying aquatic insects, which are a known component of the diet of all considered species (USFWS 1982, 2007, 2015b). Fugitive dust from land disturbance activities and the movement of truck/construction equipment during construction could settle into local streams contributing to sedimentation. Sedimentation impacts also have the potential to migrate offsite and into receiving streams.

Of the three species considered, gray bats have the greatest potential to be impacted by sedimentation. The species is known to predominantly forage over waterways and a major portion of its diet is reported to be flying insects with aquatic larval stages (USFWS 1982).

Stream sedimentation impacts tend to be temporary in nature during the construction period provided that construction activities with the potential to cause erosion problems are properly planned and sited, and adhere to project-specific BMPs and appropriate regulatory permit requirements. As part of the project BMPs, an erosion and sediment control plan and site-specific groundwater protection plan would be prepared and would reduce potential impacts. Therefore, it is not anticipated that water quality of nearby streams and wetlands would be adversely impacted by on-site construction.

Noise and Vibration

With respect to potential noise impacts, construction noise would have the farthest impact extent, but would be limited in duration to the period of construction and would occur during daylight hours. Although proposed blasting activities would result in the loudest noise levels, blast noise is within the frequency range of 2 to 200 Hertz (Hz) (Cardno 2016e), outside the hearing range of bats (reported to be typically above 1,000 Hz) (Siemens and Schaub 2011). High frequency noise disturbance (>20,000 Hz) has been shown to deter bats from using established roosts in bridges (California Department of Transportation 2016). Bats have been shown to decrease foraging use in areas with significant noise disturbance (Schaub et al. 2008). Displacement from roosting and foraging areas has the potential to decrease fitness by increasing susceptibility to predation, reducing foraging efficiency, and reducing the quality of the roosting environment (California Department of Transportation 2016). However, USFWS reported that bats can acclimate to loud noise stimuli over time, and that Indiana bats subjected to repeated military training noise at Camp Atterbury, Indiana maintained near base wide distribution, and that bats at Fort Leonard Wood, Missouri subjected to simulated artillery and small-arms fire did not startle, frighten, or leave the area. Further they reported that Indiana bats did not avoid active night training areas or change foraging during night maneuvers (USFWS 2010).

Construction noise would occur during daylight hours only and is not expected to have a negative impact on foraging federally listed bats. Ample forested habitat occurs adjacent to the construction footprint within the action area. Landscape outside the action area is heavily forested as well. Impacts from construction
noise would be temporary in nature. Blasting noise is expected to be outside the hearing range of bats as discussed above. Therefore, impacts from noise to foraging and roosting federally listed bats in the summer are expected to be minimal.

Once in operation, noise associated with small arms live-fire at the proposed outdoor firing range is expected to have the potential to impact federally listed bats. Figure 3-4 shows the predicted peak noise contours for the live-fire operations at the firing range.

The 104 dBP contour encompasses 19.1 hectares (47.1 acres), of which 84 percent (16.0 hectares [39.6 acres]) is forested potential Indiana bat and northern long-eared bat foraging and roosting habitat. Construction disturbance would remove 74.1 percent (11.9 hectares [29.4 acres]), of the forested habitat within the 104 dBP firing range noise contour.

The 87 dBP noise contour encompasses 287.4 hectares (710.2 acres), of which 73.7 percent (211.7 hectares [523.1 acres]) is forested potential Indiana bat and northern long-eared bat foraging and roosting habitat. Construction disturbance would remove 14.31 percent (30.3 hectares [74.9 acres]) of forested habitat within the 87 dBP firing range noise contour.

Because all live-fire activities would occur during daylight hours, potential noise impacts from such activities would be limited to roosting bats and would not affect bats during nighttime foraging. Firing activities are anticipated to be limited to 1 day per month and five days a week (Monday–Friday) during an annual 6-week qualification/recertification program during the months of March and April. Each year the major portion of firearms recertification would occur when bats are still in hibernation and it would end before juveniles are present on the landscape.

As stated above, the USFWS reported that Indiana bats subjected to repeated military training noise at Camp Atterbury maintained near base wide distribution, and that bats at Fort Leonard Wood subjected to simulated artillery and small-arms fire did not startle, frighten, or leave the area. Due to the recurring use of the outdoor firing range, live fire activities at the outdoor firing range are expected to have minor, periodic, and temporary impacts on roosting federally listed bats.

Potential vibration impacts to federally listed bats from project-related construction activities outside of hibernation would occur within the action area. While some vibration would be produced by construction machinery, the greatest and farthest reaching impact would occur from blasting. Primary vibration impacts outside of hibernation are likely associated with displacement from roosts and disturbance to torpor during cool weather. Impacts from vibration are temporary and would be limited to the period of construction. Similar to noise, vibration from blasting would only occur during and immediately following a blasting event.

Vibration during hibernation has the potential to modify normal hibernation patterns and may cause abandonment of hibernacula or specific sites within hibernacula. Past studies have indicated that hibernating bats can tolerate vibration levels of 1.52 to 5.08 mm/s (West Virginia Department of Environmental Protection 2006).

Blasting during construction would be the primary source of vibration with the potential to impact hibernating bats. Under Modified Alternative 2 – Roxana, blasting within 0.8 kilometer (0.5 mile) of one cave-like feature (potential hibernaculum) identified during the 2016 habitat assessment as potential federally listed bat winter habitat (Copperhead Environmental Consulting 2016). In the absence of
swarming surveys or internal winter surveys of the potential hibernaculum, listed bat species are assumed to be present within the feature during the winter.

In order to avoid potential adverse impacts to hibernating federally listed bats at the potential hibernaculum within 0.8 kilometer (0.5 mile) of the project area, the Bureau would not conduct construction blasting from November 15 through March 31.

**Increased Human Presence**

Human disturbance during construction would be limited to daylight hours during the period of construction. Potential for disturbance once the facilities are in operation would be minimized because most areas receiving human disturbance would already have been cleared of habitat. Additionally, studies have shown that bats at Fort Leonard Wood and Camp Atterbury acclimated to human disturbance and continued use of previously used areas (USFWS 2010). This suggests that federally listed bats occurring in the project area could habituate to human disturbance.

Disturbance to hibernating federally listed bats can cause arousal and the depletion of energy and water reserves needed to survive hibernation. Disturbance also has the potential to limit the ability of females to successfully fertilize, gestate, and birth pups in the spring. Access to the federal USP and FPC site would be tightly controlled. Internal access to the potential hibernaculum would not be permitted. In addition, the potential hibernaculum would be fenced off and warning signs installed around the area to prevent direct disturbance.

**Collisions with Vehicles**

Bat mortality, including federally listed species, caused by collisions with motor vehicles is known to occur. Russel et al. (2009) found 27 road-killed little brown bats, 1 Indiana bat, and 1 unknown *Myotis* when searching a heavily trafficked highway in Pennsylvania from May through September. While minor traffic increases are anticipated during construction, the majority of new traffic would occur during daylight hours and would have no impact on nocturnal bats.

Once in operation, the facility would staff approximately 300 full-time employees a total of 360 trips are expected to occur during peak traffic hours, typically daylight hours (i.e., 7:00–9:00 a.m. and 3:00–5:00 p.m.). Because most of these trips would occur during daylight hours, the potential for bat-vehicle collisions is expected to be discountable.

**Introduction of Invasive Species**

Transportation and spread of invasive species within the project area could be facilitated by the implementation of Modified Alternative 2 – Roxana and could degrade habitat for federally listed bat species. Invasive species can degrade local habitats, changing insect prey abundance and diversity, and can degrade roosting and foraging habitat for federally listed bat species. Introduction of invasive species to the site can occur via contractor equipment during construction, or can be introduced through fill material transported from offsite. In addition, soils disturbed during construction are often quickly colonized by invasive species.

The Kentucky Exotic Pest Plant Council maintains a list of 38 Exotic Invasive Plants of Kentucky that have been identified as *Severe Threat*, which is defined as those species that “possess characteristics of invasive species and spread easily into native plant communities and displace native vegetation” (Kentucky Exotic Pest Plant Council 2013).
Contractors would be required to inspect vehicles and equipment to ensure that visible plant and seed material has been removed prior to entering the project area. Fill material utilized during construction would be taken from onsite. As the estimated volume of construction excavation material to be used as structural fill exceeds the volume of estimated fill needed, no fill material would be brought on site.

Upon completion of construction, disturbed areas that are not developed would be revegetated and maintained as grassy lawn areas. Implementation of appropriate invasive species control procedures would greatly reduce the colonization of the project area related to the proposed action to the extent that it should have no impact on federally listed bats.

**Hazardous Materials Spills**

During the period of construction, there is a possibility for small-scale spills of hazardous materials (e.g., diesel fuel, gasoline, hydraulic fluids, oils, lubricants, paints, solvents, adhesives, and battery chemicals). Accidental hazardous material spills could adversely impact soil and surface and groundwater in the action area in the vicinity of the construction site and along transportation routes. Spills entering surface or groundwater could have a negative impact on aquatic fauna that make up part of the prey base for the federally listed bat species or could be directly consumed by bats while drinking. The implementation of BMPs, sediment control plan, site-specific groundwater protection plan, appropriate waste disposal, and appropriate handling and storage procedures would decrease the likelihood of spills and would prevent migration of hazardous materials away from spill locations. Construction contractors would be responsible for following regulations pertaining to hazardous materials and it is the contractor’s responsibility to comply with all federal, state, and local regulations.

Once implemented, the facility would utilize machinery and vehicles that require cleaning, painting, batteries, and routine maintenance. The same types of hazardous materials identified above would be utilized onsite, although quantities needed and potential for spills would be lower than during construction. During operation of the facility, proper hazardous materials handling and storage protocols combined with proper spill response would decrease the likelihood of spills and reduce the potential for impacts to federally listed bat species to the extent that they are discountable.

**Night Lighting**

While many species of bats frequently forage around lighting, other species appear to avoid it (Jung and Kalko 2010). Indiana bats are known to avoid foraging in well-lit urban areas, with avoidance potentially driven by light avoidance (Sparks et al. 2005). Federally listed bats may be susceptible to predation while being illuminated by artificial lighting at the project area as they forage and commute between foraging and roosting areas. Lighting could reduce time spent foraging in lit areas and could increase the risk of predation (Federal Highway Administration et al. 2016).

Night lighting would be necessary during the construction period. Possible lighting locations would be at the entrance off of KY 588, at points along the access road to the construction areas, at construction and material storage trailers, and in the construction zones for buildings to meet safety standards. The construction lighting would not be as intensive as the lighting required for operation of the USP and FPC. Construction lighting would be aimed toward construction activities and away from forested habitat and thus would primarily affect areas already cleared of habitat. Once constructed, security of the facilities would require significant artificial lighting throughout dark hours. Permanent lighting of the facility would be addressed using full cutoff lights, which do not emit direct uplight, thereby minimizing the amount of incidental light reaching the forest. Impacts from lighting are anticipated to be largely concentrated in areas
where trees have been cleared for construction that would no longer be suitable habitat for federally listed bats.

As discussed in Section 3.8.4, exterior lights would be fitted with full cutoff type fixtures, which do not emit direct uplight from the lamp. The potential hibernaculum within the project area is outside the tree clearing limits and area of ground disturbance, and would not be impacted by the proposed lighting of the facilities.

Table 3-14 summarizes the potential impacts to federally listed bat species with implementation of Modified Alternative 2 – Roxana.

<table>
<thead>
<tr>
<th>Stressor</th>
<th>Potential Direct and Indirect Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat Loss</td>
<td>IB and NLEB: Loss of 49 hectares (121 acres) of summer habitat reduces the number of roost sites and area of foraging habitat. No potential hibernacula would be lost. Swarming habitat near potential hibernacula would be removed. GB: No direct loss of summer habitat is anticipated. No potential hibernacula would be lost. Swarming habitat near potential hibernaculum would be removed.</td>
</tr>
<tr>
<td>Stream Sedimentation</td>
<td>NLEB, IB, GB: Potential impact to drinking and prey production. Use of BMPs, erosion control plan, sediment control plan, and site-specific groundwater protection plan would avoid and minimize potential impacts to the species from sedimentation. Impacts expected to be insignificant.</td>
</tr>
<tr>
<td>Noise and Vibration</td>
<td>NLEB, IB, GB: Disturbance to species is dependent on noise type, proximity, duration, incidence, and acclimation of local population, if present. Primary impacts would be from operation of firing range. Disturbance to species is dependent on intensity of vibration and distance to habitat. Primary impact is the potential for summer roost abandonment near blasting sites. Blasting during the hibernation period would not be conducted.</td>
</tr>
<tr>
<td>Increased Human Presence</td>
<td>NLEB, IB, GB: Disturbance could cause abandonment of roosts, foraging areas, or hibernacula. Human disturbance is likely in areas that would no longer be bat habitat. Potential hibernaculum would not be disturbed. Impacts expected to be insignificant.</td>
</tr>
<tr>
<td>Collisions with Vehicles</td>
<td>NLEB, IB, GB: Collisions with vehicles has the potential to cause direct take of federally listed bats; however, anticipated traffic increase during night time is expected to be low. Impacts expected to be discountable.</td>
</tr>
<tr>
<td>Invasive Species</td>
<td>NLEB, IB, GB: Construction activities could increase the potential for the introduction of invasive species from equipment or fill material. Introductions can change prey abundance and vegetative community composition. Due to invasive species control procedures, no impact anticipated.</td>
</tr>
<tr>
<td>Hazardous Materials Spills</td>
<td>NLEB, IB, GB: Potential for spills to contaminate water sources utilized for drinking and supporting insect prey. Use of BMPs and site-specific groundwater protection plan would avoid impacts to the species from hazardous materials. Impacts expected to be discountable.</td>
</tr>
<tr>
<td>Night Lighting</td>
<td>NLEB, IB, GB: Light pollution could result in disruption of normal foraging and roosting behavior, and modify the local insect population and distribution. All exterior lights would be fitted with full cutoff type fixtures, which do not emit direct uplight from the lamp. Impacts expected to be insignificant.</td>
</tr>
</tbody>
</table>

Implementation of Modified Alternative 2 – Roxana would result in the permanent loss of approximately 49 hectares (121 acres) of potential Indiana and northern long-eared bat roosting and foraging habitat. Additionally, vibrations from blasting associated with the proposed action could temporarily displace roosting Indiana and northern long-eared bats, and nighttime lighting could result in reduced foraging, abandonment of roosts, and changes in insect populations. No potential Indiana or northern long-eared bat hibernacula would be impacted during construction or operation of the proposed USP and FPC. Therefore, implementation of Modified Alternative 2 – Roxana may affect, and is likely to adversely affect the Indiana bat and northern long-eared bat. However, as implementation of proposed mitigation measures would
reduce impacts to the Indiana bat and northern long-eared bat, no population-level or regionally significant impact to either species is expected to occur. Therefore, implementation of the preferred alternative (Modified Alternative 2 – Roxana) would have less than significant impacts on the Indiana bat and northern long-eared bat.

Implementation of Modified Alternative 2 – Roxana would have no permanent impact on gray bat roosting or foraging habitat, and no potential hibernacula would be impacted during construction or operation of the USP and FPC. Removal of trees near the potential hibernaculum could potentially impact swarming habitat for gray bats. Therefore, the proposed action may affect, and is not likely to adversely affect the gray bat, and impacts to the species would be less than significant.

In accordance with ESA section 7, the Bureau has conducted formal consultation with USFWS regarding the potential effects to the Indiana bat and northern long-eared bat (Appendix H, *USFWS Endangered Species Act Consultation*). The USFWS has concluded in their BO that implementation of Modified Alternative 2 – Roxana and associated mitigation measures (refer to Section 3.8.4, Mitigation) is likely to adversely affect the Indiana bat and the northern long-eared bat. The USFWS also concluded that Modified Alternative 2 – Roxana is not likely to jeopardize the continued existence of these federally listed species. The USFWS Final BO is included in Appendix H, *USFWS Endangered Species Act Consultation*. In addition, during informal consultation, the USFWS provided concurrence on the Bureau’s determination that Modified Alternative 2 – Roxana may affect but would not adversely affect the gray bat (USFWS 2017c) (Appendix H, *USFWS Endangered Species Act Consultation*).  

**State-listed Species**

State-listed species that have the potential to occur in the Roxana site are presented in Table 3-11 and described in Section 3.8.1.3, *Threatened and Endangered Species*. No state-listed species have populations that are restricted to the project area or adjacent lands. Impacts from construction and operation activities to individual state-listed plants and wildlife would be similar in nature to those described in Sections 3.8.2.1, *Vegetation*, and 3.8.2.2, *Wildlife*, respectively.

Individual state-listed liverworts, mosses, and vascular plants, such as white walnut, would potentially be removed during excavation and grading of 49 hectares (121 acres) of forested area under the preferred alternative. However, the majority of forested and woodland habitat on the Roxana site would not be impacted, and similar habitat and communities are abundant throughout the region.

Wildlife often respond to human disturbance, such as construction noise and visual stressors, with accelerated heart rates and metabolic function, resulting in energetic costs, impacts to behavior and fitness, and avoidance of otherwise suitable habitat (Taylor and Knight 2003). Although state-listed wildlife species potentially occurring on the Roxana site would likely be displaced during construction activities, such species would be expected to return to the area and utilize available habitats with the site once construction activities are finished.

State-listed terrestrial snails and insects could inadvertently be killed or harmed during grading and other construction activities; however, the majority of forested, woodland, and aquatic habitats on the Roxana site would not be impacted, and similar habitats are abundant throughout the region. Additionally, no state-listed snail or insect species is known to have populations that are restricted to the project area or adjacent lands.
Individual Wehrle’s salamanders could inadvertently be killed or harmed during grading and other construction activities; however, long-term, permanent impacts to populations of the species would not result because the majority of suitable habitat for the species on the site would not be impacted.

Potential common raven nesting habitat (cliffs) would not be impacted by the preferred alternative. Additionally, the common raven is a commensal predator that often benefits from resources provided by human activities. Such resources can include food (organic garbage), nesting substrates (telephone poles and structures), and foraging habitat (increase in edge habitat from development) (Boarman et al. 2006).

Impacts to the eastern small-footed myotis would be similar in nature to those described above for federally listed bat species. Construction at the Roxana site would result in the permanent loss of approximately 49 hectares (121 acres) of potential foraging and roosting habitat. Blasting would not be conducted when bats are hibernating (November 15 through March 31). Outside of the hibernation period, vibration effects would potentially result in displacement of individual eastern small-footed myotis from roosts near blasting sites. However, such impact would be temporary and of short duration. Effects from facility lighting are anticipated to be largely concentrated in areas where trees would be cleared for construction and would no longer be suitable bat habitat. Light pollution from nighttime site lighting could result in reduced foraging, abandonment of roosts, and changes in insect populations. However, the majority of forested habitat in the Roxana site would not be impacted and would remain suitable bat foraging and roosting habitat.

Individual long-tailed shrews could inadvertently be killed or harmed during grading and other construction activities; however, long-term, permanent impacts to populations of the species would not result because the majority of suitable habitat for the species on the site would not be impacted.

Therefore, although individual state-listed species have the potential to be impacted by Modified Alternative 2 – Roxana, no state-listed species have populations that are restricted to the project area or adjacent lands. As such, Modified Alternative 2 – Roxana may impact individual state-listed species and have slight impacts on habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to a population or species.

3.8.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be developed and there would be no impacts to vegetation, wildlife, or threatened and endangered species.

3.8.4 Mitigation

As required under section 7 of the ESA, the Bureau has conducted formal consultation with the USFWS regarding potential impacts to the Indiana bat, northern long-eared bat, and gray bat. A BA was prepared by the Bureau to evaluate the potential effects of the preferred alternative (Modified Alternative 2 – Roxana) on federally listed species and determine whether any such species or habitat are likely to be adversely affected by the proposed action. Based on the analysis provided to the USFWS in the BA and coordination between the Bureau and the Kentucky Field Office of the USFWS, the USFWS has issued a BO that describes potential impacts to the federally listed species.

To minimize potential impacts to individuals or habitats affected by actions, BOs specify non-discretionary reasonable and prudent measures and terms and conditions, which are specific methods by which the reasonable and prudent measures are to be accomplished. The BO issued by USFWS for the preferred alternative (included in Appendix H, USFWS Endangered Species Act Consultation) included one reasonable and prudent measure and one term and condition, both of which state that “the Bureau shall ensure that the project will occur as designed, planned, and documented in the BA and this BO.” Therefore,
the non-discretionary reasonable and prudent measures and terms and conditions for Modified Alternative 2 – Roxana are the conservation measures listed in the BA (Copperhead Environmental Consulting 2017), and are presented below.

With implementation of Modified Alternative 2 – Roxana, the Bureau would:

1) Contribute to the Imperiled Bat Conservation Fund as compensatory mitigation for the adverse effects on Indiana bats and northern long-eared bats that would result from the permanent loss and modification of forested habitat. The contribution amount would be determined according to the process described in the Revised Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky (USFWS 2016f) or an appropriate succeeding document. Payment into the fund would be based on the acreage (currently proposed as 49 hectares [121 acres]) and time of year that forested habitat is removed. The entire contribution would be made prior to tree removal on the project site.

2) Develop an erosion and sediment control plan detailing BMPs to be implemented during construction and submit the plan to the Kentucky Division of Water for approval.

3) Implement the approved erosion and sediment control plan.

4) Avoid tree removal during the months of June and July.

5) Avoid blasting from November 15 through March 31.

6) Conduct all construction activities occurring from April 15 through October 31 in suitable Indiana bat and/or northern long-eared bat habitat during daylight hours.

7) Direct construction lighting toward construction activities and away from forested habitat during any nighttime construction activities.

8) Require contractors to inspect vehicles and equipment to ensure that visible plant and seed material has been removed prior to entering the project area.

9) Install outdoor lights (high mast, wall packs, and parking lot and sidewalk light poles) with full cutoff fixtures (emit no direct uplight) for operational activities at the facility.

10) Fence off the feature identified as a potential hibernaculum and install warning signs around the area to prevent direct disturbance.
4.0 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

CEQ regulations for implementing NEPA require EISs address the relationship between a project’s short-term impacts on the environment and the effects those impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment.

As discussed in Chapter 3 of this document and the relevant sections of the 2016 RFEIS incorporated by reference, implementation of the proposed action would result in both short- and long-term environmental effects. However, implementation of the proposed action is not expected to result in the types of impacts that would reduce environmental productivity, affect biodiversity, or permanently narrow the range of beneficial uses of the environment.

Short-term impacts associated with construction of the proposed facilities on the Roxana site, as modified, would result in impacts to the natural and built environment during the estimated 48 to 60-month period of construction. Short-term effects would include localized disruptions to traffic from construction vehicles utilizing area roadways, a temporary increase in air pollution emissions, and noise in the immediate vicinity of the affected area. Noise from construction activities would be short-term and would not be expected to result in permanent damage or long-term changes in wildlife productivity or habitat use. It is anticipated that construction of the proposed USP and FPC would generate short-term economic productivity in terms of new construction jobs, and purchasing of materials, supplies, and services.

From a long-term perspective, developing a USP and FPC would represent a long-term commitment of land use. For as long as the site is serving as a federal correctional facility, other potential land uses would be precluded. Development of the USP and FPC at the Roxana site, as modified, would clear approximately 49 hectares (121 acres) of forested area. Within the context of the undisturbed woodland area that would remain at and surrounding the site, this removal would not significantly impact the long-term natural resource productivity of the area. Depending upon their location, humans and wildlife would intermittently experience somewhat increased levels of noise during monthly firearms training and annual recertification. In terms of socioeconomic productivity, the economic viability of the Letcher County, Kentucky region would experience long-term benefits from the increased and on-going spending for goods and services to support operation of the USP and FPC and the addition of approximately 300 new permanent jobs that would need to be filled at the USP and FPC.
5.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA implementing regulations also require EISs to address irreversible and irretrievable commitments of resources that would be used if the proposed action is approved and implemented. The term “resources” (both renewable and nonrenewable) means the natural and cultural resources committed to, or lost by, the action, as well as labor, funds, and materials committed to the action.

Construction and operation of the proposed USP and FPC would involve irretrievable commitments of resources. In some cases, resources committed would be recovered in a relatively short period of time. In other cases resources would be irreversibly or irretrievably committed by virtue of being consumed or by the apparent limitlessness of the period of their commitment to a specific use. Irreversible and irretrievable commitments of resources can sometimes be compensated for by the provision of similar resources with substantially the same use or value.

Only a portion of the modified Roxana site (approximately one-third) would be required for the construction of the USP and FPC. Resources consumed as a result of the development of the federal correctional facility would be offset by the creation of the facility and the resulting societal benefits. The use of the developed portion of the land could be considered irretrievably committed.

Facility development under Modified Alternative 2 – Roxana would expend fuel and require the commitment of various construction materials, including cement, aggregate, steel, asphalt, and lumber. There is the potential, however, that these materials could be recycled at some point in the future; therefore, they may not be an irreversible or irretrievable commitment of resources. Implementation of Modified Alternative 2 – Roxana would also require the consumption of fossil fuels and electrical energy during both the construction and operation of the facility and would be considered an irretrievable commitment of these resources. The total amount of construction materials required for this action is relatively small when compared to the resources available in the region. The construction materials and energy required for construction is not in short supply; their use would not have an adverse impact on the continued availability of these resources and the energy resource commitment is not anticipated to be excessive in terms of region-wide usage. Furthermore, construction would comply, to the extent practicable, with the requirements of EO 13693, Planning for Federal Sustainability; with LEED standards, and with energy efficient standards and planning programs contained in 10 CFR 433, 10 CFR 436, and IEEE Standard 739 to minimize irreversible or irretrievable effects to multiple nonrenewable and renewable resources.

Costs associated with roadway and utility improvements to serve the site are not precisely known at this time; however, these costs would be offset by the direct economic benefits of the total project-related expenditures and the annual operating budget. Over the long term, construction of the proposed facility could result in an increase in the pace of development within Letcher County than would occur if the project were not constructed. Although the nature of such development can be controlled through the application of land use regulations, any induced land development is for all practical purposes, an irreversible and irretrievable commitment of land and materials.
6.0 CUMULATIVE IMPACTS

This chapter (1) describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts, (2) analyzes the incremental interaction the proposed action may have with other actions, and, (3) evaluates cumulative impacts potentially resulting from these interactions. The approach taken in the analysis of cumulative impacts follows the objectives of NEPA, CEQ regulations, and CEQ guidance. Cumulative impacts are defined in 40 CFR 1508.7 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. A cumulative impact results from the additive effect of all projects in the same geographical area. Generally, an impact can be considered cumulative if: a) effects of several actions occur in the same locale, b) effects on a particular resource are the same in nature, and c) effects are long-term in nature. The common factor key to cumulative assessment is identifying any potential temporally and/or spatially overlapping or successive effects that may significantly affect resources in the analysis areas.

6.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

This section identifies past, present, and reasonably foreseeable future actions not related to the proposed action that have the potential to cumulatively impact the resources in the affected environment for the proposed action and its regionally affected area. Geographic distribution, intensity, duration, and historical effects of similar activities are considered when determining whether a particular activity may contribute cumulatively and significantly to the impacts of Modified Alternative 2 – Roxana on the resources identified in the 2017 Final Supplemental RFEIS. Based on discussions with the economic development leaders for Letcher County, development within the county has not been strong and there are very few past, present, or reasonably foreseeable future actions that when combined with the proposed action would result in cumulative impacts to the resources evaluated in this 2017 Final Supplemental RFEIS (Letcher County 2016). An ongoing project in the area is the Gateway Regional Business Park. One future project identified includes a new regional airport. In addition to these projects, there are infrastructure and utility projects associated with the proposed action that have the potential to result in cumulative impacts.

6.1.1 Gateway Regional Business Park

The Gateway Regional Business Park is approximately 262 acres (106 hectares) and is located at the junction of U.S. 23 and U.S. 119, approximately 20 miles east of Roxana. The site was developed about 10 years ago and initially included eight businesses; four businesses are currently operating on the site (Letcher County 2016). The original master plan for the business park accommodated 24 lots (Appalachian Industrial Authority 2004). Construction and operation of the business park would have potential impacts to land use, topography and soils, air quality, noise, infrastructure and utilities, and water resources. The Gateway Regional Business Park has the potential to be incompatible with surrounding land uses; however, Letcher County does not have any zoning ordinances that would regulate development and compatibility. Topography and soils would have been impacted as a result of construction activities. It is anticipated that temporary impacts to air quality and noise would have occurred as a result of construction activities. Infrastructure and utilities would have the potential to be impacted due to increased demands on potable
water, wastewater treatment, natural gas, electricity, and solid waste. Additionally, the business park has the potential for water resources to be impacted by changes to drainage patterns, redirecting or increasing surface water runoff, and increases to erosion and sedimentation.

6.1.2 Letcher County Airport Project

In 2006, the Letcher County Airport Board applied to be included in the FAA’s National Plan of Integrated Airport Systems Program and be eligible to receive FAA funding for the Letcher County Airport project. The Kentucky Department of Aviation funded a site selection study, and based on the study, a site near Isom in the northern part of Letcher County was identified for development of the airport (Summit Engineering 2008). The site is approximately 8 miles from Roxana. In 2016, the airport board executed a purchase option for 243 hectares (600 acres) (Letcher County 2016). Preparation of an EIS is expected to begin in late summer or fall of 2017 (Letcher County 2017). Potential impacts resulting from the project could include land use, topography, geology, and soils, air quality, noise, infrastructure and utilities, cultural resources, water resources, and biological resources. Siting of the airport may have impacts to land use compatibility with adjacent land uses. Excavation and grading activities to prepare the site for development may result in changes and impacts to topography, geology, and soils. Both temporary and long-term impacts to air quality could occur as the result of construction and operation activities of the airport. Temporary and long-term impacts due to increases in noise would likely result from construction activities and the operation of aircraft. It is anticipated that infrastructure and utilities would have increased demands placed on them during construction as well as operation of the airport. Other impacts that could result due to construction of the airport include cultural, water, and biological resources.

6.1.3 Infrastructure and Utility Projects

Modified Alternative 2 – Roxana would require utility companies to upgrade facilities, extend cable, and construct new facilities to provide service to the proposed USP, FPC, and ancillary facilities. These projects would be dependent on the preferred alternative and conducted by the individual utility company.

Letcher County has five future sewer extension projects planned in the vicinity of Whitesburg (Kentucky Infrastructure Authority 2017). These projects would provide service to residents with failing septic systems or to those using direct discharge to waterways via straight pipes. These projects are reasonably foreseeable in the future, but have not been funded. Letcher County has many residents using illegal straight pipes that have not yet been included in future sewer projects. These residential areas may ultimately be included in future wastewater infrastructure planning.

In fall 2016, the LCWSD began planning for the construction of a new WWTP in Roxana after determining a decentralized treatment plant would be more viable and cost effective than extending sanitary sewer infrastructure (LCWSD 2017a). The proposed WWTP would be an extended aeration type package plant designed to treat up to 300,000 gallons per day (Kentucky Infrastructure Authority 2017). LCWSD engineers have surveyed a few sites for the new WWTP, but as of June 2017, no site had been chosen (LCWSD 2017b). The plant would be owned and operated by the LCWSD. However, project implementation would be dependent on the Bureau’s preferred alternative for the proposed USP and FPC.

Information is not available on potential environmental impacts for the five future sewer extension projects, and no site has been chosen for the new WWTP. However, it is assumed these projects have the potential to impact land use, soils, air quality, noise, infrastructure and utilities, cultural resources, water resources, and biological resources. The projects have the potential to be incompatible with surrounding land use,
disturb soils that could result in erosion and sedimentation issues, result in temporary increases to air emissions and temporary air quality impacts, result in temporary noise impacts due to construction activities, and impact cultural, biological, and water resources depending on the type and location of the upgrade or new construction and placement of cable. The projects would also result in a cumulative impact on the demand for wastewater treatment.

6.2 PROPOSED ACTION

Implementation of the proposed action would have potential impacts to land use, topography, geology, and soils, air quality, noise, infrastructure and utilities, water resources, and biological resources. The proposed action would result in conversion of land uses. Letcher County does not have any zoning ordinances that would regulate development and compatibility. Nonetheless, the buffer area to be maintained around the federal correctional facility would be compatible with adjacent land uses. The proposed action would disturb and redistribute soils, rock, and spoil material, resulting in significant impacts on topography, geology, and soils within the Roxana site under Modified Alternative 2. These impacts would be managed through the use of appropriate BMPs to prevent erosion and sedimentation and surface water and stormwater drainage controls to manage runoff. The proposed action would also contribute to temporary increases in noise levels for the duration of construction, and increase local air emissions, as well as have an overall contribution to greenhouse gases. Under Modified Alternative 2 – Roxana, the proposed action would have a significant impact to natural gas infrastructure. Implementation of the proposed action under Modified Alternative 2 – Roxana would have adverse impacts on streams and wetlands. The proposed action would result in impacts to vegetation and to potential summer roosting and foraging habitat for the Indiana bat and northern long-eared bat during construction of the federal correctional facility. In addition, vibration from blast noise would potentially impact a hibernaculum considered suitable for use by Indiana, northern long-eared, or gray bats.

6.3 POTENTIAL CUMULATIVE IMPACTS

6.3.1 Land Use

When past, present, and reasonably foreseeable future projects are analyzed together, there would be changes to land use from projects in Letcher County. The Letcher County Airport project has the potential to impact land use due to the conversion of approximately 243 hectares (600 acres) of land to transportation use (Letcher County 2016). The site for the proposed Roxana WWTP has not yet been chosen; however, it would have the potential to change land use. Impacts from the Roxana WWTP could be minimized through the siting of the facility, which as an extended aeration type plant, typically has a relatively small footprint and can be landscaped to blend with the surrounding area (USEPA 2000). Modified Alternative 2 – Roxana would likely contribute to permanent impacts to land use. However, Letcher County does not have any zoning ordinances regulating development and compatibility. Nonetheless, under Modified Alternative 2 – Roxana, land use compatibility issues with adjacent properties would be minimized through the siting of the facility and use of forested buffer areas to reduce potential incompatibility issues with surrounding residences and undeveloped areas. Implementation of Modified Alternative 2 – Roxana along with past, present, and reasonably foreseeable future projects would result in cumulative impacts to land use; however, the impacts would not be significant.
6.3.2 Topography, Geology, and Soils

Excavation and grading activities associated with the past, present, and reasonably foreseeable future projects would impact topography, geology, and soils. Modified Alternative 2 – Roxana in conjunction with these other projects would result in significant impacts to topography, geology, and soils. However, erosion and sedimentation and surface water and stormwater controls would be employed for all construction projects as required by federal and state regulations, and the impacts would be managed through the use of appropriate BMPs.

6.3.3 Air Quality

As discussed in Section 3.3, Air Quality, increases in air emissions for criteria pollutants that would occur from implementation of the proposed action under Modified Alternative 2 – Roxana would have no direct or indirect significant impacts on local or regional air quality. As a result, this cumulative impacts analysis focuses on greenhouse gases (GHGs). Since individual sources of anthropogenic GHG emissions are not large enough to have an appreciable effect on climate change and the potential effects of proposed GHG emissions on climate change are global by nature, the study area for this aspect is not defined.

GHGs are gases in the Earth’s atmosphere that prevent heat from escaping into space, resulting in climate change as the Earth’s surface temperature increases above past levels. GHGs result primarily from the combustion of fossil fuels, and include carbon dioxide (CO\textsubscript{2}), methane (CH\textsubscript{4}), nitrous oxide (N\textsubscript{2}O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF\textsubscript{6}), and nitrogen trifluoride. EO 13693, Planning for Federal Sustainability in the Next Decade, was enacted to address GHGs, including GHG emissions inventory, reduction, and reporting. Emission sources evaluated in this 2017 Final Supplemental RFEIS are associated with construction and site operations. The primary GHG emission associated with these sources is CO\textsubscript{2}, and to a lesser extent, CH\textsubscript{4} and N\textsubscript{2}O. For diesel powered construction equipment, only CO\textsubscript{2} was calculated due to the limited duration of construction and the limited quantity of CH\textsubscript{4} and N\textsubscript{2}O emitted, which represent a very small fraction of the total GHG emissions, even taking into account their longer atmospheric lifetime. All three GHGs were included in the operational analysis as these emissions are ongoing and have no specified time limits.

GHGs are produced from the burning of fossil fuels, as well as through industrial and biological processes. There are no published NEPA thresholds of significance for GHG emissions resulting from a proposed action and formulation of thresholds is difficult when attempting to identify what level of emissions would substantially contribute to global climate change. The cumulative effects for GHG emissions were evaluated for the proposed construction and subsequent operation activities. Detailed calculations can be found in Appendix C, Air Emissions Calculations.

Table 6-1 presents the GHG emissions associated with the proposed construction activities under Modified Alternative 2 – Roxana. In addition to GHGs that would be generated by the operation of equipment during construction, there is also the overall reduction in carbon sequestration capability that would result from the loss of 49 hectares (121 acres) of vegetation that would be cleared during site development. After the site is developed, a portion of it would be re-vegetated with trees, although the portion that can be re-vegetated would be a fraction of the total acreage. As a result, approximately 45 hectares (110 acres) of long-term carbon storage would be permanently lost, which is an estimated annual storage loss of 2,141 metric tons of CO\textsubscript{2} using the method developed by the U.S. Department of Agriculture Forest Service to calculate carbon sequestration in a forest approximately 25 years old (Smith et al. 2006).
Table 6-1. Estimated GHG Emissions from Construction Activities and Operations under Modified Alternative 2 – Roxana

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<th>Year^</th>
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<tr>
<td>2</td>
<td>4,644</td>
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<td>3</td>
<td>4,644</td>
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<tr>
<td>Annual Operations</td>
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Note: 1. Estimates assume heavy equipment operations would conclude by the end of the third year of construction.

The GHG emissions associated with the proposed operation of stationary sources (boilers and emergency generators) and staff commuter emissions once the facilities are operational would be approximately 1,271 metric tons per year. These emissions would occur throughout the life of the operating facility.

Construction and operation of two of the past, present, and reasonably foreseeable future projects have the potential to result in emissions of GHGs that contribute to climate change when considered in conjunction with Modified Alternative 2 – Roxana: the Letcher County Airport project and the Roxana WWTP. The Letcher County Airport project would likely have long-term operational emissions. The amount of emissions for any of the criteria pollutants is not known at this time, and would be dependent on the type and frequency of aircraft operations at the airport. The LCWSD is proposing to construct an extended aeration type package WWTP in Roxana to treat up to 300,000 gallons per day. Based on the technology associated with this type of treatment plant and the proposed treatment capacity, the estimated GHG emissions associated with the annual operation of the Roxana WWTP would be approximately 17 metric tons per year (refer to Appendix C, Air Emissions Calculations).

Individual sources of anthropogenic GHG emissions are not large enough to have an appreciable effect on climate change. For this reason, emissions of GHGs from the proposed action alone would not cause appreciable global warming that would lead to climate change. These emissions would increase the atmosphere’s concentration of GHGs, and, in combination with past and future emissions from all other sources, contribute incrementally to the global warming that produces the adverse effects of climate change. As a result, a net small, adverse impact would result from the development and operation of the proposed action.

6.3.4 Noise

There is potential for construction of additional businesses at the Gateway Regional Business Park, the Roxana WWTP, or certain other infrastructure and utility projects to overlap with the construction of Modified Alternative 2 – Roxana. Therefore, there would be potential for cumulative noise impacts in the vicinity of Roxana from construction activities and construction vehicles traveling to/from the project site. Construction activities would be limited during certain days and hours during the week to minimize impacts. These cumulative impacts would be temporary and not significant. No significant impacts to sensitive noise receptors are anticipated from firearms training or other operational noise. Operation of the Roxana WWTP would generate noise. The resulting impact to sensitive noise receptors, however, is not known at this time. Increases in noise levels would be anticipated from aircraft operations at the Letcher County Airport; however, these impacts would be considered infrequent. Implementation of Modified Alternative 2 – Roxana along with past, present, and reasonably foreseeable future projects would not result in significant cumulative noise impacts.

6.0 Cumulative Impacts

September 2017
6.3.5 Infrastructure and Utilities

Modified Alternative 2 – Roxana would contribute to cumulative impacts on infrastructure and utility demand. The demand for treatment of wastewater under Modified Alternative 2 would increase the LCWSD’s WWTP to approximately 87 percent of its current design capacity; therefore, Modified Alternative 2 – Roxana combined with reasonably foreseeable future projects would potentially exceed the capacity of the plant and be a significant impact. However, most of the future projects in the LCWSD and Whitesburg service area currently do not have funding and have not been programmed for construction. The effort to include the existing pending projects and any potential future projects requires extensive planning and would need to be approved through the facilities planning and approval process (City of Nesbitt 2015). Each county sewer service owner prepares a regional facilities plan approximately every 10 years.

The LCWSD is currently planning for and designing a new wastewater treatment facility in Roxana. As planned for by the LCWSD, the new WWTP in Roxana would add 300,000 gallons per day of additional capacity, and could service the new federal correctional facility (Bell Engineering 2017; Kentucky Infrastructure Authority 2017). The LCWSD determined a new decentralized facility is a more viable option for extending service to Roxana than new sanitary sewer infrastructure. The LCWSD recently submitted the project proposal to the Kentucky River Area Development District for funding (LCWSD 2017a; Bell Engineering 2017). The timing of the future sewer projects and future planning for expansion of wastewater treatment capacity within Letcher County would minimize the cumulative impacts of Modified Alternative 2 – Roxana.

6.3.6 Water Resources

Implementation of Modified Alternative 2 – Roxana along with past, present, and reasonably foreseeable future projects would disturb soils and would result in temporary increases in soil disturbance and potential soil erosion and a permanent increase in impervious surfaces in the area, with a consequential increase in stormwater runoff. Implementation of BMPs as parts of an erosion and sediment control plan and groundwater protection plan for construction would minimize these impacts. Under Kentucky regulations, the Letcher County Airport and Roxana WWTP, and likely also the Gateway Regional Business Park, would require a groundwater protection plan. This assessment assumes these projects would implement BMPs to limit erosion and runoff. Therefore, cumulative impacts to local water resources would not be significant.

Modified Alternative 2 – Roxana would adversely affect approximately 1,710 meters (5,610 linear feet) of streams and 0.98 hectare (2.44 acres) of wetlands. The Bureau would obtain a permit for streams and wetlands impacts from the USACE under CWA Sections 401 and 404, which would require full mitigation of impacts. The mitigation would reduce the direct impacts to less than significant. Direct impacts to wetlands and streams by the other past, present, and reasonably foreseeable future construction projects are unknown. Given the size of the projects, particularly the Letcher County Airport, impacts to wetlands or streams would be expected. Compliance with federal regulations for wetlands and stream impacts would require full mitigation of impacts. As a result, cumulative impacts would not be significant.

6.3.7 Biological Resources

Implementation of Modified Alternative 2 – Roxana would involve ground disturbing activities and tree clearing for construction of new facilities. Direct impacts to forested land would comprise an estimated 49
hectares (121 acres). When considered cumulatively, it is anticipated that the past, present, and reasonably foreseeable future projects in the area would result in the development of several hundred acres of land in Letcher County. Much of this land is forested. The cumulative loss of several hundred acres of forest would constitute a loss of a small fraction of forested land within the 338 square mile land area of Letcher County, and is not considered to be significant.

Construction-related noise has the potential to temporarily disturb wildlife in the immediate vicinity of the project area. Permanent impacts to wildlife would result from the cumulative loss of habitat from construction of Modified Alternative 2 – Roxana and cumulative projects in the area. Wildlife populations would be permanently displaced by the past, present, and reasonably foreseeable future projects, however, suitable habitat would be available on adjacent land areas. Under the proposed action, more than two-thirds of the project site under Modified Alternative 2 – Roxana would remain undisturbed and continue to provide habitat for wildlife found on-site. Therefore, cumulative impacts to wildlife would not be significant.

Modified Alternative 2 – Roxana would impact summer roosting and foraging habitat of the federally endangered Indiana bat and threatened northern long-eared bat and a winter hibernaculum that would be considered suitable for use by the Indiana bat, northern long-eared bat, or the federally endangered gray bat. The Bureau would mitigate the impacts to federally listed bats. Conservation measures would also be implemented to minimize potential direct and indirect impacts to these bat species from site lighting. Cumulative impacts to these bat species and their habitat could result from construction and operation of the Letcher County Airport and the Roxana WWTP; however, specific impacts are not known at this time. If mitigation and conservation measures are implemented for both of those projects, it is anticipated that the cumulative impacts to federally listed bats would not be considered significant.
7.0 REFERENCES


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8.0  LIST OF PREPARERS

Federal Bureau of Prisons
Cheryl Ciccone, Acting Chief,
Capacity Planning and Construction
Issac Gaston, Site Selection Specialist
Jody Smith, Senior Project Manager, Capacity
Planning and Construction

Cardno
Cristina Ailes – Public Involvement Specialist
  B.S. Environmental Science
  B.A. International Studies
  Years of Experience: 8

Jim Campe – Noise
  B.S. Naval Architecture and Offshore
  Engineering
  Years of Experience: 27

Erika Fuery – Hazardous Materials and Waste
  M.S. Environmental Science
  Years of Experience: 16

Kathy Hall – Quality Control
  B.A. Earth and Environmental Sciences
  Years of Experience: 18

Lesley Hamilton – Air Quality
  B.A. Chemistry
  Years of Experience: 29

Bruce Ikelheimer – Noise
  Ph.D. Mechanical Engineering
  Years of Experience: 22

Kathleen Riek – Project Director; Land Use;
  Noise
  B.S. Biology
  Years of Experience: 25

Clint Scheuerman – Biological Resources
  M.S. Biological Sciences
  Years of Experience: 13

Abby Shoff – GIS Specialist, Graphics
  B.S. Geographical Information Systems
  Years of Experience: 5

Lori Thursby – Project Manager; Archaeological
  Resources
  M. Architectural History
  Years of Experience: 21

Jill Yamaner – Infrastructure and Utilities
  M.S. Environmental Engineering
  Years of Experience: 24

Dale Nicholson – Grading and Excavation
  Modeling
  B.S. Civil Engineering
  Years of Experience: 37

John Feddock – Quality Control Grading and
  Excavation Modeling
  M.S. Mining Engineering
  Years of Experience: 47

Earl Chornsbay – Cut and Fill Modeling
  Years of Experience: 33

Cardno’s signed conflict of interest statement is included in Appendix K.
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9.0 DISTRIBUTION LIST

Federal Elected Officials

Senator Mitch McConnell
  317 Russell Senate Office Building
  Washington, DC 20510

Representative Harold Rogers
  2406 Rayburn House Office Building
  Washington, DC 20515

State Elected Officials

Governor Matt Bevin
  700 Capitol Avenue, Suite 100
  Frankfort, KY 40601

Representative Leslie Combs
  245 E. Cedar Drive
  Pikeville, KY 41501

Representative John Short
  240 Briarwood Lane
  Mallie, KY 41836

Local Elected Officials

James Craft
  Mayor of Whitesburg
  38 East Main Street
  Whitesburg, KY 41858

Todd DePriest
  Mayor of Jenkins
  P.O. Box 568
  Jenkins, KY 41537

Honorable Jim Ward
  Letcher County Judge Executive
  156 Main Street, Suite 107
  Whitesburg, KY 41858

Honorable Edison G. Banks, II
  Judge, 47th Circuit
  48 East Main Street
  Whitesburg, KY 41858

Senator Rand Paul
  167 Russell Senate Office Building
  Washington, DC 20510

Senator Johnny Ray Turner
  849 Crestwood Drive
  Prestonsburg, KY 41653

Honorable Samuel Wright
  Supreme Court of Kentucky
  P.O. Box 64
  Mayking, KY 41837

Honorable Kevin R. Mullins
  District Judge of the 47th Judicial District
  156 Main Street, Suite 101C
  Whitesburg, KY 41858

Terry Adams
  District 2 Magistrate
  P.O. Box 488
  Isom, KY 41824

Keith Adams
  District 4 Magistrate
  P.O. Box 5
  Jeremiah, KY 41826

James Bates
  Whitesburg City Council
  38 East Main Street
  Whitesburg, KY 41858
Robin Bowen-Watko  
Whitesburg City Council  
27 Della Drive  
Whitesburg, KY 41858

Larry Everidge  
Whitesburg City Council  
38 East Main Street  
Whitesburg, KY 41858

Tom Sexton  
Whitesburg City Council  
38 East Main Street  
Whitesburg, KY 41858

Sheila Short  
Whitesburg City Council  
181 Shady Drive  
Whitesburg, KY 41858

Earlene Williams  
Whitesburg City Council  
146 Maryland Drive  
Whitesburg, KY 41858

Federal Agencies

U.S. Environmental Protection Agency – EIS  
Filing Section

Ntale Kajumba  
U.S. Environmental Protection Agency  
Region 4  
61 Forsyth Street  
Atlanta, GA 30303

David Baldridge  
U.S. Army Corps of Engineers  
Louisville District  
845 Sassafras Creek Road  
Sassafras, KY 41759

Jamie Hatton  
County Attorney  
95 A Main Street  
Whitesburg, KY 41858

Danny Webb  
Sheriff  
6 Broadway Street  
Whitesburg, KY 41858

Bob Howard  
247 Tunnel Road  
Whitesburg, KY 41858

Don McCall  
156 Main Street  
Whitesburg, KY 41858

Rebecca Amburgey  
Jenkins City Council  
P.O. Box 436  
Whitesburg, KY 41858

Michaela Noble  
U.S. Department of the Interior  
Office of Environmental Policy and Compliance  
1849 C Street, NW/MS 5547-MIB  
Washington, DC 20240

Lee Andrews  
U.S. Fish and Wildlife Service  
Kentucky Field Office  
330 W Broadway, Suite 265  
Frankfort, KY 40601
### State Agencies

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<td>Energy and Environment Cabinet</td>
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### Local Agencies

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<td>Letcher County Economic Development</td>
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<td>Box 186, Jenkins, KY 41437</td>
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<td>Letcher County Planning Commission</td>
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### Organizations

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Individuals

Citizen of SW Virginia [name not provided] Marty Baker
Michael [last name not provided] Shad Baker
Barbara Adams George Ball
Bobby Adams Ranko Balog
Cheryl Adams Ruth Bamberger
D. Adams Scott Banbury
Danielle Adams Lundy Bancroft
Darren Adams Christopher Bangs
Dickie Adams Bob Banks
Douglas Adams Davis Banks
Frank Adams Nancy Banks
Hettie Adams Ian Baran
Jeannie Adams Ellen Barfield
Paul Adams Jerry and Alberta Barker
Trish Adams Hope Barrows
Wade Adams Sally Barto
Larry Adams (Hazard, KY) Christopher Bates
Larry Adams (Isom, KY) Connie Bates
James Akers Danny and Dionne Bates
India Allen Wendy Bates
Terry Allen Duane Beachey
Keith Alnwick Augustine Beard
Stephen Amber Leslie Bebensee
Kayla Amburgey Benjamin Becker
Shane Amburgey Benny Becker
Emily Anderson Alice Beecher
Karen Anderson Alice Beecher
Tina Ann Alexandra Beer
Reevyn Aronson Alexandra Beer
Donna Aros Wendy Bentley
Christina Atkins John Bergen
David Atteberry Dan Berger
Dominique Aulisio Dan Berger
Alta Bailey Jimmy Betts
Craig Baily Marlene Bielecki
Kevin and Courtney Baker Scottie Billiter
Benjamin Blair
Clyde Blair
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Ken Bowman
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Shirley Breeding
Tim Breeding
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Jorge Chang
Stacie Charlebois
William Childers
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Sarah Clark           Rick Damron
Ryan Clover-Owens    Lisa Daniels
Robin Kunkel Code     Aeryn Darst
Jacob Colley          Maggie Davidson
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Patricia Collins      Brenda Day
Victoria Collins      Carol Day
Heather Combs         Dauphus Day
Johnny Combs          Vera De Chalambert
Trudi Connolly        Suki DeJong
Debbie Cook           Hunter Demster
Rebecca Cook          Paul Densmore
Sandra Cook           Gary Denton
Cara Cooper           Joe and Brenda DePriest
Heather Corbett       Todd DePriest
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Delana Cornett        Daniel Dixon
Elwood Cornett        Eric Dixon
Kenneth Cornett       Jennifer Dixon
Ralph Cornett         Willie Dodson
Terry Cornett         Jack Dresser
Annie Jane Cotten     Roger Drew
Michael Coyle         Emily Earl
Cindy Crabb           Andrea Eldridge
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Anna Craft            Hazel Eldridge
Roland Craft          Miriam Elliott
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Amy Crawford          Cesar Esmeral
Gary and Sandy Creech Sarah Estep
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Kate Culver           Chasity Eversole
Phil Cunningham       Star Fae
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Jean Curry            Stacy Federico
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Robert Hares  Bobby Ison
Jill Harmer  Danny Ison
Jill Harmer  James Ison
Peter Harrell  Kendall and Carol Ison
Rita Harris  Marshall Ison
Crystal Hart  Patricia Ison
Jill Hatch  Sherwood and Rhoda Ison
Jill Hatel  Mike Jackson
Douglas and Alice Hayes  Ozz Jackson
Helgaleena Healingline  Eliza Jane
Renee Heberle  Jack Jarrell
Gabrielle Helle  Jeremy Jenkins (Lexington, KY)
Jon Henrikson  Jeremy Jenkins (Somerset, KY)
Julie Herrada  Cara Jennings
Natasha Hester  Elizabeth Jennings
William Hibbitts  Brian Johnson
Tyler Hill  James Johnson
Jarrad Hipps  Tonya Johnson
Connie Hogg  Alexys Jones
Sandy Hogg  Elizabeth Jones
Angie Holbrook  Spencer Kaaz
Sheila Holbrook  Eleni Kalfus
Tammy Holbrook  Molly Kaviar
Robert Holcomb  Maria Kenney
Jonathan Hootman  Ellis Keyes
Jack Hornnickel  James Kincaid
Caleb Howard  Brenda Kincer
Sarah Howard  G. Kincer
Julia Howell  Robin and Dwayne Kincer
Peter Howland  Sandra Kincer
J Howse  Annette and Pat King
Henry Hughes  Eric King
Kathy Hughes  Larry King
Patrycja Humienik  Heather Kinney
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2017 Final Supplemental Revised Final Environmental Impact Statement for USP and FPC
Letcher County, Kentucky

9.0 Distribution List
September 2017
S. Mandisa Moore-O'Neal
James Moroney
Belinda Morris
Evaleena Mullins
Mahala Mullins
Meghan Mullins
Carol Murphy
Annette Napier
Durward and Deborah Narramore
Lisa Narramore
Brady Nash
Jack Neff
Rachael Neffshade
Kyla Neilan
Paul Nesbitt
Psra Newman
Winglock Ng
Tanya Nguyen
Michelle Nickels
Gabriella Nunez
Freddy Oakes
Pierre Oakes
Warren Oakes
Cecelia O'Brien
Scott Odierno
Cassie Odom
Tyler Offerman
Faith Oglesby
Jenny O'Neill
Chris Oney
Kimberly Ong
Avigail Oren
Patricia Orlinski
Stanley Osborne
Nick Paliughi
Wai Ling Pang
Annabelle Parker

Scott Parkin
Leslie and Paul Parsons
Lee Patrizzi
Ike Patterson
David Pellow
Robert T. Perdue
James and Rhonda Perry
Jennifer Persha
Zach Pesch
Jamie Phillips
Rodney Pigman
Basilis Piperas
Charlotte Pirch
Gabriel Piser
Susan Polis
Lona Leigh Pomraning
Nancy Porter-Steele
Emily Posner
Mira Posner
Angel Poveromo
Trina Powers
Gary and Rita Pratt
Taylor Prince
Stephen Proffitt
Lill Prospenno
Patricia Purdy
Angel Putney
Bill Quigley
Maxine Quillen
Miclan Quorpenccetta
Leah Raczynski
Cailey Radcliffè
Stephen Raher
Jourdan Rahschulte
Dana Rasso
Emily Ratner
Tarence Ray
JoAnn Redmond
Teresa Reynolds
Ben Reynoso
Danna Richardson
Stephen C. Richter
Ian Ries
Ryan Riley
Sarah Riveros
Joanne Robb
Jessica Rocksein
Ned Rollins
Cathy Rose
April Rosenblum
Cindy Rosin
Alexander Ross
Leah Rothschild
Stian Roussell
Wendy Madden Rutherford
Therese Ryan
Eileen Sanders
Elizabeth Sanders
Janet Sandlin
Virginia Sandusky
Quentin Savage
Charles Saxton
Ann Sayer
Nancy Scheaffer
Judah Schept
Ryan Seal
Debbie Sequichie-Kerchee
Corinne Sereni
Delmar Sergent
Tony Sergent
David and Linda Setzer
Brian Sewell
Francis and Jan Sexton
Jeannie Sexton

Jill Sexton
Lovell Sexton
Michael Sexton
Tom Sexton
Jon Shaughnessy
Susan Shawn
Sybil Shell
Mike Shepard
Michael Shepherd
Caleb Short
Hubert Short
Susan Short
Carl Shoupe
Robert Shubert
Anthony Silvaggio
Tony Silvaggio
David Simms
Jae Sledge
Danielle Slone
Eugene Slone
Misty Slone
Joshua Smallwood
Sharon Smallwood
Walter Smelt
Ada Smith
Karen Smith
Katherine Smith
Kyle Smith
Matthew Smith
Will Smith
Nathan Snowden
Kim Socha
Robert Soley
Juanita Spangler
Duran and Dena Sparkman
Major Sparks
Marjorie Sparks

9.0 Distribution List
September 2017
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